SOUTHERN CALIFORNIA EDISON

Lee Vining Hydroelectric Project

(FERC PROJECT NO. 1388)

FINAL LICENSE APPLICATION
VOLUME II

SOUTHERN CALIFORNIA EDISON®
Energy for What's Ahead℠

January 2025

SOUTHERN CALIFORNIA EDISON

Lee Vining Hydroelectric Project
(FERC Project No. 1388)

Final License Application
Volume II

Southern California Edison
2244 Walnut Grove Avenue
Rosemead, CA 91770

January 2025

Support from:

Kleinschmidt

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APPENDIX E.1
PROTECTION, MITIGATION, AND ENHANCEMENT MEASURES

SOUTHERN CALIFORNIA EDISON

LEE VINING HYDROELECTRIC PROJECT

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PROTECTION, MITIGATION, AND ENHANCEMENT MEASURES

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LIST OF ACRONYMS AND ABBREVIATIONS

APE	Area of Potential Effects
cfs	cubic feet per second
FLA	Final License Application
HPMP	Historic Properties Management Plan
PME	protection, mitigation, and enhancement
Project	Lee Vining Hydroelectric Project (FERC Project No. 1388)
SCE	Southern California Edison [Company]
USFS	U.S. Forest Service

1.0 ENVIRONMENTAL MEASURES AND PLANS

The protection, mitigation, and enhancement (PME) measures described in this Final License Application (FLA) were developed in consultation with Stakeholders and agencies following the effects analysis conducted as part of the relicensing process for the Lee Vining Hydroelectric Project (Project), Federal Energy Regulatory Commission (FERC) (Project No. 1388). Exhibit E (provided in Volume I of this FLA) presents the analysis of the proposed PME measures informed by the Project-specific technical reports (provided in Volume III of this FLA). PME measures in this document are described in full detail where appropriate. The Resource Management Plan (PME-3) is included as Attachment 1. The draft Historic Properties Management Plan (HPMP) is in progress and will be filed as privileged and confidential later in 2025.

PME-1, WATER MANAGEMENT

PME-1 describes the way water is managed for the Project. This PME was developed in consultation with Technical Working Group members to enhance existing flow conditions below Saddlebag and Tioga Lakes, and update the methodology relating to water year type definitions. (see Tables 1 and 2).

For the term of the new license; water year type is to be calculated with precipitation data from the previous 30 years measured at the Dana Meadows snow course.

- Dry years are defined as those in which the water availability as of April 1 is representative of the water available on April 1 in the lowest 30 percent of the previous 30 years.
- Wet years are defined as those in which the water availability as of April 1 is representative of the water available on April 1 in the highest 30 percent of the previous 30 years.
- Normal years are defined as those that cannot be classified as either dry or wet years, per the above definitions.

Table 1. Minimum Flow Requirements by Location

Location	Water Year Type	Minimum Flow (cfs)	Timing/Duration
Below Saddlebag Dam [a]	Wet	30	Week 1, for 1 week [b]
		22	Week 2, for 1 week
		16	Week 3, for 1 week
		9	Remainder of the year (late summer and over-winter flows)
	Normal	20	Week 1, for 1 week [b]
		14	Week 2, for 1 week
		10	Week 3, for 1 week
		6	Remainder of the year (late summer and over-winter flows)
	Dry	4	Year-round
Below Tioga Dam [a]	Wet	10	2 weeks [b]
		2	Until October 29
		5	October 30 [c] through early spring
	Normal	5	2 weeks [b]
		2	Until October 29
		5	October 30 [c] through early spring
	Dry	2	June 1 [b] until October 29
		5	October 30 [c] through early spring
Below Poole Powerhouse [d]	All	27 cfs or the natural flow, whichever is less	August through May
	All	89 cfs or the natural flow, whichever is less	June and July

cfs = cubic feet per second; USFS = U.S. Forest Service

[a] Minimum flow requirements below Saddlebag and Tioga Dams are determined annually in consultation with USFS, no later than May 1 of each calendar year. If no agreement is reached, minimum flows in this table apply.

[b] Beginning June 1, or as soon as access allows.

[c] October 30 flows will remain at 5 cfs through drawdown, at which time outflow may equal inflow.

[d] Flows are measured by a continuously recording gaging device (acoustic velocity meter).

Reservoir levels are to be maintained for recreation and generation requirements, as shown in Table 2.

Table 2. Reservoir Level Requirements

Location	Water Year Type	Lake Elevation and Duration
Tioga Lake	Wet or Normal	As of July 4, and through September 30, the water level of Tioga Lake will be maintained within 2 feet of the crest of the spillway.
	Dry	In dry years, every effort will be made to maintain lake elevation within 2 feet of the crest of the spillway between July 4 and September 30. At a minimum, lake elevation will be maintained at its peak through September 30.
Ellery Lake	All	• Ellery Lake will be managed to be full (within 2 feet of its spillway elevation) during the annual recreation season (defined as the Friday preceding Memorial Day through the end of September). • Ellery Lake may be drawn down to a level that is more than within 2 feet of the spillway elevation if required by operating emergencies beyond the control of the licensee, or for short periods of time upon mutual agreement between SCE and USFS.

cfs = cubic feet per second; USFS = U.S. Forest Service

PME-2, Enhanced Fish Stocking

To offset entrainment and enhance a portion of the recreational fishery, Southern California Edison (SCE) proposes to stock 2,000 catchable rainbow trout or its equivalent (not to exceed 1,000 pounds of fish) to Project reservoir(s) annually. Stocking location(s) and timing will be determined annually in consultation with the California Department of Fish and Wildlife.

PME-3, Resource Management Plan (Attachment 1)

The *Resource Management Plan* (included as Attachment 1 to this document) outlines PME measures for botanical, wildlife, rare, threatened, and endangered species, as well as routine operations and maintenance activities.

PME-4, Invasive Species Monitoring

One non-native invasive plant species of concern designated for mapping was observed in 2022 and 2023 in the Botanical Resources Study Area, cheat grass (*Bromus tectorum*). Cheat grass is an annual grass that occurs in open, disturbed areas at elevations below approximately 11,155 feet above mean sea level (Jepson Flora Project, 2023). It is found throughout California except the driest deserts in the southeast of the state (Jepson Flora Project, 2023; Kelch, 2015). It has a U.S. Forest Service (USFS) treatment strategy designation of 3 (contain).

SCE intends to monitor the three existing populations of cheat grass every 3 years with the goal of containment, in line with USFS recommendations. Populations will be counted, measured, and mapped for comparison from one survey year to the next.

PME-5, HISTORIC PROPERTIES MANAGEMENT PLAN

In 1990, SCE developed an HPMP in compliance with National Historic Preservation Act Section 106 (White, 1990). The HPMP required archaeological and historic inventory of the Project Area and development of appropriate management measures. The HPMP developed management strategies to avoid effects to historic properties, monitoring of historic properties, and continual consultation with agencies (White, 1990).

The current licensing efforts included a Cultural Resource (CUL-1) Study, which included one study element covering the archaeology and built-environment resources, as well as a Tribal Resources (TRI-1) Study. The results of these studies will be used to develop the updated HPMP that addresses the management and treatment of cultural and Tribal resources that have been determined eligible for inclusion in the National Register of Historic Places (NRHP) or remain unevaluated within the Area of Potential Effects (APE) over the term of the new license. Specifically, the HPMP does the following:

- Defines the APE;
- Describes cultural and Tribal resource inventory studies and NRHP-eligibility studies conducted for the Project and their results;
- Describes the statutes, regulations, and executive orders that pertain to cultural resources management;
- Identifies potential Project-related effects to cultural and Tribal resources located within the APE;
- Identifies measures to manage Project-related activities in the vicinity of cultural and Tribal resources located within the APE;
- Describes methodology and reporting associated with periodic cultural resource site condition monitoring;
- Defines protocol for implementation of periodic cultural resource site condition monitoring upon approval of the HPMP; and
- Describes reporting and consultation requirements.

The HPMP is currently under development and will be submitted to FERC following review from Tribes and agencies later in 2025.

Further discussion of cultural and Tribal resources is provided in Exhibit E, Section 6.13, *Cultural Resources*, and Section 6.14, *Tribal Resources* (provided in Volume I of this FLA).

PME-6, Erosion and Sediment Control Plan (Attachment 2)

The *Erosion, Stream Sedimentation, Soil Mass Movement, and Dust Control Plan is* included as Attachment 2 to this document.

In general, the Project would not have a significant effect on erosion within Lee Vining Creek. However, as a standing FERC license requirement, the Project follows the *Plan for Control of Erosion, Stream Sedimentation, Soil Mass Movement, and Dust* (SCE, 1997). The 1997 plan was updated to meet current requirements of the *National Pollutant Discharge Elimination System (NPDES) General Permit for Stormwater Discharges Associated with Construction and Land Disturbance Activities* (NPDES No. CAS000002), as well as describe the use of best available technologies for selection and implementation of best management practices. The updated plan describes measures for soil stabilization, erosion protection, sediment reduction, and dust control. The plan provides the basis for the formulation of specific measures, which are addressed on a case-by-case basis with USFS to cover accidental occurrences such as a pipeline rupture.

2.0 REFERENCES

Jepson Flora Project. 2023. Jepson eFlora. The Jepson Herbarium. Regents of the University of California. Berkeley. December, Revision 12. Accessed: July 2024. Retrieved from: https://ucjeps.berkeley.edu/eflora/.

Kelch, D. 2015. *Pest Rating Proposals and Final Ratings: Cheatgrass* (Bromus tectorum*)*. California Department of Food and Agriculture. Accessed: July 2024. Retrieved from: https://blogs.cdfa.ca.gov/Section3162/?p=1375.

SCE (Southern California Edison). 1997. *Plan for Control of Erosion, Stream Sedimentation, Soil Mass Movement, and Dust*. FERC Project No. 1388-CA. September 1997.

