Modeling Quality Assurance Project Plan for the Temperature Total Maximum Daily Loads in the Rogue River Basin

May 2022

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Abbreviations

AWQMS	Ambient Water Quality Monitoring System
BLM	United States Bureau of Land Management
DEQ	Oregon Department of Environmental Quality
DMR	Discharge Monitoring Report
DRI	Desert Research Institute
EQC	Oregon Environmental Quality Commission
LBWSC	Little Butte Creek Watershed Council
MRRF	Medford Regional Reclamation Facility
MWC	Medford Water Commission
NCDC	National Climatic Data Center
NPDES	National Pollutant Discharge Elimination System
OAR	Oregon Administrative Rule
OCS	Oregon Climate Service
OWRD	Oregon Water Resources Department
QAPP	Quality Assurance Project Plan
RAWS	Remote Automatic Weather Stations
RWRF	Regional Water Reclamation Facility
STP	Sewage Treatment Plant
TIR	Thermal Infrared Radiometry
TMDL	Total Maximum Daily Load
USACE	United States Army Corps of Engineers
USBR	United States Bureau of Reclamation
USEPA	United States Environmental Protection Agency
USFS	United States Forest Service

USGS	United States Geological Survey
WQX	Water Quality Exchange
WRIS	Water Rights Information System
WWTP	Waste water treatment plant

1 Introduction

This Quality Assurance Project Plan (QAPP) summarizes the modeling approach to be used for the replacement temperature TMDLs applicable within the Applegate Subbasin (17100309), the Illinois Subbasin (17100311), the Lower Rogue Subbasin (17100310), the Middle Rogue Subbasin (17100308), and the Upper Rogue Subbasin (17100307). This group of subbasins collectively make up the watershed drainage area for the Rogue River. In this document this area is being called the Rogue River Basin.

A TMDL is a water quality restoration plan and the calculation of the maximum amount of a pollutant that a waterbody can receive while still meeting water quality standards for that particular pollutant. The maximum amount of loading a waterbody can receive is called the loading capacity. Loading from all pollutant sources must not exceed the loading capacity (TMDL) of a waterbody, including an appropriate margin of safety.

Load allocations are portions of the loading capacity that are allocated to background sources or non-point sources, such as urban, rural agriculture, or forestry activities. Wasteload allocations are portions of the total load, which are allocated to NPDES permitted sources, such as wastewater treatment plants or industries. Wasteload allocations are used to establish effluent limits in NPDES discharge permits. Allocations may also be reserved for future uses, called reserve capacity. Allocations are quantified measures that assure water quality standards will be met and may distribute the pollutant loads between nonpoint and point sources. This general TMDL concept is represented by Equation 1.

$$TMDL = \sum WLA + \sum LA + Reserve\ Capacity + MOS \qquad \text{Equation 1}$$

Where $\sum WLA$ is the sum of wasteload allocations (NPDES permitted sources), $\sum LA$ is the sum of load allocations (nonpoint sources and background), *Reserve Capacity* is allocations reserved for future uses, and *MOS* is a margin-of-safety to account for uncertainty. For a temperature TMDL, these elements establish the maximum thermal loads that a waterbody may receive without exceeding applicable water quality standards for temperature designed to protect aquatic life and other beneficial uses.

The Clean Water Act requires TMDLs be developed for waterbodies that do not meet water quality standards and are listed as water quality impaired on the State's 303(d) list. The Rogue River Basin contains several waterbodies listed on the Oregon 2018/2020 Section 303(d) Category 5 list as water quality limited for temperature (Table 1). Multiple TMDLs that were previously developed for the Rogue River Basin (DEQ, 2004; DEQ, 2007; and DEQ, 2008) must be replaced due to recent litigation. As part of this project, DEQ will also update three Rogue Basin watershed temperature TMDLs in the Sucker Creek and Lobster Creek Watersheds (DEQ, 1999b; DEQ 2002a; DEQ 2002b) that were not included in the litigation.

In 2013, the United States Environmental Protection Agency (USEPA) disapproved the Natural Conditions Criterion contained in Oregon's water quality standard for temperature due to the 2012 U.S. District Court decision for NWEA v. EPA, 855 F. Supp. 2d 1199 (D. Or., 2012). This portion of the temperature water quality standard was used in most temperature TMDLs issued from 2003 through 2012. On October 4, 2019, the U.S. District Court issued a judgment for NWEA v. EPA, No. 3:12-cv-01751-HZ (D. Or., Oct. 4, 2019) and required DEQ and USEPA to replace 15 Oregon temperature TMDLs that were based on the Natural Conditions Criterion and to reissue the temperature TMDLs based on the remaining elements of the temperature water quality standard.

This QAPP is consistent with DEQ's and USEPA's modeling QAPP guidance (DEQ, 2017; EPA, 2016) and documents the analysis and numerical modeling approach that will support the updated Rogue River Basin temperature TMDLs as well as providing other project details. In particular, this QAPP details the following:

- Definition of the issue and objectives, including the spatial and temporal extents of the water quality impairments (Section 2);
- A high-level description of the key processes and variables for temperature (Section 3);
- The overarching technical approach, including the appropriate modeling and analytical tools to be used (Section 4);
- The data sources for defining and creating inputs to the model, including data that were used in the modeling for the original TMDLs. Examples of these inputs include meteorological data, stream flow and temperature, point sources and vegetation characteristics (Sections 5 and 6);
- How the analysis and modeling will be evaluated for acceptability (Sections 7 and 9);
- Scenarios for evaluating management strategies for reducing anthropogenic thermal loads (Section 10);
- Various aspects for managing the replacement TMDLs development project, including documentation (Section 8), the project team (Section 11), data and records management (Sections 12 and 13); and
- Aspects relating to this QAPP and its role in the project (Sections 14 and 15).

2 Problem definition and management objectives

Multiple waterbodies in the Rogue River Basin do not meet the water quality standards for temperature and are listed as Category 5 and Category 4A, water quality limited on Oregon's 2018/2020 Section 303(d) list (Table 1 and Table 2). The temperature water quality standards are set at a level to protect the most sensitive beneficial uses. The beneficial uses most sensitive to water temperature are fish and aquatic life. The temperature water quality standards in the Rogue River Basin include the numeric criteria identified below. The numeric temperature criteria are based on a seven-day average daily maximum continuous measurement of temperature.

- Salmon and Steelhead Spawning: 13.0 deg-C (OAR 340-041-0028(4)(a))
- Core Cold Water Habitat: 16.0 deg-C (OAR 340-041-0028(4)(b))
- Salmon and Trout Rearing and Migration: 18.0 deg-C (OAR 340-041-0028(4)(c))

Where and when the applicable criteria apply are based on the designated fish uses maps in OAR 340-041-0271 Figure 271A and Figure 271B. The fish use designations and applicable criteria are shown in the HTML interactive map that accompanies this QAPP and is referenced in Appendix D.

The temperature standard authorizes insignificant additions of heat from human sources in waters that exceed the applicable temperature criteria as follows: Following a temperature TMDL or other cumulative effects analysis, the Human Use Allowance (HUA) will restrict all NPDES point sources and nonpoint sources to a cumulative increase of no greater than 0.3 deg-C (OAR 340-041-0028(12)(b)).

As described in Section 1, the U.S. Environmental Protection Agency (USEPA) and State of Oregon (OR) are required to revise the water temperature TMDLs for the Rogue River Basin. In revising the TMDLs, all of the allocations will be updated to target the applicable biologically-based numeric criteria (BBNC) and Human Use Allowance (HUA) water quality temperature standards.

Since the issuance of the original TMDLs, the extent and number of waterbodies that are identified as water quality limited for temperature has changed. As part of the TMDL update, DEQ will address all current temperature listings based on the most recent integrated report list. The current listings, as they pertain to the Rogue River Basin QAPP project area, were obtained from Oregon's 2018/2020 Integrated Report and are summarized in Table 1 and Table 2. The listings are also shown in the HTML interactive map that accompanies this QAPP and referenced in Appendix D.

To the extent existing data and information allow, the primary analysis and modeling objectives for this TMDL include:

1) Complete a source assessment and cumulative effects analysis to characterize or identify:

    a. Anthropogenic sources of stream temperature warming;
    b. How much warming comes from background sources;
    c. How much warming comes from each anthropogenic source or source category;
    d. The cumulative warming from all anthropogenic sources combined;
    e. Where along the stream anthropogenic warming occurs;
    f. Where the point of maximum stream warming is located; and
    g. The amount of stream warming that exceeds the human use allowance and applicable water quality standards.

2) Determine TMDL elements and allocations that attain the applicable temperature criteria by identifying:

    a. The thermal loading capacity for each temperature listed waterbody;
    b. The excess thermal load exceeding the loading capacity for each temperature listed waterbody;
    c. The thermal load and wasteload allocations necessary to meet the applicable water quality standards for each listed waterbody;
    d. Any surrogate measures;
    e. Any reserve capacity;
    f. Any margin of safety; and
    g. The seasonal variation and critical conditions corresponding to the time period when the applicable temperature criteria are exceeded.

3) Support development of the TMDL Water Quality Management Plan and evaluate implementation options.

    a. Evaluate existing land management plans, TMDL implementation plans, or rules for sufficiency in minimizing anthropogenic warming to the level established by the TMDL allocations.
    b. Identify additional management strategies or surrogate measures.
    c. Identify under what timeline and where management strategies need to be implemented.

The effort currently described in the QAPP includes use of existing models and the development of new models or new model scenarios.

Table 1: Rogue River Basin assessment units that are classified as water quality limited category 5 for temperature based on the Section 303(d) 2018/2020 Integrated Report.

Assessment Unit Name	Assessment Unit ID	Year Listed	Use Period
Abbott Creek	OR_SR_1710030701_02_105460	2010	Year Round
Abbott Creek Watershed	OR_WS_171003070110_02_105719	2010	Year Round
Anderson Creek	OR_SR_1710031105_02_104837	2010	Year Round
Anderson Creek-Bear Creek Watershed	OR_WS_171003080109_02_105767	2010	Year Round
Antelope Creek	OR_SR_1710030708_02_105509	2010	Year Round
Antelope Creek	OR_SR_1710030708_02_105519	2010	Year Round
Applegate Lake	OR_LK_1710030901_02_100274	2004	Year Round
Applegate River	OR_SR_1710030902_02_105603	2004	Year Round
Applegate River	OR_SR_1710030904_02_105618	2004	Year Round
Applegate River	OR_SR_1710030906_02_106343	2004	Year Round
Applegate River	OR_SR_1710030902_02_105599	2018	Spawning, Year Round
Applegate River	OR_SR_1710030904_02_105618	2018	Spawning
Applegate River	OR_SR_1710030906_02_106343	2018	Spawning
Ashland Creek	OR_SR_1710030801_02_105548	2010	Spawning
Battle Creek	OR_SR_1710030803_02_105589	2010	Year Round
Bear Creek	OR_SR_1710030801_05_105552	2010	Year Round
Bear Creek	OR_SR_1710030801_05_105552	2018	Spawning
Beaver Creek	OR_SR_1710030902_02_105600	2004	Year Round
Big Butte Creek	OR_SR_1710030704_02_105477	2010	Spawning, Year Round
Birdseye Creek	OR_SR_1710030802_02_105555	2010	Year Round
Bitter Lick Creek	OR_SR_1710030705_02_105491	2010	Year Round
Bitter Lick Creek-Elk Creek Watershed	OR_WS_171003070501_02_105736	2010	Year Round

Assessment Unit Name	Assessment Unit ID	Year Listed	Use Period
Briggs Creek	OR_SR_1710031107_02_104843	2010	Year Round
Carter Creek	OR_SR_1710030801_02_105542	2010	Year Round
Cold Creek	OR_SR_1710030803_02_105577	2010	Year Round
Coyote Creek	OR_SR_1710031003_02_104797	2010	Year Round
Dead Indian Creek	OR_SR_1710030708_02_105520	2010	Year Round
Deer Creek	OR_SR_1710031105_02_104834	2010	Year Round
Deer Creek	OR_SR_1710031105_02_104835	2010	Spawning, Year Round
East Fork Illinois River	OR_SR_1710031103_02_104825	2010	Spawning, Year Round
East Fork Illinois River	OR_SR_1710031103_02_104827	2010	Year Round
Elk Creek	OR_SR_1710030705_02_105484	2010	Year Round
Elk Creek	OR_SR_1710030705_02_105485	2010	Year Round
Elk Creek	OR_SR_1710030705_02_105485	2018	Spawning
Emigrant Creek	OR_SR_1710030801_02_105541	2010	Year Round
Emigrant Creek	OR_SR_1710030801_02_105550	2010	Year Round
Emigrant Creek	OR_SR_1710030801_02_105823	2010	Year Round
Emigrant Creek	OR_SR_1710030801_02_105824	2010	Year Round
Emigrant Creek	OR_SR_1710030801_02_105823	2018	Spawning
Emigrant Lake	OR_LK_1710030801_02_100257	2010	Year Round
Evans Creek	OR_SR_1710030803_02_105576	2010	Year Round
Evans Creek	OR_SR_1710030803_02_105583	2010	Year Round
Flat Creek Watershed	OR_WS_171003070107_02_105717	2010	Year Round
Florence Creek-Illinois River Watershed	OR_WS_171003110801_02_104896	2010	Year Round
Foster Bar-Rogue River Watershed	OR_WS_171003100602_02_104676	2010	Year Round
Foster Creek	OR_SR_1710030701_02_105457	2010	Year Round
Foster Creek	OR_SR_1710030701_02_105469	2010	Year Round
Galls Creek	OR_SR_1710030802_02_105560	2010	Year Round
Grave Creek	OR_SR_1710031003_02_104796	2010	Spawning
Grave Creek	OR_SR_1710031003_02_104800	2010	Spawning
Grave Creek	OR_SR_1710031003_02_106346	2010	Spawning, Year Round
Humbug Creek	OR_SR_1710030904_02_105616	2004	Year Round
Humbug Creek	OR_SR_1710030904_02_105624	2004	Year Round

Assessment Unit Name	Assessment Unit ID	Year Listed	Use Period
Humbug Creek-Applegate River Watershed	OR_WS_171003090403_02_105791	2004	Year Round
Illinois River	OR_SR_1710031106_02_104840	2010	Spawning, Year Round
Illinois River	OR_SR_1710031108_02_106306	2010	Year Round
Illinois River	OR_SR_1710031111_02_104645	2010	Spawning, Year Round
Indigo Creek	OR_SR_1710031110_02_106308	2010	Year Round
Jackson Creek	OR_SR_1710030801_02_105533	2010	Spawning
Jackson Creek	OR_SR_1710030801_02_105534	2010	Spawning, Year Round
Jackson Creek-Bear Creek Watershed	OR_WS_171003080112_02_105770	2010	Spawning
Josephine Creek	OR_SR_1710031106_02_104838	2010	Year Round
Josephine Creek Watershed	OR_WS_171003110602_02_104891	2010	Year Round
Jumpoff Joe Creek	OR_SR_1710031001_02_104783	2010	Year Round
Jumpoff Joe Creek	OR_SR_1710031001_02_106344	2010	Year Round
Klondike Creek	OR_SR_1710031108_02_104844	2010	Year Round
Klondike Creek Watershed	OR_WS_171003110802_02_104897	2010	Year Round
Lake Creek	OR_SR_1710030708_02_105510	2010	Year Round
Lake Creek-Little Butte Creek Watershed	OR_WS_171003070807_02_105753	2010	Year Round
Larson Creek	OR_SR_1710030801_02_105538	2010	Year Round
Larson Creek-Bear Creek Watershed	OR_WS_171003080110_02_105768	2010	Year Round
Last Chance Creek-Grave Creek Watershed	OR_WS_171003100301_02_105794	2010	Spawning, Year Round
Lawson Creek	OR_SR_1710031111_02_104648	2010	Year Round
Little Butte Creek	OR_SR_1710030708_02_105521	2010	Year Round
Little Butte Creek	OR_SR_1710030708_02_105521	2018	Spawning
Lost Creek	OR_SR_1710030708_02_105508	2010	Year Round
Louse Creek	OR_SR_1710031001_02_106345	2010	Year Round
Louse Creek Watershed	OR_WS_171003100103_02_106361	2010	Year Round
Lower Big Butte Creek Watershed	OR_WS_171003070408_02_105735	2010	Year Round
Lower Briggs Creek Watershed	OR_WS_171003110702_02_104895	2010	Year Round
Lower Deer Creek Watershed	OR_WS_171003110504_02_104890	2010	Year Round

Assessment Unit Name	Assessment Unit ID	Year Listed	Use Period
Lower Jumpoff Joe Creek Watershed	OR_WS_171003100104_02_104864	2010	Year Round
Lower North Fork Little Butte Creek Watershed	OR_WS_171003070802_02_105748	2010	Year Round
Lower South Fork Big Butte Creek Watershed	OR_WS_171003070404_02_105731	2010	Year Round
Lower South Fork Little Butte Creek Watershed	OR_WS_171003070806_02_105752	2010	Year Round
Lower West Fork Evans Creek Watershed	OR_WS_171003080303_02_105804	2010	Year Round
McMullin Creek	OR_SR_1710031105_02_104836	2010	Year Round
Middle South Fork Little Butte Creek Watershed	OR_WS_171003070805_02_105751	2010	Year Round
Mud Creek	OR_SR_1710030708_02_105513	2010	Year Round
Muir Creek Watershed	OR_WS_171003070102_02_105712	2010	Year Round
Myer Creek	OR_SR_1710030801_02_105537	2010	Year Round
Myer Creek-Bear Creek Watershed	OR_WS_171003080107_02_105765	2010	Year Round
Neil Creek Watershed	OR_WS_171003080104_02_105762	2010	Spawning
North Fork Big Butte Creek	OR_SR_1710030704_02_105478	2010	Spawning, Year Round
North Fork Big Butte Creek Watershed	OR_WS_171003070405_02_105732	2010	Spawning, Year Round
North Fork Little Butte Creek	OR_SR_1710030708_02_105511	2010	Year Round
North Fork Silver Creek	OR_SR_1710031109_02_104846	2010	Year Round
Palmer Creek-Applegate River Watershed	OR_WS_171003090201_02_105784	2004	Year Round
Pickett Creek	OR_SR_1710031002_02_104785	2010	Year Round
Pickett Creek-Rogue River Watershed	OR_WS_171003100201_02_104865	2010	Year Round
Pleasant Creek	OR_SR_1710030803_02_105573	2010	Year Round
Poorman Creek-Grave Creek Watershed	OR_WS_171003100305_02_104871	2010	Year Round
Powell Creek-Williams Creek Watershed	OR_WS_171003090503_02_106358	2004	Spawning, Year Round
Quartz Creek	OR_SR_1710031001_02_104782	2010	Year Round
Rancherie Creek-Illinois River Watershed	OR_WS_171003110604_02_104893	2010	Year Round
Reeder Reservoir	OR_LK_1710030801_02_100256	2010	Year Round

Assessment Unit Name	Assessment Unit ID	Year Listed	Use Period
Reuben Creek	OR_SR_1710031003_02_104802	2010	Year Round
Rock Creek	OR_SR_1710030803_02_105579	2010	Year Round
Rock Creek	OR_SR_1710030803_02_105584	2010	Year Round
Rogue River	OR_EB_1710031008_01_100280	2010	Year Round
Rogue River	OR_SR_1710030802_04_105816	2010	Year Round
Rogue River	OR_SR_1710030804_04_106341	2010	Year Round
Rogue River	OR_SR_1710031002_04_104794	2010	Year Round
Rogue River	OR_SR_1710031004_04_104821	2010	Year Round
Rogue River	OR_SR_1710031005_04_106305	2010	Year Round
Rogue River	OR_SR_1710031008_04_104646	2010	Year Round
Rogue River	OR_SR_1710030707_04_105507	2018	Spawning, Year Round
Rogue River	OR_SR_1710030802_04_105816	2018	Spawning
Rogue River	OR_SR_1710030804_04_106341	2018	Spawning
Rogue River	OR_SR_1710031006_04_104637	2018	Year Round
Rough and Ready Creek Watershed	OR_WS_171003110404_02_104885	2010	Year Round
Salt Creek	OR_SR_1710030803_02_105578	2010	Year Round
Salt Creek	OR_SR_1710030803_02_105580	2010	Year Round
Savage Creek	OR_SR_1710030804_02_105594	2010	Year Round
Savage Creek-Rogue River Watershed	OR_WS_171003080401_02_106354	2010	Year Round
Shasta Costa Creek Watershed	OR_WS_171003100601_02_106319	2010	Year Round
Silver Creek	OR_SR_1710031109_02_104845	2010	Year Round
Silver Creek	OR_SR_1710031109_02_106307	2010	Year Round
Sixmile Creek-Illinois River Watershed	OR_WS_171003110603_02_104892	2010	Year Round
Slate Creek	OR_SR_1710030906_02_104779	2004	Year Round
Slate Creek Watershed	OR_WS_171003090604_02_104861	2004	Year Round
South Fork Collier Creek	OR_SR_1710031108_02_104647	2010	Year Round
South Fork Little Butte Creek	OR_SR_1710030708_02_105515	2010	Year Round
South Fork Little Butte Creek	OR_SR_1710030708_02_105522	2010	Year Round
Star Gulch	OR_SR_1710030902_02_105598	2004	Year Round
Sterling Creek	OR_SR_1710030903_02_105611	2004	Year Round
Sugarpine Creek	OR_SR_1710030705_02_105489	2010	Spawning, Year Round

Assessment Unit Name	Assessment Unit ID	Year Listed	Use Period
Sugarpine Creek	OR_SR_1710030705_02_105490	2010	Spawning, Year Round
Sugarpine Creek Watershed	OR_WS_171003070503_02_105738	2010	Spawning, Year Round
Town of Kerby-Illinois River Watershed	OR_WS_171003110601_02_104915	2010	Year Round
Tyler Creek	OR_SR_1710030801_02_105540	2010	Year Round
Upper Antelope Creek Watershed	OR_WS_171003070810_02_105756	2010	Year Round
Upper Big Butte Creek Watershed	OR_WS_171003070406_02_105733	2010	Spawning, Year Round
Upper Briggs Creek Watershed	OR_WS_171003110701_02_104894	2010	Year Round
Upper Emigrant Creek Watershed	OR_WS_171003080101_02_105759	2010	Year Round
Upper Evans Creek Watershed	OR_WS_171003080301_02_105777	2010	Year Round
Upper South Fork Little Butte Creek Watershed	OR_WS_171003070803_02_105749	2010	Year Round
Upper West Fork Evans Creek Watershed	OR_WS_171003080302_02_105778	2010	Year Round
Upper West Fork Illinois River Watershed	OR_WS_171003110401_02_104911	2010	Spawning, Year Round
Wagner Creek	OR_SR_1710030801_02_105545	2010	Year Round
Wagner Creek	OR_SR_1710030801_02_105532	2018	Year Round
Wagner Creek Watershed	OR_WS_171003080108_02_105766	2010	Year Round
Walker Creek	OR_SR_1710030801_02_105539	2002	Year Round
Walker Creek	OR_SR_1710030801_02_105539	2010	Spawning
Walker Creek	OR_SR_1710030801_02_105551	2010	Spawning, Year Round
Walker Creek Watershed	OR_WS_171003080103_02_105761	2002	Year Round
Walker Creek Watershed	OR_WS_171003080103_02_105761	2010	Spawning
West Branch Elk Creek	OR_SR_1710030705_02_105482	2010	Year Round
West Branch Elk Creek-Elk Creek Watershed	OR_WS_171003070505_02_105740	2010	Year Round
West Fork Evans Creek	OR_SR_1710030803_02_105574	2010	Year Round
West Fork Evans Creek	OR_SR_1710030803_02_105581	2010	Year Round
West Fork Evans Creek	OR_SR_1710030803_02_105795	2010	Year Round
West Fork Illinois River	OR_SR_1710031104_02_104831	2010	Year Round
West Fork Illinois River	OR_SR_1710031104_02_104832	2010	Spawning, Year Round

Assessment Unit Name	Assessment Unit ID	Year Listed	Use Period
West Fork Williams Creek	OR_SR_1710030905_02_106342	2004	Year Round
Whisky Creek	OR_SR_1710031004_02_104811	2010	Year Round
Whisky Creek-Rogue River Watershed	OR_WS_171003100401_02_104872	2010	Year Round
Williams Creek	OR_SR_1710030905_02_105627	2004	Year Round
Willow Creek	OR_SR_1710030704_02_105480	2010	Year Round
Wolf Creek	OR_SR_1710031003_02_104801	2010	Spawning
Wolf Creek	OR_SR_1710031003_02_104803	2010	Year Round
Wolf Creek Watershed	OR_WS_171003100304_02_106363	2010	Year Round
Yale Creek	OR_SR_1710030903_02_105605	2004	Year Round

Table 2: Rogue River Basin assessment units that are classified as water quality limited category 4A for temperature based on the Section 303(d) 2018/2020 Integrated Report.

Assessment Unit Name	Assessment Unit ID	Year Listed	Use Period
Althouse Creek	OR_SR_1710031101_02_104822	2010	Year Round
East Fork Illinois River	OR_SR_1710031103_02_104828	2010	Year Round
Lobster Creek	OR_SR_1710031007_02_104638	2002	Year Round
Lobster Creek	OR_SR_1710031007_02_104640	2010	Year Round
Lower East Fork Illinois River Watershed	OR_WS_171003110303_02_104903	2010	Year Round
Lower Sucker Creek Watershed	OR_WS_171003110204_02_104883	2002	Year Round
Middle Sucker Creek Watershed	OR_WS_171003110202_02_104881	2002	Year Round
North Fork Lobster Creek Watershed	OR_WS_171003100701_02_104677	2002	Year Round
Sucker Creek	OR_SR_1710031102_02_104824	2002	Year Round
Sucker Creek	OR_SR_1710031102_02_104904	2004	Spawning, Year Round
Upper Sucker Creek Watershed	OR_WS_171003110201_02_104880	2002	Year Round

3 Conceptual model: key processes and variables

The current theory to explain the nature of heat is called the kinetic-molecular theory. The modern version of this theory was developed in the mid-19th century by Rudolf Clausis, James Clerk Maxwell, and Ludwig Boltzmann. The theory is based on the assumption that all matter is composed of a tiny population of molecules that are always in motion. The molecules in hot objects are moving faster and hence have greater kinetic energy than the molecules in cold objects. Individual molecules have a certain amount of kinetic energy based on their mass and velocity. The thermal energy of an object is determined by adding up the kinetic energy of all the molecules in that object. When a hot and cold object come into contact with each other, the molecules collide and the kinetic energy flows from the molecules with more kinetic energy to molecules with less kinetic energy. This type of flow of kinetic energy is called heat.

Temperature is an intensive property and much like concentration measures the "strength" rather than "quantity" of kinetic energy. The temperature of an object is the measure of the average kinetic energy of all the molecules in that object. Hot water has greater average kinetic energy than cold water but may not have greater total kinetic energy. For example, a small pot of water with a temperature near the boiling point has a higher average kinetic energy than a swimming pool at room temperature. The swimming pool has a much larger quantity of molecules and therefore a higher total kinetic energy than the pot of water.

Temperature is the water quality parameter of concern, but heat, in particular heat from human activities or anthropogenic sources, is the pollutant of concern. Water temperature change (ΔTw) is a function of the heat transfer in a discrete volume and may be described in terms of changes in heat per unit volume. Conversely, a change in volume can result in water temperature change for a defined amount of heat exchange. With this basic conceptual framework of water temperature change, it is possible to discuss stream temperature change as a function of two variables: heat and mass transfer.

Water Temperature Change as a Function of Heat Exchange and Volume,

$$\Delta Tw = \frac{\Delta Heat}{Density \times Specific\ Heat \times \Delta Volume} \qquad \text{Equation 2}$$

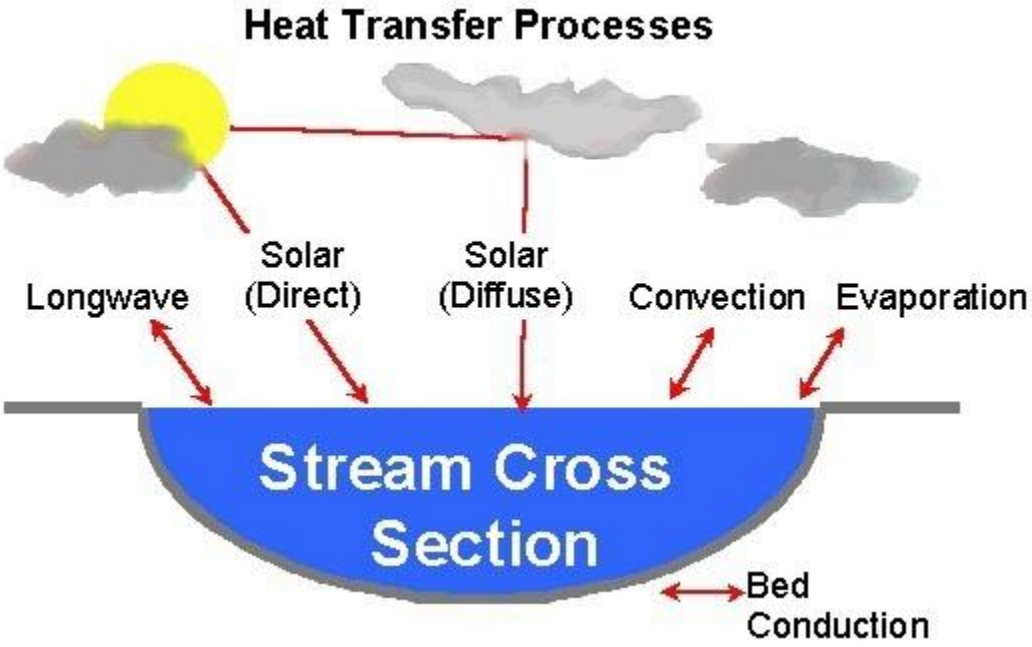

Figure 1: Major heat transfer processes.

Heat transfer relates to processes that change heat in a defined water volume. There are several thermodynamic pathways that can introduce or remove heat from a stream. These different processes are shown in Figure 1. For any given stream reach heat exchange is closely related to the season, time of day and the surrounding environment and the stream characteristics. Heat transfer can be dynamic and change over relatively small distances and time periods. Equation 3 describes the several heat transfer processes that change stream temperature (Wunderlich, 1972; Jobson and Keefer, 1979; Beschta and Weatherred, 1984; Sinokrot and Stefan, 1993; Boyd, 1996; Johnson, 2004; Hannah et al., 2008; Benyahya et al., 2012).

$$\Phi_{total} = \Phi_{solar} + \Phi_{longwave} + \Phi_{streambed} + \Phi_{convection} + \Phi_{evaporation} \qquad \text{Equation 3}$$

Where,
Φ_{total} = Net heat energy flux (+/-)
Φ_{solar} = Shortwave direct and diffuse solar radiation (+ only)
$\Phi_{longwave}$ = Longwave (thermal) radiation (+/-)
$\Phi_{streambed}$ = Streambed conduction (+/-)
$\Phi_{convection}$ = Stream/air convection[1] (+/-)
$\Phi_{evaporation}$ = Evaporation (+/-)

[1]Air/Water convection includes both turbulent and free surface conduction.

Mass transfer relates to transport of flow volume downstream, instream mixing and the introduction or removal of water from a stream. For instance, flow from a tributary will cause a temperature change if the temperature is different from the receiving water. Mass transfer commonly occurs in stream systems as a result of:

- Advection,
- Dispersion,
- Groundwater exchange,
- Hyporheic flows,
- Surface water exchange (e.g. tributary input, precipitation), and
- Other human related activities that alter stream flow volume.

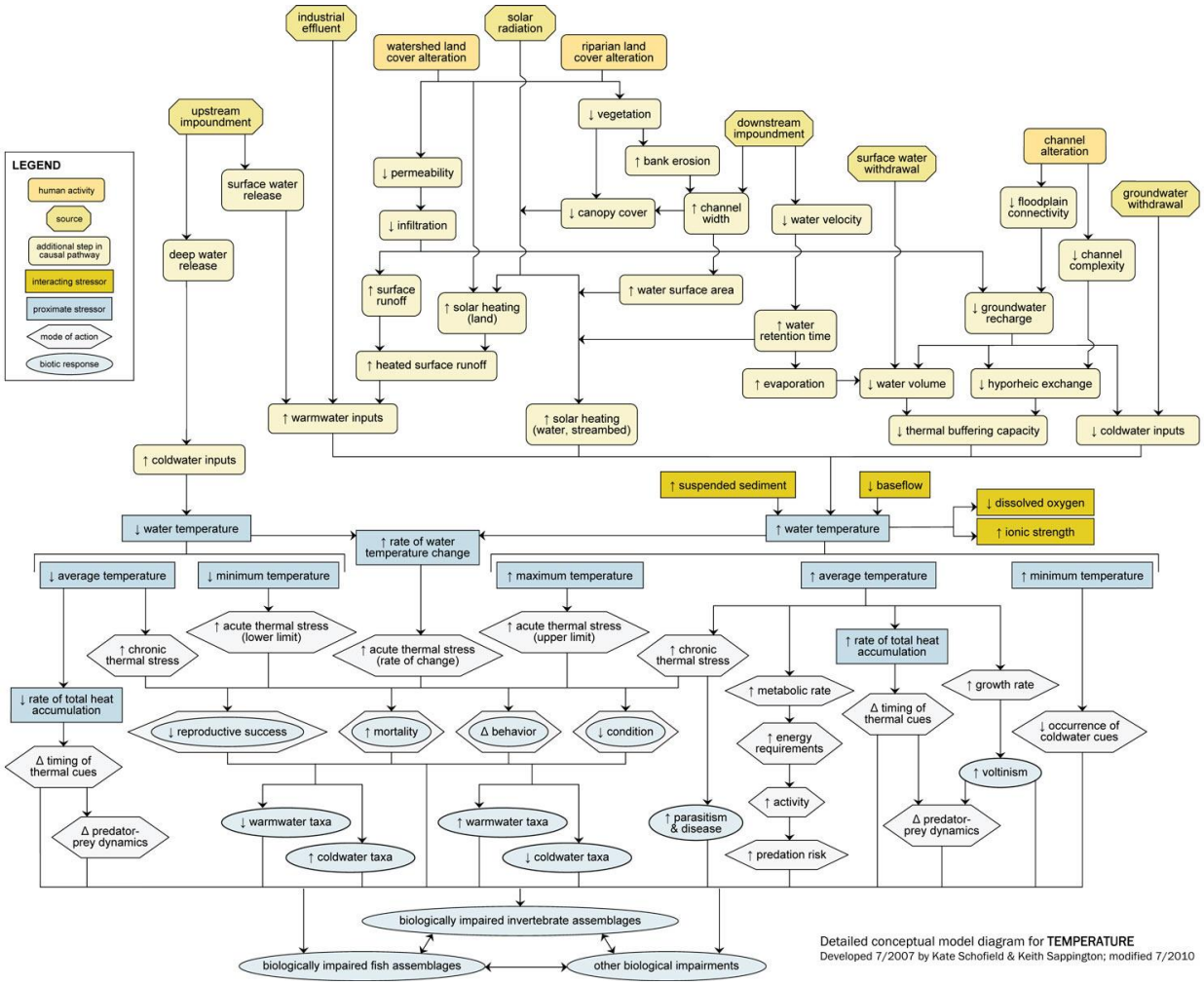

Figure 2: Conceptual diagram that identifies the key processes and variables that drive stream temperature changes and the biological responses (Schofield and Sappington, 2010).

Stream temperature is influenced by both human and natural factors. Figure 2 is a conceptual diagram that identifies the key process and variables that drive stream temperature. Human sources and natural sources are identified. Near the bottom of the diagram the biological responses are identified.

Anthropogenic Nonpoint Sources: Temperature increases from human-caused nonpoint sources are caused by increases in solar radiation loading to the stream network from the disturbance or removal of near-stream vegetation, channel modification and widening, reductions to the stream flow rate or volume,

changes in hyporheic flows and channel connectivity, reductions in cold groundwater inflows, and changes to meteorological conditions, such as those caused by climate change.

Background Sources: Background sources include all sources of pollution or pollutants not originating from human activities. In the context of a TMDL, background sources may also include anthropogenic sources of a pollutant that DEQ or another Oregon state agency does not have authority to regulate, such as pollutants emanating from another state, tribal lands, or sources otherwise beyond the jurisdiction of the state (OAR 340-042-0030(1)). Additionally, effective shade levels on smaller streams are more sensitive to riparian disturbances and so the differences between current condition solar flux and background solar flux can be larger.

Anthropogenic Point Sources: Temperature increases from point sources are those caused by warm water discharges from NPDES permitted facilities, such as industrial outfalls, municipal waste water treatment plants (WWTP), and other point sources.

4 Technical approach

4.1 Overview

Stream temperature TMDLs are generally scaled to a subbasin or basin scale since stream temperatures are affected by cumulative interactions between upstream and local sources. For this reason the TMDL considers all surface waters that affect the temperatures of 303(d) listed waterbodies. For example, the Rogue River is water quality limited for temperature. To address this listing in the TMDL, all upstream waterbodies are considered in the TMDL analysis and TMDL allocations are applied throughout the entire stream network and include all waters of the state.

An important step in the TMDL is to perform a source assessment which quantifies the background and anthropogenic contributions to stream heating. Models provide a way to evaluate potential sources of stream warming and, to the extent existing data allow, the amount of pollutant loading from these sources. The model that is selected for the TMDL analysis should support the needs of the project. Section 4.2 describes the model framework needs for this project and the models that will be used to support the TMDL.

TMDLs also require identification of seasonal variation and critical conditions. The TMDL analysis will determine seasonal variation by including a statistical summary and visual plots summarizing the instream temperatures and flow rates observed at various monitoring locations. The time period when the applicable temperature criteria are exceeded will be described in relation to the critical conditions.

The TMDL will establish a loading capacity which specifies the amount of a pollutant or pollutants that a waterbody can receive and still meet water quality standards. The pollutant addressed in the temperature TMDL is heat. The TMDL will divide the loading capacity into thermal wasteload allocations for NPDES permittees and load allocations for background and nonpoint sources of heat to ensure that the applicable temperature standards are achieved. Anthropogenic nonpoint and NPDES permitted point sources are not permitted to heat a waterbody more than 0.3 deg-C above the applicable criteria, cumulatively at the point of maximum impact. The portion of the human use allowance allocated to each source will be determined in the TMDL with the modeling approach supporting assessment of different allocation options. The modeling approach may also be used to support development of TMDL surrogate measures such as

effective shade targets. Nonpoint source allocations can be translated into surrogate measures when a pollutant is difficult to measure, highly variable, or difficult to monitor (OAR 340-042-0040(5)(b)). Thermal load allocations for nonpoint sources can be difficult to measure and monitor. Attainment of the surrogate measures ensures compliance with the nonpoint source allocations.

Stream temperatures and shade conditions for the Applegate Subbasin TMDL (DEQ, 2004), Bear Creek Watershed TMDL (DEQ, 2007), Lobster Creek Watershed TMDL (DEQ, 2002a), and Rogue River Basin TMDL (DEQ, 2008) were simulated using the computer models Heat Source (temperature and shade) and SHADOW (shade only). The model extents include most of the main rivers and their larger tributaries that contain or influence primary fish habitat. Site-specific load allocations will be developed for the streams that are simulated. Other streams will be assigned generalized load allocations based on effective shade surrogate measures that target site potential or restored vegetation types. Numeric or narrative wasteload allocations will be developed for all NPDES permittees.

4.2 Model selection

The modeling framework needs for this project include:

1) Prediction of hourly stream temperatures over a period of months and at a no greater than 500 meter longitudinal resolution.

2) Prediction of hourly solar radiation flux and daily effective shade at a no greater than 100 meter longitudinal resolution.

3) Ability to evaluate hourly stream temperature response from changes in streamside vegetation.

4) Ability to evaluate hourly stream temperature response from changes in water withdrawals and tributary stream flow within the upstream catchment.

5) Ability to evaluate hourly stream temperature response from changes in channel morphology within the upstream catchment.

6) Ability to evaluate hourly stream temperature response from changes in effluent temperature and flow discharge from NPDES permitted facilities.

The Heat Source stream thermodynamics model (Boyd and Kasper, 2003) was used to model several streams for the development of TMDLs in the Rogue River Basin (DEQ, 2002a; DEQ, 2002b; DEQ, 2004; DEQ, 2007; and DEQ, 2008). Because these models already exist and meet all the model framework needs, Heat Source was selected for stream temperature simulation in the project area. The Heat Source model was originally developed at Oregon State University as a master's thesis where it was evaluated and approved by an academic committee (Boyd, 1996). Development of the model continued and in 1999 DEQ submitted the model equations and methodology for peer review (DEQ, 1999a) and again in 2004 to the Independent Multidisciplinary Science Team (IMST, 2004) where the model was found to be scientifically sound.

The Heat Source model has been used in numerous stream temperature related studies including Loheide and Gorelick (2006), Diabat et al. (2013), Holzapfel et al. (2013), Lawrence et al. (2014), Bond et al. (2015), Woltemade and Hawkins (2016), Justice et al. (2017), and Wondzell et al. (2019). Heat Source has also been used in numerous Oregon TMDLs (DEQ, 2001, 2002c, 2003, 2005, 2006, 2007, 2008, 2010, 2018, 2019).

In addition to Heat Source, several SHADOW models exist and were used to model shade on multiple streams for TMDLs in the Rogue Basin (DEQ, 2002a; DEQ, 2004; DEQ, 2007). The SHADOW model version 2.3 is a shade, solar, and stream temperature model developed by the U.S. Forest Service (USFS, 1993). DEQ does not plan to update these models or use SHADOW for development of new shade or temperature models.

4.3 Software Development Quality Assessment

We do not anticipate any new software development or model code changes as part of this project.

5 Data availability and quality

This Section describes the data that is available to support the TMDL project and the quality assurance procedures used when collecting or reviewing the available data.

5.1 Meteorology

Meteorological data includes air temperature, sky conditions, cloudiness, relative humidity, and wind speed. Table 60 through Table 65 in Appendix A list the stations where meteorological data available in the Rogue River Basin, including 131 stations from National Oceanic and Atmospheric Association (NOAA)'s National Climatic Data Center (NCDC), 5 stations from National Interagency Fire Center's Remote Automatic Weather Stations (RAWS), 2 stations from Bureau of Reclamation Cooperative Agricultural Weather Network (AgriMet), 2 stations from Automated Hydrologic and Meteorological Monitoring Stations Network (Hydromet), 144 stations from University of Utah MesoWest database, and 5 stations from DEQ's files. The meteorological monitoring stations are also shown in the HTML interactive map that accompanies this QAPP and is referenced in Appendix D. The station IDs in Table 60 are the NCDC ID, which may differ from the station identifiers used by other sources.

The meteorological data obtained from the NCDC includes the Local Climatological Dataset (NOAA, 2005) and the Global Integrated Surface Dataset (NOAA, 2001). The Local Climatological Dataset includes quality controlled meteorological data from airports and other prominent weather stations managed by the National Weather Service, Federal Aviation Administration, and the U.S. Department of Defense. The Global Integrated Surface Dataset provides a long-term record of hourly, sub-hourly and synoptic weather observations from a variety of meteorological networks around the world. The dataset includes observations from the World Meteorological Organization, Automated Surface Observing System, Automated Weather Observing Stations, U.S. Climate Reference Network, and others.

5.2 Thermal Infrared Radiometry (TIR) data

DEQ contracted with Watershed Sciences, Inc. to provide airborne Thermal Infrared Radiometry (TIR) imagery of spatial temperature patterns within the Rogue River Basin (McIntosh et al., 1999; Watershed Sciences, 2000; Watershed Sciences, 2002; Watershed Sciences, 2004). TIR data is used to characterize the thermal regime of the streams and habitat quality. All streams and the TIR collection dates are summarized in Table 3.

Table 3: Streams and the TIR collection dates in the Rogue River Basin.

Stream	Survey Extent	Date	Time	Survey Distance
Antelope Creek	Mouth to Quarter Branch	2001-07-13	14:08-14:12	2.39 mi
Applegate River	Mouth to Applegate Dam	1999-07-19	15:37-16:16	75 km
Applegate River	Mouth to Applegate Dam	1998-08-18	15:04 - 15:43	75.4 km
Dog Face Creek	Mouth upstream 2.0 km	1998-08-18	14:24 - 14:26	2 km
East Fork Evans Creek	Mouth to headwaters	2003-08-01	14:24-15:00	17.7 mi
East Fork Williams Creek	Mouth to just upstream of Rock Creek	1999-07-21	15:23-15:25	4.1 km
Elk Creek	Mouth to headwaters	2001-07-14	13:43-14:19	19.49 mi
Evans Creek	Mouth to Forks	2003-08-01	13:50-14:22	19.1 mi
Fish Lake	Lake shoreline	2001-07-13	15:41-15:48	5.3 mi
Glade Creek	Mouth to approximately 1620 meters downstream of Jack Creek	1998-08-18	14:05 - 14:09	6.4 km
Little Applegate River	Mouth to headwaters	1999-07-21	14:26-14:45	32.3 km
Little Applegate River	Mouth to approximately 790 meters upstream of Bear Gulch	1998-08-18	13:30 - 13:52	30.5 km
Little Butte Creek	Mouth to Forks	2001-07-13	14:04-14:34	16.67 mi
McDonald Creek	Mouth to headwaters	1998-08-18	13:54 - 13:59	6.8 km
North Fork Little Butte Creek	Mouth to Fish Lake	2001-07-13	15:19-15:40	15.41 mi
Rogue River	Gold Ray Dam to Little Butte Creek	2001-07-13	13:55-14:02	6.76 mi
Rogue River	Ferry Hole Bar to Applegate River	2003-07-30	14:30-15:59	91.9 mi
Rogue River	Pickett Creek to Lost Creek Lake	2003-07-31	14:20-15:29	71.4 mi
Slate Creek	Mouth to approximately 1,180 meters upstream of Butcherknife Creek	1998-08-18	13:16 - 13:31	12.2 km
South Fork Little Butte Creek	Mouth to headwaters	2001-07-13	14:34-15:07	21.68 mi

Stream	Survey Extent	Date	Time	Survey Distance
Sterling Creek	Mouth to Miller Gulch	1998-08-18	14:33 - 14:41	7.8 km
Thompson Creek	Mouth to Ninemile Creek	1998-08-18	14:03 - 14:10	13 km
West Fork Evans Creek	Mouth to headwaters	2003-08-01	15:10-15:41	16.3 mi
West Fork Williams Creek	Mouth to just upstream of Lone Creek	1999-07-21	15:28-15:31	5.4 km
Williams Creek	Mouth to East Fork Williams Creek	1999-07-21	15:13-15:21	11.3 km
Williams Creek	Mouth to East Fork Williams Creek	1998-08-18	13:45 - 13:57	11.1 km
Yale Creek	Mouth to Headwaters	1998-08-18	14:15 - 14:21	6.9 km

5.3 Continuous stream temperature data

All available continuous stream temperature data were retrieved from DEQ's Ambient Water Quality Monitoring System (AWQMS), USGS's National Water Information System (NWIS), or were obtained during the data solicitation for DEQ's temperature TMDL replacement project. Some temperature data presented in this QAPP were retrieved from DEQ's files and were not available in AWQMS or USGS's database.

The data retrieval period for continuous stream temperature data is from January 1, 1990 to December 31, 2020. Data retrieved from the AWQMS database has a Data Quality Level (DQL) of A, B or E and a result status of "Final" or "Provisional". The data quality level criteria are outlined in DEQ's Data Quality Matrix for Field Parameters (DEQ, 2013). The TMDL program uses waterbody results with a data quality level of A, B, or E (DEQ, 2021). Data of unknown quality are used after careful review.

Appendix B summarizes 365 locations where continuous stream temperature data were collected in the Rogue River Basin and the organizations that collected that data in Table 66, and when data were collected at each location in Table 67. The location of these stations is shown in the HTML interactive map that accompanies this QAPP and referenced in Appendix D.

5.4 Stream flow data

Table 68 through Table 71 in Appendix C list the stations where continuous and instantaneous flow volume data were available in the Rogue River Basin, including 28 stations from USGS, 42 stations from OWRD, 2 stations from Hydromet, and 42 stations from DEQ's files. Table 72 lists the years that continuous stream flow data were collected at each location. The location of these stations is shown in the HTML interactive map that accompanies this QAPP and referenced in Appendix D. DEQ relies upon the quality control checks implemented by USGS and OWRD. DEQ-collected stream flow measurements utilize field and quality control methods outlined in DEQ's Mode of Operations Manual (DEQ, 2020).

5.5 Point source discharges

Table 4 identifies all the active individual NPDES permittees in the Rogue River Basin as of the date of this QAPP. Table 5 lists the registrants covered under the general NPDES GEN01, GEN03, GEN04, and GEN40 (MS4) permits in the Rogue River Basin. This group of general permits are highlighted because the permits require temperature monitoring at a frequency of at least one grab sample per month. The location of these NPDES permittees is shown in the HTML interactive map that accompanies this QAPP and is referenced in Appendix D. Many of these permittees submit Discharge Monitoring Reports (DMRs) as a condition of their permit. Depending on the monitoring requirements in the permit, some permittees are required to report effluent temperature and effluent flow rates in the DMR. The frequency and type of reporting varies by permit and permit type. Some permits only require monthly, weekly, or daily grab samples while others require summary statistics such as daily maximum, daily mean, or seven-day average daily maximum. The NPDES permits require data be collected and reported on the DMR using appropriate methods based on a quality assurance and quality control plan. Where possible, DEQ will utilize any continuous effluent data that has been provided to DEQ. When continuous data is not available, DMR data will be utilized to characterize point source discharges. Table 6 lists the current number of registrants for all the other general NPDES permits in the Rogue River Basin that are not listed in Table 5.

Table 4: Summary of individual NPDES permitted discharges in the Rogue River Basin.

Facility Name (Facility Number)	Latitude/Longitude	Permit Type and Description	Stream River Mile
Allweather Wood, White City (105365)	42.4312/-122.885	NPDES-IW-B21: Timber and Wood Products - Wood preserving	Rogue River RM 130.5
Ashland STP (3780)	42.2136/-122.714	NPDES-DOM-C1a: Sewage - 2 MGD or more but less than 5 MGD	Ashland Creek RM 0.2
Boise - Medford Plywood (9539)	42.355/-122.903	NPDES-IW-B19: Timber and Wood Products - Sawmills, log storage, instream log storage.	Bear Creek RM 6
Butte Falls STP (12800)	42.5457/-122.57	NPDES-DOM-Da: Sewage - less than 1 MGD	South Fork Big Butte Creek RM 1
Cascade Wood Products - White City (101757)	42.4387/-122.851	NPDES-IW-B20: Timber and Wood Products - Hardboard, veneer, plywood, particle board, pressboard manufacturing, wood products.	Military Slough RM 1.6
Cave Junction Wastewater Treatment Facility (15243)	42.1757/-123.651	NPDES-DOM-Da: Sewage - less than 1 MGD	Illinois River RM 54.6
Country View Mobile Home Estates (96385)	42.6374/-122.809	NPDES-DOM-Db: Sewage - less than 1 MGD with discharging lagoons	Cusick Creek RM 143.8

Facility Name (Facility Number)	Latitude/Longitude	Permit Type and Description	Stream River Mile
Fleming Middle School STP (29920)	42.5173/-123.373	NPDES-DOM-Da: Sewage - less than 1 MGD	Harris Creek RM 2.8
Gold Hill STP (33901)	42.4374/-123.077	NPDES-DOM-Da: Sewage - less than 1 MGD	Rogue River RM 118.5
Grants Pass STP (34630)	42.4284/-123.344	NPDES-DOM-C1a: Sewage - 2 MGD or more but less than 5 MGD	Rogue River RM 100.9
Hidden Valley High School STP (38625)	42.3286/-123.336	NPDES-DOM-Da: Sewage - less than 1 MGD	Applegate River RM 12.5
Medford RWRF (55125)	42.4348/-122.889	NPDES-DOM-A3: Sewage - 10 MGD or more but less than 25 MGD	Rogue River RM 130.5
Riviera Mobile Park (75500)	42.4292/-123.426	NPDES-DOM-Da: Sewage - less than 1 MGD	Rogue River RM 96
Rogue River STP (76030)	42.4313/-123.186	NPDES-DOM-Da: Sewage - less than 1 MGD	Rogue River RM 110
Shady Cove STP (80535)	42.6005/-122.835	NPDES-DOM-Da: Sewage - less than 1 MGD	Rogue River RM 142.5
Valley View Landfill (104019)	42.2624/-122.736	NPDES-IW-B15: All facilities not elsewhere classified which dispose of process wastewater (includes remediated groundwater) - Tier 2 sources	Jeffery Creek RM 1.3

Table 5: Summary of current registrants under the general NPDES GEN01, GEN03, GEN04, and GEN40 (MS4) permits in the Rogue River Basin.

Facility Name (Facility Number)	Latitude/Longitude	Permit Type and Description	Stream River Mile
ASHLAND MUNICIPAL STORMWATER, MS4 (113604)	42.1956/-122.696	GEN40: 4000 MS4-Phase 2 General Permit – Water Quality NPDES General Permit	Multiple discharge locations
BIOMASS ONE, LIMITED PARTNERSHIP (100110)	42.4363/-122.851	GEN01: Industrial Wastewater; NPDES cooling water	Rogue River RM 131.5
BOISE CASCADE - WHITE CITY VENEER (9590)	42.4293/-122.856	GEN04: Industrial Wastewater; NPDES log ponds	Rogue River RM 131
CITY OF CENTRAL POINT MUNICIPAL STORMWATER MS4 (126214)	42.376/-122.916	GEN40: 4000 MS4-Phase 2 General Permit – Water Quality NPDES General Permit	Multiple discharge locations

Facility Name (Facility Number)	Latitude/Longitude	Permit Type and Description	Stream River Mile
CITY OF EAGLE POINT MUNICIPAL STORMWATER MS4 (126232)	42.4735/-122.806	GEN40: 4000 MS4-Phase 2 General Permit – Water Quality NPDES General Permit	Multiple discharge locations
CITY OF GRANTS PASS MUNICIPAL STORMWATER MS4 (126215)	42.439/-123.328	GEN40: 4000 MS4-Phase 2 General Permit – Water Quality NPDES General Permit	Multiple discharge locations
CITY OF ROGUE RIVER MUNICIPAL STORMWATER MS4 (126217)	42.436/-123.172	GEN40: 4000 MS4-Phase 2 General Permit – Water Quality NPDES General Permit	Multiple discharge locations
HARRY AND DAVID (37200)	42.3009/-122.849	GEN01: Industrial Wastewater; NPDES cooling water	Bear Creek RM 12.5
JOSEPHINE COUNTY MUNICIPAL STORMWATER MS4 (126216)	42.426/-123.336	GEN40: 4000 MS4-Phase 2 General Permit – Water Quality NPDES General Permit	Multiple discharge locations
MEDFORD MUNICIPAL STORMWATER, MS4 (113603)	42.3278/-122.867	GEN40: 4000 MS4-Phase 2 General Permit – Water Quality NPDES General Permit	Multiple discharge locations
MURPHY ROGUE RIVER PLYWOOD DIVISION (55170)	42.427/-123.161	GEN04: Industrial Wastewater; NPDES log ponds	Rogue River RM 111
MURPHY VENEER (83367)	42.4327/-122.859	GEN04: Industrial Wastewater; NPDES log ponds	Whetstone Creek RM 4
ODFW - COLE M. RIVERS HATCHERY (64445)	42.6638/-122.684	GEN03: Industrial Wastewater; NPDES fish hatcheries	Rogue River RM 157
PACIFIC POWER & LIGHT COMPANY - EAGLE POINT (66600)	42.46/-122.845	GEN01: Industrial Wastewater; NPDES cooling water	Little Butte Creek RM 2
PACIFIC POWER & LIGHT COMPANY - PROSPECT PLANT #1 (66620)	42.7331/-122.514	GEN01: Industrial Wastewater; NPDES cooling water	Rogue River RM 169.3
PACIFIC POWER & LIGHT COMPANY - PROSPECT PLANT #2 (66622)	42.7331/-122.514	GEN01: Industrial Wastewater; NPDES cooling water	Rogue River RM 169.4

Facility Name (Facility Number)	Latitude/Longitude	Permit Type and Description	Stream River Mile
PACIFIC POWER & LIGHT COMPANY - PROSPECT PLANT #3 (66624)	42.7306/-122.42	GEN01: Industrial Wastewater; NPDES cooling water	South Fork Rogue River RM 1.5
PACIFIC POWER & LIGHT COMPANY - PROSPECT PLANT #4 (66626)	42.731/-122.515	GEN01: Industrial Wastewater; NPDES cooling water	Rogue River RM 169.3
ROGUE VALLEY SEWER SERVICES STORMWATER, MS4 (116270)	42.2667/-122.817	GEN40: 4000 MS4-Phase 2 General Permit – Water Quality NPDES General Permit	Multiple discharge locations

Table 6: Summary of the current number of registrants for all the other general NPDES permits in the Rogue River Basin that are not listed in Table 5.

Permit Type and Description	Current Number of Registrants
GEN02: Industrial Wastewater; NPDES filter backwash	6
GEN12A: Stormwater; NPDES sand & gravel mining	18
GEN12C(AGENT): Stormwater; NPDES construction more than 1 acre disturbed ground, issued by agent	6
GEN12C: Stormwater; NPDES construction more than 1 acre disturbed ground	114
GEN12CA: Stormwater; NPDES government agency construction, more than 1 acre disturbed ground	2
GEN12Z: Stormwater; NPDES specific SIC codes	49
GEN15A: Industrial Wastewater; NPDES petroleum hydrocarbon cleanup	1
GEN17A: Industrial Wastewater; NPDES wash water	8

5.6 Water rights/surface water diversions

Data on surface water diversion rates (usage) and the points of diversion (location) are available from the Oregon Water Resources Department (OWRD). OWRD regulates all commercial, industrial, domestic, and agricultural water use in the state of Oregon through water rights.

Estimates of water diversion rates and location of points of diversion can be derived from the following OWRD sources:

- Water Rights Information System (WRIS) – the WRIS database contains all permitted or certificated water rights. Data in the WRIS corresponding to quantities of water for use are expressed as maximum use allowable, generally as monthly, seasonal or annual rates or volumes. These maximum values may not correspond to actual usage, which will likely vary based on factors such as irrigation application rate or household consumer demand. DEQ may choose to incorporate the maximum amount allowable or some lesser quantity provided sufficient

information is available to support those rates in the modeling. Water rights information can also be accessed using their online mapping application (https://apps.wrd.state.or.us/apps/gis/wr/Default.aspx).

- Water Use Reports – some, but not all, water rights holders must monitor and report the water they use to the state, typically on a monthly or yearly basis, as a requirement of their water rights. These water use reports will be used to develop withdrawal time series based on available information.

5.7 Effective shade measurements

Effective shade is the percent of potential daily solar radiation flux that is blocked by vegetation and topography. DEQ and/or partner agency staff used an instrument called a solar pathfinder to collect effective shade measurements in the field. The effective shade measurement methods and quality control procedures used are outlined in the Water Quality Monitoring Technical Guide Book (OWEB, 1999) and the solar pathfinder manual (Solar Pathfinder, 2016). Table 7 lists the locations where effective shade measurements were collected. Data were collected in Elk Creek in August 2007, in Evans Creek and West Fork Evans Creek in July 2003, and in Little Butte Creek and tributaries in July 2001.

Table 7: Effective shade data collected in the Rogue River Basin.

Station ID	Station	Latitude/Longitude	Effective Shade	Data Source
11372-ORDEQ	Evans Creek at Mouth	42.4336/-123.174	38%	DEQ
11372-ORDEQ	Evans Creek at Mouth	42.4336/-123.174	51%	DEQ
11372-ORDEQ	Evans Creek at Mouth	42.4336/-123.174	35%	DEQ
11372-ORDEQ	Evans Creek at Mouth	42.4336/-123.174	37%	DEQ
11372-ORDEQ	Evans Creek at Mouth	42.4336/-123.174	49%	DEQ
11372-ORDEQ	Evans Creek at Mouth	42.4336/-123.174	35%	DEQ
11373-ORDEQ	Evans Creek downstream of Wimer Bridge	42.5331/-123.159	5%	DEQ
11373-ORDEQ	Evans Creek downstream of Wimer Bridge	42.5331/-123.159	6%	DEQ
11373-ORDEQ	Evans Creek downstream of Wimer Bridge	42.5331/-123.159	4%	DEQ
11373-ORDEQ	Evans Creek downstream of Wimer Bridge	42.5331/-123.159	4%	DEQ
11373-ORDEQ	Evans Creek downstream of Wimer Bridge	42.5331/-123.159	8%	DEQ

Station ID	Station	Latitude/Longitude	Effective Shade	Data Source
11373-ORDEQ	Evans Creek downstream of Wimer Bridge	42.5331/-123.159	8%	DEQ
11461-ORDEQ	Evans Creek at Palmerton Park	42.4397/-123.172	68%	DEQ
11461-ORDEQ	Evans Creek at Palmerton Park	42.4397/-123.172	38%	DEQ
11461-ORDEQ	Evans Creek at Palmerton Park	42.4397/-123.172	17%	DEQ
11461-ORDEQ	Evans Creek at Palmerton Park	42.4397/-123.172	66%	DEQ
11461-ORDEQ	Evans Creek at Palmerton Park	42.4397/-123.172	37%	DEQ
11461-ORDEQ	Evans Creek at Palmerton Park	42.4397/-123.172	17%	DEQ
11466-ORDEQ	Evans Creek downstream of Bridge 341	42.5845/-123.023	38%	DEQ
11466-ORDEQ	Evans Creek downstream of Bridge 341	42.5845/-123.023	39%	DEQ
11466-ORDEQ	Evans Creek downstream of Bridge 341	42.5845/-123.023	46%	DEQ
11466-ORDEQ	Evans Creek downstream of Bridge 341	42.5845/-123.023	43%	DEQ
11466-ORDEQ	Evans Creek downstream of Bridge 341	42.5845/-123.023	44%	DEQ
11466-ORDEQ	Evans Creek downstream of Bridge 341	42.5845/-123.023	40%	DEQ
25596-ORDEQ	NF Little Butte at Little Butte	42.4207/-122.612	82%	DEQ
25598-ORDEQ	NF Little Butte from Fish Lake (headwater)	42.3775/-122.349	25%	DEQ
25799-ORDEQ	SF Little Butte Creek upstream Beaver Dam	42.3286/-122.38	73%	DEQ
30188-ORDEQ	WF Evans Creek near headwaters	42.6986/-123.107	96%	DEQ
30188-ORDEQ	WF Evans Creek near headwaters	42.6986/-123.107	98%	DEQ
30188-ORDEQ	WF Evans Creek near headwaters	42.6986/-123.107	83%	DEQ
30188-ORDEQ	WF Evans Creek near headwaters	42.6986/-123.107	89%	DEQ

Station ID	Station	Latitude/Longitude	Effective Shade	Data Source
30188-ORDEQ	WF Evans Creek near headwaters	42.6986/-123.107	86%	DEQ
30188-ORDEQ	WF Evans Creek near headwaters	42.6986/-123.107	86%	DEQ
30189-ORDEQ	WF Evans Creek downstream of Sand Creek	42.6588/-123.095	34%	DEQ
30189-ORDEQ	WF Evans Creek downstream of Sand Creek	42.6588/-123.095	34%	DEQ
30189-ORDEQ	WF Evans Creek downstream of Sand Creek	42.6588/-123.095	86%	DEQ
30189-ORDEQ	WF Evans Creek downstream of Sand Creek	42.6588/-123.095	80%	DEQ
30189-ORDEQ	WF Evans Creek downstream of Sand Creek	42.6588/-123.095	75%	DEQ
30189-ORDEQ	WF Evans Creek downstream of Sand Creek	42.6588/-123.095	77%	DEQ
30190-ORDEQ	WF Evans Creek downstream of Battle Creek	42.6191/-123.042	52%	DEQ
30190-ORDEQ	WF Evans Creek downstream of Battle Creek	42.6191/-123.042	52%	DEQ
30190-ORDEQ	WF Evans Creek downstream of Battle Creek	42.6191/-123.042	72%	DEQ
30190-ORDEQ	WF Evans Creek downstream of Battle Creek	42.6191/-123.042	71%	DEQ
30190-ORDEQ	WF Evans Creek downstream of Battle Creek	42.6191/-123.042	61%	DEQ
30190-ORDEQ	WF Evans Creek downstream of Battle Creek	42.6191/-123.042	55%	DEQ
No Station ID	Elk Creek at mouth	42.6632/-122.755	34%	DEQ
No Station ID	Elk Creek at end of bottom rod upstream Alto Creek 1	42.7458/-122.705	58%	DEQ
No Station ID	Elk Creek at end of bottom rod upstream Alto Creek 2	42.7458/-122.705	60%	DEQ
No Station ID	Elk Creek at end of bottom rod upstream Alto Creek 3	42.7458/-122.705	10%	DEQ
No Station ID	Elk Creek 1/4 mile upstream dam 1	42.6805/-122.734	10%	DEQ
No Station ID	Elk Creek 1/4 mile upstream dam 2	42.6805/-122.734	60%	DEQ

Station ID	Station	Latitude/Longitude	Effective Shade	Data Source
No Station ID	Elk Creek 1/4 mile upstream dam 2	42.6805/-122.734	15%	DEQ
No Station ID	Elk Creek upstream dam	42.6798/-122.735	0%	DEQ
No Station ID	Little Applegate River downstream of Muddy Gulch	42.1574/-122.9	85%	DEQ File
No Station ID	Little Applegate River near headwaters	42.0708/-122.815	90%	DEQ File
No Station ID	Little Applegate River near river mile 14.1	42.1344/-122.837	99%	DEQ File
25592-ORDEQ	Little Butte upstream confluence w/ Nichols Branch	42.4823/-122.778	51.5%	LBWSC/BLM
No Station ID	Little Butte upstream Hwy 62 Bridge	42.4622/-122.816	32%	LBWSC/BLM
No Station ID	Little Butte above mouth in Denman	42.4485/-122.878	12%	LBWSC/DEQ
14346700	Little Butte at Lake Creek Town	42.4218/-122.623	10%	OWRD
25595-ORDEQ	SF Little Butte Creek at gage	42.4192/-122.613	33%	OWRD
25597-ORDEQ	SF Little Butte Creek upstream Dead Indian Creek	42.3383/-122.45	24.5%	OWRD
25792-ORDEQ	SF Little Butte Creek below Lost Creek	42.3796/-122.575	35.5%	OWRD
25795-ORDEQ	SF Little Butte Creek upstream Soda Creek	42.3552/-122.512	87.5%	OWRD

6 Model development and calibration

Waterbodies where model development was initiated for the Applegate Subbasin TMDL (DEQ, 2004), Bear Creek Watershed TMDL (DEQ, 2007), Lobster Creek Watershed TMDL (DEQ, 2002a), and Rogue River Basin TMDL (DEQ, 2008) are listed in Table 8. The waterbodies listed in Table 9 will have new models developed. The extent and location of these models is shown in the HTML interactive map that accompanies this QAPP and is referenced in Appendix D.

Table 8: Waterbodies where a model has already been developed. The model year is identified if another year is proposed for a new model on the same waterbody.

Model Version	Model Waterbody
Heat Source version 6 temperature model	Bear Creek, Lobster Creek
Heat Source version 8 temperature model	Antelope Creek, Elk Creek, Evans Creek and West Fork Evans Creek, Little Butte Creek and North Fork Little Butte Creek, Rogue River, South Fork Little Butte Creek
SHADOW shade model	Multiple streams in the Applegate Subbasin, Bear Creek Watershed, and Lobster Creek Watershed (see sections 6.4 – 6.6)

The setup and calibration for the Heat Source models listed in Table 8 was completed by DEQ and documented in the Applegate Subbasin TMDL (DEQ, 2004), Bear Creek Watershed TMDL (DEQ, 2007), Lobster Creek Watershed TMDL (DEQ, 2002a), and Rogue River Basin TMDL (DEQ, 2008). The SHADOW models are shade only models and were setup and calibrated by the BLM, USFS, and Lower Rogue Watershed Council. Adjustments to the existing calibrated models are unlikely to occur as part of this project. However, if it is determined that the model calibration needs to be updated, the model inputs that are expected to be modified are described in Section 6.1. DEQ will follow the model acceptance criteria and model fit statistics described in Section 7.2.

Not listed in Table 8 are existing SHADOW models for various streams in the Sucker Creek Watershed (DEQ, 1999b; DEQ, 2002b), a Heat Source temperature model for Sucker Creek (DEQ, 2002b), and Heat Source shade models for Cheney Creek, Thompson Creek, Slate Creek, and Waters Creek in the Applegate Subbasin (DEQ, 2004). These models were documented in their respective TMDLs but unfortunately have gone missing from DEQ's files. DEQ does not plan to replace these models with new ones. Instead DEQ will utilize a "Shade Curve" approach as described in Section 6.3.

Table 9: Waterbodies and year for which new models are expected to be developed.

Model Version	Model Waterbody
Heat Source version 8 temperature model	Applegate River, Little Applegate River

New calibrated temperature models are being developed for the Applegate River and the Little Applegate River. Models were originally developed for these rivers in support of the Applegate Subbasin TMDL (DEQ, 2004) but the current condition calibrated models have gone missing from DEQ's files. The new models will support estimating background conditions for a longer period of time compared to the original models. The original models only simulated a single day. Data from the same year (1999) will be used to develop the new models. DEQ considered developing a new calibration for a more recent time period but there are insufficient temperature data available. Instead DEQ will complete management scenarios (Section 10) to characterize more recent vegetation and shade conditions. The Little Applegate River is a major tributary to the Applegate River. The new calibrated model on the Little Applegate River will support development of tributary boundary conditions under various management scenarios.

DEQ will develop effective shade curves for all other waterbodies that were not specifically listed in Table 8 and Table 9. Effective shade curves represent the maximum possible effective shade for different vegetation types, stream widths, and stream aspect. Every combination of these conditions are modeled in Heat Source to develop the estimated effective shade. The results are summarized in a shade curve plot. The results can also be summarized in a lookup table with additional combinations of vegetation height, density, and buffer width included. Effective shade curves were developed for the original Applegate

Subbasin TMDL (DEQ, 2004), Bear Creek Watershed TMDL (DEQ, 2007), Lobster Creek Watershed TMDL (DEQ, 2002a), and Rogue River Basin TMDL (DEQ, 2008). Adjustments to the existing shade curve models are unlikely to occur as part of this project. However, if it is determined that the models need to be updated DEQ will follow the procedures outlined in this QAPP.

6.1 General model inputs and parameters

6.1.1 Heat Source version 6

Table 10 summarizes all of the user entered model inputs and parameters required to run Heat Source version 6; and identifies the subset of inputs and parameters that could possibly be modified to improve the calibration of the model. It should be noted, it is unlikely all of these will be used as calibration parameters; rather this list identifies the candidate model inputs that will be considered for adjustment through the calibration process.