White, D. R. M. 1990. *Management Plan for Historic and Archaeological Resources Associated with the Lee Vining Creek Hydroelectric Project (FERC Project No. 1388), Mono County, California*. April 1990.

ATTACHMENT 1
RESOURCE MANAGEMENT PLAN

SOUTHERN CALIFORNIA EDISON
LEE VINING HYDROELECTRIC PROJECT
(FERC PROJECT NO. 1388)

RESOURCE MANAGEMENT PLAN

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LIST OF ACRONYMS AND ABBREVIATIONS

APP	Avian Protection Plan
BMP	best management practice
CDFW	California Department of Fish and Wildlife
DLA	Draft License Application
ESAP	Endangered Species Alert Program
FERC	Federal Energy Regulatory Commission
FLA	Final License Application
HFDT	High Fire District Threat
O&M	operations and maintenance
PME	protection, mitigation, and enhancement
Project	Lee Vining Hydroelectric Project (FERC Project No. 1388)
RMP	Resources Management Plan
SCE	Southern California Edison [Company]
USFS	U.S. Forest Service
USFWS	U.S. Fish and Wildlife Service
WMP	Wildfire Mitigation Plan

1.0 INTRODUCTION

Southern California Edison [Company] (SCE) has prepared this Resources Management Plan (RMP) to accompany SCE's application for a new Federal Energy Regulatory Commission (FERC) license for the Lee Vining Hydroelectric Project (Project; FERC Project No. 1388).

Combining resource areas under one RMP will enable SCE to more comprehensively train staff and successfully implement protection, mitigation, and enhancement (PME) measures. This plan also describes routine operations and maintenance (O&M) activities that occur within the FERC Project Boundary.

The RMP will guide SCE management and stewardship activities as outlined in this document. Specifically, the following activities are governed by this RMP:

- Routine O&M activities
- Implementation of SCE company-wide management and protection plans
- Monitoring of invasive plants
- Aesthetic resources

Additionally, a Historic Properties Management Plan is being prepared as part of the relicensing for the Project and will be filed with FERC later in 2025. The Historic Properties Management Plan is a standalone document and includes measures to avoid, protect, mitigate, or enhance cultural and Tribal resources; it is not discussed in this RMP, as portions of it contain confidential information.

2.0 PROJECT OPERATIONS

SCE provides the following high-level overview of Project operations for background and informational purposes only. A more detailed description of Project facilities operations is included in Exhibits A and B, filed in Volume I of the Final License Application (FLA). The Project consists of three dams and reservoirs, an auxiliary dam, a flowline consisting of a pipeline and penstock, and a powerhouse.

The powerhouse is automatically controlled from the Eastern Hydro Operations Center located in Bishop, California; however, the powerhouse can be operated manually should it be necessary. The outlets at Saddlebag and Tioga Reservoirs are manually operated and adjusted for minimum flow requirements and water storage management. A bypass outlet at Ellery Lake can be remotely operated to release flow during powerhouse outages. Flow through the powerhouse is manually adjusted and can be adjusted locally or remotely from the Eastern Hydro Operations Center.

The Project is operated in compliance with existing regulatory requirements, agreements, and water rights to generate power. Sections 2.1, *Water Management*, and

2.2, *Inspections and Maintenance*, describe how the Project manages water in compliance with its FERC license and water delivery agreements to support its operations, and how inspections and maintenance of Project facilities are carried out. Project operations are described in further detail in Exhibit B of the FLA.

2.1. WATER MANAGEMENT

Releases and spills from both Saddlebag and Tioga Lakes flow into Ellery Lake, which is the intake and regulating reservoir for Poole Powerhouse. Ellery Lake is the forebay for the powerhouse, and its storage level is not as varied as the two upper reservoirs. Water is conveyed from Ellery Lake to the powerhouse via the flowline and penstock.

SCE stores water from the drainage area in the Project's reservoirs and releases the water for power generation, which is the primary, non-consumptive use of water within the Lee Vining Creek watershed. . Once water has left the FERC Project Boundary, SCE has no control over downstream diversions.

SCE optimizes powerhouse generation to meet load requests from the California Independent System Operator. This process of delivering intraday load to satisfy demands is known as Hydro-resource Optimization. The Poole Powerhouse is typically activated during peak hours in response to grid demand. This operation leads to the release of flow into Lee Vining Creek below the Poole Powerhouse, with these instances generally lasting fewer than 8 hours.

As described in FLA Exhibit A, seven stream gages within the FERC Project Boundary actively record flows released from the Project dams; these gages are published by U.S. Geological Survey but are owned by SCE. Flows leaving the Poole Powerhouse are measured by acoustic velocity meter installed within the powerhouse. During those periods when short-term repair and testing of the Poole Powerhouse facilities may be needed (i.e., Poole Powerhouse is offline), minimum flows in Lee Vining Creek are measured downstream of Ellery Lake, below Rhinedollar Dam. SCE is authorized under the license to temporarily modify minimum flows if required by operating emergencies beyond its control. SCE may also modify minimum flows for short periods upon mutual agreement with the U.S. Forest Service (USFS).

2.2. ROUTINE INSPECTIONS AND MAINTENANCE

Routine inspections and maintenance activities are conducted at Project facilities to verify the structural and/or functional integrity of the facilities, identify conditions that might disrupt operations or threaten public safety, and maintain the facilities in safe and operational conditions (Table 2.2-1). These activities are generally described in FLA Exhibit E, Section 4.4, *Project Maintenance,* and further described in the below sections.

Routine inspections are conducted by an operator 4 to 5 days per week. Monthly spill prevention, control, and countermeasure inspections, as well as switchyard inspections, also occur. During spring and summer peak run-off conditions, inspections occur daily;. weekly and monthly inspections occur outside of peak run-off, while hydrographers perform weekly inspections of Saddlebag Dam in summer months. Monthly inspections occur at all dams year-round; however, there is limited visibility in winter months.

Routine O&M activities include minor road and trail maintenance; transmission, power, and communication line maintenance; maintenance outages; powerhouse inspections and maintenance; and flowline inspections and maintenance. Maintenance work is conducted as needed throughout the year. Trash rack grids are raked to ensure they are clean and free of debris. Minor concrete repairs and spalling is fixed as needed. Other normal maintenance includes snow removal and emergency repairs to the generator and associated equipment as needed.

Table 2.2-1. Routine Project Inspection and Maintenance Activities

Maintenance Activity	Relevant Area	Frequency	Description
Maintenance of dirt/native roads and parking areas, including ditch and culvert maintenance	• All native Project roads and parking areas (e.g., Poole Power Plant Road) • Parking areas at boater put-in/take-outs	Annually and as needed	**Minor** Project road maintenance: • Grading within the road prism • Removing debris and basic repairs, including filing of pothole • Maintaining erosion control features such as drains, ditches, and water bars • Repairing, replacing, or installing access control structures such as posts, cables, and barrier rock • Cleaning and clearing debris and sediment from culverts with a backhoe or hand shovel • Repairing and replacing signage • Conducting vegetation management concurrently with road maintenance on an as-needed basis **Major** Project road maintenance: • Placing or replacing culverts and other drainage features
Repaving/patching asphalt roads	• Paved Project roads and parking areas (e.g., pavement around Poole Powerhouse) • Paved Project roads around powerhouse, machine shop, and warehouse buildings	As needed (approximately every 2–3 years)	**Minor** Project road maintenance: • Cleaning and clearing debris and sediment from culverts and ditches with a backhoe or hand shovel • Filling blacktop and potholes with hand tools **Major** Project road maintenance: • Using pick-up truck, dump truck, loaders, backhoes, and graders for resurfacing larger/longer parking areas or roads

Maintenance Activity	Relevant Area	Frequency	Description
Vegetation trimming and removal/clearing	All Project roads and facilities: powerhouse, dams, water conveyance system, penstock, buried pipe or flowlines, and stream gage sites	Every other year; as needed.	• Brush mowing along roadway to maintain road as necessary for safe line of sight and passage • Trimming both manually and with tools/equipment (i.e., weed whacker or chainsaw) • Removing or preventing tree growth whose roots could intrude on the pipelines and diminish their integrity • Trimming or mowing around access locations such as hatches or manholes to be free of vegetation out to 10 feet
Hazard tree inspection and removal	All Project roads and facilities: powerhouse, dams, water conveyance system, penstock, and stream gage sites	• Weekly and monthly inspections • Removal as needed	• Removing hazard brush and trees that are deemed a threat to road or vehicles traveling over them or near Project infrastructure • Removing both manually and with tools/equipment
Slide debris removal	All Project roads	As needed, typically following winter rains	• Removing slide debris with grader, loader, and dump truck • Spreading material on road near debris slide as road base
Structural inspection and maintenance	• Powerhouse • Saddlebag Dam • Tioga Dam • Tioga Auxiliary Dam • Rhinedollar Dam • Penstock • Water conveyance system	• Weekly and monthly inspections • Daily during spring/summer in peak run-off conditions • Maintenance work as needed	• Raking trash rack grids to ensure they are clean and free of debris • Spillway debris removal • Fixing minor concrete repairs/spalling • Handrail repairs
Material/slash burning	Varies depending upon source material location	Annually, or as needed	• Obtaining permit from Inyo National Forest when needed • Burning brush, slash, or other vegetation accumulated from various Project operations

Maintenance Activity	Relevant Area	Frequency	Description
Manage access gates and security fencing	• Vicinity of powerhouse, including machine shop and warehouse • Gates at Tioga, Saddlebag, and Rhinedollar Dams • Selected locations around access points at open flumes	Inspect weekly and monthly during other facility inspections	Repair as needed
Sediment management (physical removal) [a]	Intake areas	As needed	Removing sediment with hand shovels, if needed
Facility painting	• Powerhouse, handrails, maintenance buildings • Penstock • Parking lots	Annually maintain as needed (facilities on a rotation of every 10–20 years)	Following general aesthetic guidelines (e.g., painting in earth tones, landscaping with vegetation similar to surrounding areas)

[a] Sediment removal/management with hand shovels is considered a standard operations and maintenance activity, though none has been conducted in the past 20 years of the Project.

2.2.1. Facilities Repair

SCE routinely makes repairs to structures and facilities and conducts maintenance to retain the functional and structural integrity of the Project facilities. Facilities include gaging stations and flumes, intakes and diversion structures, and flow meters. Within these facilities, maintenance and repairs may occur on gates, barricades, small structures (e.g., gaging stations and storage facilities), streambanks, and diversions. Major categories of facilities include the following:

- Measuring stations and flumes—SCE uses measuring stations and flumes to measure water in the waterways. Maintenance work related to gaging stations and flumes include mowing vegetation to provide access along channel banks and removing stream deposit within an area of measuring stations to allow for unobstructed water flow and the accurate reading of water flow in waterways.

- Intake and diversion structures—SCE uses intake and diversion structures to divert water from a stream or canal. Stream deposits (accumulated sediment and woody debris) are removed above and/or below intake structures, as needed.

- Gate inspection and maintenance—This may include the operation of intake drain gates, sand traps, and chamber drain gates. These routine operations do not result in the draining of any ponds, which minimize effects to the stream. SCE is required to inspect penstocks, which does involve lowering the ponds to expose the entry point to the penstock.

2.2.2. Maintenance Outage

SCE conducts annual maintenance outages at the Poole Powerhouse to support minor maintenance and repair any wear and tear, typically during low-flow periods (fall). The maintenance outage typically lasts for 1 to 3 weeks. During the outage, SCE conducts mechanical and electrical inspections and maintenance of powerhouse appurtenances. In conjunction with the maintenance outage, SCE also makes minor repairs (e.g., trash rack grid raking, spillway debris removal, concrete spalling/repairs, handrail repairs) to the dams, as appropriate.

SCE conducts physical inspections of the flowline/penstock every quarter.

2.2.3. Distribution, Power, and Communication Line Maintenance

The Project includes a switchyard immediately adjacent to the Poole Powerhouse. This short connection is maintained by Project personnel.

2.2.4. Road Grading and Maintenance

Access roads to Project dams are inspected during normal Project activities. Repairs and maintenance are typically conducted in the spring, following the rainy winter season, and as needed throughout the summer and fall. Maintenance activities include filing potholes, grading the road prism, adding gravel to address instances of washout, mowing grass, and light brushing. Vegetation management is discussed in Section 4.1, *Botanical and Wildlife Resources*.

3.0 NON-PROJECT CORPORATE-WIDE PLANS

The following are non-Project, SCE management plans that will continue to be implemented during the new license, in conjunction with the RMP. These existing plans are corporate-wide, non-Project plans that outline general internal processes and procedures, providing direction to SCE staff when working across all SCE-owned facilities. For these reasons, they are not considered part of the FERC license, but rather are described below to indicate, for informational purposes only, how these plans are implemented for this Project.

3.1. WILDFIRE MITIGATION PLAN

SCE has an existing and recently updated Wildfire Mitigation Plan (WMP) (SCE, 2022). The plan outlines methods to reduce the risk of wildfire that may be caused by utility actions or equipment and minimize consequences of wildfire by managing vegetation and other potential fuel sources. The WMP includes an actionable, measurable, and adaptive plan to reduce the risk of potential ignitions associated with SCE's electrical infrastructure in high fire risk areas by increasing system hardening, bolstering situational awareness, and enhancing operational practices. While this RMP is considered confidential because of the sensitive facility information, it is available for review by resource agencies at their request. The key provisions are listed below:

- Risk assessment and mapping
- Situational awareness
- Grid design and system hardening
- Asset management and inspections
- Vegetation management and inspections
- Grid operations and protocols
- Data governance
- Resource allocation methodology
- Emergency planning and preparedness
- Stakeholder cooperation and community engagement
- Agency consultation

SCE conducts additional vegetation inspections and maintenance in High Fire District Threats (HFDTs) as part of the WMP (SCE, 2022). Sites located in the HFDT are inspected on an annual basis, and many sites have an expanded clearance; expanded clearances in HFDT for high voltage facilities have a 100-foot clearance, and low voltage sites have a 30-foot clearance to reduce wildfire ignition risks. To maintain the expanded clearances, vegetation maintenance is done annually on a regularly scheduled rotation.

SCE maintains rights-of-way to approximately 10 feet on either side of Project flowlines, penstocks, Project roads, and Project structures to prevent buildup of woody growth and dead debris that could contribute to wildfire risks.

3.2. Avian Protection Plan

SCE developed the Avian Protection Plan (APP) as company-wide guidance for the protection of avian species at SCE-owned facilities. The APP is implemented for the Project in accordance with primary federal laws protecting birds, the Bald and Golden Eagle Protection Act, the federal Endangered Species Act, and the Migratory Bird Treaty Act. Within the plan, there are established roles for various SCE personnel to follow state and federal laws as they relate to the protection of bird species within the FERC Project Boundary. The primary procedures discussed in this document include permitting, avian mortality notification and prevention, proactive retrofits, bird nest removal, injured bird discovery, and ground-disturbing activities. As this plan is adapted to meet the needs of each specific activity and is implemented in accordance with other best management practices (BMP) and appropriate consultation activities, a plan specific to the Project is not necessary.

3.3. Nesting Bird Guidance for Small Projects

SCE's Nesting Bird Management Guidance for Small Projects was approved in April 2016 as a company-wide plan to provide guidance to staff when working at SCE-owned facilities. This plan is implemented as needed at the Project to prevent take of active nests, eggs, nestlings, or nesting birds as a result of construction activities. SCE defines management of nesting birds as "avoiding or minimizing project activities that have the potential to cause active nest failures as well as to minimize or avoid construction delays." For each activity, SCE's avian biologist define a buffer around existing nests at the Project site(s) based on guidelines provided in the guidance document. Pre-activity nesting bird surveys are conducted during the recognized nesting season and adjusted for altitude across the FERC Project Boundary. As this guidance document was developed to meet the needs of each specific activity and implemented in accordance with other BMPs and appropriate consultation activities across all SCE facilities statewide, a plan specific to the Project is not necessary.

3.4. Vegetation Management Program Guides

SCE has two main corporate-wide documents that guide vegetation management at any SCE-owned sites: the *Vegetation Management Operations Manual* and the *SCE VM-3 Program Guide WMP: VM-3 Expanded Clearances for Legacy Facilities* (Vegetation Management Activity of the WMP). The *Vegetation Management Operations Manual* is guidance primarily for keeping trees clear of transmission lines. The Vegetation

Management Activity of the WMP outlines other procedures for keeping hydropower facilities clear of vegetation and reducing the risk of wildfire.

Along buried pipelines, SCE is focused on removing or preventing tree growth whose roots could intrude on the pipelines and diminish their integrity. Routine maintenance around access locations such as hatches or manholes is also cleared free of vegetation out to 10 feet. SCE monitors vegetation growth on a yearly basis and treats as needed. However, conveyance systems/pipelines are scheduled for routine clearing on a 3-year rotation, with a decadal cycle for larger tree and wood-debris removal.

As the vegetation management program is adapted to meet the needs of each specific activity and implemented in accordance with other BMPs and appropriate consultation activities across all SCE facilities statewide, a plan specific to the Project is not necessary.

3.5. Endangered Species Alert Program

The Endangered Species Alert Program (ESAP) (SCE, 2005) was developed to provide SCE personnel with a means to identify when they may be working within an area with the potential occurrence of legally protected plant and animal species in the SCE service territory. For each of these species within the SCE service territory, the ESAP Manual includes a photograph, description, natural history information, and map showing the species' distribution in relation to SCE facilities. Should a proposed activity have potential to adversely affect a known special-status species population, SCE's Environmental Department staff will be notified to evaluate the situation and, if needed, participate in consultation with the relevant regulatory agencies.

3.6. Invasive Mussel Prevention Plan

SCE implemented the Invasive Mussel Prevention Plan in July 2017, which outlines the prevention of introduction and spread of invasive quagga mussel (*Dreissena rostriformis bugensis*) and zebra mussel (*Dreissena polymorpha*) into Project lakes. Quagga and zebra mussels have rapidly spread throughout the United States; once established, these mussels have the potential to result in physical damage to intake pipes and similar hard surfaces that would comprise the Project's infrastructure. Establishment of mussel species is most often the direct result of transportation via boats or vessels. Most Project lakes are open to the public for recreation, so transportation of these species is possible. Lakes operated by SCE are hydrologically connected and susceptible to sequential infestation.

SCE assessed each lake for their vulnerability to be invaded in 2009–2010. Results from this study indicate that all Project lakes are low risk for establishment and introduction. Even with this low risk, SCE continues to provide public education and outreach through signs, kiosks, and brochures, explaining the economic damage that invasive mussel species can cause and how to prevent their spread.

As this invasive mussel prevention plan is adapted to meet the needs of each specific activity and implemented in accordance with other BMPs and appropriate consultation activities across all SCE facilities statewide, a plan specific to the Project is not necessary.

3.7. Hazardous Substances Plan

The Project follows the Plan for Oil and Hazardous Waste Storage and Spill Prevention and Cleanup. The plan requires SCE to (1) maintain a cache of spill cleanup equipment suitable in the FERC Project Boundary for any spill from a project; (2) periodically inform the USFS of the location of the spill cleanup equipment on USFS lands and of the location, type, and quantity of oil and hazardous substances stored in the project Aarea; and (3) inform the USFS immediately of the nature, time, date, location, and action taken for any spill. Additionally, the plan describes approximate quantities of hazardous materials stored within the FERC Project Boundary, storage procedures, spill prevention measures, and cleanup measures.