The following bulleted list of input categories and specific inputs describes the general form and function of the inputs, and why the inputs are candidates for adjustment during calibration:

- Morphology – The morphology inputs that could be used as calibration parameters include upstream and downstream channel elevations, Manning's *n*, and rating curve coefficients *a* and *b* for a power function. Channel hydraulics are important for predicting stream temperatures because they govern the surface area of water that could be exposed to solar radiation, the residence time for exposure, and the degree of light penetration into the water column. Field data for these inputs are often difficult to collect over large spatial scales, and values can vary significantly on a small scale. Heat Source is a one-dimensional model and complex channel configurations are represented as a trapezoidal pattern. Adjustments to inputs that affect channel hydraulics are often necessary to calibrate the model.

- Meteorology – The meteorological input modified in calibration is wind speed. Wind speed can vary significantly on a small geographic scale and the distance to the source of the meteorological data is often much greater than the small-scale localized weather. Hence, adjusting wind is an appropriate calibration method to account for more site-specific weather patterns.

- Mass and thermal flux – Mass and thermal inflows and outflows are inputs often adjusted during the calibration process. These inflows of heat and water consist of tributary and groundwater inflows as well as diversions (i.e., water rights withdrawals) and groundwater losses. The temporal and geographic extents of flow gaging and temperature monitoring on tributaries or groundwater are generally sparse. An effective way of improving the calibration is to complete a flow mass balance with available data, and then add, subtract, or adjust flows either globally or in specific locations within the bounds of the flow mass balance and available measurements, and the temperature response predicted by the model.

- Vegetation – Vegetation characteristics input into the model are often derived from aerial imagery or LiDAR. The vegetation characteristics determine the degree to which near-stream vegetation has the capacity to block incidental solar radiation on the surface of the modeled waterbody. Three vegetation inputs incorporated into the model calibration process are the vegetation density, overhang, and height. Field measurements offer a general understanding of vegetation characteristics within the watershed, however variability in these parameters can be significant on smaller geographic scales. To improve the model fit these model inputs may be modified on a global scale for different vegetation classes within the bounds of available data.

Table 10: Summary of model inputs required for Heat Source version 6.

Input Type	Input/Parameter	Units	Calibration Parameter
General	Model Date	date (mm/dd/yyyy)	NO
General	Longitudinal Stream Sample Distance	meters	NO
General	Number of Tributary Inflow Sites	-	NO
General	Number of Meteorological Data Sites	-	NO
General	Total Longitudinal Distance	meters	NO
General	Stop Distance	meters	NO
General	Latitude	decimal degrees	NO
General	Longitude	decimal degrees	NO
General	Riparian Zone Width	meters	NO
Meteorological Data	Meteorological Data Model Kilometers	kilometers	NO
Meteorological Data	Wind Speed	meters/second	YES
Meteorological Data	Relative Humidity	proportion (0-1)	NO
Meteorological Data	Air Temperature	degrees Celsius	NO
Boundary Condition	Boundary Condition Inflow Rate	cubic meters/second	NO
Boundary Condition	Water Temperature	degrees Celsius	NO
Tributary	Tributary Inflow Model Kilometers	kilometers	NO
Tributary	Tributary Inflow Rate	cubic meters/second	YES
Tributary	Water Temperature	degrees Celsius	YES
Land Cover Data	Topographic Shade Angle - West	degrees	NO
Land Cover Data	Topographic Shade Angle - South	degrees	NO
Land Cover Data	Topographic Shade Angle - East	degrees	NO
Land Cover Data	Landcover Code	-	NO
Land Cover Codes	Landcover Height	meters	YES
Land Cover Codes	Canopy Density	proportion (0-1)	YES
Land Cover Codes	Landcover Overhang	meters	YES
Morphology Data	Channel Bed Elevation	meters	NO
Morphology Data	Manning's Roughness Coefficient, n	seconds/meter	YES

Input Type	Input/Parameter	Units	Calibration Parameter
Morphology Data	Near-stream Disturbance Zone (NSDZ) Width	meters	NO
Morphology Data	Rating Curve Coefficient, a	unitless	YES
Morphology Data	Rating Curve Coefficient, b	unitless	YES
Morphology Data	Percent Bedrock	proportion (0-1)	NO
Morphology Data	Channel Aspect	degrees	NO
Morphology Data	Channel Incision	meters	NO
Morphology Data	Valley Length (optional)	meters	NO

6.1.2 Heat Source version 8

The model inputs and parameters for Heat Source version 8 are similar to Heat Source version 6 with a few notable exceptions:

- Model can simulate an unlimited number of days;
- Star pattern landcover input with variable landcover height, density, and ground elevation inputs;
- allows for variable flow rate time series on the boundary conditions and tributary inputs;
- requires input of latitude, longitude and aspect for each node of the model;
- uses Manning's equation exclusively to calculate channel hydraulics and omits the ability to specify rating curve coefficients for certain aspects of channel hydraulics;
- includes cloudiness (as a percentage of clear sky) as a meteorological input—Heat Source version 6 assumes the clear sky conditions;
- allows specifically for groundwater (accretion) and diversion inputs to the model;
- specifies additional morphology data such as bottom width, bed sediment parameters and channel gradient;
- specifies bed conduction inputs such as hyporheic exchange parameters; and
- allows for the use of LiDAR data to be used for vegetation density and overhang.

Table 11 summarizes the list of model parameters that are different between Heat Source version 6 and Heat Source version 8. Columns V6 and V8 indicate if the parameter or input is included in version 6 or version 8 of Heat Source. The calibration parameter column indicates if the input or parameter might be modified to improve the calibration.

Table 11: Summary of the model inputs and parameters that are different between Heat Source version 6 and Heat Source version 8.

Input Type	Input/Parameter	Units	V6	V8	Calibration Parameter
General	Riparian Zone Width	meters	YES	NO	NO
General	Initial Conditions (assumed/user defined)	-	YES	NO	NO
Land Cover Data	Landcover Source	-	YES	NO	NO
Morphology Data	Flow Volume	cubic meters/second	YES	NO	NO
Morphology Data	Percent Bedrock	proportion (0-1)	YES	NO	NO
Morphology Data	Channel Incision	meters	YES	NO	NO
Morphology Data	Valley Length	meters	YES	NO	NO
Meteorological Data	Cloudiness	proportion (0-1)	NO	YES	YES
Accretion	Accretion Inflow Rate	cubic meters/second	NO	YES	YES
Accretion	Water Temperature	degrees Celsius	NO	YES	YES
Accretion	Withdrawal Flow Rate	cubic meters/second	NO	YES	YES
Morphology Data	Channel Gradient	meters/meters	NO	YES	YES
Morphology Data	Channel Angle z	meters/meters	NO	YES	YES
General	LiDAR Density	proportion (0-1)	NO	YES	YES
General	LiDAR Overhang	meters	NO	YES	YES
Morphology Data	Channel Bottom Width	meters	NO	YES	YES
Morphology Data	Hyporheic Zone Thickness	meters	NO	YES	YES
Morphology Data	Percent Hyporheic Exchange	proportion (0-1)	NO	YES	YES
Morphology Data	Porosity	proportion (0-1)	NO	YES	YES
General	Stream Length	kilometers	NO	YES	NO
General	Modeling Start Date	date (mm/dd/yyyy)	NO	YES	NO
General	Flush Initial Condition	days	NO	YES	NO
General	Model Time Step	minutes	NO	YES	NO
General	Model Distance Step	meters	NO	YES	NO

Input Type	Input/Parameter	Units	V6	V8	Calibration Parameter
General	Include Evaporation Losses From Flow (True/False)	-	NO	YES	NO
General	Evaporation Method (Mass Transfer/Penman)	-	NO	YES	NO
General	Wind Function Coefficient a	unitless	NO	YES	NO
General	Wind Function Coefficient b	unitless	NO	YES	NO
General	Include Deep Alluvium Temperature (True/False)	-	NO	YES	NO
General	Deep Alluvium Temperature	degrees Celsius	NO	YES	NO
General	Distance Between Transect Samples	meters	NO	YES	NO
Accretion	Stream Kilometers	kilometers	NO	YES	NO
Land Cover Codes	Landcover Code	-	NO	YES	NO
Morphology Data	Stream Kilometers	kilometers	NO	YES	NO
Morphology Data	Sediment Thermal Conductivity	watts/meters/degrees Celsius	NO	YES	NO
General	Time Offset From UTC	hours	NO	YES	NO
General	Number Of Samples Per Transect	-	NO	YES	NO
General	Account For Emergent Veg Shading (True/False)	-	NO	YES	NO
General	Land Cover Sample Method (Point/Zone)	-	NO	YES	NO
General	LiDAR Data Used For Veg Codes (True/False)	-	NO	YES	NO
Morphology Data	Sediment Thermal Diffusivity	square centimeters/second	NO	YES	NO

6.1.3 SHADOW

The SHADOW model version 2.3 is a shade, solar, and stream temperature model developed by the U.S. Forest Service (USFS, 1993). Complete documentation of the model methodology, model inputs, and model outputs are discussed in the SHADOW user's manual (USFS, 1993).

6.2 Data gaps

Non-steady state stream models typically require a significant amount of data because of the large spatial and temporal extents the models typically encompass. As the model size or modeling period increase, the amount of information needed to parameterize it also increases. Often it is not possible to parameterize a model entirely from field data because it can be resource intensive or impractical to collect everything that is needed. In general, these data gaps may be considered and addressed in a number of ways. Table 12 summarizes methods that are used to derive the data needed to parameterize the model.

To the greatest extent possible, the method used to derive the model parameters for the existing TMDL models have been summarized in the boundary conditions and tributary inputs tables in Section 6. The tables are located in sections 6.x.6 where x is the specific sub-section for each model (e.g. Section 6.7.6 for Antelope Creek).

Table 12: Methods to derive model parameters for data gaps.

Method	Possible Parameters	Description
Direct surrogate	Tributary temperatures, meteorological inputs, sediment	Often, neighboring or nearby tributary watersheds share climatological and landscape features. Model parameters that have an incomplete record or no data may be parameterized using data from a neighboring or nearby location where data is available.
Calibration adjustment	All inputs	In some instances, a significant input may be required for appropriate representation in the modeling, however little may be known about the nature of that input. An example of this is groundwater influx and temperature. Datasets for these inputs can be estimated by adjusting the necessary values within acceptable ranges during the calibration process.
Literature-based values	All inputs	Literature values are often used for model parameters or unquantified model inputs when little is known about the site-specific nature of those inputs. Examples of these types of parameters include stream bed heat transfer properties, hyporheic characteristics or substrate porosity (Bencala and Walters, 1983; Hart, 1995; Pelletier et al., 2006; Sinokrot and Stefan, 1993).
Mass balance	Tributary temperature and flow	On main stem modeled reaches, tributary stream flow or temperature can be estimated using a mass balance approach assuming either flow or temperature data for the tributary are known. If estimating temperature, flow is required, and if estimating flow, temperature is required. Often TIR data are used to estimate tributary flow because upstream, downstream and tributary temperatures are known, and upstream and tributary flows are known (or estimated).

Method	Possible Parameters	Description
Simple linear regression	Tributary temperature and flow	Parameters such as flow and temperature in neighboring or nearby tributaries often demonstrate similar diurnal patterns or hydrographs which allow for the development of suitable mathematical relationships (simple linear regression) in order to fill the data gaps for those inputs. This method requires at least some data exist for the incomplete dataset in order to develop the relationship.
Drainage area ratio	Tributary flow	For ungaged tributaries, flows can be estimated using the ratio between the watershed drainage areas of the ungaged location and from a nearby gaged tributary (Ries et al., 2017; Risley, 2009; Gianfagna, 2015). For example, if the watershed area upstream of a gaged tributary is 10 square kilometers, and the watershed area of an ungaged tributary is 5, the flows in the ungaged tributary are estimated to be half of those in the gaged tributary. The method is typically used to calculate low flow or flood frequency statistics. In that context a weighting factor is recommended when the drainage area ratio of the two sites is between 0.5 and 1.5. Weighting factors can be evaluated if instantaneous observed flows are available at the ungaged location.
Flow-probability-probability-flow (QPPQ)	Tributary flow	The flow-probability-probability-flow (QPPQ) method makes use of relating flow duration curves between a gaged tributary and an ungaged tributary (Lorenz and Ziegeweid, 2016). The flow duration curve at ungaged sites is estimated using regression approaches (Risley et al., 2008) and the online USGS tool StreamStats (Ries et al., 2017).
Adiabatic adjustment	Air temperature	Air temperature can vary significantly throughout a watershed, particularly with large differences in elevation from headwaters to the mouth of the drainage. To account for these differences, air temperatures can be adjusted using an equation that relates air temperature measured at a meteorological station to a location of a given elevation using the dry adiabatic lapse rate of 9.8 °C/km and the differences in elevation.
GIS Data	Channel position, Channel width, Landcover, Gradient, Elevation, Topographic shade angles	Several landscape scale GIS data sets can be used to derive a number of model parameters. Digital orthophotos quads (DOQs) are used to classify landcover and estimate vegetation type, height, density, and overhang. DOQs can also be used to determine stream position, stream aspect, and channel width. A digital elevation model (DEM) consists of digital information that provides a uniform matrix of terrain elevation values. It provides basic quantitative data for deriving surface elevation, stream gradient, and maximum topographic shade angles.

6.3 Effective shade curves and lookup tables

Effective shade curves are plots that present the maximum possible effective shade as a function of different types of natural near-stream vegetation, active channel widths, and stream aspect. Channel width is plotted on the x-axis, effective shade is on the y-axis, and a separate symbol and/or line color is used for each stream aspect. Separate plots are produced for each type of natural vegetation that is expected in the TMDL project area. The plots are called effective shade curves because the pattern on the plot resembles a gentle downward slopping curve. As channel width increases effective shade gets smaller. The plots are produced from the output of Heat Source version 6 shade models that have been parameterized with every combination of the previously mentioned conditions. The effective shade curve approach can be used almost anywhere to quantify the amount of background solar radiation loading and the effective shade necessary to eliminate temperature increases from anthropogenic disturbance or removal of near-stream vegetation.

This model approach can also be used to develop a lookup table to determine the effective shade resulting from other combinations vegetation height, vegetation density, vegetation overhang, and vegetation buffer widths that are different from background conditions. The lookup table provides a convenient way for readers of the TMDL to estimate the effective shade for current conditions without using the model. The lookup table can also be used as a reverse lookup to determine what vegetation height, buffer width, or vegetation density would achieve a certain effective shade.

6.3.1 Model domain

The model domain is not specific to any single waterbody but will be parameterized using a latitude and longitude located in the TMDL watershed to ensure that the modeled solar altitude and sun angles are appropriate for the area.

6.3.2 Spatial and temporal resolution

The model input spatial resolution (*dx*) is 30 meters. Outputs are generated every 100 meters. The spatial resolution is not very meaningful however, since each output distance step will represent a unique combination of the different modeled vegetation and channel conditions. The model time step (*dt*) is 1 minute and outputs are generated every hour.

6.3.3 Source characteristics

The effective shade curve approach can be used almost anywhere in the watershed to quantify the amount of background solar radiation loading and the effective shade necessary to eliminate temperature increases from anthropogenic disturbance or removal of near-stream vegetation.

The lookup tables can be used to estimate existing shade or current solar loading. Other potential sources of thermal loading and the temperature response will not be evaluated by this model.

6.3.4 Time frame of simulation

The model period is a single day in late July or early August. This time frame was chosen to characterize the solar loading when maximum stream temperatures are observed, the sun altitude angle is highest, and the period of solar exposure is longest.

6.3.5 Important assumptions

Models used to develop effective shade curves assume no cloud cover and no topographic shade. The modeled terrain is flat so there is no difference in ground elevation between the stream and the adjacent vegetation buffer area. The vegetation density, vegetation height, vegetation overhang, and vegetation buffer width are assumed to be equal on both sides of the stream. The width of the active channel is assumed to be equal to the distance between near-stream vegetation on either side of the stream.

Effective shade curves were developed for the original Applegate Subbasin TMDL (DEQ, 2004), Bear Creek Watershed TMDL (DEQ, 2007), Lobster Creek Watershed TMDL (DEQ, 2002a), and Rogue River Basin TMDL (DEQ, 2008). Adjustments to the existing shade curve models are unlikely to occur as part of this project. However, if it is determined that the models need to be updated DEQ will follow the procedures outlined in this QAPP.

6.3.6 Model inputs

There are two categories of models each with different sets of inputs:

- Effective shade curves: Model input values for vegetation height, vegetation density, vegetation overhang, and vegetation buffer width correspond to the restored streamside vegetation types expected in areas that are currently lacking streamside vegetation because of anthropogenic disturbance. The specific values will be determined during the TMDL process and will likely be the same or similar to the values presented in the Applegate Subbasin TMDL (DEQ, 2004), Bear Creek Watershed TMDL (DEQ, 2007), Lobster Creek Watershed TMDL (DEQ, 2002a), and Rogue River Basin TMDL (DEQ, 2008). The other model inputs are the same as what is described in Table 13.
- Effective shade lookup tables: Model input values to be used for the lookup tables are described in Table 13.

Table 13: Range of model inputs to be used for effective shade lookup tables.

Model Input	Value Range
Vegetation height (meters)	0 - 90 (or expected maximum)
Vegetation density (percent)	0 -100
Vegetation overhang (meters)	0 - 3 (or expected maximum)
Vegetation buffer width (meters)	0 - 45
Active channel width (meters)	0 - 100 (or expected maximum)
Stream aspect (degrees)	North/South (0/180); Northeast/Southwest (45/225); East/West (90/270); Southeast/Northwest (135/315)
Topographic shade angles (degrees)	0
Cloudiness	0

6.4 SHADOW Applegate Subbasin

The Applegate Subbasin SHADOW models are shade models developed by the USFS and BLM. DEQ does not intend to update these models. If the need arises to revisit some of the modeling, this QAPP will be updated as needed. The model setup is described in the original Applegate Subbasin TMDL (DEQ, 2004).

6.4.1 Model domain

The extent of the model domain is select tributaries to the Applegate River and Little Applegate River in the Williams Creek Watershed (1710030905), Upper Applegate River Watershed (1710030902), and Little Applegate River Watershed (1710030903). Select tributaries include 1917 Gulch, 1918 Gulch, Alexander Gulch, Armstrong Gulch, Bailey Gulch, Bear Wallow Creek, Beaver Creek, Benson Gulch, Bill Creek, Brushy Gulch, Charley Buck Gulch, Clapboard Gulch, Deadman Gulch, East Fork Williams Creek, Glade Creek, Glade Fork, Goodwin Creek, Hanley Gulch, Haskins Gulch, Honeysuckle Creek, Kinney Creek, Ladybug Gulch, Lightning Gulch, Lime Gulch, Lone Creek, Mule Creek, Munger Creek, Nine Dollar Gulch, North Fork Munger Creek, Palmer Creek, Petes Camp Creek, Powell Creek, Right Hand Fork of the West Fork Williams, Right Hand Fork Rock Creek, Rock Creek, Rock Gulch, Star Gulch, Sterling Creek, Sugar Loaf Gulch, Tree Branch Creek, Wallow Creek, Water Gulch, West Fork Williams Creek, Williams Creek, and Yale Creek. The model extent is shown in the HTML interactive map that accompanies this QAPP and is referenced in Appendix C.

6.5 SHADOW Bear Creek Watershed

The Bear Creek Watershed SHADOW models are shade models developed by the USFS. The model setup for the USFS SHADOW models are described in the original Bear Creek Watershed TMDL (DEQ, 2007). DEQ does not intend to update these models but will include the model results in the updated TMDL. If the need arises to revisit some of these models, this QAPP will be updated as needed.

The BLM has also developed SHADOW shade models on BLM administered lands for 14 different streams in the Bear Creek watershed (BLM, 2006 and BLM, 2008). DEQ is exploring the possibility of including the BLM models in the updated TMDL. Additional discussion with BLM is needed. DEQ also needs to review the model and determine the model setup and calibration results achieve the quality acceptance criteria identified in Section 7. If the models are used for the TMDL, documentation of the models will follow the same procedures outlined in Section 8.

6.5.1 Model domain

The extent of the model domain is select tributaries to Bear Creek from the mouth to headwaters in the Bear Creek Watershed (1710030801). Select tributaries include Anderson Creek, Ashland Creek, Butler Creek, Coleman Creek, Emigrant Creek, Griffin Creek, Jackson Creek, Larson Creek, Lazy Creek, Myer Creek, Neil Creek, Wagner Creek, and Walker Creek. The model extent is shown in the HTML interactive map that accompanies this QAPP and is referenced in Appendix C.

6.6 SHADOW Lobster Creek Watershed

The Lobster Creek Watershed SHADOW models are shade models developed by the USFS and Lower Rogue Watershed Council. DEQ does not intend to update these models. If the need arises to revisit some

of the modeling, this QAPP will be updated as needed. The model setup is described in the original Lobster Creek Watershed TMDL (DEQ, 2002a).

6.6.1 Model domain

The extent of the model domain is Lobster Creek and select tributaries to Lobster Creek in the Lobster Creek Watershed (1710031007). Select tributaries include Lost Valley Creek, North Fork Lobster Creek, South Fork Lobster Creek, Boulder Creek, Fall Creek, and Deadline Creek. The model extent is shown in the HTML interactive map that accompanies this QAPP and is referenced in Appendix C.

6.7 Antelope Creek

The Antelope Creek model is a temperature model developed using Heat Source 8.0. The model was developed by DEQ.

6.7.1 Model domain

The extent of the model domain is Antelope Creek from the confluence with Little Butte Creek to just upstream of Yankee Creek. The model extent is shown in the HTML interactive map that accompanies this QAPP and is referenced in Appendix D.

6.7.2 Spatial and temporal resolution

The model input spatial resolution (*dx*) is 50 meters. Outputs are generated every 100 meters. The model time step (*dt*) is 1 minute and outputs are generated every hour.

A *dx* of 50 meters was chosen to capture the range of solar flux input caused by the varied vegetation conditions along the length of the stream. The high resolution *dx* will allow evaluation of multiple vegetation management scenarios for each designated management agency.

6.7.3 Source characteristics

The primary sources of thermal loading contributing to temperatures exceedances in Antelope Creek include increases in solar radiation loading from the disturbance or removal of near-stream vegetation, reductions to stream flow rate or volume, and background sources (DEQ, 2008). Other potential sources include channel modification and widening and warming caused by climate change. The contribution of these latter potential sources may be investigated as part of the model scenarios.

There are no permitted individual NPDES point sources along the model extent.

The majority land use along Antelope Creek is agriculture accounting for about 71 percent of the near-stream area. Table 14 summarizes all the land uses within 100 meters of the digitized Antelope Creek centerline. Land uses were summarized using the 2016 National Land Cover Database (Yang et al., 2018). Note that Shrub/Scrub and Herbaceous land uses can be areas where forest clearcuts have occurred and would be classified as forest after regrowth.

Table 14: Summary of land uses along the model extent within 100 meters of the digitized Antelope Creek centerline based on the 2016 National Land Cover Database (Yang et al., 2018).

2016 NLCD Land Cover	Acres	Percent of Total Acres
Hay/Pasture	353.8	70.7
Emergent Herbaceous Wetlands	65.6	13.1
Woody Wetlands	43.8	8.7
Developed, Open Space	15.6	3.1
Shrub/Scrub	10.9	2.2
Developed, Low Intensity	7.1	1.4
Developed, Medium Intensity	2.7	0.5
Developed, High Intensity	0.7	0.1
Herbaceous	0.4	0.1

Anthropogenic related stream warming caused by nonpoint sources is closely associated with the uses, the activities, and the condition of vegetation adjacent to the stream. How activities and uses are managed in these areas is partially determined by a variety of different rules and management plans established by the landowner and any agency with land use authority. To better understand the spatial distribution of different agency rules or management plans along the model extent DEQ mapped known designated management agencies (Table 15).

A designated management agency is defined in OAR 340-042-0030(2) as a federal, state, or local governmental agency that has legal authority over a sector or source contributing pollutants. Typically, persons or designated management agencies that are identified in the TMDL Water Quality Management Plan (WQMP) are responsible for developing TMDL implementation plans and implementing management strategies to reduce pollutant loading. Table 15 summarizes the potential designated management agencies and responsible persons along Antelope Creek model extent.

Table 15: Summary of potential designated management agencies (DMAs) or responsible persons along the model extent within 100 meters of the digitized Antelope Creek centerline.

DMA or Responsible Person	Acres	Percent of Total Acres
Oregon Department of Agriculture	424.9	81.5
Jackson County	84.8	16.3
Oregon Department of Transportation	6.0	1.2
Oregon Department of Fish and Wildlife	5.6	1.1

6.7.4 Time frame of simulation

The model period is July 01, 2001 to August 31, 2001.

6.7.5 Important assumptions

The effort currently described in the QAPP includes use of existing models. Key calibration assumptions made during the model setup and calibration process were documented in the original Rogue River Basin TMDL (DEQ, 2008) and the model user guide (Boyd and Kasper, 2003).

6.7.6 Model inputs

Table 16 summarizes the current configuration of the model input parameters and the source of these data. Temperature, flow, and meteorological input parameters are summarized to improve documentation of the TMDL approach.

Table 16: Boundary condition and tributary inputs to the existing Antelope Creek Heat Source model.

Model Location Name (Station ID)	Model Location (kilometers)	Input Type	Model Input	Data Source	Note
Antelope Creek at Yankee Road Bridge (14348150)	10.1	Boundary Condition	Flow	Derived data. USGS	Estimated by proportioning flows at the mouth between the headwaters and tributaries based on location in the watershed.
Antelope Creek at Yankee Road Bridge (LB12)	10.1	Boundary Condition	Water Temperature	MWC	
Quarter Branch (14348150)	4.05	Tributary	Flow	Derived data. USGS	Estimated by proportioning flows at the mouth between the headwaters and tributaries.
Dry Creek (14348150)	3.35	Tributary	Flow	Derived data. USGS	Estimated by proportioning flows at the mouth between the headwaters and tributaries.
Quarter Branch (LB12)	4.05	Tributary	Water Temperature	MWC	Temperatures from the MWC boundary condition (station LB12) were used for tributary inflow temperatures
Dry Creek (LB12)	3.35	Tributary	Water Temperature	MWC	Temperatures from the MWC boundary condition (station LB12) were used for tributary inflow temperatures

Model Location Name (Station ID)	Model Location (kilometers)	Input Type	Model Input	Data Source	Note
KMFR - Medford Airport	0.3, 5.45	Meteorological	Wind Speed	Derived data. NCDC	Wind sheltering coefficient of 0.5 applied to this reach.
KMFR - Medford Airport	0.3, 5.45	Meteorological	Air Temperature, Cloudiness, Relative Humidity	NCDC	

Hourly meteorology inputs into the model include air temperature, cloudiness, relative humidity, and wind speed. Air temperature data were modified using the dry adiabatic lapse rate to adjust for differences in elevation between the measurement location and the model input location. Wind speeds were adjusted to improve the calibration using a wind-sheltering coefficient to represent difference in wind speed between the measurement location and above the stream within the riparian area.

6.7.7 Model calibration

The expected model calibration sites and data sources are summarized in Table 17. The model location in the table below describes the distance of each input from the most downstream model node. Effective shade model calibrations sites are summarized in Table 7. The model inputs and parameters that are expected to be modified to improve model fit are described in Section 6.1.

Table 17: Calibration sites and parameters used in the existing Antelope Creek Heat Source model.

Model Location Name (Station ID)	Model Location (kilometers)	Calibration Parameter	Data Source
Antelope Creek at Riley Road (LB17)	5.45	Water Temperature	MWC
Antelope Creek at gage (14348150)	0.7	Flow	OWRD
Antelope Creek at Little Butte RM 0.1 (25584-ORDEQ)	0.3	Water Temperature	DEQ
Model extent	Model extent	Water Temperature (TIR)	Watershed Sciences (2002)

6.8 Applegate River

The Applegate River model will be a temperature model developed using Heat Source 8.0.8. The model will be developed by DEQ.

6.8.1 Model domain

The extent of the model domain is the Applegate River from the mouth to immediately downstream of Applegate Dam. The model extent is shown in the HTML interactive map that accompanies this QAPP and is referenced in Appendix D.

6.8.2 Spatial and temporal resolution

The model input spatial resolution (*dx*) is 50 meters. Outputs are generated every 200 meters. The model time step (*dt*) is 1 minute and outputs are generated every hour.

A *dx* of 50 meters was chosen to capture the range of solar flux input caused by the varied vegetation conditions along the length of the stream. The high resolution *dx* will allow evaluation of multiple vegetation management scenarios for each designated management agency.

6.8.3 Source characteristics

The primary sources of thermal loading contributing to temperatures exceedances in the Applegate River include increases in solar radiation loading from the disturbance or removal of near-stream vegetation and background sources (DEQ, 2004). Other potential sources include reductions to stream flow rate or volume, channel modification and widening, releases and management of water impounded by Applegate Dam, and warming caused by climate change. The contribution of these latter potential sources may be investigated as part of the model scenarios.

There is one permitted individual NPDES point source along the model extent (Hidden Valley High School STP). Detail about this permittee is summarized in Table 18. The current NPDES permit for Hidden Valley High School STP does not authorize discharge May 1st – October 31st so they are not a source of warming during the summer period.

Table 18: Summary of individual NPDES permitted discharges in the Applegate River.

Facility Name (Facility Number)	Latitude/Longitude	Permit Type and Description	Stream/River Mile
Hidden Valley High School STP (38625)	42.3286/-123.336	NPDES-DOM-Da: Sewage - less than 1 MGD	Applegate River RM 12.5

The majority land uses along the Applegate River are forestry, emergent herbaceous wetlands, and agriculture accounting for about 86 percent of the near-stream area. Table 19 summarizes all the land uses within 100 meters of the digitized Applegate River centerline. Land uses were summarized using the 2016 National Land Cover Database (Yang et al., 2018). Note that Shrub/Scrub and Herbaceous land uses can be areas where forest clearcuts have occurred and would be classified as forest after regrowth.

Table 19: Summary of land uses along the model extent within 100 meters of the digitized Applegate River centerline based on the 2016 National Land Cover Database (Yang et al., 2018).

2016 NLCD Land Cover	Acres	Percent of Total Acres
Emergent Herbaceous Wetlands	850.0	23.2
Hay/Pasture	793.1	21.6
Woody Wetlands	615.8	16.8

2016 NLCD Land Cover	Acres	Percent of Total Acres
Evergreen Forest	393.0	10.7
Shrub/Scrub	385.4	10.5
Developed, Open Space	284.4	7.7
Developed, Low Intensity	171.2	4.7
Herbaceous	63.2	1.7
Mixed Forest	61.4	1.7
Developed, Medium Intensity	28.2	0.8
Barren Land	22.0	0.6
Developed, High Intensity	2.7	0.1
Cultivated Crops	1.1	<0.05

Anthropogenic related stream warming caused by nonpoint sources is closely associated with the uses, the activities, and the condition of vegetation adjacent to the stream. How activities and uses are managed in these areas is partially determined by a variety of different rules and management plans established by the landowner and any agency with land use authority. To better understand the spatial distribution of different agency rules or management plans along the model extent DEQ mapped known designated management agencies (Table 20).

A designated management agency is defined in OAR 340-042-0030(2) as a federal, state, or local governmental agency that has legal authority over a sector or source contributing pollutants. Typically, persons or designated management agencies that are identified in the TMDL Water Quality Management Plan (WQMP) are responsible for developing TMDL implementation plans and implementing management strategies to reduce pollutant loading. Table 20 summarizes the potential designated management agencies and responsible persons along the Applegate River model extent.

Table 20: Summary of potential designated management agencies (DMAs) or responsible persons along the model extent within 100 meters of the digitized Applegate River centerline.

DMA or Responsible Person	Acres	Percent of Total Acres
Oregon Department of Agriculture	1864.4	46.4
Jackson County	704.7	17.5
Oregon Department of Forestry - Private Forestland	362.9	9
Oregon Department of Geology and Mineral Industries	331.4	8.2
Josephine County	326.0	8.1
U.S. Forest Service	192.1	4.8
U.S. Bureau of Land Management	98.8	2.5
State of Oregon	57.3	1.4
U.S. Army Corps of Engineers	42.1	1
Oregon Department of Transportation	40.9	1
U.S. Government	1.8	<0.05

6.8.4 Time frame of simulation

The model period is July 19, 1999 to August 09, 1999.

6.8.5 Important assumptions

Model development for the Applegate River will be completed by DEQ and assumptions will be documented in the TMDL. Other key assumptions about model constants are described in the Heat Source model user guide (Boyd and Kasper, 2003).

6.8.6 Model inputs

Table 21 summarizes the current configuration of the model input parameters and the source of these data. Temperature, flow, and meteorological input parameters are summarized to improve documentation of the TMDL approach.

Table 21: Boundary condition and tributary inputs to the Applegate River Heat Source model.

Model Location Name (Station ID)	Model Location (kilometers)	Input Type	Model Input	Data Source	Note
Applegate River near Copper (14362000)	74.17	Boundary Condition	Flow	USGS	
Applegate River near Copper (14362000)	74.17	Boundary Condition	Water Temperature	USGS	
Palmer Creek	68.16	Tributary	Flow	Derived data.	Derive using drainage area ratio or QPPQ method using USGS 14362000 or 14362250
Beaver Creek	66.1	Tributary	Flow	Derived data.	Derive using drainage area ratio or QPPQ method using USGS 14362000 or 14362250
Little Applegate River (14365500)	55.6	Tributary	Flow	OWRD	

Model Location Name (Station ID)	Model Location (kilometers)	Input Type	Model Input	Data Source	Note
Forest Creek	51.47	Tributary	Flow	Derived data.	Derive using drainage area ratio or QPPQ method using USGS 14365000
Keeler Creek	46.6	Tributary	Flow	Derived data.	Derive using drainage area ratio or QPPQ method using USGS 14365000
Thompson Creek	42.15	Tributary	Flow	Derived data.	Derive using drainage area ratio with OWRD 14368300 or QPPQ method using USGS 14365000
Williams Creek	32.85	Tributary	Flow	Derived data.	Derive using drainage area ratio with OWRD 14368300 or QPPQ method using USGS 14365000
Murphy Creek	21.05	Tributary	Flow	Derived data.	Derive using drainage area ratio or QPPQ method using USGS 14365000
Slate Creek	4.75	Tributary	Flow	Derived data.	Derive using drainage area ratio or QPPQ method using USGS 14365000
Palmer Creek (28375-ORDEQ)	68.16	Tributary	Water Temperature	DEQ/Applegate WC	
Beaver Creek (28362-ORDEQ)	66.1	Tributary	Water Temperature	DEQ/Applegate WC	

Model Location Name (Station ID)	Model Location (kilometers)	Input Type	Model Input	Data Source	Note
Little Applegate River (28369-ORDEQ)	55.6	Tributary	Water Temperature	DEQ/Applegate WC	
Forest Creek (23870-ORDEQ)	51.47	Tributary	Water Temperature	DEQ/Applegate WC	Temperatures not available 7/9 - 7/26
Keeler Creek (40618-ORDEQ)	46.6	Tributary	Water Temperature	DEQ/BLM	
Thompson Creek	42.15	Tributary	Water Temperature	Derived data.	Use 28385-ORDEQ or derive at 33528-ORDEQ using regression between between 28385-ORDEQ and 33528-ORDEQ
Williams Creek (WILL (Williams Creek))	32.85	Tributary	Water Temperature	BLM	Temperatures only available 7/16-7/22, derive rest using regression between WILL or 28381-ORDEQ and 28383-ORDEQ
Murphy Creek (28374-ORDEQ)	21.05	Tributary	Water Temperature	DEQ/Applegate WC	
Slate Creek (23758-ORDEQ)	4.75	Tributary	Water Temperature	DEQ/Applegate WC	
353214 - Star Oregon (Star Ranger Station)	1	Meteorological	Air Temperature	RAWS (USFS)	Applied to all modeled reaches
353214 - Star Oregon (Star Ranger Station)	1	Meteorological	Relative Humidity, Wind Speed	RAWS (USFS)	

Model Location Name (Station ID)	Model Location (kilometers)	Input Type	Model Input	Data Source	Note
WBAN:24225 - Medford International Airport	1	Meteorological	Cloudiness	NCDC	Assumed clear skies for periods when sky condition was not recorded.

Hourly meteorology inputs into the model include air temperature, cloudiness, relative humidity, and wind speed. Air temperature data may be modified using the dry adiabatic lapse rate to adjust for differences in elevation between the measurement location and the model input location. Wind speeds may be adjusted to improve the calibration using a wind-sheltering coefficient to represent difference in wind speed between the measurement location and above the stream within the riparian area.

The near-stream vegetation inputs to the model include vegetation height and canopy cover. These inputs were derived by digitizing and classifying riparian vegetation type polygons based on aerial photos.

6.8.7 Model calibration

The expected model calibration sites and data sources are summarized in Table 22. The model location in the table below describes the distance of each input from the most downstream model node. Effective shade model calibrations sites are summarized in Table 7. The model inputs and parameters that are expected to be modified to improve model fit are described in Section 6.1.

Table 22: Calibration sites and parameters used in the Applegate River Heat Source model.

Model Location Name (Station ID)	Model Location (kilometers)	Calibration Parameter	Data Source
Copper Gage	75.55	Velocity, Depth	DEQ, ARWC, OWRD
Applegate River at Little Applegate (Rogue) (28359-ORDEQ)	55.65	Water Temperature	DEQ
Applegate River near Applegate (14366000)	45.2	Water Temperature, Flow	USGS
Near the Applegate gage	45.15	Velocity, Depth	DEQ, ARWC, OWRD
Applegate River near Wilderville (14369500)	12.6	Water Temperature, Flow	USGS
Near the Wilderville gage	12.45	Velocity, Depth	DEQ, ARWC, OWRD
Model extent	Model extent	Water Temperature (TIR)	Watershed Sciences (2000)

6.9 Bear Creek

The Bear Creek model is a temperature model developed using Heat Source 6.0. The model was developed by DEQ.

6.9.1 Model domain

The extent of the model domain is Bear Creek from the mouth upstream to confluence of Walker and Emigrant Creeks. The model extent is shown in the HTML interactive map that accompanies this QAPP and is referenced in Appendix D.

6.9.2 Spatial and temporal resolution

The model input spatial resolution (*dx*) is 100 meters. Outputs are generated every 100 meters. The model time step (*dt*) is 1 minute and outputs are generated every hour.

A *dx* of 100 meters was chosen to capture the range of solar flux input caused by the varied vegetation conditions along the length of the stream. The high resolution *dx* will allow evaluation of multiple vegetation management scenarios for each designated management agency.

6.9.3 Source characteristics

The primary sources of thermal loading contributing to temperatures exceedances in Bear Creek include increases in solar radiation loading from the disturbance or removal of near-stream vegetation, point source discharges, reductions to stream flow rate or volume, water impoundments behind irrigation structures, and background sources (DEQ, 2007). Other potential sources include channel modification and widening, and warming caused by climate change. The contribution of these latter potential sources may be investigated as part of the model scenarios.

There is one permitted individual NPDES point source along the model extent. Detail about the point source is summarized in Table 23. The City of Ashland (#3780) owns and operates a wastewater treatment facility that discharges treated effluent into Ashland Creek upstream of its confluence with Bear Creek at river mile 0.2. Currently there are plans to move the outfall to Bear Creek approximately 100 feet downstream from the confluence of Ashland Creek at about river mile 22.8. DEQ may consider this new outfall in the Bear Creek model scenarios.

Table 23: Summary of individual NPDES permitted discharges in Bear Creek.

Facility Name (Facility Number)	Latitude/Longitude	Permit Type and Description	Stream/River Mile
Ashland STP (3780)	42.2136/-122.714	NPDES-DOM-C1a: Sewage - 2 MGD or more but less than 5 MGD	Ashland Creek RM 0.2 (current); Bear Creek RM 22.8 (future)
Boise - Medford Plywood (9539)	42.355/-122.903	NPDES-IW-B19: Timber and Wood Products - Sawmills, log storage, instream log storage.	Bear Creek RM 6

The majority land uses along Bear Creek are developed areas, forestry, and agriculture accounting for about 91 percent of the near-stream area. Table 24 summarizes all the land uses within 100 meters of the digitized Bear Creek centerline. Land uses were summarized using the 2016 National Land Cover Database (Yang et al., 2018). Note that Shrub/Scrub and Herbaceous land uses can be areas where forest clearcuts have occurred and would be classified as forest after regrowth.

Table 24: Summary of land uses along the model extent within 100 meters of the digitized Bear Creek centerline based on the 2016 National Land Cover Database (Yang et al., 2018).

2016 NLCD Land Cover	Acres	Percent of Total Acres
Hay/Pasture	497.5	22.9
Woody Wetlands	467.7	21.5
Developed, Low Intensity	293.3	13.5
Developed, Open Space	282.2	13
Developed, Medium Intensity	219.7	10.1
Emergent Herbaceous Wetlands	186.8	8.6
Shrub/Scrub	122.1	5.6
Developed, High Intensity	62.0	2.9
Herbaceous	22.0	1
Evergreen Forest	16.2	0.7
Barren Land	1.6	0.1
Cultivated Crops	0.7	<0.05
Mixed Forest	0.2	<0.05

Anthropogenic related stream warming caused by nonpoint sources is closely associated with the uses, the activities, and the condition of vegetation adjacent to the stream. How activities and uses are managed in these areas is partially determined by a variety of different rules and management plans established by the landowner and any agency with land use authority. To better understand the spatial distribution of different agency rules or management plans along the model extent DEQ mapped known designated management agencies (Table 25).

A designated management agency is defined in OAR 340-042-0030(2) as a federal, state, or local governmental agency that has legal authority over a sector or source contributing pollutants. Typically, persons or designated management agencies that are identified in the TMDL Water Quality Management Plan (WQMP) are responsible for developing TMDL implementation plans and implementing management strategies to reduce pollutant loading. Table 25 summarizes the potential designated management agencies and responsible persons along Bear Creek model extent.

Table 25: Summary of potential designated management agencies (DMAs) or responsible persons along the model extent within 100 meters of the digitized Bear Creek centerline.

DMA or Responsible Person	Acres	Percent of Total Acres
Jackson County	938.6	35.7
City of Medford	542.7	20.6
Oregon Department of Agriculture	369.8	14.1

DMA or Responsible Person	Acres	Percent of Total Acres
Oregon Department of Transportation	270.6	10.3
City of Ashland	121.0	4.6
State of Oregon	116.9	4.4
City of Phoenix	88.9	3.4
City of Talent	75.6	2.9
City of Central Point	61.0	2.3
Oregon Department of Fish and Wildlife	36.8	1.4
U.S. Government	4.9	0.2
Central Oregon & Pacific Railroad	2.2	0.1

6.9.4 Time frame of simulation

The model period is for a single day: August 03, 1999.

6.9.5 Important assumptions

The effort currently described in the QAPP includes use of existing models. Key calibration assumptions made during the model setup and calibration process were documented in the original Bear Creek Watershed TMDL (DEQ, 2007) and the model user guide (Boyd and Kasper, 2003).

6.9.6 Model inputs

Table 26 summarizes the current configuration of the model input parameters and the source of these data. Temperature, flow, and meteorological input parameters are summarized to improve documentation of the TMDL approach.

Table 26: Boundary condition and tributary inputs to the existing Bear Creek Heat Source model.

Model Location Name (Station ID)	Model Location (meters)	Input Type	Model Input	Data Source	Note
Bear Creek at Walker/Emigrant Confluence (404295)	0	Boundary Condition	Water Temperature	DEQ	Data not in AWQMS.
Jackson Creek (407124)	40670	Tributary	Flow	OWRD	
Griffin Creek (407122)	38040	Tributary	Flow	OWRD	
Lone Pine Creek (407126)	32700	Tributary	Flow	OWRD	
Lazy Creek (407125)	26000	Tributary	Flow	DEQ	

Model Location Name (Station ID)	Model Location (meters)	Input Type	Model Input	Data Source	Note
Larson Creek (407133)	25500	Tributary	Flow	OWRD	
Payne Creek (407129)	19700	Tributary	Flow	DEQ	
Wagner Creek (407130)	14480	Tributary	Flow	OWRD	
Meyer Creek (406343)	11250	Tributary	Flow	DEQ	
Butler Creek (407132)	9500	Tributary	Flow	DEQ	
Ashland Creek (407108)	7420	Tributary	Flow	OWRD	
Gaerky Creek (407121)	3750	Tributary	Flow	DEQ	
Neil Creek (407128)	1460	Tributary	Flow	DEQ	
Jackson Creek (407124)	40670	Tributary	Water Temperature	DEQ	Data not in AWQMS.
Griffin Creek (407122)	38040	Tributary	Water Temperature	DEQ	Data not in AWQMS.
Lone Pine Creek (407126)	32700	Tributary	Water Temperature	DEQ	Data not in AWQMS.
Lazy Creek (407125)	26000	Tributary	Water Temperature	DEQ	Data not in AWQMS.
Larson Creek (407133)	25500	Tributary	Water Temperature	DEQ	Data not in AWQMS.
Payne Creek (407129)	19700	Tributary	Water Temperature	DEQ	Data not in AWQMS.
Wagner Creek (407130)	14480	Tributary	Water Temperature	DEQ	Data not in AWQMS.
Meyer Creek (406343)	11250	Tributary	Water Temperature	DEQ	Data not in AWQMS.
Butler Creek (407132)	9500	Tributary	Water Temperature	DEQ	Data not in AWQMS.
Ashland Creek (407108)	7420	Tributary	Water Temperature	DEQ	Data not in AWQMS.
Gaerky Creek (407121)	3750	Tributary	Water Temperature	DEQ	Data not in AWQMS.
Neil Creek (407128)	1460	Tributary	Water Temperature	DEQ	Data not in AWQMS.

Model Location Name (Station ID)	Model Location (meters)	Input Type	Model Input	Data Source	Note
Hanley Road, Central Point	0, 1400, 5400, 7400, 20600, 25400, 31000, 32600, 38000, 40600, 44500	Meteorological	Air Temperature, Relative Humidity, Wind Speed	OSU Extension Service	

Hourly meteorology inputs into the model include air temperature, relative humidity, and wind speed. Air temperature data were modified using the dry adiabatic lapse rate to adjust for differences in elevation between the measurement location and the model input location. Wind speeds were adjusted to improve the calibration using a wind-sheltering coefficient to represent difference in wind speed between the measurement location and above the stream within the riparian area.

The near-stream vegetation inputs to the model include vegetation height and canopy cover. These inputs were derived by digitizing and classifying riparian vegetation type polygons based on aerial photos, digital imagery and on site field measurements.

6.9.7 Model calibration

The expected model calibration sites and data sources are summarized in Table 27. The model location in the table below describes the distance of each input from the most upstream model node. Effective shade model calibrations sites are summarized in Table 7. The model inputs and parameters that are expected to be modified to improve model fit are described in Section 6.1.

Table 27: Calibration sites and parameters used in the existing Bear Creek Heat Source model.

Model Location Name (Station ID)	Model Location (meters)	Calibration Parameter	Data Source
Bear Creek at the mouth (407114)	44500	Water Temperature	DEQ
Bear Creek upstream of Jackson Creek (405225)	40600	Water Temperature	DEQ
Bear Creek upstream of Griffin Creek (407113)	38000	Water Temperature	DEQ
Bear Creek upstream of Lone Pine Creek (407115)	32600	Water Temperature	DEQ
Bear Creek at approximately river mile 8 (407117)	31000	Water Temperature	DEQ
Bear Creek upstream of Larson Creek (407112)	25400	Water Temperature	DEQ
Bear Creek upstream of Coleman Creek (407111)	20600	Water Temperature	DEQ
Bear Creek upstream of Ashland Creek (405084)	7400	Water Temperature	DEQ
Bear Creek downstream of Kitchen Creek (407109)	5400	Water Temperature	DEQ

Model Location Name (Station ID)	Model Location (meters)	Calibration Parameter	Data Source
Bear Creek upstream of Neil Creek (407110)	1400	Water Temperature	DEQ

6.10 Elk Creek

The Elk Creek model is a temperature model developed using Heat Source 8.0. The model was developed by DEQ.

6.10.1 Model domain

The extent of the model domain is Elk Creek from the confluence with the Rogue River to just upstream of Bitter Lick Creek. The model extent is shown in the HTML interactive map that accompanies this QAPP and is referenced in Appendix D.

6.10.2 Spatial and temporal resolution

The model input spatial resolution (*dx*) is 50 meters. Outputs are generated every 100 meters. The model time step (*dt*) is 1 minute and outputs are generated every hour.

A *dx* of 50 meters was chosen to capture the range of solar flux input caused by the varied vegetation conditions along the length of the stream. The high resolution *dx* will allow evaluation of multiple vegetation management scenarios for each designated management agency.

6.10.3 Source characteristics

The primary sources of thermal loading contributing to temperatures exceedances in Elk Creek include increases in solar radiation loading from the disturbance or removal of near-stream vegetation and background sources (DEQ, 2008). Other potential sources include channel modification and widening, reductions to stream flow rate, and warming caused by climate change. The contribution of these latter potential sources may be investigated as part of the model scenarios.

There are no permitted individual NPDES point sources along the model extent.

The majority land use along Elk Creek is forestry accounting for about 93 percent of the near-stream area. Table 28 summarizes all the land uses within 100 meters of the digitized Elk Creek centerline. Land uses were summarized using the 2016 National Land Cover Database (Yang et al., 2018). Note that Shrub/Scrub and Herbaceous land uses can be areas where forest clearcuts have occurred and would be classified as forest after regrowth.

Table 28: Summary of land uses along the model extent within 100 meters of the digitized Elk Creek centerline based on the 2016 National Land Cover Database (Yang et al., 2018).

2016 NLCD Land Cover	Acres	Percent of Total Acres
Shrub/Scrub	515.7	46.4
Evergreen Forest	431.9	38.9
Hay/Pasture	48.7	4.4

2016 NLCD Land Cover	Acres	Percent of Total Acres
Herbaceous	35.4	3.2
Mixed Forest	23.1	2.1
Developed, Open Space	22.2	2
Deciduous Forest	21.3	1.9
Developed, Low Intensity	6.2	0.6
Woody Wetlands	3.6	0.3
Developed, Medium Intensity	1.3	0.1
Developed, High Intensity	0.9	0.1
Barren Land	0.7	0.1

Anthropogenic related stream warming caused by nonpoint sources is closely associated with the uses, the activities, and the condition of vegetation adjacent to the stream. How activities and uses are managed in these areas is partially determined by a variety of different rules and management plans established by the landowner and any agency with land use authority. To better understand the spatial distribution of different agency rules or management plans along the model extent DEQ mapped known designated management agencies (Table 29).

A designated management agency is defined in OAR 340-042-0030(2) as a federal, state, or local governmental agency that has legal authority over a sector or source contributing pollutants. Typically, persons or designated management agencies that are identified in the TMDL Water Quality Management Plan (WQMP) are responsible for developing TMDL implementation plans and implementing management strategies to reduce pollutant loading. Table 29 summarizes the potential designated management agencies and responsible persons along Elk Creek model extent.

Table 29: Summary of potential designated management agencies (DMAs) or responsible persons along the model extent within 100 meters of the digitized Elk Creek centerline.

DMA or Responsible Person	Acres	Percent of Total Acres
U.S. Government	602.6	51.7
Oregon Department of Forestry - Private Forestland	253.0	21.7
Jackson County	120.7	10.4
U.S. Bureau of Land Management	100.0	8.6
Oregon Department of Agriculture	68.0	5.8
State of Oregon	12.0	1
Oregon Department of Transportation	4.3	0.4
U.S. Forest Service	3.5	0.3
Bonneville Power Administration	1.2	0.1

6.10.4 Time frame of simulation

The model period is July 01, 2001 to August 31, 2001.

6.10.5 Important assumptions

The effort currently described in the QAPP includes use of existing models. Key calibration assumptions made during the model setup and calibration process were documented in the original Rogue River Basin TMDL (DEQ, 2008) and the model user guide (Boyd and Kasper, 2003).

6.10.6 Model inputs

Table 30 summarizes the current configuration of the model input parameters and the source of these data. Temperature, flow, and meteorological input parameters are summarized to improve documentation of the TMDL approach.

Table 30: Boundary condition and tributary inputs to the existing Elk Creek Heat Source model.

Model Location Name (Station ID)	Model Location (kilometers)	Input Type	Model Input	Data Source	Note
Headwater	22.5	Boundary Condition	Flow	Derived data.	Estimated by proportioning flows based on an instantaneous flow measurement plus the aerial relationship to the gage
Headwater (25968-ORDEQ)	22.5	Boundary Condition	Water Temperature	DEQ	These data are not in AWQMS.
River km 14.45 to 19.3		Point of Diversion	Flow	Derived data. OWRD	Applied as a distributed diversion of 0.047 cfs total along the reach.
River km 5.35 to 14.45		Point of Diversion	Flow	Derived data. OWRD	Applied as a distributed diversion of 0.036 cfs total along the reach.
Bitter Lick Creek	22.4	Tributary	Flow	Derived data.	Estimated by proportioning flows based on an instantaneous flow measurement plus the aerial relationship to the gage

Model Location Name (Station ID)	Model Location (kilometers)	Input Type	Model Input	Data Source	Note
Sugarpine Creek	17.85	Tributary	Flow	Derived data.	Estimated by proportioning flows based on an instantaneous flow measurement plus the aerial relationship to the gage
Flat Creek	14.3	Tributary	Flow	Derived data.	Estimated by proportioning flows based on an instantaneous flow measurement plus the aerial relationship to the gage
West Branch Elk Creek	5.65	Tributary	Flow	Derived data.	Estimated by proportioning flows based on an instantaneous flow measurement plus the aerial relationship to the gage
Bitter Lick Creek (25967-ORDEQ)	22.4	Tributary	Water Temperature	DEQ	These data are not in AWQMS.
Sugarpine Creek (25966-ORDEQ)	17.85	Tributary	Water Temperature	DEQ	These data are not in AWQMS.
Flat Creek (25964-ORDEQ)	14.3	Tributary	Water Temperature	DEQ	These data are not in AWQMS.
West Branch Elk Creek (25804-ORDEQ)	5.65	Tributary	Water Temperature	DEQ	These data are not in AWQMS.
KMFR - Medford Airport	4.55, 5.85	Meteorological	Wind Speed	Derived data. NCDC	Wind sheltering coefficient of 0.5 applied to this reach.
KMFR - Medford Airport	2.65	Meteorological	Wind Speed	Derived data. NCDC	Wind sheltering coefficient of 0.75 applied to this reach.

Model Location Name (Station ID)	Model Location (kilometers)	Input Type	Model Input	Data Source	Note
KMFR - Medford Airport	14.5, 15.7	Meteorological	Wind Speed	Derived data. NCDC	
KMFR - Medford Airport	2.65, 4.55, 5.85, 14.5, 15.7	Meteorological	Air Temperature, Cloudiness, Relative Humidity	NCDC	

Hourly meteorology inputs into the model include air temperature, cloudiness, relative humidity, and wind speed. Air temperature data were modified using the dry adiabatic lapse rate to adjust for differences in elevation between the measurement location and the model input location. Wind speeds were adjusted to improve the calibration using a wind-sheltering coefficient to represent difference in wind speed between the measurement location and above the stream within the riparian area.

6.10.7 Model calibration

The expected model calibration sites and data sources are summarized in Table 31. The model location in the table below describes the distance of each input from the most downstream model node. Effective shade model calibrations sites are summarized in Table 7. The model inputs and parameters that are expected to be modified to improve model fit are described in Section 6.1.

Table 31: Calibration sites and parameters used in the existing Elk Creek Heat Source model.

Model Location Name (Station ID)	Model Location (kilometers)	Calibration Parameter	Data Source
Elk Creek at S.M. 9.4 (UR15)	15.7	Water Temperature	Upper Rogue Watershed Council
Elk Creek upstream Flat Creek (25965-ORDEQ)	14.5	Water Temperature	DEQ
Elk Creek at the end of bottom rod upstream Alto Creek 1	12.4	Effective Shade	DEQ
Elk Creek ~ 250’ upstream of confluence West Branch Elk Creek (25805-ORDEQ)	5.85	Water Temperature	DEQ
Elk Creek ~1000’ upstream Elk Creek Dam (25803-ORDEQ)	4.55	Water Temperature	DEQ
Elk Creek 1/4 mile upstream dam 1	3.35	Effective Shade	DEQ
Elk Creek upstream dam	3.15	Effective Shade	DEQ
Elk Creek downstream Elk Creek Dam (at gage) (25802-ORDEQ)	2.65	Water Temperature	DEQ
Elk Creek near Trail, OR (14338000)	2.5	Flow	USGS

Model Location Name (Station ID)	Model Location (kilometers)	Calibration Parameter	Data Source
Elk Creek at the mouth	0.15	Effective Shade	DEQ
Elk Creek 1/4 mile upstream dam 2		Effective Shade	DEQ
Elk Creek at end of bottom rod upstream Alto Creek 2		Effective Shade	DEQ
Elk Creek at end of bottom rod upstream Alto Creek 3		Effective Shade	DEQ
Model extent	Model extent	Water Temperature (TIR)	Watershed Sciences (2002)

6.11 Evans Creek and West Fork Evans Creek

The Evans Creek and West Fork Evans Creek model is a temperature model developed using Heat Source 8.0. The model was developed by DEQ.

6.11.1 Model domain

The extent of the model domain is Evans Creek from the confluence with the Rogue River to West Fork Evans Creek near the headwaters. The model extent is shown in the HTML interactive map that accompanies this QAPP and is referenced in Appendix D.

6.11.2 Spatial and temporal resolution

The model input spatial resolution (*dx*) is 50 meters. Outputs are generated every 100 meters. The model time step (*dt*) is 1 minute and outputs are generated every hour.

A *dx* of 50 meters was chosen to capture the range of solar flux input caused by the varied vegetation conditions along the length of the stream. The high resolution *dx* will allow evaluation of multiple vegetation management scenarios for each designated management agency.

6.11.3 Source characteristics

The primary sources of thermal loading contributing to temperatures exceedances in Evans Creek and West Fork Evans Creek include increases in solar radiation loading from the disturbance or removal of near-stream vegetation and background sources (DEQ, 2008). Other potential sources include channel modification and widening, reductions to stream flow rate, and warming caused by climate change. The contribution of these latter potential sources may be investigated as part of the model scenarios.

There are no permitted individual NPDES point sources along the model extent.

The majority land use along Evans Creek and West Fork Evans Creek is forestry accounting for about 69 percent of the near-stream area. Table 32 summarizes all the land uses within 100 meters of the digitized Evans Creek and West Fork Evans Creek centerline. Land uses were summarized using the 2016 National Land Cover Database (Yang et al., 2018). Note that Shrub/Scrub and Herbaceous land uses can be areas where forest clearcuts have occurred and would be classified as forest after regrowth.

Table 32: Summary of land uses along the model extent within 100 meters of the digitized Evans Creek and West Fork Evans Creek centerline based on the 2016 National Land Cover Database (Yang et al., 2018).

2016 NLCD Land Cover	Acres	Percent of Total Acres
Evergreen Forest	1315.0	45.1
Hay/Pasture	426.1	14.6
Shrub/Scrub	338.7	11.6
Developed, Open Space	220.6	7.6
Woody Wetlands	200.6	6.9
Emergent Herbaceous Wetlands	143.7	4.9
Mixed Forest	133.7	4.6
Developed, Low Intensity	86.1	3
Herbaceous	24.2	0.8
Developed, Medium Intensity	11.3	0.4
Deciduous Forest	9.6	0.3
Cultivated Crops	2.4	0.1
Barren Land	1.8	0.1
Developed, High Intensity	1.3	<0.05

Anthropogenic related stream warming caused by nonpoint sources is closely associated with the uses, the activities, and the condition of vegetation adjacent to the stream. How activities and uses are managed in these areas is partially determined by a variety of different rules and management plans established by the landowner and any agency with land use authority. To better understand the spatial distribution of different agency rules or management plans along the model extent DEQ mapped known designated management agencies (Table 33).

A designated management agency is defined in OAR 340-042-0030(2) as a federal, state, or local governmental agency that has legal authority over a sector or source contributing pollutants. Typically, persons or designated management agencies that are identified in the TMDL Water Quality Management Plan (WQMP) are responsible for developing TMDL implementation plans and implementing management strategies to reduce pollutant loading. Table 33 summarizes the potential designated management agencies and responsible persons along Evans Creek and West Fork Evans Creek model extent.

Table 33: Summary of potential designated management agencies (DMAs) or responsible persons along the model extent within 100 meters of the digitized Evans Creek and West Fork Evans Creek centerline.

DMA or Responsible Person	Acres	Percent of Total Acres
Oregon Department of Forestry - Private Forestland	1025.8	34.7
U.S. Bureau of Land Management	813.4	27.5
Jackson County	550.1	18.6
Oregon Department of Agriculture	496.4	16.8
City of Rogue River	60.4	2
Oregon Department of Transportation	8.8	0.3

DMA or Responsible Person	Acres	Percent of Total Acres
Oregon Department of Fish and Wildlife	0.1	<0.05

6.11.4 Time frame of simulation

The model period is July 01, 2003 to August 31, 2003.

6.11.5 Important assumptions

The effort currently described in the QAPP includes use of existing models. Key calibration assumptions made during the model setup and calibration process were documented in the original Rogue River Basin TMDL (DEQ, 2008) and the model user guide (Boyd and Kasper, 2003).

6.11.6 Model inputs

Table 34 summarizes the current configuration of the model input parameters and the source of these data. Temperature, flow, and meteorological input parameters are summarized to improve documentation of the TMDL approach.

Table 34: Boundary condition and tributary inputs to the existing Evans Creek and West Fork Evans Creek Heat Source model.

Model Location Name (Station ID)	Model Location (kilometers)	Input Type	Model Input	Data Source	Note
Evans Creek at Swamp Creek Rd Bridge	59.7	Boundary Condition	Flow	DEQ	Applied as a constant flow of 0.075 m^3/s based on instantaneous flow measurements during modeling period
Evans Creek at Swamp Creek Rd Bridge (ODEQ Vemco 2700)	59.7	Boundary Condition	Water Temperature	DEQ	
River km 0.1 to 0.8		Point of Diversion	Flow	Derived data. OWRD	Applied as a distributed diversion of 1.73 cfs total along the reach.
River km 0.85 to 13.3		Point of Diversion	Flow	Derived data. OWRD	Applied as a distributed diversion of 0.176 cfs total along the reach.

Model Location Name (Station ID)	Model Location (kilometers)	Input Type	Model Input	Data Source	Note
River km 13.35 to 31.65		Point of Diversion	Flow	Derived data. OWRD	Applied as a distributed diversion of 1.81 cfs total along the reach.
River km 31.7 to 37.15		Point of Diversion	Flow	Derived data. OWRD	Applied as a distributed diversion of 1.925 cfs total along the reach.
Cedar Creek (RB)	56.75	Tributary	Flow	DEQ	Applied as a constant flow of 0.055 m^3/s based on instantaneous flow measurements during modeling period
Rock Creek & Salt Creek	45	Tributary	Flow	DEQ	Applied as a constant flow of 0.050 m^3/s based on instantaneous flow measurements during modeling period
Battle Creek RB	37.15	Tributary	Flow	DEQ	Applied as a constant flow of 0.050 m^3/s based on instantaneous flow measurements during modeling period
EF Evans Cr	31.65	Tributary	Flow	DEQ	Applied as a constant flow of 0.015 m^3/s based on instantaneous flow measurements during modeling period
Cedar Creek (RB) (ODEQ Vemco 2700)	56.75	Tributary	Water Temperature	DEQ	No measured data for this creek were collected. The WF Evans Creek data were used for this tributary.

Model Location Name (Station ID)	Model Location (kilometers)	Input Type	Model Input	Data Source	Note
Rock Creek & Salt Creek (ODEQ Vemco 2700)	45	Tributary	Water Temperature	DEQ	No measured data for this creek were collected. The WF Evans Creek data were used for this tributary.
Battle Creek RB (ODEQ Vemco 2700)	37.15	Tributary	Water Temperature	DEQ	No measured data for this creek were collected. The WF Evans Creek data were used for this tributary.
EF Evans Cr (ODEQ Vemco 2693)	31.65	Tributary	Water Temperature	DEQ	
KMFR - Medford Airport	13.3	Meteorological	Wind Speed	Derived data. NCDC	Wind sheltering coefficient of 0.5 applied to this reach.
KMFR - Medford Airport	0.05, 37.05, 47.45, 59.7	Meteorological	Wind Speed	Derived data. NCDC	
KMFR - Medford Airport	0.05, 13.3, 37.05, 47.45, 59.7	Meteorological	Air Temperature, Cloudiness, Relative Humidity	NCDC	

Hourly meteorology inputs into the model include air temperature, cloudiness, relative humidity, and wind speed. Air temperature data were modified using the dry adiabatic lapse rate to adjust for differences in elevation between the measurement location and the model input location. Wind speeds were adjusted to improve the calibration using a wind-sheltering coefficient to represent difference in wind speed between the measurement location and above the stream within the riparian area.

6.11.7 Model calibration

The expected model calibration sites and data sources are summarized in Table 35. The model location in the table below describes the distance of each input from the most downstream model node. Effective shade model calibrations sites are summarized in Table 7. The model inputs and parameters that are expected to be modified to improve model fit are described in Section 6.1.

Table 35: Calibration sites and parameters used in the existing Evans Creek and West Fork Evans Creek Heat Source model.

Model Location Name (Station ID)	Model Location (kilometers)	Calibration Parameter	Data Source
Evans Creek at Swamp Creek Rd Bridge (30188-ORDEQ)	59.7	Flow	DEQ
WF Evans Creek near headwaters (30188-ORDEQ)	59.7	Water Temperature, Effective Shade	DEQ
WF Evans Creek downstream of Sand Creek (30189-ORDEQ)	47.45	Water Temperature, Flow, Effective Shade	DEQ
WF Evans Creek downstream of Battle Creek (30190-ORDEQ)	37.05	Water Temperature, Flow, Effective Shade	DEQ
Evans Creek downstream of Bridge 341 (11466-ORDEQ)	29.5	Flow, Effective Shade	DEQ
Evans Creek downstream of Wimer Bridge (11373-ORDEQ)	13.3	Water Temperature, Flow, Effective Shade	DEQ
Evans Creek at Palmerton Park (11461-ORDEQ)	0.8	Flow, Effective Shade	DEQ
Evans Creek at the mouth (11372-ORDEQ)	0.05	Water Temperature, Flow, Effective Shade	DEQ
Model extent	Model extent	Water Temperature (TIR)	Watershed Sciences (2004)

6.12 Little Applegate River

The Little Applegate River model will be a temperature model developed using Heat Source 8.0.8. The model will be developed by DEQ.

6.12.1 Model domain

The extent of the model domain is the Little Applegate River from the mouth to approximately 2500 feet downstream of McDonald Creek. The model extent is shown in the HTML interactive map that accompanies this QAPP and is referenced in Appendix D.

6.12.2 Spatial and temporal resolution

The model input spatial resolution (*dx*) is 50 meters. Outputs are generated every 100 meters. The model time step (*dt*) is 1 minute and outputs are generated every hour.

A *dx* of 50 meters was chosen to capture the range of solar flux input caused by the varied vegetation conditions along the length of the stream. The high resolution *dx* will allow evaluation of multiple vegetation management scenarios for each designated management agency.

6.12.3 Source characteristics

The primary sources of thermal loading contributing to temperatures exceedances in the Little Applegate River include increases in solar radiation loading from the disturbance or removal of near-stream vegetation, reductions to stream flow rate or volume, and background sources (DEQ, 2004). Other potential sources include channel modification and widening and warming caused by climate change. The contribution of these latter potential sources may be investigated as part of the model scenarios.

There are no permitted individual NPDES point sources along the model extent.

The majority land use along the Little Applegate River is forestry accounting for about 88 percent of the near-stream area. Table 36 summarizes all the land uses within 100 meters of the digitized Little Applegate River centerline. Land uses were summarized using the 2016 National Land Cover Database (Yang et al., 2018). Note that Shrub/Scrub and Herbaceous land uses can be areas where forest clearcuts have occurred and would be classified as forest after regrowth.

Table 36: Summary of land uses along the model extent within 100 meters of the digitized Little Applegate River centerline based on the 2016 National Land Cover Database (Yang et al., 2018).

2016 NLCD Land Cover	Acres	Percent of Total Acres
Evergreen Forest	1108.4	66.6
Shrub/Scrub	310.9	18.7
Developed, Open Space	123.2	7.4
Hay/Pasture	48.9	2.9
Woody Wetlands	23.6	1.4
Herbaceous	19.3	1.2
Developed, Low Intensity	18.5	1.1
Emergent Herbaceous Wetlands	6.4	0.4
Mixed Forest	4.0	0.2
Developed, Medium Intensity	0.4	<0.05

Anthropogenic related stream warming caused by nonpoint sources is closely associated with the uses, the activities, and the condition of vegetation adjacent to the stream. How activities and uses are managed in these areas is partially determined by a variety of different rules and management plans established by the landowner and any agency with land use authority. To better understand the spatial distribution of different agency rules or management plans along the model extent DEQ mapped known designated management agencies (Table 37).

A designated management agency is defined in OAR 340-042-0030(2) as a federal, state, or local governmental agency that has legal authority over a sector or source contributing pollutants. Typically, persons or designated management agencies that are identified in the TMDL Water Quality Management Plan (WQMP) are responsible for developing TMDL implementation plans and implementing management strategies to reduce pollutant loading. Table 37 summarizes the potential designated management agencies and responsible persons along the Little Applegate River model extent.

Table 37: Summary of potential designated management agencies (DMAs) or responsible persons along the model extent within 100 meters of the digitized Little Applegate River centerline.

DMA or Responsible Person	Acres	Percent of Total Acres
Oregon Department of Forestry - Private Forestland	592.3	34.8
U.S. Forest Service	427.3	25.1
Oregon Department of Agriculture	289.3	17
U.S. Bureau of Land Management	233.6	13.7
Jackson County	159.8	9.4

6.12.4 Time frame of simulation

The model period is July 19, 1999 to August 23, 1999.

6.12.5 Important assumptions

Model development for the Little Applegate River will be completed by DEQ and assumptions will be documented in the TMDL. Other key assumptions about model constants are described in the Heat Source model user guide (Boyd and Kasper, 2003).

6.12.6 Model inputs

Table 38 summarizes the current configuration of the model input parameters and the source of these data. Temperature, flow, and meteorological input parameters are summarized to improve documentation of the TMDL approach.

Table 38: Boundary condition and tributary inputs to the Little Applegate River Heat Source model.