4.0 PROJECT-SPECIFIC MANAGEMENT PLANS AND MEASURES

The following are SCE's proposed Project-specific plans or measures, developed as part of the Project relicensing, which will be implemented, when appropriate, as part of routine O&M activities at the Project described in Section 2.2. Where appropriate, individual plans are included as attachments to this RMP.

4.1. Erosion Control Plan (Appendix E.1, Attachment 2)

In general, the Project does not have a significant effect on erosion within Lee Vining Creek. SCE has updated the Project's 1997 *Plan for Control of Erosion, Stream Sedimentation, Soil Mass Movement, and Dust* (SCE, 1997). The plan was developed to provide general measures to control erosion, stream sedimentation, soil mass movement, and dust occurring as the result of routine O&M of the facilities.

4.2. Botanical and Wildlife Resources

Routine Project O&M includes numerous activities to ensure the safe operations of the Project. Botanical and wildlife resource surveys were conducted as part of the relicensing; based on the data collected during relicensing surveys, no adverse effects to botanical or wildlife resources, including special-status species, within the FERC Project Boundary were identified as a result of routine O&M activities.

The below sections identify routine O&M activities associated with the Project that may pertain to botanical or wildlife resources. These activities typically occur within previously disturbed areas or in areas that are regularly maintained and cleared of vegetation surrounding the Project facilities.

4.2.1. Measures to Project Botanical Resources

The goals and objectives of this section include the following:

- Provide a clear operational decision-making process related to botanical resources when planning and/or implementing routine O&M activities.

- During routine O&M activities, prevent disturbance or effects to federally and state-listed rare, threatened, or endangered species; USFS species of conservation concern; species with a California Rare Plant Rank designation of 1 or 2; or other special-status plant species.
- During routine O&M activities, reduce spread of existing populations and introduction of non-native invasive species through the use of BMPs.
- Describe the methodology for cheat grass monitoring at Poole Powerhouse.

4.2.1.1. Special-Status Plants and Sensitive Natural Communities

GENERAL AVOIDANCE MEASURES

During routine O&M activities, where special-status species and sensitive natural communities exist, avoidance of those species will be employed wherever possible. Measures to facilitate avoidance may include, but are not restricted to, the following:

- Demarcation of the maximum extent of the special-status resource(s) to be avoided: This may include flagging of individual resources or installation of a temporary barrier (e.g., roping off areas to be avoided; installation of silt fencing, straw wattles, or gravel/sandbags if soil disturbance is anticipated) to prevent effects to the species.
- Retention of a biological monitor during ground-disturbing or vegetation removal activities so that special-status resources are avoided: SCE, its biologist, and appropriate agencies will jointly determine the need for monitoring. Any effects to federally or state-listed species will be reported to the USFS, U.S. Fish and Wildlife Service (USFWS), FERC (as appropriate), and California Department of Fish and Wildlife (CDFW) within 24 hours.

MITIGATION FOR UNAVOIDABLE EFFECTS

If effects of a routine O&M activity to special-status plant species or sensitive natural communities cannot be avoided, effects will be minimized to the extent possible. Mitigation for effects may be required depending on the status and size of the affected population.

Measures to mitigate for unavoidable effects may include, but are not restricted to, the following:

- Collection of plant material (e.g., seeds, corms, bulbs, whole plants) for distribution and revegetation after the activity is completed
- Translocation of special-status plants

Implementation of the appropriate mitigation measures will be managed by SCE's Environmental Manager. If deemed necessary, a plan will be developed and submitted to the USFS and/or CDFW (as appropriate) for review and approval prior to implementation.

4.2.1.2. Invasive Plants

Implementation of BMPs that reduce invasive plant introduction and spread can help reduce future maintenance needs and costs; reduce fire hazards; reduce herbicide use; enhance access and safety; limit liability for the governing agency or lessee, maintain good public relations; and protect existing wildlife habitat, native plant populations, beneficial insects, as well as threatened and endangered species (Cal-IPC, 2012).

Every 3 years following license issuance, SCE intends to monitor the three existing populations of cheat grass (*Bromus tectorum)* at Poole Powerhouse (PME-4, *Invasive Species Monitoring*) with the goal of containment, in line with USFS recommendations. Populations will be counted, measured, and mapped for comparison from one survey year to the next. In the event that SCE intends to conduct ground-disturbing activities near any of the cheat grass populations as part of any routine O&M activity, SCE will develop a plan to prevent or reduce the opportunity for spread in consultation with the USFS.

For non-routine O&M activities that could introduce a new species or cause an existing species to propagate, SCE will consult with the Inyo National Forest to determine the appropriate measures to be implemented with respect to control of invasive plants.

<u>BEST MANAGEMENT PRACTICES</u>

Appropriate BMPs will be dependent on the type of work activity; location of the work (e.g., existing disturbed area, naturally vegetated area); timing of the work; invasive plant species identified; and treatment method required. The following general BMPs are recommended to avoid/minimize the spread of invasive plant species when conducting routine O&M activities:

- Where feasible, do not stage equipment, materials, or crews in invasive plant-infested areas.
- Where feasible, invasive plant infestations will be designated as control areas (i.e., areas where equipment, traffic, and soil-disturbing activities will be excluded). If control areas are designated, they will be identified on Project maps and delineated in the field with flagging.
- All equipment and vehicles used for ground disturbing projects will be free of invasive plant material before entering the FERC Project Boundary. Equipment will be considered clean when visual inspection does not reveal soil, seeds, plant material, or other such debris. Cleaning will occur at a vehicle washing station or steam cleaning facility before the equipment and vehicles enter the FERC Project Boundary.
- When working in areas of known invasive plant infestations within the FERC Project Boundary, equipment will be cleaned before moving to other work sites to prevent the spread of invasive plant species from an infested to potentially non-infested area. Prior to accessing sites free of non-native invasive plants, SCE personnel will clean footwear of soil and seeds and disinfect soles with bleach. In instances where SCE

staff have been working in an area with infestation and the intent is to move to an area that is infestation free, SCE staff are trained annually to clean the equipment before use in the new area (FERC-required annual training). Depending on the circumstances, the equipment is either moved via trailer to an off-site location and cleaned, or is cleaned on-site (before moving), as appropriate. Infested areas will be identified on Project maps.

- If erosion control measures are used (e.g., hay bales, straw wattles), they will be certified weed-free. If certified weed-free materials are not available, weed-free rice straw or non-vegetated material (e.g., sand or gravel bags) will be substituted.

4.2.2. Trimming and Mowing Along Roads, Along Trails, and Around Project Facilities

As part of routine O&M at the Project, vegetation trimming and removal/clearing is performed as needed at all Project facilities, including Poole Powerhouse, dams, penstock, and stream gages for safety purposes and to prevent overgrowth of vegetation that interferes with the flow of water and the measurement of flow through the gaging stations. SCE staff brush mow using a flail-type mower along roadways to maintain roads as necessary for safe line of sight and passage, as well as wildfire mitigation. Trimming is performed both manually and with tools/equipment (i.e., string trimmer or chainsaw). Herbicides are only used in the Inyo National Forest with USFS approval under specific conditions, and consistent with the *Forest-wide Invasive Plants Treatment Project Environmental Assessment* (USFS, 2019).

4.2.3. Hazard Tree Removal[1]

Hazard tree inspection and removal are performed as needed at Project facilities as part of routine O&M activities. SCE staff remove hazard brush and trees deemed a threat to road or vehicles traveling them, or near Project infrastructure. Removal occurs as needed and is performed both manually and with tools/equipment.

In 2022, to support wildfire prevention, an effort began to convert the habitat type around Poole Powerhouse from conifer-dominated to deciduous and shrub habitat (e.g., aspen, willow, and maple). Large conifers pose a greater fire hazard and potential risks of falling in winter risk than shrubs and deciduous trees. SCE removed all large conifers (approximately 200 trees) from the area in 2022 with approval from the USFS and CDFW. SCE continues to remove conifer saplings as they are identified, on an as-needed basis, in the vicinity of Poole Powerhouse to manage the habitat.

[1] Hazard trees include dead, decadent or rotten trees, forked trees, trees weakened by decay or disease, trees susceptible to wind-throw, and trees that are leaning toward the conductors or have large branches that may fall on the lines or facilities. Hazard trees will be felled and left as is, just as they would have been if nature had allowed them to fall. The maximum stump height of any tree felled will be 12 inches measured from the uphill side of the stump. No removal of wood is authorized for any SCE or contractor employee for personal use or gain.

4.2.4. Measures to Protect Wildlife Resources

The goals and objectives of this section include:

- Provide a clear operational decision-making process related to special-status wildlife resources when planning and/or implementing routine O&M activities.

- During routine O&M activities, prevent disturbance or adverse effect on special-status wildlife species including federally and state-listed endangered and threatened species, USFS At-Risk Species and Species of Conservation Concern, California Species of Special Concern, and nesting birds and raptors.

4.2.4.1. Special-Status Wildlife

PME measures for special-status wildlife during routine O&M activities are described below. These measures are intended to protect resources in the FERC Project Boundary and are not indicative of an identified Project effect.

General Avoidance Measures

During routine O&M activities, effects to special-status species will be avoided wherever possible. During the annual planning process, the SCE Environmental Manager will review the planned routine O&M locations and determine if there is the potential for the occurrence of special-status wildlife. If the SCE Environmental Manager determines that any planned routine O&M location has the potential to support a special-status wildlife species, field surveys will be conducted as early as possible in the planning process to allow modifications to routine O&M activities, where feasible, to avoid or reduce a potential effect.

Yosemite Toad

Yosemite toad (*Anaxyrus canorus*) is known to occur at three locations adjacent or in close proximity to the FERC Project Boundary: the southern end of Saddlebag Lake, in a few locations west of Lee Vining Creek below Slate Creek, and at the inlet to Tioga Lake. These locations have not been subject to routine maintenance in the past and are not anticipated to undergo routine maintenance in the future. SCE will avoid performing routine O&M or other ground -disturbing activities in these locations during the term of the new license. Should future O&M activities be needed in any of these areas, SCE will have qualified biologists survey the area for Yosemite toad activity and flag an avoidance area with an appropriately sized buffer to avoid take of Yosemite toad. Prior to conducting activities in known Yosemite toad locations, SCE will consult with the USFS and USFWS to seek their review and approval in advance of the activity.