Model Location Name (Station ID)	Model Location (kilometers)	Input Type	Model Input	Data Source	Note
Little Applegate River downstream of McDonald Creek	26.45	Boundary Condition	Flow	Derived data.	
Little Applegate River downstream of McDonald Creek (LAPM)	26.45	Boundary Condition	Water Temperature	USFS	
Glade Creek	20.2	Tributary	Flow	Derived data.	
Bear Gulch	14.45	Tributary	Flow	Derived data.	

Model Location Name (Station ID)	Model Location (kilometers)	Input Type	Model Input	Data Source	Note
Yale Creek	10.05	Tributary	Flow	Derived data.	
Sterling Creek	5.1	Tributary	Flow	Derived data.	
Glade Creek (GLAD)	20.2	Tributary	Water Temperature	USFS	Approximate confluence coordinates and model location; finalize during modeling
Bear Gulch (BRGL)	14.45	Tributary	Water Temperature	USFS	
Yale Creek (28384-ORDEQ)	10.05	Tributary	Water Temperature	Applegate River Watershed Council	
Sterling Creek (28376-ORDEQ)	5.1	Tributary	Water Temperature	Applegate River Watershed Council	
358071	1	Meteorological	Air Temperature, Relative Humidity, Wind Speed	DRI-RAWS	Applied to all modeled reaches
KMFR - Medford Airport	0, 3.86, 10.05, 14.5, 15.4	Meteorological	Air Temperature, Relative Humidity, Wind Speed	NCDC	
No Station ID	1	Meteorological	Cloudiness	DEQ	Assume no clouds

Hourly meteorology inputs into the model include air temperature, cloudiness, relative humidity, and wind speed. Air temperature data may be modified using the dry adiabatic lapse rate to adjust for differences in elevation between the measurement location and the model input location. Wind speeds may be adjusted to improve the calibration using a wind-sheltering coefficient to represent difference in wind speed between the measurement location and above the stream within the riparian area.

The near-stream vegetation inputs to the model include vegetation height and canopy cover. These inputs were derived by digitizing and classifying riparian vegetation type polygons based on aerial photos.

6.12.7 Model calibration

The expected model calibration sites and data sources are summarized in Table 39. The model location in the table below describes the distance of each input from the most downstream model node. Effective shade model calibrations sites are summarized in Table 7. The model inputs and parameters that are expected to be modified to improve model fit are described in Section 6.1.

Table 39: Calibration sites and parameters used in the Little Applegate River Heat Source model.

Model Location Name (Station ID)	Model Location (kilometers)	Calibration Parameter	Data Source
Little Applegate River near headwaters	31.5	Effective Shade	DEQ
Little Applegate River near river mile 14.1	23.1	Effective Shade	DEQ
Little Applegate River upstream of Glade	21	Wetted Width, Velocity, Flow, Depth	DEQ
Little Applegate River downstream of Muddy Gulch	15.75	Wetted Width, Velocity, Flow, Effective Shade, Depth	DEQ
Little Applegate River below Muddy Gulch at Tunnel Ridge Trailhead (LAPT)	15.4	Water Temperature	BLM
Little Applegate River upstream of Bear Gulch (LAPB)	14.5	Water Temperature	USFS
Little Applegate River 500’ downstream of Yale Creek	10.1	Wetted Width, Velocity, Flow, Depth	DEQ
Little Applegate River at Yale Creek (28372-ORDEQ)	10.05	Water Temperature	Applegate River Watershed Council
Little Applegate River at Road Mile 2.6 (28370-ORDEQ)	3.86	Water Temperature	Applegate River Watershed Council
Little Applegate River at Road Mile 2.6	3.65	Wetted Width, Velocity, Flow, Depth	DEQ
Little Applegate River 600’ upstream of the mouth	0.1	Wetted Width, Velocity, Flow, Depth	DEQ
Little Applegate River at the mouth (28369-ORDEQ)	0	Water Temperature	Applegate River Watershed Council
Model extent	Model extent	Water Temperature (TIR)	Watershed Sciences (2000)

6.13 Little Butte Creek and North Fork Little Butte Creek

The Little Butte Creek and North Fork Little Butte Creek model is a temperature model developed using Heat Source 8.0. The model was developed by DEQ.

6.13.1 Model domain

The extent of the model domain is Little Butte Creek at the confluence with the Rogue River upstream to North Fork Little Butte Creek at Fish Lake. The model extent is shown in the HTML interactive map that accompanies this QAPP and is referenced in Appendix D.

6.13.2 Spatial and temporal resolution

The model input spatial resolution (*dx*) is 50 meters. Outputs are generated every 200 meters. The model time step (*dt*) is 0.5 minute and outputs are generated every hour.

A *dx* of 50 meters was chosen to capture the range of solar flux input caused by the varied vegetation conditions along the length of the stream. The high resolution *dx* will allow evaluation of multiple vegetation management scenarios for each designated management agency.

6.13.3 Source characteristics

The primary sources of thermal loading contributing to temperatures exceedances in Little Butte Creek and North Fork Little Butte Creek include increases in solar radiation loading from the disturbance or removal of near-stream vegetation, reductions to stream flow rate or volume, releases and management of water impounded by Fish Lake Dam, and background sources (DEQ, 2008). Other potential sources include channel modification and widening and warming caused by climate change. The contribution of these latter potential sources may be investigated as part of the model scenarios.

There are no permitted individual NPDES point sources along the model extent.

The majority land uses along Little Butte Creek and North Fork Little Butte Creek are forestry and agriculture accounting for about 81 percent of the near-stream area. Table 40 summarizes all the land uses within 100 meters of the digitized Little Butte Creek and North Fork Little Butte Creek centerline. Land uses were summarized using the 2016 National Land Cover Database (Yang et al., 2018). Note that Shrub/Scrub and Herbaceous land uses can be areas where forest clearcuts have occurred and would be classified as forest after regrowth.

Table 40: Summary of land uses along the model extent within 100 meters of the digitized Little Butte Creek and North Fork Little Butte Creek centerline based on the 2016 National Land Cover Database (Yang et al., 2018).

2016 NLCD Land Cover	Acres	Percent of Total Acres
Evergreen Forest	716.8	27.1
Hay/Pasture	687.0	25.9
Shrub/Scrub	513.1	19.4
Developed, Low Intensity	165.2	6.2

2016 NLCD Land Cover	Acres	Percent of Total Acres
Emergent Herbaceous Wetlands	160.3	6.1
Developed, Open Space	123.7	4.7
Woody Wetlands	94.5	3.6
Mixed Forest	72.9	2.8
Deciduous Forest	38.7	1.5
Developed, Medium Intensity	38.5	1.5
Herbaceous	27.6	1
Cultivated Crops	4.7	0.2
Barren Land	3.6	0.1
Developed, High Intensity	2.9	0.1

Anthropogenic related stream warming caused by nonpoint sources is closely associated with the uses, the activities, and the condition of vegetation adjacent to the stream. How activities and uses are managed in these areas is partially determined by a variety of different rules and management plans established by the landowner and any agency with land use authority. To better understand the spatial distribution of different agency rules or management plans along the model extent DEQ mapped known designated management agencies (Table 41).

A designated management agency is defined in OAR 340-042-0030(2) as a federal, state, or local governmental agency that has legal authority over a sector or source contributing pollutants. Typically, persons or designated management agencies that are identified in the TMDL Water Quality Management Plan (WQMP) are responsible for developing TMDL implementation plans and implementing management strategies to reduce pollutant loading. Table 41 summarizes the potential designated management agencies and responsible persons along Little Butte Creek and North Fork Little Butte Creek model extent.

Table 41: Summary of potential designated management agencies (DMAs) or responsible persons along the model extent within 100 meters of the digitized Little Butte Creek and North Fork Little Butte Creek centerline.

DMA or Responsible Person	Acres	Percent of Total Acres
U.S. Forest Service	1202.8	31.3
Oregon Department of Agriculture	1147.8	29.9
U.S. Bureau of Land Management	356.6	9.3
Jackson County	342.1	8.9
Oregon Department of Forestry - Private Forestland	222.5	5.8
Oregon Department of Fish and Wildlife	208.6	5.4
City of Eagle Point	174.6	4.5
Oregon Department of Transportation	158.1	4.1
State of Oregon	28.7	0.7
Oregon Parks and Recreation Department	2.6	0.1

6.13.4 Time frame of simulation

The model period is July 01, 2001 to August 31, 2001.

6.13.5 Important assumptions

The effort currently described in the QAPP includes use of existing models. Key calibration assumptions made during the model setup and calibration process were documented in the original Rogue River Basin TMDL (DEQ, 2008) and the model user guide (Boyd and Kasper, 2003).

6.13.6 Model inputs

Table 42 summarizes the current configuration of the model input parameters and the source of these data. Temperature, flow, and meteorological input parameters are summarized to improve documentation of the TMDL approach.

Table 42: Boundary condition and tributary inputs to the existing Little Butte Creek and North Fork Little Butte Creek Heat Source model.

Model Location Name (Station ID)	Model Location (kilometers)	Input Type	Model Input	Data Source	Note
NF Little Butte from Fish Lake (headwater) (FSHO)	54.1	Boundary Condition	Flow	USBR	
NF Little Butte from Fish Lake (headwater) (25598-ORDEQ)	54.1	Boundary Condition	Water Temperature	DEQ	These data are not in AWQMS.
Unnamed diversion at model kilometer 42.65	42.65	Point of Diversion	Flow	Derived data. OWRD	Set as a constant point of diversion of 0.045 cfs.
Unnamed diversion at model kilometer 40.05	40.05	Point of Diversion	Flow	Derived data. OWRD	Set as a constant point of diversion of 0.13 cfs.
Unnamed diversion at model kilometer 37.9	37.9	Point of Diversion	Flow	Derived data. OWRD	Set as a constant point of diversion of 0.9 cfs.
Unnamed diversion at model kilometer 35.6	35.6	Point of Diversion	Flow	Derived data. OWRD	Set as a constant point of diversion of 13.4 cfs.

Model Location Name (Station ID)	Model Location (kilometers)	Input Type	Model Input	Data Source	Note
Unnamed diversion at model kilometer 35.2	35.2	Point of Diversion	Flow	Derived data. OWRD	Set as a constant point of diversion of 3.56 cfs.
Unnamed diversion at model kilometer 30.85	30.85	Point of Diversion	Flow	Derived data. OWRD	Set as a constant point of diversion of 0.7 cfs.
Unnamed diversion at model kilometer 30.5	30.5	Point of Diversion	Flow	Derived data. OWRD	Set as a constant point of diversion of 0.75 cfs.
Unnamed diversion at model kilometer 30.4	30.4	Point of Diversion	Flow	Derived data. OWRD	Set as a constant point of diversion of 1.36 cfs.
Joint System Canal Diversion	29.3	Point of Diversion	Flow	Derived data. OWRD	This data set is a time series (variable) of withdrawal
Unnamed diversion at model kilometer 27.1	27.1	Point of Diversion	Flow	Derived data. OWRD	Set as a constant point of diversion of 1 cfs.
Unnamed diversion at model kilometer 25.6	25.6	Point of Diversion	Flow	Derived data. OWRD	Set as a constant point of diversion of 0.53 cfs.
Unnamed diversion at model kilometer 24.9	24.9	Point of Diversion	Flow	Derived data. OWRD	Set as a constant point of diversion of 0.044 cfs.
Unnamed diversion at model kilometer 23.75	23.75	Point of Diversion	Flow	Derived data. OWRD	Set as a constant point of diversion of 0.055 cfs.
Unnamed diversion at model kilometer 23.4	23.4	Point of Diversion	Flow	Derived data. OWRD	Set as a constant point of diversion of 0.45 cfs.

Model Location Name (Station ID)	Model Location (kilometers)	Input Type	Model Input	Data Source	Note
Unnamed diversion at model kilometer 23	23	Point of Diversion	Flow	Derived data. OWRD	Set as a constant point of diversion of 0.2 cfs.
Unnamed diversion at model kilometer 22.2	22.2	Point of Diversion	Flow	Derived data. OWRD	Set as a constant point of diversion of 0.59 cfs.
Unnamed diversion at model kilometer 21.6	21.6	Point of Diversion	Flow	Derived data. OWRD	Set as a constant point of diversion of 0.1 cfs.
Unnamed diversion at model kilometer 21.55	21.55	Point of Diversion	Flow	Derived data. OWRD	Set as a constant point of diversion of 0.16 cfs.
Unnamed diversion at model kilometer 21.25	21.25	Point of Diversion	Flow	Derived data. OWRD	Set as a constant point of diversion of 1.44 cfs.
Unnamed diversion at model kilometer 19.1	19.1	Point of Diversion	Flow	Derived data. OWRD	Set as a constant point of diversion of 0.25 cfs.
Unnamed diversion at model kilometer 18.7	18.7	Point of Diversion	Flow	Derived data. OWRD	Set as a constant point of diversion of 0.49 cfs.
Unnamed diversion at model kilometer 18.35	18.35	Point of Diversion	Flow	Derived data. OWRD	Set as a constant point of diversion of 0.3 cfs.
Unnamed diversion at model kilometer 17.05	17.05	Point of Diversion	Flow	Derived data. OWRD	Set as a constant point of diversion of 0.025 cfs.
Unnamed diversion at model kilometer 17	17	Point of Diversion	Flow	Derived data. OWRD	Set as a constant point of diversion of 0.5 cfs.

Model Location Name (Station ID)	Model Location (kilometers)	Input Type	Model Input	Data Source	Note
Unnamed diversion at model kilometer 16.95	16.95	Point of Diversion	Flow	Derived data. OWRD	Set as a constant point of diversion of 0.04 cfs.
Unnamed diversion at model kilometer 15.35	15.35	Point of Diversion	Flow	Derived data. OWRD	Set as a constant point of diversion of 0.04 cfs.
Unnamed diversion at model kilometer 15.25	15.25	Point of Diversion	Flow	Derived data. OWRD	Set as a constant point of diversion of 0.05 cfs.
Unnamed diversion at model kilometer 13.45	13.45	Point of Diversion	Flow	Derived data. OWRD	Set as a constant point of diversion of 0.12 cfs.
Crater Canal Diversion	13.3	Point of Diversion	Flow	Derived data. OWRD	This data set is a time series (variable) of withdrawal
Unnamed diversion at model kilometer 13.15	13.15	Point of Diversion	Flow	Derived data. OWRD	Set as a constant point of diversion of 0.05 cfs.
Unnamed diversion at model kilometer 10.3	10.3	Point of Diversion	Flow	Derived data. OWRD	Set as a constant point of diversion of 0.02 cfs.
Unnamed diversion at model kilometer 7.95	7.95	Point of Diversion	Flow	Derived data. OWRD	Set as a constant point of diversion of 0.01 cfs.
Unnamed diversion at model kilometer 7.85	7.85	Point of Diversion	Flow	Derived data. OWRD	Set as a constant point of diversion of 0.038 cfs.
Unnamed diversion at model kilometer 7.75	7.75	Point of Diversion	Flow	Derived data. OWRD	Set as a constant point of diversion of 0.25 cfs.

Model Location Name (Station ID)	Model Location (kilometers)	Input Type	Model Input	Data Source	Note
Unnamed diversion at model kilometer 7.65	7.65	Point of Diversion	Flow	Derived data. OWRD	Set as a constant point of diversion of 0.005 cfs.
Unnamed diversion at model kilometer 7.6	7.6	Point of Diversion	Flow	Derived data. OWRD	Set as a constant point of diversion of 0.004 cfs.
Unnamed diversion at model kilometer 7.2	7.2	Point of Diversion	Flow	Derived data. OWRD	Set as a constant point of diversion of 0.26 cfs.
Unnamed diversion at model kilometer 7	7	Point of Diversion	Flow	Derived data. OWRD	Set as a constant point of diversion of 0.14 cfs.
Unnamed diversion at model kilometer 6.7	6.7	Point of Diversion	Flow	Derived data. OWRD	Set as a constant point of diversion of 0.36 cfs.
Unnamed diversion at model kilometer 6.6	6.6	Point of Diversion	Flow	Derived data. OWRD	Set as a constant point of diversion of 0.07 cfs.
Unnamed diversion at model kilometer 6.55	6.55	Point of Diversion	Flow	Derived data. OWRD	Set as a constant point of diversion of 0.25 cfs.
Unnamed diversion at model kilometer 6.35	6.35	Point of Diversion	Flow	Derived data. OWRD	Set as a constant point of diversion of 0.015 cfs.
Unnamed diversion at model kilometer 6.25	6.25	Point of Diversion	Flow	Derived data. OWRD	Set as a constant point of diversion of 0.12 cfs.
Unnamed diversion at model kilometer 6.15	6.15	Point of Diversion	Flow	Derived data. OWRD	Set as a constant point of diversion of 0.03 cfs.

Model Location Name (Station ID)	Model Location (kilometers)	Input Type	Model Input	Data Source	Note
Unnamed diversion at model kilometer 5.5	5.5	Point of Diversion	Flow	Derived data. OWRD	Set as a constant point of diversion of 0.2 cfs.
Unnamed diversion at model kilometer 4.6	4.6	Point of Diversion	Flow	Derived data. OWRD	Set as a constant point of diversion of 0.44 cfs.
Unnamed diversion at model kilometer 4.2	4.2	Point of Diversion	Flow	Derived data. OWRD	Set as a constant point of diversion of 0.5 cfs.
Unnamed diversion at model kilometer 3.5	3.5	Point of Diversion	Flow	Derived data. OWRD	Set as a constant point of diversion of 0.61 cfs.
Unnamed diversion at model kilometer 3.2	3.2	Point of Diversion	Flow	Derived data. OWRD	Set as a constant point of diversion of 0.325 cfs.
Unnamed diversion at model kilometer 3.15	3.15	Point of Diversion	Flow	Derived data. OWRD	Set as a constant point of diversion of 0.13 cfs.
Unnamed diversion at model kilometer 2.75	2.75	Point of Diversion	Flow	Derived data. OWRD	Set as a constant point of diversion of 0.21 cfs.
Unnamed tributary at model kilometer 51.7	51.7	Tributary	Flow	Derived data.	These flows were added to balance the water budget of the system.
Springs at model kilometer 48.2	48.2	Tributary	Flow	Derived data.	These flows were added to balance the water budget of the system.
Unnamed tributary at model kilometer 47.4	47.4	Tributary	Flow	Derived data.	These flows were added to balance the water budget of the system.

Model Location Name (Station ID)	Model Location (kilometers)	Input Type	Model Input	Data Source	Note
South Fork Little Butte Creek	27.9	Tributary	Flow	Derived data.	These flows were added to balance the water budget of the system.
Lake Creek	27.23	Tributary	Flow	Derived data.	Flows from Lake Creek represent the mean of 3 instantaneous flow measurements
Salt Creek	23.55	Tributary	Flow	Derived data.	Flows from Salt Creek represent the mean of 2 instantaneous flow measurements
Nichols Branch	10.3	Tributary	Flow	Derived data.	Flows from Nichols Branch represent a linear interpolation of 3 instantaneous flow measurements
Buchanan Ditch, Upstream Storm Drain Ditch	6.95	Tributary	Flow	Derived data.	Flows from the Buchanan Ditch represent the mean of 2 instantaneous flow measurements
EPID Ditch, Downstream Ditch, at Wayside	6.9	Tributary	Flow	Derived data.	Flows from the EPID Ditch represent the mean of 2 instantaneous flow measurements
Antelope Creek	4.5	Tributary	Flow	Derived data.	Flows from Antelope Creek represent a linear interpolation of 2 instantaneous flow measurements
Unnamed tributary at model kilometer 51.7	51.7	Tributary	Water Temperature	Derived data.	Inflow temperature were estimated based on average annual air temperature of (8 deg-C).

Model Location Name (Station ID)	Model Location (kilometers)	Input Type	Model Input	Data Source	Note
Springs at model kilometer 48.2	48.2	Tributary	Water Temperature	Derived data.	Inflow temperature were estimated based on average annual air temperature of (8 deg-C).
Unnamed tributary at model kilometer 47.4	47.4	Tributary	Water Temperature	Derived data.	Inflow temperature were estimated based on average annual air temperature of (8 deg-C).
South Fork Little Butte Creek (25595-ORDEQ)	27.9	Tributary	Water Temperature	DEQ	These data are not in AWQMS.
Lake Creek (25594-ORDEQ)	27.23	Tributary	Water Temperature	DEQ	These data are not in AWQMS.
Salt Creek	23.55	Tributary	Water Temperature	Derived data.	Inflow temperature were estimated.
Nichols Branch (25591-ORDEQ)	10.3	Tributary	Water Temperature	DEQ	These data are not in AWQMS.
Buchanan Ditch, Upstream Storm Drain Ditch	6.95	Tributary	Water Temperature	Derived data.	Inflow temperature were estimated at 22 deg-C.
EPID Ditch, Downstream Ditch, at Wayside	6.9	Tributary	Water Temperature	Derived data.	Inflow temperature were estimated at 22 deg-C.
Antelope Creek (25584-ORDEQ)	4.5	Tributary	Water Temperature	DEQ	These data are not in AWQMS.
FIS, Fish Lake near Ashland OR	54.1	Meteorological	Air Temperature	USBR	

Model Location Name (Station ID)	Model Location (kilometers)	Input Type	Model Input	Data Source	Note
KMFR - Medford Airport	6.58, 10.48, 19.23, 27.78, 28, 36.45, 54.1	Meteorological	Wind Speed	Derived data. NCDC	Wind sheltering coefficient of 0.1 applied to this reach.
KMFR - Medford Airport	2.2, 2.3	Meteorological	Wind Speed	Derived data. NCDC	Wind sheltering coefficient of 0.5 applied to this reach.
KMFR - Medford Airport	2.2, 2.3, 6.58, 10.48, 19.23, 27.78, 28, 36.45, 54.1	Meteorological	Air Temperature, Cloudiness, Relative Humidity	NCDC	
No Station ID	36.45	Meteorological	Air Temperature	Derived data.	Estimated as an average of Fish Lake and Medford Airport temperatures.

Hourly meteorology inputs into the model include air temperature, cloudiness, relative humidity, and wind speed. Air temperature data were modified using the dry adiabatic lapse rate to adjust for differences in elevation between the measurement location and the model input location. Wind speeds were adjusted to improve the calibration using a wind-sheltering coefficient to represent difference in wind speed between the measurement location and above the stream within the riparian area.

6.13.7 Model calibration

The expected model calibration sites and data sources are summarized in Table 43. The model location in the table below describes the distance of each input from the most downstream model node. Effective shade model calibrations sites are summarized in Table 7. The model inputs and parameters that are expected to be modified to improve model fit are described in Section 6.1.

Table 43: Calibration sites and parameters used in the existing Little Butte Creek and North Fork Little Butte Creek Heat Source model.

Model Location Name (Station ID)	Model Location (kilometers)	Calibration Parameter	Data Source
NF Little Butte from Fish Lake (headwater) (25598-ORDEQ)	54.1	Flow, Effective Shade	DEQ
NF Little Butte Creek downstream Fish Lake (25598-ORDEQ)	54	Water Temperature	DEQ
NF Little Butte Creek at Gage > NFCG	53.25	Flow	LBWSC/DEQ

Model Location Name (Station ID)	Model Location (kilometers)	Calibration Parameter	Data Source
NF Little Butte at BLM Rd. 36-3E-31, 25599 (25599-ORDEQ)	39	Flow	DEQ
NF Little Butte Creek at Gaging Station (inactive)	36.45	Flow	LBWSC/DEQ
NF Little Butte Creek at the gage and Hwy 140 (LB43)	36.45	Water Temperature	MWC
NF Little Butte at Little Butte (25596-ORDEQ)	28.1	Flow, Effective Shade	DEQ
NF Little Butte Creek at Little Butte Creek (25596-ORDEQ)	28	Water Temperature	DEQ
Little Butte Creek downstream of the confluence (25789-ORDEQ)	27.78	Water Temperature	DEQ
Little Butte at Lake Creek Town (14346700)	27.75	Flow, Effective Shade	OWRD
Little Butte Creek at Lake Creek (LBCO)	27.1	Flow	USBR
Little Butte Creek at RM 11.8 (LB18)	19.23	Water Temperature	MWC
Little Butte Creek upstream of Nichols Branch (25592-ORDEQ)	10.48	Water Temperature	DEQ
Little Butte upstream confluence w/ Nichols Branch (25592-ORDEQ)	10.45	Flow, Effective Shade	LBWSC/BLM, DEQ
Little Butte upstream of Mill at Little Butte Park	8.6	Flow	DEQ
Little Butte Creek upstream of Hwy 62 bridge at the gage (25585-ORDEQ)	6.58	Water Temperature	DEQ
Little Butte upstream Hwy 62 Bridge	6.4	Flow, Effective Shade	LBWSC/BLM
Little Butte Creek at Agate Road (10602-ORDEQ)	2.3	Water Temperature	DEQ
Little Butte Creek at Agate Road Bridge (LB33)	2.2	Water Temperature	MWC
Little Butte above the mouth in Denman	0.15	Flow, Effective Shade	LBWSC/DEQ
Model extent	Model extent	Water Temperature (TIR)	Watershed Sciences (2002)

6.14 Lobster Creek

The Lobster Creek model is a temperature model developed using Heat Source 6.0. The model was developed by DEQ.

6.14.1 Model domain

The extent of the model domain is Lobster Creek upstream of Lost Valley Creek to the mouth at the confluence with the Rogue River. The model extent is shown in the HTML interactive map that accompanies this QAPP and is referenced in Appendix D.

6.14.2 Spatial and temporal resolution

The model input spatial resolution (*dx*) is 100 meters. Outputs are generated every 100 meters. The model time step (*dt*) is 1 minute and outputs are generated every hour.

A *dx* of 100 meters was chosen to capture the range of solar flux input caused by the varied vegetation conditions along the length of the stream. The high resolution *dx* will allow evaluation of multiple vegetation management scenarios for each designated management agency.

6.14.3 Source characteristics

The primary sources of thermal loading contributing to temperatures exceedances in Lobster Creek include increases in solar radiation loading from the disturbance or removal of near-stream vegetation and background sources (DEQ, 2002b). Other potential sources include channel modification and widening, reductions to stream flow rate, and warming caused by climate change. The contribution of these latter potential sources may be investigated as part of the model scenarios.

There are no permitted individual NPDES point sources along the model extent.

The majority land use along Lobster Creek is forestry accounting for about 92 percent of the near-stream area. Table 44 summarizes all the land uses within 100 meters of the digitized Lobster Creek centerline. Land uses were summarized using the 2016 National Land Cover Database (Yang et al., 2018). Note that Shrub/Scrub and Herbaceous land uses can be areas where forest clearcuts have occurred and would be classified as forest after regrowth.

Table 44: Summary of land uses along the model extent within 100 meters of the digitized Lobster Creek centerline based on the 2016 National Land Cover Database (Yang et al., 2018).

2016 NLCD Land Cover	Acres	Percent of Total Acres
Mixed Forest	307.1	41.6
Evergreen Forest	209.5	28.4
Shrub/Scrub	64.9	8.8
Herbaceous	48.3	6.5
Developed, Open Space	38.7	5.2
Deciduous Forest	26.7	3.6
Woody Wetlands	24.7	3.3
Emergent Herbaceous Wetlands	10.9	1.5

2016 NLCD Land Cover	Acres	Percent of Total Acres
Developed, Low Intensity	3.6	0.5
Barren Land	2.9	0.4
Developed, Medium Intensity	1.1	0.1
Developed, High Intensity	0.4	0.1

Anthropogenic related stream warming caused by nonpoint sources is closely associated with the uses, the activities, and the condition of vegetation adjacent to the stream. How activities and uses are managed in these areas is partially determined by a variety of different rules and management plans established by the landowner and any agency with land use authority. To better understand the spatial distribution of different agency rules or management plans along the model extent DEQ mapped known designated management agencies (Table 45).

A designated management agency is defined in OAR 340-042-0030(2) as a federal, state, or local governmental agency that has legal authority over a sector or source contributing pollutants. Typically, persons or designated management agencies that are identified in the TMDL Water Quality Management Plan (WQMP) are responsible for developing TMDL implementation plans and implementing management strategies to reduce pollutant loading. Table 45 summarizes the potential designated management agencies and responsible persons along Lobster Creek model extent.

Table 45: Summary of potential designated management agencies (DMAs) or responsible persons along the model extent within 100 meters of the digitized Lobster Creek centerline.

DMA or Responsible Person	Acres	Percent of Total Acres
Oregon Department of Forestry - Private Forestland	702.5	92.3
U.S. Forest Service	40.6	5.3
U.S. Government	7.7	1
Oregon Department of State Lands - Waterway	6.9	0.9
Curry County	3.1	0.4

6.14.4 Time frame of simulation

The model period is for a single day: July 22, 1999.

6.14.5 Important assumptions

The effort currently described in the QAPP includes use of existing models. Key calibration assumptions made during the model setup and calibration process were documented in the original Lobster Creek Watershed TMDL (DEQ, 2002a) and the model user guide (Boyd and Kasper, 2003).

6.14.6 Model inputs

Table 46 summarizes the current configuration of the model input parameters and the source of these data. Temperature, flow, and meteorological input parameters are summarized to improve documentation of the TMDL approach.

Table 46: Boundary condition and tributary inputs to the existing Lobster Creek Heat Source model.

Model Location Name (Station ID)	Model Location (meters)	Input Type	Model Input	Data Source	Note
Lobster Creek Upstream of Lost Valley Creek	0	Boundary Condition	Flow	DEQ	
Lobster Creek Upstream of Lost Valley Creek (6849)	0	Boundary Condition	Water Temperature	Lower Rogue Watershed Council	
Groundwater	14000	Tributary	Flow	Derived data.	Instantaneous groundwater inflow estimate of 0.04 cms
Groundwater	12400	Tributary	Flow	Derived data.	Instantaneous groundwater inflow estimate of 0.11 cms
Deadline Creek	5900	Tributary	Flow	DEQ	Instantaneous flow measurement of 0.031 cms
Fall Creek	4100	Tributary	Flow	DEQ	Instantaneous flow measurement of 0.065 cms
Lost Valley Creek	300	Tributary	Flow	DEQ	Instantaneous flow measurement of 0.122 cms
Groundwater	14000	Tributary	Water Temperature	Derived data.	Derived using a mass balance
Groundwater	12400	Tributary	Water Temperature	Derived data.	Derived using a mass balance
Deadline Creek (6880)	5900	Tributary	Water Temperature	Lower Rogue Watershed Council	
Fall Creek (6860)	4100	Tributary	Water Temperature	Lower Rogue Watershed Council	
Lost Valley Creek (6850)	300	Tributary	Water Temperature	Lower Rogue Watershed Council	

Model Location Name (Station ID)	Model Location (meters)	Input Type	Model Input	Data Source	Note
6891	12400	Meteorological	Air Temperature	South Coast WSC	
Agness	0, 4300, 6000, 12400, 15300	Meteorological	Relative Humidity, Wind Speed	RAWS	
	0, 4300, 6000, 15300	Meteorological	Air Temperature	Derived data.	Based on air temperature from Lobster mainstem at Gorge (ID 6891)

Hourly meteorology inputs into the model include air temperature, relative humidity, and wind speed. Air temperature data were modified using the dry adiabatic lapse rate to adjust for differences in elevation between the measurement location and the model input location. Wind speeds were adjusted to improve the calibration using a wind-sheltering coefficient to represent difference in wind speed between the measurement location and above the stream within the riparian area.

6.14.7 Model calibration

The expected model calibration sites and data sources are summarized in Table 47. The model location in the table below describes the distance of each input from the most upstream model node. Effective shade model calibrations sites are summarized in Table 7. The model inputs and parameters that are expected to be modified to improve model fit are described in Section 6.1.

Table 47: Calibration sites and parameters used in the existing Lobster Creek Heat Source model.

Model Location Name (Station ID)	Model Location (meters)	Calibration Parameter	Data Source
Lobster Creek mouth	15300	Water Temperature, Flow	USFS, DEQ
Lobster Creek at Gorge (6890)	12400	Water Temperature	Lower Rogue Watershed Council
Lobster Creek downstream of Deadline Creek (6881)	6000	Water Temperature	Lower Rogue Watershed Council
Lobster Creek downstream of Deadline Creek	5900	Flow	DEQ
Lobster Creek at REMAP site	4300	Flow	DEQ
Lobster Creek at REMAP site (6863)	4300	Water Temperature	Lower Rogue Watershed Council

6.15 Rogue River

The Rogue River model is a temperature model developed using Heat Source 8.0. The model was developed by DEQ.

6.15.1 Model domain

The extent of the model domain is the Rogue River from just upstream of tidewaters in the estuary to just downstream of Lost Creek Reservoir. The model extent is shown in the HTML interactive map that accompanies this QAPP and is referenced in Appendix D.

6.15.2 Spatial and temporal resolution

The model input spatial resolution (*dx*) is 50 meters. Outputs are generated every 500 meters. The model time step (*dt*) is 1 minute and outputs are generated every hour.

A *dx* of 50 meters was chosen to capture the range of solar flux input caused by the varied vegetation conditions along the length of the stream. The high resolution *dx* will allow evaluation of multiple vegetation management scenarios for each designated management agency.

6.15.3 Source characteristics

The primary sources of thermal loading contributing to temperatures exceedances in the Rogue River include increases in solar radiation loading from the disturbance or removal of near-stream vegetation, point source discharges, reductions to stream flow rate or volume, releases and management of water impounded by William L. Jess Dam, and background sources (DEQ, 2008). Other potential sources include channel modification and widening and warming caused by climate change. The contribution of these latter potential sources may be investigated as part of the model scenarios.

There are seven permitted individual NPDES point sources along the model extent. Detail about each point source is summarized in Table 48.

Table 48: Summary of individual NPDES permitted discharges in the Rogue River.

Facility Name (Facility Number)	Latitude/Longitude	Permit Type and Description	Stream/River Mile
Allweather Wood, White City (105365)	42.4312/-122.885	NPDES-IW-B21: Timber and Wood Products - Wood preserving	Rogue River RM 130.5
Gold Hill STP (33901)	42.4374/-123.077	NPDES-DOM-Da: Sewage - less than 1 MGD	Rogue River RM 118.5
Grants Pass STP (34630)	42.4284/-123.344	NPDES-DOM-C1a: Sewage - 2 MGD or more but less than 5 MGD	Rogue River RM 100.9
Medford RWRF (55125)	42.4348/-122.889	NPDES-DOM-A3: Sewage - 10 MGD or more but less than 25 MGD	Rogue River RM 130.5
Riviera Mobile Park (75500)	42.4292/-123.426	NPDES-DOM-Da: Sewage - less than 1 MGD	Rogue River RM 96

Facility Name (Facility Number)	Latitude/Longitude	Permit Type and Description	Stream/River Mile
Rogue River STP (76030)	42.4313/-123.186	NPDES-DOM-Da: Sewage - less than 1 MGD	Rogue River RM 110
Shady Cove STP (80535)	42.6005/-122.835	NPDES-DOM-Da: Sewage - less than 1 MGD	Rogue River RM 142.5

The majority land use along the Rogue River is forestry accounting for about 63 percent of the near-stream area. Table 49 summarizes all the land uses within 100 meters of the digitized Rogue River centerline. Land uses were summarized using the 2016 National Land Cover Database (Yang et al., 2018). Note that Shrub/Scrub and Herbaceous land uses can be areas where forest clearcuts have occurred and would be classified as forest after regrowth.

Table 49: Summary of land uses along the model extent within 100 meters of the digitized Rogue River centerline based on the 2016 National Land Cover Database (Yang et al., 2018).

2016 NLCD Land Cover	Acres	Percent of Total Acres
Evergreen Forest	2281.5	27.5
Herbaceous	1130.4	13.6
Emergent Herbaceous Wetlands	974.3	11.8
Woody Wetlands	681.9	8.2
Developed, Open Space	671.9	8.1
Shrub/Scrub	628.0	7.6
Hay/Pasture	590.2	7.1
Mixed Forest	479.0	5.8
Developed, Low Intensity	356.7	4.3
Barren Land	341.4	4.1
Developed, Medium Intensity	110.8	1.3
Deciduous Forest	25.8	0.3
Developed, High Intensity	15.8	0.2
Cultivated Crops	1.6	<0.05

Anthropogenic related stream warming caused by nonpoint sources is closely associated with the uses, the activities, and the condition of vegetation adjacent to the stream. How activities and uses are managed in these areas is partially determined by a variety of different rules and management plans established by the landowner and any agency with land use authority. To better understand the spatial distribution of different agency rules or management plans along the model extent DEQ mapped known designated management agencies (Table 50).

A designated management agency is defined in OAR 340-042-0030(2) as a federal, state, or local governmental agency that has legal authority over a sector or source contributing pollutants. Typically, persons or designated management agencies that are identified in the TMDL Water Quality Management Plan (WQMP) are responsible for developing TMDL implementation plans and implementing management strategies to reduce pollutant loading. Table 50 summarizes the potential designated management agencies and responsible persons along the Rogue River model extent.

Table 50: Summary of potential designated management agencies (DMAs) or responsible persons along the model extent within 100 meters of the digitized Rogue River centerline.

DMA or Responsible Person	Acres	Percent of Total Acres
U.S. Forest Service	2467.7	18.8
Oregon Department of State Lands - Waterway	2314.5	17.6
U.S. Bureau of Land Management	1988.9	15.1
Josephine County	1748.4	13.3
Jackson County	1343.5	10.2
Oregon Department of Agriculture	918.4	7
Oregon Department of Transportation	477.4	3.6
Oregon Department of Forestry - Private Forestland	455.4	3.5
Curry County	452.7	3.4
City of Grants Pass	267.5	2
City of Shady Cove	198.1	1.5
Oregon Parks and Recreation Department	159.3	1.2
Oregon Department of Fish and Wildlife	148.3	1.1
City of Gold Hill	71.9	0.5
State of Oregon	39.5	0.3
Oregon Department of Forestry - State Forestland	32.8	0.2
Central Oregon & Pacific Railroad	23.3	0.2
City of Rogue River	22.4	0.2
Oregon Department of Geology and Mineral Industries	16.8	0.1
Oregon Department of State Lands	7.4	0.1
U.S. Government	5.2	<0.05

6.15.4 Time frame of simulation

The model period is March 01, 2003 to October 31, 2003.

6.15.5 Important assumptions

The effort currently described in the QAPP includes use of existing models. Key calibration assumptions made during the model setup and calibration process were documented in the original Rogue River Basin TMDL (DEQ, 2008) and the model user guide (Boyd and Kasper, 2003).

6.15.6 Model inputs

Table 51 summarizes the current configuration of the model input parameters and the source of these data. Temperature, flow, and meteorological input parameters are summarized to improve documentation of the TMDL approach.

Table 51: Boundary condition and tributary inputs to the existing Rogue River Heat Source model.

Model Location Name (Station ID)	Model Location (kilometers)	Input Type	Model Input	Data Source	Note
Rogue River near Mcleod (14337600)	249	Boundary Condition	Flow	USGS	
Rogue River near Mcleod (14337600)	249	Boundary Condition	Water Temperature	USGS	
Medford Water	213.1	Point of Diversion	Flow	Derived data. OWRD	
Rogue River PODs	205.3	Point of Diversion	Flow	Derived data. OWRD	
Gold Hill Irrigation District	197.45	Point of Diversion	Flow	Derived data. OWRD	
Grants Pass Irrigation District	173.7	Point of Diversion	Flow	Derived data. OWRD	
City of Grants Pass Water	164.9	Point of Diversion	Flow	Derived data. OWRD	
Country View Mobile Home Estates	238.55	Point Source	Flow	DEQ	No data, used Shady Cove as surrogate
Shady Cove STP	233.55	Point Source	Flow	DEQ	Daily grab temperature from DMR
Cascade Wood Products - White City	213.25	Point Source	Flow	DEQ	Cascade Wood Discharges To Military Slough; Monthly grab data from DMR
Medford RWRF	210.55	Point Source	Flow	MRRF	
Gold Hill STP	190.2	Point Source	Flow	DEQ	Daily grab temperature from DMR

Model Location Name (Station ID)	Model Location (kilometers)	Input Type	Model Input	Data Source	Note
Rogue River STP	177.95	Point Source	Flow	DEQ	Daily grab temperature from DMR
Grants Pass STP	162.8	Point Source	Flow	DEQ	Daily grab temperature from DMR
Riviera Mobile Park	155.2	Point Source	Flow	DEQ	Daily grab temperature from DMR
Country View Mobile Home Estates	238.55	Point Source	Water Temperature	DEQ	No data, used Shady Cove as surrogate
Shady Cove STP	233.55	Point Source	Water Temperature	DEQ	Daily grab temperature from DMR
Cascade Wood Products - White City	213.25	Point Source	Water Temperature	DEQ	Monthly grab data from DMR
Medford RWRF	210.55	Point Source	Water Temperature	MRRF	
Gold Hill STP	190.2	Point Source	Water Temperature	DEQ	Daily grab temperature from DMR
Rogue River STP	177.95	Point Source	Water Temperature	DEQ	Daily grab temperature from DMR
Grants Pass STP	162.8	Point Source	Water Temperature	DEQ	Daily grab temperature from DMR
Riviera Mobile Park	155.2	Point Source	Water Temperature	DEQ	Daily grab temperature from DMR
Elk Creek (14338000)	245.1	Tributary	Flow	USGS	

Model Location Name (Station ID)	Model Location (kilometers)	Input Type	Model Input	Data Source	Note
Trail Creek	239.8	Tributary	Flow	Derived data.	No gage, used ratio of drainage area with Elk Creek (0.442) to compute flow
Little Butte Creek	213.5	Tributary	Flow	Derived data.	No gage data current with the modeling period; used regression with Elk Creek 1945 - 1950, historic gage below Eagle Creek
Bear Creek (14357500)	203.8	Tributary	Flow	USGS	USGS gage at river mile 10.1
Flow Balance	200	Tributary	Flow	Derived data.	Added to reproduce observed flows at USGS gage near Grants Pass (river KM 164.8)
Evans Creek	178.8	Tributary	Flow	Derived data.	No gage on Evans Creek, mass balance to derive using the Grants Pass gage (river KM 164.8)
Applegate River (14369500)	153.3	Tributary	Flow	USGS	USGS gage at RM 7.6 (near Wilderville)
Trib for flow balance (near Foster Creek)	55.1	Tributary	Flow	Derived data.	No gage on Foster Creek, added to reproduce observed flows at USGS gage near Agness

Model Location Name (Station ID)	Model Location (kilometers)	Input Type	Model Input	Data Source	Note
Illinois River	44.5	Tributary	Flow	Derived data.	Performed a regression between Illinois River near Kerby (rm 50) and the Illinois River near Agness (river mile 5) between 1961 and 1983
Lobster Creek	18.4	Tributary	Flow	Derived data.	Used a ratio of drainage area with South Fork Coquille River at Powers (0.41) to compute flow
Elk Creek (14338000)	245.1	Tributary	Water Temperature	USGS	
Trail Creek (24477-ORDEQ)	239.8	Tributary	Water Temperature	Derived data.	DEQ data sourced from Trail Creek at mouth (24477-ORDEQ) from 5/7 - 9/16; a linear regression was conducted using Elk Creek data outside of that date range.
Little Butte Creek (10602-ORDEQ)	213.5	Tributary	Water Temperature	Derived data.	DEQ data sourced from Little Butte Creek (10602-ORDEQ) from 5/7 – 6/30, and Medford Water Commission data from 7/1 – 9/15. In the absence of either data source a linear regression with Elk Creek data was conducted.

Model Location Name (Station ID)	Model Location (kilometers)	Input Type	Model Input	Data Source	Note
Bear Creek (10602-ORDEQ)	203.8	Tributary	Water Temperature	DEQ	Little Butte Creek temperature data were used as a surrogate due to no temperature data in 2003.
Flow Balance (24451-ORDEQ)	200	Tributary	Water Temperature	Derived data. DEQ/MWC	Data from Big Butte Creek were used to perform a regression with Elk Creek temperature data; a minimum of 5 deg-C was set.
Evans Creek (11372-ORDEQ)	178.8	Tributary	Water Temperature	Derived data.	DEQ data sourced from Evans Creek at the mouth (11372-ORDEQ) from 4/23 – 9/16; regression based on Applegate River temperatures were performed to estimate temperatures outside of that date range.
Applegate River (14369500)	153.3	Tributary	Water Temperature	USGS	
Trib for flow balance (near Foster Creek) (30369-ORDEQ)	55.1	Tributary	Water Temperature	Derived data.	DEQ data sourced from Foster Creek at the mouth (30369-ORDEQ) from 7/11 – 9/24, Evans Creek data were substitute for temperature data outside of that date range.

Model Location Name (Station ID)	Model Location (kilometers)	Input Type	Model Input	Data Source	Note
Illinois River (10425-ORDEQ)	44.5	Tributary	Water Temperature	Derived data.	DEQ data sourced from Illinois River at the mouth (10425-ORDEQ) from 7/17 – 10/13; regression based on Applegate River temperatures were performed to estimate temperatures outside of that date range.
Lobster Creek (30194-ORDEQ)	18.4	Tributary	Water Temperature	Derived data.	DEQ data sourced from Lobster Creek at the mouth (30194-ORDEQ) from 7/17 – 10/13; regression based on Applegate River temperatures were performed to estimate temperatures outside of that date range.
brko - Brookings	14.3, 18.7, 44.5, 44.9, 47.4, 48.7	Meteorological	Wind Speed	Oregon AgriMet Weather Station	Wind shelter coefficient of 0.50 applied to this reach.
brko - Brookings	14.3, 18.7, 44.5, 44.9, 47.4, 48.7	Meteorological	Air Temperature, Cloudiness, Relative Humidity	Oregon AgriMet Weather Station	
Grants Pass	61.5, 68.2, 92, 105.7, 110.5, 126.9, 140.1, 182.8, 189.2	Meteorological	Air Temperature	OCS	Missing data were filled in with estimated values correlated (linear regression) with Medford air temperature data.

Model Location Name (Station ID)	Model Location (kilometers)	Input Type	Model Input	Data Source	Note
KMFR - Medford Airport	61.5, 68.2, 92, 105.7, 110.5	Meteorological	Wind Speed	NCDC	Wind shelter coefficient of 0.25 applied to this reach.
KMFR - Medford Airport	61.5, 68.2, 92, 105.7, 110.5, 126.9, 140.1, 182.8, 189.2, 202, 202.7, 208.5, 211, 223.8, 223.85, 235.6, 248.9	Meteorological	Air Temperature, Cloudiness, Relative Humidity, Wind Speed	NCDC	
Lost Creek Reservoir	211, 223.8, 223.85, 235.6, 248.9	Meteorological	Air Temperature	USACE	Missing data were filled in with Medford data.

Hourly meteorology inputs into the model include air temperature, cloudiness, relative humidity, and wind speed. Air temperature data were modified using the dry adiabatic lapse rate to adjust for differences in elevation between the measurement location and the model input location. Wind speeds were adjusted to improve the calibration using a wind-sheltering coefficient to represent difference in wind speed between the measurement location and above the stream within the riparian area.

6.15.7 Model calibration

The expected model calibration sites and data sources are summarized in Table 52. The model location in the table below describes the distance of each input from the most downstream model node. Effective shade model calibrations sites are summarized in Table 7. The model inputs and parameters that are expected to be modified to improve model fit are described in Section 6.1.

Table 52: Calibration sites and parameters used in the existing Rogue River Heat Source model.

Model Location Name (Station ID)	Model Location (kilometers)	Calibration Parameter	Data Source
Rogue River near Mcleod (14337600)	248.9	Water Temperature, Flow	USGS
Rogue River at Shady Cove Park-Shady Cove, OR (30517-ORDEQ)	235.6	Water Temperature	DEQ
Rogue River at Dodge Bridge, near Eagle Point (14339000)	223.85	Water Temperature, Flow	USGS
Rogue River at Dodge Park (HWY 234) (10423-ORDEQ)	223.8	Water Temperature	DEQ

Model Location Name (Station ID)	Model Location (kilometers)	Calibration Parameter	Data Source
Rogue River upstream Medford WWTP	211	Water Temperature	MRRF
Rogue River downstream of Medford WWTP (30317-ORDEQ)	208.5	Water Temperature	MRRF/DEQ
Rogue River at Raygold near Central Point (14359000)	202.7	Water Temperature, Flow	USGS
Rogue River at USGS Gauge below Gold Ray Dam (30195-ORDEQ)	202	Water Temperature	DEQ
Rogue River at Highway 234 North of Gold Hill (10421-ORDEQ)	189.2	Water Temperature	DEQ
Rogue River at Valley of the Rogue State Park (10600-ORDEQ)	182.8	Water Temperature	DEQ
Rogue River at Grants Pass, OR (14361500)	164.8	Flow	USGS
Rogue River at Robertson Bridge (10418-ORDEQ)	140.1	Water Temperature	DEQ
Rogue River downstream of Galice Creek, just upstream of boat ramp (30211-ORDEQ)	126.9	Water Temperature	DEQ
Rogue River downstream of Graves Creek (10417-ORDEQ)	110.5	Water Temperature	DEQ
Rogue River downstream of Whiskey Creek (30570-ORDEQ)	105.7	Water Temperature	DEQ
Rogue River downstream of Meadow Creek (30641-ORDEQ)	92	Water Temperature	DEQ
Rogue River downstream of East Creek (30647-ORDEQ)	68.2	Water Temperature	DEQ
Rogue River downstream of Fall Creek (30646-ORDEQ)	61.5	Water Temperature	DEQ
Rogue River near Agnes (14372300)	48.7	Water Temperature, Flow	USGS
Rogue River 300 ft below Shasta Costa Creek (30654-ORDEQ)	47.4	Water Temperature	DEQ
Rogue River upstream of Illinois River (10416-ORDEQ)	44.9	Water Temperature	DEQ
Rogue River downstream of Illinois (10415-ORDEQ)	44.5	Water Temperature	DEQ
Rogue River upstream of Lobster Creek (10414-ORDEQ)	18.7	Water Temperature	DEQ

Model Location Name (Station ID)	Model Location (kilometers)	Calibration Parameter	Data Source
Rogue River at Huntley Park (10413-ORDEQ)	14.3	Water Temperature	DEQ
Model extent	Model extent	Water Temperature (TIR)	Watershed Sciences (2004)

6.16 South Fork Little Butte Creek

The South Fork Little Butte Creek model is a temperature model developed using Heat Source 8.0. The model was developed by DEQ.

6.16.1 Model domain

The extent of the model domain is South Fork Little Butte Creek from at the confluence with Little Butte Creek to just upstream of Beaver Dam Creek. The model extent is shown in the HTML interactive map that accompanies this QAPP and is referenced in Appendix D.

6.16.2 Spatial and temporal resolution

The model input spatial resolution (*dx*) is 50 meters. Outputs are generated every 100 meters. The model time step (*dt*) is 0.5 minute and outputs are generated every hour.

A *dx* of 50 meters was chosen to capture the range of solar flux input caused by the varied vegetation conditions along the length of the stream. The high resolution *dx* will allow evaluation of multiple vegetation management scenarios for each designated management agency.

6.16.3 Source characteristics

The primary sources of thermal loading contributing to temperatures exceedances in South Fork Little Butte Creek include increases in solar radiation loading from the disturbance or removal of near-stream vegetation and background sources (DEQ, 2008). Other potential sources include channel modification and widening, reductions to stream flow rate, and warming caused by climate change. The contribution of these latter potential sources may be investigated as part of the model scenarios.

There are no permitted individual NPDES point sources along the model extent.

The majority land use along South Fork Little Butte Creek is forestry accounting for about 86 percent of the near-stream area. Table 53 summarizes all the land uses within 100 meters of the digitized South Fork Little Butte Creek centerline. Land uses were summarized using the 2016 National Land Cover Database (Yang et al., 2018). Note that Shrub/Scrub and Herbaceous land uses can be areas where forest clearcuts have occurred and would be classified as forest after regrowth.

Table 53: Summary of land uses along the model extent within 100 meters of the digitized South Fork Little Butte Creek centerline based on the 2016 National Land Cover Database (Yang et al., 2018).

2016 NLCD Land Cover	Acres	Percent of Total Acres
Evergreen Forest	591.8	42.7

2016 NLCD Land Cover	Acres	Percent of Total Acres
Shrub/Scrub	434.6	31.4
Hay/Pasture	107.4	7.8
Mixed Forest	90.3	6.5
Developed, Open Space	50.0	3.6
Deciduous Forest	34.7	2.5
Woody Wetlands	25.6	1.8
Developed, Low Intensity	21.1	1.5
Emergent Herbaceous Wetlands	14.9	1.1
Herbaceous	14.7	1.1
Developed, Medium Intensity	0.7	0.1

Anthropogenic related stream warming caused by nonpoint sources is closely associated with the uses, the activities, and the condition of vegetation adjacent to the stream. How activities and uses are managed in these areas is partially determined by a variety of different rules and management plans established by the landowner and any agency with land use authority. To better understand the spatial distribution of different agency rules or management plans along the model extent DEQ mapped known designated management agencies (Table 54).

A designated management agency is defined in OAR 340-042-0030(2) as a federal, state, or local governmental agency that has legal authority over a sector or source contributing pollutants. Typically, persons or designated management agencies that are identified in the TMDL Water Quality Management Plan (WQMP) are responsible for developing TMDL implementation plans and implementing management strategies to reduce pollutant loading. Table 54 summarizes the potential designated management agencies and responsible persons along South Fork Little Butte Creek model extent.

Table 54: Summary of potential designated management agencies (DMAs) or responsible persons along the model extent within 100 meters of the digitized South Fork Little Butte Creek centerline.

DMA or Responsible Person	Acres	Percent of Total Acres
U.S. Bureau of Land Management	1162.6	45.7
U.S. Forest Service	492.3	19.3
Oregon Department of Agriculture	480.2	18.9
Oregon Department of Forestry - Private Forestland	229.8	9
Jackson County	180.2	7.1

6.16.4 Time frame of simulation

The model period is July 01, 2001 to August 31, 2001.

6.16.5 Important assumptions

The effort currently described in the QAPP includes use of existing models. Key calibration assumptions made during the model setup and calibration process were documented in the original Rogue River Basin TMDL (DEQ, 2008) and the model user guide (Boyd and Kasper, 2003).

6.16.6 Model inputs

Table 55 summarizes the current configuration of the model input parameters and the source of these data. Temperature, flow, and meteorological input parameters are summarized to improve documentation of the TMDL approach.

Table 55: Boundary condition and tributary inputs to the existing South Fork Little Butte Creek Heat Source model.

Model Location Name (Station ID)	Model Location (kilometers)	Input Type	Model Input	Data Source	Note
Headwaters	28.45	Boundary Condition	Flow	Derived data.	Flow time series for the headwaters was estimated from instantaneous measurements and flow balance methods.
Headwaters (25799-ORDEQ)	28.45	Boundary Condition	Water Temperature	DEQ	These data are not in AWQMS.
Joint System Canal Diversion	1.75	Point of Diversion	Flow	Derived data.	Flow time series for this tributary was estimated from flow and temperature balance methods.
Unnamed diversions from river KMs 2.4 to 7		Point of Diversion	Flow	Derived data. OWRD	This diversion of 4.93 cfs was modeled as a distributed diversion from river KMs 2.4 to 7.
Unnamed diversions from river KMs 21.3 to 24.5		Point of Diversion	Flow	Derived data. OWRD	This diversion of 5.65 cfs was modeled as a distributed diversion from river KMs 21.3 to 24.5.
Unnamed diversions from river KMs 7.05 to 14.05		Point of Diversion	Flow	Derived data. OWRD	This diversion of 4.94 cfs was modeled as a distributed diversion from river KMs 7.05 to 14.05.
Beaver Dam Creek	28.3	Tributary	Flow	Derived data.	Flow time series for this tributary was estimated from instantaneous measurements and flow balance methods.

Model Location Name (Station ID)	Model Location (kilometers)	Input Type	Model Input	Data Source	Note
Dead Indian Creek	20.9	Tributary	Flow	Derived data.	Flow time series for this tributary was estimated from instantaneous measurements and flow balance methods.
Soda Creek	13.75	Tributary	Flow	Derived data.	Flow time series for this tributary was estimated from instantaneous measurements and flow balance methods.
Return flows from Joint System Canal	0.7	Tributary	Flow	Derived data.	Flow time series for this tributary was estimated from flow and temperature balance methods.
Beaver Dam Creek (25798-ORDEQ)	28.3	Tributary	Water Temperature	DEQ	These data are not in AWQMS.
Dead Indian Creek (25797-ORDEQ)	20.9	Tributary	Water Temperature	DEQ	These data are not in AWQMS.
Soda Creek (25797-ORDEQ)	13.75	Tributary	Water Temperature	DEQ	Dead Indian Creek temperature data were used as a surrogate for this tributary input.
Return flows from Joint System Canal	0.7	Tributary	Water Temperature	DEQ	This temperature time series was based on North Fork Little Butte Creek at mouth measurements because water in the canal originates in the NF Little Butte Creek near this location.
KMFR - Medford Airport	0.13, 6.53, 13.98	Meteorological	Wind Speed	NCDC	Wind shelter coefficient of 0.1 applied to this reach.

Model Location Name (Station ID)	Model Location (kilometers)	Input Type	Model Input	Data Source	Note
KMFR - Medford Airport	21.23, 28.45	Meteorological	Wind Speed	NCDC	Wind shelter coefficient of 0.5 applied to this reach.
KMFR - Medford Airport	0.13, 6.53, 13.98, 21.23, 28.45	Meteorological	Air Temperature, Cloudiness, Relative Humidity	NCDC	

Hourly meteorology inputs into the model include air temperature, cloudiness, relative humidity, and wind speed. Air temperature data were modified using the dry adiabatic lapse rate to adjust for differences in elevation between the measurement location and the model input location. Wind speeds were adjusted to improve the calibration using a wind-sheltering coefficient to represent difference in wind speed between the measurement location and above the stream within the riparian area.

6.16.7 Model calibration

The expected model calibration sites and data sources are summarized in Table 56. The model location in the table below describes the distance of each input from the most downstream model node. Effective shade model calibrations sites are summarized in Table 7. The model inputs and parameters that are expected to be modified to improve model fit are described in Section 6.1.

Table 56: Calibration sites and parameters used in the existing South Fork Little Butte Creek Heat Source model.

Model Location Name (Station ID)	Model Location (kilometers)	Calibration Parameter	Data Source
SF Little Butte Creek upstream Beaver Dam (25799-ORDEQ)	28.45	Flow, Effective Shade	DEQ
SF Little Butte Creek upstream Dead Indian Creek (25597-ORDEQ)	21.23	Flow, Effective Shade	OWRD
SF Little Butte upstream Dead Indian Creek RM 14.5 (Camp Latgawa) (25597-ORDEQ)	21.23	Water Temperature	DEQ
SF Little Butte Creek upstream Soda Creek (25795-ORDEQ)	13.98	Flow, Effective Shade	OWRD
SF Little Butte upstream Soda RM 9.8 (25795-ORDEQ)	13.98	Water Temperature	DEQ
SF Little Butte Creek below Lost Creek (25792-ORDEQ)	6.53	Flow, Effective Shade	OWRD
SF Little Butte upstream Lost RM 4.5 (25792-ORDEQ)	6.53	Water Temperature	DEQ

Model Location Name (Station ID)	Model Location (kilometers)	Calibration Parameter	Data Source
SF Little Butte Creek at gage (25595-ORDEQ)	0.13	Flow, Effective Shade	OWRD
South Fork Little Butte at Little Butte (25595-ORDEQ)	0.13	Water Temperature	DEQ
Model extent	Model extent	Water Temperature (TIR)	Watershed Sciences (2002)

7 Model evaluation and acceptance

7.1 Model uncertainty and sensitivity

Model uncertainty can arise from a number of sources including error associated with measuring field parameters used for model input or calibration, lack of knowledge on the appropriate value to use for model parameters or constants, or an imperfect mathematical formulation in the model of real world physical processes. A model's sensitivity is the degree to which predictions are affected by changes in a single or multiple input parameters.

In many cases, the major source of uncertainty is due to uncertainty in spatial representation of the river channel and adjacent landcover (e.g., bathymetry, vegetation height and density) from lack of data or simplification, configuration of the boundary conditions (e.g., uncertainty in estimation of ungaged tributary flows or temperatures), and uncertainty from limited amount or spatial distribution of observed data used for calibration. These sources of uncertainty are largely unavoidable, but do not invalidate the use of the model for decision purposes.

During the calibration process, it is good practice to evaluate and minimize uncertainty associated with the model parameters to the greatest extent practical (Beck, 1987; EPA, 2009). During the model calibration process, the responsiveness of the model predictions to various assumptions and rate constants should be evaluated. The model setup should include parameters based on literature recommendations and best professional judgment.

Reducing uncertainty in measured field parameters used for model input and calibration is accomplished in the following ways:

- Data used for the TMDL must have been collected based on a project plan with quality assurance and quality control protocols for collecting and analyzing samples.
- The sampling and laboratory analysis must follow widely accepted scientific methods and protocols. These may include DEQ's Mode of Operations Manual (DEQ, 2020), USEPA's methods (EPA, 1983), USGS's published techniques of water-resources investigations, the USGS

National Field Manual, or Standard Methods for the Examination of Water and Wastewater. All acceptable methods include applicable precision and accuracy checks.

- When possible, accuracy and precision should be evaluated using DEQ's data validation criteria as outlined in DEQ Data Quality Matrix for Field Parameters (DEQ, 2013). The TMDL program uses waterbody results that demonstrate a data quality level of A, B, or E with careful review (DEQ, 2021). For continuous temperature data a data quality of A or B corresponds to an absolute accuracy 1.0 deg-C and absolute precision 2.0 deg-C. Data of unknown quality lacking audit and pre and post accuracy checks may also be used following a careful review where it is determined the results appear reasonable and free of issues based on professional judgment.

Uncertainties in the mathematical formulation are addressed by using open source models that allow free and transparent inspection of model code, and models that have had their methodologies peer reviewed and evaluated.

It is not anticipated that additional uncertainty or sensitivity analyses will be performed on the existing calibrated models.

7.2 Model acceptance

This section identifies the model acceptance criteria. Model acceptance relies on satisfying seven (7) conditions:

1) Incorporation of all available field observations of the system (e.g., geometry, flow, boundary inputs/withdrawals, and meteorology) for the time period simulated.

2) Model parameters and unmeasured boundary conditions that are within literature-supported and physically defensible ranges.

3) Model predicted results have been compared with the associated observed measurements using graphical presentations. Visual comparisons are useful in evaluating model performance over the appropriate temporal or spatial scales.

4) Goodness of fit statistics have been calculated comparing the model predicted results to the associated observed measurements. The calibration goodness of fit statistics are shown in Equation 4 through Equation 8.

5) Goodness of fit statistics have been used to inform the appropriate use of the model. Where a model achieves an excellent or good fit it can generally assume a strong role in decision making about appropriate management options. Conversely, where a model achieves only a fair or poor fit it should assume a much less prominent role in decision making about appropriate management options. If a desired level of quality is not achieved on some or all measures, the model might still be useful; however, a detailed description of its potential range of applicability will be provided.

6) Written documentation of all important elements in the model, including model setup, model parameterization, key assumptions, and known areas of uncertainty.

7) Peer review as described in Section 9.

Equation 5 through Equation 8 are the goodness of fit statistics to be calculated for each calibrated temperature model. Equation 4 through Equation 7 are the goodness of fit statistics to be calculated for each calibrated shade model.

Coefficient of Determination – R squared (R^2): A coefficient of determination, or R^2, of one indicates a perfect fit. R^2 is a measure of how well predicted values fit the observed data. It compares the variations in the residuals to the variation of the observed data.

$$R^2 = 1 - \frac{\sum(X_{obs} - X_{mod})^2}{\sum\left(X_{obs} - \overline{X_{obs}}\right)^2} \qquad \text{Equation 4}$$

Mean Error (ME): A mean error of zero indicates a perfect fit. A positive value indicates on average the model predicted values are less than the observed data. A negative value indicates on average the model predicted values are greater than the observed data. The mean error statistic may give a false ideal value of zero (or near zero) if the average of the positive deviations between predictions and observations is about equal to the average of the negative deviations in a data set. Because of this, the mean absolute error (MAE) statistic should be used in conjunction with mean error to evaluate model performance.

$$ME = \frac{1}{n}\sum(X_{mod} - X_{obs}) \qquad \text{Equation 5}$$

Mean Absolute Error (MAE): A mean absolute error of zero indicates a perfect fit. The magnitude of the mean absolute error indicates the average deviation between model predicted values and observed data. The mean absolute error cannot give a false zero.

$$MAE = \frac{1}{n}\sum|X_{mod} - X_{obs}| \qquad \text{Equation 6}$$

Root Mean Square Error (RMSE): A root mean square error of zero indicates a perfect fit. Root mean square error is a measure of the magnitude of the difference between model predicted values and observed data.

$$RMSE = \sqrt{\frac{1}{n}\sum(X_{mod} - X_{obs})^2} \qquad \text{Equation 7}$$

Nash-Sutcliffe efficiency coefficient (NS): Nash-Sutcliffe efficiencies can range from -∞ to 1. An efficiency of 1 corresponds to a perfect match of modeled predicted values to the observed data. An efficiency of 0 indicates that the model predictions are as accurate as the mean of the observed data, whereas an efficiency less than zero occurs when the observed mean is a better predictor than the model.

$$NS = 1 - \frac{\sum(X_{obs} - X_{mod})^2}{\sum\left(X_{obs} - \overline{X_{obs}}\right)^2} \qquad \text{Equation 8}$$

where,
X_{mod} = The model predicted results;
X_{obs} = The observed or measured results;
$\overline{X}_{obs}$ = The mean of the observed or measured temperature;
n = The sample size.

8 Documentation in model reports

Model documentation will consist of a series of TMDL technical appendices describing the model setup, model calibration results, model scenario setup, and model scenario results.

The model setup and calibration documentation will include details on the calibrated model domain and layout; spatial and temporal resolution; timeframe of simulation; summary of data used for model inputs; summary of methods used to fill data gaps; summary of data used for calibration; time series plots comparing observed and model predicted temperatures and other parameters as appropriate; goodness-of-fit statistics, and plots and tables summarizing temperature and effective shade model results.

The model scenario setup and scenario results documentation will include a description of the scenario, what model elements were modified for the scenario; tables, plots, or narrative summarizing the final values for any modified inputs or parameters; methods or data sources used to setup the scenario; and plots and tables that summarize the scenario results.

When no changes or minor changes are made to the existing TMDL models, the existing TMDL technical appendices will be amended as necessary to document any changes to the existing calibration or management scenarios. For more extensive changes or entirely new models new technical appendices may need to be developed to document the models and results.

9 Peer review

Peer review of the models and model results will be conducted in the following ways:

DEQ will conduct internal peer review during the modeling process with input from USEPA Region 10 as needed. For models being developed by USEPA's contractor, Tetra Tech, USEPA and DEQ will peer review all contractor developed models and model documentation.

DEQ will consider feedback on model scenarios and results from the TMDL advisory group and make changes as appropriate.

DEQ will review and respond to any public comments received on the model and model results, and make changes as appropriate.

10 Management scenarios

Management scenarios described in this section summarize the means by which sources of stream warming and different management alternatives will be evaluated. Some of these model scenarios may not be developed due to lack of sufficient data and information, because the management scenario is not applicable to the specific waterbody, or because it is determined the scenario will require an effort and

timeline that does not align with the project schedule or available resources. In some cases, the management scenario has already been developed as part of the previous TMDL and does not need further adjustment. DEQ will review all available data and information during model development and document final model scenario decisions, setup, and results in the TMDL technical appendix.

10.1 Current conditions

This scenario evaluates the stream temperature response under current existing conditions. This scenario is similar to the calibrated model except that some sources conditions will be modified, may be removed, or new ones added to reflect the current conditions or discharge loads if they are significantly different from the calibrated model. Elements of this scenario or scenarios may include:

- Updating the Rogue River model to characterize current discharges from Allweather Wood, Gold Hill STP, Grants Pass STP, Medford Regional Water Reclamation Facility, Riviera Mobile Park, Rogue River STP, and Shady Cove STP.
- Updating the landcover inputs on the Applegate and Little Applegate models so they are based on more recent LiDAR data.
- Updating the Bear Creek model to characterize current discharge from the Boise Cascade Medford Plywood facility. This facility does not discharge during the model period.

10.2 Background

This scenario evaluates the stream temperature response from background sources only. Background sources include all sources of pollution or pollutants not originating from human activities. Background sources may also include anthropogenic sources of a pollutant that DEQ or another Oregon state agency does not have authority to regulate, such as pollutants emanating from another state, tribal lands, or sources otherwise beyond the jurisdiction of the state (OAR 340-042-0030(1)). This scenario essentially combines the following model scenarios: restored vegetation, restored stream flow, improvements to channel morphology, and potentially elements of the climate scenario. The background scenario will be compared to the current conditions model scenario to determine the point of maximum impact, and the amount of cumulative warming originating from human activities that DEQ or another Oregon state agency have authority to regulate.

10.3 Restored vegetation

This scenario evaluates the stream temperature response with streamside vegetation at restored conditions. The stream temperature warming or cooling contributed by removal of streamside vegetation is evaluated by comparing this scenario to the current condition model. Elements of this scenario or scenarios may include:

- Restoring streamside vegetation in areas along the model extent that are currently characterized as lacking streamside vegetation because of anthropogenic disturbance. The restored vegetation type, height, density, and overhang values will be determined during the TMDL process and will likely be the same or similar to the values presented in the Applegate Subbasin TMDL (DEQ, 2004), Bear Creek Watershed TMDL (DEQ, 2007), Lobster Creek Watershed TMDL (DEQ, 2002a), and Rogue River Basin TMDL (DEQ, 2008).

- Model inputs for land cover height, canopy density, and overhang will be modified to reflect the restored conditions.
- All other model inputs will be the same as the current condition model.

10.4 Protected vegetation

This set of scenarios evaluate the amount of effective shade contributed by streamside vegetation along the stream that is currently protected by statue, rule, ordinance, or some other approved management plan (voluntary or regulatory). Multiple scenarios may be developed to evaluate different aspects of management plans and protection policies. The purpose of this scenario is to determine the amount of effective shade contributed by streamside vegetation in protected areas and if existing management strategies are sufficient to achieve TMDL allocations and surrogate measure effective shade targets. This scenario may be a subset of the TMDL implementation scenario. Attainment of the effective shade targets and allocations assigned to riparian management nonpoint sources are evaluated by comparing this scenario to the background model scenario. Elements of this scenario or scenarios may include:

- Identifying streamside vegetation areas along the model extent that are protected and will not be removed. The exact definition of a protected area will be determined during the TMDL process.
- Model inputs for land cover height, density, and overhang outside protected areas will be set to zero.
- Model inputs for land cover height, density, and overhang inside protected areas will be set to current conditions or restored conditions depending on the scenario.
- All other model inputs will be the same as the current condition model.