Bighorn Sheep

Bighorn sheep (*Ovis canadensis*) freely roam throughout the vicinity of the FERC Project Boundary without interference from the Project. No special measures are needed to protect bighorn sheep with respect to routine O&M activities.

4.3. AESTHETIC RESOURCES

Buildings, other structures, and pipelines are designed, placed, landscaped, and painted in earth tones to blend into the surrounding area. The facility areas are landscaped with trees and scrubs to screen and break up the lines of the buildings.

Project-related routine O&M activities will consider building materials, color, conservation of vegetation, and landscaping to preserve the aesthetics of the FERC Project Boundary.

5.0 CONSULTATION AND PLAN REVIEW

5.1. PRE-LICENSE CONSULTATION

This RMP was developed during the relicensing process, prior to submittal of the FLA in January 2025, as indicated below.

- June 11, 2024: RMP outline provided to Technical Work Group
- July 16, 2024: Draft RMP distributed to Technical Working Group
- August 27, 2024: RMP filed as part of the Project Draft License Application (DLA)
- August 28, 2024 through November 25, 2024: Formal DLA comment period
- DLA comments addressed in revised RMP, where appropriate
- January 28, 2025: RMP filed as part of the Project FLA

5.2. FUTURE AMENDMENTS TO THE RESOURCES MANAGEMENT PLAN

This RMP will be reviewed internally by SCE Operations staff on an annual basis and included in any environmental training for the Project. Any revisions to this RMP proposed by SCE must be developed in consultation with USFS, USFWS, and CDFW. SCE will allow 30 days for the agencies to comment and to make recommendations on SCE's proposed RMP revisions before filing the proposed revised RMP with FERC for approval. SCE will include with the proposed revised RMP filed with FERC documentation of consultation, copies of recommendations and other comments submitted by the agencies as provided above, and specific descriptions of how the agencies' comments are accommodated by the plan. If SCE does not adopt a recommendation submitted by a consulting agency, SCE's consultation document will include SCE's reasons, based on Project-specific information.

Any amendments to this RMP will become effective upon approval by FERC.

6.0 REFERENCES

Cal-IPC (California Invasive Plant Council). 2012. *Preventing the Spread of Invasive Plants: Best Management Practices for Land Managers (3rd Edition).* Berkeley, CA: Accessed: July 2024. Retrieved from: https://cal-ipc.org/docs/bmps/dd9jwo1ml8vttq9527zjhek99qr/BMPLandManager.pdf.

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USFS (U.S. Forest Service). 2019. *Forest-Wide Invasive Plant Treatment Project, Environmental Assessment*. Inyo National Forest. April 2019.

USFWS (U.S. Fish and Wildlife Service). 2024. Survey Protocols, via search feature. Accessed: July 2024. Retrieved from: https://www.fws.gov/search?$keywords=%22survey%20protocols%22.

ATTACHMENT 2
EROSION AND SEDIMENT CONTROL PLAN

SOUTHERN CALIFORNIA EDISON

LEE VINING HYDROELECTRIC PROJECT

(FERC PROJECT NO. 1388)

EROSION AND SEDIMENT CONTROL PLAN

Energy for What's Ahead℠

January 2025

SOUTHERN CALIFORNIA EDISON

LEE VINING HYDROELECTRIC PROJECT
(FERC PROJECT NO. 1388)

EROSION AND SEDIMENT CONTROL PLAN

Southern California Edison
2244 Walnut Grove Avenue
Rosemead, CA 91770

January 2025

Support from:

Kleinschmidt

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BMP	best management practice
FERC	Federal Energy Regulatory Commission
General Permit	General Permit for Stormwater Discharges Associated with Construction and Land Disturbance Activities
O&M	operation and maintenance
Project	Lee Vining Hydroelectric Project (FERC Project No. 1388)
RUSLE2	Revised Universal Soil Loss Equation 2
SCE	Southern California Edison [Company]
SWRCB	State Water Resources Control Board
USFS	U.S. Forest Service

1.0 INTRODUCTION

Southern California Edison (SCE) Company is the Licensee, owner, and operator of the Lee Vining Hydroelectric Project (Project), Federal Energy Regulatory Commission (FERC) Project No. 1388 located on Lee Vining Creek near the community of Lee Vining in Inyo County, California. Project facilities are located within the Inyo National Forest (managed by the U.S. Forest Service [USFS]). The FERC Project Boundary includes some private lands owned by the Licensee. The Project consists of three dams and reservoirs, an auxiliary dam, a flowline consisting of a pipeline and penstock, and a powerhouse. SCE currently operates the Project under a 30-year license issued by FERC on February 4, 1997. The license will expire January 31, 2027. SCE is seeking a license renewal to continue its existing operation and maintenance (O&M) of the Project. Figure 1-1 provides an overview of the location and general layout of facilities relative to the FERC Project Boundary. SCE is not proposing any changes to Project maintenance or any new construction as part of this relicensing.

Most of the Project facilities have been in existence since the early 1900's. No changes in the existing facilities or the maintenance of those facilities are proposed under the new license. Project-related activities will generally be limited to routine O&M activities. This Erosion, Stream Sedimentation, Soil Mass Movement, and Dust Control Plan has been developed to (1) provide general measures to control erosion, stream sedimentation, soil mass movement, and dust occurring as the result of routine O&M of the facilities; and (2) provide the basis for the formulation of specific measures which will be addressed on a case-by-case basis with USFS and State Water Resources Control Board (SWRCB) with regard to non-routine O&M activities.

SCE has a long-standing relationship with USFS implementing erosion control. Through this relationship, procedures have been established for control of erosion and sedimentation for routine O&M projects. Additionally, general measures for control and remediation of washouts and soil movements associated with accidental occurrences, such as a rupture of flow lines, have been established and incorporated into this Plan. Specific and detailed remediation measures will be determined on a case-by-case basis as necessitated by the type of event.

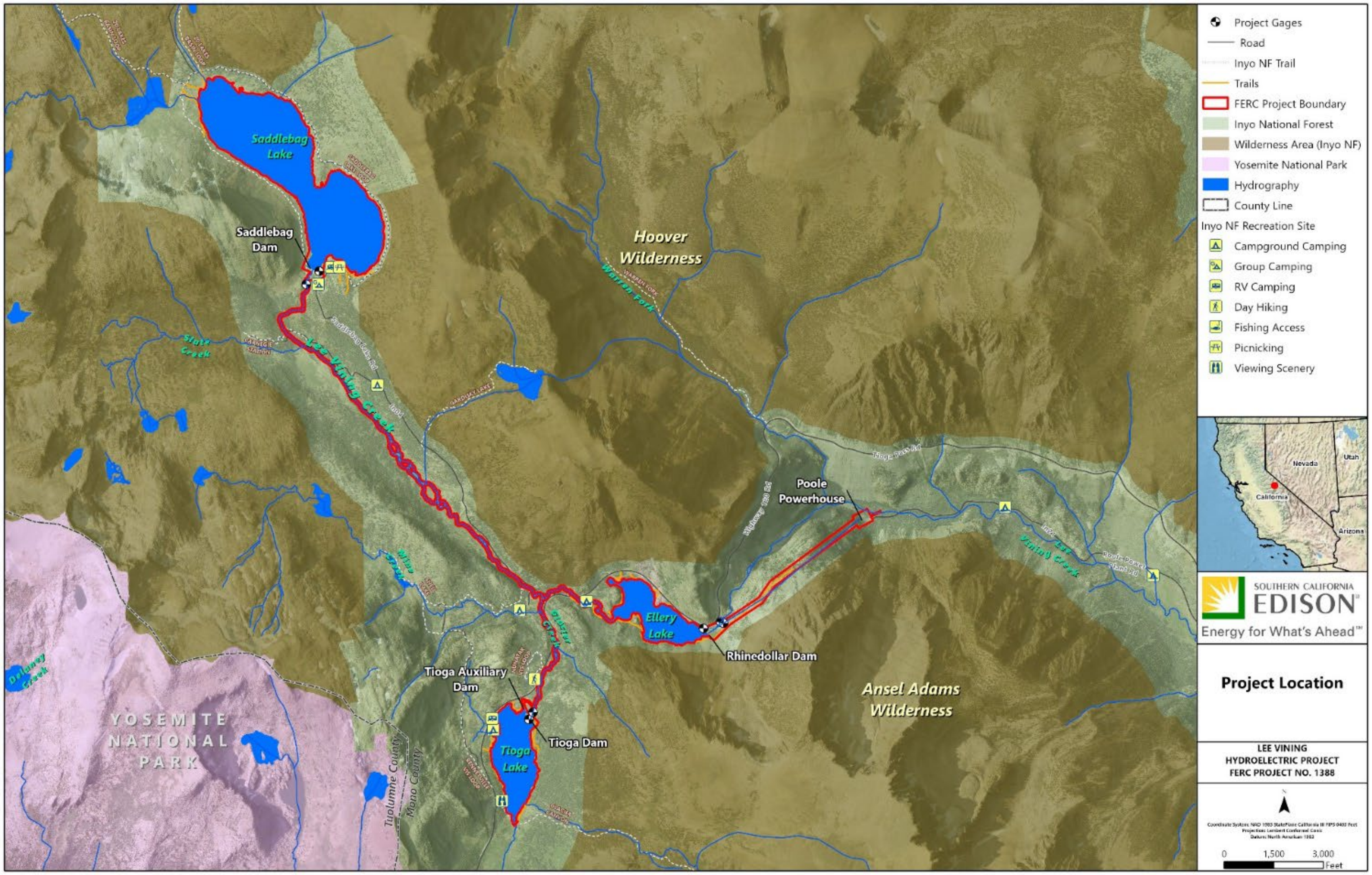

Figure 1-1. Project Location, Proposed FERC Project Boundary, and Facilities.

2.0 DESCRIPTION OF POTENTIAL SOURCES FOR EROSION, SEDIMENTATION, SOIL MASS MOVEMENT, AND DUST

Potential sources of erosion, dust, sedimentation, and soil mass movements could be associated with routine O&M activities of the existing facilities.

Minor/routine O&M activities that may occur periodically include under normal operations of the Project:

- Access roadway repair, repaving or patching;
- Structural inspection and maintenance;
- Bridge repair;
- Maintenance of dams and diversion structures;
- Repair of flow lines and penstocks;
- Repair of buildings and other facilities within proposed FERC Project Boundary;
- Removal of sediment from reservoirs and forebays;[1]
- Vegetation trimming and removal/clearing near facilities, roadways and structures;
- Hazard tree inspection and removal;
- Slide debris removal;
- Material/slash burning;
- Manage access gates and security fencing;
- Facility painting; or
- Other minor channel maintenance and facility modifications as may be required by FERC as a result of periodic inspections.

3.0 DESCRIPTION OF MEASURES FOR SOIL STABILIZATION AND EROSION PROTECTION, SEDIMENT REDUCTION, AND DUST CONTROL

This section describes general measures that will be used, where applicable, for erosion control and soil stabilization as part of routine O&M activities, some of which are listed above.

3.1. GOOD SITE MANAGEMENT "HOUSEKEEPING"

The following describes general minimum best management practices (BMPs) that will be implemented, where applicable, for routine O&M activities that result in grading or disturbance of soil. SCE will implement good site management (i.e., "housekeeping")

[1] Sediment removal/management with hand shovels is considered a standard O&M activity, though none has been conducted in the past 20 years of the Project.

measures for materials that could potentially be a threat to water quality if discharged or exposed to stormwater:

- SCE will identify and protect the materials that could be a threat to water quality.
- Stockpiles will be protected to limit exposure to precipitation and prevent erosion and pollutant transport.
- Chemicals will be stored in watertight containers with secondary containment to prevent any spillage or leakage or store in a completely enclosed storage area.
- SCE will implement BMPs to control the off-site tracking of sediment and loose materials.
- SCE will implement BMPs to control the discharge of plastic materials and limit the use of plastic materials when more sustainable, environmentally friendly alternatives exist. SCE will consider the use of plastic materials resistant to solar degradation where plastic materials are deemed necessary.

SCE will implement good housekeeping measures for waste management as follows:

- SCE will minimize the discharge of pollutants from equipment and vehicle washing, wheel wash water, masonry wash waters, and other wash waters. To mitigate impacts to water quality, wash waters will be captured and treated prior to discharge or disposed of at a permitted facility that can accept that waste.
- SCE will provide containment (e.g., secondary containment) of sanitation facilities (e.g., portable toilets) to prevent discharges of pollutants to the stormwater drainage system or receiving water.
- SCE will clean or replace sanitation facilities and inspect them regularly for leaks and spills.
- SCE will keep debris or trash in waste containers if it is subject to transport from the site by wind or run-off.
- SCE will cover waste disposal containers at the end of every business day and during a precipitation event.
- SCE will prevent discharges from waste disposal containers to the stormwater drainage system or receiving water (e.g., containers with solid bottoms and regular maintenance).
- SCE will contain and securely protect stockpiled waste material from wind and precipitation unless actively being used.
- SCE will secure and contain concrete washout areas and other washout areas that may contain additional pollutants to minimize discharge into the underlying soil and onto surrounding areas. Washout areas will be covered prior to and during a precipitation event.

SCE will implement good housekeeping for vehicle/equipment storage and maintenance as follows:

- SCE will contain fuel, grease, and oil to prevent them from leaking into ground, storm drains, or surface waters.
- SCE will place all equipment or vehicles that are to be fueled, maintained, and/or stored in a designated area with BMPs installed.
- SCE will clean leaks immediately and dispose of leaked materials properly in accordance with the law.

SCE will implement good housekeeping for landscape materials as follows:

- SCE will contain and protect stockpiled materials such as mulches, topsoil, and other erodible landscape materials from wind and precipitation unless being actively used.
- SCE will contain packaged landscape materials (e.g., fertilizers) when they are not being actively used.
- SCE will discontinue the application of any erodible landscape material at least 2 days before a forecasted precipitation event or during periods of precipitation.
- SCE will apply erodible landscape material at quantities and rates in accordance with manufacturer recommendations or based on written specifications by knowledgeable and experienced field personnel.

SCE will implement good housekeeping measures on the construction, operations, and maintenance sites to control the aerial deposition of site materials and from site operations. Such particulates can include, but are not limited to, metals, nutrients, organics, sediment, other particulates, and trash.

3.2. Best Management Practices for Routine O&M Activities

3.2.1. Preserve Existing Topsoil

SCE will preserve existing topsoil, unless infeasible, through the following practices:

- Stockpiling existing topsoil, or transferring topsoil to other locations, to deploy and reestablish vegetation prior to termination of coverage.
- Stabilizing disturbed topsoil during routine O&M activities.

Methods for stabilizing disturbed topsoil will be developed on a case-by-case basis, as necessitated by the specific activity.

Preserving existing topsoil is not required where the intended function of a specific area of the site dictates that the topsoil be disturbed or removed (e.g., removal of topsoil containing invasive seedbanks, lack of space to stockpile topsoil, and sites that are designed to be highly impervious after construction with little to no vegetation intended to remain).

3.2.2. Erosion Control

During routine O&M, SCE will implement the following practices to eliminate or minimize site erosion:

- Implement effective wind erosion control.
- Preserve existing vegetation.
- Minimize the amount of soil exposed during operations, or maintenance activities.
- Minimize the disturbance of steep slopes.
- Schedule earthwork to minimize the amount of disturbed area when feasible.
- Minimize soil compaction in areas other than where the intended function of a specific area dictates that it be compacted.
- Reestablish vegetation or non-vegetative erosion controls as soon as practicable.
- Limit the use of plastic materials when more sustainable, environmentally friendly alternatives exist. Where plastic materials are deemed necessary, SCE will consider the use of plastic materials resistant to solar degradation.
- Control stormwater and non-stormwater discharges to minimize downstream channel and bank erosion.
- Control peak flowrates and total volume of stormwater and authorized non-stormwater discharges to minimize channel and streambank erosion and scour in the immediate vicinity of discharge points.

Erosion control BMPs (except for sprayed products) will be available on-site or at a nearby location (e.g., common lay-down yard) year-round with trained persons able to deploy the product. If SCE stabilizes soil using bonded-fiber matrices, hydromulches, spray tackifiers, or other land-applied products, SCE will apply the product according to the manufacturer's instructions and guidance to allow for ample cure time and to prevent treatment chemicals from being transported by runoff.

3.2.3. Sediment Controls

During routine O&M activities, SCE will implement the following site sediment controls:

- Establish and maintain effective perimeter controls.

3.2.4. Surface Water Buffer[2]

During routine O&M activities, SCE will provide and maintain natural buffers and/or equivalent erosion and sediment controls when a water of the U.S. (e.g., Lee Vining Creek

[2] The surface water buffer requirements apply to work above the top-of-bank or high-water level of waters of the United States. Work within a channel or streambed (water body-dependent construction), Clean Water Act § 404 projects with a § 401 certification, and projects where no natural surface buffer exists (e.g., concrete

or Project reservoirs) is located within 50 feet of the site's earth disturbances, unless infeasible.

During routine O&M activities, SCE will comply with one of the following alternatives for any discharges to waters of the U.S. located within 50 feet of a site's earth disturbances:

- Provide and maintain a 50-foot undisturbed natural buffer from the edge of the disturbed area to the top of bank.
- Provide and maintain an undisturbed natural buffer that is less than 50 feet and is supplemented by erosion and sediment controls that achieve, in combination, the sediment load reduction equivalent to a 50-foot undisturbed natural buffer. The equivalent sediment load may be calculated using the Revised Universal Soil Loss Equation 2 (RUSLE2) method or another method approved by the Regional Water Board.
- Implement erosion and sediment controls to achieve the sediment load reduction equivalent to a 50-foot undisturbed natural buffer when infeasible to provide and maintain an undisturbed natural buffer of any size. The equivalent sediment load may be calculated using RUSLE2 or another method approved by the Regional Water Board.

3.2.5. Maintenance and Repair

SCE's Environmental Manager will verify all BMP maintenance and repairs were appropriately implemented during the next visual inspection following completion. The Environmental Manager may delegate BMP maintenance and repair verification to an appropriately trained delegate.

Should it be deemed necessary, following visual inspection, SCE will begin maintaining, repairing, and/or implementing design changes (reviewing alternatives that have not been used yet) to BMPs within 72 hours of identification of failures or other shortcomings. These changes will be completed as soon as possible, prior to the next forecasted precipitation event.

3.2.6. Installation of Erosion-Control Structures

In areas prone to significant flows and in areas prone to erosion, structures such as riprap, rock gabions, or small concrete retaining structures may be necessary. Where required, sedimentation basins may be utilized to control sediments where work is conducted within or adjacent to streams. Except where required by USFS or SWRCB, the basins will be temporary structures that will be used during operations, or maintenance activities and as an interim measure before revegetation measures become effective.

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channelization) are exempt from the requirements. All types of in-channel work may be regulated under § 401 (Clean Water Act - Regional Boards), § 404 (Clean Water Act - Army Corps of Engineers), or §1602 (California Fish and Game Code) and would are not covered in this Plan.

3.2.7. Water Bars, Silt Fences, Etc.

Where applicable for maintenance or minor projects, water bars will be used on slopes to dissipate the energy of flowing water and reduce soil erosion. The water bars will be placed at about 30 degrees from perpendicular from the slope and may be constructed from earth, concrete, or sandbags. Water bars would be removed after the maintenance or construction is complete.