10.5 Stream flow

This scenario evaluates the stream temperature response from water withdrawals. The stream temperature warming or cooling is evaluated by comparing the water withdrawal scenario to a model scenario with the stream flow rates set to a natural flow. Assumptions and methods used to estimate natural stream flow will be documented in the TMDL.

10.6 Tributary temperatures

This scenario evaluates the stream temperature response from restoration actions on tributaries. The stream temperature warming or cooling contributed by removal of streamside vegetation on tributaries is evaluated by comparing this scenario to the current condition model. Assumptions and methods used to estimate restored tributary conditions will be documented in the TMDL. Elements of this scenario or scenarios may include:

- Tributary inputs will be set to reflect restored temperature and flow conditions. The tributary flow will reflect maintaining all currently permitted water withdrawals as instream flow.
- All other model inputs will be the same as the current condition model.

10.7 Climate

This scenario evaluates the stream temperature response from changes in air temperature and relative humidity connected to human caused changes to global or micro climate conditions. Warming or cooling from climate related impacts will be evaluated by comparing this scenario to the current conditions model scenario. Assumptions and methods used to develop this scenario will be documented in the TMDL. Elements of this scenario or scenarios may include:

- Model inputs for air temperature and relative humidity may be modified to reflect potential conditions or conditions without climate change impacts assuming enough information exists that would allow downscaling to the site specific conditions in model extent.
- Model inputs for groundwater or stream flow may also be modified if sufficient information exists that would allow downscaling to the site specific conditions in model extent.
- All other model inputs will be the same as the current condition model.

10.8 Channel morphology

This scenario evaluates stream temperature response from improvements to channel morphology, including projects to restore cold water refuges. The warming or cooling from channel morphology improvements is evaluated by comparing this scenario to the current conditions model scenario. Assumptions and methods used to develop this scenario will be documented in the TMDL. Elements of this scenario or scenarios may include:

- Modifying channel width and/or depth to reflect locations where improvements to channel morphology are needed. The location of channel morphology projects will be determined during the TMDL process.
- Model configurations for channel width, bank angle, channel position, Manning's *n*, gradient, elevation, porosity, percent hyporheic flow, hyporheic zone thickness, land cover height, density, and overhang may be modified in areas with improved channel morphology.
- All other model inputs will be the same as the current condition model.

10.9 No point sources

This scenario evaluates the stream temperature response from removing point source heat load. The stream temperature warming or cooling from permitted NPDES point sources is evaluated by comparing this scenario to the current conditions model scenario. Elements of this scenario or scenarios may include:

- Removal of all point sources from the model.
- All other model inputs will be the same as the current condition model.

10.10 TMDL wasteload allocations

This scenario evaluates stream temperature warming or cooling from the TMDL wasteload allocations. These scenarios will be compared to the no point source model scenario to evaluate attainment of the

human use allowance allocations. Numeric or narrative wasteload allocations will be developed for all NPDES permittees but some of the permittees may not be included in this model scenario due to availability of effluent data, lack of discharge, or because the discharge is not a significant source or thermal loading. Elements of this scenario or scenarios may include:

- Modifying point source discharges to reflect proposed or existing TMDL wasteload allocations.
- All other model inputs will be the same as the current condition model.

10.11 TMDL implementation plans

This set of scenarios evaluate the stream temperature response from proposed or existing DMA and responsible person management plans, TMDL implementation plans, or rules. These scenarios will be compared to the background model scenario to evaluate attainment of the human use allowance allocations or surrogate measures. It is likely that multiple model scenarios will be developed evaluating a single implementation plan or multiple implementation plans together. Assumptions and methods used to develop this scenario will be documented in the TMDL. Elements of this scenario or scenarios may include:

- Modifying streamside vegetation, instream flow, and/or channel morphology to reflect the proposed or existing implementation plan. Translating the plan elements to the modeled landscape conditions will be determined during the TMDL process.
- Model inputs for land cover height, density, overhang, boundary condition flow and temperature, channel width, bank angle, Manning's *n*, porosity, percent hyporheic flow, and hyporheic zone thickness, may be modified.
- All other model inputs will be the same as the current calibrated model.

DEQ may also rely upon the results of relevant studies, reports, or published articles to supplement the model scenario; or as the primary source of information for locations or situations where the model results are not applicable.

10.12 Dams

DEQ and others assessed the temperature impact of the William L. Jess Dam on the Rogue River (DEQ, 2008) and the Applegate Dam on the Applegate River (DEQ, 2004) using temperature and flow data collected upstream and downstream, and before and after construction of the dams. A no dam model scenario was also developed for William L. Jess Dam ("No Lost Creek Reservoir scenario") as well as other low head dams on the Rogue River (Savage Rapids, Gold Hill, and Gold Ray). The low head dams were removed and are no longer impacting temperatures in the Rogue River. The temperature impact of other dams in the Rogue Basin were not evaluated. DEQ does not expect to update the existing dam assessments or develop any new no dam model scenarios. There is insufficient temperature data to support such an assessment. The existing analysis is the best available information on the temperature impact of the dams.

11 Project organization

11.1 Project team/roles

Project roles and responsibilities are described in Table 57.

Table 57: The roles and responsibilities of each team member involved in the temperature TMDL replacement project.

Name	Position	Role and Responsibilities
Jennifer Wigal	Water Quality Administrator, Oregon DEQ	Sponsor 1. Provide guidance to team and project manager 2. Approve project plan and changes to the project, scope, budget, and schedule (pending manager elevation as necessary) 3. Sustain support of decision makers at their level, all stakeholders 4. Remove roadblocks 5. Communicate progress to other managers and WQ Director 6. Review project status 7. Manage resistance 8. Ensure communication with employees affected by changes 9. Provide forum to listen to concerns
Gene Foster	Manager, Watershed Management, Oregon DEQ	Manager 1. Review and approve team work products 2. Communicate progress to other managers 3. Approve project plan, changes to the project, and any changes that affect scope and schedule 4. Approve development and finalization of solutions to issues that occur during the project 5. Decide measures of project success
Michele Martin	Project Manager, Water Quality, Oregon DEQ	Project Manager 1. Facilitate meetings, effective meeting management 2. Provide feedback and leadership in the development of meeting agendas, activities during meetings, and tasks. 3. Provide feedback on project planning and design 4. Keep sponsor informed 5. Develop project charter 6. Develop project plan (including major tasks, milestones, project schedule, communication

Name	Position	Role and Responsibilities
		plan, risk analysis, etc.) 7. Develop team meeting agendas 8. Keep track of meeting decisions and notes (very brief), and team ideas 9. Ensure team's work drives towards outcomes and deliverables 10. Sustain engagement of team members and team performance 11. Control project scope (with Technical Lead) 12. Coordinate team communication: Emails, SharePoint, shared drives 13. Closeout project and document lessons learned
Ryan Michie	Senior Water Quality Analyst, Watershed Management, Oregon DEQ	Project Technical Lead 1. Lead, oversee, and direct development of the project QAPP 2. Lead, oversee, and direct the public data solicitation process 3. Coordination with EPA and Contractor 4. Lead, oversee, and direct DEQ technical staff 5. Perform model calibration/evaluation 6. Run model scenarios 7. Analyze and interpret model results 8. Lead, oversee, and direct TMDL document writing 9. Participate and present at TMDL public meetings 10. Respond to public comments
Jim Bloom	Senior Water Quality Analyst, Watershed Management, Oregon DEQ	1. Develop and configure models 2. Perform model calibration/evaluation 3. Run model scenarios 4. Analyze and interpret model results 5. Write TMDL 6. Participate and present at TMDL public meetings 7. Respond to public comments
Erin Costello	Water Quality Analyst, Watershed Management, Oregon DEQ	1. Write QAPP 2. Develop and configure models 3. Perform model calibration/evaluation 4. Run model scenarios 5. Analyze and interpret model results 6. Write TMDL 7. Participate and present at TMDL public

Name	Position	Role and Responsibilities
		meetings 8. Respond to public comments
David Fairbarin	Water Quality Analyst, Watershed Management, Oregon DEQ	1. Write QAPP 2. Develop and configure models 3. Perform model calibration/evaluation 4. Run model scenarios 5. Analyze and interpret model results 6. Write TMDL 7. Participate and present at TMDL public meetings 8. Respond to public comments
Yuan Grund	Water Quality Analyst, Watershed Management, Oregon DEQ	1. Write QAPP 2. Perform data evaluation 3. Run model scenarios 4. Analyze and interpret model results
Bill Meyers	Basin Coordinator, Oregon DEQ	1. Review QAPP and TMDL 2. Write WQMP 3. TMDL Advisory Committee coordinator 4. Participate and present at TMDL public meetings 5. Respond to public comments
Chris Moore	DEQ QAPP Officer, Oregon DEQ	Review QAPP
Dianne Lloyd	Oregon Department of Justice	Legal Counsel
Rob Burkhardt	Water Quality Specialist, Oregon DEQ	Project team point of contact to NPDES permit program and permittees Review wasteload allocations
Tetra Tech	Contractor	TMDL development support
Claire Schary	EPA Region 10	Non-technical TMDL reviewer
Ben Cope	EPA Region 10 QAPP Officer for Modeling Projects	EPA Modeling Lead 1. Review QAPPs 2. Review EPA Contractor work products
Jayshika Ramrakha	EPA Region 10 EPA Task Order Manager	Direct EPA Contractor
TMDL Advisory Committee	Each TMDL will have a local, public advisory committee	1. Participate in TMDL Advisory Committee Meetings

Name	Position	Role and Responsibilities
		2. Provide input to DEQ on TMDL and WQMP elements

11.2 Expertise and special training requirements

Additional expertise or special training is not necessary at this time.

DEQ staff involved in developing and configuring models, performing model calibration, running model scenarios, and analyzing and interpreting model results have experience in these tasks from numerous other modeling projects. The Project Manager has extensive experience managing large complex projects and will ensure strict adherence to the project protocols.

11.3 Reports to management

The DEQ Project Manager (or designee) will provide progress reports to DEQ Management and USEPA as needed based on new project information. As appropriate, these reports will provide information on the following:

- Adherence to project schedule and/or budget.
- Deviations from approved QAPP, as determined from project assessment and oversight activities.
- The impact of any deviations on model application quality and uncertainty.
- The need for and results of response actions to correct any deviations.
- Potential uncertainties in decisions based on model predictions and data.
- Data quality assessment findings regarding model input data and model outputs.

11.4 Project schedule

The project schedule for the Rogue River Basin TMDL is scheduled to occur in two phases. The pre TMDL project phase, and the TMDL and WQMP development phase.

Pre TMDL project phase

The pre TMDL project phase will generally occur between January 2020 through the end of August 2022. In this phase most of the planning and technical work occurs. Specific tasks include:

Task P1 Data gathering and project organization.

P1.1 Organize and gather effluent data from all active NPDES permittees in the temperature TMDL replacement project area.

P1.2 Organize and gather all available and relevant river temperature, stream flow, habitat, effective shade, and channel morphology.

P1.3 Complete an open data solicitation. During the solicitation period, the public may submit continuous stream temperature data and NPDES effluent data to DEQ in the watersheds subject to the temperature TMDL replacements.

P1.4 Review data collected. Data submitted to DEQ will be screened for completeness and quality, and whether the results are within the typical range expected for that season and time of day.

P1.5 Stream temperature data will be made available in DEQ's Ambient Water Quality Monitoring System database (AWQMS).

Task P2 Develop modeling Quality Assurance Project Plans (QAPPs). The modeling QAPPs will identify the available data and overall technical approach to be taken for each TMDL project.

Task P3 Mapping of Designated Management Agencies (DMAs) and Responsible Persons for counties that are within the project area. All Oregon counties are within the project area except Tillamook, Clatsop, and Deschutes counties.

Task P4 Development of computer code to streamline analysis tasks and TMDL document production.

Task P5 Development of template TMDL and WQMP section outlines and language.

Task P6 Implement Modeling QAPPs. This task is a follow-up to Task P2. Gathering of new data and completion of new technical work described in the modeling QAPPs.

TMDL and WQMP development phase

The TMDL and WQMP development phase is scheduled to begin in 2024 with USEPA's final agency action approving or disapproving of the TMDL no later than April 17, 2026. In this phase, the draft TMDL and WQMP documents will be written; a TMDL advisory committee will be convened to discuss the updated TMDL allocations, any revisions to the WQMP, and potential fiscal impacts in the case of a rulemaking process; and finally DEQ will conduct a public comment period. DEQ will respond to all public comments received, revise the TMDL and WQMP as necessary, and issue the final TMDL to USEPA for their action.

12 Data management

DEQ does not anticipate collecting additional field samples. Water quality data gathered and used for this project will be managed in DEQ's AWQMS database or the project files.

The modeling software to be used for this project is available on DEQ's TMDL program website.

Model-generated data resulting from testing, calibration, and scenarios will be stored in spreadsheets and text files by DEQ in the TMDL project directory. Metadata describing the content, date, and personnel involved in modeling will be documented alongside raw and summarized data.

Secondary data developed as part of this task will be maintained as hardcopy only, both hardcopy and electronic, or electronic only, depending on their nature.

All electronic data will be maintained on DEQ's computers and servers. DEQ's computers are serviced by in-house specialists. When a problem with DEQ's computers and servers occurs, in-house computer specialists diagnose the problem and correct it if possible. When outside assistance is necessary, the computer specialists call the appropriate vendor. For other computer equipment requiring outside repair

and not covered by a service contract, local computer service companies are used on a time-and-materials basis.

Routine maintenance of DEQ's computers and servers is performed by in-house computer specialists. Electric power to each computer flows through a surge suppressor to protect electronic components from potentially damaging voltage spikes. All computer users have been instructed on the importance of routinely archiving work assignment data files from hard drive to server storage. The office network server is backed up on tape nightly during the week. Screening for viruses on electronic files loaded on DEQ's computers or the network is standard policy. Automated screening systems have been placed on all computer systems and are updated regularly to ensure that viruses are identified and destroyed. Annual maintenance of software is performed to keep up with evolutionary changes in computer storage, media, and programs.

13 Recordkeeping and archiving

All data and documents generated during the course of the TMDL project will be archived according to the current Oregon State Archives Records Retention Schedules. Generally TMDL documents will be retained until 15 years after the TMDL is no longer operational.

Records that are stored in electronic format will be located in either the TMDL project folder or Master TMDL folder located on DEQ's TMDL server. The TMDL project folder will contain at minimum the following subfolders: "Project Plans", "Data", "NPDES", "Models", and "Meetings". Alternative names and additional subfolders can be used as appropriate. The Master TMDL folder will contain the written TMDL documents (Word, PDF) along with supporting written documents that support the public comment period and TMDL issuance. The contents and organization of these subfolders is described below.

Project Plans: All documents related to project planning, project proposals, project schedules, and the modeling QAPPs. Each will reside in their relevant subfolders. The final versions of documents will be clearly identified from drafts and ideally located in separate folders.

Data: All field data organized or collected in support of the TMDL project. This may include water quality samples, field sheets, photos, monitoring metadata, third party sampling project plans, or other documentation. The data should be organized by parameter and data source if possible.

NPDES: All available NPDES effluent data, discharge monitoring reports, copies of NPDES permits, and related information. Data and permit information will be organized for each permittee and located in separate subfolders.

Models: All models used for the TMDL project including calibration and scenario models. The models should be organized into subfolders for each model domain and model scenario. Draft models and the final TMDL models will be clearly identified and ideally saved in separate folders. The model folders should include:

- The model with all input and output files and any executable code used;
- Copy of all raw and summarized data (including GIS files) used for model input with data source and location metadata included;

- Scripts or spreadsheets used to transform raw data or used to derive model inputs;
- Key assumptions and documentation for the model setup and parameterization;
- Documentation of newly developed model code or modifications to the existing model; and
- Identification of staff that completed the model.

Meetings: All documents produced for external meetings including agendas, presentations, posters, and meeting handouts. Material for each meeting will be saved in a subfolder organized by date and meeting type. For example the folder name for the first meeting of the TMDL advisory group would be "2022-08-15 Temperature AG 1". Draft documents and final documents will be clearly identified and ideally saved in separate folders.

TMDL documents: At each key stage of TMDL and WQMP development copies of the following documents will be saved in separate subfolders within the project folder on the Master TMDL directory. The final versions of documents will be clearly identified from drafts and ideally saved in separate folders.

- Public Comment Draft:
  - Briefing memo to DEQ Water Quality Division Administrator or Director on public comment draft
  - Draft TMDL and WQMP Report (Both Word and PDF)
  - Draft TMDL Appendices (Both Word and PDF)
  - Public Notice document
  - TMDL Summary Fact Sheet
  - News release
  - GovDelivery Notice and email
  - Other public notification emails
  - Mailing List (if used)
  - Public Comments Errata
- Public Comments Received: Copy of all public comments received
- Final TMDL and WQMP documents:
  - Briefing memo to DEQ Water Quality Division Administrator or Director on final TMDL
  - Signed TMDL order (both Word and PDF)
  - TMDL issuance letter to USEPA (both Word and PDF)
  - USEPA approval letter (USEPA)
  - Response to Comment Document (both Word and PDF)
  - TMDL and WQMP Report (both Word and PDF)
  - TMDL Appendices (both Word and PDF)
  - TMDL Summary Fact Sheet
  - News release
  - GovDelivery Notice and email
  - Other public notification emails

- Relevant EQC agenda documents
- Designated Management Agency/Responsible Person notification letters (both Word and PDF)
- Addendums
- Errata
- Petitions
- Director's Petition Action (acceptance or rejection of petition)
- Response to Petition
- ATTAINS upload files

14 QAPP review and approval

The DEQ Project Technical Lead will distribute the draft QAPP to the respective DEQ and USEPA project team members for review. Comments will be provided to the Project Technical Lead for further discussion. When possible, revision and submittal of the final plan will be made within 10 business days of receipt of comments. Following approval, the Project Technical Lead will distribute the final, signed copy to the respective DEQ and USEPA project team members.

USEPA has an independent responsibility for this QAPP and must complete a separate approval protocol. USEPA approval is necessary for USEPA contractors to begin any modeling work.

Official copies of the final, approved QAPP will be retained in DEQ's document control system. If any change(s) to the QAPP are required during the project, they must be described in a memorandum and approved by the signatories to this QAPP and attached to the QAPP.

15 Implementation and adaptive management

DEQ plans to develop a Risk Management Plan to identify project constraints, the risks that may arise during project implementation, and potential solutions. Identified project constraints include the abbreviated project schedule with hard deadlines established via court order, limited resources, uncertain funding from USEPA, and a complex TMDL technical effort which may require additional time and public process. Projects risks from these constraints and proposed solutions are described in Table 58.

Table 58: Projects risks and proposed solutions.

Risk Description	Solution
Extended public process for complex TMDLs	Communication to DEQ manager and external contacts as deemed necessary by the manager
Team member availability: Inadequate resources to effectively produce the TMDL	Dedicate additional resources to support the effort from internal staff

Risk Description	Solution
Delivery commitment	Designate the projects as priority and dedicate additional resources to support the effort from internal staff or contractor (depending on contractor funding)
Scope creep: Working on the TMDLs could be an opportunity for attempts to add additional technical work that are outside the project scope	Sponsor and Manager to address scope creep with stakeholders as necessary

Should a situation arise that requires a significant change in the technical approach, the project team will update the QAPP as needed through revisions or addenda.

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17 Revision history

Table 59: QAPP revision history.

Revision	Date	Changes	Editor
1.0	5.23.2022	New QAPP	R. Michie

Appendix A Meteorology data summary

Table 60: Meteorological stations and data available in the National Climatic Data Center (NCDC) database in the Rogue River Basin.

Station ID	Station	Latitude/Longitude
20015704	COPPER 4 NE	42.0833/-123.1
20015715	GREEN SPRINGS POWER PLANT	42.1167/-122.567
20015725	CAVE JUNCTION 1 WNW	42.1833/-123.683
20015734	ASHLAND	42.2167/-122.717
20015735	RUCH	42.2333/-123.033
20015736	WILLIAMS 1 NW	42.2261/-123.284
20015738	KERBY 3 NNW	42.2375/-123.673
20015744	APPLEGATE	42.25/-123.183
20015753	MEDFORD EXPERIMENT STN	42.3/-122.867
20015762	LAKE CREEK 2 S	42.3903/-122.626
20015763	MEDFORD WSO AP	42.3833/-122.883
20015771	RAYGOLD	42.4333/-122.983
20015772	GRANTS PASS	42.4333/-123.35
20015774	GOLD BEACH 1 NE	42.4333/-124.4
20015780	LAKE CREEK 3 NE	42.45/-122.567
20015785	BUTTE FALLS 1 SE	42.5333/-122.55
20015786	EAGLE PT DODGE BR	42.5333/-122.867
20015791	AGNESS 2 N	42.575/-124.058
20015798	SEXTON SUMMIT	42.6003/-123.364
20015800	ILLAHE	42.6286/-124.058
20015807	LOST CREEK DAM	42.67/-122.684
20015814	PROSPECT 2 SW	42.7333/-122.517
20016521	BUNCOM 1 NNE	42.1667/-122.983
30000079	LAKE CREEK 1 E	42.4258/-122.623
30000427	SELMA 4 E	42.2753/-123.528
30001887	MEDFORD	42.0811/-122.716
30016054	JACKSONVILLE 0.3WSW	42.3108/-122.973
30018542	SHADY COVE 0.6 SSW	42.6038/-122.824
30019119	AGNESS 6.4 NE	42.6502/-124.017
30022892	CENTRAL POINT 10N	42.4875/-122.948

Station ID	Station	Latitude/Longitude
30025552	JACKSONVILLE 0.5SSW	42.306/-122.972
30028358	CENTRAL POINT 5.7NW	42.4334/-122.987
30029369	CAVE JUNCTION 3.7E	42.1573/-123.573
30030395	WILLIAMS 1 N	42.2647/-123.258
30031178	JACKSONVILLE 10 S	42.169/-122.991
30032805	PROSPECT 7 SW	42.698/-122.624
30033838	MEDFORD 2 SE	42.3137/-122.823
30034242	JACKSONVILLE 8.9WSW	42.2763/-123.139
30037871	MEDFORD 3 SSE	42.3039/-122.835
30039740	ROGUE RIVER 6 N	42.5228/-123.165
30040248	MEDFORD 3.2 E	42.3381/-122.79
30040975	TALENT 2.6 S	42.2034/-122.774
30042481	GOLD HILL 0.2 WSW	42.4335/-123.053
30042580	ASHLAND 1.4 E	42.1922/-122.672
30049768	ASHLAND 1.4 ESE	42.1794/-122.676
30050477	GRANTS PASS 10.0NNW	42.5653/-123.427
30051784	CAVE JUNCTION 1.9SE	42.1494/-123.616
30054772	ASHLAND 1 WNW	42.1944/-122.718
30056562	MEDFORD 5.0 SSW	42.2742/-122.894
30059282	PROSPECT 3 SW	42.7144/-122.57
30061997	SHADY COVE 0.2 S	42.6089/-122.819
30062265	ASHLAND 1 SE	42.1783/-122.688
30064526	MEDFORD 1.1 NNE	42.3536/-122.842
30064707	ASHLAND 2.4 ESE	42.1753/-122.657
30065343	ASHLAND 1.0 SSE	42.1756/-122.696
30068889	O'BRIEN 2 SW	42.0525/-123.714
30070238	MEDFORD 1.0 NW	42.35/-122.867
30072255	ASHLAND 2.9 SE	42.1589/-122.662
30074665	DEAD INDIAN OREGON	42.2833/-122.317
30074749	BIGELOW CAMP	42.08/-123.34
30074755	SQUAW PEAK OREGON	42.0667/-123.017
30074841	BIG RED MOUNTAIN	42.05/-122.85
30074846	EVANS CREEK OREGON	42.5978/-123.103
30074864	AGNESS OREGON	42.5522/-124.058
30074882	ZIM OREGON	42.685/-122.39
30075050	BUCK PEAK OREGON	42.0703/-123.233

Station ID	Station	Latitude/Longitude
30075110	LAWSON OREGON	42.4167/-124.133
30075332	STAR OREGON	42.15/-123.067
30075554	MOUNT STELLA OREGON	42.9372/-122.435
30075574	PROVOLT SEED ORCHARD OREGON	42.2897/-123.23
30076102	ILLINOIS VALLEY AIRPORT OREGON	42.1039/-123.685
30076143	CALVERT PEAK OREGON	42.7778/-123.729
30076230	KING MOUNTAIN	42.72/-123.2
30076295	MERLIN SEED ORCHARD OREGON	42.4947/-123.397
30076357	BUCKHORN SPRINGS OREGON	42.1197/-122.563
30076364	ONION MOUNTAIN LOOKOUT OREGON	42.4544/-123.615
30076540	FISH LK.	42.38/-122.35
30078049	JACKSONVILLE 0.2E	42.3136/-122.964
30078464	GOLD HILL 5.4 NNW	42.5069/-123.089
30078467	GRANTS PASS 6.1 SSE	42.3572/-123.29
30078936	CENTRAL POINT 3.3NNW	42.4196/-122.932
30078983	ASHLAND 0.9 N	42.2024/-122.703
30079127	SHADY COVE 0.6 NE	42.6185/-122.812
30079301	MEDFORD 2.5 ESE	42.3316/-122.805
30079314	ASHLAND 0.7 SSE	42.1807/-122.695
30079342	SELMA 6.8 SE	42.2182/-123.512
30079416	ASHLAND 1.2 NNW	42.2065/-122.71
30079429	EAGLE POINT 2.6 WNW	42.476/-122.848
30079430	MEDFORD 6.6 SSW	42.2602/-122.924
30079734	MEDFORD 3.5 SSW	42.2954/-122.886
30082577	MEDFORD 5.1 S	42.2667/-122.854
30082870	MEDFORD 1.3 NE	42.351/-122.833
30082895	ROGUE RIVER 11.0N	42.595/-123.179
30082939	WILDERVILLE 2.4 WSW	42.3835/-123.507
30083038	ASHLAND 0.8 S	42.1783/-122.697
30083939	MEDFORD 0.5 SSE	42.3338/-122.849
30084170	WILLIAMS 3.8 NNE	42.2708/-123.248
30084206	BUTTE FALLS 4.5 NNW	42.5984/-122.613
30084591	MERLIN 1.7 N	42.542/-123.426
30084600	CENTRAL POINT 2.5WSW	42.3628/-122.958
30084657	GRANTS PASS 9.5 W	42.4489/-123.511
30090504	MEDFORD 2.8 E	42.3325/-122.799

Station ID	Station	Latitude/Longitude
30093857	ROGUE RIVER 4.1 NNW	42.4926/-123.187
30094361	MEDFORD 4.7 SSW	42.2771/-122.887
30094622	MEDFORD 5.7 S	42.259/-122.87
30094660	MEDFORD 5.1 SSW	42.2675/-122.875
30101010	ASHLAND 0.5 N	42.1975/-122.7
30101416	APPLEGATE 8.3 SSW	42.1399/-123.236
30102823	GRANTS PASS 4.6 SSW	42.3788/-123.356
30103237	GRANTS PASS 9.8 SSE	42.3174/-123.231
30103253	SELMA 0.6 NNW	42.2878/-123.619
30103655	MEDFORD 2.6 ESE	42.3218/-122.808
30107396	CAVE JUNCTION 0.4ENE	42.1707/-123.638
30107966	MEDFORD 4.2 WSW	42.306/-122.922
30108158	ROGUE RIVER 1.0 N	42.4496/-123.167
30108635	CENTRAL POINT 2.5WNW	42.3915/-122.954
30109106	WILDERVILLE 1.0 WNW	42.3853/-123.487
30112012	GRANTS PASS 3.2 W	42.4335/-123.387
30112545	CAVE JUNCTION 3.8S	42.1122/-123.653
30114305	JACKSONVILLE 0.5WSW	42.3109/-122.977
30120373	EAGLE POINT 2.8 ENE	42.4807/-122.747
30121077	EAGLE POINT 6.4 SSE	42.3785/-122.76
30121390	CENTRAL POINT 1.1NW	42.3855/-122.926
30123203	GRANTS PASS 5.9 WNW	42.4723/-123.432
30123214	GRANTS PASS 0.7 NE	42.4489/-123.316
30123315	GRANTS PASS 7.6 NW	42.5117/-123.44
30123682	ASHLAND 4.2 NNW	42.2434/-122.741
30123776	ROGUE RIVER 6.2 N	42.5249/-123.156
30124203	APPLEGATE 1.9 SSW	42.2325/-123.184
30124495	JACKSONVILLE 3.9SSW	42.2588/-122.991
30124870	MEDFORD 2.0 SSW	42.313/-122.868

Table 61: Meteorological stations and data, including humidity, precipitation, temperature, wind direction, and wind speed, available in the Remote Automatic Weather Station (RAWS) database in the Rogue River Basin.

Station ID	Station	Latitude/Longitude	Agency
orOAGN	AGNESS	42.5522/-124.058	USFS
orOBIG	BIG BUTTE	42.6889/-122.385	USFS
orOFLY	FLYNN PRAIRIE	42.3956/-124.379	S&PF

Station ID	Station	Latitude/Longitude	Agency
orOIND	INDIGO	42.4917/-123.886	
orOMER	MERLIN SEED ORCHARD	42.4997/-123.369	S&PF

Table 62: Meteorological stations and data, including air temperature, precipitation, relative humidity and wind, available in the USBR AgriMet database in the Rogue River Basin.

Station ID	Station	Latitude/Longitude
BRKO	BROOKINGS, OREGON AGRIMET WEATHER STATION	42.03/-124.241
MDFO	MEDFORD, OREGON AGRIMET WEATHER STATION	42.3311/-122.938

Table 63: Meteorological stations and data available in the USBR Hydromet database in the Rogue River Basin.

Station ID	Station	Latitude/Longitude
AGA	AGATE DAM AND RESERVOIR NEAR MEDFORD, OR	42.415/-122.772
EMI	EMIGRANT DAM AND LAKE NEAR ASHLAND, OR	42.1639/-122.604

Table 64: Meteorological stations and data, including air temperature, precipitation, relative humidity, wind speed and wind direction, available in the MesoWest database in the Rogue River Basin.

Station ID	Station	Latitude/Longitude
1963P	ASHLAND - OR	42.1999/-122.704
1984P	GRANTS PASS - OR	42.4739/-123.391
1992P	THREE PINES RANCH	42.2787/-122.722
2019P	APPLEGATE STREET - JACKSONVILLE	42.3069/-122.974
2020P	PIONEER HILLS	42.2759/-122.886
2025P	OREGON CAVES	42.1053/-123.41
2042P	STONEGATE ESTATES	42.3111/-122.81
2062P	SAMS VALLEY - SOUTHERN OREGON	42.5159/-122.898
2066P	PHOENIX	42.2773/-122.806
2071P	DEK EAGLE POINT	42.4639/-122.809
2074P	STERLING CREEK (800’ ABOVE) - JACKSONVILLE	42.2582/-122.997
2078P	NEW HAVEN	42.392/-122.893
2079P	RUCH - OR	42.241/-123.058
2080P	MT. ASHLAND SKI AREA	42.0812/-122.705
2089P	BROWNSBORO HWY EAGLE POINT	42.4804/-122.767
2092P	LRR-02	42.433/-123.353
2099P	FLYINGHORSE FARM	42.5578/-123.089
2100P	EAST MEDFORD 2000 FT ELEVATION	42.3357/-122.787

Station ID	Station	Latitude/Longitude
2101P	AGNESS CABIN - OUTSIDE	42.5394/-124.052
2103P	GSI OFFICE 696 SISKIYOU BLVD ASHLAND	42.1916/-122.704
2104P	TSO-02	42.4332/-123.353
2107P	BEAR CREEK 2	42.3372/-122.836
2672P	HOME OUTDOOR SENSOR	42.4413/-123.454
3000P	AH HQ OUTSIDE	42.4822/-123.354
3901P	APPLEGATE RANCH	42.3317/-123.316
3911P	SHADY COVE	42.6087/-122.821
4120P	ANNAPOLIS DRIVE	42.3507/-122.821
4173P	MOUNTAIN MEADOWS - ASHLAND -OR	42.2074/-122.702
A3800	MEDFORD MTV	42.342/-122.91
A3801	GRANTS PASS - PARKSIDE SCHOOL	42.4341/-123.348
A4205	SHADY COVE - SHADY COVE SCHOOL	42.6232/-122.81
A4206	ASHLAND FIRE DEPT	42.1941/-122.709
A4207	MEDFORD WELCH & JACKSON	42.3316/-122.88
A4209	CAVE JUNCTION FOREST SERVICE	42.1617/-123.648
A4520	PROVOLT - SEED ORCHARD	42.2901/-123.232
A4684	TALENT - RAPP LANE	42.2299/-122.788
ANTO	ANTELOPE CREEK AND DIVERSION AT DAM	42.4111/-122.743
APPO3	APLGATE RIVER NEAR COPPER NEAR APPLEGATE 14SE	42.0639/-123.11
AS153	N7ZMR-4 GRANTS PASS	42.5/-123.371
AV193	KD6CCP-13 WHITE CITY	42.561/-122.932
AV476	W7BSK TALENT	42.2333/-122.775
BCAO	BEAR CREEK ABOVE ASHLAND, OR	42.195/-122.669
BCAO3	BEAR CREEK BELOW ASHLAND CREEK AT ASHLAND	42.2161/-122.721
BCMO	BEAR CREEK AT MOUTH BELOW CENTRAL POINT, OR	42.4264/-122.957
BCTO	BEAR CREEK BELOW PHOENIX DIVERSION NEAR TALENT	42.2536/-122.789
BJBO	BEAR CREEK AT JACKSON ST. BRIDGE, MEDFORD, OR	42.3317/-122.869
BKFO3	BALD KNOB	42.6936/-124.039
BUCO3	BUCKHORN SPRINGS	42.1206/-122.564
BUFO3	BUTTE FALLS 1SE	42.5383/-122.553
C2551	CW2551 MEDFORD	42.308/-122.899
C2974	CW2974 MEDFORD	42.3445/-122.906
C3705	CW3705 ASHLAND	42.1977/-122.722
C3857	CW3857 ASHLAND	42.0513/-122.582
C3932	CW3932 CENTRAL POINT	42.35/-122.9

Station ID	Station	Latitude/Longitude
C5474	CW5474 GRANTS PASS	42.4287/-123.386
C5579	CW5579 O'BRIEN	42.0443/-123.714
C6256	CW6256 GRANTS PASS	42.5387/-123.348
C6811	CW6811 GRANTS PASS	42.442/-123.309
C7524	CW7524 ASHLAND	42.2/-122.7
C8242	CW8242 ASHLAND	42.278/-122.722
C8876	CW8876 WILLIAMS	42.201/-123.309
CAVEX	CAVE CAVE JUNCTION	42.1209/-123.571
CL002	RIM	42.9117/-122.149
COOPMFR	MEDFORD, OR	42.37/-122.87
CVFO3	CALVERT PEAK	42.7791/-123.735
D1580	DW1580 JACKSONVILLE	42.318/-122.967
D5789	DW5789 MEDFORD	42.3292/-122.809
D6626	DW6626 ASHLAND	42.2268/-122.719
D6803	DW6803 ASHLAND	42.1833/-122.683
D6842	DW6842 GOLD BEACH	42.4723/-124.364
D7303	DW7303 ASHLAND	42.318/-122.983
D8000	DW8000 MEDFORD	42.3507/-122.883
D8339	DW8339 CAVE JUNCTION	42.2/-123.7
D9559	DW9559 ROGUE RIVER	42.4345/-123.155
E1735	EW1735 CENTRAL POINT	42.3663/-122.931
E3335	EW3335 JACKSONVILLE	42.2358/-123.087
E3480	EW3480 ASHLAND	42.1253/-122.609
E4806	EW4806 GRANTS PASS	42.424/-123.322
E5112	EW5112 JACKSONVILLE	42.1692/-122.991
E5447	EW5447 EAGLE POINT	42.5197/-122.882
E5853	EW5853 CENTRAL POINT	42.4047/-122.946
E6892	EW6892 MEDFORD	42.317/-122.847
E7191	EW7191 SELMA	42.2707/-123.554
E8600	EW8600 JACKSONVILLE	42.2408/-123.058
E8887	EW8887 WILDERVILLE	42.4195/-123.488
EGSO	EMIGRANT CREEK ABOVE GREEN SPRINGS POWERPLANT, OR	42.1222/-122.546
EPTO	ANTELOPE CREEK NEAR EAGLE POINT, OR	42.4556/-122.827
EVFO3	EVANS CREEK	42.5977/-123.105
F2003	FW2003 MEDFORD	42.3362/-122.789
F4834	FW4834 MEDFORD	42.3387/-122.803

Station ID	Station	Latitude/Longitude
F6572	FW6572 CAVEJUNCTION	42.1112/-123.667
F8614	FW8614 GRANTS PASS	42.4528/-123.329
F8731	FW8731 ROGUE RIVER CITY	42.4495/-123.167
FLKO3	FISH LAKE DAM NEAR BUTTE FALLS 13SSE	42.3778/-122.347
FSHO	NF LITTLE BUTTE CR BELOW FISH LAKE	42.3772/-122.359
GILO	SOUTH FORK LITTLE BUTTE CREEK AT GILKEY, OR	42.3586/-122.509
GILO3	SOUTH FORK LITTLE BUTTE CREEK AT GILKEY NEAR LAKECREEK 10SE	42.3583/-122.509
ILHO3	ILLAHE NEAR AGNESS 16NNE	42.6292/-124.057
K3S4	ILLINVALLEY	42.1036/-123.682
K3S8	GRANTS PASS AIRPORT	42.5101/-123.388
KMFR	ROGUE VALLEY INTERNATIONAL AIRPORT	42.375/-122.877
L02EX	L02E CAVE JUNCTION	42.158/-123.603
LBCO3	LITTLE BUTTE CREEK AT LAKECREEK	42.4222/-122.622
LBEO	LITTLE BUTTE CREEK BELOW EAGLE POINT, OR	42.4628/-122.815
MFDO	BEAR CREEK AT MEDFORD, OR	42.3308/-122.872
MLFO3	MERLIN	42.4998/-123.369
MSFO3	MOUNT STELLA	42.9361/-122.435
NFLO	NORTH FORK LITTLE BUTTE CREEK AT 140, OR	42.4028/-122.537
OD115	I5 NB AT EAST PINE MP32.78	42.3789/-122.904
OD118	OR62 EB AT UNION CREEK MP56.02	42.907/-122.445
ODT22	I5 NB AT SISKIYOU SUMMIT MP4.5	42.0633/-122.603
ODT23	US199 WB AT HAYES HILL MP16.39	42.33/-123.591
ODT24	I5 SB AT SEXTON MOUNTAIN MP69	42.5988/-123.384
ODT25	OBRIEN (US 199 MP 41)	42.0013/-123.723
ODT26	I5 SB AT MEDFORD VIADUCT MP28.94	42.3314/-122.871
ODT60	BUTTE CREEK ICE SIGN W (OR 140 MP 21.7)	42.3904/-122.479
ODT69	US101 SB AT GOLD BEACH MP327.54	42.429/-124.413
ODT92	OR238 EB AT JACKSONVILLE HILL MP30.5	42.2913/-122.994
OMFO3	ONION MOUNTAIN LOOKOUT	42.4541/-123.616
PC012	EAST MERLIN	42.5188/-123.415
PC014	WEST WIMER	42.5386/-123.168
PC015	ROGUE RIVER	42.4145/-123.163
PC026	WILDERVILLE	42.3829/-123.455
PC028	PROSPECT	42.7558/-122.483
PC029	NORTH SHADY COVE	42.6745/-122.831
PC030	EAST CAVE JUNCTION	42.1583/-123.562

Station ID	Station	Latitude/Longitude
PC037	DEER CREEK - OR	42.2689/-123.548
PC038	TAKILMA-MICRO	42.1339/-123.608
PC039	UPPER RIVER RD	42.4365/-123.415
PRFO3	PROVOLT SEED ORCHARD	42.2902/-123.233
RBFO3	DEAD INDIAN	42.2997/-122.326
RIOO	ANTELOPE CREEK ABOVE RIO CANYON NEAR EAGLE POINT, OR	42.3503/-122.688
ROGEX	ROGE GALICE	42.6955/-123.665
SBFO3	ILLINOIS VALLEY AIRPORT	42.1037/-123.685
SFLO	SOUTH FORK LITTLE BUTTE CREEK AT MOUTH, OR	42.4181/-122.612
SQFO3	SQUAW PEAK	42.0697/-123.012
SRFO3	STAR	42.1494/-123.062
TS122	MEDFORD PORT #1	42.3619/-122.872
TS597	MEDFORD PORT #2	42.1662/-123.211
TS950	RSF QUICK DEPLOY #1	42.1393/-122.705
TS951	RSF QUICK DEPLOY #2	42.4547/-123.617
TT333	SISKIYOU MTN FIRE PORT	42.1255/-122.708
TT352	SMOKE MONITOR 1 RSF PORT	42.2/-122.71
TT471	WASHINGTON PORTABLE 1	42.3283/-123.749

Table 65: Meteorological data provided to DEQ from the various sources for the Rogue River Basin.

Source	Latitude/Longitude	Available Data
6891, SOUTH COAST WSC	42.5272/-124.294	Air Temperature
FIS, FISH LAKE NEAR ASHLAND OR, USBR	42.3775/-122.349	Air Temperature
GRANTS PASS, OCS	42.4333/-123.317	Air Temperature
HANLEY ROAD, CENTRAL POINT, OSU EXTENSION SERVICE	42.3321/-122.944	Air Temperature, Relative Humidity, Wind Speed
LOST CREEK RESERVOIR, USACE	42.671/-122.675	Air Temperature

Appendix B Continuous stream temperature data summary

Table 66: Continuous temperature monitoring stations in the Rogue River Basin currently available in public databases and DEQ files.

Station ID	Station	Latitude/Longitude	Organization
10032-ORDEQ	Rogue River downstream of Medford STP	42.4391/-122.916	DEQ
10413-ORDEQ	Rogue River at Huntley Park	42.4823/-124.328	DEQ
10414-ORDEQ	Rogue River at Lobster Creek Bridge	42.5035/-124.293	DEQ
10415-ORDEQ	Rogue River downstream of Illinois	42.5515/-124.069	DEQ
10416-ORDEQ	Rogue River 500 feet upstream of Illinois (Agness)	42.5508/-124.065	DEQ
10417-ORDEQ	Rogue River at Grave Creek Road (Galice)	42.6489/-123.585	DEQ
10418-ORDEQ	Rogue River at Robertson Bridge (Merlin)	42.4965/-123.489	DEQ
10421-ORDEQ	Rogue River at Hwy 234 (north of Gold Hill)	42.4324/-123.091	DEQ
10422-ORDEQ	Rogue River upstream of Raygold Dam	42.4374/-122.982	DEQ
10423-ORDEQ	Rogue River at Hwy 234 (Dodge Park)	42.525/-122.843	DEQ
10427-ORDEQ	Grave Creek at mouth	42.6472/-123.581	DEQ
10428-ORDEQ	Applegate River at Hwy 199 (near Wilderville)	42.3974/-123.457	DEQ
10600-ORDEQ	Rogue River at Valley of the Rogue State Park	42.4087/-123.129	DEQ
10602-ORDEQ	Little Butte Creek at Agate Road (White City)	42.4553/-122.856	DEQ
11051-ORDEQ	Bear Creek at Kirtland Road (Central Point)	42.4268/-122.957	DEQ
11052-ORDEQ	Rogue River at Table Rock Road (Medford)	42.4408/-122.892	DEQ
11372-ORDEQ	Evans Creek at mouth (Rogue River)	42.4336/-123.175	DEQ
11373-ORDEQ	Evans Creek downstream of Wimer	42.5332/-123.16	DEQ
11466-ORDEQ	Evans Creek at Bridge #341	42.5842/-123.025	DEQ
11467-ORDEQ	Ward Creek at Main Street (Rogue River)	42.4331/-123.166	DEQ

Station ID	Station	Latitude/Longitude	Organization
12377-ORDEQ	Bear Creek 500 feet downstream of Rrvid (Jackson Street) Dam	42.3328/-122.871	DEQ
13196-ORDEQ	Jumpoff Joe Creek at River Mile 1.17	42.5225/-123.483	DEQ
21822-ORDEQ	Obrien Creek at River Mile 0.90	42.1023/-123.24	DEQ
23062-ORDEQ	Emigrant Creek at gaging station (Bear, Rogue)	42.1638/-122.605	DEQ
23355-ORDEQ	West Fork Illinois River upstream of Whiskey Creek	42.0222/-123.769	DEQ
23358-ORDEQ	Elk Creek at confluence with West Fork Illinois River	42.034/-123.75	DEQ
23362-ORDEQ	West Fork Illinois River upstream of Rough and Ready Creek	42.0864/-123.676	DEQ
23365-ORDEQ	West Fork Illinois River at confluence with mainstem Illinois River	42.1607/-123.661	DEQ
23370-ORDEQ	East Fork Illinois River upstream of Althouse Creek	42.1292/-123.615	DEQ
23415-ORDEQ	Grave Creek upstream of Slate Creek	42.6697/-123.193	DEQ
23421-ORDEQ	Wolf Creek at confluence of Grave Creek	42.649/-123.48	DEQ
23425-ORDEQ	Coyote Creek at confluence of Wolf Creek	42.6934/-123.397	DEQ
23426-ORDEQ	Wolf Creek upstream of Coyote Creek	42.6944/-123.396	DEQ
23428-ORDEQ	Grave Creek upstream of Butte Creek	42.6414/-123.504	DEQ
23738-ORDEQ	Salt Creek at Hwy 140	42.4394/-122.649	DEQ
23758-ORDEQ	Slate Creek at mouth, tributary to Applegate River	42.3963/-123.457	DEQ
23759-ORDEQ	Slate Creek at Redwood Tavern, tributary to Applegate River	42.3618/-123.542	DEQ
23760-ORDEQ	Slate Creek at Road Mile 1.6, tributary to Applegate River	42.364/-123.582	DEQ
23764-ORDEQ	Little Butte Creek at River Mile 11.7	42.4605/-122.694	DEQ
23765-ORDEQ	Reese Creek at Hwy 62 bridge	42.5377/-122.812	DEQ
23840-ORDEQ	Rueben Creek at River Mile 0.22 (Grave, Rogue)	42.655/-123.571	DEQ
23841-ORDEQ	Jenny Creek at River Mile 3.7 (Rogue)	42.658/-123.79	DEQ
23842-ORDEQ	Lake Creek at River Mile 0.035 (Cave, Sucker, East Fork Illinois, Illinois, Rogue)	42.1115/-123.424	DEQ
23870-ORDEQ	Forest Creek at Hamilton Road	42.2302/-123.066	DEQ

Station ID	Station	Latitude/Longitude	Organization
24355-ORDEQ	Deer Creek downstream of Clear Creek	42.272/-123.629	DEQ
24360-ORDEQ	Wolf Creek at Culvert Bridge 33-5-7	42.7169/-123.338	DEQ
24409-ORDEQ	Antelope Creek downstream of Riley Road (tributary of Little Butte Creek)	42.4403/-122.784	DEQ
24410-ORDEQ	South Fork Little Butte Creek at River Mile 9.8	42.3603/-122.491	DEQ
24411-ORDEQ	West Fork Trail Creek at River Mile 1 (tributary to Upper Rogue River)	42.6829/-122.854	DEQ
24449-ORDEQ	Indian Creek at Shady Cove Park (tributary to Upper Rogue River)	42.6104/-122.811	DEQ
24450-ORDEQ	Elk Creek at River Mile 9.4 (tributary to Upper Rogue River)	42.7654/-122.683	DEQ
24451-ORDEQ	Big Butte Creek at mouth	42.6567/-122.694	DEQ
24457-ORDEQ	Elk Creek at mouth (tributary to Upper Rogue River)	42.6623/-122.756	DEQ
24458-ORDEQ	Trail Creek at River Mile 3.5 (tributary to Upper Rogue River)	42.6867/-122.841	DEQ
24477-ORDEQ	Trail Creek at mouth (tributary to Upper Rogue River)	42.6463/-122.809	DEQ
25330-ORDEQ	Jim Hunt Creek	42.4462/-124.316	DEQ
25584-ORDEQ	Antelope Creek at Little Butte RM 0.1	42.4581/-122.829	DEQ
25584-ORDEQ	Antelope Creek	42.4581/-122.829	DEQ
25585-ORDEQ	Little Butte Creek upstream of Hwy 62 bridge at the gage	42.4624/-122.814	DEQ
25591-ORDEQ	Nichols Branch	42.4825/-122.78	DEQ
25592-ORDEQ	Little Butte Creek upstream of Nichols Branch	42.4823/-122.778	DEQ
25594-ORDEQ	Lake Creek at Little Butte Creek	42.4196/-122.621	DEQ
25595-ORDEQ	South Fork Little Butte Creek at Little Butte Creek	42.4179/-122.612	DEQ
25596-ORDEQ	North Fork Little Butte Creek at Little Butte Creek	42.4213/-122.613	DEQ
25597-ORDEQ	SF Little Butte upstream Dead Indian Creek RM 14.5 (Camp Latgawa)	42.3383/-122.45	DEQ
25598-ORDEQ	NF Little Butte from Fish Lake (headwater)	42.3775/-122.349	DEQ
25598-ORDEQ	NF Little Butte Creek downstream Fish Lake	42.3775/-122.349	DEQ

Station ID	Station	Latitude/Longitude	Organization
25789-ORDEQ	Little Butte Creek downstream of the confluence	42.4199/-122.616	DEQ
25792-ORDEQ	SF Little Butte upstream Lost RM 4.5	42.3796/-122.575	DEQ
25795-ORDEQ	SF Little Butte upstream Soda RM 9.8	42.3552/-122.512	DEQ
25797-ORDEQ	Dead Indian Creek	42.3381/-122.451	DEQ
25797-ORDEQ	Soda Creek	42.3381/-122.451	DEQ
25798-ORDEQ	Beaver Dam Creek	42.328/-122.38	DEQ
25799-ORDEQ	Headwaters	42.3286/-122.38	DEQ
25802-ORDEQ	Elk Creek downstream Elk Creek Dam (at gage)	42.6788/-122.74	DEQ
25803-ORDEQ	Elk Creek 1000 feet upstream of dam	42.6887/-122.727	DEQ
25804-ORDEQ	West Branch Elk Creek	42.6954/-122.728	DEQ
25805-ORDEQ	Elk Creek ~ 250’ upstream of confluence West Branch Elk Creek	42.6968/-122.723	DEQ
25812-ORDEQ	East Fork Illinois River	42.1619/-123.659	DEQ
25813-ORDEQ	Sucker Creek	42.1289/-123.605	DEQ
25814-ORDEQ	Sucker Creek	42.1489/-123.541	DEQ
25816-ORDEQ	Sucker Creek at Cannon Ranch	42.1552/-123.528	DEQ
25844-ORDEQ	Lobster Creek (tributary to Rogue River) at River Mile 6.4 downstream of Fall Creek	42.5789/-124.256	DEQ
25846-ORDEQ	Lobster Creek (tributary to Rogue River) below Deadline Creek	42.5668/-124.265	DEQ
25847-ORDEQ	Lobster Creek (tributary to Rogue River) at River Mile 1.6	42.5269/-124.296	DEQ
25964-ORDEQ	Flat Creek	42.7555/-122.695	DEQ
25965-ORDEQ	Elk Creek upstream Flat Creek	42.7563/-122.691	DEQ
25966-ORDEQ	Sugarpine Creek	42.7785/-122.664	DEQ
25967-ORDEQ	Bitter Lick Creek	42.7921/-122.638	DEQ
25968-ORDEQ	Headwater	42.7912/-122.636	DEQ
26542-ORDEQ	South Fork Deer Creek above Dry Creek	42.2589/-123.443	DEQ
26543-ORDEQ	South Fork Deer Creek below tributary running through quarry in Section 29	42.2409/-123.428	DEQ
26544-ORDEQ	South Fork Deer Creek below Paradise Creek	42.2191/-123.426	DEQ
26545-ORDEQ	Louse Creek above Granite Hill Road/Grouse Creek Road junction	42.5034/-123.32	DEQ

Station ID	Station	Latitude/Longitude	Organization
26546-ORDEQ	Upper Louse Creek above Road 35-5-21	42.4984/-123.251	DEQ
26547-ORDEQ	Powell Creek in Section 17 above Wallow Creek at 38-5-17 road	42.2596/-123.328	DEQ
26548-ORDEQ	Powell Creek in Section 19 at 38-5-19 road crossing	42.2502/-123.342	DEQ
26549-ORDEQ	Powell Creek in Section 25 above 38-5-15 road crossing at hairpin turn	42.2429/-123.364	DEQ
26550-ORDEQ	Powell Creek above confluence with Williams Creek, at lower BLM line, Sec. 15	42.2667/-123.284	DEQ
26551-ORDEQ	Powell Creek at Section 17/16 line	42.2687/-123.274	DEQ
26558-ORDEQ	Baldy Creek at Section 13/18 line	42.0937/-122.523	DEQ
26559-ORDEQ	Beaver Creek below confluence with Pete's Camp Creek at Section 7/18 line	42.0978/-122.991	DEQ
26560-ORDEQ	Beaver Creek at Section 11/12 boundary	42.1045/-123.012	DEQ
26561-ORDEQ	Griffin Creek at lower BLM line Section 26 NW1/4 NW1/4	42.2418/-122.909	DEQ
26562-ORDEQ	Wagner Creek above confluence with Yank Gulch	42.2074/-122.789	DEQ
26608-ORDEQ	Anderson Creek at Hwy 199 (Deer Creek, Illinois, Rogue)	42.2891/-123.612	DEQ
26611-ORDEQ	Deer Creek at River Mile 5.8 (Illinois, Rogue)	42.2761/-123.599	DEQ
26612-ORDEQ	Deer Creek 125 yards downstream of White Creek (Illinois, Rogue)	42.2625/-123.476	DEQ
26613-ORDEQ	McMullen Creek downstream of Lake Selmac (Deer Creek, Illinois, Rogue)	42.2681/-123.58	DEQ
26614-ORDEQ	Page Creek at approximately River Mile 0.7 (Illinois, East Fork Illinois, Rogue)	42.0279/-123.615	DEQ
26615-ORDEQ	West Fork Illinois River downstream of Elk Creek (Illinois, Rogue)	42.0366/-123.748	DEQ
26616-ORDEQ	West Fork Illinois River downstream of Rough & Ready Creek (Illinois, Rogue)	42.0865/-123.673	DEQ
26619-ORDEQ	Elk Creek at Hwy 199 (Illinois, Rogue)	42.0166/-123.729	DEQ
26620-ORDEQ	Illinois River 150 feet downstream of Deer Creek (Rogue)	42.2698/-123.688	DEQ

Station ID	Station	Latitude/Longitude	Organization
26621-ORDEQ	Althouse at Dick George Road (Illinois, East Fork Illinois, Rogue)	42.0962/-123.58	DEQ
26632-ORDEQ	Little Butte Cr. at bridge in town of Lake Creek (Rogue)	42.4217/-122.623	DEQ
26634-ORDEQ	Lost Creek near mouth, park with covered bridge, Lost Creek Road (Rogue)	42.3803/-122.58	DEQ
26637-ORDEQ	Little Butte, at mill diversion pond nr. Reese Cr. Rd. (Rogue)	42.4768/-122.791	DEQ
28145-ORDEQ	Whiskey Creek at Rogue River confluence	42.6587/-123.637	DEQ
28146-ORDEQ	West Fork Whiskey Creek above confluence with East Fork Whiskey Creek	42.6868/-123.631	DEQ
28147-ORDEQ	East Fork Whiskey Creek near confluence with West Fork Whiskey Creek	42.6875/-123.63	DEQ
28265-ORDEQ	Sugarpine Creek near mouth	42.7757/-122.669	DEQ
28276-ORDEQ	Sucker Creek at River Mile 7.2 (Illinois, East Fork Illinois, Rogue)	42.1599/-123.512	DEQ
28277-ORDEQ	Sucker Creek at Hummingbird Lane (Illinois, East Fork Illinois, Rogue)	42.1321/-123.58	DEQ
28305-ORDEQ	Indian Creek above bridge (Rogue River below Lobster Creek)	42.4174/-124.376	DEQ
28306-ORDEQ	East Fork Edson Creek near mouth (Rogue River below Lobster Creek)	42.4806/-124.393	DEQ
28307-ORDEQ	East Fork Edson Creek (Rogue River below Lobster Creek)	42.4844/-124.39	DEQ
28308-ORDEQ	Squaw Creek near mouth (Rogue River below Lobster Creek)	42.4693/-124.36	DEQ
28309-ORDEQ	East Fork Squaw Creek near mouth (Rogue River below Lobster Creek)	42.308/-123.649	DEQ
28359-ORDEQ	Applegate River at Little Applegate (Rogue)	42.1986/-123.045	DEQ
28360-ORDEQ	Applegate River at Beaver Creek (Rogue)	42.1204/-123.084	DEQ
28362-ORDEQ	Beaver Creek at mouth (Applegate, Rogue)	42.1204/-123.084	DEQ
28363-ORDEQ	Cheney Creek at second bridge (Applegate, Rogue)	42.3487/-123.477	DEQ
28364-ORDEQ	Cheney Creek downstream of Little Cheney Creek (Applegate, Rogue)	42.3618/-123.45	DEQ

Station ID	Station	Latitude/Longitude	Organization
28365-ORDEQ	East Fork Williams Creek at Browns Road (Applegate, Rogue)	42.2109/-123.273	DEQ
28366-ORDEQ	Grouse Creek at mouth	42.1646/-122.995	DEQ
28369-ORDEQ	Little Applegate River at mouth (Rogue)	42.1987/-123.045	DEQ
28370-ORDEQ	Little Applegate River at Road Mile 2.6 (Rogue)	42.18/-123.007	DEQ
28372-ORDEQ	Little Applegate River at Yale Creek (Rogue)	42.1488/-122.956	DEQ
28373-ORDEQ	Munger Creek at Kincaid Road (Applegate, Rogue)	42.2078/-123.323	DEQ
28374-ORDEQ	Murphy Creek at bridge (Applegate, Rogue)	42.3015/-123.37	DEQ
28375-ORDEQ	Palmer Creek at Palmer Creek Road (Applegate, Rogue)	42.1038/-123.092	DEQ
28376-ORDEQ	Sterling Creek at Little Applegate Road (Applegate, Rogue)	42.1723/-122.998	DEQ
28379-ORDEQ	West Fork Williams Creek at Caves Camp Road (Applegate, Rogue)	42.1978/-123.323	DEQ
28380-ORDEQ	West Fork Williams Creek at mouth (Applegate, Rogue)	42.2128/-123.274	DEQ
28381-ORDEQ	Williams Creek at Powell Creek (Applegate, Rogue)	42.2724/-123.249	DEQ
28383-ORDEQ	Williams Creek at Williams Hwy Bridge (Applegate, Rogue)	42.2402/-123.26	DEQ
28384-ORDEQ	Yale Creek at mouth (Little Applegate, Applegate, Rogue)	42.1488/-122.956	DEQ
28385-ORDEQ	Thompson Creek at Tallowbox Creek (Applegate, Rogue)	42.2088/-123.201	DEQ
28648-ORDEQ	North Fork Big Butte Creek at Bridge 265	42.5541/-122.547	DEQ
28649-ORDEQ	South Fork Big Butte Creek 50 feet upstream of Bridge 26.1	42.5336/-122.551	DEQ
29572-ORDEQ	Lost Valley Creek at mouth	42.6097/-124.256	DEQ
29574-ORDEQ	Fall Creek at mouth	42.5809/-124.253	DEQ
29576-ORDEQ	Deadline Creek (Lobster Creek) at mouth	42.5673/-124.265	DEQ
29629-ORDEQ	Saunders Creek near bridge	42.4454/-124.37	DEQ
29630-ORDEQ	Edson Creek at county bridge	42.4704/-124.386	DEQ
29637-ORDEQ	Edson Creek Wetland tributary	42.4823/-124.399	DEQ
29697-ORDEQ	Edson Creek, above bridge #256	42.4748/-124.39	DEQ

Station ID	Station	Latitude/Longitude	Organization
29701-ORDEQ	Indian Creek above hatchery intake	42.4248/-124.397	DEQ
29835-ORDEQ	Coyote Creek below Miller Gulch Road (River Mile 2.7)	42.6821/-123.354	DEQ
29837-ORDEQ	Wolf Creek below Hughes Gulch	42.6674/-123.465	DEQ
29838-ORDEQ	Coyote Creek above Interstate 5 bridge	42.6854/-123.389	DEQ
29839-ORDEQ	Poorman Creek near mouth	42.6592/-123.529	DEQ
29841-ORDEQ	Coyote Creek above Miller Gulch Road (River Mile 4.3)	42.6789/-123.325	DEQ
29842-ORDEQ	Grave Creek above Tom East Creek (Rogue River)	42.6296/-123.319	DEQ
29843-ORDEQ	Coyote Creek below Kennedy Gulch (Wolf Creek, Grave Creek, Rogue River)	42.6868/-123.371	DEQ
29846-ORDEQ	Grave Creek 2.5 miles above Quartz Mill Gulch	42.6403/-123.263	DEQ
29847-ORDEQ	Grave Creek below Quartz Mill Creek (Rogue River)	42.6335/-123.297	DEQ
29848-ORDEQ	Grave Creek above Shanks Creek	42.6271/-123.346	DEQ
29849-ORDEQ	Grave Creek at Sunny Valley (Rogue River)	42.6357/-123.376	DEQ
29850-ORDEQ	Grave Creek below Rat Creek (Rogue River)	42.6382/-123.4	DEQ
29851-ORDEQ	Grave Creek at Leland (Rogue River)	42.6397/-123.443	DEQ
29852-ORDEQ	Grave Creek above Lower Tom East Creek (Rogue River)	42.649/-123.465	DEQ
29853-ORDEQ	Wolf Creek above Water Tank Gulch (Grave Creek, Rogue River)	42.6813/-123.448	DEQ
29854-ORDEQ	Wolf Creek below Farmer Gulch (Grave Creek, Rogue River)	42.6913/-123.418	DEQ
29858-ORDEQ	Wolf Creek below Levens Gulch (Grave Creek, Rogue River)	42.714/-123.318	DEQ
29860-ORDEQ	Wolf Creek below Speaker (Grave Creek, Rogue River)	42.7156/-123.298	DEQ
29862-ORDEQ	Coyote Creek below Scholey Gulch (Wolf Creek, Grave Creek, Rogue River)	42.6786/-123.308	DEQ
30188-ORDEQ	West Fork Evans Creek near headwaters	42.7461/-123.103	DEQ
30189-ORDEQ	West Fork Evans Creek downstream of Sand Creek	42.6584/-123.096	DEQ

Station ID	Station	Latitude/Longitude	Organization
30190-ORDEQ	West Fork Evans Creek downstream of Battle Creek	42.6187/-123.043	DEQ
30194-ORDEQ	Lobster Creek at mouth	42.5042/-124.295	DEQ
30195-ORDEQ	Rogue River downstream of Raygold Dam	42.4361/-122.987	DEQ
30209-ORDEQ	Sardine Creek at mouth	42.4361/-123.078	DEQ
30211-ORDEQ	Rogue River downstream of Galice Creek	42.5672/-123.594	DEQ
30317-ORDEQ	Rogue River downstream of Medford WWTP (on private porperty; Landowner: Mace)	42.4403/-122.932	DEQ
30369-ORDEQ	Foster Creek at mouth	42.6344/-124.049	DEQ
30517-ORDEQ	Rogue River at Shady Cove Park-Shady Cove, OR	42.6135/-122.814	DEQ
30570-ORDEQ	Rogue River downstream of Whiskey Creek	42.6589/-123.639	DEQ
30641-ORDEQ	Rogue River downstream of Meadow Creek	42.6882/-123.75	DEQ
30646-ORDEQ	Rogue River downstream of Fall Creek	42.6576/-124.001	DEQ
30647-ORDEQ	Rogue River downstream of East Creek	42.679/-123.941	DEQ
30654-ORDEQ	Rogue River 300 ft below Shasta Costa Creek	42.5704/-124.052	DEQ
31968-ORDEQ	Willow Creek at mouth (Big Butte Creek, Rogue River)	42.5214/-122.487	DEQ
31969-ORDEQ	South Fork Big Butte Creek above Willow Creek	42.5224/-122.488	DEQ
31970-ORDEQ	Willow Creek at Willow Lake dam (South Fork Big Butte Creek, Rogue River)	42.4797/-122.449	DEQ
31971-ORDEQ	Antelope Creek 0.5 miles above Rio Canyon, near bridge 641 (Rogue River)	42.3501/-122.687	DEQ
31972-ORDEQ	Lake Creek 0.5 miles above Randle Creek (South Fork Little Butte Creek, Rogue River)	42.401/-122.624	DEQ
32644-ORDEQ	Silver Creek near mouth (Lower Rogue)	42.5014/-124.235	DEQ
32814-ORDEQ	Fall Creek at mouth	42.5803/-124.257	DEQ
32815-ORDEQ	Deadline Creek at mouth	42.5673/-124.265	DEQ

Station ID	Station	Latitude/Longitude	Organization
32816-ORDEQ	Lobster Creek, mainstem below Deadline	42.567/-124.265	DEQ
32817-ORDEQ	Lost Valley Creek at mouth	42.6097/-124.256	DEQ
32858-ORDEQ	Edson Creek at County Bridge (Rogue R)	42.4704/-124.386	DEQ
32860-ORDEQ	Saunders Creek near bridge (Rogue River)	42.4454/-124.37	DEQ
32861-ORDEQ	Indian Creek above hatchery intake (Rogue R)	42.4248/-124.397	DEQ
33527-ORDEQ	Cheney Creek at Fish Hatchery Road (Applegate, Rogue)	42.3679/-123.449	DEQ
33528-ORDEQ	Thompson Creek at River Mile 1.1 (Applegate, Rogue)	42.243/-123.175	DEQ
33529-ORDEQ	West Fork Williams downstream of Baltimore Ditch (Applegate, Rogue)	42.2019/-123.31	DEQ
33530-ORDEQ	East Fork Williams at Rock Creek (Applegate, Rogue)	42.1786/-123.262	DEQ
33531-ORDEQ	Thompson Creek at River Mile 5.6 (Applegate, Rogue)	42.1934/-123.217	DEQ
33532-ORDEQ	Thompson Creek at USFS Boundary (Applegate, Rogue)	42.1558/-123.235	DEQ
33533-ORDEQ	Thompson Creek below Ninemile Creek (Applegate, Rogue)	42.1684/-123.229	DEQ
33534-ORDEQ	Ninemile Creek (Thompson, Applegate, Rouge)	42.1636/-123.226	DEQ
33535-ORDEQ	East Fork Williams Creek upstream of Rock Creek (Applegate, Rogue)	42.1778/-123.261	DEQ
33536-ORDEQ	East Fork Williams Creek downstream of Rock Creek (Applegate, Rogue)	42.1791/-123.262	DEQ
33537-ORDEQ	Rock Creek at mouth (Williams, Applegate, Rogue)	42.1787/-123.262	DEQ
33538-ORDEQ	Thompson Creek at River Mile 4.5 (Applegate, Rogue)	42.2028/-123.202	DEQ
33539-ORDEQ	Goodwin Creek at River Mile 1	42.1867/-123.314	DEQ
33540-ORDEQ	Williams Creek above Powell Creek (Applegate, Rogue)	42.2649/-123.249	DEQ
33632-ORDEQ	South Fork Big Butte Creek above fish hatchery intake (Big Butte Creek, Rogue)	42.5386/-122.543	DEQ

Station ID	Station	Latitude/Longitude	Organization
33633-ORDEQ	South Fork Big Butte Creek below Hukill Creek (Big Butte Creek, Rogue)	42.5483/-122.573	DEQ
33635-ORDEQ	Big Butte Creek at River Mile 5.9 (stream mile 6.3) (Rogue River)	42.594/-122.649	DEQ
33636-ORDEQ	North Fork Little Butte Creek at gaging station on Hwy 140 (Big Butte Creek, Rogue River)	42.403/-122.537	DEQ
34296-ORDEQ	Edson Creek DS of EF Edson Creek (Rogue)	42.4794/-124.393	DEQ
36732-ORDEQ	Edson Cr EF at Rock Quarry	42.4871/-124.389	DEQ
36734-ORDEQ	Edson Cr WF ABV EF	42.4805/-124.395	DEQ
36906-ORDEQ	Rogue River at Boat Landing at Bella Rosa Inn	42.4229/-123.193	DEQ
38089-ORDEQ	Edson Ck East Fork below Powerline Crossing	42.4926/-124.387	DEQ
38281-ORDEQ	Wagner Creek at Wagner Creek Park	42.2372/-122.787	DEQ
40026-ORDEQ	Edson Creek US BPA Access	42.4953/-124.389	DEQ
40064-ORDEQ	Wagner CK at West Lateral Diversion	42.2169/-122.79	DEQ
40065-ORDEQ	Wagner Ck 110 Meters DS of Wagner Creek Rd	42.2103/-122.789	DEQ
40066-ORDEQ	Wagner Ck at Access BR 84 Meters DS of Holton CK Confluence	42.2255/-122.792	DEQ
404295	Bear Creek at Walker/Emigrant Confluence	42.1931/-122.651	DEQ
405084	Bear Creek upstream of Ashland Creek	42.2156/-122.719	DEQ
405225	Bear Creek upstream of Jackson Creek	42.4126/-122.94	DEQ
40616-ORDEQ	Conde Creek above T.I.D diversion, Section 8/9 line	42.2758/-122.482	DEQ
40618-ORDEQ	Keeler Creek at lower BLM line, Section 25 SE 1/4 NW 1/4	42.2392/-123.108	DEQ
406343	Meyer Creek	42.2293/-122.754	DEQ
407108	Ashland Creek	42.2152/-122.718	DEQ
407109	Bear Creek downstream of Kitchen Creek	42.2062/-122.703	DEQ
407110	Bear Creek upstream of Neil Creek	42.1949/-122.663	DEQ
407111	Bear Creek upstream of Coleman Creek	42.2845/-122.819	DEQ
407112	Bear Creek upstream of Larson Creek	42.3134/-122.85	DEQ

Station ID	Station	Latitude/Longitude	Organization
407113	Bear Creek upstream of Griffin Creek	42.3954/-122.924	DEQ
407114	Bear Creek at the mouth	42.4317/-122.967	DEQ
407115	Bear Creek upstream of Lone Pine Creek	42.3652/-122.886	DEQ
407117	Bear Creek at approximately river mile 8	42.3536/-122.879	DEQ
407121	Gaerky Creek	42.2003/-122.689	DEQ
407122	Griffin Creek	42.3949/-122.923	DEQ
407124	Jackson Creek	42.4125/-122.941	DEQ
407125	Lazy Creek	42.3181/-122.852	DEQ
407126	Lone Pine Creek	42.3655/-122.885	DEQ
407128	Neil Creek	42.1727/-122.642	DEQ
407129	Payne Creek	42.2778/-122.816	DEQ
407130	Wagner Creek	42.2476/-122.778	DEQ
407132	Butler Creek	42.222/-122.739	DEQ
407133	Larson Creek	42.3141/-122.85	DEQ
No Station ID	Return flows from Joint System Canal	42.4159/-122.608	DEQ
ODEQ Vemco 2693	EF Evans Cr	42.5842/-123.024	DEQ
ODEQ Vemco 2700	Evans Creek at Swamp Creek Rd Bridge	42.746/-123.102	DEQ
ODEQ Vemco 2700	Cedar Creek (RB)	42.746/-123.102	DEQ
ODEQ Vemco 2700	Rock Creek & Salt Creek	42.746/-123.102	DEQ
ODEQ Vemco 2700	Battle Creek RB	42.746/-123.102	DEQ
LAPT	Little Applegate River below Muddy Gulch at Tunnel Ridge Trailhead	42.1578/-122.902	BLM
WILL (Williams Creek)	Williams Creek	42.295/-123.239	BLM
CRLA_WQ04	Monitoring Location CRLA_WQ04	43.0695/-122.232	EPA WQX
CRLA_WQ08	Monitoring Location CRLA_WQ08	42.8868/-122.281	EPA WQX
CRLA_WQ11	Monitoring Location CRLA_WQ11	42.9395/-122.274	EPA WQX
CRLA_WQ12	Monitoring Location CRLA_WQ12	42.9113/-122.278	EPA WQX
CRLA_WQ15	Monitoring Location CRLA_WQ15	42.929/-122.198	EPA WQX
CRLA_WQ16	Monitoring Location CRLA_WQ16	42.9144/-122.209	EPA WQX
CRLA_WQ19	Monitoring Location CRLA_WQ19	42.9867/-122.28	EPA WQX
CRLA_WQ28	Monitoring Location CRLA_WQ28	42.8912/-122.189	EPA WQX

Station ID	Station	Latitude/Longitude	Organization
CRLA_WQ38	Monitoring Location CRLA_WQ38	42.8941/-122.167	EPA WQX
CRLA_WQ39	Monitoring Location CRLA_WQ39	42.9258/-122.218	EPA WQX
ORCA_WQ01	Monitoring Location ORCA_WQ01	42.0982/-123.413	EPA WQX
ORCA_WQ02	Monitoring Location ORCA_WQ02	42.1047/-123.39	EPA WQX
ORCA_WQ03	Monitoring Location ORCA_WQ03	42.0932/-123.416	EPA WQX
6849	Lobster Creek Upstream of Lost Valley Creek	42.6106/-124.254	Lower Rogue Watershed Council
6850	Lost Valley Creek	42.6103/-124.256	Lower Rogue Watershed Council
6860	Fall Creek	42.5808/-124.253	Lower Rogue Watershed Council
6863	Lobster Creek at REMAP site	42.5789/-124.255	Lower Rogue Watershed Council
6880	Deadline Creek	42.5675/-124.263	Lower Rogue Watershed Council
6881	Lobster Creek downstream of Deadline Creek	42.5667/-124.264	Lower Rogue Watershed Council
6890	Lobster Creek at Gorge	42.5272/-124.294	Lower Rogue Watershed Council
No Station ID	Rogue River upstream Medford WWTP	42.4379/-122.903	MRRF
LB12	Antelope Creek at Yankee Road Bridge	42.4217/-122.749	MWC
LB12	Quarter Branch	42.46/-122.832	MWC
LB12	Dry Creek	42.46/-122.832	MWC
LB17	Antelope Creek at Riley Road	42.4402/-122.782	MWC
LB18	Little Butte Creek at RM 11.8	42.4605/-122.694	MWC
LB33	Little Butte Creek at Agate Road Bridge	42.4553/-122.856	MWC
LB43	NF Little Butte Creek at the gage and Hwy 140	42.403/-122.537	MWC
14335200	S Fk Big Butte Cr Ab Willow Cr Nr Butte Falls, OR	42.5213/-122.486	OWRD
14335230	Willow Cr Ab Willow Lk Nr Butte Falls	42.4642/-122.438	OWRD
14335235	Bieberstedt Cr Ab Willow Lk Nr Butte Falls	42.4674/-122.458	OWRD
14335250	Willow Cr Dam Outlet Nr Butte Falls, OR	42.4795/-122.449	OWRD
14335300	Willow Cr Nr Butte Falls, OR	42.487/-122.453	OWRD

Station ID	Station	Latitude/Longitude	Organization
14335500	S Fk Big Butte Cr Nr Butte Falls, OR	42.5397/-122.554	OWRD
14336700	N Fk Big Butte Cr Nr Butte Falls, OR	42.554/-122.547	OWRD
14337000	Big Butte Cr Bl Butte Falls, OR	42.5599/-122.579	OWRD
14340800	S Fk Little Butte Cr Ab Soda Cr Nr Lakecreek, OR	42.3572/-122.509	OWRD
14341610	S Fk Little Butte Cr At Mouth Nr Lakecreek, OR	42.4178/-122.612	OWRD
14342500	N Fk Little Butte Cr At Fish Lake Nr Lakecreek, OR	42.3769/-122.359	OWRD
14343000	N Fk Little Butte Cr Nr Lakecreek, OR	42.4028/-122.536	OWRD
14346700	Little Butte Cr At Lakecreek, OR	42.4218/-122.623	OWRD
14346900	Little Butte Cr At Brownsboro, OR	42.4655/-122.722	OWRD
14347800	Little Butte Cr At Eagle Point, OR	42.4766/-122.793	OWRD
14348000	Little Butte Cr Bl Eagle Point, OR	42.4625/-122.815	OWRD
14348080	Antelope Cr Bl Rogue River Valley Irr Dist Div Nr White City, OR	42.4116/-122.744	OWRD
14348150	Antelope Cr Nr Eagle Point, OR	42.4553/-122.827	OWRD
14348400	Emigrant Cr Ab Green Springs Powerplant Nr Ashland, OR	42.121/-122.549	OWRD
14358610	Griffin Cr Bl Murphy Cr Nr Medford	42.2701/-122.914	OWRD
14358680	Griffin Cr At Central Point, OR	42.3944/-122.925	OWRD
14358725	Jackson Cr At Jacksonville, OR	42.3209/-122.959	OWRD
14358750	Jackson Cr At Central Point, OR	42.4075/-122.941	OWRD
14358800	Bear Cr Ab Mouth Nr Central Point, OR	42.4267/-122.957	OWRD
14360500	Evans Cr At Wimer, OR	42.5382/-123.149	OWRD
14363450	Mcdonald Cr Nr Talent, OR	42.1013/-122.798	OWRD
14365500	Little Applegate R Nr Ruch, OR	42.1971/-123.041	OWRD
14368300	Williams Cr At Williams, OR	42.2311/-123.262	OWRD
14375200	Sucker Cr At Bridgeview, OR	42.1281/-123.605	OWRD
14377550	Lake Selmac Nr Selma, OR	42.2608/-123.585	OWRD
UR15	Elk Creek at S.M. 9.4	42.7612/-122.684	Upper Rogue Watershed Council
BRGL	Bear Gulch	42.1574/-122.91	USFS
GLAD	Glade Creek	42.14/-122.859	USFS
LAPB	Little Applegate River upstream of Bear Gulch	42.1565/-122.909	USFS

Station ID	Station	Latitude/Longitude	Organization
LAPM	Little Applegate River downstream of McDonald Creek	42.1149/-122.821	USFS
MCDN	McDonald Creek	42.109/-122.817	USFS
No Station ID	Lobster Creek mouth	42.5066/-124.296	USFS
RRSNF-004	Flat Creek_LTWT	42.9188/-122.458	USFS
RRSNF-005	Red Blanket Creek abv Lick Creek_LTWT	42.7812/-122.4	USFS
RRSNF-006	Abbott Creek_LTWT	42.859/-122.51	USFS
RRSNF-007	Muir Creek at Muir Camp_LTWT	43.049/-122.35	USFS
RRSNF-008	National Creek_WT	43.021/-122.35	USFS
RRSNF-009	Union Creek_WT	42.9061/-122.442	USFS
RRSNF-010	West Fork Muir Creek_LTWT	43.084/-122.398	USFS
RRSNF-011	Woodruff Creek_LTWT	42.878/-122.511	USFS
RRSNF-012	West Branch Willow Creek_LTWT	42.5213/-122.487	USFS
RRSNF-013	Sturgis Fork Creek, Lower_LTWT	42.076/-123.213	USFS
RRSNF-014	Foster Creek_LTWT	42.635/-124.053	USFS
14330000	Rogue River Below Prospect, OR	42.7296/-122.516	USGS
14334700	S Fk Rogue R South Of Prospect, OReg.	42.7124/-122.507	USGS
14335072	Rogue R At Cole M Rivers F Hatchery Nr Mcleod, OR	42.6658/-122.686	USGS
14335075	Rogue River At Mcleod,OReg.	42.6596/-122.693	USGS
14335200	So Fk Big Butte Cr Ab Willow Cr Nr B Fls,OReg.	42.5207/-122.486	USGS
14335500	South Fork Big Butte Cr Nr Butte Falls,OReg.	42.5401/-122.555	USGS
14337500	Big Butte Creek Near Mcleod, OR	42.6512/-122.691	USGS
14337600	Rogue River Near Mcleod, OR	42.6554/-122.715	USGS
14337800	Elk Creek Near Cascade Gorge,OReg.	42.7735/-122.672	USGS
14337830	Elk Creek Below Alco Creek, Near Trail, OR	42.7304/-122.711	USGS
14337870	West Branch Elk Creek Near Trail,OReg.	42.711/-122.75	USGS
14338000	Elk Creek Near Trail, OR	42.6787/-122.742	USGS
14338100	Rogue River At Trail, OR	42.6473/-122.806	USGS
14339000	Rogue River At Dodge Bridge, Near Eagle Point, OR	42.5248/-122.843	USGS
14359000	Rogue River At Raygold Near Central Point, OR	42.4373/-122.987	USGS

Station ID	Station	Latitude/Longitude	Organization
14361050	Rogue River Abv Savage Rapids Dam Nr Rogue R, OR	42.4235/-123.193	USGS
14361500	Rogue River At Grants Pass, OR	42.4304/-123.318	USGS
14362000	Applegate River Near Copper, OR	42.0637/-123.111	USGS
14363450	Mcdonald Creek Near Talent, OR	42.1013/-122.798	USGS
14366000	Applegate River Near Applegate, OR	42.2415/-123.14	USGS
14369500	Applegate River Near Wilderville, OR	42.354/-123.407	USGS
14372300	Rogue River Near Agness, OR	42.5784/-124.058	USGS

Table 67: Summary of existing temperature data in the Rogue River Basin. Columns Jan – Dec indicate the number of daily maximum temperature results in each month. Data from the DEQ file that are not in the databases were not summarized in the table.