Where applicable, silt fences may be used near streams and in areas subjected to high runoff. These fences would be placed so that the screen material will slow down water and trap sediments. Straw bales or wattles may also be used to reduce sedimentation in and adjacent to streams.

3.2.8. Slope Stabilization

Where applicable, straw and/or jute matting may be used in the stabilization of slopes. This material would be placed on graded slopes and used to hold the slope prior to revegetation and after revegetation until plants have been established. Jute matting is effective with revegetation efforts since plants can be placed in openings of the mats. Straw would be placed as mulch and is effective on small or gently sloping areas where heavy erosion is not expected.

3.2.9. Revegetation

Where applicable, revegetation may be used in the control of erosion and sedimentation on a long-term basis. Revegetation methods and plant selection are site-specific and would require preparation of a revegetation plan to identify types of plants to be used and the appropriate method and time of planting.

Where feasible, a revegetation monitoring program would be established to determine survival thresholds, growth objectives and the success of the revegetation effort.

3.2.10. Monitoring

The effectiveness of all erosion and sedimentation control measures would be monitored both during and after storm events. If needed, erosion control structures would be repaired and resultant erosion damage remediated.

3.3. Non-Routine Operation and Maintenance Requirements

For non-routine O&M activities, specific measures would depend upon the site and physical conditions encountered. SCE will develop plans for non-routine O&M activities in consultation with USFS, U.S. Fish and Wildlife Service, California Department of Fish and Wildlife, and SWRCB, as appropriate, on a site-specific basis and submit the plan to FERC for approval.

3.4. MEASURES TO REDUCE SEDIMENTATION FROM SEDIMENT REMOVAL ACTIVITIES

Forebays and other impoundments may require removal of sediments on a periodic basis, and dam faces and other facilities require occasional maintenance. These activities may result in short-term sedimentation or siltation.

Procedures may include ramping of releases to reduce the amount of sediments released, sediment removal (e.g., sluicing, dredging, or removal by clamshell), and material disposal methods and locations.

3.5. MEASURES FOR REMEDIATION OF MAJOR LAND MOVEMENTS

Rupture of flow lines or failure of slopes along the flow line may result in major land movements requiring remediation, or cut slopes for roadways or other facilities may fail and result in major land movements.

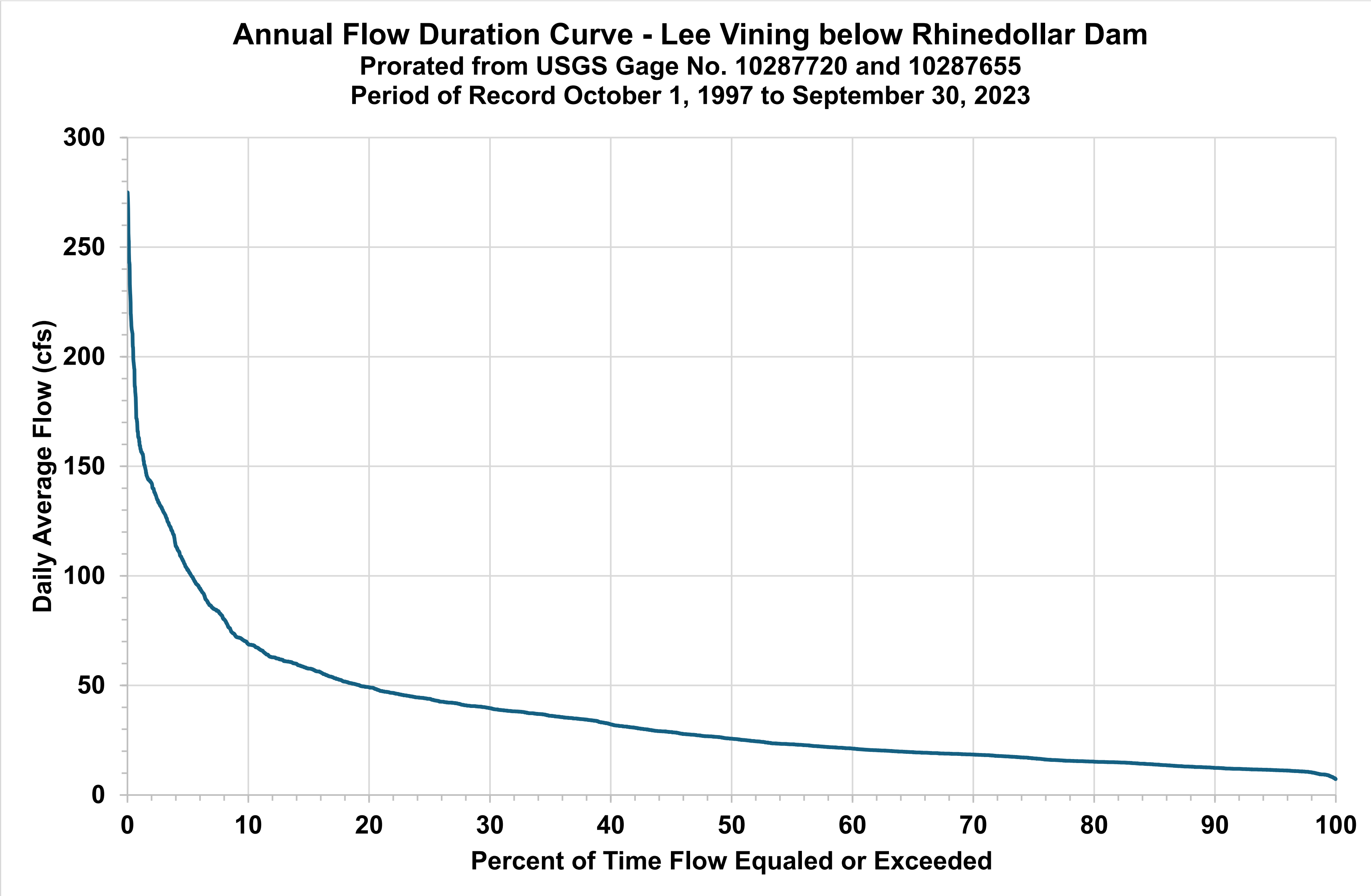
The remediation of land movements would be conducted in consultation with USFS and under the supervision of a registered engineering geologist. In general, slope failures would be repaired through remedial grading and slope stabilization and, where necessary, with retaining walls, riprap, or other structures. Areas would be revegetated, as appropriate.