Year	Station ID	Station	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1990	14330000	Rogue River Below Prospect, OR	31	28	31	30	31	30	31	31	30	31	30	31
1990	14334700	S Fk Rogue R South Of Prospect, OReg.	31	28	30	30	31	30	31	31	30	31	30	31
1990	14335075	Rogue River At Mcleod,OReg.	31	28	31	30	31	30	28	31	30	31	30	31
1990	14337500	Big Butte Creek Near Mcleod, OR	31	28	31	30	31	30	31	29	24	28	30	31
1990	14337600	Rogue River Near Mcleod, OR	31	11	5	30	31	30	31	31	30	31	30	31
1990	14337800	Elk Creek Near Cascade Gorge,OReg.	31	28	31	30	31	30	31	31	30	31	30	31
1990	14337830	Elk Creek Below Alco Creek, Near Trail, OR	31	18	31	30	31	30	31	31	30	31	30	30
1990	14337870	West Branch Elk Creek Near Trail,OReg.	31	28	31	30	31	30	31	31	30	31	30	31
1990	14338000	Elk Creek Near Trail, OR	31	28	31	30	31	30	31	31	30	31	30	31
1990	14338100	Rogue River At Trail, OR	31	28	31	30	31	30	31	31	30	31	30	31
1990	14339000	Rogue River At Dodge Bridge, Near Eagle Point, OR	31	28	31	30	31	30	31	31	30	31	30	31
1990	14362000	Applegate River Near Copper, OR	31	28	31	30	31	30	31	28	30	31	30	31
1990	14366000	Applegate River Near Applegate, OR	18	28	31	30	31	30	31	31	30	31	30	31
1990	14369500	Applegate River Near Wilderville, OR	31	28	31	30	31	30	31	31	30	31	30	31
1991	14330000	Rogue River Below Prospect, OR	31	28	31	30	31	30	31	31	30	31	30	31
1991	14334700	S Fk Rogue R South Of Prospect, OReg.	31	28	31	30	31	30	31	31	30	31	30	31
1991	14335075	Rogue River At Mcleod,OReg.	31	28	26	30	31	30	31	31	30	31	30	31
1991	14337500	Big Butte Creek Near Mcleod, OR	31	28	31	30	31	30	31	31	30	31	30	31
1991	14337600	Rogue River Near Mcleod, OR	31	28	31	30	31	30	31	31	30	31	30	31
1991	14337800	Elk Creek Near Cascade Gorge,OReg.	31	28	31	30	31	30	31	31	30	31	30	31
1991	14337830	Elk Creek Below Alco Creek, Near Trail, OR	31	28	31	30	31	30	31	31	30	31	30	31
1991	14337870	West Branch Elk Creek Near Trail,OReg.	31	28	31	30	31	30	31	31	30	31	30	31
1991	14338000	Elk Creek Near Trail, OR	31	28	31	30	31	30	31	31	30	31	30	31
1991	14338100	Rogue River At Trail, OR	31	28	31	30	31	30	31	31	30	31	30	31
1991	14339000	Rogue River At Dodge Bridge, Near Eagle Point, OR	31	28	31	30	31	30	31	26	30	31	30	31
1991	14362000	Applegate River Near Copper, OR	31	28	31	30	31	30	31	31	30	31	30	31

Year	Station ID	Station	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1991	14366000	Applegate River Near Applegate, OR	31	28	31	30	31	30	31	31	30	31	30	31
1991	14369500	Applegate River Near Wilderville, OR	31	28	31	30	31	30	31	31	30	29	30	31
1992	14330000	Rogue River Below Prospect, OR	31	29	31	30	31	30	31	31	30	31	30	31
1992	14334700	S Fk Rogue R South Of Prospect, OReg.	31	29	21	30	31	30	31	31	29			
1992	14335075	Rogue River At Mcleod,OReg.	31	29	31	30	31	30	15	6	30	31	30	31
1992	14337500	Big Butte Creek Near Mcleod, OR	31	29	31	30	31	17	31	27	30	31	30	31
1992	14337600	Rogue River Near Mcleod, OR	31	29	31	30	31	30	31	31	30	31	30	31
1992	14337800	Elk Creek Near Cascade Gorge,OReg.	31	29	31	30	31	30	31		9	31	30	31
1992	14337830	Elk Creek Below Alco Creek, Near Trail, OR	31	29	31	30	31	30	26	7	30	28	29	28
1992	14337870	West Branch Elk Creek Near Trail,OReg.	31	29	31	30	31	30	31	31	30	31	30	31
1992	14338000	Elk Creek Near Trail, OR	31	29	31	30	31	30	31	31	30	31	30	31
1992	14338100	Rogue River At Trail, OR	31	29	31	30	31	30	31	31	30	18	28	31
1992	14339000	Rogue River At Dodge Bridge, Near Eagle Point, OR	31	26	30	30	31	30	31	31	30	31	30	31
1992	14362000	Applegate River Near Copper, OR	31	29	31	30	31	22	25	31	12	31	30	31
1992	14366000	Applegate River Near Applegate, OR	31	29	31	30	31	30	31	31	29	31	28	30
1992	14369500	Applegate River Near Wilderville, OR	31	29	31	30	28	30	31	31	30	31	26	25
1993	14330000	Rogue River Below Prospect, OR	31	28	31	30	31	30	29	3		7	30	31
1993	14335075	Rogue River At Mcleod,OReg.	31	28	3	18	31	30	31	18	30	31	30	26
1993	14337500	Big Butte Creek Near Mcleod, OR	31	28	31	30	31	30	31	31	29			
1993	14337600	Rogue River Near Mcleod, OR	31	28	31	30	31	30	31	31	30	31	30	31
1993	14337800	Elk Creek Near Cascade Gorge,OReg.	30	28	29	10	26	30	24	31	30	21	20	31
1993	14337830	Elk Creek Below Alco Creek, Near Trail, OR	31	16	31	30	31	9	31	31	30	31	30	31
1993	14337870	West Branch Elk Creek Near Trail,OReg.	31	28	31	30	31	30	31	31	30	31	30	31
1993	14338000	Elk Creek Near Trail, OR	31	28	31	30	31	30	31	31	30	31	30	31
1993	14338100	Rogue River At Trail, OR	31	28	30	30	31	30	31	31	30	31	30	31
1993	14339000	Rogue River At Dodge Bridge, Near Eagle Point, OR	31	28	31	30	31	30	31	31	30	31	30	31
1993	14362000	Applegate River Near Copper, OR	31	28	31	30	31	30	31	31	30	31	30	31
1993	14366000	Applegate River Near Applegate, OR	30	28	31	30	31	30	31	31	30	31	30	31

Year	Station ID	Station	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1993	14369500	Applegate River Near Wilderville, OR	27	28	31	30	20	30	31	31	30	31	30	31
1994	14330000	Rogue River Below Prospect, OR	31	28	31	30	31	30	31	31	30	31	30	31
1994	14335075	Rogue River At Mcleod,OReg.	19	28	30	30	31	30	31	31	25	5	30	31
1994	14337500	Big Butte Creek Near Mcleod, OR									1	31	30	31
1994	14337600	Rogue River Near Mcleod, OR	31	28	31	30	31	30	31	31	30	31	30	31
1994	14337800	Elk Creek Near Cascade Gorge,OReg.	31	28	31	30	31	29	12		18	12	30	31
1994	14337830	Elk Creek Below Alco Creek, Near Trail, OR	27	28	31	30	31	30	31	31	30	31	30	19
1994	14337870	West Branch Elk Creek Near Trail,OReg.	31	28	31	30	31	30	31	31	30	31	30	31
1994	14338000	Elk Creek Near Trail, OR	31	28	31	30	31	30	31	31	30	31	30	31
1994	14338100	Rogue River At Trail, OR	31	28	29	30	31	30	31	31	30	31	30	31
1994	14339000	Rogue River At Dodge Bridge, Near Eagle Point, OR	31	28	31	30	31	30	31	31	30	31	30	31
1994	14362000	Applegate River Near Copper, OR	31	28	31	30	31	30	31	31	27	14	30	31
1994	14366000	Applegate River Near Applegate, OR	31	28	31	30	31	30	31	31	30	31	30	31
1994	14369500	Applegate River Near Wilderville, OR	31	28	31	30	31	30	31	31	30	31	30	31
1995	14330000	Rogue River Below Prospect, OR	31	28	22	6	31	30	31	31	30	31	30	31
1995	14335075	Rogue River At Mcleod,OReg.	31	28	31	30	31	30	31	31	30	31	30	31
1995	14337500	Big Butte Creek Near Mcleod, OR	31	28	31	30	31	30	31	31	30	31	30	31
1995	14337600	Rogue River Near Mcleod, OR	31	28	31	30	31	30	31	31	30	31	30	31
1995	14337800	Elk Creek Near Cascade Gorge,OReg.	11	21	31	27	6	14	2	16	30	31	29	
1995	14337830	Elk Creek Below Alco Creek, Near Trail, OR	31	28	31	30	31	21	7	2	6	31	30	31
1995	14337870	West Branch Elk Creek Near Trail,OReg.	31	28	31	30	31	30	31	31	30	31	30	31
1995	14338000	Elk Creek Near Trail, OR	31	28	31	30	31	30	31	31	30	31	30	31
1995	14338100	Rogue River At Trail, OR	31	28	31	30	31	30	31	31	30	31	30	31
1995	14339000	Rogue River At Dodge Bridge, Near Eagle Point, OR	31	28	31	30	31	30	31	25	15	30	30	31
1995	14359000	Rogue River At Raygold Near Central Point, OR										28	6	
1995	14362000	Applegate River Near Copper, OR	31	28	31	30	31	30	24		29	31	30	31
1995	14366000	Applegate River Near Applegate, OR	31	28	31	30	31	30	31	31	30	31	30	31
1995	14369500	Applegate River Near Wilderville, OR	12	24	9	26	6	8	31	31	30	31	30	31

Year	Station ID	Station	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1995	14372300	Rogue River Near Agness, OR	13	28	31	30	30	30	31	31	30	31	30	31
1996	14330000	Rogue River Below Prospect, OR	31	1	31	21	15	30	31	31	30	31	30	31
1996	14335075	Rogue River At Mcleod,OReg.	17	24	31	16	31	17	31	31	29	31	19	
1996	14337500	Big Butte Creek Near Mcleod, OR	31	29	31	30	31	30	31	31	30	31	30	31
1996	14337600	Rogue River Near Mcleod, OR	31	29	31	30	31	30	31	31	30	31	28	31
1996	14337800	Elk Creek Near Cascade Gorge,OReg.	3	23	31	30	31	30	31	31	30	31	17	
1996	14337830	Elk Creek Below Alco Creek, Near Trail, OR	31	29	31	30	31	30	31	31	30	31	30	31
1996	14337870	West Branch Elk Creek Near Trail,OReg.	31	29	31	30	31	30	31	31	30	31	30	31
1996	14338000	Elk Creek Near Trail, OR	31	29	31	30	31	30	31	31	30	31	30	31
1996	14338100	Rogue River At Trail, OR	31	29	31	30	31	30	31	31	30	31	30	31
1996	14339000	Rogue River At Dodge Bridge, Near Eagle Point, OR	31	29	31	30	31	28	31	31	30	31	30	31
1996	14359000	Rogue River At Raygold Near Central Point, OR		19	18	19	31	24	31	31	25	31	30	31
1996	14362000	Applegate River Near Copper, OR	31	29	31	30	31	30	16		11	31	29	31
1996	14366000	Applegate River Near Applegate, OR	31	29	31	30	31	28	31	31	26	31	30	31
1996	14369500	Applegate River Near Wilderville, OR	31	29	3	11	31	30	31	31	25	29	30	31
1996	14372300	Rogue River Near Agness, OR	31	29	31	30	31	17		30	27	31	30	31
1997	14330000	Rogue River Below Prospect, OR	14	28	31	30	31	30	31	31	30	31	30	31
1997	14335075	Rogue River At Mcleod,OReg.	8	28	31	13	2	30	31	31	30	31	30	31
1997	14337500	Big Butte Creek Near Mcleod, OR	31	21		30	31	30	31	31	29			
1997	14337600	Rogue River Near Mcleod, OR	31	28	31	30	31	30	31	31	30	31	30	31
1997	14337800	Elk Creek Near Cascade Gorge,OReg.	1	28	31	30	31	30	31	31	30	31	30	31
1997	14337830	Elk Creek Below Alco Creek, Near Trail, OR	31	28	31	30	31	30	31	31	30	31	30	31
1997	14337870	West Branch Elk Creek Near Trail,OReg.	31	28	31	30	31	30	31	31	30	31	30	31
1997	14338000	Elk Creek Near Trail, OR	31	28	31	30	31	30	31	31	30	31	30	31
1997	14338100	Rogue River At Trail, OR	31	28	31	30	31	30	31	31	30	31	30	31
1997	14339000	Rogue River At Dodge Bridge, Near Eagle Point, OR	31	28	31	29	30	20	22	31	30	31	30	31
1997	14359000	Rogue River At Raygold Near Central Point, OR	31	28	31	22	31	29	21	15	4	29	30	31
1997	14362000	Applegate River Near Copper, OR	31	28	26	21		22	28	31	30	31	30	31

Year	Station ID	Station	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1997	14366000	Applegate River Near Applegate, OR	28	28	29	30	31	30	29	26	30	31	30	31
1997	14369500	Applegate River Near Wilderville, OR	28	28	31	30	31	30	17	31	30	31	30	31
1997	14372300	Rogue River Near Agness, OR	31	28	31	30	31	30	23	26	30	31	30	31
1997	26545-ORDEQ	Louse Creek above Granite Hill Road/Grouse Creek Road junction								11	30	6		
1998	14330000	Rogue River Below Prospect, OR	31	28	31	30	31	30	31	31	30	31	30	31
1998	14335075	Rogue River At Mcleod,OReg.	7	17	20	30	31	30	21	6	20			
1998	14337600	Rogue River Near Mcleod, OR	31	28	31	30	31	30	31	31	30	31	30	29
1998	14337800	Elk Creek Near Cascade Gorge,OReg.	31	28	4		12	29	31	31	30			
1998	14337830	Elk Creek Below Alco Creek, Near Trail, OR	31	28	31	21	2	17	24	31	30	31	29	25
1998	14337870	West Branch Elk Creek Near Trail,OReg.	31	28	31	30	31	30	31	31	30	31	26	31
1998	14338000	Elk Creek Near Trail, OR	31	28	31	30	31	30	31	31	30	31	20	22
1998	14338100	Rogue River At Trail, OR	31	28	31	30	29	16	31	31	30	31	30	31
1998	14339000	Rogue River At Dodge Bridge, Near Eagle Point, OR	20		8	28	24	15		20	30	31	30	31
1998	14359000	Rogue River At Raygold Near Central Point, OR	31	28	31	30	31	27	31	31	30	31	25	11
1998	14362000	Applegate River Near Copper, OR	23	28	31	30	31	29	31	31	30	31	27	31
1998	14366000	Applegate River Near Applegate, OR	28	22	31	30	31	30	31	31	30	31	9	31
1998	14369500	Applegate River Near Wilderville, OR	31	28	31	11	31	29	23	31	30	31	30	30
1998	14372300	Rogue River Near Agness, OR	31	28	31	30	31	30	31	31	30	31	30	31
1998	23362-ORDEQ	West Fork Illinois River upstream of Rough and Ready Creek						5	31	31	27			
1998	23365-ORDEQ	West Fork Illinois River at confluence with mainstem Illinois River							26	31	29			
1998	23758-ORDEQ	Slate Creek at mouth, tributary to Applegate River						3	31	27				
1998	23759-ORDEQ	Slate Creek at Redwood Tavern, tributary to Applegate River						2	31	27				
1998	23760-ORDEQ	Slate Creek at Road Mile 1.6, tributary to Applegate River						2	31	27				

Year	Station ID	Station	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1998	23870-ORDEQ	Forest Creek at Hamilton Road							29	11				
1998	25330-ORDEQ	Jim Hunt Creek						18	31	31	13			
1998	25846-ORDEQ	Lobster Creek (tributary to Rogue River) below Deadline Creek						17	31	31	30	6		
1998	26546-ORDEQ	Upper Louse Creek above Road 35-5-21							16	31	30	26		
1998	26550-ORDEQ	Powell Creek above confluence with Williams Creek, at lower BLM line, Sec. 15						11	31	31	30	20		
1998	26551-ORDEQ	Powell Creek at Section 17/16 line						8	31	31	30	20		
1998	26562-ORDEQ	Wagner Creek above confluence with Yank Gulch										5		
1998	26615-ORDEQ	West Fork Illinois River downstream of Elk Creek (Illinois, Rogue)						7	31	31	27			
1998	26616-ORDEQ	West Fork Illinois River downstream of Rough & Ready Creek (Illinois, Rogue)							21	31	27			
1998	28145-ORDEQ	Whiskey Creek at Rogue River confluence						18	31	31	30	5		
1998	28146-ORDEQ	West Fork Whiskey Creek above confluence with East Fork Whiskey Creek						22	31	31	30	5		
1998	28147-ORDEQ	East Fork Whiskey Creek near confluence with West Fork Whiskey Creek						22	31	31	30	5		
1998	28359-ORDEQ	Applegate River at Little Applegate (Rogue)							29	11				
1998	28360-ORDEQ	Applegate River at Beaver Creek (Rogue)							29	11				
1998	28362-ORDEQ	Beaver Creek at mouth (Applegate, Rogue)							29	11				
1998	28365-ORDEQ	East Fork Williams Creek at Browns Road (Applegate, Rogue)							11	30				

Year	Station ID	Station	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1998	28366-ORDEQ	Grouse Creek at mouth							29	31	3			
1998	28369-ORDEQ	Little Applegate River at mouth (Rogue)							29	11				
1998	28373-ORDEQ	Munger Creek at Kincaid Road (Applegate, Rogue)						4	31	30				
1998	28374-ORDEQ	Murphy Creek at bridge (Applegate, Rogue)						3	31	16				
1998	28375-ORDEQ	Palmer Creek at Palmer Creek Road (Applegate, Rogue)						4	31	11				
1998	28380-ORDEQ	West Fork Williams Creek at mouth (Applegate, Rogue)						4	31	30				
1998	28381-ORDEQ	Williams Creek at Powell Creek (Applegate, Rogue)						4	31	31	23			
1998	28383-ORDEQ	Williams Creek at Williams Hwy Bridge (Applegate, Rogue)						4	19					
1998	28384-ORDEQ	Yale Creek at mouth (Little Applegate, Applegate, Rogue)							29	31	3			
1998	28385-ORDEQ	Thompson Creek at Tallowbox Creek (Applegate, Rogue)							22	30				
1998	29572-ORDEQ	Lost Valley Creek at mouth						11	31	31	30	6		
1998	29574-ORDEQ	Fall Creek at mouth						17	31	31	30	6		
1998	29576-ORDEQ	Deadline Creek (Lobster Creek) at mouth						17	31	31	14			
1998	29629-ORDEQ	Saunders Creek near bridge						18	31	31	13			
1998	29630-ORDEQ	Edson Creek at county bridge						18	30	31	13			
1998	29701-ORDEQ	Indian Creek above hatchery intake							20	31	13			

Year	Station ID	Station	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1998	32814-ORDEQ	Fall Creek at mouth						17	31	23				
1998	32815-ORDEQ	Deadline Creek at mouth						17	31	23				
1998	32816-ORDEQ	Lobster Creek, mainstem below Deadline						17	31	23				
1998	32817-ORDEQ	Lost Valley Creek at mouth						11	31	29				
1998	32858-ORDEQ	Edson Creek at County Bridge (Rogue R)							14	31	13			
1998	32860-ORDEQ	Saunders Creek near bridge (Rogue River)						18	31	22				
1998	32861-ORDEQ	Indian Creek above hatchery intake (Rogue R)							20	31	13			
1999	14330000	Rogue River Below Prospect, OR	31	28	31	30	31	30	31	31	30	31	30	31
1999	14335075	Rogue River At Mcleod,OReg.		22	31	30	31	30	31	31	30	31	30	31
1999	14337500	Big Butte Creek Near Mcleod, OR									1	28	30	31
1999	14337600	Rogue River Near Mcleod, OR	31	28	31	30	31	30	31	31	20	30	30	31
1999	14337830	Elk Creek Below Alco Creek, Near Trail, OR	31	28	31	30	31	30	31	31	25	31	30	31
1999	14337870	West Branch Elk Creek Near Trail,OReg.	31	28	26	30	31	30	31	31	2	12	30	29
1999	14338000	Elk Creek Near Trail, OR	25	24	20	22	31	30	31	31	30	31	22	31
1999	14338100	Rogue River At Trail, OR	31	28	31	25	28	27	31	31	30	31	30	18
1999	14339000	Rogue River At Dodge Bridge, Near Eagle Point, OR	31	27	30	30	23	30	31	31	30	28	30	31
1999	14359000	Rogue River At Raygold Near Central Point, OR	20	28	31	30	31	30	31	30	30	31	30	31
1999	14362000	Applegate River Near Copper, OR	31	28	31	30	31	30	31	28	30	31	30	31
1999	14366000	Applegate River Near Applegate, OR	17	28	31	30	31	30	31	31	30	31	16	26
1999	14369500	Applegate River Near Wilderville, OR	18	28	25	30	27	28	30	29	29	31	30	31
1999	14372300	Rogue River Near Agness, OR	31	28	31	30	31	30	31	31	30	31	30	31
1999	23358-ORDEQ	Elk Creek at confluence with West Fork Illinois River						10	31	31	20			

Year	Station ID	Station	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1999	23362-ORDEQ	West Fork Illinois River upstream of Rough and Ready Creek						3	31	31	30	8		
1999	23365-ORDEQ	West Fork Illinois River at confluence with mainstem Illinois River						1	31	31	30	11		
1999	23758-ORDEQ	Slate Creek at mouth, tributary to Applegate River						1	31	23				
1999	23759-ORDEQ	Slate Creek at Redwood Tavern, tributary to Applegate River						1	31	31	28			
1999	23870-ORDEQ	Forest Creek at Hamilton Road							11	31	22			
1999	25812-ORDEQ	East Fork Illinois River							25	31	30	11		
1999	25813-ORDEQ	Sucker Creek							23	31	2			
1999	25816-ORDEQ	Sucker Creek at Cannon Ranch						6	31	31	2			
1999	26542-ORDEQ	South Fork Deer Creek above Dry Creek							29	31	30	18		
1999	26543-ORDEQ	South Fork Deer Creek below tributary running through quarry in Section 29							29	31	30	18		
1999	26544-ORDEQ	South Fork Deer Creek below Paradise Creek							29	31	30	18		
1999	26545-ORDEQ	Louse Creek above Granite Hill Road/Grouse Creek Road junction							24	31	30	13		
1999	26546-ORDEQ	Upper Louse Creek above Road 35-5-21							18	31	30	13		
1999	26547-ORDEQ	Powell Creek in Section 17 above Wallow Creek at 38-5-17 road						16	31	31	30	31	2	
1999	26549-ORDEQ	Powell Creek in Section 25 above 38-5-15 road crossing at hairpin turn							24	31	30	31	2	
1999	26550-ORDEQ	Powell Creek above confluence with Williams Creek, at lower BLM line, Sec. 15							24	31	30	31	2	

Year	Station ID	Station	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1999	26558-ORDEQ	Baldy Creek at Section 13/18 line							16	31	30	12		
1999	26559-ORDEQ	Beaver Creek below confluence with Pete's Camp Creek at Section 7/18 line							9	31	30	3		
1999	26560-ORDEQ	Beaver Creek at Section 11/12 boundary							9	31	30	3		
1999	26561-ORDEQ	Griffin Creek at lower BLM line Section 26 NW1/4 NW1/4							12	31	30	5		
1999	26562-ORDEQ	Wagner Creek above confluence with Yank Gulch							12	31	30	12		
1999	26608-ORDEQ	Anderson Creek at Hwy 199 (Deer Creek, Illinois, Rogue)						8	31	31	20			
1999	26613-ORDEQ	McMullen Creek downstream of Lake Selmac (Deer Creek, Illinois, Rogue)						8	31	31	20			
1999	26614-ORDEQ	Page Creek at approximately River Mile 0.7 (Illinois, East Fork Illinois, Rogue)						6	31	15				
1999	26615-ORDEQ	West Fork Illinois River downstream of Elk Creek (Illinois, Rogue)						10	31	31	20			
1999	26616-ORDEQ	West Fork Illinois River downstream of Rough & Ready Creek (Illinois, Rogue)						3	31	31	30	8		
1999	26619-ORDEQ	Elk Creek at Hwy 199 (Illinois, Rogue)						3	31	31	19			
1999	26620-ORDEQ	Illinois River 150 feet downstream of Deer Creek (Rogue)						3	31	31	30	8		
1999	26621-ORDEQ	Althouse at Dick George Road (Illinois, East Fork Illinois, Rogue)							14		18			
1999	28145-ORDEQ	Whiskey Creek at Rogue River confluence							31	31	30	28		
1999	28146-ORDEQ	West Fork Whiskey Creek above confluence with East Fork Whiskey Creek							31	31	30	26		
1999	28147-ORDEQ	East Fork Whiskey Creek near confluence with West Fork Whiskey Creek							31	31	30	26		

Year	Station ID	Station	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1999	28276-ORDEQ	Sucker Creek at River Mile 7.2 (Illinois, East Fork Illinois, Rogue)							22	31	2			
1999	28277-ORDEQ	Sucker Creek at Hummingbird Lane (Illinois, East Fork Illinois, Rogue)							31	31	2			
1999	28306-ORDEQ	East Fork Edson Creek near mouth (Rogue River below Lobster Creek)							3	2				
1999	28359-ORDEQ	Applegate River at Little Applegate (Rogue)							23	31	22			
1999	28362-ORDEQ	Beaver Creek at mouth (Applegate, Rogue)						13	31	31	22			
1999	28363-ORDEQ	Cheney Creek at second bridge (Applegate, Rogue)						1	31	31	28			
1999	28365-ORDEQ	East Fork Williams Creek at Browns Road (Applegate, Rogue)						9	31	31	23			
1999	28366-ORDEQ	Grouse Creek at mouth							23	31	22			
1999	28369-ORDEQ	Little Applegate River at mouth (Rogue)							23	31	22			
1999	28370-ORDEQ	Little Applegate River at Road Mile 2.6 (Rogue)							23	31	22			
1999	28372-ORDEQ	Little Applegate River at Yale Creek (Rogue)							23	31	22			
1999	28373-ORDEQ	Munger Creek at Kincaid Road (Applegate, Rogue)						9	31	31	23			
1999	28374-ORDEQ	Murphy Creek at bridge (Applegate, Rogue)						1	31	31	28			
1999	28375-ORDEQ	Palmer Creek at Palmer Creek Road (Applegate, Rogue)							23	31	22			
1999	28376-ORDEQ	Sterling Creek at Little Applegate Road (Applegate, Rogue)							23	31	22			
1999	28379-ORDEQ	West Fork Williams Creek at Caves Camp Road (Applegate, Rogue)						9	31	31	23			

Year	Station ID	Station	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1999	28383-ORDEQ	Williams Creek at Williams Hwy Bridge (Applegate, Rogue)						9	31	31	23			
1999	28384-ORDEQ	Yale Creek at mouth (Little Applegate, Applegate, Rogue)							23	31	22			
1999	28385-ORDEQ	Thompson Creek at Tallowbox Creek (Applegate, Rogue)						9	31	31	23			
1999	29630-ORDEQ	Edson Creek at county bridge							3	2				
1999	29637-ORDEQ	Edson Creek Wetland tributary							3	2				
1999	29697-ORDEQ	Edson Creek, above bridge #256							3	2				
1999	34296-ORDEQ	Edson Creek DS of EF Edson Creek (Rogue)							3	2				
1999	40616-ORDEQ	Conde Creek above T.I.D diversion, Section 8/9 line						22	31	31	30	17		
1999	40618-ORDEQ	Keeler Creek at lower BLM line, Section 25 SE 1/4 NW 1/4						23	31	31	30	3		
2000	10427-ORDEQ	Grave Creek at mouth						17	31	31	11			
2000	14330000	Rogue River Below Prospect, OR	31	29	31	30	31	30	31	31	30	31	30	31
2000	14335075	Rogue River At Mcleod,OReg.	31	19	31	30	31	30	31	31	8			
2000	14337500	Big Butte Creek Near Mcleod, OR	31	29	31	30	31	30	31	31	30			
2000	14337600	Rogue River Near Mcleod, OR	31	29	31	30	31	29	31	31	30	31	30	31
2000	14337830	Elk Creek Below Alco Creek, Near Trail, OR	31	29	26		29	13				27	30	30
2000	14337870	West Branch Elk Creek Near Trail,OReg.	30		25	12	28	30	31	31	29			
2000	14338000	Elk Creek Near Trail, OR	31	29	31	30	31	30	31	31	30	31	30	31
2000	14338100	Rogue River At Trail, OR	31	29	28	30	31	30	31	31	30			
2000	14339000	Rogue River At Dodge Bridge, Near Eagle Point, OR	31	29	27	29	31	29	31	31	30	31	30	31
2000	14359000	Rogue River At Raygold Near Central Point, OR	31	18	31	30	6			31	30	31	30	31

Year	Station ID	Station	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2000	14362000	Applegate River Near Copper, OR	31	29	31	30	26	30	31	28	25	31	30	31
2000	14366000	Applegate River Near Applegate, OR	28	29	31	29	20	29	31	31	30	31	30	31
2000	14369500	Applegate River Near Wilderville, OR	31	29	31	30	31	30	31	31	30	28	30	31
2000	14372300	Rogue River Near Agness, OR	31	29	31	30	31	30	31	31	30	31	30	31
2000	21822-ORDEQ	Obrien Creek at River Mile 0.90							12	31	17			
2000	23355-ORDEQ	West Fork Illinois River upstream of Whiskey Creek								10	30	31	12	
2000	23365-ORDEQ	West Fork Illinois River at confluence with mainstem Illinois River							19	31	25			
2000	23370-ORDEQ	East Fork Illinois River upstream of Althouse Creek								14				
2000	23415-ORDEQ	Grave Creek upstream of Slate Creek							6	31	4			
2000	23425-ORDEQ	Coyote Creek at confluence of Wolf Creek						17	31	31	4			
2000	23428-ORDEQ	Grave Creek upstream of Butte Creek									7			
2000	23840-ORDEQ	Rueben Creek at River Mile 0.22 (Grave, Rogue)						17	31	31	17			
2000	23841-ORDEQ	Jenny Creek at River Mile 3.7 (Rogue)							6	31	19			
2000	23842-ORDEQ	Lake Creek at River Mile 0.035 (Cave, Sucker, East Fork Illinois, Illinois, Rogue)							21	31	19			
2000	24355-ORDEQ	Deer Creek downstream of Clear Creek						2	31	22				
2000	25812-ORDEQ	East Fork Illinois River							19	31	25			
2000	25844-ORDEQ	Lobster Creek (tributary to Rogue River) at River Mile 6.4 downstream of Fall Creek							26	29				

Year	Station ID	Station	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2000	25846-ORDEQ	Lobster Creek (tributary to Rogue River) below Deadline Creek							26	28				
2000	26542-ORDEQ	South Fork Deer Creek above Dry Creek						7	31	31	28			
2000	26544-ORDEQ	South Fork Deer Creek below Paradise Creek						7	31	31	28			
2000	26545-ORDEQ	Louse Creek above Granite Hill Road/Grouse Creek Road junction						7	31	31	28			
2000	26547-ORDEQ	Powell Creek in Section 17 above Wallow Creek at 38-5-17 road						15	31	31	30	2		
2000	26548-ORDEQ	Powell Creek in Section 19 at 38-5-19 road crossing						15	31	31	30	2		
2000	26549-ORDEQ	Powell Creek in Section 25 above 38-5-15 road crossing at hairpin turn						15	31	31	30	2		
2000	26550-ORDEQ	Powell Creek above confluence with Williams Creek, at lower BLM line, Sec. 15						15	31	31	30	2		
2000	26562-ORDEQ	Wagner Creek above confluence with Yank Gulch							14	31	24			
2000	26613-ORDEQ	McMullen Creek downstream of Lake Selmac (Deer Creek, Illinois, Rogue)							18	31	28			
2000	28305-ORDEQ	Indian Creek above bridge (Rogue River below Lobster Creek)							20	31	13			
2000	28306-ORDEQ	East Fork Edson Creek near mouth (Rogue River below Lobster Creek)						2	31	31	13			
2000	28307-ORDEQ	East Fork Edson Creek (Rogue River below Lobster Creek)						2	31	31	13			
2000	28308-ORDEQ	Squaw Creek near mouth (Rogue River below Lobster Creek)							26	29				
2000	28309-ORDEQ	East Fork Squaw Creek near mouth (Rogue River below Lobster Creek)							20	29				
2000	28648-ORDEQ	North Fork Big Butte Creek at Bridge 265							19	31	30	2		

Year	Station ID	Station	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2000	28649-ORDEQ	South Fork Big Butte Creek 50 feet upstream of Bridge 26.1							18					
2000	40616-ORDEQ	Conde Creek above T.I.D diversion, Section 8/9 line						28	31	31	27			
2000	40618-ORDEQ	Keeler Creek at lower BLM line, Section 25 SE 1/4 NW 1/4						29	31	31	30	10		
2001	14330000	Rogue River Below Prospect, OR	31	28	31	30	31	30	31	31	30	31	30	25
2001	14337600	Rogue River Near Mcleod, OR	31	28	31	30	31	30	31	31	14	22	30	28
2001	14337830	Elk Creek Below Alco Creek, Near Trail, OR	27	20	31	30	31	30	31	31	30	31	30	31
2001	14338000	Elk Creek Near Trail, OR	31	28	31	30	31	30	31	31	30	31	30	25
2001	14339000	Rogue River At Dodge Bridge, Near Eagle Point, OR	31	28	31	30	31	30	31	31	30	31	30	31
2001	14359000	Rogue River At Raygold Near Central Point, OR	31	28	31	30	31	30	31	31	30	31	30	31
2001	14362000	Applegate River Near Copper, OR	31	28	31	30	31	30	31	31	20	31	30	31
2001	14366000	Applegate River Near Applegate, OR	29	28	31	30	26	20	31	31	30	31	25	28
2001	14369500	Applegate River Near Wilderville, OR	31	28	31	30	31	7	27	31	30	31	30	31
2001	14372300	Rogue River Near Agness, OR	31	28	31	30	31	30	31	31	30	31	30	31
2001	23358-ORDEQ	Elk Creek at confluence with West Fork Illinois River						12	31	31	30	10		
2001	23362-ORDEQ	West Fork Illinois River upstream of Rough and Ready Creek						12	31	31	30	9		
2001	23365-ORDEQ	West Fork Illinois River at confluence with mainstem Illinois River						15	31	31	30	9		
2001	25813-ORDEQ	Sucker Creek						15	31	31	30	10		
2001	25814-ORDEQ	Sucker Creek						15	31	31	30	10		
2001	25816-ORDEQ	Sucker Creek at Cannon Ranch						15	31	31	30	10		
2001	25844-ORDEQ	Lobster Creek (tributary to Rogue River) at River Mile 6.4 downstream of Fall Creek						8	31	31	3			

Year	Station ID	Station	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2001	25846-ORDEQ	Lobster Creek (tributary to Rogue River) below Deadline Creek						7	31	31	3			
2001	26608-ORDEQ	Anderson Creek at Hwy 199 (Deer Creek, Illinois, Rogue)						16	24	10	21	10		
2001	26611-ORDEQ	Deer Creek at River Mile 5.8 (Illinois, Rogue)						16	28	19	30	9		
2001	26612-ORDEQ	Deer Creek 125 yards downstream of White Creek (Illinois, Rogue)						16	31	31	30	10		
2001	26613-ORDEQ	McMullen Creek downstream of Lake Selmac (Deer Creek, Illinois, Rogue)						16	31	25	30	9		
2001	26615-ORDEQ	West Fork Illinois River downstream of Elk Creek (Illinois, Rogue)						12	31	31	30	9		
2001	26616-ORDEQ	West Fork Illinois River downstream of Rough & Ready Creek (Illinois, Rogue)						12	31	31	30	9		
2001	26621-ORDEQ	Althouse at Dick George Road (Illinois, East Fork Illinois, Rogue)						15	7					
2002	10414-ORDEQ	Rogue River at Lobster Creek Bridge						3	31	26				
2002	13196-ORDEQ	Jumpoff Joe Creek at River Mile 1.17						5	29					
2002	14330000	Rogue River Below Prospect, OR	27	25	31	30	27	30	31	31	30	31	30	31
2002	14337600	Rogue River Near Mcleod, OR	16	23	31	30	31	30	30	31	30	31	30	31
2002	14337830	Elk Creek Below Alco Creek, Near Trail, OR	31	28	31	30	31	30	31	31	30	31	24	28
2002	14338000	Elk Creek Near Trail, OR	28	28	31	30	31	30	31	31	30	31	30	31
2002	14339000	Rogue River At Dodge Bridge, Near Eagle Point, OR	31	28	30	30	31	30	31	31	30	31	30	31
2002	14359000	Rogue River At Raygold Near Central Point, OR	31	28	31	30	31	30	31	31	30	31	30	31
2002	14362000	Applegate River Near Copper, OR	31	28	31	30	31	30	31	31	30	31	30	31
2002	14366000	Applegate River Near Applegate, OR	31	28	31	30	31	30	31	31	30	31	30	31
2002	14369500	Applegate River Near Wilderville, OR	31	28	31	30	31	30	31	31	30	31	30	31
2002	14372300	Rogue River Near Agness, OR	31	28	31	30	31	26	31	31	30	31	30	31

Year	Station ID	Station	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2002	23421-ORDEQ	Wolf Creek at confluence of Grave Creek					7	30	22					
2002	23425-ORDEQ	Coyote Creek at confluence of Wolf Creek					6	30	22					
2002	23426-ORDEQ	Wolf Creek upstream of Coyote Creek					6	30	22					
2002	23758-ORDEQ	Slate Creek at mouth, tributary to Applegate River						27	31	31	25			
2002	23759-ORDEQ	Slate Creek at Redwood Tavern, tributary to Applegate River						27	31	31	25			
2002	23760-ORDEQ	Slate Creek at Road Mile 1.6, tributary to Applegate River						27	31	31	25			
2002	24360-ORDEQ	Wolf Creek at Culvert Bridge 33-5-7					1	30	31	12				
2002	25844-ORDEQ	Lobster Creek (tributary to Rogue River) at River Mile 6.4 downstream of Fall Creek						3	31	26				
2002	25846-ORDEQ	Lobster Creek (tributary to Rogue River) below Deadline Creek						3	31	26				
2002	28359-ORDEQ	Applegate River at Little Applegate (Rogue)						26	31	31	25			
2002	28362-ORDEQ	Beaver Creek at mouth (Applegate, Rogue)						26	31	30	30	18		
2002	28363-ORDEQ	Cheney Creek at second bridge (Applegate, Rogue)						27	8					
2002	28364-ORDEQ	Cheney Creek downstream of Little Cheney Creek (Applegate, Rogue)						27	25	31	25			
2002	28365-ORDEQ	East Fork Williams Creek at Browns Road (Applegate, Rogue)						27	31	31	26			
2002	28366-ORDEQ	Grouse Creek at mouth						26	29	25	15			
2002	28372-ORDEQ	Little Applegate River at Yale Creek (Rogue)						26	31	31	25			

Year	Station ID	Station	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2002	28374-ORDEQ	Murphy Creek at bridge (Applegate, Rogue)						27	31	31	25			
2002	28379-ORDEQ	West Fork Williams Creek at Caves Camp Road (Applegate, Rogue)						27	31	31	25			
2002	28383-ORDEQ	Williams Creek at Williams Hwy Bridge (Applegate, Rogue)						27	31	31	25			
2002	28384-ORDEQ	Yale Creek at mouth (Little Applegate, Applegate, Rogue)						26	8					
2002	28385-ORDEQ	Thompson Creek at Tallowbox Creek (Applegate, Rogue)						27	31	31	4			
2002	29630-ORDEQ	Edson Creek at county bridge						3	31	26				
2002	29835-ORDEQ	Coyote Creek below Miller Gulch Road (River Mile 2.7)					3	30	29					
2002	29837-ORDEQ	Wolf Creek below Hughes Gulch					7	30	22					
2002	29838-ORDEQ	Coyote Creek above Interstate 5 bridge					4	30	22					
2002	29839-ORDEQ	Poorman Creek near mouth					15	30	31	18	26			
2002	29841-ORDEQ	Coyote Creek above Miller Gulch Road (River Mile 4.3)					3	30	29					
2002	29842-ORDEQ	Grave Creek above Tom East Creek (Rogue River)					12	30	31	31	26			
2002	29843-ORDEQ	Coyote Creek below Kennedy Gulch (Wolf Creek, Grave Creek, Rogue River)					4	24						
2002	29846-ORDEQ	Grave Creek 2.5 miles above Quartz Mill Gulch					13	30	31	31	26			
2002	29847-ORDEQ	Grave Creek below Quartz Mill Creek (Rogue River)					13	30	31	31	26			
2002	29848-ORDEQ	Grave Creek above Shanks Creek					12	30	31	31	26			

Year	Station ID	Station	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2002	29849-ORDEQ	Grave Creek at Sunny Valley (Rogue River)					12	30	10					
2002	29850-ORDEQ	Grave Creek below Rat Creek (Rogue River)					12	30	31					
2002	29851-ORDEQ	Grave Creek at Leland (Rogue River)					9	30						
2002	29852-ORDEQ	Grave Creek above Lower Tom East Creek (Rogue River)					9	30	31	31	26			
2002	29853-ORDEQ	Wolf Creek above Water Tank Gulch (Grave Creek, Rogue River)					6	30	16					
2002	29854-ORDEQ	Wolf Creek below Farmer Gulch (Grave Creek, Rogue River)					6	30	22					
2002	29858-ORDEQ	Wolf Creek below Levens Gulch (Grave Creek, Rogue River)					1	30	31	31	30	2		
2002	29860-ORDEQ	Wolf Creek below Speaker (Grave Creek, Rogue River)					1	30	31	31	30	2		
2002	29862-ORDEQ	Coyote Creek below Scholey Gulch (Wolf Creek, Grave Creek, Rogue River)					3	30	29					
2002	33530-ORDEQ	East Fork Williams at Rock Creek (Applegate, Rogue)						27	31	31	25			
2003	10413-ORDEQ	Rogue River at Huntley Park							6					
2003	10416-ORDEQ	Rogue River 500 feet upstream of Illinois (Agness)							14	31	30	12		
2003	10417-ORDEQ	Rogue River at Grave Creek Road (Galice)					25	30	31	31	22			
2003	10421-ORDEQ	Rogue River at Hwy 234 (north of Gold Hill)				5	22	29	25	31	15			
2003	10422-ORDEQ	Rogue River upstream of Raygold Dam							23	8				
2003	10600-ORDEQ	Rogue River at Valley of the Rogue State Park				6	31	30	21	31	15			

Year	Station ID	Station	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2003	10602-ORDEQ	Little Butte Creek at Agate Road (White City)					24							
2003	11052-ORDEQ	Rogue River at Table Rock Road (Medford)						16	31	31	29			
2003	11372-ORDEQ	Evans Creek at mouth (Rogue River)				7	31	30	31	31	16			
2003	11373-ORDEQ	Evans Creek downstream of Wimer				7	31	30	31	31	16			
2003	11466-ORDEQ	Evans Creek at Bridge #341				6	31	30	31	31	16			
2003	11467-ORDEQ	Ward Creek at Main Street (Rogue River)				6	31	30	31	31	16			
2003	14330000	Rogue River Below Prospect, OR	31	28	31	30	31	30	31	31	30	31	30	31
2003	14337600	Rogue River Near Mcleod, OR	31	28	30	30	31	30	31	31	30	31	30	31
2003	14337830	Elk Creek Below Alco Creek, Near Trail, OR	31	28	31	30	31	30	31	31	30			
2003	14338000	Elk Creek Near Trail, OR	31	28	31	30	31	30	31	31	30	31	30	31
2003	14339000	Rogue River At Dodge Bridge, Near Eagle Point, OR	31	28	31	30	31	30	31	31	30	31	30	31
2003	14359000	Rogue River At Raygold Near Central Point, OR	31	28	31	30	31	30	31	31	30	31	30	31
2003	14362000	Applegate River Near Copper, OR	31	28	31	30	31	30	31	31	30	12	30	31
2003	14366000	Applegate River Near Applegate, OR	31	28	31	30	31	30	31	31	30	31	30	31
2003	14369500	Applegate River Near Wilderville, OR	31	28	31	30	31	30	31	31	30	31	30	31
2003	14372300	Rogue River Near Agness, OR	31	28	31	30	31	30	31	31	30	31	30	31
2003	23738-ORDEQ	Salt Creek at Hwy 140						16	31	31	29			
2003	23759-ORDEQ	Slate Creek at Redwood Tavern, tributary to Applegate River						25	31	31	30	2		
2003	23760-ORDEQ	Slate Creek at Road Mile 1.6, tributary to Applegate River						25	31	31	30	2		
2003	23764-ORDEQ	Little Butte Creek at River Mile 11.7						16	31	31	29			

Year	Station ID	Station	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2003	23765-ORDEQ	Reese Creek at Hwy 62 bridge						27	31	31	30	16		
2003	24409-ORDEQ	Antelope Creek downstream of Riley Road (tributary of Little Butte Creek)						16	31	31	29			
2003	24410-ORDEQ	South Fork Little Butte Creek at River Mile 9.8						20	31	31	30	9		
2003	24449-ORDEQ	Indian Creek at Shady Cove Park (tributary to Upper Rogue River)					24	30	9		6			
2003	24450-ORDEQ	Elk Creek at River Mile 9.4 (tributary to Upper Rogue River)						27	31	31	30	16		
2003	24451-ORDEQ	Big Butte Creek at mouth						20	31	31	30	16		
2003	24457-ORDEQ	Elk Creek at mouth (tributary to Upper Rogue River)						27	31	31	30	16		
2003	24458-ORDEQ	Trail Creek at River Mile 3.5 (tributary to Upper Rogue River)						27	31	28				
2003	24477-ORDEQ	Trail Creek at mouth (tributary to Upper Rogue River)					24	30	31	31	15			
2003	25594-ORDEQ	Lake Creek at Little Butte Creek						16	31	31	29			
2003	25595-ORDEQ	South Fork Little Butte Creek at Little Butte Creek						16	31	31	29			
2003	25596-ORDEQ	North Fork Little Butte Creek at Little Butte Creek						16	31	31	29			
2003	25803-ORDEQ	Elk Creek 1000 feet upstream of dam						16	31	31	29			
2003	25844-ORDEQ	Lobster Creek (tributary to Rogue River) at River Mile 6.4 downstream of Fall Creek						6	31	31	24			
2003	25846-ORDEQ	Lobster Creek (tributary to Rogue River) below Deadline Creek						6	31	31	24			
2003	28265-ORDEQ	Sugarpine Creek near mouth						27	31	31	30	16		

Year	Station ID	Station	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2003	28308-ORDEQ	Squaw Creek near mouth (Rogue River below Lobster Creek)						6	31	31	21			
2003	28359-ORDEQ	Applegate River at Little Applegate (Rogue)						25	31	31	30	5		
2003	28362-ORDEQ	Beaver Creek at mouth (Applegate, Rogue)						25	31	31	30	5		
2003	28366-ORDEQ	Grouse Creek at mouth						7	23	24	30	5		
2003	28369-ORDEQ	Little Applegate River at mouth (Rogue)						25	31	31	30	7		
2003	28370-ORDEQ	Little Applegate River at Road Mile 2.6 (Rogue)						25	31	31	30	5		
2003	28372-ORDEQ	Little Applegate River at Yale Creek (Rogue)						25	31	31	6	5		
2003	28374-ORDEQ	Murphy Creek at bridge (Applegate, Rogue)						25	31	31	30	2		
2003	28375-ORDEQ	Palmer Creek at Palmer Creek Road (Applegate, Rogue)						25	24	13	19			
2003	28379-ORDEQ	West Fork Williams Creek at Caves Camp Road (Applegate, Rogue)						25	31	31	30	2		
2003	28380-ORDEQ	West Fork Williams Creek at mouth (Applegate, Rogue)						20	31	31	30	2		
2003	28383-ORDEQ	Williams Creek at Williams Hwy Bridge (Applegate, Rogue)						25	31	31	30	2		
2003	28384-ORDEQ	Yale Creek at mouth (Little Applegate, Applegate, Rogue)						25	31	31	30	5		
2003	28385-ORDEQ	Thompson Creek at Tallowbox Creek (Applegate, Rogue)						25	31	31	30	5		
2003	29629-ORDEQ	Saunders Creek near bridge						6	31	31	21			
2003	29630-ORDEQ	Edson Creek at county bridge						6	31	31	24			

Year	Station ID	Station	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2003	30188-ORDEQ	West Fork Evans Creek near headwaters				7	31	30	31	31	16			
2003	30189-ORDEQ	West Fork Evans Creek downstream of Sand Creek				7	31	30	17	31	16			
2003	30190-ORDEQ	West Fork Evans Creek downstream of Battle Creek				7	31	26	7	31	16			
2003	30195-ORDEQ	Rogue River downstream of Raygold Dam				5	31	27	10	31	15			
2003	30209-ORDEQ	Sardine Creek at mouth					24	30	13					
2003	30211-ORDEQ	Rogue River downstream of Galice Creek					25	18	9	31	16			
2003	30317-ORDEQ	Rogue River downstream of Medford WWTP (on private porperty; Landowner: Mace)				5	31	30	31	31	15			
2003	30369-ORDEQ	Foster Creek at mouth							20	31	23			
2003	30570-ORDEQ	Rogue River downstream of Whiskey Creek							22	31	22			
2003	30646-ORDEQ	Rogue River downstream of Fall Creek							20	31	24			
2003	31968-ORDEQ	Willow Creek at mouth (Big Butte Creek, Rogue River)							24	31	30	31	30	31
2003	31969-ORDEQ	South Fork Big Butte Creek above Willow Creek							24	31	30	31	30	31
2003	31970-ORDEQ	Willow Creek at Willow Lake dam (South Fork Big Butte Creek, Rogue River)							24	31	30	22	13	
2003	31972-ORDEQ	Lake Creek 0.5 miles above Randle Creek (South Fork Little Butte Creek, Rogue River)						16	31	31	29			
2003	32644-ORDEQ	Silver Creek near mouth (Lower Rogue)						6	31	31	24			
2003	33527-ORDEQ	Cheney Creek at Fish Hatchery Road (Applegate, Rogue)						25	31	31	6			

Year	Station ID	Station	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2003	33528-ORDEQ	Thompson Creek at River Mile 1.1 (Applegate, Rogue)						25	31	27	21	5		
2003	33529-ORDEQ	West Fork Williams downstream of Baltimore Ditch (Applegate, Rogue)						25	31	31	30	2		
2003	33531-ORDEQ	Thompson Creek at River Mile 5.6 (Applegate, Rogue)						20	31	31	30	5		
2003	33535-ORDEQ	East Fork Williams Creek upstream of Rock Creek (Applegate, Rogue)						25	31	31	30	2		
2003	33536-ORDEQ	East Fork Williams Creek downstream of Rock Creek (Applegate, Rogue)						25	31	31	30	2		
2003	33537-ORDEQ	Rock Creek at mouth (Williams, Applegate, Rogue)						15	31	17	30	2		
2003	33538-ORDEQ	Thompson Creek at River Mile 4.5 (Applegate, Rogue)						5	31	31	30	5		
2003	33539-ORDEQ	Goodwin Creek at River Mile 1						25	31	31	30	2		
2003	33540-ORDEQ	Williams Creek above Powell Creek (Applegate, Rogue)						20	28	26	2			
2004	10032-ORDEQ	Rogue River downstream of Medford STP						20	31	31				
2004	10602-ORDEQ	Little Butte Creek at Agate Road (White City)						23	31	31				
2004	13196-ORDEQ	Jumpoff Joe Creek at River Mile 1.17						4			14			
2004	14330000	Rogue River Below Prospect, OR	31	29	31	30	31	30	31	31	30	31	30	31
2004	14337600	Rogue River Near Mcleod, OR	31	29	31	30	31	30	31	31	30	29	30	31
2004	14338000	Elk Creek Near Trail, OR	31	29	31	30	31	30	31	31	30	31	28	31
2004	14339000	Rogue River At Dodge Bridge, Near Eagle Point, OR	31	29	30	30	31	30	31	31	30	28	30	31
2004	14359000	Rogue River At Raygold Near Central Point, OR	31	29	31	30	29	27	31	31	30	8		24
2004	14362000	Applegate River Near Copper, OR	31	29	31	30	31	30	31	31	16	31	30	31
2004	14366000	Applegate River Near Applegate, OR	31	29	31	30	31	30	30	31	30	31	30	31

Year	Station ID	Station	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2004	14369500	Applegate River Near Wilderville, OR	31	29	31	30	31	30	31	31	30	31	30	31
2004	14372300	Rogue River Near Agness, OR	31	29	31	30	31	30	31	31	30	31	30	31
2004	21822-ORDEQ	Obrien Creek at River Mile 0.90						8	31	31	13			
2004	23738-ORDEQ	Salt Creek at Hwy 140						19	31	31				
2004	23758-ORDEQ	Slate Creek at mouth, tributary to Applegate River						29	31	19	30	3		
2004	23759-ORDEQ	Slate Creek at Redwood Tavern, tributary to Applegate River						29	31	31	30	3		
2004	23760-ORDEQ	Slate Creek at Road Mile 1.6, tributary to Applegate River						29	31	31	30	3		
2004	23764-ORDEQ	Little Butte Creek at River Mile 11.7							26	31	30	10		
2004	24409-ORDEQ	Antelope Creek downstream of Riley Road (tributary of Little Butte Creek)							26	31	30	10		
2004	24410-ORDEQ	South Fork Little Butte Creek at River Mile 9.8						19	31	31				
2004	24411-ORDEQ	West Fork Trail Creek at River Mile 1 (tributary to Upper Rogue River)						20	29					
2004	24450-ORDEQ	Elk Creek at River Mile 9.4 (tributary to Upper Rogue River)						24	31	31	30	14		
2004	24451-ORDEQ	Big Butte Creek at mouth						20	31	31	30	14		
2004	24457-ORDEQ	Elk Creek at mouth (tributary to Upper Rogue River)							15	31				
2004	24458-ORDEQ	Trail Creek at River Mile 3.5 (tributary to Upper Rogue River)						20	31	31				
2004	25594-ORDEQ	Lake Creek at Little Butte Creek						19	31	31				

Year	Station ID	Station	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2004	25595-ORDEQ	South Fork Little Butte Creek at Little Butte Creek						19	31	31				
2004	25596-ORDEQ	North Fork Little Butte Creek at Little Butte Creek						19	31	31	30	10		
2004	25803-ORDEQ	Elk Creek 1000 feet upstream of dam						20	31	31	30	14		
2004	25844-ORDEQ	Lobster Creek (tributary to Rogue River) at River Mile 6.4 downstream of Fall Creek						7	31	31				
2004	25846-ORDEQ	Lobster Creek (tributary to Rogue River) below Deadline Creek						7	31	31				
2004	26634-ORDEQ	Lost Creek near mouth, park with covered bridge, Lost Creek Road (Rogue)						19	10					
2004	28265-ORDEQ	Sugarpine Creek near mouth						24	31	31	30	14		
2004	28359-ORDEQ	Applegate River at Little Applegate (Rogue)						30	31	31	30	4		
2004	28362-ORDEQ	Beaver Creek at mouth (Applegate, Rogue)						27	31	31	30	4		
2004	28365-ORDEQ	East Fork Williams Creek at Browns Road (Applegate, Rogue)						29	31	31	30	3		
2004	28366-ORDEQ	Grouse Creek at mouth						27	14					
2004	28369-ORDEQ	Little Applegate River at mouth (Rogue)							4	31	30	4		
2004	28372-ORDEQ	Little Applegate River at Yale Creek (Rogue)						21						
2004	28374-ORDEQ	Murphy Creek at bridge (Applegate, Rogue)						29	31	31	30	3		
2004	28375-ORDEQ	Palmer Creek at Palmer Creek Road (Applegate, Rogue)						27	14					
2004	28379-ORDEQ	West Fork Williams Creek at Caves Camp Road (Applegate, Rogue)						29	31	31	30	3		

Year	Station ID	Station	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2004	28380-ORDEQ	West Fork Williams Creek at mouth (Applegate, Rogue)						29	31	31	30	3		
2004	28383-ORDEQ	Williams Creek at Williams Hwy Bridge (Applegate, Rogue)						29	31	31				
2004	28384-ORDEQ	Yale Creek at mouth (Little Applegate, Applegate, Rogue)							16	31	26			
2004	28385-ORDEQ	Thompson Creek at Tallowbox Creek (Applegate, Rogue)						27	31	31	30	3		
2004	29572-ORDEQ	Lost Valley Creek at mouth						5	31	31	16			
2004	29574-ORDEQ	Fall Creek at mouth						7	31	31	16			
2004	29576-ORDEQ	Deadline Creek (Lobster Creek) at mouth						7	31	31	16			
2004	29630-ORDEQ	Edson Creek at county bridge						5	31	31	14			
2004	31968-ORDEQ	Willow Creek at mouth (Big Butte Creek, Rogue River)	31	29	11			23	31	31				
2004	31969-ORDEQ	South Fork Big Butte Creek above Willow Creek	31	29	12			23	31	31	30			
2004	31970-ORDEQ	Willow Creek at Willow Lake dam (South Fork Big Butte Creek, Rogue River)						23	31	31				
2004	31972-ORDEQ	Lake Creek 0.5 miles above Randle Creek (South Fork Little Butte Creek, Rogue River)						19	31	31				
2004	33527-ORDEQ	Cheney Creek at Fish Hatchery Road (Applegate, Rogue)						29	13					
2004	33528-ORDEQ	Thompson Creek at River Mile 1.1 (Applegate, Rogue)						26	13					
2004	33529-ORDEQ	West Fork Williams downstream of Baltimore Ditch (Applegate, Rogue)						29	31	31	30	3		
2004	33530-ORDEQ	East Fork Williams at Rock Creek (Applegate, Rogue)						29	31	31	30	3		

Year	Station ID	Station	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2004	33531-ORDEQ	Thompson Creek at River Mile 5.6 (Applegate, Rogue)						26	31	31	6			
2004	33532-ORDEQ	Thompson Creek at USFS Boundary (Applegate, Rogue)						27	31	31	6			
2004	33533-ORDEQ	Thompson Creek below Ninemile Creek (Applegate, Rogue)						27	31	31	6			
2004	33534-ORDEQ	Ninemile Creek (Thompson, Applegate, Rouge)						27	13					
2004	33632-ORDEQ	South Fork Big Butte Creek above fish hatchery intake (Big Butte Creek, Rogue)						27	31	31	30			
2004	33633-ORDEQ	South Fork Big Butte Creek below Hukill Creek (Big Butte Creek, Rogue)						27	31	31	30			
2004	33635-ORDEQ	Big Butte Creek at River Mile 5.9 (stream mile 6.3) (Rogue River)						27	31	31	30			
2004	33636-ORDEQ	North Fork Little Butte Creek at gaging station on Hwy 140 (Big Butte Creek, Rogue River)						27	31	31				
2004	RRSNF-004	Flat Creek_LTWT						28	31	31	30	6		
2004	RRSNF-006	Abbott Creek_LTWT						27	31	31	30	7		
2004	RRSNF-007	Muir Creek at Muir Camp_LTWT						28	31	31	30	7		
2004	RRSNF-008	National Creek_WT						28	31	31	30	7		
2004	RRSNF-009	Union Creek_WT						28	31	31	30	7		
2004	RRSNF-010	West Fork Muir Creek_LTWT						28	20					
2004	RRSNF-011	Woodruff Creek_LTWT						27	31	31	30	7		
2004	RRSNF-012	West Branch Willow Creek_LTWT						27	31	31	30	11		
2004	RRSNF-013	Sturgis Fork Creek, Lower_LTWT							31	31	23			
2004	RRSNF-014	Foster Creek_LTWT						28	31	31	30	7		
2005	10602-ORDEQ	Little Butte Creek at Agate Road (White City)					4	30	31	31	30	3		
2005	13196-ORDEQ	Jumpoff Joe Creek at River Mile 1.17							18	31	26			

Year	Station ID	Station	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2005	14330000	Rogue River Below Prospect, OR	20	28	31	30	31	25	31	31	30	31	30	27
2005	14337600	Rogue River Near Mcleod, OR	31	28	31	30	31	30	31	31	30	31	30	31
2005	14338000	Elk Creek Near Trail, OR	31	28	31	30	31	30	31	19	30	31	30	30
2005	14339000	Rogue River At Dodge Bridge, Near Eagle Point, OR	31	28	31	30	31	30	31	31	30	31	30	31
2005	14359000	Rogue River At Raygold Near Central Point, OR	31	15		28	31	30	29	31	30			
2005	14362000	Applegate River Near Copper, OR	31	28	31	30	31	30	31	31	30	31	30	31
2005	14366000	Applegate River Near Applegate, OR	31	28	31	30	31	30	31	31	30	31	30	31
2005	14369500	Applegate River Near Wilderville, OR	31	28	31	30	31	30	31	31	30	31	30	26
2005	14372300	Rogue River Near Agness, OR	31	28	31	30	31	30	31	31	30	31	30	31
2005	21822-ORDEQ	Obrien Creek at River Mile 0.90							18	31	26			
2005	23738-ORDEQ	Salt Creek at Hwy 140						28	31	31	30	3		
2005	23764-ORDEQ	Little Butte Creek at River Mile 11.7					4	30	31	31	30	19		
2005	23765-ORDEQ	Reese Creek at Hwy 62 bridge						16	31	31	30	19		
2005	24409-ORDEQ	Antelope Creek downstream of Riley Road (tributary of Little Butte Creek)						21	31	31	30	3		
2005	24410-ORDEQ	South Fork Little Butte Creek at River Mile 9.8						28	31	31	30	3		
2005	24411-ORDEQ	West Fork Trail Creek at River Mile 1 (tributary to Upper Rogue River)					4	30	31	31	30	19		
2005	24450-ORDEQ	Elk Creek at River Mile 9.4 (tributary to Upper Rogue River)					4	30	31					
2005	24457-ORDEQ	Elk Creek at mouth (tributary to Upper Rogue River)						28	31	31	30	19		
2005	24458-ORDEQ	Trail Creek at River Mile 3.5 (tributary to Upper Rogue River)					4	30	31	31	30	19		

Year	Station ID	Station	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2005	24477-ORDEQ	Trail Creek at mouth (tributary to Upper Rogue River)					4	30	31	31	15			
2005	25594-ORDEQ	Lake Creek at Little Butte Creek						28	31	31	30	3		
2005	25595-ORDEQ	South Fork Little Butte Creek at Little Butte Creek						28	31	31	30	3		
2005	25596-ORDEQ	North Fork Little Butte Creek at Little Butte Creek						28	31	31	30	3		
2005	25803-ORDEQ	Elk Creek 1000 feet upstream of dam					4	30	31	31	30	19		
2005	26634-ORDEQ	Lost Creek near mouth, park with covered bridge, Lost Creek Road (Rogue)						28	31	20	30	3		
2005	28265-ORDEQ	Sugarpine Creek near mouth						16	31	31	30	19		
2005	31968-ORDEQ	Willow Creek at mouth (Big Butte Creek, Rogue River)						20	31	31	30	17		
2005	31969-ORDEQ	South Fork Big Butte Creek above Willow Creek						20	31	31	30	17		
2005	31970-ORDEQ	Willow Creek at Willow Lake dam (South Fork Big Butte Creek, Rogue River)						23	31	31	30	5		
2005	31971-ORDEQ	Antelope Creek 0.5 miles above Rio Canyon, near bridge 641 (Rogue River)						21	20					
2005	31972-ORDEQ	Lake Creek 0.5 miles above Randle Creek (South Fork Little Butte Creek, Rogue River)						28	31	31	30	3		
2005	33632-ORDEQ	South Fork Big Butte Creek above fish hatchery intake (Big Butte Creek, Rogue)						23	31	31	30	17		
2005	33633-ORDEQ	South Fork Big Butte Creek below Hukill Creek (Big Butte Creek, Rogue)						23	31	31	30	17		
2005	33635-ORDEQ	Big Butte Creek at River Mile 5.9 (stream mile 6.3) (Rogue River)						23	31	31	30	17		
2005	33636-ORDEQ	North Fork Little Butte Creek at gaging station on Hwy 140 (Big Butte Creek, Rogue River)						21	31	31	30	5		

Year	Station ID	Station	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2005	RRSNF-004	Flat Creek_LTWT						15	31	31	15			
2005	RRSNF-006	Abbott Creek_LTWT						16	31	31	15			
2005	RRSNF-007	Muir Creek at Muir Camp_LTWT						16	31	31	15			
2005	RRSNF-010	West Fork Muir Creek_LTWT						16	31	31	15			
2005	RRSNF-011	Woodruff Creek_LTWT						16	31	31	15			
2005	RRSNF-012	West Branch Willow Creek_LTWT						15	31	31	18			
2005	RRSNF-014	Foster Creek_LTWT						16	31	31	15			
2006	14330000	Rogue River Below Prospect, OR	8	28	31	30	31	30	31	31	30	31	30	31
2006	14337600	Rogue River Near Mcleod, OR	31	28	31	30	31	30	31	31	30	31	30	31
2006	14338000	Elk Creek Near Trail, OR	25	26	31	30	31	11				6	25	31
2006	14339000	Rogue River At Dodge Bridge, Near Eagle Point, OR	31	28	31	30	31	30	31	31	30	31	30	31
2006	14359000	Rogue River At Raygold Near Central Point, OR				27	31	30	31	31	30	31	30	31
2006	14362000	Applegate River Near Copper, OR	31	28	31	30	31	30	31	31	30	31	30	31
2006	14366000	Applegate River Near Applegate, OR	31	28	31	30	31	30	31	31	30	31	30	31
2006	14369500	Applegate River Near Wilderville, OR			3	30	31	25	31	31	30	31	30	31
2006	14372300	Rogue River Near Agness, OR	31	28	31	30	31	30	31	31	30	31	30	31
2007	14330000	Rogue River Below Prospect, OR	31	28	31	30	26	30	31	31	30	31	30	31
2007	14337600	Rogue River Near Mcleod, OR	31	28	31	30	31	30	31	31	30	31	30	31
2007	14338000	Elk Creek Near Trail, OR	31	28	31	30	31	30	31	31	30	31	30	31
2007	14339000	Rogue River At Dodge Bridge, Near Eagle Point, OR	31	28	31	30	31	30	31	22		21	30	31
2007	14359000	Rogue River At Raygold Near Central Point, OR	31	28	13	25	31	30	31	31	30	31	30	29
2007	14361500	Rogue River At Grants Pass, OR								1	29	31	30	30
2007	14362000	Applegate River Near Copper, OR	31	28	31	30	31	30	31	31	30	31	30	31
2007	14366000	Applegate River Near Applegate, OR	31	28	31	30	31	30	31	31	30	31	30	31
2007	14369500	Applegate River Near Wilderville, OR	12	25	31	30	31	30	31	27	30	31	30	31
2007	14372300	Rogue River Near Agness, OR	31	28	31	30	31	30	31	31	30	31	30	31
2008	14330000	Rogue River Below Prospect, OR	31	29	31	30	31	30	31	31	30	31	30	31
2008	14337600	Rogue River Near Mcleod, OR	31	29	31	30	31	30	31	31	30	31	30	31

Year	Station ID	Station	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2008	14338000	Elk Creek Near Trail, OR	26	29	31	30	31	30	31	31	30	31	30	31
2008	14339000	Rogue River At Dodge Bridge, Near Eagle Point, OR	31	29	31	30	29	30	30	31	30	31	30	31
2008	14359000	Rogue River At Raygold Near Central Point, OR	31	29	31	30	31	30	31	31	30	29	9	22
2008	14361500	Rogue River At Grants Pass, OR	30	26	31	30	23	28	29	31	30	31	30	31
2008	14362000	Applegate River Near Copper, OR	28	29	31	30	31	30	31	31	30	31	30	31
2008	14366000	Applegate River Near Applegate, OR	30	29	31	30	31	30	31	31	30	31	26	30
2008	14369500	Applegate River Near Wilderville, OR	30	29	31	27	31	25	31	29	14	20	30	31
2008	14372300	Rogue River Near Agness, OR	31	29	31	30	31	30	31	31	30	31	29	31
2009	14330000	Rogue River Below Prospect, OR	31	28	31	30	31	30	31	31	30	31	30	31
2009	14337600	Rogue River Near Mcleod, OR	31	28	31	30	31	29	31	31	30	31	30	31
2009	14338000	Elk Creek Near Trail, OR	31	28	31	30	31	30	31	31	30	31	30	31
2009	14339000	Rogue River At Dodge Bridge, Near Eagle Point, OR	31	28	31	30	31	30	31	31	30	31	30	31
2009	14359000	Rogue River At Raygold Near Central Point, OR	10	2	31	30	31	30	31	31	30	31	30	31
2009	14361050	Rogue River Abv Savage Rapids Dam Nr Rogue R, OR							17	31	30	31	30	30
2009	14361500	Rogue River At Grants Pass, OR	31	25	31	30	27	30	31	31	30	31	30	31
2009	14362000	Applegate River Near Copper, OR	31	28	31	30	31	30	31	31	30	31	30	31
2009	14366000	Applegate River Near Applegate, OR	31	25	31	30	31	30	31	31	25	31	30	31
2009	14369500	Applegate River Near Wilderville, OR	31	28	31	25	7	19	31	31	30	31	30	31
2009	14372300	Rogue River Near Agness, OR	31	28	31	30	31	30	31	31	30	31	30	31
2010	14330000	Rogue River Below Prospect, OR	31	28	31	30	31	30	31	31	30	31	30	31
2010	14337600	Rogue River Near Mcleod, OR	31	28	31	30	17	22	31	29	30	31	23	31
2010	14338000	Elk Creek Near Trail, OR	31	28	31	30	31	30	31	31	30	31	30	31
2010	14339000	Rogue River At Dodge Bridge, Near Eagle Point, OR	31	28	31	30	31	30	31	31	30	31	30	28
2010	14359000	Rogue River At Raygold Near Central Point, OR	28	28	31	30	30	19	31	31	30	31	30	31
2010	14361050	Rogue River Abv Savage Rapids Dam Nr Rogue R, OR	31	23	31	12								
2010	14361500	Rogue River At Grants Pass, OR	31	28	31	30	31	30	31	31	30	31	30	31
2010	14362000	Applegate River Near Copper, OR	31	28	31	30	31	30	31	31	30	31	30	31
2010	14366000	Applegate River Near Applegate, OR	31	28	31	30	31	30	31	31	30	31	30	31

Year	Station ID	Station	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2010	14369500	Applegate River Near Wilderville, OR	31	28	31	30	31	30	31	31	30	31	30	31
2010	14372300	Rogue River Near Agness, OR	31	28	31	30	31	30	31	31	30	31	30	31
2011	10418-ORDEQ	Rogue River at Robertson Bridge (Merlin)							5	31	29	4		
2011	10421-ORDEQ	Rogue River at Hwy 234 (north of Gold Hill)							5	31	29	4		
2011	10423-ORDEQ	Rogue River at Hwy 234 (Dodge Park)							5	31	29	2		
2011	10428-ORDEQ	Applegate River at Hwy 199 (near Wilderville)							5	31	29	4		
2011	10600-ORDEQ	Rogue River at Valley of the Rogue State Park							5	31	29	4		
2011	14330000	Rogue River Below Prospect, OR	31	28	31	30	31	30	31	31	30	31	30	31
2011	14337600	Rogue River Near Mcleod, OR	31	28	31	30	28	30	31	31	30	31	30	31
2011	14338000	Elk Creek Near Trail, OR	31	28	31	30	31	30	31	31	30	31	30	31
2011	14339000	Rogue River At Dodge Bridge, Near Eagle Point, OR	28	28	31	30	31	30	31	31	30	31	30	31
2011	14359000	Rogue River At Raygold Near Central Point, OR	31	28	31	30	31	30	31	31	30	31	30	31
2011	14361500	Rogue River At Grants Pass, OR	31	28	31	30	31	30	31	31	30	31	30	31
2011	14362000	Applegate River Near Copper, OR	31	28	31	30	31	30	31	31	30	31	30	31
2011	14366000	Applegate River Near Applegate, OR	31	28	31	30	31	30	31	31	30	31	30	31
2011	14369500	Applegate River Near Wilderville, OR	31	28	31	30	31	30	31	31	30	31	30	31
2011	14372300	Rogue River Near Agness, OR	31	28	31	30	31	30	31	31	30	31	30	31
2011	30195-ORDEQ	Rogue River downstream of Raygold Dam							5	31	29	4		
2011	30317-ORDEQ	Rogue River downstream of Medford WWTP (on private porperty; Landowner: Mace)							5	31	29	2		
2011	36906-ORDEQ	Rogue River at Boat Landing at Bella Rosa Inn							5	31	29	4		
2011	RRSNF-004	Flat Creek_LTWT							20	31	30	5		
2012	14330000	Rogue River Below Prospect, OR	31	29	31	30	31	30	31	31	30	31	30	31

Year	Station ID	Station	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2012	14335072	Rogue R At Cole M Rivers F Hatchery Nr Mcleod, OR								17	30	31	30	31
2012	14337600	Rogue River Near Mcleod, OR	31	29	31	30	31	30	31	31	30	31	29	28
2012	14338000	Elk Creek Near Trail, OR	31	29	31	30	31	28	31	31	30	31	30	31
2012	14339000	Rogue River At Dodge Bridge, Near Eagle Point, OR	31	29	31	30	31	30	31	31	30	31	30	31
2012	14359000	Rogue River At Raygold Near Central Point, OR	31	29	31	30	31	30	31	31	30	31	30	24
2012	14361500	Rogue River At Grants Pass, OR	31	29	31	30	31	30	31	31	30	31	30	31
2012	14362000	Applegate River Near Copper, OR	31	29	31	30	31	30	31	31	30	31	30	31
2012	14366000	Applegate River Near Applegate, OR	31	29	31	30	31	30	31	31	30	31	30	28
2012	14369500	Applegate River Near Wilderville, OR	31	29	31	30	31	30	31	29	30	31	30	30
2012	14372300	Rogue River Near Agness, OR	31	29	31	30	31	30	31	31	30	31	30	31
2012	RRSNF-005	Red Blanket Creek abv Lick Creek_LTWT						15	31	31	30	31		
2013	14330000	Rogue River Below Prospect, OR	31	28	31	30	31	30	31	31	30	31	30	31
2013	14335072	Rogue R At Cole M Rivers F Hatchery Nr Mcleod, OR	31	28	31	30	31	30	31	31	30	31	30	31
2013	14335230	Willow Cr Ab Willow Lk Nr Butte Falls										31	30	31
2013	14335300	Willow Cr Nr Butte Falls, OR						30	31	31	30	31	30	31
2013	14335500	S Fk Big Butte Cr Nr Butte Falls, OR										14	30	31
2013	14337600	Rogue River Near Mcleod, OR	17	28	31	30	31	30	31	31	30	31	30	31
2013	14338000	Elk Creek Near Trail, OR	31	28	31	30	31	30	31	31	30	31	30	31
2013	14339000	Rogue River At Dodge Bridge, Near Eagle Point, OR	31	28	31	30	31	30	31	31	30	31	30	31
2013	14359000	Rogue River At Raygold Near Central Point, OR	18	28	31	30	31	30	31	28	30	31	30	31
2013	14361500	Rogue River At Grants Pass, OR	31	28	31	30	31	30	31	31	30	31	30	31
2013	14362000	Applegate River Near Copper, OR	23	25	31	30	31	30	31	31	18	31	30	31
2013	14366000	Applegate River Near Applegate, OR	31	28	29	27	30	30	31	27	30	31	30	31
2013	14369500	Applegate River Near Wilderville, OR		20	31	30	31	27	16	30	30	31	30	31
2013	14372300	Rogue River Near Agness, OR	31	28	31	30	31	30	31	31	30	31	30	31
2014	14330000	Rogue River Below Prospect, OR	31	28	31	30	31	30	31	31	30	31	30	31
2014	14335072	Rogue R At Cole M Rivers F Hatchery Nr Mcleod, OR	31	28	31	30	31	30	31	31	30	31	30	31
2014	14335200	S Fk Big Butte Cr Ab Willow Cr Nr Butte Falls, OR										31	30	31

Year	Station ID	Station	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2014	14335230	Willow Cr Ab Willow Lk Nr Butte Falls	31	28	31	30	31	30	31	31	30	31	30	31
2014	14335300	Willow Cr Nr Butte Falls, OR	31	28	31	30	31	30	31	31	30	31	30	31
2014	14335500	S Fk Big Butte Cr Nr Butte Falls, OR	31	28	31	30	31	30	31	31	30	31	30	31
2014	14336700	N Fk Big Butte Cr Nr Butte Falls, OR												9
2014	14337600	Rogue River Near Mcleod, OR	31	28	31	30	31	30	31	31	30	31	30	31
2014	14338000	Elk Creek Near Trail, OR	31	28	31	30	31	30	31	31	30	31	30	31
2014	14339000	Rogue River At Dodge Bridge, Near Eagle Point, OR	31	28	31	30	31	30	31	31	30	31	30	31
2014	14342500	N Fk Little Butte Cr At Fish Lake Nr Lakecreek, OR										31	30	31
2014	14343000	N Fk Little Butte Cr Nr Lakecreek, OR										31	30	31
2014	14346700	Little Butte Cr At Lakecreek, OR										31	30	31
2014	14359000	Rogue River At Raygold Near Central Point, OR	31	28	31	30	31	30	31	31	30	31	30	31
2014	14361500	Rogue River At Grants Pass, OR	31	28	31	30	31	30	31	31	30	31	30	31
2014	14362000	Applegate River Near Copper, OR	31	28	31	30	31	30	31	31	30	31	30	31
2014	14366000	Applegate River Near Applegate, OR	31	28	31	30	31	30	31	31	30	31	30	31
2014	14369500	Applegate River Near Wilderville, OR	31	28	31	30	31	19	31	31	30	31	30	31
2014	14372300	Rogue River Near Agness, OR	31	28	31	30	31	30	31	31	30	31	30	31
2015	11051-ORDEQ	Bear Creek at Kirtland Road (Central Point)									20	28		
2015	12377-ORDEQ	Bear Creek 500 feet downstream of Rrvid (Jackson Street) Dam											20	29
2015	14330000	Rogue River Below Prospect, OR	31	28	31	30	31	30	31	31	30	31	30	31
2015	14335072	Rogue R At Cole M Rivers F Hatchery Nr Mcleod, OR	31	28	31	30	31	30	31	31	30	31	30	31
2015	14335200	S Fk Big Butte Cr Ab Willow Cr Nr Butte Falls, OR	31	28	31	30	31	30	31	31	30	31	30	31
2015	14335230	Willow Cr Ab Willow Lk Nr Butte Falls	31	28	31	30	31	30	31	31	30	31	30	31
2015	14335235	Bieberstedt Cr Ab Willow Lk Nr Butte Falls				9	31	30	31	31	30	31	30	31
2015	14335250	Willow Cr Dam Outlet Nr Butte Falls, OR				1	31	30	31	31	30	31	30	31
2015	14335300	Willow Cr Nr Butte Falls, OR	31	28	31	30	31	30	31	31	30	31	30	31
2015	14335500	S Fk Big Butte Cr Nr Butte Falls, OR	31	28	31	30	31	30	31	31	30	31	30	31

Year	Station ID	Station	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2015	14336700	N Fk Big Butte Cr Nr Butte Falls, OR	31	28	31	30	31	30	31	23	17	25	22	19
2015	14337000	Big Butte Cr Bl Butte Falls, OR					5	30	31	31	30	31	30	31
2015	14337600	Rogue River Near Mcleod, OR	31	28	31	30	31	30	31	31	30	31	30	31
2015	14338000	Elk Creek Near Trail, OR	31	28	31	30	31	30	31	31	30	31	30	31
2015	14339000	Rogue River At Dodge Bridge, Near Eagle Point, OR	31	28	31	30	31	30	31	31	30	31	30	31
2015	14340800	S Fk Little Butte Cr Ab Soda Cr Nr Lakecreek, OR					1	30	31	31	30	31	30	31
2015	14341610	S Fk Little Butte Cr At Mouth Nr Lakecreek, OR					31	30	31	31	30	31	30	31
2015	14342500	N Fk Little Butte Cr At Fish Lake Nr Lakecreek, OR	31	28	31	30	31	30	31	31	30	31	30	31
2015	14343000	N Fk Little Butte Cr Nr Lakecreek, OR	31	28	31	30	31	30	31	31	30	31	30	31
2015	14346700	Little Butte Cr At Lakecreek, OR	31	28	31	30	31	30	31	31	30	31	30	31
2015	14347800	Little Butte Cr At Eagle Point, OR				7	31	30	31	31	30	31	30	31
2015	14348000	Little Butte Cr Bl Eagle Point, OR				8	31	30	31	31	30	29		
2015	14348080	Antelope Cr Bl Rogue River Valley Irr Dist Div Nr White City, OR				14	31	18		1	20	31	30	31
2015	14348150	Antelope Cr Nr Eagle Point, OR					31	30	31	31	30	31	30	31
2015	14348400	Emigrant Cr Ab Green Springs Powerplant Nr Ashland, OR										11	24	1
2015	14358610	Griffin Cr Bl Murphy Cr Nr Medford												31
2015	14358680	Griffin Cr At Central Point, OR								28	30	31	30	31
2015	14358725	Jackson Cr At Jacksonville, OR				28	28	1						23
2015	14358750	Jackson Cr At Central Point, OR					26	30	31	31	30	29	28	31
2015	14358800	Bear Cr Ab Mouth Nr Central Point, OR							15	28	30	31	30	31
2015	14359000	Rogue River At Raygold Near Central Point, OR	31	28	31	30	31	30	31	31	30	31	30	31
2015	14360500	Evans Cr At Wimer, OR					9	30	22	9	30	31	30	31
2015	14361500	Rogue River At Grants Pass, OR	31	28	31	30	31	28	31	31	30	31	30	31
2015	14362000	Applegate River Near Copper, OR	31	28	31	30	31	30	31	31	30	31	30	31
2015	14363450	Mcdonald Cr Nr Talent, OR					11	30	16	31	30	31	30	31
2015	14365500	Little Applegate R Nr Ruch, OR					12	30	31	31	30	31	30	31

Year	Station ID	Station	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2015	14366000	Applegate River Near Applegate, OR	31	28	31	30	31	30	31	31	30	31	30	31
2015	14368300	Williams Cr At Williams, OR	18	28	31	30	31	30	31	31	30	31	30	31
2015	14369500	Applegate River Near Wilderville, OR	31	28	31	30	31	30	31	31	30	31	30	31
2015	14372300	Rogue River Near Agness, OR	31	28	31	30	31	30	31	31	30	31	30	31
2015	23062-ORDEQ	Emigrant Creek at gaging station (Bear, Rogue)									6	31	30	31
2015	26632-ORDEQ	Little Butte Cr. at bridge in town of Lake Creek (Rogue)								4	30	31	30	31
2015	26637-ORDEQ	Little Butte, at mill diversion pond nr. Reese Cr. Rd. (Rogue)								11	29	31	30	31
2016	11051-ORDEQ	Bear Creek at Kirtland Road (Central Point)				2	31	30	31	31	30	12		
2016	12377-ORDEQ	Bear Creek 500 feet downstream of Rrvid (Jackson Street) Dam	31	29	31	27						4	30	31
2016	14330000	Rogue River Below Prospect, OR	31	29	31	30	31	30	31	31	30	31	30	31
2016	14335072	Rogue R At Cole M Rivers F Hatchery Nr Mcleod, OR	31	29	31	30	31	30	31	31	30	31	30	31
2016	14335200	S Fk Big Butte Cr Ab Willow Cr Nr Butte Falls, OR	31	29	31	30	31	30	31	31	30	31	30	31
2016	14335230	Willow Cr Ab Willow Lk Nr Butte Falls	31	29	31	30	31	30	31	31	30	31	30	5
2016	14335235	Bieberstedt Cr Ab Willow Lk Nr Butte Falls	31	29	31	30	31	30	31	31	30	31	30	31
2016	14335250	Willow Cr Dam Outlet Nr Butte Falls, OR	31	29	31	30	31	30	31	31	30	31	30	31
2016	14335300	Willow Cr Nr Butte Falls, OR	31	29	31	30	31	30	31	31	30	31	30	31
2016	14335500	S Fk Big Butte Cr Nr Butte Falls, OR	31	29	31	30	31	30	31	31	30	31	30	31
2016	14336700	N Fk Big Butte Cr Nr Butte Falls, OR	19	29	21		3				23	31	30	31
2016	14337000	Big Butte Cr Bl Butte Falls, OR	31	29	31	30	31	30	31	31	30	31	30	31
2016	14337600	Rogue River Near Mcleod, OR	31	29	31	30	31	30	31	31	30	31	30	31
2016	14338000	Elk Creek Near Trail, OR	31	29	31	30	31	30	31	31	30	31	30	31
2016	14339000	Rogue River At Dodge Bridge, Near Eagle Point, OR	31	29	31	30	31	30	31	31	30	31	30	31
2016	14340800	S Fk Little Butte Cr Ab Soda Cr Nr Lakecreek, OR	31	29	31	30	31	30	31	31	30	31	30	31
2016	14341610	S Fk Little Butte Cr At Mouth Nr Lakecreek, OR	31	20	31	30	31	30	31	31	30	31	30	31

Year	Station ID	Station	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2016	14342500	N Fk Little Butte Cr At Fish Lake Nr Lakecreek, OR	31	29	31	30	31	30	31	31	30	31	30	31
2016	14343000	N Fk Little Butte Cr Nr Lakecreek, OR	31	29	31	30	31	30	31	31	30	31	30	31
2016	14346700	Little Butte Cr At Lakecreek, OR	31	29	31	30	31	30	31	31	30	31	30	31
2016	14347800	Little Butte Cr At Eagle Point, OR	31	29	31	30	31	30	31	31	30	31	30	31
2016	14348000	Little Butte Cr Bl Eagle Point, OR									5	31	30	31
2016	14348080	Antelope Cr Bl Rogue River Valley Irr Dist Div Nr White City, OR	31	29	31	30	16		4	31	30	31	30	31
2016	14348150	Antelope Cr Nr Eagle Point, OR	31	29	31	30	31	30	31	31	30	31	30	31
2016	14348400	Emigrant Cr Ab Green Springs Powerplant Nr Ashland, OR	31	29	31	30	31	30	20			28	30	16
2016	14358610	Griffin Cr Bl Murphy Cr Nr Medford	31	29	31	30	31	15				14	30	31
2016	14358680	Griffin Cr At Central Point, OR	31	29	31	30	31	30	31	31	30	31	30	31
2016	14358725	Jackson Cr At Jacksonville, OR	31	17	31	30	31	5						
2016	14358750	Jackson Cr At Central Point, OR	31	29	31	30	31	30	31	31	30	31	30	31
2016	14358800	Bear Cr Ab Mouth Nr Central Point, OR	27					29	31	31	30	19		
2016	14359000	Rogue River At Raygold Near Central Point, OR	31	29	27	23	31	30	31	31	30	31	30	17
2016	14360500	Evans Cr At Wimer, OR	31	11	30	30	31	30	31	31	30	31	30	31
2016	14361500	Rogue River At Grants Pass, OR	31	29	31	30	31	30	31	30	29	31	30	31
2016	14362000	Applegate River Near Copper, OR	31	29	31	30	31	30	31	31	30	31	30	30
2016	14363450	Mcdonald Cr Nr Talent, OR	31	29	31	30	31	30	31	31	30	31	30	31
2016	14365500	Little Applegate R Nr Ruch, OR	31	29	31	30	31	30	25	31	30	31	30	31
2016	14366000	Applegate River Near Applegate, OR	31	29	31	30	31	30	31	31	30	22	30	31
2016	14368300	Williams Cr At Williams, OR	31	29	30	30	31	30	31	31	30	13	10	31
2016	14369500	Applegate River Near Wilderville, OR	31	29	31	30	31	30	31	31	30	31	30	31
2016	14372300	Rogue River Near Agness, OR	31	29	31	30	31	30	31	31	30	31	30	31
2016	14375200	Sucker Cr At Bridgeview, OR	5	29	31	30	31	30	31	31	30	31	30	31
2016	23062-ORDEQ	Emigrant Creek at gaging station (Bear, Rogue)	31	29	31	30	31	30	31	3	15	30	30	31

Year	Station ID	Station	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2016	25844-ORDEQ	Lobster Creek (tributary to Rogue River) at River Mile 6.4 downstream of Fall Creek						10	31	31	25			
2016	25847-ORDEQ	Lobster Creek (tributary to Rogue River) at River Mile 1.6						10	31	31	30	19		
2016	26632-ORDEQ	Little Butte Cr. at bridge in town of Lake Creek (Rogue)	31	29	10	30	31	30	31	31	30	30	30	31
2016	26637-ORDEQ	Little Butte, at mill diversion pond nr. Reese Cr. Rd. (Rogue)	31	29	31	13	8	30	31	16	30	30	30	31
2016	28306-ORDEQ	East Fork Edson Creek near mouth (Rogue River below Lobster Creek)						8	31	31	26			
2016	29697-ORDEQ	Edson Creek, above bridge #256						8	31	31	26			
2016	30194-ORDEQ	Lobster Creek at mouth						10	31	31	30	19		
2016	36732-ORDEQ	Edson Cr EF at Rock Quarry						8	31	31	26			
2016	36734-ORDEQ	Edson Cr WF ABV EF						8	31	31	26			
2016	38089-ORDEQ	Edson Ck East Fork below Powerline Crossing							31	31	26			
2016	40026-ORDEQ	Edson Creek US BPA Access						8	31	31	26			
2017	11051-ORDEQ	Bear Creek at Kirtland Road (Central Point)						28	31	31	30	31	5	
2017	12377-ORDEQ	Bear Creek 500 feet downstream of Rrvid (Jackson Street) Dam	31	28	31	30	30						24	31
2017	14330000	Rogue River Below Prospect, OR	31	28	31	30	31	30	31	31	30	31	30	31
2017	14335072	Rogue R At Cole M Rivers F Hatchery Nr Mcleod, OR	31	28	31	30	31	30	31	31	30	31	30	31
2017	14335200	S Fk Big Butte Cr Ab Willow Cr Nr Butte Falls, OR	31	28	31	30	31	30	31	31	30	31	30	26
2017	14335230	Willow Cr Ab Willow Lk Nr Butte Falls		2	22	30	31	30	31	31	30	31	30	31
2017	14335235	Bieberstedt Cr Ab Willow Lk Nr Butte Falls	31	28	31	30	31	30	31	31	30	31	30	31

Year	Station ID	Station	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2017	14335250	Willow Cr Dam Outlet Nr Butte Falls, OR	31	28	31	30	31	30	31	31	30	31	30	31
2017	14335300	Willow Cr Nr Butte Falls, OR	31	28	31	30	31	30	31	31	30	31	30	31
2017	14335500	S Fk Big Butte Cr Nr Butte Falls, OR	31	28	31	30	31	30	31	29	30	31	30	31
2017	14336700	N Fk Big Butte Cr Nr Butte Falls, OR	31	28	31	30	31	30	31	31	30	31	30	31
2017	14337000	Big Butte Cr Bl Butte Falls, OR	31	28	31	30	31	30	31	17	11	31	30	31
2017	14337600	Rogue River Near Mcleod, OR	31	28	31	30	31	30	31	30	30	31	30	31
2017	14338000	Elk Creek Near Trail, OR	31	28	31	30	31	30	31	31	30	31	30	31
2017	14339000	Rogue River At Dodge Bridge, Near Eagle Point, OR	31	28	31	30	31	30	31	31	30	31	30	31
2017	14340800	S Fk Little Butte Cr Ab Soda Cr Nr Lakecreek, OR	31	28	31	30	31	30	31	31	30	31	30	31
2017	14341610	S Fk Little Butte Cr At Mouth Nr Lakecreek, OR	31	28	31	30	31	2	29	31	30	31	30	31
2017	14342500	N Fk Little Butte Cr At Fish Lake Nr Lakecreek, OR	31	28	31	30	31	30	31	31	30	31	30	31
2017	14343000	N Fk Little Butte Cr Nr Lakecreek, OR	31	28	31	30	31	30	31	31	30	31	30	31
2017	14346700	Little Butte Cr At Lakecreek, OR	31	28	31	30	31	30	31	31	30	31	30	31
2017	14346900	Little Butte Cr At Brownsboro, OR											23	31
2017	14347800	Little Butte Cr At Eagle Point, OR	31	28	31	30	31	30	31	31	30	31	30	31
2017	14348000	Little Butte Cr Bl Eagle Point, OR	31	28	31	30	31	30	31	31	30	31	30	31
2017	14348080	Antelope Cr Bl Rogue River Valley Irr Dist Div Nr White City, OR	31	28	31	30	31	30	31	31	30	31	30	31
2017	14348150	Antelope Cr Nr Eagle Point, OR	31	26	31	30	31	30	31	31	30	31	30	31
2017	14348400	Emigrant Cr Ab Green Springs Powerplant Nr Ashland, OR	4	28	31	30	31	30	31	31	30	31	30	31
2017	14358610	Griffin Cr Bl Murphy Cr Nr Medford	31	28	31	30	31	30	31	9				4
2017	14358680	Griffin Cr At Central Point, OR	31	28	31	30	31	30	31	31	30	31	30	31
2017	14358725	Jackson Cr At Jacksonville, OR	4	28	31	30	31	23					7	31
2017	14358750	Jackson Cr At Central Point, OR	31	28	31	30	31	30	31	31	30	31	30	31
2017	14358800	Bear Cr Ab Mouth Nr Central Point, OR					16	30	31	31	28	31	30	31
2017	14359000	Rogue River At Raygold Near Central Point, OR	31	28	31	30	31	30	31	31	30	31	30	30
2017	14360500	Evans Cr At Wimer, OR	18			4	31	30	31	31	30	31	30	31

Year	Station ID	Station	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2017	14361500	Rogue River At Grants Pass, OR	31	28	31	30	31	30	31	31	30	31	30	31
2017	14362000	Applegate River Near Copper, OR	25	28	31	30	31	30	29	31	30	31	30	31
2017	14363450	Mcdonald Cr Nr Talent, OR	31	28	31	30	31	30	31	31	30	31	30	31
2017	14365500	Little Applegate R Nr Ruch, OR	31	28	31	30	31	30	31	31	30	31	30	31
2017	14366000	Applegate River Near Applegate, OR	31	28	31	30	31	30	31	31	30	31	30	31
2017	14368300	Williams Cr At Williams, OR	31	28	31	30	31	30	31	31	30	31	13	31
2017	14369500	Applegate River Near Wilderville, OR	31	26	27	30	31	30	31	31	26	31	24	31
2017	14372300	Rogue River Near Agness, OR	31	28	31	30	31	30	31	31	30	31	30	31
2017	14375200	Sucker Cr At Bridgeview, OR	31	28	31	30	31	30	31	31	30	31	30	31
2017	14377550	Lake Selmac Nr Selma, OR										6	30	31
2017	23062-ORDEQ	Emigrant Creek at gaging station (Bear, Rogue)	31	28	31	30	31	30	26	31	30	31	30	24
2017	26632-ORDEQ	Little Butte Cr. at bridge in town of Lake Creek (Rogue)	31	28	31	29	31	30	31	31	30	31	30	31
2017	26637-ORDEQ	Little Butte, at mill diversion pond nr. Reese Cr. Rd. (Rogue)	29	28	31	30	29	30	31	31	27	31	27	31
2017	38281-ORDEQ	Wagner Creek at Wagner Creek Park							19	31	30	4		
2017	40065-ORDEQ	Wagner Ck 110 Meters DS of Wagner Creek Rd							19	31	30	4		
2018	11051-ORDEQ	Bear Creek at Kirtland Road (Central Point)				13	31	30	31	31	29	30	29	9
2018	12377-ORDEQ	Bear Creek 500 feet downstream of Rrvid (Jackson Street) Dam	31	28	31	18								
2018	14330000	Rogue River Below Prospect, OR	31	28	31	30	31	30	31	31	30	31	30	31
2018	14335072	Rogue R At Cole M Rivers F Hatchery Nr Mcleod, OR	28	28	31	30	31	30	31	31	30	31	30	31
2018	14335200	S Fk Big Butte Cr Ab Willow Cr Nr Butte Falls, OR	25	28	31	30	31	30	31	31	30	31	30	31
2018	14335230	Willow Cr Ab Willow Lk Nr Butte Falls	31	28	31	30	31	30	31	31	30	29	30	31
2018	14335235	Bieberstedt Cr Ab Willow Lk Nr Butte Falls	31	28	31	30	31	30	31	31	30	31	30	31
2018	14335250	Willow Cr Dam Outlet Nr Butte Falls, OR	31	28	31	30	31	30	31	31	30	31	30	31

Year	Station ID	Station	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2018	14335300	Willow Cr Nr Butte Falls, OR	31	28	31	30	31	30	31	31	30	31	30	31
2018	14335500	S Fk Big Butte Cr Nr Butte Falls, OR	31	28	31	30	31	30	31	15				16
2018	14336700	N Fk Big Butte Cr Nr Butte Falls, OR	31	28	31	30	31	29	31	31	30	31	30	31
2018	14337000	Big Butte Cr Bl Butte Falls, OR	31	28	31	30	31	30	31	31	30	31	30	31
2018	14337600	Rogue River Near Mcleod, OR	31	28	31	30	31	30	31	31	30	31	30	31
2018	14338000	Elk Creek Near Trail, OR	31	28	31	30	31	30	31	31	30	31	30	31
2018	14339000	Rogue River At Dodge Bridge, Near Eagle Point, OR	31	28	31	30	31	30	31	31	30	31	30	31
2018	14340800	S Fk Little Butte Cr Ab Soda Cr Nr Lakecreek, OR	31	28	31	30	31	30	31	31	30	31	30	31
2018	14341610	S Fk Little Butte Cr At Mouth Nr Lakecreek, OR	31	28	31	30	31	30	31	31	30	31	30	31
2018	14342500	N Fk Little Butte Cr At Fish Lake Nr Lakecreek, OR	31	28	31	30	31	30	31	31	30	31	30	31
2018	14343000	N Fk Little Butte Cr Nr Lakecreek, OR	31	28	31	29	31	30	31	31	23	31	19	31
2018	14346700	Little Butte Cr At Lakecreek, OR	31	28	31	30	31	30	31	31	30	30	30	31
2018	14346900	Little Butte Cr At Brownsboro, OR	31	28	16									
2018	14347800	Little Butte Cr At Eagle Point, OR	31	28	31	30	31	30	31	31	30	31	30	31
2018	14348000	Little Butte Cr Bl Eagle Point, OR	31	28	30	30	31	30	31	31	30	31	30	31
2018	14348080	Antelope Cr Bl Rogue River Valley Irr Dist Div Nr White City, OR	29	28	31	30	19	30	31	31	30	29	30	31
2018	14348150	Antelope Cr Nr Eagle Point, OR	31	28	31	30	31	30	31	31	30	31	30	31
2018	14348400	Emigrant Cr Ab Green Springs Powerplant Nr Ashland, OR	31	28	31	30	31	30	30			22	30	31
2018	14358610	Griffin Cr Bl Murphy Cr Nr Medford	31	28	31	30	31	6						11
2018	14358680	Griffin Cr At Central Point, OR	31	28	31	30	31	30	31	31	30	31	30	31
2018	14358725	Jackson Cr At Jacksonville, OR	31	28	17	30	31	1						8
2018	14358750	Jackson Cr At Central Point, OR	31	28	31	30	31	30	31	31	30	31	30	31
2018	14358800	Bear Cr Ab Mouth Nr Central Point, OR	31	28	31	30	31	30	31	31	30	31	30	6
2018	14359000	Rogue River At Raygold Near Central Point, OR	31	28	31	30	31	30	31	31	30	31	30	31
2018	14360500	Evans Cr At Wimer, OR	31	28	31	30	31	30	31	31	30	31	30	31
2018	14361500	Rogue River At Grants Pass, OR	31	28	31	26	31	30	31	31	30	31	30	31

Year	Station ID	Station	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2018	14362000	Applegate River Near Copper, OR	31	28	31	29	31	30	31	31	30	31	30	31
2018	14363450	Mcdonald Cr Nr Talent, OR	31	26	31	30	31	30	31	31	30	31	30	31
2018	14365500	Little Applegate R Nr Ruch, OR	31	28	31	30	31	30	31	31	30	31	30	31
2018	14366000	Applegate River Near Applegate, OR	31	28	31	30	31	30	31	31	30	31	30	31
2018	14368300	Williams Cr At Williams, OR	31	28	31	30	21			25	29	21	30	31
2018	14369500	Applegate River Near Wilderville, OR	31	28	31	30	31	30	31	31	30	31	29	31
2018	14372300	Rogue River Near Agness, OR	31	28	31	30	31	30	31	31	30	31	30	31
2018	14375200	Sucker Cr At Bridgeview, OR	31	28	31	30	31	30	31	31	30	31	30	31
2018	14377550	Lake Selmac Nr Selma, OR	7											
2018	23062-ORDEQ	Emigrant Creek at gaging station (Bear, Rogue)	31	28	31	30	31	30	31	31	18			
2018	26632-ORDEQ	Little Butte Cr. at bridge in town of Lake Creek (Rogue)	31	28	31	30	31	30	31	31	30	30	30	6
2018	26637-ORDEQ	Little Butte, at mill diversion pond nr. Reese Cr. Rd. (Rogue)	31	27	23	30	31	30	31	31	30	31	30	12
2018	38281-ORDEQ	Wagner Creek at Wagner Creek Park					30	30	31	31	30	24		
2018	40065-ORDEQ	Wagner Ck 110 Meters DS of Wagner Creek Rd					30	30	22		1	24		
2018	40066-ORDEQ	Wagner Ck at Access BR 84 Meters DS of Holton CK Confluence					30	29	31	31	30	24		
2019	14330000	Rogue River Below Prospect, OR	31	28	31	30	31	30	31	31	30	31	30	31
2019	14335072	Rogue R At Cole M Rivers F Hatchery Nr Mcleod, OR	31	28	31	30	31	30	31	31	30	31	30	31
2019	14335200	S Fk Big Butte Cr Ab Willow Cr Nr Butte Falls, OR	31	28	31	30	31	30	31	31	30	31	30	31
2019	14335230	Willow Cr Ab Willow Lk Nr Butte Falls	31	28	31	30	31	30	31	31	30	31	30	31
2019	14335235	Bieberstedt Cr Ab Willow Lk Nr Butte Falls	31	28	31	30	31	30	31	31	30	31	30	31
2019	14335250	Willow Cr Dam Outlet Nr Butte Falls, OR	31	28	31	30	31	24	13	24	30	24		
2019	14335300	Willow Cr Nr Butte Falls, OR	31	28	31	30	31	30	31	31	30	31	30	31
2019	14335500	S Fk Big Butte Cr Nr Butte Falls, OR	31	28	31	30	31	19	31	31	30	31	30	31

Year	Station ID	Station	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2019	14336700	N Fk Big Butte Cr Nr Butte Falls, OR	31	28	29	30	31	30	31	31	30	28	30	31
2019	14337000	Big Butte Cr Bl Butte Falls, OR	31	28	31	30	31	30	31	31	30	31	30	31
2019	14337600	Rogue River Near Mcleod, OR	31	28	31	30	31	30	31	31	30	31	30	31
2019	14338000	Elk Creek Near Trail, OR	31	28	31	25	31	30	31	31	30	31	30	31
2019	14339000	Rogue River At Dodge Bridge, Near Eagle Point, OR	31	28	31	30	31	30	31	31	30	31	30	31
2019	14340800	S Fk Little Butte Cr Ab Soda Cr Nr Lakecreek, OR	31	28	31	30	31	30	31	31	30	31	30	31
2019	14341610	S Fk Little Butte Cr At Mouth Nr Lakecreek, OR	31	28	31	30	15	30	31	31	30	31	30	31
2019	14342500	N Fk Little Butte Cr At Fish Lake Nr Lakecreek, OR	31	28	31	30	31	29						
2019	14343000	N Fk Little Butte Cr Nr Lakecreek, OR	31	28	31	30	31	30	31	31	30	31	30	31
2019	14346700	Little Butte Cr At Lakecreek, OR	31	28	31	30	31	30	31	31	30	31	30	31
2019	14347800	Little Butte Cr At Eagle Point, OR	31	28	31	30	31	30	31	31	30	31	30	31
2019	14348000	Little Butte Cr Bl Eagle Point, OR	31	28	31	30	31	30	18					
2019	14348080	Antelope Cr Bl Rogue River Valley Irr Dist Div Nr White City, OR	24	12	31	30	31	2	6	11	30	31	30	31
2019	14348150	Antelope Cr Nr Eagle Point, OR	31	28	31	30	23	30	31	31	30	31	30	31
2019	14348400	Emigrant Cr Ab Green Springs Powerplant Nr Ashland, OR	31	28	31	30	31	30	31	31	18	31	30	31
2019	14358610	Griffin Cr Bl Murphy Cr Nr Medford	31	28	31	30	31	8						8
2019	14358680	Griffin Cr At Central Point, OR	31	28	31	30	31	30	31	31	30	31	30	31
2019	14358725	Jackson Cr At Jacksonville, OR	21	17	31	30	31	16						
2019	14358750	Jackson Cr At Central Point, OR	31	28	31	30	31	30	31	31	30	31	30	31
2019	14359000	Rogue River At Raygold Near Central Point, OR	31	28	31	30	31	30	31	31	30	31	30	31
2019	14360500	Evans Cr At Wimer, OR	19						12	31	30	31	30	31
2019	14361500	Rogue River At Grants Pass, OR	31	28	31	30	31	30	31	31	30	31	30	31
2019	14362000	Applegate River Near Copper, OR	31	28	31	30	31	30	31	31	30	31	30	31
2019	14363450	Mcdonald Cr Nr Talent, OR	31	27	18	8	31	30	31	31	30	31	30	31
2019	14365500	Little Applegate R Nr Ruch, OR	31	28	31	30	31	30	31	31	30	31	30	31
2019	14366000	Applegate River Near Applegate, OR	31	28	31	30	31	30	31	31	30	31	7	22

Year	Station ID	Station	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2019	14368300	Williams Cr At Williams, OR	31	28	31	30	31	30	31	31	30	31	30	31
2019	14369500	Applegate River Near Wilderville, OR	31	28	31	30	31	30	31	31	30	31	30	29
2019	14372300	Rogue River Near Agness, OR	31	28	31	30	31	30	31	31	30	31	30	31
2019	14375200	Sucker Cr At Bridgeview, OR	31	28	31	30	31	30	31	31	30	31	30	31
2019	38281-ORDEQ	Wagner Creek at Wagner Creek Park					14	30	31	31	30	15		
2019	40064-ORDEQ	Wagner CK at West Lateral Diversion					14	30	31	31				
2019	40065-ORDEQ	Wagner Ck 110 Meters DS of Wagner Creek Rd					13	30	31	31	30	15		
2019	40066-ORDEQ	Wagner Ck at Access BR 84 Meters DS of Holton CK Confluence					12	30	31	31	30	15		
2020	14330000	Rogue River Below Prospect, OR	31	29	31	30	31	30	31	31	30	31	30	31
2020	14335072	Rogue R At Cole M Rivers F Hatchery Nr Mcleod, OR	31	29	31	30	31	30	31	31	30	31	30	31
2020	14335200	S Fk Big Butte Cr Ab Willow Cr Nr Butte Falls, OR	31	29	31	30	31	30	31	31	30	31	30	31
2020	14335230	Willow Cr Ab Willow Lk Nr Butte Falls	31	29	31	30	31	30	31	31	30	31	30	31
2020	14335235	Bieberstedt Cr Ab Willow Lk Nr Butte Falls	31	29	31	30	31	30	31	31	30	31	30	31
2020	14335300	Willow Cr Nr Butte Falls, OR	31	29	31	30	31	30	31	31	30	31	30	31
2020	14335500	S Fk Big Butte Cr Nr Butte Falls, OR	31	29	31	30	31	30	31	31	30	31	30	31
2020	14336700	N Fk Big Butte Cr Nr Butte Falls, OR	31	28	31	30	31	30	31	31	30	31	30	31
2020	14337000	Big Butte Cr Bl Butte Falls, OR	31	29	31	30	31	30	31	31	30	31	30	31
2020	14337600	Rogue River Near Mcleod, OR	31	29	31	30	31	30	31	31	30	31	30	31
2020	14338000	Elk Creek Near Trail, OR	31	29	31	30	31	30	31	31	30	31	30	31
2020	14339000	Rogue River At Dodge Bridge, Near Eagle Point, OR	31	29	31	30	31	30	31	31	30	31	30	31
2020	14340800	S Fk Little Butte Cr Ab Soda Cr Nr Lakecreek, OR	31	29	31	30	31	30	31	31	30	31	30	31
2020	14341610	S Fk Little Butte Cr At Mouth Nr Lakecreek, OR	31	29	31	30	31	20			15	31	24	31
2020	14343000	N Fk Little Butte Cr Nr Lakecreek, OR	31	29	31	30	31	30	31	31	30	31	30	31
2020	14346700	Little Butte Cr At Lakecreek, OR	31	29	31	30	31	30	31	31	20			
2020	14347800	Little Butte Cr At Eagle Point, OR	31	29	31	30	31	30	31	31	30	31	30	31

Year	Station ID	Station	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2020	14348080	Antelope Cr Bl Rogue River Valley Irr Dist Div Nr White City, OR	31	29	31	30	31	24	16	31	30	31	30	31
2020	14348150	Antelope Cr Nr Eagle Point, OR	31	29	31	30	31	30	31	31	30	31	30	31
2020	14348400	Emigrant Cr Ab Green Springs Powerplant Nr Ashland, OR	31	29	31	30	31	30	31				17	19
2020	14358610	Griffin Cr Bl Murphy Cr Nr Medford	30	29	31	15		3						8
2020	14358680	Griffin Cr At Central Point, OR	31	29	31	30	31	30	31	31	30	31	30	31
2020	14358750	Jackson Cr At Central Point, OR	31	29	31	30	31	30	31	31	30	31	30	31
2020	14359000	Rogue River At Raygold Near Central Point, OR	31	29	31	30	31	30	31	31	30	31	30	31
2020	14360500	Evans Cr At Wimer, OR	31	29	31	30	31	30	30	26	27	31	30	31
2020	14361500	Rogue River At Grants Pass, OR	31	29	31	30	31	29	31	31	30	31	30	31
2020	14362000	Applegate River Near Copper, OR	31	29	31	30	31	30	31	31	29	31	30	31
2020	14363450	Mcdonald Cr Nr Talent, OR	30	29	31	30	31	30	31	31	30	31	30	29
2020	14365500	Little Applegate R Nr Ruch, OR	31	29	31	30	31	30	31	31	30	31	30	31
2020	14366000	Applegate River Near Applegate, OR	31	29	31	30	31	30	31	31	30	31	30	31
2020	14368300	Williams Cr At Williams, OR	31	29	31	30	31	30	31	31	30	31	30	31
2020	14369500	Applegate River Near Wilderville, OR	31	29	31	30	31	30	31	30	26	31	30	26
2020	14372300	Rogue River Near Agness, OR	31	29	31	30	31	30	31	31	30	31	30	31
2020	14375200	Sucker Cr At Bridgeview, OR	31	29	31	30	31	30	31	31	30	31	30	31
2020	38281-ORDEQ	Wagner Creek at Wagner Creek Park					2	30	31	31	30	25		
2020	40064-ORDEQ	Wagner CK at West Lateral Diversion					2	30	31	31	30	25		
2020	40065-ORDEQ	Wagner Ck 110 Meters DS of Wagner Creek Rd					2	30	31	31	30	25		
2020	40066-ORDEQ	Wagner Ck at Access BR 84 Meters DS of Holton CK Confluence					2	30	31	31	30	25		

Appendix C Stream flow data summary

Table 68: Continuous flow measurements available from the USGS flow gaging stations in the Rogue River Basin.

Station ID	Station	Latitude/Longitude
14328000	Rogue River Above Prospect, OR	42.77485/-122.4998
14330000	Rogue River Below Prospect, OR	42.72957/-122.5161
14332000	South Fork Rogue River Near Prospect, OR	42.70818/-122.3928
14334700	S Fk Rogue R South Of Prospect, OR	42.71235/-122.5067
14335072	Rogue R At Cole M Rivers F Hatchery Nr Mcleod, OR	42.66583/-122.6864
14337500	Big Butte Creek Near Mcleod, OR	42.65124/-122.6914
14337600	Rogue River Near Mcleod, OR	42.6554/-122.715
14337800	Elk Creek Near Cascade Gorge,OR	42.77346/-122.672
14337830	Elk Creek Below Alco Creek, Near Trail, OR	42.7304/-122.7114
14337870	West Branch Elk Creek Near Trail,OR	42.71096/-122.7498
14338000	Elk Creek Near Trail, OR	42.67874/-122.742
14339000	Rogue River At Dodge Bridge, Near Eagle Point, OR	42.52485/-122.8428
14348430	Unnamed Trib To Wbr Carter Creek, Near Ashland, OR	42.0785/-122.5962
14353000	West Fork Ashland Creek Near Ashland, OR	42.14874/-122.7167
14353500	East Fork Ashland Creek Near Ashland, OR	42.15263/-122.7095
14354200	Bear Creek Blw Ashland Creek At Ashland, OR	42.21596/-122.7223
14357500	Bear Creek At Medford, OR	42.32402/-122.8667
14359000	Rogue River At Raygold Near Central Point, OR	42.43735/-122.9873
14361500	Rogue River At Grants Pass, OR	42.4304/-123.3178
14362000	Applegate River Near Copper, OR	42.06374/-123.1114
14362250	Star Gulch Near Ruch, OR	42.15401/-123.0753
14366000	Applegate River Near Applegate, OR	42.24151/-123.14
14369500	Applegate River Near Wilderville, OR	42.35401/-123.4067
14372300	Rogue River Near Agness, OR	42.57844/-124.0581
14375100	Sucker Creek Blw Little Grayback Ck, Nr Holland,OR	42.15956/-123.479
14375400	Elk Creek Near Obrien,OR	42.0315/-123.7378
14377100	Illinois River Near Kerby, OR	42.23178/-123.6637
420425122361700	Highway Runoff Site Nr I5 And Old Hwy 99	42.07358/-122.6047

Table 69: Continuous flow measurements available from the OWRD flow gaging stations in the Rogue River Basin.

Station ID	Station	Latitude/Longitude
14335200	S Fk Big Butte Cr Ab Willow Cr Nr Butte Falls, OR	42.5213/-122.486
14335230	Willow Cr Ab Willow Lk Nr Butte Falls	42.4642/-122.438
14335235	Bieberstedt Cr Ab Willow Lk Nr Butte Falls	42.4674/-122.458
14335250	Willow Cr Dam Outlet Nr Butte Falls, OR	42.4795/-122.449
14335300	Willow Cr Nr Butte Falls, OR	42.487/-122.453
14335500	S Fk Big Butte Cr Nr Butte Falls, OR	42.5397/-122.554
14336100	Eagle Point I D Cn Bl C Rd Nr Butte Falls, OR	42.5789/-122.622
14336700	N Fk Big Butte Cr Nr Butte Falls, OR	42.554/-122.547
14337000	Big Butte Cr Bl Butte Falls, OR	42.5599/-122.579
14340800	S Fk Little Butte Cr Ab Soda Cr Nr Lakecreek, OR	42.3572/-122.509
14341610	S Fk Little Butte Cr At Mouth Nr Lakecreek, OR	42.4178/-122.612
14342500	N Fk Little Butte Cr At Fish Lake Nr Lakecreek, OR	42.3769/-122.359
14343000	N Fk Little Butte Cr Nr Lakecreek, OR	42.4028/-122.536
14346700	Little Butte Cr At Lakecreek, OR	42.4218/-122.623
14346900	Little Butte Cr At Brownsboro, OR	42.4655/-122.722
14347798	Little Butte Cr Mill Race At Eagle Point, OR	42.4769/-122.793
14347800	Little Butte Cr At Eagle Point, OR	42.4766/-122.793
14348000	Little Butte Cr Bl Eagle Point, OR	42.4625/-122.815
14348080	Antelope Cr Bl Rogue River Valley Irr Dist Div Nr White City, OR	42.4116/-122.744
14348150	Antelope Cr Nr Eagle Point, OR	42.4553/-122.827
14348400	Emigrant Cr Ab Green Springs Powerplant Nr Ashland, OR	42.121/-122.549
14358610	Griffin Cr Bl Murphy Cr Nr Medford	42.2701/-122.914
14358680	Griffin Cr At Central Point, OR	42.3944/-122.925
14358725	Jackson Cr At Jacksonville, OR	42.3209/-122.959
14358750	Jackson Cr At Central Point, OR	42.4075/-122.941
14358800	Bear Cr Ab Mouth Nr Central Point, OR	42.4267/-122.957
14360500	Evans Cr At Wimer, OR	42.5382/-123.149
14363450	Mcdonald Cr Nr Talent, OR	42.1013/-122.798
14365500	Little Applegate R Nr Ruch, OR	42.1971/-123.041
14368300	Williams Cr At Williams, OR	42.2311/-123.262
14372500	E Fk Illinois R Nr Takilma, OR	42.0029/-123.626
14375200	Sucker Cr At Bridgeview, OR	42.1281/-123.605
25595-ORDEQ	SF Little Butte Creek at gage	42.4192/-122.613

Station ID	Station	Latitude/Longitude
25597-ORDEQ	SF Little Butte Creek upstream Dead Indian Creek	42.3383/-122.45
25792-ORDEQ	SF Little Butte Creek below Lost Creek	42.3796/-122.575
25795-ORDEQ	SF Little Butte Creek upstream Soda Creek	42.3552/-122.512
407108	Ashland Creek	42.2152/-122.718
407122	Griffin Creek	42.3949/-122.923
407124	Jackson Creek	42.4125/-122.941
407126	Lone Pine Creek	42.3655/-122.885
407130	Wagner Creek	42.2476/-122.778
407133	Larson Creek	42.3141/-122.85

Table 70: Continuous flow measurements available from the USBR Hydromet monitoring stations in the Rogue River Basin.

Station ID	Station	Latitude/Longitude
AGA	Agate Dam And Reservoir Near Medford, OR	42.415/-122.772
EMI	Emigrant Dam And Lake Near Ashland, OR	42.1639/-122.604

Table 71: Instantaneous flow measurements from DEQ and others in the Rogue River Basin.

Station ID	Station	Latitude/Longitude	Data Source
11372-ORDEQ	Evans Creek at the mouth	42.4336/-123.174	DEQ
11373-ORDEQ	Evans Creek downstream of Wimer Bridge	42.5331/-123.159	DEQ
11461-ORDEQ	Evans Creek at Palmerton Park	42.4397/-123.172	DEQ
11466-ORDEQ	Evans Creek downstream of Bridge 341	42.5845/-123.023	DEQ
25596-ORDEQ	NF Little Butte at Little Butte	42.4207/-122.612	DEQ
25598-ORDEQ	NF Little Butte from Fish Lake (headwater)	42.3775/-122.349	DEQ
25599-ORDEQ	NF Little Butte at BLM Rd. 36-3E-31, 25599	42.3924/-122.504	DEQ
25799-ORDEQ	SF Little Butte Creek upstream Beaver Dam	42.3286/-122.38	DEQ
30188-ORDEQ	Evans Creek at Swamp Creek Rd Bridge	42.6986/-123.107	DEQ

Station ID	Station	Latitude/Longitude	Data Source
30189-ORDEQ	WF Evans Creek downstream of Sand Creek	42.6588/-123.095	DEQ
30190-ORDEQ	WF Evans Creek downstream of Battle Creek	42.6191/-123.042	DEQ
406343	Meyer Creek	42.2293/-122.754	DEQ
407121	Gaerky Creek	42.2003/-122.689	DEQ
407125	Lazy Creek	42.3181/-122.852	DEQ
407128	Neil Creek	42.1727/-122.642	DEQ
407129	Payne Creek	42.2778/-122.816	DEQ
407132	Butler Creek	42.222/-122.739	DEQ
No Station ID	Battle Creek RB		DEQ
No Station ID	Cedar Creek (RB)		DEQ
No Station ID	Deadline Creek	42.5675/-124.263	DEQ
No Station ID	EF Evans Cr		DEQ
No Station ID	Evans Creek at Swamp Creek Rd Bridge		DEQ
No Station ID	Fall Creek	42.5808/-124.253	DEQ
No Station ID	Little Applegate River 500’ downstream of Yale Creek	42.1502/-122.956	DEQ
No Station ID	Little Applegate River 600’ upstream of the mouth	42.1984/-123.043	DEQ
No Station ID	Little Applegate River at Road Mile 2.6	42.181/-123.009	DEQ
No Station ID	Little Applegate River downstream of Muddy Gulch	42.1574/-122.9	DEQ
No Station ID	Little Applegate River upstream of Glade	42.1416/-122.854	DEQ
No Station ID	Little Butte upstream of Mill at Little Butte Park	42.4749/-122.797	DEQ
No Station ID	Lobster Creek at REMAP site	42.5789/-124.255	DEQ
No Station ID	Lobster Creek downstream of Deadline Creek	42.5667/-124.264	DEQ
No Station ID	Lobster Creek mouth	42.5066/-124.296	DEQ
No Station ID	Lobster Creek Upstream of Lost Valley Creek	42.6106/-124.254	DEQ
No Station ID	Lost Valley Creek	42.6103/-124.256	DEQ
No Station ID	Rock Creek & Salt Creek		DEQ
25592-ORDEQ	Little Butte upstream confluence w/ Nichols Branch	42.4823/-122.778	LBWSC/BLM
No Station ID	Little Butte upstream Hwy 62 Bridge	42.4622/-122.816	LBWSC/BLM
No Station ID	Little Butte above the mouth in Denman	42.4485/-122.878	LBWSC/DEQ
No Station ID	NF Little Butte Creek at Gage > NFCG	42.3764/-122.357	LBWSC/DEQ

Station ID	Station	Latitude/Longitude	Data Source
No Station ID	NF Little Butte Creek at Gaging Station (inactive)	42.4015/-122.532	LBWSC/DEQ
FSHO	NF Little Butte from Fish Lake (headwater)	42.3775/-122.349	USBR
LBCO	Little Butte Creek at Lake Creek	42.4218/-122.623	USBR

Table 72: Summary of existing flow data in the Rogue River Basin. Columns Jan – Dec indicate the number of daily mean flow results in each month.

Year	Station ID	Station	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1990	14328000	Rogue River Above Prospect, OR	31	28	31	30	31	30	31	31	30	31	30	31
1990	14330000	Rogue River Below Prospect, OR	31	28	31	30	31	30	31	31	30	31	30	31
1990	14332000	South Fork Rogue River Near Prospect, OR	31	28	31	30	31	30	31	31	30	31	30	31
1990	14334700	S Fk Rogue R South Of Prospect, OR	31	28	31	30	31	30	31	31	30	31	30	31
1990	14335200	S Fk Big Butte Cr Ab Willow Cr Nr Butte Falls, OR	31	28	31	30	31	30	31	31	30	31	30	31
1990	14335250	Willow Cr Dam Outlet Nr Butte Falls, OR	31	28	31	30	31	30	31	31	30	31	30	31
1990	14335500	S Fk Big Butte Cr Nr Butte Falls, OR	31	28	31	30	31	30	31	31	30	31	30	31
1990	14336100	Eagle Point I D Cn Bl C Rd Nr Butte Falls, OR	31	28	31	30	31	30	31	31	30	31	30	31
1990	14337500	Big Butte Creek Near Mcleod, OR	31	28	31	30	31	30	31	31	30	31	30	31
1990	14337800	Elk Creek Near Cascade Gorge,OR	31	28	31	30	31	30	31	31	30	31	30	31
1990	14337830	Elk Creek Below Alco Creek, Near Trail, OR	28	21	26	30	31	30	31	31	30	31	30	31
1990	14337870	West Branch Elk Creek Near Trail,OR	31	28	31	30	31	30	31	31	30	31	30	31
1990	14338000	Elk Creek Near Trail, OR	31	28	31	30	31	30	31	31	30	31	30	31
1990	14339000	Rogue River At Dodge Bridge, Near Eagle Point, OR	31	28	31	30	31	30	31	31	30	31	30	31
1990	14340400	Dead Indian Collection Cn Nr Pinehurst, OR	31	28	31	30	31	30	31	31	30	31	30	31
1990	14341600	Rogue R Valley Cn S Int Nr Lakecreek, OR			19	30	31	30	31	31	30	2		
1990	14342500	N Fk Little Butte Cr At Fish Lake Nr Lakecreek, OR	31	28	31	30	31	30	31	31	30	31	30	31
1990	14345000	Rogue R Valley Cn At Intake Nr Lakecreek, OR			19	30	31	30	31	31	30	3		
1990	14345500	Rogue R Valley Cn Bl Jct Nr Lakecreek, OR			31	30	31	30	31	31	30	3		
1990	14346600	Agate Res Feed Cn Nr White City, OR	31	28	31	30	31	30	31	31	30	31	30	31
1990	14354200	Bear Creek Blw Ashland Creek At Ashland, OR							31	31	30	31	30	31
1990	14357500	Bear Creek At Medford, OR	31	28	31	30	31	30	31	31	30	31	30	31
1990	14359000	Rogue River At Raygold Near Central Point, OR	31	28	31	30	31	30	31	31	30	31	30	31
1990	14361100	Gravity Cn Nr Grants Pass, OR	31	28	31	30	31	30	31	31	30	31	30	31
1990	14361110	S Highline Cn Nr Grants Pass, OR	31	28	31	30	31	30	31	31	30	31	30	31

Year	Station ID	Station	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1990	14361120	Tokay Cn Nr Grants Pass, OR	31	28	31	30	31	30	31	31	30	31	30	31
1990	14361130	Evans Cr Lat Nr Grants Pass, OR	31	28	31	30	31	30	31	31	30	31	30	31
1990	14361140	Savage Lat At Intake Nr Grants Pass, OR	31	28	31	30	31	30	31	31	30	31	30	31
1990	14361500	Rogue River At Grants Pass, OR	31	28	31	30	31	30	31	31	30	31	30	31
1990	14362000	Applegate River Near Copper, OR	31	28	31	30	31	30	31	31	30	31	30	31
1990	14362250	Star Gulch Near Ruch, OR	31	28	31	30	31	30	31	31	30	31	30	31
1990	14366000	Applegate River Near Applegate, OR	31	28	31	30	31	30	31	31	30	31	30	31
1990	14369500	Applegate River Near Wilderville, OR	31	28	31	30	31	30	31	31	30	31	30	31
1990	14372300	Rogue River Near Agness, OR	31	28	31	30	31	30	31	31	30	31	30	31
1990	14372500	E Fk Illinois R Nr Takilma, OR	31	28	31	30	31	30	31	31	30	31	30	31
1990	14375100	Sucker Creek Blw Little Grayback Ck, Nr Holland,OR	31	28	31	30	31	30	31	31	30	31	30	31
1990	14375400	Elk Creek Near Obrien,OR	31	28	31	30	31	30	31	31	30	31	30	31
1990	14377100	Illinois River Near Kerby, OR	31	28	31	30	31	30	31	31	30	31	30	31
1990	AGA	Agate Dam And Reservoir Near Medford, OR	31	28	31	30	31	30	31	31	30	31	30	31
1990	EMI	Emigrant Dam And Lake Near Ashland, OR	31	28	31	30	31	30	31	31	30	31	30	31
1991	14328000	Rogue River Above Prospect, OR	31	28	31	30	31	30	31	31	30	31	30	31
1991	14330000	Rogue River Below Prospect, OR	31	28	31	30	31	30	31	31	30	31	30	31
1991	14332000	South Fork Rogue River Near Prospect, OR	31	28	31	30	31	30	31	31	30	31	30	31
1991	14334700	S Fk Rogue R South Of Prospect, OR	31	28	31	30	31	30	31	31	30	31	30	31
1991	14335200	S Fk Big Butte Cr Ab Willow Cr Nr Butte Falls, OR	31	28	31	30	31	30	31	31	30	31	30	31
1991	14335250	Willow Cr Dam Outlet Nr Butte Falls, OR	31	28	31	30	31	30	31	31	30			
1991	14335500	S Fk Big Butte Cr Nr Butte Falls, OR	31	28	31	30	31	30	31	31	30	31	30	31
1991	14336100	Eagle Point I D Cn Bl C Rd Nr Butte Falls, OR	31	28	31	30	31	30	31	31	30	31	30	31
1991	14337500	Big Butte Creek Near Mcleod, OR	31	28	31	30	31	30	31	31	30	31	30	31
1991	14337800	Elk Creek Near Cascade Gorge,OR	31	28	31	30	31	30	31	31	30	31	30	31
1991	14337830	Elk Creek Below Alco Creek, Near Trail, OR	25	27	27	30	30	30	31	31	30	31	30	29
1991	14337870	West Branch Elk Creek Near Trail,OR	31	28	31	30	31	30	31	31	30	31	30	31

Year	Station ID	Station	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1991	14338000	Elk Creek Near Trail, OR	31	28	31	30	31	30	31	31	30	31	30	31
1991	14339000	Rogue River At Dodge Bridge, Near Eagle Point, OR	31	28	31	30	31	30	31	31	30	31	30	31
1991	14340400	Dead Indian Collection Cn Nr Pinehurst, OR	31	28	25		11	30	31	31	30	31	30	31
1991	14341600	Rogue R Valley Cn S Int Nr Lakecreek, OR			3	30	31	30	31	31	30	31	30	31
1991	14342500	N Fk Little Butte Cr At Fish Lake Nr Lakecreek, OR	31	28	31	30	31	30	31	31	30	31	30	31
1991	14345000	Rogue R Valley Cn At Intake Nr Lakecreek, OR			31	30	31	30	31	31		14	28	19
1991	14345500	Rogue R Valley Cn Bl Jct Nr Lakecreek, OR			3	29	31	30	31	31	30	31		
1991	14346600	Agate Res Feed Cn Nr White City, OR	31	28	31	30	31	30	31	31	30	31	30	31
1991	14354200	Bear Creek Blw Ashland Creek At Ashland, OR	31	28	31	30	31	30	31	31	30	31	30	31
1991	14357500	Bear Creek At Medford, OR	31	28	31	30	31	30	31	31	30	31	30	31
1991	14359000	Rogue River At Raygold Near Central Point, OR	31	28	31	30	31	30	31	31	30	31	30	31
1991	14361100	Gravity Cn Nr Grants Pass, OR	31	28	31	30	31	30	31	31	30	31	30	31
1991	14361110	S Highline Cn Nr Grants Pass, OR	31	28	31	30	31	30	31	31	30	20		
1991	14361120	Tokay Cn Nr Grants Pass, OR	31	28	31	30	31	30	31	31	30	31	30	31
1991	14361130	Evans Cr Lat Nr Grants Pass, OR	31	28	31	30	31	30	31	31	30	31	30	31
1991	14361140	Savage Lat At Intake Nr Grants Pass, OR	31	28	31	30	31	30	31	31	30	31	30	31
1991	14361500	Rogue River At Grants Pass, OR	31	28	31	30	31	30	31	31	30	31	30	31
1991	14362000	Applegate River Near Copper, OR	31	28	31	30	31	30	31	31	30	31	30	31
1991	14362250	Star Gulch Near Ruch, OR	31	28	31	30	31	30	31	31	30	31	30	31
1991	14366000	Applegate River Near Applegate, OR	31	28	31	30	31	30	31	31	30	31	30	31
1991	14369500	Applegate River Near Wilderville, OR	31	28	31	30	31	30	31	31	30	31	30	31
1991	14372300	Rogue River Near Agness, OR	31	28	31	30	31	30	31	31	30	31	30	31
1991	14372500	E Fk Illinois R Nr Takilma, OR	31	28	31	30	31	30	31	31	30	31	30	31
1991	14375100	Sucker Creek Blw Little Grayback Ck, Nr Holland,OR	31	28	31	30	31	30	31	31	29			
1991	14375400	Elk Creek Near Obrien,OR	31	28	31	30	31	30	31	31	30			
1991	14377100	Illinois River Near Kerby, OR	31	28	31	30	31	30	31	31	30	31	30	31

Year	Station ID	Station	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1991	AGA	Agate Dam And Reservoir Near Medford, OR	31	28	31	30	31	30	31	31	30	31	30	31
1991	EMI	Emigrant Dam And Lake Near Ashland, OR	31	28	31	30	31	30	31	31	30	31	30	31
1992	14328000	Rogue River Above Prospect, OR	31	29	31	30	31	30	31	31	30	31	30	31
1992	14330000	Rogue River Below Prospect, OR	31	29	31	30	31	30	31	31	30	31	30	31
1992	14332000	South Fork Rogue River Near Prospect, OR	31	29	31	30	31	30	31	31	30	31	30	31
1992	14334700	S Fk Rogue R South Of Prospect, OR	31	29	31	30	31	30	31	31	30			
1992	14335200	S Fk Big Butte Cr Ab Willow Cr Nr Butte Falls, OR	31	29	31	30	31	30	31	31	30	31	16	
1992	14335500	S Fk Big Butte Cr Nr Butte Falls, OR	31	29	31	30	31	30	31	31	30	31	30	31
1992	14336100	Eagle Point I D Cn Bl C Rd Nr Butte Falls, OR	31	29	31	30	31	30	31	31	30			
1992	14337500	Big Butte Creek Near Mcleod, OR	31	29	31	30	31	30	31	31	30	31	30	31
1992	14337800	Elk Creek Near Cascade Gorge,OR	31	29	31	30	31	30	31	31	30	31	30	31
1992	14337830	Elk Creek Below Alco Creek, Near Trail, OR	31	29	31	30	31	30	31	31	30	31	29	27
1992	14337870	West Branch Elk Creek Near Trail,OR	31	29	31	30	31	30	31	31	30	31	30	31
1992	14338000	Elk Creek Near Trail, OR	31	29	31	30	31	30	31	31	30	31	30	31
1992	14339000	Rogue River At Dodge Bridge, Near Eagle Point, OR	31	29	31	30	31	30	31	31	30	31	30	31
1992	14340400	Dead Indian Collection Cn Nr Pinehurst, OR	31	29	31	30	31	30	31	31	30			
1992	14341600	Rogue R Valley Cn S Int Nr Lakecreek, OR	31	23	15	30	31	30	31	31	30	31	30	31
1992	14342500	N Fk Little Butte Cr At Fish Lake Nr Lakecreek, OR	31	29	31	30	31	30	31	31	30	31	30	31
1992	14345000	Rogue R Valley Cn At Intake Nr Lakecreek, OR				3	31	30	31	31	30	31	30	19
1992	14345500	Rogue R Valley Cn Bl Jct Nr Lakecreek, OR			15	30	31	30	31	31	30	31	30	15
1992	14346600	Agate Res Feed Cn Nr White City, OR	31	29	31	30	31	30	31	31	30	31		
1992	14354200	Bear Creek Blw Ashland Creek At Ashland, OR	31	29	31	30	31	30	31	31	30	31	30	31
1992	14357500	Bear Creek At Medford, OR	31	29	31	30	31	30	31	31	30	31	30	31
1992	14359000	Rogue River At Raygold Near Central Point, OR	31	29	31	30	31	30	31	31	30	31	30	31
1992	14361100	Gravity Cn Nr Grants Pass, OR	31	29	31	30	31	30	31	31	30	31	30	31
1992	14361110	S Highline Cn Nr Grants Pass, OR				3	31	30	31	26	29	31	30	31

Year	Station ID	Station	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1992	14361120	Tokay Cn Nr Grants Pass, OR	31	29	31	30	31	30	31	31	30	31	30	31
1992	14361130	Evans Cr Lat Nr Grants Pass, OR	31	29	31	30	31	30	31	31	30	31	30	31
1992	14361140	Savage Lat At Intake Nr Grants Pass, OR	31	29	31	30	31	30	31	31	30	31	30	31
1992	14361500	Rogue River At Grants Pass, OR	31	29	31	30	31	30	31	31	30	31	30	31
1992	14362000	Applegate River Near Copper, OR	31	29	31	30	31	30	31	31	30	31	30	31
1992	14362250	Star Gulch Near Ruch, OR	31	29	31	30	31	30	31	31	30	31	30	31
1992	14366000	Applegate River Near Applegate, OR	31	29	31	30	31	30	31	31	30	31	30	31
1992	14369500	Applegate River Near Wilderville, OR	31	29	31	30	31	30	31	31	30	31	30	31
1992	14372300	Rogue River Near Agness, OR	31	29	31	30	31	30	31	31	30	31	30	31
1992	14372500	E Fk Illinois R Nr Takilma, OR	31	29	31	30	31	30	31	31	30	31	30	31
1992	14377100	Illinois River Near Kerby, OR	31	29	31	30	31	30	31	31	30	31	30	31
1992	AGA	Agate Dam And Reservoir Near Medford, OR	31	29	31	30	31	30	31	31	30	31	30	31
1992	EMI	Emigrant Dam And Lake Near Ashland, OR	31	29	31	30	31	30	31	31	30	31	30	31
1993	14328000	Rogue River Above Prospect, OR	31	28	31	30	31	30	31	31	30	31	30	31
1993	14330000	Rogue River Below Prospect, OR	31	28	31	30	31	30	31	31	30	31	30	31
1993	14332000	South Fork Rogue River Near Prospect, OR	31	28	31	30	31	30	31	31	30	31	30	31
1993	14335200	S Fk Big Butte Cr Ab Willow Cr Nr Butte Falls, OR		18	31	30	31	30	31	31	30	31	30	31
1993	14335500	S Fk Big Butte Cr Nr Butte Falls, OR	31	28	31	30	31	30	31	31	30	31	30	31
1993	14337500	Big Butte Creek Near Mcleod, OR	31	28	31	30	31	30	31	31	30	31	30	31
1993	14337800	Elk Creek Near Cascade Gorge,OR	31	28	31	30	31	30	31	31	30	31	30	31
1993	14337830	Elk Creek Below Alco Creek, Near Trail, OR	26	17	10	17	31	28	31	31	30	31	30	30
1993	14337870	West Branch Elk Creek Near Trail,OR	31	28	31	30	31	30	31	31	30	31	30	31
1993	14338000	Elk Creek Near Trail, OR	31	28	31	30	31	30	31	31	30	31	30	31
1993	14339000	Rogue River At Dodge Bridge, Near Eagle Point, OR	31	28	31	30	31	30	31	31	30	31	30	31
1993	14340400	Dead Indian Collection Cn Nr Pinehurst, OR										14	15	31
1993	14341600	Rogue R Valley Cn S Int Nr Lakecreek, OR	31	28	31	30	31	30	31	31	30	31	30	6

Year	Station ID	Station	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1993	14342500	N Fk Little Butte Cr At Fish Lake Nr Lakecreek, OR	31	28	31	30	31	30	31	31	30	31	30	31
1993	14345000	Rogue R Valley Cn At Intake Nr Lakecreek, OR	31	28	31	30	31	30	31	31	30	31	30	31
1993	14345500	Rogue R Valley Cn Bl Jct Nr Lakecreek, OR	17	28	31	30	31	30	31	31	30	31	30	31
1993	14346600	Agate Res Feed Cn Nr White City, OR								31	30			
1993	14354200	Bear Creek Blw Ashland Creek At Ashland, OR	31	28	31	30	31	30	31	31	30	31	30	31
1993	14357500	Bear Creek At Medford, OR	31	28	31	30	31	30	31	31	30	31	30	31
1993	14359000	Rogue River At Raygold Near Central Point, OR	31	28	31	30	31	30	31	31	30	31	30	31
1993	14361100	Gravity Cn Nr Grants Pass, OR	31	28	31	30	31	30	31	31	30	31	30	31
1993	14361110	S Highline Cn Nr Grants Pass, OR	31	28	31	30	31	30	31	31	30	31	30	31
1993	14361120	Tokay Cn Nr Grants Pass, OR	31	28	31	30	31	30	31	31	30	31	30	31
1993	14361130	Evans Cr Lat Nr Grants Pass, OR	31	28	31	30	31	30	31	31	30	31	30	31
1993	14361140	Savage Lat At Intake Nr Grants Pass, OR	31	28	31	30	31	30	31	31	30	31	30	31
1993	14361500	Rogue River At Grants Pass, OR	31	28	31	30	31	30	31	31	30	31	30	31
1993	14362000	Applegate River Near Copper, OR	31	28	31	30	31	30	31	31	30	31	30	31
1993	14362250	Star Gulch Near Ruch, OR	31	28	31	30	31	30	31	31	30	31	30	31
1993	14366000	Applegate River Near Applegate, OR	31	28	31	30	31	30	31	31	30	31	30	31
1993	14369500	Applegate River Near Wilderville, OR	31	28	31	30	31	30	31	31	30	31	30	31
1993	14372300	Rogue River Near Agness, OR	31	28	31	30	31	30	31	31	30	31	30	31
1993	14372500	E Fk Illinois R Nr Takilma, OR	31	28	31	30	31	30	31	31	30	31	30	31
1993	14377100	Illinois River Near Kerby, OR	31	28	31	30	31	30	31	31	30	31	30	31
1993	AGA	Agate Dam And Reservoir Near Medford, OR	31	28	31	30	31	30	31	31	30	31	30	31
1993	EMI	Emigrant Dam And Lake Near Ashland, OR	31	28	31	30	31	30	31	31	30	31	30	31
1994	14328000	Rogue River Above Prospect, OR	31	28	31	30	31	30	31	31	30	31	30	31
1994	14330000	Rogue River Below Prospect, OR	31	28	31	30	31	30	31	31	30	31	30	31
1994	14332000	South Fork Rogue River Near Prospect, OR	31	28	31	30	31	30	31	31	30	31	30	31
1994	14335200	S Fk Big Butte Cr Ab Willow Cr Nr Butte Falls, OR	31	28	31	30	31	30	31	31	30	31	30	31
1994	14335250	Willow Cr Dam Outlet Nr Butte Falls, OR										31		

Year	Station ID	Station	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1994	14335500	S Fk Big Butte Cr Nr Butte Falls, OR	31	28	31	30	31	30	31	31	30	31	30	31
1994	14336100	Eagle Point I D Cn Bl C Rd Nr Butte Falls, OR										31	30	31
1994	14337500	Big Butte Creek Near Mcleod, OR	31	28	31	30	31	30	31	31	30	31	30	31
1994	14337800	Elk Creek Near Cascade Gorge,OR	31	28	31	30	31	30	31	31	30	31	30	31
1994	14337830	Elk Creek Below Alco Creek, Near Trail, OR	31	24	30	30	31	30	31	31	30	31	29	26
1994	14337870	West Branch Elk Creek Near Trail,OR	31	28	31	30	31	30	31	31	30	31	30	31
1994	14338000	Elk Creek Near Trail, OR	31	28	31	30	31	30	31	31	30	31	30	31
1994	14339000	Rogue River At Dodge Bridge, Near Eagle Point, OR	31	28	31	30	31	30	31	31	30	31	30	31
1994	14340400	Dead Indian Collection Cn Nr Pinehurst, OR	31	28	31	30	31	30	31	31	30	31	30	31
1994	14341600	Rogue R Valley Cn S Int Nr Lakecreek, OR	13	1	31	30	31	30	31	31	30			19
1994	14342500	N Fk Little Butte Cr At Fish Lake Nr Lakecreek, OR	31	28	31	30	31	30	31	31	30	31	30	31
1994	14345000	Rogue R Valley Cn At Intake Nr Lakecreek, OR	31	28	31	30	31	30	31	31	30	31	30	31
1994	14345500	Rogue R Valley Cn Bl Jct Nr Lakecreek, OR	31	28	31	30	31	30	31	31	30	31	30	31
1994	14346600	Agate Res Feed Cn Nr White City, OR										17		
1994	14354200	Bear Creek Blw Ashland Creek At Ashland, OR	31	28	31	30	31	30	31	31	30	31	30	31
1994	14357500	Bear Creek At Medford, OR	31	28	31	30	31	30	31	31	30	31	30	31
1994	14359000	Rogue River At Raygold Near Central Point, OR	31	28	31	30	31	30	31	31	30	31	30	31
1994	14361100	Gravity Cn Nr Grants Pass, OR	31	28	31	30	31	30	31	31	30	31	30	31
1994	14361110	S Highline Cn Nr Grants Pass, OR	31	28	31	30	31	30	31	31	30			
1994	14361120	Tokay Cn Nr Grants Pass, OR	31	28	31	30	31	30	31	31	30	31	30	31
1994	14361130	Evans Cr Lat Nr Grants Pass, OR	31	28	31	30	31	30	31	31	30	31	30	31
1994	14361140	Savage Lat At Intake Nr Grants Pass, OR	31	28	31	30	31	30	31	31	30	31	30	31
1994	14361500	Rogue River At Grants Pass, OR	31	28	31	30	31	30	31	31	30	31	30	31
1994	14362000	Applegate River Near Copper, OR	31	28	31	30	31	30	31	31	30	31	30	31
1994	14362250	Star Gulch Near Ruch, OR	31	28	31	30	31	30	31	31	30	31	30	31
1994	14366000	Applegate River Near Applegate, OR	31	28	31	30	31	30	31	31	30	31	30	31

Year	Station ID	Station	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1994	14369500	Applegate River Near Wilderville, OR	31	28	31	30	31	30	31	31	30	31	30	31
1994	14372300	Rogue River Near Agness, OR	31	28	31	30	31	30	31	31	30	31	30	31
1994	14372500	E Fk Illinois R Nr Takilma, OR	31	28	31	30	31	30	31	31	30	31	30	31
1994	14377100	Illinois River Near Kerby, OR	31	28	31	30	31	30	31	31	30	31	30	31
1994	AGA	Agate Dam And Reservoir Near Medford, OR	31	28	31	30	31	30	31	31	30	31	30	31
1994	EMI	Emigrant Dam And Lake Near Ashland, OR	31	28	31	30	31	30	31	31	30	31	30	31
1995	14328000	Rogue River Above Prospect, OR	31	28	31	30	31	30	31	31	30	31	30	31
1995	14330000	Rogue River Below Prospect, OR	31	28	31	30	31	30	31	31	30	31	30	31
1995	14332000	South Fork Rogue River Near Prospect, OR	31	28	31	30	31	30	31	31	30	31	30	31
1995	14335200	S Fk Big Butte Cr Ab Willow Cr Nr Butte Falls, OR	31	28	31	30	31	30	31	31	30	31	30	31
1995	14335250	Willow Cr Dam Outlet Nr Butte Falls, OR				18	31	30	31	31	30	31	30	31
1995	14335500	S Fk Big Butte Cr Nr Butte Falls, OR	31	28	31	30	31	30	31	31	30			
1995	14336100	Eagle Point I D Cn Bl C Rd Nr Butte Falls, OR	31	28	31	30	31	30	31	31	30	31	30	31
1995	14337500	Big Butte Creek Near Mcleod, OR	31	28	31	30	31	30	31	31	30	31	30	31
1995	14337800	Elk Creek Near Cascade Gorge,OR	31	28	31	30	31	30	31	31	30	31	30	31
1995	14337830	Elk Creek Below Alco Creek, Near Trail, OR	20	23	19	24	28	30	31	31	30	31	29	14
1995	14337870	West Branch Elk Creek Near Trail,OR	31	28	31	30	31	30	31	31	30	31	30	31
1995	14338000	Elk Creek Near Trail, OR	31	28	31	30	31	30	31	31	30	31	30	31
1995	14339000	Rogue River At Dodge Bridge, Near Eagle Point, OR	31	28	31	30	31	30	31	31	30	31	30	31
1995	14340400	Dead Indian Collection Cn Nr Pinehurst, OR	31	28	31	30	31	30	31	31	30	31	30	31
1995	14341600	Rogue R Valley Cn S Int Nr Lakecreek, OR	31	28	31	30	31	30	31	31	30	31	30	31
1995	14342500	N Fk Little Butte Cr At Fish Lake Nr Lakecreek, OR	31	28	31	30	31	30	31	31	30	31	30	31
1995	14345000	Rogue R Valley Cn At Intake Nr Lakecreek, OR	31	28	31	30	31	30	31	31	30	31	30	31
1995	14345500	Rogue R Valley Cn Bl Jct Nr Lakecreek, OR	31	28	31	30	31	30	31	31	30	31	30	31
1995	14346600	Agate Res Feed Cn Nr White City, OR				19	31	30	31	31	30			
1995	14354200	Bear Creek Blw Ashland Creek At Ashland, OR	31	28	31	30	31	30	31	31	30	31	30	31

Year	Station ID	Station	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1995	14357500	Bear Creek At Medford, OR	31	28	31	30	31	30	31	31	30	31	30	31
1995	14359000	Rogue River At Raygold Near Central Point, OR	31	28	31	30	31	30	31	31	30	31	30	31
1995	14361100	Gravity Cn Nr Grants Pass, OR	31	28	31	30	31	30	31	31	30	31	30	31
1995	14361110	S Highline Cn Nr Grants Pass, OR										31	30	31
1995	14361120	Tokay Cn Nr Grants Pass, OR	31	28	31	30	31	30	31	31	30	31	30	31
1995	14361130	Evans Cr Lat Nr Grants Pass, OR	31	28	31	30	31	30	31	31	30	31	30	31
1995	14361140	Savage Lat At Intake Nr Grants Pass, OR	31	28	31	30	31	30	31	31	30	31	30	31
1995	14361500	Rogue River At Grants Pass, OR	31	28	31	30	31	30	31	31	30	31	30	31
1995	14362000	Applegate River Near Copper, OR	31	28	31	30	31	30	31	31	30	31	30	31
1995	14362250	Star Gulch Near Ruch, OR	31	28	31	30	31	30	31	31	30	31	30	31
1995	14366000	Applegate River Near Applegate, OR	31	28	31	30	31	30	31	31	30	31	30	31
1995	14369500	Applegate River Near Wilderville, OR	31	28	31	30	31	30	31	31	30	31	30	31
1995	14372300	Rogue River Near Agness, OR	31	28	31	30	31	30	31	31	30	31	30	31
1995	14372500	E Fk Illinois R Nr Takilma, OR	31	28	31	30	31	30	31	31	30	31	30	31
1995	14377100	Illinois River Near Kerby, OR	31	28	31	30	31	30	31	31	30	31	30	31
1995	AGA	Agate Dam And Reservoir Near Medford, OR	31	28	31	30	31	30	31	31	30	31	30	31
1995	EMI	Emigrant Dam And Lake Near Ashland, OR	31	28	31	30	31	30	31	31	30	31	30	31
1996	14328000	Rogue River Above Prospect, OR	31	29	31	30	31	30	31	31	30	31	30	31
1996	14330000	Rogue River Below Prospect, OR	31	29	31	30	31	30	31	31	30	31	30	31
1996	14332000	South Fork Rogue River Near Prospect, OR	31	29	31	30	31	30	31	31	30	31	30	31
1996	14335200	S Fk Big Butte Cr Ab Willow Cr Nr Butte Falls, OR	5	4	31	30	31	30	31	31	30	31	30	31
1996	14335250	Willow Cr Dam Outlet Nr Butte Falls, OR	31	29	31		22	30	31	31	30			
1996	14335500	S Fk Big Butte Cr Nr Butte Falls, OR		8	31	30	31	30	31	31	30			
1996	14336100	Eagle Point I D Cn Bl C Rd Nr Butte Falls, OR	31	29	31	30	31	30	31	31	30			
1996	14337500	Big Butte Creek Near Mcleod, OR	31	29	31	30	31	30	31	31	30	31	30	31
1996	14337800	Elk Creek Near Cascade Gorge,OR	31	29	31	30	31	30	31	31	30	31	30	31
1996	14337830	Elk Creek Below Alco Creek, Near Trail, OR	9	5	29	22	22	30	31	31	30	31	22	2
1996	14337870	West Branch Elk Creek Near Trail,OR	31	29	31	30	31	30	31	31	30	31	30	31

Year	Station ID	Station	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1996	14338000	Elk Creek Near Trail, OR	31	29	31	30	31	30	31	31	30	31	30	31
1996	14339000	Rogue River At Dodge Bridge, Near Eagle Point, OR	31	29	31	30	31	30	31	31	30	31	30	31
1996	14340400	Dead Indian Collection Cn Nr Pinehurst, OR	31	29	31	30	31	30	31	31	30			
1996	14341600	Rogue R Valley Cn S Int Nr Lakecreek, OR	31	29	31	30	31	30	31	31	30			
1996	14342500	N Fk Little Butte Cr At Fish Lake Nr Lakecreek, OR	31	29	31	30	31	30	31	31	30			
1996	14345000	Rogue R Valley Cn At Intake Nr Lakecreek, OR	31	29	31	30	31	30	31	31	30			
1996	14345500	Rogue R Valley Cn Bl Jct Nr Lakecreek, OR	31	29	31	30	31	30	31	31	30			
1996	14346600	Agate Res Feed Cn Nr White City, OR				22	31	30	31	31	30			
1996	14354200	Bear Creek Blw Ashland Creek At Ashland, OR	31	29	31	30	31	30	31	31	30	31	30	31
1996	14357500	Bear Creek At Medford, OR	31	29	31	30	31	30	31	31	30	31	30	31
1996	14359000	Rogue River At Raygold Near Central Point, OR	31	29	31	30	31	30	31	31	30	31	30	31
1996	14361100	Gravity Cn Nr Grants Pass, OR	31	29	31	30	31	30	31	31	30			
1996	14361110	S Highline Cn Nr Grants Pass, OR	31	29	31	30	31	30	31	31	30			
1996	14361120	Tokay Cn Nr Grants Pass, OR	31	29	31	30	31	30	31	31	30			
1996	14361130	Evans Cr Lat Nr Grants Pass, OR	31	29	31	30	31	30	31	31	30			
1996	14361140	Savage Lat At Intake Nr Grants Pass, OR	31	29	31	30	31	30	31	31	30			
1996	14361500	Rogue River At Grants Pass, OR	31	29	31	30	31	30	31	31	30	31	30	31
1996	14362000	Applegate River Near Copper, OR	31	29	31	30	31	30	31	31	30	31	30	31
1996	14362250	Star Gulch Near Ruch, OR	31	29	31	30	31	30	31	31	30	31	30	31
1996	14366000	Applegate River Near Applegate, OR	31	29	31	30	31	30	31	31	30	31	30	31
1996	14369500	Applegate River Near Wilderville, OR	31	29	31	30	31	30	31	31	30	31	30	31
1996	14372300	Rogue River Near Agness, OR	31	29	31	30	31	30	31	31	30	31	30	31
1996	14372500	E Fk Illinois R Nr Takilma, OR	31	29	31	30	31	30	31	31	30			
1996	14377100	Illinois River Near Kerby, OR	31	29	31	30	31	30	31	31	30	31	30	31
1996	AGA	Agate Dam And Reservoir Near Medford, OR	31	29	31	30	31	30	31	31	30	31	30	31
1996	EMI	Emigrant Dam And Lake Near Ashland, OR	31	29	31	30	31	30	31	31	30	31	30	31

Year	Station ID	Station	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1997	14328000	Rogue River Above Prospect, OR	31	28	31	30	31	30	31	31	30	31	30	31
1997	14330000	Rogue River Below Prospect, OR	31	28	31	30	31	30	31	31	30	31	30	31
1997	14332000	South Fork Rogue River Near Prospect, OR	31	28	31	30	31	30	31	31	30	31	30	31
1997	14335200	S Fk Big Butte Cr Ab Willow Cr Nr Butte Falls, OR	31	28	31	30	31	30	31	31	30	31	30	31
1997	14337500	Big Butte Creek Near Mcleod, OR	31	28	31	30	31	30	31	31	30	31	30	31
1997	14337800	Elk Creek Near Cascade Gorge,OR	31	28	31	30	31	30	31	31	30	31	30	31
1997	14337830	Elk Creek Below Alco Creek, Near Trail, OR	17	25	28	24	30	30	31	31	30	31	30	28
1997	14337870	West Branch Elk Creek Near Trail,OR	31	28	31	30	31	30	31	31	30	31	30	31
1997	14338000	Elk Creek Near Trail, OR	31	28	31	30	31	30	31	31	30	31	30	31
1997	14339000	Rogue River At Dodge Bridge, Near Eagle Point, OR	31	28	31	30	31	30	31	31	30	31	30	31
1997	14354200	Bear Creek Blw Ashland Creek At Ashland, OR	31	28	31	30	31	30	31	31	30	31	30	31
1997	14357500	Bear Creek At Medford, OR	31	28	31	30	31	30	31	31	30	31	30	31
1997	14359000	Rogue River At Raygold Near Central Point, OR	31	28	31	30	31	30	31	31	30	31	30	31
1997	14361500	Rogue River At Grants Pass, OR	31	28	31	30	31	30	31	31	30	31	30	31
1997	14362000	Applegate River Near Copper, OR	31	28	31	30	31	30	31	31	30	31	30	31
1997	14362250	Star Gulch Near Ruch, OR	31	28	31	30	31	30	31	31	30	31	30	31
1997	14366000	Applegate River Near Applegate, OR	31	28	31	30	31	30	31	31	30	31	30	31
1997	14369500	Applegate River Near Wilderville, OR	31	28	31	30	31	30	31	31	30	31	30	31
1997	14372300	Rogue River Near Agness, OR	31	28	31	30	31	30	31	31	30	31	30	31
1997	14377100	Illinois River Near Kerby, OR	31	28	31	30	31	30	31	31	30	31	30	31
1997	AGA	Agate Dam And Reservoir Near Medford, OR	31	28	31	30	31	30	31	31	30	31	30	31
1997	EMI	Emigrant Dam And Lake Near Ashland, OR	31	28	31	30	31	30	31	31	30	31	30	31
1998	14328000	Rogue River Above Prospect, OR	31	28	31	30	31	30	31	31	29			
1998	14330000	Rogue River Below Prospect, OR	31	28	31	30	31	30	31	31	30	31	30	31
1998	14332000	South Fork Rogue River Near Prospect, OR	31	28	31	30	31	30	31	31	30	31	30	31
1998	14335200	S Fk Big Butte Cr Ab Willow Cr Nr Butte Falls, OR	31	28	31	30	31	30	31	31	30	31	30	31
1998	14337500	Big Butte Creek Near Mcleod, OR	31	28	31	30	31	30	31	31	30	31	30	31

Year	Station ID	Station	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1998	14337800	Elk Creek Near Cascade Gorge,OR	31	28	31	30	31	30	31	31	30	31	30	31
1998	14337830	Elk Creek Below Alco Creek, Near Trail, OR	9	19	21	30	23	30	31	31	30	31	22	18
1998	14337870	West Branch Elk Creek Near Trail,OR	31	28	31	30	31	30	31	31	30	31	30	31
1998	14338000	Elk Creek Near Trail, OR	31	28	31	30	31	30	31	31	30	31	30	31
1998	14339000	Rogue River At Dodge Bridge, Near Eagle Point, OR	31	28	31	30	31	30	31	31	30	31	30	31
1998	14354200	Bear Creek Blw Ashland Creek At Ashland, OR	31	28	31	30	31	30	31	31	30	31	30	31
1998	14357500	Bear Creek At Medford, OR	31	28	31	30	31	30	31	31	30	31	30	31
1998	14359000	Rogue River At Raygold Near Central Point, OR	31	28	31	30	31	30	31	31	30	31	30	31
1998	14361500	Rogue River At Grants Pass, OR	31	28	31	30	31	30	31	31	30	31	30	31
1998	14362000	Applegate River Near Copper, OR	31	28	31	30	31	30	31	31	30	31	30	31
1998	14362250	Star Gulch Near Ruch, OR	31	28	31	30	31	30	31	31	30	31	30	31
1998	14366000	Applegate River Near Applegate, OR	31	28	31	30	31	30	31	31	30	31	30	31
1998	14369500	Applegate River Near Wilderville, OR	31	28	31	30	31	30	31	31	30	31	30	31
1998	14372300	Rogue River Near Agness, OR	31	28	31	30	31	30	31	31	30	31	30	31
1998	14377100	Illinois River Near Kerby, OR	31	28	31	30	31	30	31	31	30	31	30	31
1998	AGA	Agate Dam And Reservoir Near Medford, OR	31	28	31	30	31	30	31	31	30	31	30	31
1998	EMI	Emigrant Dam And Lake Near Ashland, OR	31	28	31	30	31	30	31	31	30	31	30	31
1999	14330000	Rogue River Below Prospect, OR	31	28	31	30	31	30	31	31	30	31	30	31
1999	14332000	South Fork Rogue River Near Prospect, OR	31	28	31	30	31	30	31	31	30	31	30	31
1999	14335200	S Fk Big Butte Cr Ab Willow Cr Nr Butte Falls, OR	31	28	31	30	31	30	31	31	30	31	30	31
1999	14337500	Big Butte Creek Near Mcleod, OR	31	28	31	30	31	30	31	31	30	31	30	31
1999	14337800	Elk Creek Near Cascade Gorge,OR	31	28	31	30	31	30	31	31	30	31	30	31
1999	14337830	Elk Creek Below Alco Creek, Near Trail, OR	17	8	21	20	29	30	31	31	30	31	30	29
1999	14337870	West Branch Elk Creek Near Trail,OR	31	28	31	30	31	30	31	31	30	31	30	31
1999	14338000	Elk Creek Near Trail, OR	31	28	31	30	31	30	31	31	30	31	30	31
1999	14339000	Rogue River At Dodge Bridge, Near Eagle Point, OR	31	28	31	30	31	30	31	31	30	31	30	31

Year	Station ID	Station	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1999	14341610	S Fk Little Butte Cr At Mouth Nr Lakecreek, OR										26	8	
1999	14346700	Little Butte Cr At Lakecreek, OR										17	30	23
1999	14354200	Bear Creek Blw Ashland Creek At Ashland, OR	31	28	31	30	31	30	31	31	30	31	30	31
1999	14357500	Bear Creek At Medford, OR	31	28	31	30	31	30	31	31	30	31	30	31
1999	14359000	Rogue River At Raygold Near Central Point, OR	31	28	31	30	31	30	31	31	30	31	30	31
1999	14361500	Rogue River At Grants Pass, OR	31	28	31	30	31	30	31	31	30	31	30	31
1999	14362000	Applegate River Near Copper, OR	31	28	31	30	31	30	31	31	30	31	30	31
1999	14362250	Star Gulch Near Ruch, OR	31	28	31	30	31	30	31	31	30	31	30	31
1999	14366000	Applegate River Near Applegate, OR	31	28	31	30	31	30	31	31	30	31	30	31
1999	14369500	Applegate River Near Wilderville, OR	31	28	31	30	31	30	31	31	30	31	30	31
1999	14372300	Rogue River Near Agness, OR	31	28	31	30	31	30	31	31	30	31	30	31
1999	14377100	Illinois River Near Kerby, OR	31	28	31	30	31	30	31	31	30	31	30	31
1999	AGA	Agate Dam And Reservoir Near Medford, OR	31	28	31	30	31	30	31	31	30	31	30	31
1999	EMI	Emigrant Dam And Lake Near Ashland, OR	31	28	31	30	31	30	31	31	30	31	30	31
2000	14330000	Rogue River Below Prospect, OR	31	29	31	30	31	30	31	31	30	31	30	31
2000	14332000	South Fork Rogue River Near Prospect, OR	31	29	31	30	31	30	31	31	30	31	30	31
2000	14335200	S Fk Big Butte Cr Ab Willow Cr Nr Butte Falls, OR	31	29	31	30	31	30	31	31	30			
2000	14337500	Big Butte Creek Near Mcleod, OR	31	29	31	30	31	30	31	31	30	31	30	31
2000	14337800	Elk Creek Near Cascade Gorge,OR	31	29	31	30	31	30	31	31	29			
2000	14337830	Elk Creek Below Alco Creek, Near Trail, OR	18	13	23	26	31	30	31	31	30	31	30	31
2000	14337870	West Branch Elk Creek Near Trail,OR	31	29	31	30	31	30	31	31	29			
2000	14338000	Elk Creek Near Trail, OR	31	29	31	30	31	30	31	31	30	31	30	31
2000	14339000	Rogue River At Dodge Bridge, Near Eagle Point, OR	31	29	31	30	31	30	31	31	30	31	30	31
2000	14341610	S Fk Little Butte Cr At Mouth Nr Lakecreek, OR	4	4	16	4				21	30	31	30	31
2000	14346700	Little Butte Cr At Lakecreek, OR	29	29	31	27	31	30	31	31	30	31	30	31
2000	14348150	Antelope Cr Nr Eagle Point, OR		1	31	27	31	30	31	7		1	22	30
2000	14354200	Bear Creek Blw Ashland Creek At Ashland, OR	31	29	31	30	31	30	31	31	30	31	30	31

Year	Station ID	Station	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2000	14357500	Bear Creek At Medford, OR	31	29	31	30	31	30	31	31	30	31	30	31
2000	14359000	Rogue River At Raygold Near Central Point, OR	31	29	31	30	31	30	31	31	30	31	30	31
2000	14361500	Rogue River At Grants Pass, OR	31	29	31	30	31	30	31	31	30	31	30	31
2000	14362000	Applegate River Near Copper, OR	31	29	31	30	31	30	31	31	30	31	30	31
2000	14362250	Star Gulch Near Ruch, OR	31	29	31	30	31	30	31	31	30	31	30	31
2000	14366000	Applegate River Near Applegate, OR	31	29	31	30	31	30	31	31	30	31	30	31
2000	14369500	Applegate River Near Wilderville, OR	31	29	31	30	31	30	31	31	30	31	30	31
2000	14372300	Rogue River Near Agness, OR	31	29	31	30	31	30	31	31	30	31	30	31
2000	14372500	E Fk Illinois R Nr Takilma, OR										31	30	31
2000	14377100	Illinois River Near Kerby, OR	31	29	31	30	31	30	31	31	30	31	30	31
2000	AGA	Agate Dam And Reservoir Near Medford, OR	31	29	31	30	31	30	31	31	30	31	30	31
2000	EMI	Emigrant Dam And Lake Near Ashland, OR	31	29	31	30	31	30	31	31	30	31	30	31
2001	14330000	Rogue River Below Prospect, OR	31	28	31	30	31	30	31	31	30	31	30	31
2001	14332000	South Fork Rogue River Near Prospect, OR	31	28	31	30	31	30	31	31	30	31	30	31
2001	14335200	S Fk Big Butte Cr Ab Willow Cr Nr Butte Falls, OR		23	31	30	31	30	31	31	30	31	30	31
2001	14337500	Big Butte Creek Near Mcleod, OR	31	28	31	30	31	30	31	31	30	31	30	31
2001	14337600	Rogue River Near Mcleod, OR									1	31	30	31
2001	14337830	Elk Creek Below Alco Creek, Near Trail, OR	31	28	31	30	31	30	31	31	30	31	29	15
2001	14338000	Elk Creek Near Trail, OR	31	28	31	30	31	30	31	31	30	31	30	31
2001	14339000	Rogue River At Dodge Bridge, Near Eagle Point, OR	31	28	31	30	31	30	31	31	30	31	30	31
2001	14341610	S Fk Little Butte Cr At Mouth Nr Lakecreek, OR	31	28	31	30	31	30	31	31	27	31	30	31
2001	14346700	Little Butte Cr At Lakecreek, OR	31	28	30	30	31	30	31	31	30	31	30	31
2001	14348150	Antelope Cr Nr Eagle Point, OR	12	26	30	30	31	30	29	29	27	2	10	11
2001	14354200	Bear Creek Blw Ashland Creek At Ashland, OR	31	28	31	30	31	30	31	31	30	31	30	31
2001	14357500	Bear Creek At Medford, OR	31	28	31	30	31	30	31	31	30	31	30	31
2001	14359000	Rogue River At Raygold Near Central Point, OR	31	28	31	30	31	30	31	31	30	31	30	31
2001	14361500	Rogue River At Grants Pass, OR	31	28	31	30	31	30	31	31	30	31	30	31

Year	Station ID	Station	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2001	14362000	Applegate River Near Copper, OR	31	28	31	30	31	30	31	31	30	31	30	31
2001	14362250	Star Gulch Near Ruch, OR	31	28	31	30	31	30	31	31	30	31	30	31
2001	14366000	Applegate River Near Applegate, OR	31	28	31	30	31	30	31	31	30	31	30	31
2001	14369500	Applegate River Near Wilderville, OR	31	28	31	30	31	30	31	31	30	31	30	31
2001	14372300	Rogue River Near Agness, OR	31	28	31	30	31	30	31	31	30	31	30	31
2001	14372500	E Fk Illinois R Nr Takilma, OR	31	28	31	30	31	30	31	31	30	31	28	31
2001	14375200	Sucker Cr At Bridgeview, OR							15	31	29	31	11	10
2001	14377100	Illinois River Near Kerby, OR	31	28	31	30	31	30	31	31	30	31	30	31
2001	AGA	Agate Dam And Reservoir Near Medford, OR	31	28	31	30	31	30	31	31	30	31	30	31
2001	EMI	Emigrant Dam And Lake Near Ashland, OR	31	28	31	30	31	30	31	31	30	31	30	31
2002	14330000	Rogue River Below Prospect, OR	31	28	31	30	31	30	31	31	30	31	30	31
2002	14332000	South Fork Rogue River Near Prospect, OR	31	28	31	30	31	30	31	31	30	31	30	31
2002	14335200	S Fk Big Butte Cr Ab Willow Cr Nr Butte Falls, OR	31	3	25	30	31	5						
2002	14337500	Big Butte Creek Near Mcleod, OR	31	28	31	30	31	30	31	31	30	31	30	31
2002	14337600	Rogue River Near Mcleod, OR	31	28	31	30	31	30	31	31	30	31	30	31
2002	14337830	Elk Creek Below Alco Creek, Near Trail, OR	18	17	27	29	31	30	31	31	30	31	30	22
2002	14338000	Elk Creek Near Trail, OR	31	28	31	30	31	30	31	31	30	31	30	31
2002	14339000	Rogue River At Dodge Bridge, Near Eagle Point, OR	31	28	31	30	31	30	31	31	30	31	30	31
2002	14341610	S Fk Little Butte Cr At Mouth Nr Lakecreek, OR	31	28	31	30	31	30	31	31	30	31	21	
2002	14346700	Little Butte Cr At Lakecreek, OR	31	28	30	27	31	30	31	31	30	18	26	28
2002	14348150	Antelope Cr Nr Eagle Point, OR	31	28	31	29	31	16		19	30	31	30	28
2002	14353000	West Fork Ashland Creek Near Ashland, OR										31	30	31
2002	14353500	East Fork Ashland Creek Near Ashland, OR										31	30	31
2002	14354200	Bear Creek Blw Ashland Creek At Ashland, OR	31	28	31	30	31	30	31	31	30	31	30	31
2002	14357500	Bear Creek At Medford, OR	31	28	31	30	31	30	31	31	30	31	30	31
2002	14359000	Rogue River At Raygold Near Central Point, OR	31	28	31	30	31	30	31	31	30	31	30	31
2002	14361500	Rogue River At Grants Pass, OR	31	28	31	30	31	30	31	31	30	31	30	31

Year	Station ID	Station	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2002	14362000	Applegate River Near Copper, OR	31	28	31	30	31	30	31	31	30	31	30	31
2002	14362250	Star Gulch Near Ruch, OR	31	28	31	30	31	30	31	31	30	31	30	31
2002	14366000	Applegate River Near Applegate, OR	31	28	31	30	31	30	31	31	30	31	30	31
2002	14369500	Applegate River Near Wilderville, OR	31	28	31	30	31	30	31	31	30	31	30	31
2002	14372300	Rogue River Near Agness, OR	31	28	31	30	31	30	31	31	30	31	30	31
2002	14372500	E Fk Illinois R Nr Takilma, OR	31	28	31	30	31	30	31	31	30	23	30	31
2002	14375200	Sucker Cr At Bridgeview, OR	19	20	31	28	31	30	31	31	30	31	30	21
2002	14377100	Illinois River Near Kerby, OR	31	28	31	30	31	30	31	31	30	31	30	31
2002	AGA	Agate Dam And Reservoir Near Medford, OR	31	28	31	30	31	30	31	31	30	31	30	31
2002	EMI	Emigrant Dam And Lake Near Ashland, OR	31	28	31	30	31	30	31	31	30	31	30	31
2003	14330000	Rogue River Below Prospect, OR	31	28	31	30	31	30	31	31	30	31	30	31
2003	14332000	South Fork Rogue River Near Prospect, OR	31	28	31	30	31	30	31	31	30	31	30	31
2003	14337500	Big Butte Creek Near Mcleod, OR	31	28	31	30	31	30	31	31	30	31	30	31
2003	14337600	Rogue River Near Mcleod, OR	31	28	31	30	31	30	31	31	30	31	30	31
2003	14337830	Elk Creek Below Alco Creek, Near Trail, OR	17	22	17	15	29	30	31	31	29			
2003	14338000	Elk Creek Near Trail, OR	31	28	31	30	31	30	31	31	30	31	30	31
2003	14339000	Rogue River At Dodge Bridge, Near Eagle Point, OR	31	28	31	30	31	30	31	31	30	31	30	31
2003	14340800	S Fk Little Butte Cr Ab Soda Cr Nr Lakecreek, OR						4	31	31	30	31	30	31
2003	14341610	S Fk Little Butte Cr At Mouth Nr Lakecreek, OR		9	31	30	31	30	31	31	30	31	30	31
2003	14343000	N Fk Little Butte Cr Nr Lakecreek, OR						2	29	31	30	31	30	31
2003	14346700	Little Butte Cr At Lakecreek, OR	31	28	29	28	31	29	31	30	30	28	29	28
2003	14348150	Antelope Cr Nr Eagle Point, OR	30	27	31	28	31	30	31	24	30	31	30	29
2003	14353000	West Fork Ashland Creek Near Ashland, OR	31	28	31	30	31	30	31	31	30	31	30	31
2003	14353500	East Fork Ashland Creek Near Ashland, OR	31	28	31	30	31	30	31	31	30	31	30	31
2003	14354200	Bear Creek Blw Ashland Creek At Ashland, OR	31	28	31	30	31	30	31	31	30	31	30	31
2003	14357500	Bear Creek At Medford, OR	31	28	31	30	31	30	31	31	30	31	30	31
2003	14359000	Rogue River At Raygold Near Central Point, OR	31	28	31	30	31	30	31	31	30	31	30	31

Year	Station ID	Station	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2003	14361500	Rogue River At Grants Pass, OR	31	28	31	30	31	30	31	31	30	31	30	31
2003	14362000	Applegate River Near Copper, OR	31	28	31	30	31	30	31	31	30	31	30	31
2003	14362250	Star Gulch Near Ruch, OR	31	28	31	30	31	30	31	31	30	31	30	31
2003	14366000	Applegate River Near Applegate, OR	31	28	31	30	31	30	31	31	30	31	30	31
2003	14369500	Applegate River Near Wilderville, OR	31	28	31	30	31	30	31	31	30	31	30	31
2003	14372300	Rogue River Near Agness, OR	31	28	31	30	31	30	31	31	30	31	30	31
2003	14372500	E Fk Illinois R Nr Takilma, OR	31	28	31	30	31	30	31	31	30	26		8
2003	14375200	Sucker Cr At Bridgeview, OR	3	23	10							4	30	26
2003	14377100	Illinois River Near Kerby, OR	31	28	31	30	31	30	31	31	30	31	30	31
2003	AGA	Agate Dam And Reservoir Near Medford, OR	31	28	31	30	31	30	31	31	30	31	30	31
2003	EMI	Emigrant Dam And Lake Near Ashland, OR	31	28	31	30	31	30	31	31	30	31	30	31
2004	14330000	Rogue River Below Prospect, OR	31	29	31	30	31	30	31	31	30	31	30	31
2004	14332000	South Fork Rogue River Near Prospect, OR	31	29	31	30	31	30	31	31	30	31	30	31
2004	14337500	Big Butte Creek Near Mcleod, OR	31	29	31	30	31	30	31	31	30	31	30	31
2004	14337600	Rogue River Near Mcleod, OR	31	29	31	30	31	30	31	31	30	31	30	31
2004	14338000	Elk Creek Near Trail, OR	31	29	31	30	31	30	31	31	30	31	30	31
2004	14339000	Rogue River At Dodge Bridge, Near Eagle Point, OR	31	29	31	30	31	30	31	31	30	31	30	31
2004	14340800	S Fk Little Butte Cr Ab Soda Cr Nr Lakecreek, OR	31	27	31	30	31	30	31	31	30	31	30	30
2004	14341610	S Fk Little Butte Cr At Mouth Nr Lakecreek, OR	31	29	31	30	31	27	31	31	30	31	30	30
2004	14343000	N Fk Little Butte Cr Nr Lakecreek, OR	31	29	31	30	31	30	31	31	30	31	30	31
2004	14346700	Little Butte Cr At Lakecreek, OR	31	29	31	29	31	29	28	31	30	30	27	28
2004	14348150	Antelope Cr Nr Eagle Point, OR	20	27	31	30	31	30	31	28	30	31	30	31
2004	14353000	West Fork Ashland Creek Near Ashland, OR	31	29	31	30	31	30	31	31	30	31	30	31
2004	14353500	East Fork Ashland Creek Near Ashland, OR	31	29	31	30	31	30	31	31	30	31	30	31
2004	14354200	Bear Creek Blw Ashland Creek At Ashland, OR	31	29	31	30	31	30	31	31	30	31	30	31
2004	14357500	Bear Creek At Medford, OR	31	29	31	30	31	30	31	31	30	31	30	31
2004	14358800	Bear Cr Ab Mouth Nr Central Point, OR										23	27	26

Year	Station ID	Station	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2004	14359000	Rogue River At Raygold Near Central Point, OR	31	29	31	30	31	30	31	31	30	31	30	31
2004	14361500	Rogue River At Grants Pass, OR	31	29	31	30	31	30	31	31	30	31	30	31
2004	14362000	Applegate River Near Copper, OR	31	29	31	30	31	30	31	31	30	31	30	31
2004	14362250	Star Gulch Near Ruch, OR	31	29	31	30	31	30	31	31	30	31	30	31
2004	14366000	Applegate River Near Applegate, OR	31	29	31	30	31	30	31	31	30	31	30	31
2004	14369500	Applegate River Near Wilderville, OR	31	29	31	30	31	30	31	31	30	31	30	31
2004	14372300	Rogue River Near Agness, OR	31	29	31	30	31	30	31	31	30	31	30	31
2004	14372500	E Fk Illinois R Nr Takilma, OR	31	8										
2004	14375200	Sucker Cr At Bridgeview, OR	23	25	31	30	31	30	31	31	30	7		
2004	14377100	Illinois River Near Kerby, OR	31	29	31	30	31	30	31	31	30	31	30	31
2004	AGA	Agate Dam And Reservoir Near Medford, OR	31	29	31	30	31	30	31	31	30	31	30	31
2004	EMI	Emigrant Dam And Lake Near Ashland, OR	31	29	31	30	31	30	31	31	30	31	30	31
2005	14330000	Rogue River Below Prospect, OR	31	28	31	30	31	30	31	31	30	31	30	31
2005	14332000	South Fork Rogue River Near Prospect, OR	31	28	31	30	31	30	31	31	30	31	30	31
2005	14335200	S Fk Big Butte Cr Ab Willow Cr Nr Butte Falls, OR					22	30	31	31	30	31	30	31
2005	14337500	Big Butte Creek Near Mcleod, OR	31	28	31	30	31	30	31	31	30	31	30	31
2005	14337600	Rogue River Near Mcleod, OR	31	28	31	30	31	30	31	31	30	31	30	31
2005	14338000	Elk Creek Near Trail, OR	31	28	31	30	31	30	31	31	30	31	30	31
2005	14339000	Rogue River At Dodge Bridge, Near Eagle Point, OR	31	28	31	30	31	30	31	31	30	31	30	31
2005	14340800	S Fk Little Butte Cr Ab Soda Cr Nr Lakecreek, OR	31	28	31	30	25	30	31	31	30	31	30	31
2005	14341610	S Fk Little Butte Cr At Mouth Nr Lakecreek, OR	31	28	31	30	31	24	27	31	30	31	30	26
2005	14343000	N Fk Little Butte Cr Nr Lakecreek, OR	31	28	31	30	31	30	31	31	30	31	30	31
2005	14346700	Little Butte Cr At Lakecreek, OR	31	27	30	28	29	28	27	31	30	31	28	28
2005	14348000	Little Butte Cr Bl Eagle Point, OR											28	30
2005	14348150	Antelope Cr Nr Eagle Point, OR	31	28	29	30	26	30	31	31	30	29	30	17
2005	14348400	Emigrant Cr Ab Green Springs Powerplant Nr Ashland, OR										30	29	28

Year	Station ID	Station	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2005	14353000	West Fork Ashland Creek Near Ashland, OR	31	28	31	30	31	30	31	31	30	31	30	31
2005	14353500	East Fork Ashland Creek Near Ashland, OR	31	28	31	30	31	30	31	31	30	31	30	31
2005	14354200	Bear Creek Blw Ashland Creek At Ashland, OR	31	28	31	30	31	30	31	31	30	31	30	31
2005	14357500	Bear Creek At Medford, OR	31	28	31	30	31	30	31	31	30	31	30	31
2005	14358800	Bear Cr Ab Mouth Nr Central Point, OR	30	28	31	30	23	30	31	31	30	31	26	23
2005	14359000	Rogue River At Raygold Near Central Point, OR	31	28	31	30	31	30	31	31	30	31	30	31
2005	14361500	Rogue River At Grants Pass, OR	31	28	31	30	31	30	31	31	30	31	30	31
2005	14362000	Applegate River Near Copper, OR	31	28	31	30	31	30	31	31	30	31	30	31
2005	14362250	Star Gulch Near Ruch, OR	31	28	31	30	31	30	31	31	30	31	30	31
2005	14366000	Applegate River Near Applegate, OR	31	28	31	30	31	30	31	31	30	31	30	31
2005	14369500	Applegate River Near Wilderville, OR	31	28	31	30	31	30	31	31	30	31	30	31
2005	14372300	Rogue River Near Agness, OR	31	28	31	30	31	30	31	31	30	31	30	31
2005	14372500	E Fk Illinois R Nr Takilma, OR									23	31	29	31
2005	14375200	Sucker Cr At Bridgeview, OR									23	31	30	16
2005	14377100	Illinois River Near Kerby, OR	31	28	31	30	31	30	31	31	30	31	30	31
2005	AGA	Agate Dam And Reservoir Near Medford, OR	31	28	31	30	31	30	31	31	30	31	30	31
2005	EMI	Emigrant Dam And Lake Near Ashland, OR	31	28	31	30	31	30	31	31	30	31	30	31
2006	14330000	Rogue River Below Prospect, OR	31	28	31	30	31	30	31	31	30	31	30	31
2006	14332000	South Fork Rogue River Near Prospect, OR	31	28	31	30	31	30	31	31	30	31	30	31
2006	14335200	S Fk Big Butte Cr Ab Willow Cr Nr Butte Falls, OR	31	28	31	30	9							
2006	14337500	Big Butte Creek Near Mcleod, OR	31	28	31	30	31	30	31	31	30	31	30	31
2006	14337600	Rogue River Near Mcleod, OR	31	28	31	30	31	30	31	31	30	31	30	31
2006	14338000	Elk Creek Near Trail, OR	31	28	31	30	31	11				31	30	31
2006	14339000	Rogue River At Dodge Bridge, Near Eagle Point, OR	31	28	31	30	31	30	31	31	30	31	30	31
2006	14340800	S Fk Little Butte Cr Ab Soda Cr Nr Lakecreek, OR	31	28	31	30	31	30	31	31	30	31	30	31
2006	14341610	S Fk Little Butte Cr At Mouth Nr Lakecreek, OR	31	28	31	30	31	30	31	26	29	31	30	31

Year	Station ID	Station	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2006	14342500	N Fk Little Butte Cr At Fish Lake Nr Lakecreek, OR									12	31	30	31
2006	14343000	N Fk Little Butte Cr Nr Lakecreek, OR	31	27	31	30	31	30	31	31	30	31	30	31
2006	14346700	Little Butte Cr At Lakecreek, OR	31	28	31	30	31	30	31	31	30	31	30	30
2006	14348000	Little Butte Cr Bl Eagle Point, OR	31	28	31	30	31	30	31	31	30	31	30	31
2006	14348150	Antelope Cr Nr Eagle Point, OR	19	23	31	30	31	30	31	31	30	27	30	31
2006	14348400	Emigrant Cr Ab Green Springs Powerplant Nr Ashland, OR	29	28	30	27	31	27	30	15			10	31
2006	14353000	West Fork Ashland Creek Near Ashland, OR	31	28	31	30	31	30	31	31	30	31	30	31
2006	14353500	East Fork Ashland Creek Near Ashland, OR	31	28	31	30	31	30	31	31	30	31	30	31
2006	14354200	Bear Creek Blw Ashland Creek At Ashland, OR	31	28	31	30	31	30	31	31	30	31	30	31
2006	14357500	Bear Creek At Medford, OR	31	28	31	30	31	30	31	31	30	31	30	31
2006	14358800	Bear Cr Ab Mouth Nr Central Point, OR	8						19	31	30	31	30	29
2006	14359000	Rogue River At Raygold Near Central Point, OR	31	28	31	30	31	30	31	31	30	31	30	31
2006	14361500	Rogue River At Grants Pass, OR	31	28	31	30	31	30	31	31	30	31	30	31
2006	14362000	Applegate River Near Copper, OR	31	28	31	30	31	30	31	31	30	31	30	31
2006	14362250	Star Gulch Near Ruch, OR	31	28	31	30	31	30	31	31	30	31	30	31
2006	14366000	Applegate River Near Applegate, OR	31	28	31	30	31	30	31	31	30	31	30	31
2006	14369500	Applegate River Near Wilderville, OR	31	28	31	30	31	30	31	31	30	31	30	31
2006	14372300	Rogue River Near Agness, OR	31	28	31	30	31	30	31	31	30	31	30	31
2006	14372500	E Fk Illinois R Nr Takilma, OR	31	28	31	30	31	30	31	30	30	31	30	31
2006	14375200	Sucker Cr At Bridgeview, OR	7	19	31	29	31	30	31	31	30	31	30	22
2006	14377100	Illinois River Near Kerby, OR	31	28	31	30	31	30	31	31	30	31	30	31
2006	AGA	Agate Dam And Reservoir Near Medford, OR	31	28	31	30	31	30	31	31	30	31	30	31
2006	EMI	Emigrant Dam And Lake Near Ashland, OR	31	28	31	30	31	30	31	31	30	31	30	31
2007	14330000	Rogue River Below Prospect, OR	31	28	31	30	31	30	31	31	30	31	30	31
2007	14332000	South Fork Rogue River Near Prospect, OR	31	28	31	30	31	30	31	31	30	31	30	31
2007	14335200	S Fk Big Butte Cr Ab Willow Cr Nr Butte Falls, OR										31	30	31

Year	Station ID	Station	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2007	14337500	Big Butte Creek Near Mcleod, OR	31	28	31	30	31	30	31	31	30	31	30	31
2007	14337600	Rogue River Near Mcleod, OR	31	28	31	30	31	30	31	31	30	31	30	31
2007	14338000	Elk Creek Near Trail, OR	31	28	31	30	31	30	31	31	30	31	30	31
2007	14339000	Rogue River At Dodge Bridge, Near Eagle Point, OR	31	28	31	30	31	30	31	31	30	31	30	31
2007	14340800	S Fk Little Butte Cr Ab Soda Cr Nr Lakecreek, OR	31	28	31	30	31	30	31	31	30	31	30	31
2007	14341610	S Fk Little Butte Cr At Mouth Nr Lakecreek, OR	31	28	31	30	27	30	31	31	30	31	30	31
2007	14342500	N Fk Little Butte Cr At Fish Lake Nr Lakecreek, OR	31	28	31	30	31	30	31	31	30	31	30	31
2007	14343000	N Fk Little Butte Cr Nr Lakecreek, OR	31	28	31	30	31	30	31	31	30	31	30	31
2007	14346700	Little Butte Cr At Lakecreek, OR	31	28	31	30	31	30	31	31	30	31	30	31
2007	14348000	Little Butte Cr Bl Eagle Point, OR	31	28	31	30	31	30	31	31	30	31	30	31
2007	14348150	Antelope Cr Nr Eagle Point, OR	31	28	31	30	31	30	31	31	30	31	30	31
2007	14348400	Emigrant Cr Ab Green Springs Powerplant Nr Ashland, OR	31	25	29	30	31	30	31	31	29	31	30	29
2007	14353000	West Fork Ashland Creek Near Ashland, OR	31	28	31	30	31	30	31	31	30	31	30	31
2007	14353500	East Fork Ashland Creek Near Ashland, OR	31	28	31	30	31	30	31	31	30	31	30	31
2007	14354200	Bear Creek Blw Ashland Creek At Ashland, OR	31	28	31	30	31	30	31	31	30	31	30	31
2007	14357500	Bear Creek At Medford, OR	31	28	31	30	31	30	31	31	30	31	30	31
2007	14358800	Bear Cr Ab Mouth Nr Central Point, OR	28	22	29	30	31	30	31	31	30	31	30	31
2007	14359000	Rogue River At Raygold Near Central Point, OR	31	28	31	30	31	30	31	31	30	31	30	31
2007	14361500	Rogue River At Grants Pass, OR	31	28	31	30	31	30	31	31	30	31	30	31
2007	14362000	Applegate River Near Copper, OR	31	28	31	30	31	30	31	31	30	31	30	31
2007	14362250	Star Gulch Near Ruch, OR	31	28	31	30	31	30	31	31	30	31	30	31
2007	14366000	Applegate River Near Applegate, OR	31	28	31	30	31	30	31	31	30	31	30	31
2007	14369500	Applegate River Near Wilderville, OR	31	28	31	30	31	30	31	31	30	31	30	31
2007	14372300	Rogue River Near Agness, OR	31	28	31	30	31	30	31	31	30	31	30	31
2007	14372500	E Fk Illinois R Nr Takilma, OR	31	28	31	30	31	30	31	31	30	31	30	31
2007	14375200	Sucker Cr At Bridgeview, OR	28	28	31	30	31	30	31	31	30	31	30	31

Year	Station ID	Station	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2007	14377100	Illinois River Near Kerby, OR	31	28	31	30	31	30	31	31	30	31	30	31
2007	AGA	Agate Dam And Reservoir Near Medford, OR	31	28	31	30	31	30	31	31	30	31	30	31
2007	EMI	Emigrant Dam And Lake Near Ashland, OR	31	28	31	30	31	30	31	31	30	31	30	31
2008	14330000	Rogue River Below Prospect, OR	31	29	31	30	31	30	31	31	30	31	30	31
2008	14332000	South Fork Rogue River Near Prospect, OR	31	29	31	30	31	30	31	31	30	31	30	31
2008	14335200	S Fk Big Butte Cr Ab Willow Cr Nr Butte Falls, OR	31	29	31	30	31	30	31	31	30	31	30	31
2008	14337500	Big Butte Creek Near Mcleod, OR	31	29	31	30	31	30	31	31	30	31	30	31
2008	14337600	Rogue River Near Mcleod, OR	31	29	31	30	31	30	31	31	30	31	30	31
2008	14338000	Elk Creek Near Trail, OR	31	29	31	30	31	30	31	31	30	31	30	31
2008	14339000	Rogue River At Dodge Bridge, Near Eagle Point, OR	31	29	31	30	31	30	31	31	30	31	30	31
2008	14340800	S Fk Little Butte Cr Ab Soda Cr Nr Lakecreek, OR	31	29	31	30	29	30	29	31	30	31	30	31
2008	14341610	S Fk Little Butte Cr At Mouth Nr Lakecreek, OR	31	29	31	30	31	30	31	31	30	31	30	31
2008	14342500	N Fk Little Butte Cr At Fish Lake Nr Lakecreek, OR	31	29	31	30	31	30	31	31	30	31	30	31
2008	14343000	N Fk Little Butte Cr Nr Lakecreek, OR	24	29	31	30	29	30	31	31	30	31	30	31
2008	14346700	Little Butte Cr At Lakecreek, OR	31	29	31	30	31	30	31	31	30	31	30	31
2008	14348000	Little Butte Cr Bl Eagle Point, OR	31	29	31	30	31	30	31	31	30	31	30	31
2008	14348150	Antelope Cr Nr Eagle Point, OR	31	29	31	30	29	30	31	31	30	22	30	31
2008	14348400	Emigrant Cr Ab Green Springs Powerplant Nr Ashland, OR	29	29	28	28	31	30	31	31	30	31	30	31
2008	14353000	West Fork Ashland Creek Near Ashland, OR	31	29	31	30	31	30	31	31	30	31	30	31
2008	14353500	East Fork Ashland Creek Near Ashland, OR	31	29	31	30	31	30	31	31	30	31	30	31
2008	14354200	Bear Creek Blw Ashland Creek At Ashland, OR	31	29	31	30	31	30	31	31	30	31	30	31
2008	14357500	Bear Creek At Medford, OR	31	29	31	30	31	30	31	31	30	31	30	31
2008	14358680	Griffin Cr At Central Point, OR		7	31	30	31	30	31	31	30	31	30	31
2008	14358750	Jackson Cr At Central Point, OR											25	31
2008	14358800	Bear Cr Ab Mouth Nr Central Point, OR	31	29	31	30	31	30	31	31	30	31	30	31
2008	14359000	Rogue River At Raygold Near Central Point, OR	31	29	31	30	31	30	31	31	30	31	30	31

Year	Station ID	Station	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2008	14361500	Rogue River At Grants Pass, OR	31	29	31	30	31	30	31	31	30	31	30	31
2008	14362000	Applegate River Near Copper, OR	31	29	31	30	31	30	31	31	30	31	30	31
2008	14362250	Star Gulch Near Ruch, OR	31	29	31	30	31	30	31	31	30	31	30	31
2008	14366000	Applegate River Near Applegate, OR	31	29	31	30	31	30	31	31	30	31	30	31
2008	14369500	Applegate River Near Wilderville, OR	31	29	31	30	31	30	31	31	30	31	30	31
2008	14372300	Rogue River Near Agness, OR	31	29	31	30	31	30	31	31	30	31	30	31
2008	14372500	E Fk Illinois R Nr Takilma, OR	31	29	31	30	31	30	31	31	30	31	30	31
2008	14375100	Sucker Creek Blw Little Grayback Ck, Nr Holland,OR										31	30	31
2008	14375200	Sucker Cr At Bridgeview, OR	29	29	31	30	31	30	31	31	30	31	30	28
2008	14377100	Illinois River Near Kerby, OR	31	29	31	30	31	30	31	31	30	31	30	31
2008	AGA	Agate Dam And Reservoir Near Medford, OR	31	29	31	30	31	30	31	31	30	31	30	31
2008	EMI	Emigrant Dam And Lake Near Ashland, OR	31	29	31	30	31	30	31	31	30	31	30	31
2009	14330000	Rogue River Below Prospect, OR	31	28	31	30	31	30	31	31	30	31	30	31
2009	14332000	South Fork Rogue River Near Prospect, OR	31	28	31	30	31	30	31	31	30	31	30	31
2009	14335200	S Fk Big Butte Cr Ab Willow Cr Nr Butte Falls, OR	31	28	31	30	31	30	31	31	30	31	30	31
2009	14337500	Big Butte Creek Near Mcleod, OR	31	28	31	30	31	30	31	31	30	31	30	31
2009	14337600	Rogue River Near Mcleod, OR	31	28	31	30	31	30	31	31	30	31	30	31
2009	14338000	Elk Creek Near Trail, OR	31	28	31	30	31	30	31	31	30	31	30	31
2009	14339000	Rogue River At Dodge Bridge, Near Eagle Point, OR	31	28	31	30	31	30	31	31	30	31	30	31
2009	14340800	S Fk Little Butte Cr Ab Soda Cr Nr Lakecreek, OR	31	28	31	30	31	30	31	31	30	31	30	31
2009	14341610	S Fk Little Butte Cr At Mouth Nr Lakecreek, OR	31	28	31	30	31	30	31	31	30	31	30	31
2009	14342500	N Fk Little Butte Cr At Fish Lake Nr Lakecreek, OR	31	28	31	30	31	30	31	31	30	31	30	31
2009	14343000	N Fk Little Butte Cr Nr Lakecreek, OR	31	28	31	30	31	30	31	31	30	31	30	31
2009	14346700	Little Butte Cr At Lakecreek, OR	31	28	31	30	31	30	31	31	30	31	30	31
2009	14348000	Little Butte Cr Bl Eagle Point, OR	31	28	31	30	31	30	31	31	30	31	30	31

Year	Station ID	Station	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2009	14348080	Antelope Cr Bl Rogue River Valley Irr Dist Div Nr White City, OR											1	15
2009	14348150	Antelope Cr Nr Eagle Point, OR	31	28	31	30	31	30	31	30	30	31	30	31
2009	14348400	Emigrant Cr Ab Green Springs Powerplant Nr Ashland, OR	31	28	31	30	31	30	31	31	30	31	30	31
2009	14353000	West Fork Ashland Creek Near Ashland, OR	31	28	31	30	31	30	31	31	30	31	30	31
2009	14353500	East Fork Ashland Creek Near Ashland, OR	31	28	31	30	31	30	31	31	30	31	30	31
2009	14354200	Bear Creek Blw Ashland Creek At Ashland, OR	31	28	31	30	31	30	31	31	30	31	30	31
2009	14357500	Bear Creek At Medford, OR	31	28	31	30	31	30	31	31	30	31	30	31
2009	14358680	Griffin Cr At Central Point, OR	31	28	31	30	31	30	31	31	30	31	30	31
2009	14358750	Jackson Cr At Central Point, OR	31	28	31	23	31	30	31	31	30	31	30	31
2009	14358800	Bear Cr Ab Mouth Nr Central Point, OR	31	28	31	30	31	30	31	31	30	31	30	31
2009	14359000	Rogue River At Raygold Near Central Point, OR	31	28	31	30	31	30	31	31	30	31	30	31
2009	14360500	Evans Cr At Wimer, OR							11	31	30	31	30	31
2009	14361500	Rogue River At Grants Pass, OR	31	28	31	30	31	30	31	31	30	31	30	31
2009	14362000	Applegate River Near Copper, OR	31	28	31	30	31	30	31	31	30	31	30	31
2009	14362250	Star Gulch Near Ruch, OR	31	28	31	30	31	30	31	31	30	31	30	31
2009	14365500	Little Applegate R Nr Ruch, OR				30		30	30	31	30	31	30	31
2009	14366000	Applegate River Near Applegate, OR	31	28	31	30	31	30	31	31	30	31	30	31
2009	14369500	Applegate River Near Wilderville, OR	31	28	31	30	31	30	31	31	30	31	30	31
2009	14372300	Rogue River Near Agness, OR	31	28	31	30	31	30	31	31	30	31	30	31
2009	14372500	E Fk Illinois R Nr Takilma, OR	31	28	31	30	31	30	31	31	30	31	30	31
2009	14375100	Sucker Creek Blw Little Grayback Ck, Nr Holland,OR	31	28	31	30	31	30	31	31	30	31	30	31
2009	14375200	Sucker Cr At Bridgeview, OR	31	26	27							1		1
2009	14377100	Illinois River Near Kerby, OR	31	28	31	30	31	30	31	31	30	31	30	31
2009	AGA	Agate Dam And Reservoir Near Medford, OR	31	28	31	30	31	30	31	31	30	31	30	31
2009	EMI	Emigrant Dam And Lake Near Ashland, OR	31	28	31	30	31	30	31	31	30	31	30	31
2010	14330000	Rogue River Below Prospect, OR	31	28	31	30	31	30	31	31	30	31	30	31

Year	Station ID	Station	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2010	14332000	South Fork Rogue River Near Prospect, OR	31	28	31	30	31	30	31	31	30	31	30	31
2010	14335200	S Fk Big Butte Cr Ab Willow Cr Nr Butte Falls, OR	31	28	31	30	31	30	31	31	30	31	30	31
2010	14337500	Big Butte Creek Near Mcleod, OR	31	28	31	30	31	30	31	31	30	31	30	31
2010	14337600	Rogue River Near Mcleod, OR	31	28	31	30	31	30	31	31	30	31	30	31
2010	14338000	Elk Creek Near Trail, OR	31	28	31	30	31	30	31	31	30	31	30	31
2010	14339000	Rogue River At Dodge Bridge, Near Eagle Point, OR	31	28	31	30	31	30	31	31	30	31	30	31
2010	14340800	S Fk Little Butte Cr Ab Soda Cr Nr Lakecreek, OR	31	28	31	30	31	30	31	31	30	31	30	31
2010	14341610	S Fk Little Butte Cr At Mouth Nr Lakecreek, OR	31	28	31	30	31	30	31	31	30	31	30	31
2010	14342500	N Fk Little Butte Cr At Fish Lake Nr Lakecreek, OR	31	28	31	30	31	30	31	31	30	31	30	31
2010	14343000	N Fk Little Butte Cr Nr Lakecreek, OR	31	28	31	30	31	30	31	31	30	31	30	31
2010	14346700	Little Butte Cr At Lakecreek, OR	31	28	31	30	31	30	31	31	30	31	30	31
2010	14348000	Little Butte Cr Bl Eagle Point, OR	31	28	31	30	31	30	31	31	30	31	30	31
2010	14348080	Antelope Cr Bl Rogue River Valley Irr Dist Div Nr White City, OR	31	28	31	30	31	30	31	31	30	31	30	31
2010	14348150	Antelope Cr Nr Eagle Point, OR	31	28	31	30	31	30	31	31	30	31	30	31
2010	14348400	Emigrant Cr Ab Green Springs Powerplant Nr Ashland, OR	31	28	31	30	31	30	31	31	30	31	30	31
2010	14353000	West Fork Ashland Creek Near Ashland, OR	31	28	31	30	31	30	31	31	30	31	30	31
2010	14353500	East Fork Ashland Creek Near Ashland, OR	31	28	31	30	31	30	31	31	30	31	30	31
2010	14354200	Bear Creek Blw Ashland Creek At Ashland, OR	31	28	31	30	31	30	31	31	30	31	30	31
2010	14357500	Bear Creek At Medford, OR	31	28	31	30	31	30	31	31	30	31	30	31
2010	14358610	Griffin Cr Bl Murphy Cr Nr Medford					7	30	31	31	30	31	30	31
2010	14358680	Griffin Cr At Central Point, OR	31	28	31	30	31	30	31	31	30	31	30	31
2010	14358725	Jackson Cr At Jacksonville, OR					13	30	31	31	30	31	30	31
2010	14358750	Jackson Cr At Central Point, OR	31	28	31	30	31	30	31	31	30	31	30	31
2010	14358800	Bear Cr Ab Mouth Nr Central Point, OR	31	28	31	30	31	30	31	31	30	31	30	31
2010	14359000	Rogue River At Raygold Near Central Point, OR	31	28	31	30	31	30	31	31	30	31	30	31

Year	Station ID	Station	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2010	14360500	Evans Cr At Wimer, OR	31	28	31	30	31	30	31	31	30	31	30	31
2010	14361500	Rogue River At Grants Pass, OR	31	28	31	30	31	30	31	31	30	31	30	31
2010	14362000	Applegate River Near Copper, OR	31	28	31	30	31	30	31	31	30	31	30	31
2010	14362250	Star Gulch Near Ruch, OR	31	28	31	30	31	30	31	31	30	31	30	31
2010	14365500	Little Applegate R Nr Ruch, OR	31	28	31	30	31	30	31	31	30	31	30	31
2010	14366000	Applegate River Near Applegate, OR	31	28	31	30	31	30	31	31	30	31	30	31
2010	14369500	Applegate River Near Wilderville, OR	31	28	31	30	31	30	31	31	30	31	30	31
2010	14372300	Rogue River Near Agness, OR	31	28	31	30	31	30	31	31	30	31	30	31
2010	14372500	E Fk Illinois R Nr Takilma, OR	31	28	31	30	31	30	31	31	30	31	30	31
2010	14375100	Sucker Creek Blw Little Grayback Ck, Nr Holland,OR	31	28	31	30	31	30	31	31	30	31	30	31
2010	14375200	Sucker Cr At Bridgeview, OR	1	1	3	30	31	30	31	31	30	31	30	31
2010	14377100	Illinois River Near Kerby, OR	31	28	31	30	31	30	31	31	30	31	30	31
2010	AGA	Agate Dam And Reservoir Near Medford, OR	31	28	31	30	31	30	31	31	30	31	30	31
2010	EMI	Emigrant Dam And Lake Near Ashland, OR	31	28	31	30	31	30	31	31	30	31	30	31
2011	14330000	Rogue River Below Prospect, OR	31	28	31	30	31	30	31	31	30	31	30	31
2011	14332000	South Fork Rogue River Near Prospect, OR	31	28	31	30	31	30	31	31	30	31	30	31
2011	14335072	Rogue R At Cole M Rivers F Hatchery Nr Mcleod, OR												16
2011	14335200	S Fk Big Butte Cr Ab Willow Cr Nr Butte Falls, OR	31	28	31	30	31	30	31	31	30	31	30	31
2011	14337500	Big Butte Creek Near Mcleod, OR	31	28	31	30	31	30	31	31	30	31	30	31
2011	14337600	Rogue River Near Mcleod, OR	31	28	31	30	31	30	31	31	30	31	30	31
2011	14338000	Elk Creek Near Trail, OR	31	28	31	30	31	30	31	31	30	31	30	31
2011	14339000	Rogue River At Dodge Bridge, Near Eagle Point, OR	31	28	31	30	31	30	31	31	30	31	30	31
2011	14340800	S Fk Little Butte Cr Ab Soda Cr Nr Lakecreek, OR	31	28	31	30	31	30	31	31	30	31	30	31
2011	14341610	S Fk Little Butte Cr At Mouth Nr Lakecreek, OR	31	28	31	30	31	30	31	31	30	31	30	31
2011	14342500	N Fk Little Butte Cr At Fish Lake Nr Lakecreek, OR	31	28	31	30	31	30	31	31	30	31	30	31

Year	Station ID	Station	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2011	14343000	N Fk Little Butte Cr Nr Lakecreek, OR	31	28	31	30	31	30	31	31	30	31	30	31
2011	14346700	Little Butte Cr At Lakecreek, OR	31	28	31	30	31	30	31	31	30	31	30	31
2011	14348000	Little Butte Cr Bl Eagle Point, OR	31	28	31	30	31	30	31	31	30	31	30	31
2011	14348080	Antelope Cr Bl Rogue River Valley Irr Dist Div Nr White City, OR	31	28	31	30	31	30	31	31	30	31	30	31
2011	14348150	Antelope Cr Nr Eagle Point, OR	31	28	31	30	31	30	31	31	30	31	30	31
2011	14348400	Emigrant Cr Ab Green Springs Powerplant Nr Ashland, OR	31	28	31	30	31	30	31	31	30	31	30	31
2011	14353000	West Fork Ashland Creek Near Ashland, OR	31	28	31	30	31	30	31	31	30	31	30	31
2011	14353500	East Fork Ashland Creek Near Ashland, OR	31	28	31	30	31	30	31	31	30	31	30	31
2011	14354200	Bear Creek Blw Ashland Creek At Ashland, OR	31	28	31	30	31	30	31	31	30	31	30	31
2011	14357500	Bear Creek At Medford, OR	31	28	31	30	31	30	31	31	30	31	30	31
2011	14358610	Griffin Cr Bl Murphy Cr Nr Medford	31	28	31	30	31	30	31	31	30	31	30	31
2011	14358680	Griffin Cr At Central Point, OR	31	28	31	30	31	30	31	31	30	31	30	31
2011	14358725	Jackson Cr At Jacksonville, OR	31	28	31	30	31	30	31	31	30	31	30	31
2011	14358750	Jackson Cr At Central Point, OR	31	28	31	30	31	30	31	31	30	31	30	31
2011	14358800	Bear Cr Ab Mouth Nr Central Point, OR	31	28	31	30	31	30	31	31	30	31	30	31
2011	14359000	Rogue River At Raygold Near Central Point, OR	31	28	31	30	31	30	31	31	30	31	30	31
2011	14360500	Evans Cr At Wimer, OR	31	28	31	30	31	30	31	31	30	31	30	31
2011	14361500	Rogue River At Grants Pass, OR	31	28	31	30	31	30	31	31	30	31	30	31
2011	14362000	Applegate River Near Copper, OR	31	28	31	30	31	30	31	31	30	31	30	31
2011	14362250	Star Gulch Near Ruch, OR	31	28	31	30	31	30	31	31	30	31	30	31
2011	14363450	Mcdonald Cr Nr Talent, OR								13	30	31	30	31
2011	14365500	Little Applegate R Nr Ruch, OR	31	28	31	30	31	30	31	31	30	31	30	31
2011	14366000	Applegate River Near Applegate, OR	31	28	31	30	31	30	31	31	30	31	30	31
2011	14369500	Applegate River Near Wilderville, OR	31	28	31	30	31	30	31	31	30	31	30	31
2011	14372300	Rogue River Near Agness, OR	31	28	31	30	31	30	31	31	30	31	30	31
2011	14372500	E Fk Illinois R Nr Takilma, OR	31	28	31	30	31	30	31	31	30	31	30	31

Year	Station ID	Station	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2011	14375100	Sucker Creek Blw Little Grayback Ck, Nr Holland,OR	31	28	31	30	31	30	31	31	30	31	30	31
2011	14375200	Sucker Cr At Bridgeview, OR	31	28	31	30	31	30	31	31	30	31	30	31
2011	14377100	Illinois River Near Kerby, OR	31	28	31	30	31	30	31	31	30	31	30	31
2011	AGA	Agate Dam And Reservoir Near Medford, OR	31	28	31	30	31	30	31	31	30	31	30	31
2011	EMI	Emigrant Dam And Lake Near Ashland, OR	31	28	31	30	31	30	31	31	30	31	30	31
2012	14330000	Rogue River Below Prospect, OR	31	29	31	30	31	30	31	31	30	31	30	31
2012	14332000	South Fork Rogue River Near Prospect, OR	31	29	31	30	31	30	31	31	30	31	30	31
2012	14335072	Rogue R At Cole M Rivers F Hatchery Nr Mcleod, OR	31	29	31	30	31	30	31	31	30	31	30	31
2012	14335200	S Fk Big Butte Cr Ab Willow Cr Nr Butte Falls, OR	31	29	31	30	31	30	31	31	30	31	30	31
2012	14335230	Willow Cr Ab Willow Lk Nr Butte Falls												21
2012	14335235	Bieberstedt Cr Ab Willow Lk Nr Butte Falls											4	31
2012	14335250	Willow Cr Dam Outlet Nr Butte Falls, OR											14	31
2012	14337500	Big Butte Creek Near Mcleod, OR	31	29	31	30	31	30	31	31	30	31	30	31
2012	14337600	Rogue River Near Mcleod, OR	31	29	31	30	31	30	31	31	30	31	30	31
2012	14338000	Elk Creek Near Trail, OR	31	29	31	30	31	30	31	31	30	31	30	31
2012	14339000	Rogue River At Dodge Bridge, Near Eagle Point, OR	31	29	31	30	31	30	31	31	30	31	30	31
2012	14340800	S Fk Little Butte Cr Ab Soda Cr Nr Lakecreek, OR	31	29	31	30	31	30	31	31	30	31	30	31
2012	14341610	S Fk Little Butte Cr At Mouth Nr Lakecreek, OR	31	29	31	30	31	30	31	31	30	31	30	31
2012	14342500	N Fk Little Butte Cr At Fish Lake Nr Lakecreek, OR	31	29	31	30	31	30	31	31	30	31	30	31
2012	14343000	N Fk Little Butte Cr Nr Lakecreek, OR	31	29	31	30	31	30	31	31	30	31	30	31
2012	14346700	Little Butte Cr At Lakecreek, OR	31	29	31	30	31	30	31	31	30	31	30	31
2012	14348000	Little Butte Cr Bl Eagle Point, OR	31	29	31	30	31	30	31	31	30	31	30	31
2012	14348080	Antelope Cr Bl Rogue River Valley Irr Dist Div Nr White City, OR	31	29	31	30	31	30	31	31	30	31	30	31
2012	14348150	Antelope Cr Nr Eagle Point, OR	31	29	31	30	31	30	31	31	30	31	30	31

Year	Station ID	Station	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2012	14348400	Emigrant Cr Ab Green Springs Powerplant Nr Ashland, OR	31	29	31	30	31	30	31	31	30	31	30	31
2012	14353000	West Fork Ashland Creek Near Ashland, OR	31	29	31	30	31	30	31	31	30	31	30	31
2012	14353500	East Fork Ashland Creek Near Ashland, OR	31	29	31	30	31	30	31	31	30	31	30	31
2012	14354200	Bear Creek Blw Ashland Creek At Ashland, OR	31	29	31	30	31	30	31	31	30	31	30	31
2012	14357500	Bear Creek At Medford, OR	31	29	31	30	31	30	31	31	30	31	30	31
2012	14358610	Griffin Cr Bl Murphy Cr Nr Medford	31	29	31	30	31	30	31	31	30	31	30	31
2012	14358680	Griffin Cr At Central Point, OR	31	29	31	30	31	30	31	31	30	31	30	31
2012	14358725	Jackson Cr At Jacksonville, OR	31	29	31	30	31	30	31	31	30	31	30	31
2012	14358750	Jackson Cr At Central Point, OR	31	29	31	30	31	30	31	31	30	31	30	31
2012	14358800	Bear Cr Ab Mouth Nr Central Point, OR	31	29	31	30	31	30	31	31	30	31	30	31
2012	14359000	Rogue River At Raygold Near Central Point, OR	31	29	31	30	31	30	31	31	30	31	30	31
2012	14360500	Evans Cr At Wimer, OR	31	29	31	30	31	30	31	31	30	31	30	31
2012	14361500	Rogue River At Grants Pass, OR	31	29	31	30	31	30	31	31	30	31	30	31
2012	14362000	Applegate River Near Copper, OR	31	29	31	30	31	30	31	31	30	31	30	31
2012	14362250	Star Gulch Near Ruch, OR	31	29	31	30	31	30	31	31	30	31	30	31
2012	14363450	Mcdonald Cr Nr Talent, OR	31	29	31	30	31	30	31	31	30	31	30	31
2012	14365500	Little Applegate R Nr Ruch, OR	31	29	31	30	31	30	31	31	30	31	30	31
2012	14366000	Applegate River Near Applegate, OR	31	29	31	30	31	30	31	31	30	31	30	31
2012	14369500	Applegate River Near Wilderville, OR	31	29	31	30	31	30	31	31	30	31	30	31
2012	14372300	Rogue River Near Agness, OR	31	29	31	30	31	30	31	31	30	31	30	31
2012	14372500	E Fk Illinois R Nr Takilma, OR	31	29	31	30	31	30	31	31	30	31	30	31
2012	14375100	Sucker Creek Blw Little Grayback Ck, Nr Holland,OR	31	29	31	30	31	30	31	31	30	31	30	31
2012	14375200	Sucker Cr At Bridgeview, OR	31	29	31	30	31	30	31	31	30	31	30	31
2012	14377100	Illinois River Near Kerby, OR	31	29	31	30	31	30	31	31	30	31	30	31
2012	AGA	Agate Dam And Reservoir Near Medford, OR	31	29	31	30	31	30	31	31	30	31	30	31
2012	EMI	Emigrant Dam And Lake Near Ashland, OR	31	29	31	30	31	30	31	31	30	31	30	31

Year	Station ID	Station	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2013	14330000	Rogue River Below Prospect, OR	31	28	31	30	31	30	31	31	30	31	30	31
2013	14332000	South Fork Rogue River Near Prospect, OR	31	28	31	30	31	30	31	31	30	31	30	31
2013	14335072	Rogue R At Cole M Rivers F Hatchery Nr Mcleod, OR	31	28	31	30	31	30	31	31	30	31	30	31
2013	14335200	S Fk Big Butte Cr Ab Willow Cr Nr Butte Falls, OR	31	28	31	30	31	30	31	31	30	31	30	31
2013	14335230	Willow Cr Ab Willow Lk Nr Butte Falls	31	28	31	30	31	30	31	31	30	31	30	31
2013	14335235	Bieberstedt Cr Ab Willow Lk Nr Butte Falls	31	28	31	30	31	30	31	31	30	31	30	31
2013	14335250	Willow Cr Dam Outlet Nr Butte Falls, OR	31	28	31	30	31	30	31	31	30	31	30	31
2013	14335300	Willow Cr Nr Butte Falls, OR					3	30	31	31	30	31	30	31
2013	14335500	S Fk Big Butte Cr Nr Butte Falls, OR										31	30	31
2013	14337500	Big Butte Creek Near Mcleod, OR	31	28	31	30	31	30	31	31	30	31	30	31
2013	14337600	Rogue River Near Mcleod, OR	31	28	31	30	31	30	31	31	30	31	30	31
2013	14338000	Elk Creek Near Trail, OR	31	28	31	30	31	30	31	31	30	31	30	31
2013	14339000	Rogue River At Dodge Bridge, Near Eagle Point, OR	31	28	31	30	31	30	31	31	30	31	30	31
2013	14340800	S Fk Little Butte Cr Ab Soda Cr Nr Lakecreek, OR	31	28	31	30	31	30	31	31	30	31	30	31
2013	14341610	S Fk Little Butte Cr At Mouth Nr Lakecreek, OR	31	28	31	30	31	30	31	31	30	31	30	31
2013	14342500	N Fk Little Butte Cr At Fish Lake Nr Lakecreek, OR	31	28	31	30	31	30	31	31	30	31	30	31
2013	14343000	N Fk Little Butte Cr Nr Lakecreek, OR	31	28	31	30	31	30	31	31	30	31	30	31
2013	14346700	Little Butte Cr At Lakecreek, OR	31	28	31	30	31	30	31	31	30	31	30	31
2013	14348000	Little Butte Cr Bl Eagle Point, OR	31	28	31	30	31	30	31	31	30	31	30	31
2013	14348080	Antelope Cr Bl Rogue River Valley Irr Dist Div Nr White City, OR	31	28	31	30	31	30	31	31	30	31	30	31
2013	14348150	Antelope Cr Nr Eagle Point, OR	31	28	31	30	31	30	31	31	30	31	30	31
2013	14348400	Emigrant Cr Ab Green Springs Powerplant Nr Ashland, OR	31	28	31	30	31	30	31	31	30	31	30	31
2013	14353000	West Fork Ashland Creek Near Ashland, OR	31	28	31	30	31	30	31	31	30	31	30	31
2013	14353500	East Fork Ashland Creek Near Ashland, OR	31	28	31	30	31	30	31	31	30	31	30	31

Year	Station ID	Station	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2013	14354200	Bear Creek Blw Ashland Creek At Ashland, OR	31	28	31	30	31	30	31	31	30	31	30	31
2013	14357500	Bear Creek At Medford, OR	31	28	31	30	31	30	31	31	30	31	30	31
2013	14358610	Griffin Cr Bl Murphy Cr Nr Medford	31	28	31	30	31	30	31	31	30	31	30	31
2013	14358680	Griffin Cr At Central Point, OR	31	28	31	30	31	30	31	31	30	31	30	31
2013	14358725	Jackson Cr At Jacksonville, OR	31	28	31	30	31	30	31	31	30	31	30	31
2013	14358750	Jackson Cr At Central Point, OR	31	28	31	30	31	30	31	31	30	31	30	31
2013	14358800	Bear Cr Ab Mouth Nr Central Point, OR	31	28	31	30	31	30	31	31	30	31	30	31
2013	14359000	Rogue River At Raygold Near Central Point, OR	31	28	31	30	31	30	31	31	30	31	30	31
2013	14360500	Evans Cr At Wimer, OR	31	28	31	30	31	30	31	31	30	31	30	31
2013	14361500	Rogue River At Grants Pass, OR	31	28	31	30	31	30	31	31	30	31	30	31
2013	14362000	Applegate River Near Copper, OR	31	28	31	30	31	30	31	31	30	31	30	31
2013	14362250	Star Gulch Near Ruch, OR	31	28	31	30	31	30	31	31	30	31	30	31
2013	14363450	Mcdonald Cr Nr Talent, OR	31	28	31	30	31	30	31	31	30	31	30	31
2013	14365500	Little Applegate R Nr Ruch, OR	31	28	31	30	31	30	31	31	30	31	30	31
2013	14366000	Applegate River Near Applegate, OR	31	28	31	30	31	30	31	31	30	31	30	31
2013	14369500	Applegate River Near Wilderville, OR	31	28	31	30	31	30	31	31	30	31	30	31
2013	14372300	Rogue River Near Agness, OR	31	28	31	30	31	30	31	31	30	31	30	31
2013	14372500	E Fk Illinois R Nr Takilma, OR	31	28	31	30	31	30	31	31	30	31	30	31
2013	14375100	Sucker Creek Blw Little Grayback Ck, Nr Holland,OR	31	28	31	30	31	30	31	31	30	31	30	31
2013	14375200	Sucker Cr At Bridgeview, OR	31	28	31	30	31	30	31	31	30	31	30	31
2013	14377100	Illinois River Near Kerby, OR	31	28	31	30	31	30	31	31	30	31	30	31
2013	AGA	Agate Dam And Reservoir Near Medford, OR	31	28	31	30	31	30	31	31	30	31	30	31
2013	EMI	Emigrant Dam And Lake Near Ashland, OR	31	28	31	30	31	30	31	31	30	31	30	31
2014	14328000	Rogue River Above Prospect, OR								18	30	31	30	31
2014	14330000	Rogue River Below Prospect, OR	31	28	31	30	31	30	31	31	30	31	30	31
2014	14332000	South Fork Rogue River Near Prospect, OR	31	28	31	30	31	30	31	31	30	31	30	31

Year	Station ID	Station	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2014	14335072	Rogue R At Cole M Rivers F Hatchery Nr Mcleod, OR	31	28	31	30	31	30	31	31	30	31	30	31
2014	14335200	S Fk Big Butte Cr Ab Willow Cr Nr Butte Falls, OR	31	28	31	30	31	30	31	31	30	31	30	31
2014	14335230	Willow Cr Ab Willow Lk Nr Butte Falls	31	28	31	30	31	30	31	31	30	31	30	31
2014	14335235	Bieberstedt Cr Ab Willow Lk Nr Butte Falls	31	28	31	30	31	30	31	31	30	31	30	31
2014	14335250	Willow Cr Dam Outlet Nr Butte Falls, OR	31	28	31	30	31	30	31	31	30	31	30	31
2014	14335300	Willow Cr Nr Butte Falls, OR	31	28	31	30	31	30	31	31	30	31	30	31
2014	14335500	S Fk Big Butte Cr Nr Butte Falls, OR	31	28	31	30	31	30	31	31	30	31	30	31
2014	14336700	N Fk Big Butte Cr Nr Butte Falls, OR												16
2014	14337500	Big Butte Creek Near Mcleod, OR	31	28	31	30	31	30	31	31	30	31	30	31
2014	14337600	Rogue River Near Mcleod, OR	31	28	31	30	31	30	31	31	30	31	30	31
2014	14338000	Elk Creek Near Trail, OR	31	28	31	30	31	30	31	31	30	31	30	31
2014	14339000	Rogue River At Dodge Bridge, Near Eagle Point, OR	31	28	31	30	31	30	31	31	30	31	30	31
2014	14340800	S Fk Little Butte Cr Ab Soda Cr Nr Lakecreek, OR	31	28	31	30	31	30	31	31	30	31	30	31
2014	14341610	S Fk Little Butte Cr At Mouth Nr Lakecreek, OR	31	28	31	30	31	30	31	31	30	31	30	31
2014	14342500	N Fk Little Butte Cr At Fish Lake Nr Lakecreek, OR	31	28	31	30	31	30	31	31	30	31	30	31
2014	14343000	N Fk Little Butte Cr Nr Lakecreek, OR	31	28	31	30	31	30	31	31	30	31	30	31
2014	14346700	Little Butte Cr At Lakecreek, OR	31	28	31	30	31	30	31	31	30	31	30	31
2014	14347798	Little Butte Cr Mill Race At Eagle Point, OR										3	30	31
2014	14347800	Little Butte Cr At Eagle Point, OR									29	3	30	31
2014	14348000	Little Butte Cr Bl Eagle Point, OR	31	28	31	30	31	30	31	31	30	31	30	31
2014	14348080	Antelope Cr Bl Rogue River Valley Irr Dist Div Nr White City, OR	31	28	31	30	31	30	31	31	30	31	30	31
2014	14348150	Antelope Cr Nr Eagle Point, OR	31	28	31	30	31	30	31	31	30	31	30	31
2014	14348400	Emigrant Cr Ab Green Springs Powerplant Nr Ashland, OR	31	28	31	30	31	30	31	31	30	31	30	31
2014	14353000	West Fork Ashland Creek Near Ashland, OR	31	28	31	30	31	30	31	31	30	31	30	31

Year	Station ID	Station	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2014	14353500	East Fork Ashland Creek Near Ashland, OR	31	28	31	30	31	30	31	31	30	31	30	31
2014	14354200	Bear Creek Blw Ashland Creek At Ashland, OR	31	28	31	30	31	30	31	31	30	31	30	31
2014	14357500	Bear Creek At Medford, OR	31	28	31	30	31	30	31	31	30	31	30	31
2014	14358610	Griffin Cr Bl Murphy Cr Nr Medford	31	28	31	30	31	30	31	31	30	31	30	31
2014	14358680	Griffin Cr At Central Point, OR	31	28	31	30	31	30	31	31	30	31	30	31
2014	14358725	Jackson Cr At Jacksonville, OR	31	28	31	30	31	30	31	31	30	31	30	31
2014	14358750	Jackson Cr At Central Point, OR	31	28	31	30	31	30	31	31	30	31	30	31
2014	14358800	Bear Cr Ab Mouth Nr Central Point, OR	31	28	31	30	31	30	31	31	30	31	30	31
2014	14359000	Rogue River At Raygold Near Central Point, OR	31	28	31	30	31	30	31	31	30	31	30	31
2014	14360500	Evans Cr At Wimer, OR	31	28	31	30	31	30	31	31	30	31	30	31
2014	14361500	Rogue River At Grants Pass, OR	31	28	31	30	31	30	31	31	30	31	30	31
2014	14362000	Applegate River Near Copper, OR	31	28	31	30	31	30	31	31	30	31	30	31
2014	14362250	Star Gulch Near Ruch, OR	31	28	31	30	31	30	31	31	30	31	30	31
2014	14363450	Mcdonald Cr Nr Talent, OR	31	28	31	30	31	30	31	31	30	31	30	31
2014	14365500	Little Applegate R Nr Ruch, OR	31	28	31	30	31	30	31	31	30	31	30	31
2014	14366000	Applegate River Near Applegate, OR	31	28	31	30	31	30	31	31	30	31	30	31
2014	14368300	Williams Cr At Williams, OR										1	1	
2014	14369500	Applegate River Near Wilderville, OR	31	28	31	30	31	30	31	31	30	31	30	31
2014	14372300	Rogue River Near Agness, OR	31	28	31	30	31	30	31	31	30	31	30	31
2014	14372500	E Fk Illinois R Nr Takilma, OR	31	28	31	30	31	30	31	31	30	31	30	31
2014	14375100	Sucker Creek Blw Little Grayback Ck, Nr Holland,OR	31	28	31	30	31	30	31	31	30	31	30	31
2014	14375200	Sucker Cr At Bridgeview, OR	31	28	31	30	31	30	31	31	30	31	30	31
2014	14377100	Illinois River Near Kerby, OR	31	28	31	30	31	30	31	31	30	31	30	31
2014	AGA	Agate Dam And Reservoir Near Medford, OR	31	28	31	30	31	30	31	31	30	31	30	31
2014	EMI	Emigrant Dam And Lake Near Ashland, OR	31	28	31	30	31	30	31	31	30	31	30	31
2015	14328000	Rogue River Above Prospect, OR	31	28	31	30	31	30	31	31	30	31	30	31
2015	14330000	Rogue River Below Prospect, OR	31	28	31	30	31	30	31	31	30	31	30	31

Year	Station ID	Station	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2015	14332000	South Fork Rogue River Near Prospect, OR	31	28	31	30	31	30	31	31	30	31	30	31
2015	14335072	Rogue R At Cole M Rivers F Hatchery Nr Mcleod, OR	31	28	31	30	31	30	31	31	30	31	30	31
2015	14335200	S Fk Big Butte Cr Ab Willow Cr Nr Butte Falls, OR	31	28	31	30	31	30	31	31	30	31	30	31
2015	14335230	Willow Cr Ab Willow Lk Nr Butte Falls	31	28	31	30	31	30	31	31	30	31	30	31
2015	14335235	Bieberstedt Cr Ab Willow Lk Nr Butte Falls	31	28	31	30	31	30	31	31	30	31	30	31
2015	14335250	Willow Cr Dam Outlet Nr Butte Falls, OR	31	28	31	30	31	30	31	31	30	31	30	31
2015	14335300	Willow Cr Nr Butte Falls, OR	31	28	31	30	31	30	31	31	30	31	30	31
2015	14335500	S Fk Big Butte Cr Nr Butte Falls, OR	31	28	31	30	31	30	31	31	30	31	30	31
2015	14336100	Eagle Point I D Cn Bl C Rd Nr Butte Falls, OR		24	31	30	31	30	31	31	30	31	30	31
2015	14336700	N Fk Big Butte Cr Nr Butte Falls, OR	31	28	31	30	31	30	31	31	30	31	30	31
2015	14337000	Big Butte Cr Bl Butte Falls, OR	31	28	31	30	31	30	31	31	30	31	30	31
2015	14337500	Big Butte Creek Near Mcleod, OR	31	28	31	30	31	30	31	31	30	31	30	31
2015	14337600	Rogue River Near Mcleod, OR	31	28	31	30	31	30	31	31	30	31	30	31
2015	14338000	Elk Creek Near Trail, OR	31	28	31	30	31	30	31	31	30	31	30	31
2015	14339000	Rogue River At Dodge Bridge, Near Eagle Point, OR	31	28	31	30	31	30	31	31	30	31	30	31
2015	14340800	S Fk Little Butte Cr Ab Soda Cr Nr Lakecreek, OR	31	28	31	30	31	30	31	31	30	31	30	31
2015	14341610	S Fk Little Butte Cr At Mouth Nr Lakecreek, OR	31	28	31	30	31	30	31	31	29	31	30	31
2015	14342500	N Fk Little Butte Cr At Fish Lake Nr Lakecreek, OR	31	28	31	30	31	30	31	31	30	31	30	31
2015	14343000	N Fk Little Butte Cr Nr Lakecreek, OR	31	28	31	30	31	30	31	31	30	31	30	31
2015	14346700	Little Butte Cr At Lakecreek, OR	31	28	31	30	31	30	31	31	30	31	30	31
2015	14347798	Little Butte Cr Mill Race At Eagle Point, OR	31	28	31	30	31	30	31	31	30	31	30	31
2015	14347800	Little Butte Cr At Eagle Point, OR	31	28	31	30	31	30	31	31	30	31	30	31
2015	14348000	Little Butte Cr Bl Eagle Point, OR	31	28	31	30	31	30	31	31	30	31	30	31
2015	14348080	Antelope Cr Bl Rogue River Valley Irr Dist Div Nr White City, OR	31	28	31	30	31	30	31	31	30	31	30	31
2015	14348150	Antelope Cr Nr Eagle Point, OR	31	27	31	30	31	30	31	31	30	31	30	31

Year	Station ID	Station	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2015	14348400	Emigrant Cr Ab Green Springs Powerplant Nr Ashland, OR	31	28	31	30	31	30	31	31	30	31	30	30
2015	14353000	West Fork Ashland Creek Near Ashland, OR	31	28	31	30	31	30	31	31	30	31	30	31
2015	14353500	East Fork Ashland Creek Near Ashland, OR	31	28	31	30	31	30	31	31	30	31	30	31
2015	14354200	Bear Creek Blw Ashland Creek At Ashland, OR	31	28	31	30	31	30	31	31	30	31	30	31
2015	14357500	Bear Creek At Medford, OR	31	28	31	30	31	30	31	31	30	31	30	31
2015	14358610	Griffin Cr Bl Murphy Cr Nr Medford	31	28	31	30	31	30	31	31	30	31	30	31
2015	14358680	Griffin Cr At Central Point, OR	31	28	31	30	31	30	31	31	30	31	30	31
2015	14358725	Jackson Cr At Jacksonville, OR	31	28	31	30	31	30	31	31	30	31	30	31
2015	14358750	Jackson Cr At Central Point, OR	31	28	31	30	31	30	31	31	30	31	30	31
2015	14358800	Bear Cr Ab Mouth Nr Central Point, OR	31	28	31	30	31	30	31	31	30	31	30	31
2015	14359000	Rogue River At Raygold Near Central Point, OR	31	28	31	30	31	30	31	31	30	31	30	31
2015	14360500	Evans Cr At Wimer, OR	31	28	31	30	31	30	31	31	30	31	30	31
2015	14361500	Rogue River At Grants Pass, OR	31	28	31	30	31	30	31	31	30	31	30	31
2015	14362000	Applegate River Near Copper, OR	31	28	31	30	31	30	31	31	30	31	30	31
2015	14362250	Star Gulch Near Ruch, OR	31	28	31	30	31	30	31	31	30	31	30	31
2015	14363450	Mcdonald Cr Nr Talent, OR	31	28	31	30	31	30	31	31	30	31	30	31
2015	14365500	Little Applegate R Nr Ruch, OR	31	28	31	30	31	30	31	31	30	31	30	31
2015	14366000	Applegate River Near Applegate, OR	31	28	31	30	31	30	31	31	30	31	30	31
2015	14368300	Williams Cr At Williams, OR	31	28	31	30	31	30	31	31	30	31	30	31
2015	14369500	Applegate River Near Wilderville, OR	31	28	31	30	31	30	31	31	30	31	30	31
2015	14372300	Rogue River Near Agness, OR	31	28	31	30	31	30	31	31	30	31	30	31
2015	14372500	E Fk Illinois R Nr Takilma, OR	31	28	31	30	31	30	31	31	30	31	30	31
2015	14375100	Sucker Creek Blw Little Grayback Ck, Nr Holland,OR	31	28	31	30	31	30	31	31	30	31	30	31
2015	14375200	Sucker Cr At Bridgeview, OR	31	28	31	30	31	30	31	31	30	31	30	31
2015	14377100	Illinois River Near Kerby, OR	31	28	31	30	31	30	31	31	30	31	30	31
2015	AGA	Agate Dam And Reservoir Near Medford, OR	31	28	31	30	31	30	31	31	30	31	30	31

Year	Station ID	Station	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2015	EMI	Emigrant Dam And Lake Near Ashland, OR	31	28	31	30	31	30	31	31	30	31	30	31
2016	14328000	Rogue River Above Prospect, OR	31	29	31	30	31	30	31	31	30	31	30	31
2016	14330000	Rogue River Below Prospect, OR	31	29	31	30	31	30	31	31	30	31	30	30
2016	14332000	South Fork Rogue River Near Prospect, OR	31	29	31	30	31	30	31	31	30	31	30	31
2016	14335072	Rogue R At Cole M Rivers F Hatchery Nr Mcleod, OR	31	29	31	30	31	30	31	31	30	31	30	31
2016	14335200	S Fk Big Butte Cr Ab Willow Cr Nr Butte Falls, OR	31	29	31	30	31	30	31	31	30	31	30	31
2016	14335230	Willow Cr Ab Willow Lk Nr Butte Falls	31	29	31	30	31	30	31	31	30	31	30	31
2016	14335235	Bieberstedt Cr Ab Willow Lk Nr Butte Falls	31	29	31	30	31	30	31	31	30	31	30	31
2016	14335250	Willow Cr Dam Outlet Nr Butte Falls, OR	31	29	31	30	31	30	31	31	30	31	30	31
2016	14335300	Willow Cr Nr Butte Falls, OR	31	29	31	30	31	30	31	31	30	31	30	31
2016	14335500	S Fk Big Butte Cr Nr Butte Falls, OR	31	29	31	30	31	30	31	31	30	31	30	31
2016	14336100	Eagle Point I D Cn Bl C Rd Nr Butte Falls, OR	31	29	31	30	31	30	31	31	30	31	30	31
2016	14336700	N Fk Big Butte Cr Nr Butte Falls, OR	31	29	31	30	31	30	31	31	30	31	30	31
2016	14337000	Big Butte Cr Bl Butte Falls, OR	31	29	31	30	31	30	31	31	30	31	30	31
2016	14337500	Big Butte Creek Near Mcleod, OR	31	29	31	30	31	30	31	31	30	31	30	31
2016	14337600	Rogue River Near Mcleod, OR	31	29	31	30	31	30	31	31	30	31	30	31
2016	14338000	Elk Creek Near Trail, OR	31	29	31	30	31	30	31	31	30	31	30	31
2016	14339000	Rogue River At Dodge Bridge, Near Eagle Point, OR	31	29	31	30	31	30	31	31	30	31	30	31
2016	14340800	S Fk Little Butte Cr Ab Soda Cr Nr Lakecreek, OR	31	29	31	30	31	30	31	31	30	31	30	31
2016	14341610	S Fk Little Butte Cr At Mouth Nr Lakecreek, OR	31	29	31	30	31	30	31	31	30	31	30	31
2016	14342500	N Fk Little Butte Cr At Fish Lake Nr Lakecreek, OR	31	29	31	30	31	30	31	31	30	31	30	31
2016	14343000	N Fk Little Butte Cr Nr Lakecreek, OR	31	29	31	30	31	30	31	31	30	31	30	31
2016	14346700	Little Butte Cr At Lakecreek, OR	31	29	31	30	31	30	31	31	30	31	30	31
2016	14347798	Little Butte Cr Mill Race At Eagle Point, OR	31	29	31	30	31	30	31	31	30	31	30	31
2016	14347800	Little Butte Cr At Eagle Point, OR	31	29	31	30	31	30	31	31	30	31	30	31
2016	14348000	Little Butte Cr Bl Eagle Point, OR	31	29	31	30	31	30	31	31	30	31	30	31

Year	Station ID	Station	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2016	14348080	Antelope Cr Bl Rogue River Valley Irr Dist Div Nr White City, OR	31	29	31	30	31	30	31	31	30	31	30	31
2016	14348150	Antelope Cr Nr Eagle Point, OR	31	29	31	30	31	30	31	31	30	31	30	31
2016	14348400	Emigrant Cr Ab Green Springs Powerplant Nr Ashland, OR	31	29	31	30	31	30	31	31	30	31	30	31
2016	14353000	West Fork Ashland Creek Near Ashland, OR	31	29	31	30	31	30	31	31	30	31	30	31
2016	14353500	East Fork Ashland Creek Near Ashland, OR	31	29	31	30	31	30	31	31	30	31	30	31
2016	14354200	Bear Creek Blw Ashland Creek At Ashland, OR	31	29	31	30	31	30	31	31	30	31	30	31
2016	14357500	Bear Creek At Medford, OR	31	29	31	30	31	30	31	31	30	31	30	31
2016	14358610	Griffin Cr Bl Murphy Cr Nr Medford	31	29	31	30	31	30	31	31	30	31	30	30
2016	14358680	Griffin Cr At Central Point, OR	31	29	31	30	31	30	31	31	30	31	30	31
2016	14358725	Jackson Cr At Jacksonville, OR	31	29	31	30	31	30	31	31	30	31	30	31
2016	14358750	Jackson Cr At Central Point, OR	31	29	31	30	31	30	31	31	30	31	30	31
2016	14358800	Bear Cr Ab Mouth Nr Central Point, OR	31	29	31	30	31	30	31	31	30	31	30	31
2016	14359000	Rogue River At Raygold Near Central Point, OR	31	29	31	30	31	30	31	31	30	31	30	31
2016	14360500	Evans Cr At Wimer, OR	31	29	31	30	31	30	31	31	30	31	30	31
2016	14361500	Rogue River At Grants Pass, OR	31	29	31	30	31	30	31	31	30	31	30	31
2016	14362000	Applegate River Near Copper, OR	31	29	31	30	31	30	31	31	30	31	30	31
2016	14362250	Star Gulch Near Ruch, OR	31	29	31	30	31	30	31	31	30	31	30	31
2016	14363450	Mcdonald Cr Nr Talent, OR	31	29	31	30	31	30	31	31	30	31	30	31
2016	14365500	Little Applegate R Nr Ruch, OR	31	29	31	30	31	30	31	31	30	31	30	31
2016	14366000	Applegate River Near Applegate, OR	31	29	31	30	31	30	31	31	30	31	30	31
2016	14368300	Williams Cr At Williams, OR	31	29	31	30	31	30	31	31	30	31	30	31
2016	14369500	Applegate River Near Wilderville, OR	31	29	31	30	31	30	31	31	30	31	30	31
2016	14372300	Rogue River Near Agness, OR	31	29	31	30	31	30	31	31	30	31	30	31
2016	14372500	E Fk Illinois R Nr Takilma, OR	31	29	31	30	31	30	31	31	30	31	30	31
2016	14375100	Sucker Creek Blw Little Grayback Ck, Nr Holland,OR	31	29	31	30	31	30	31	31	30	31	30	31
2016	14375200	Sucker Cr At Bridgeview, OR	31	29	31	30	31	30	31	31	30	31	30	31

Year	Station ID	Station	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2016	14377100	Illinois River Near Kerby, OR	31	29	31	30	31	30	31	31	30	31	30	31
2016	AGA	Agate Dam And Reservoir Near Medford, OR	31	29	31	30	31	30	31	31	30	31	30	31
2016	EMI	Emigrant Dam And Lake Near Ashland, OR	31	29	31	30	31	30	31	31	30	31	30	31
2017	14328000	Rogue River Above Prospect, OR	31	20	31	30	31	30	31	31	30	31	30	31
2017	14330000	Rogue River Below Prospect, OR	31	28	31	30	31	30	31	31	30	31	30	31
2017	14332000	South Fork Rogue River Near Prospect, OR	31	28	31	30	31	30	31	31	30	31	30	31
2017	14335072	Rogue R At Cole M Rivers F Hatchery Nr Mcleod, OR	31	28	31	30	31	30	31	31	30	31	30	31
2017	14335200	S Fk Big Butte Cr Ab Willow Cr Nr Butte Falls, OR	31	28	31	30	31	30	31	31	30	31	30	31
2017	14335230	Willow Cr Ab Willow Lk Nr Butte Falls	31	28	31	30	31	30	31	31	30	31	30	31
2017	14335235	Bieberstedt Cr Ab Willow Lk Nr Butte Falls	31	28	31	30	31	30	31	31	30	31	30	31
2017	14335250	Willow Cr Dam Outlet Nr Butte Falls, OR	31	28	31	30	31	30	31	31	30	31	30	31
2017	14335300	Willow Cr Nr Butte Falls, OR	31	28	31	30	31	30	31	31	30	31	30	31
2017	14335500	S Fk Big Butte Cr Nr Butte Falls, OR	31	28	31	30	31	30	31	31	30	31	30	31
2017	14336100	Eagle Point I D Cn Bl C Rd Nr Butte Falls, OR	31	28	31	30	31	30	31	31	30	31	30	31
2017	14336700	N Fk Big Butte Cr Nr Butte Falls, OR	31	28	31	30	31	30	31	31	30	31	30	31
2017	14337000	Big Butte Cr Bl Butte Falls, OR	31	28	31	30	31	30	31	31	30	31	30	31
2017	14337500	Big Butte Creek Near Mcleod, OR	31	28	31	30	31	30	31	31	30	31	30	31
2017	14337600	Rogue River Near Mcleod, OR	31	28	31	30	31	30	31	31	30	31	30	31
2017	14338000	Elk Creek Near Trail, OR	31	28	31	30	31	30	31	31	30	31	30	31
2017	14339000	Rogue River At Dodge Bridge, Near Eagle Point, OR	31	28	31	30	31	30	31	31	30	31	30	31
2017	14340800	S Fk Little Butte Cr Ab Soda Cr Nr Lakecreek, OR	31	28	31	30	31	30	31	31	30	31	30	31
2017	14341610	S Fk Little Butte Cr At Mouth Nr Lakecreek, OR	31	28	31	30	31	30	31	31	30	31	30	31
2017	14342500	N Fk Little Butte Cr At Fish Lake Nr Lakecreek, OR	31	28	31	30	31	30	31	31	30	31	30	31
2017	14343000	N Fk Little Butte Cr Nr Lakecreek, OR	31	28	31	30	31	30	31	31	30	31	30	31
2017	14346700	Little Butte Cr At Lakecreek, OR	31	28	31	30	31	30	31	31	30	31	30	31
2017	14346900	Little Butte Cr At Brownsboro, OR											24	31

Year	Station ID	Station	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2017	14347798	Little Butte Cr Mill Race At Eagle Point, OR	31	28	31	30	31	30	31	31	30	31	30	31
2017	14347800	Little Butte Cr At Eagle Point, OR	31	28	31	30	31	30	31	31	30	31	30	31
2017	14348000	Little Butte Cr Bl Eagle Point, OR	31	28	31	30	31	30	31	31	30	31	30	31
2017	14348080	Antelope Cr Bl Rogue River Valley Irr Dist Div Nr White City, OR	31	28	31	30	31	30	31	31	30	31	30	31
2017	14348150	Antelope Cr Nr Eagle Point, OR	31	28	31	30	31	30	31	31	30	31	30	31
2017	14348400	Emigrant Cr Ab Green Springs Powerplant Nr Ashland, OR	31	28	31	30	31	30	31	31	30	31	30	31
2017	14348430	Unnamed Trib To Wbr Carter Creek, Near Ashland, OR											23	31
2017	14353000	West Fork Ashland Creek Near Ashland, OR	31	28	31	30	31	30	31	31	30	31	30	31
2017	14353500	East Fork Ashland Creek Near Ashland, OR	31	28	31	30	31	30	31	31	30	31	30	31
2017	14354200	Bear Creek Blw Ashland Creek At Ashland, OR	31	28	31	30	31	30	31	31	30	31	30	31
2017	14357500	Bear Creek At Medford, OR	31	28	31	30	31	30	31	31	30	31	30	31
2017	14358610	Griffin Cr Bl Murphy Cr Nr Medford	30	28	31	30	31	30	31	31	30	31	30	31
2017	14358680	Griffin Cr At Central Point, OR	31	28	31	30	31	30	31	31	30	31	30	31
2017	14358725	Jackson Cr At Jacksonville, OR	31	28	31	30	31	30	31	31	30	31	30	31
2017	14358750	Jackson Cr At Central Point, OR	31	28	31	30	31	30	31	31	30	31	30	31
2017	14358800	Bear Cr Ab Mouth Nr Central Point, OR	31	28	31	30	31	30	31	31	30	31	30	31
2017	14359000	Rogue River At Raygold Near Central Point, OR	31	28	31	30	31	30	31	31	30	31	30	31
2017	14360500	Evans Cr At Wimer, OR	31	28	31	30	31	30	31	31	30	31	30	31
2017	14361500	Rogue River At Grants Pass, OR	31	28	31	30	31	30	31	31	30	31	30	31
2017	14362000	Applegate River Near Copper, OR	31	28	31	30	31	30	31	31	30	31	30	31
2017	14362250	Star Gulch Near Ruch, OR	31	28	31	30	31	30	31	31	30	31	30	31
2017	14363450	Mcdonald Cr Nr Talent, OR	31	28	31	30	31	30	31	31	30	31	30	31
2017	14365500	Little Applegate R Nr Ruch, OR	31	28	31	30	31	30	31	31	30	31	30	31
2017	14366000	Applegate River Near Applegate, OR	31	28	31	30	31	30	31	31	30	31	30	31
2017	14368300	Williams Cr At Williams, OR	31	28	31	30	31	30	31	31	30	31	30	31
2017	14369500	Applegate River Near Wilderville, OR	31	28	31	30	31	30	31	31	30	31	30	31

Year	Station ID	Station	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2017	14372300	Rogue River Near Agness, OR	31	28	31	30	31	30	31	31	30	31	30	31
2017	14372500	E Fk Illinois R Nr Takilma, OR	31	28	31	30	31	30	31	31	30	31	30	31
2017	14375100	Sucker Creek Blw Little Grayback Ck, Nr Holland,OR	31	28	31	30	31	30	31	31	30	31	30	31
2017	14375200	Sucker Cr At Bridgeview, OR	31	28	31	30	31	30	31	31	30	31	30	31
2017	14377100	Illinois River Near Kerby, OR	31	27	29	30	31	30	31	31	30	31	30	31
2017	420425122361700	Highway Runoff Site Nr I5 And Old Hwy 99												31
2017	AGA	Agate Dam And Reservoir Near Medford, OR	31	28	31	30	31	30	31	31	30	31	30	31
2017	EMI	Emigrant Dam And Lake Near Ashland, OR	31	28	31	30	31	30	31	31	30	31	30	31
2018	14328000	Rogue River Above Prospect, OR	31	28	31	30	31	30	31	31	30	31	30	31
2018	14330000	Rogue River Below Prospect, OR	31	28	31	30	31	30	31	31	30	31	30	31
2018	14332000	South Fork Rogue River Near Prospect, OR	31	28	31	30	31	30	31	31	30	31	30	31
2018	14335072	Rogue R At Cole M Rivers F Hatchery Nr Mcleod, OR	31	28	31	30	31	30	31	31	30	31	30	31
2018	14335200	S Fk Big Butte Cr Ab Willow Cr Nr Butte Falls, OR	31	28	31	30	31	30	31	31	30	31	30	31
2018	14335230	Willow Cr Ab Willow Lk Nr Butte Falls	31	28	31	30	31	30	31	31	30	31	30	31
2018	14335235	Bieberstedt Cr Ab Willow Lk Nr Butte Falls	31	28	31	30	31	30	31	31	30	31	30	31
2018	14335250	Willow Cr Dam Outlet Nr Butte Falls, OR	31	28	31	30	31	30	31	31	30	31	30	31
2018	14335300	Willow Cr Nr Butte Falls, OR	31	28	31	30	31	30	31	31	30	31	30	31
2018	14335500	S Fk Big Butte Cr Nr Butte Falls, OR	31	28	31	30	31	30	31	31	30	31	30	31
2018	14336100	Eagle Point I D Cn Bl C Rd Nr Butte Falls, OR	31	28	31	30	31	30	31	31	30	31	30	31
2018	14336700	N Fk Big Butte Cr Nr Butte Falls, OR	31	28	31	30	31	30	31	31	30	31	30	31
2018	14337000	Big Butte Cr Bl Butte Falls, OR	31	28	31	30	31	30	31	31	30	31	30	31
2018	14337500	Big Butte Creek Near Mcleod, OR	31	28	31	30	31	30	31	31	30	31	30	31
2018	14337600	Rogue River Near Mcleod, OR	31	28	31	30	31	30	31	31	30	31	30	31
2018	14338000	Elk Creek Near Trail, OR	31	28	31	30	31	30	31	31	30	31	30	31
2018	14339000	Rogue River At Dodge Bridge, Near Eagle Point, OR	31	28	31	30	31	30	31	31	30	31	30	31
2018	14340800	S Fk Little Butte Cr Ab Soda Cr Nr Lakecreek, OR	31	28	31	30	31	30	31	31	30	31	30	31

Year	Station ID	Station	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2018	14341610	S Fk Little Butte Cr At Mouth Nr Lakecreek, OR	31	28	31	30	31	30	31	31	30	31	30	31
2018	14342500	N Fk Little Butte Cr At Fish Lake Nr Lakecreek, OR	31	28	31	30	31	30	31	31	30	31	30	31
2018	14343000	N Fk Little Butte Cr Nr Lakecreek, OR	31	28	31	30	31	30	31	31	30	31	30	31
2018	14346700	Little Butte Cr At Lakecreek, OR	31	28	31	30	31	30	31	31	30	31	30	31
2018	14346900	Little Butte Cr At Brownsboro, OR	31	28	31	30	31	30	31	31	30	31	30	31
2018	14347798	Little Butte Cr Mill Race At Eagle Point, OR	31	28	31	30	31	30	31	31	30	29	30	31
2018	14347800	Little Butte Cr At Eagle Point, OR	31	28	31	30	31	30	31	31	30	31	30	31
2018	14348000	Little Butte Cr Bl Eagle Point, OR	31	28	31	30	31	30	31	31	30	31	30	31
2018	14348080	Antelope Cr Bl Rogue River Valley Irr Dist Div Nr White City, OR	31	28	31	30	31	30	31	31	30	31	30	31
2018	14348150	Antelope Cr Nr Eagle Point, OR	31	28	31	30	31	30	31	31	30	31	30	31
2018	14348400	Emigrant Cr Ab Green Springs Powerplant Nr Ashland, OR	31	28	31	30	31	30	31	31	30	31	30	31
2018	14348430	Unnamed Trib To Wbr Carter Creek, Near Ashland, OR	31	28	31	30	31	30	31	31	30	31	30	31
2018	14353000	West Fork Ashland Creek Near Ashland, OR	31	28	31	30	31	30	31	31	30	31	30	31
2018	14353500	East Fork Ashland Creek Near Ashland, OR	31	28	31	30	31	30	31	31	30	31	30	31
2018	14354200	Bear Creek Blw Ashland Creek At Ashland, OR	31	28	31	30	31	30	31	31	30	31	30	31
2018	14357500	Bear Creek At Medford, OR	31	28	31	30	31	30	31	31	30	31	30	31
2018	14358610	Griffin Cr Bl Murphy Cr Nr Medford	31	28	31	30	31	30	31	31	30	31	30	31
2018	14358680	Griffin Cr At Central Point, OR	31	28	31	30	31	30	31	31	30	31	30	31
2018	14358725	Jackson Cr At Jacksonville, OR	31	28	31	30	31	30	31	31	30	31	30	31
2018	14358750	Jackson Cr At Central Point, OR	31	28	31	30	31	30	31	31	30	31	30	31
2018	14358800	Bear Cr Ab Mouth Nr Central Point, OR	31	28	31	30	31	30	31	31	30	31	30	31
2018	14359000	Rogue River At Raygold Near Central Point, OR	31	28	31	30	31	30	31	31	30	31	30	31
2018	14360500	Evans Cr At Wimer, OR	31	28	31	30	31	30	31	31	30	31	30	31
2018	14361500	Rogue River At Grants Pass, OR	31	28	31	30	31	30	31	31	30	31	30	31
2018	14362000	Applegate River Near Copper, OR	31	28	31	30	31	30	31	31	30	31	30	31

Year	Station ID	Station	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2018	14362250	Star Gulch Near Ruch, OR	31	28	31	30	31	30	31	31	30	31	30	31
2018	14363450	Mcdonald Cr Nr Talent, OR	31	28	31	30	31	30	31	31	30	31	30	31
2018	14365500	Little Applegate R Nr Ruch, OR	31	28	31	30	31	30	31	31	30	31	30	31
2018	14366000	Applegate River Near Applegate, OR	31	28	31	30	31	30	31	31	30	31	30	31
2018	14368300	Williams Cr At Williams, OR	31	28	31	30	31	30	31	31	30	31	30	31
2018	14369500	Applegate River Near Wilderville, OR	31	28	31	30	31	30	31	31	30	31	30	31
2018	14372300	Rogue River Near Agness, OR	31	28	31	30	31	30	31	31	30	31	30	31
2018	14372500	E Fk Illinois R Nr Takilma, OR	31	28	31	30	31	30	31	31	30	31	30	31
2018	14375100	Sucker Creek Blw Little Grayback Ck, Nr Holland,OR	31	28	31	30	31	30	31	31	30	31	30	31
2018	14375200	Sucker Cr At Bridgeview, OR	31	28	31	30	31	30	31	31	30	31	30	31
2018	14377100	Illinois River Near Kerby, OR	31	28	31	30	31	30	31	31	30	31	30	31
2018	420425122361700	Highway Runoff Site Nr I5 And Old Hwy 99	31	28	31	30	31	30	31	31	30	31	30	31
2018	AGA	Agate Dam And Reservoir Near Medford, OR	31	28	31	30	31	30	31	31	30	31	30	31
2018	EMI	Emigrant Dam And Lake Near Ashland, OR	31	28	31	30	31	30	31	31	30	31	30	31
2019	14328000	Rogue River Above Prospect, OR	31	28	31	30	31	30	31	31	30	31	30	31
2019	14330000	Rogue River Below Prospect, OR	31	28	31	30	31	30	31	31	30	31	30	31
2019	14332000	South Fork Rogue River Near Prospect, OR	31	28	31	30	31	30	31	31	30	31	30	31
2019	14335072	Rogue R At Cole M Rivers F Hatchery Nr Mcleod, OR	31	28	31	30	31	30	31	31	30	31	30	31
2019	14335200	S Fk Big Butte Cr Ab Willow Cr Nr Butte Falls, OR	31	28	31	30	31	30	31	31	30	31	30	31
2019	14335230	Willow Cr Ab Willow Lk Nr Butte Falls	31	28	31	30	31	30	31	31	30	31	30	31
2019	14335235	Bieberstedt Cr Ab Willow Lk Nr Butte Falls	31	28	31	30	31	30	31	31	30	31	30	31
2019	14335250	Willow Cr Dam Outlet Nr Butte Falls, OR	31	28	31	30	31	30	31	31	30	31	30	31
2019	14335300	Willow Cr Nr Butte Falls, OR	31	28	31	30	31	30	31	31	30	31	30	31
2019	14335500	S Fk Big Butte Cr Nr Butte Falls, OR	31	28	31	30	31	30	31	31	30	31	30	31
2019	14336100	Eagle Point I D Cn Bl C Rd Nr Butte Falls, OR	31	28	31	30	31	30	31	31	30	26	27	31
2019	14336700	N Fk Big Butte Cr Nr Butte Falls, OR	31	28	31	30	31	30	31	31	30	31	30	31

Year	Station ID	Station	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2019	14337000	Big Butte Cr Bl Butte Falls, OR	31	28	31	30	31	30	31	31	30	31	30	31
2019	14337500	Big Butte Creek Near Mcleod, OR	31	28	31	30	31	30	31	31	30	31	30	31
2019	14337600	Rogue River Near Mcleod, OR	31	28	31	30	31	30	31	31	30	31	30	31
2019	14338000	Elk Creek Near Trail, OR	31	28	31	30	31	30	31	31	30	31	30	31
2019	14339000	Rogue River At Dodge Bridge, Near Eagle Point, OR	31	28	31	30	31	30	31	31	30	31	30	31
2019	14340800	S Fk Little Butte Cr Ab Soda Cr Nr Lakecreek, OR	31	28	31	30	31	30	31	31	30	31	30	31
2019	14341610	S Fk Little Butte Cr At Mouth Nr Lakecreek, OR	31	28	31	30	31	30	31	31	30	31	30	31
2019	14342500	N Fk Little Butte Cr At Fish Lake Nr Lakecreek, OR	31	28	31	30	31	30	31	31	30	31	30	31
2019	14343000	N Fk Little Butte Cr Nr Lakecreek, OR	31	28	31	30	31	30	31	31	30	31	30	31
2019	14346700	Little Butte Cr At Lakecreek, OR	31	28	31	30	31	30	31	31	30	31	30	31
2019	14346900	Little Butte Cr At Brownsboro, OR	31	28	31	30	31	30	31	31	30	31	30	31
2019	14347798	Little Butte Cr Mill Race At Eagle Point, OR	31	28	31	30	31	30	31	31	30	31	30	31
2019	14347800	Little Butte Cr At Eagle Point, OR	31	28	31	30	31	30	31	31	30	31	30	31
2019	14348000	Little Butte Cr Bl Eagle Point, OR	31	28	31	30	31	30	31	31	30	31	30	31
2019	14348080	Antelope Cr Bl Rogue River Valley Irr Dist Div Nr White City, OR	31	28	31	30	31	30	31	31	30	31	30	31
2019	14348150	Antelope Cr Nr Eagle Point, OR	31	28	31	30	31	30	31	31	30	31	30	31
2019	14348400	Emigrant Cr Ab Green Springs Powerplant Nr Ashland, OR	31	28	31	30	31	30	31	31	30	31	30	31
2019	14348430	Unnamed Trib To Wbr Carter Creek, Near Ashland, OR	31	28	31	30	31	30	31	31	30	31	14	
2019	14353000	West Fork Ashland Creek Near Ashland, OR	31	28	31	30	31	30	31	31	30	31	30	31
2019	14353500	East Fork Ashland Creek Near Ashland, OR	31	28	31	30	31	30	31	31	30	31	30	31
2019	14354200	Bear Creek Blw Ashland Creek At Ashland, OR	31	28	31	30	31	30	31	31	30	31	30	31
2019	14357500	Bear Creek At Medford, OR	31	28	31	30	31	30	31	31	30	31	30	31
2019	14358610	Griffin Cr Bl Murphy Cr Nr Medford	31	28	31	30	31	30	31	31	30	31	30	31
2019	14358680	Griffin Cr At Central Point, OR	31	28	31	30	31	30	31	31	30	31	30	31

Year	Station ID	Station	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2019	14358725	Jackson Cr At Jacksonville, OR	31	28	31	30	31	30	31	31	30	31	30	31
2019	14358750	Jackson Cr At Central Point, OR	31	28	31	30	31	30	31	31	30	31	30	31
2019	14358800	Bear Cr Ab Mouth Nr Central Point, OR	31	28	31	30	31	30	31	31	30	31	30	31
2019	14359000	Rogue River At Raygold Near Central Point, OR	31	28	31	30	31	30	31	31	30	31	30	31
2019	14360500	Evans Cr At Wimer, OR	31	28	31	30	31	30	31	31	30	31	30	31
2019	14361500	Rogue River At Grants Pass, OR	31	28	31	30	31	30	31	31	30	31	30	31
2019	14362000	Applegate River Near Copper, OR	31	28	31	30	31	30	31	31	30	31	30	31
2019	14362250	Star Gulch Near Ruch, OR	31	28	31	30	31	30	31	31	30	31	30	31
2019	14363450	Mcdonald Cr Nr Talent, OR	31	28	17	8	31	30	31	31	30	31	30	31
2019	14365500	Little Applegate R Nr Ruch, OR	31	28	31	30	31	30	31	31	30	31	30	31
2019	14366000	Applegate River Near Applegate, OR	31	28	31	30	31	30	31	31	30	31	30	31
2019	14368300	Williams Cr At Williams, OR	31	28	31	30	31	30	31	31	30	31	30	31
2019	14369500	Applegate River Near Wilderville, OR	31	28	31	30	31	30	31	31	30	31	30	31
2019	14372300	Rogue River Near Agness, OR	31	28	31	30	31	30	31	31	30	31	30	31
2019	14372500	E Fk Illinois R Nr Takilma, OR	31	28	31	30	31	30	31	31	30	31	30	31
2019	14375100	Sucker Creek Blw Little Grayback Ck, Nr Holland,OR	31	28	31	30	31	30	31	31	30	31	30	31
2019	14375200	Sucker Cr At Bridgeview, OR	31	28	31	30	31	30	31	31	30	31	30	31
2019	14377100	Illinois River Near Kerby, OR	31	28	31	30	31	30	31	31	30	31	30	31
2019	420425122361700	Highway Runoff Site Nr I5 And Old Hwy 99	31	28	17									
2019	AGA	Agate Dam And Reservoir Near Medford, OR	31	28	31	30	31	30	31	31	30	31	30	31
2019	EMI	Emigrant Dam And Lake Near Ashland, OR	31	28	31	30	31	30	31	31	30	31	30	31
2020	14328000	Rogue River Above Prospect, OR	31	29	31	30	31	30	31	31	30	31	30	31
2020	14330000	Rogue River Below Prospect, OR	31	29	31	30	31	30	31	31	30	31	30	31
2020	14332000	South Fork Rogue River Near Prospect, OR	31	29	31	30	31	30	31	31	30	31	30	31
2020	14335072	Rogue R At Cole M Rivers F Hatchery Nr Mcleod, OR	31	29	31	30	31	30	31	31	30	31	30	31
2020	14335200	S Fk Big Butte Cr Ab Willow Cr Nr Butte Falls, OR	31	29	31	30	31	30	31	31	30	31	30	31

Year	Station ID	Station	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2020	14335230	Willow Cr Ab Willow Lk Nr Butte Falls	31	29	31	30	31	30	31	31	30	31	30	31
2020	14335235	Bieberstedt Cr Ab Willow Lk Nr Butte Falls	31	29	31	30	31	30	31	31	30	31	30	31
2020	14335250	Willow Cr Dam Outlet Nr Butte Falls, OR	31	29	31	30	31	30	31	31	30	31	30	31
2020	14335300	Willow Cr Nr Butte Falls, OR	31	29	31	30	31	30	31	31	30	31	30	31
2020	14335500	S Fk Big Butte Cr Nr Butte Falls, OR	31	29	31	30	31	30	31	31	30	31	30	31
2020	14336100	Eagle Point I D Cn Bl C Rd Nr Butte Falls, OR	31	29	31	30	31	30	31	31	30	31	30	31
2020	14336700	N Fk Big Butte Cr Nr Butte Falls, OR	31	29	31	30	31	30	31	31	30	31	30	31
2020	14337000	Big Butte Cr Bl Butte Falls, OR	31	29	31	30	31	30	31	31	30	31	30	31
2020	14337500	Big Butte Creek Near Mcleod, OR	31	29	31	30	31	30	31	31	30	31	30	31
2020	14337600	Rogue River Near Mcleod, OR	31	29	31	30	31	30	31	31	30	31	30	31
2020	14338000	Elk Creek Near Trail, OR	31	29	31	30	31	30	31	31	30	31	30	31
2020	14339000	Rogue River At Dodge Bridge, Near Eagle Point, OR	31	29	31	30	31	30	31	31	30	31	30	31
2020	14340800	S Fk Little Butte Cr Ab Soda Cr Nr Lakecreek, OR	31	29	31	30	31	30	31	31	30	31	30	31
2020	14341610	S Fk Little Butte Cr At Mouth Nr Lakecreek, OR	31	29	31	30	31	30	31	31	30	31	30	31
2020	14342500	N Fk Little Butte Cr At Fish Lake Nr Lakecreek, OR	31	29	31	30	31	30	31	31	30	31	30	31
2020	14343000	N Fk Little Butte Cr Nr Lakecreek, OR	31	29	31	30	31	30	31	31	30	31	30	31
2020	14346700	Little Butte Cr At Lakecreek, OR	31	29	31	30	31	30	31	31	30	31	30	31
2020	14346900	Little Butte Cr At Brownsboro, OR	31	29	31	30	31	30	31	31	30	31	30	31
2020	14347798	Little Butte Cr Mill Race At Eagle Point, OR	31	29	31	30	31	30	31	31	30	31	30	31
2020	14347800	Little Butte Cr At Eagle Point, OR	31	29	31	30	31	30	31	31	28	31	30	31
2020	14348000	Little Butte Cr Bl Eagle Point, OR	31	29	31	30	31	30	31	31	30	31	30	31
2020	14348080	Antelope Cr Bl Rogue River Valley Irr Dist Div Nr White City, OR	31	29	31	30	31	30	31	31	30	31	30	31
2020	14348150	Antelope Cr Nr Eagle Point, OR	31	29	31	30	31	30	31	31	30	31	30	31
2020	14348400	Emigrant Cr Ab Green Springs Powerplant Nr Ashland, OR	31	29	31	30	31	30	31	31	30	31	30	31
2020	14353000	West Fork Ashland Creek Near Ashland, OR	31	29	31	30	31	30	31	31	30	31	30	31

Year	Station ID	Station	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2020	14353500	East Fork Ashland Creek Near Ashland, OR	31	29	31	30	31	30	31	31	30	31	30	31
2020	14354200	Bear Creek Blw Ashland Creek At Ashland, OR	31	29	31	30	31	30	31	31	30	31	30	31
2020	14357500	Bear Creek At Medford, OR	31	29	31	30	31	30	31	31	30	31	30	31
2020	14358610	Griffin Cr Bl Murphy Cr Nr Medford	31	29	31	30	31	30	31	31	30	30	30	31
2020	14358680	Griffin Cr At Central Point, OR	31	29	31	30	31	30	31	31	30	31	30	31
2020	14358725	Jackson Cr At Jacksonville, OR	31	29	31	30	31	30	31	31	30	31	30	31
2020	14358750	Jackson Cr At Central Point, OR	31	29	31	30	31	30	31	31	30	31	30	31
2020	14358800	Bear Cr Ab Mouth Nr Central Point, OR	31	29	31	30	31	30	31	31	30	31	30	31
2020	14359000	Rogue River At Raygold Near Central Point, OR	31	29	31	30	31	30	31	31	30	31	30	31
2020	14360500	Evans Cr At Wimer, OR	31	29	31	30	31	30	31	31	30	31	29	31
2020	14361500	Rogue River At Grants Pass, OR	31	29	31	30	31	30	31	31	30	31	30	31
2020	14362000	Applegate River Near Copper, OR	31	29	31	30	31	30	31	31	30	31	30	31
2020	14362250	Star Gulch Near Ruch, OR	31	29	31	30	31	30	31	31	30	31	30	31
2020	14363450	Mcdonald Cr Nr Talent, OR	31	29	31	30	31	30	31	31	30	31	30	31
2020	14365500	Little Applegate R Nr Ruch, OR	31	29	31	30	31	30	31	31	30	31	30	31
2020	14366000	Applegate River Near Applegate, OR	31	29	31	30	31	30	31	31	30	31	30	31
2020	14368300	Williams Cr At Williams, OR	31	29	31	30	31	30	31	31	30	31	30	31
2020	14369500	Applegate River Near Wilderville, OR	31	29	31	30	31	30	31	31	30	31	30	31
2020	14372300	Rogue River Near Agness, OR	31	29	31	30	31	30	31	31	30	31	30	31
2020	14372500	E Fk Illinois R Nr Takilma, OR	31	29	31	30	31	30	31	31	30	31	30	31
2020	14375100	Sucker Creek Blw Little Grayback Ck, Nr Holland,OR	31	29	31	30	31	30	31	31	30	31	30	31
2020	14375200	Sucker Cr At Bridgeview, OR	31	29	31	30	31	30	31	31	30	31	30	31
2020	14377100	Illinois River Near Kerby, OR	31	29	31	30	31	30	31	31	30	31	30	31
2020	AGA	Agate Dam And Reservoir Near Medford, OR	31	29	31	30	31	30	31	31	30	31	30	31
2020	EMI	Emigrant Dam And Lake Near Ashland, OR	31	29	31	30	31	30	31	31	30	31	30	31

Appendix D HTML map

DEQ prepared an interactive HTML map to display relevant information described in this QAPP. The map will be posted to DEQ's website alongside this QAPP and saved in same location as the QAPP in DEQ's files. The interactive map contains the following layers and location information:

1. OpenStreetMap base map.
2. USGS hydro cache base map that represents hydrologic information of the National Hydrography Dataset (NHD).
3. 2017 and 2018 one foot Oregon Statewide Imagery Program (OSIP) aerial imagery.
4. TMDL project area boundary.
5. Available continuous stream temperature monitoring locations, organizations that collected that data, and the count of days per month for each year when temperature data are available.
6. Available stream flow monitoring locations, organizations that collected that data, and the count of days per month for each year when flow data are available.
7. The location of meteorological monitoring locations and the source of the data.
8. The location of active individual NPDES permitted facilities, the permit type, and DEQ file number.
9. The locations of current registrants covered under the general NPDES GEN01, GEN03, GEN04, GEN05, GEN19, or GEN40 (MS4) permits.
10. The extent of existing calibrated models described in this QAPP.
11. The extent of newly proposed calibrated models described in this QAPP.
12. The location of model calibration sites, including temperature, flow, and effective shade monitoring sites.
13. The location of temperature monitoring used for model boundary conditions and tributary inputs.
14. The location of flow monitoring locations used for model boundary conditions and tributary inputs.
15. Eight-digit hydrologic unit boundaries (HUC8 Subbasins).
16. Ten-digit hydrologic unit boundaries (HUC10 Watersheds).
17. Twelve-digit hydrologic unit boundaries (HUC12 Subwatersheds).
18. 2018/2020 303(d) Integrated Report status that are classified as water quality limited Category 5 and/or Category 4A for temperature.
19. Fish use designations depicted in OAR 340-041-0271 Figure 271A.

20. Salmon and Steelhead spawning use extent and period depicted in OAR 340-041-0271 Figure 271B.