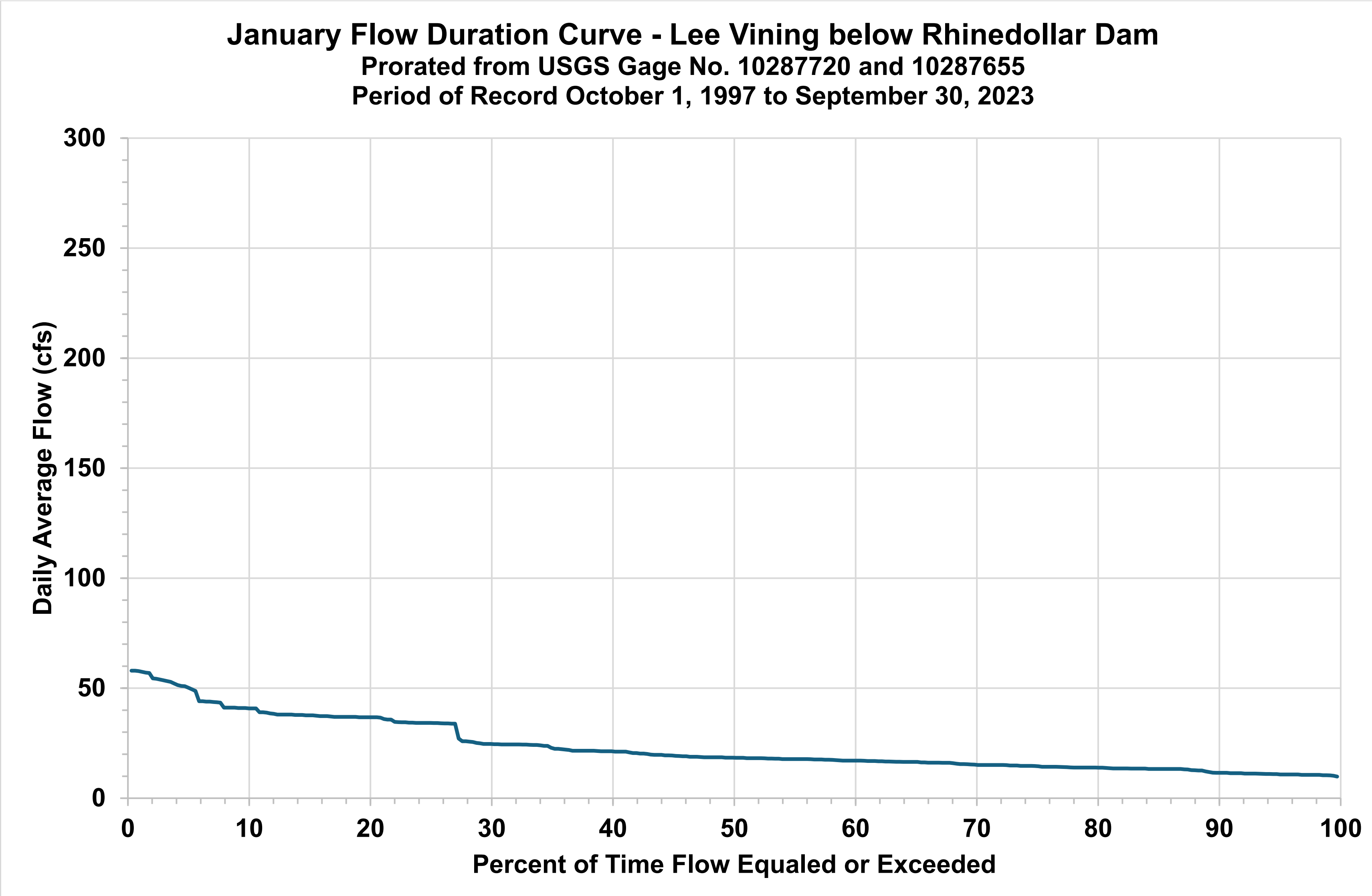
3.6. MEASURES FOR DUST CONTROL

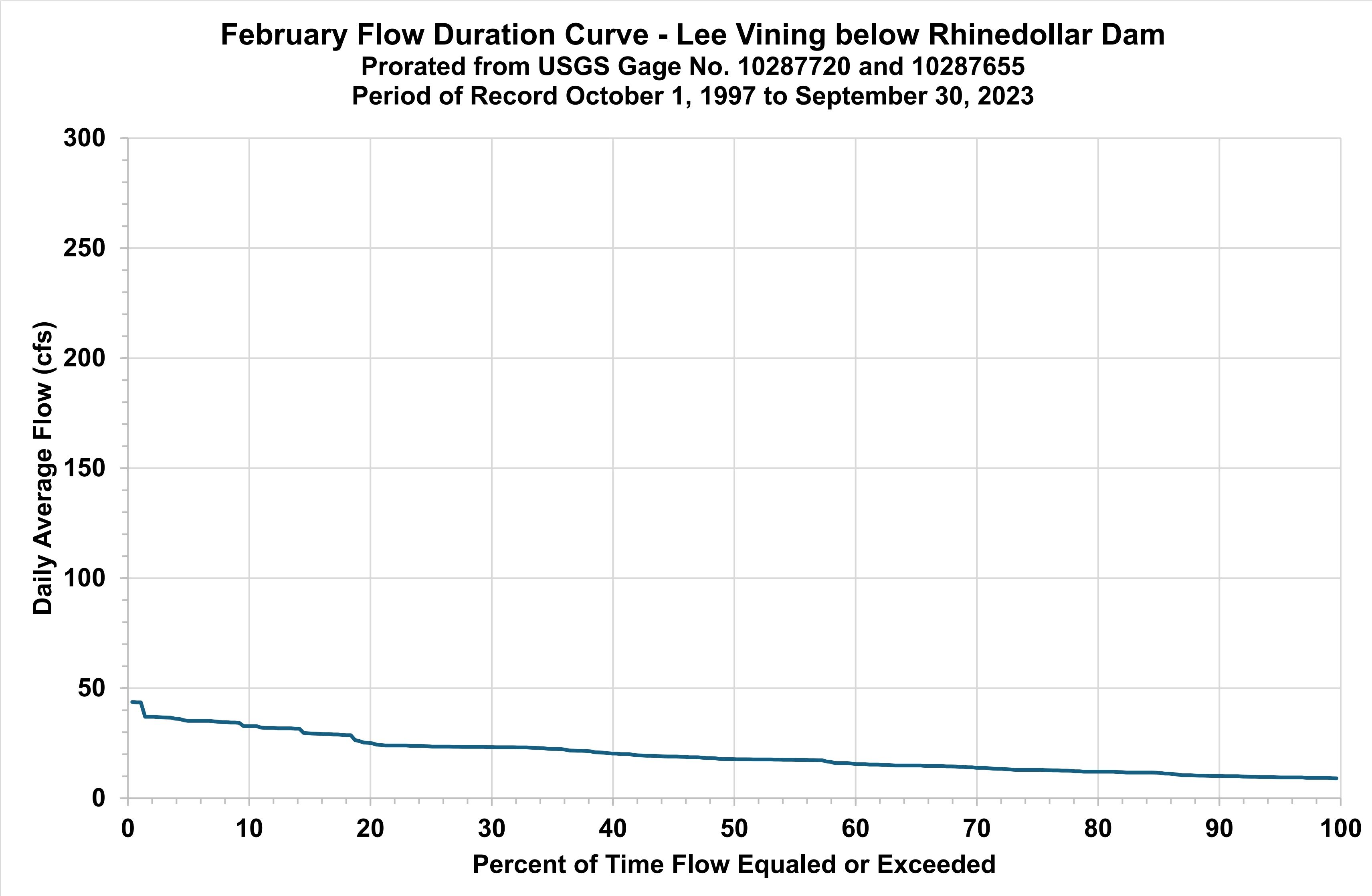
Dust emissions primarily occur during routine O&M activities from vehicular activities and from lofting of dust from sites where vegetation has been removed. Dust will be primarily controlled through application of water from water trucks. When necessary, water will be applied to soil surfaces at least twice a day and more frequently as needed to prevent blowing dust.

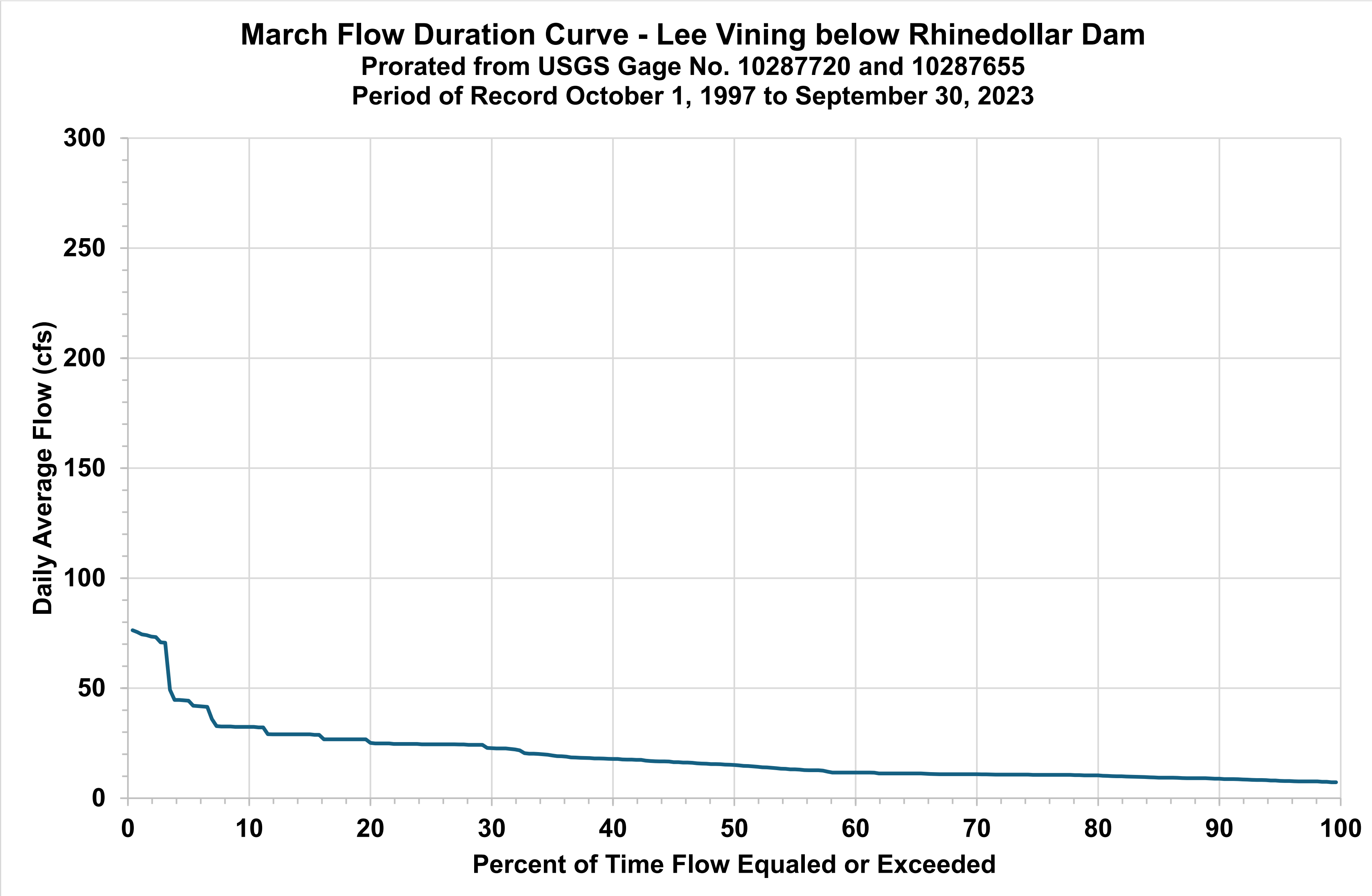
APPENDIX E.2
FLOW DURATION CURVES

Rhinedollar Dam


Annual Flow Duration Curve - Lee Vining below Rhinedollar Dam
Prorated from USGS Gage No. 10287720 and 10287655
Period of Record October 1, 1997 to September 30, 2023
Daily Average Flow (cfs)
0
50
100
150
200
250
300
0
10
20
30
40
50
60
70
80
90
100
Percent of Time Flow Equaled or Exceeded


January Flow Duration Curve - Lee Vining below Rhinedollar Dam
Prorated from USGS Gage No. 10287720 and 10287655
Period of Record October 1, 1997 to September 30, 2023
Daily Average Flow (cfs)
300
250
200
150
100
50
0
0
10
20
30
40
50
60
70
80
90
100
Percent of Time Flow Equaled or Exceeded


February Flow Duration Curve - Lee Vining below Rhinedollar Dam
Prorated from USGS Gage No. 10287720 and 10287655
Period of Record October 1, 1997 to September 30, 2023
Daily Average Flow (cfs)
300
250
200
150
100
50
0
0
10
20
30
40
50
60
70
80
90
100
Percent of Time Flow Equaled or Exceeded


March Flow Duration Curve - Lee Vining below Rhinedollar Dam
Prorated from USGS Gage No. 10287720 and 10287655
Period of Record October 1, 1997 to September 30, 2023
Daily Average Flow (cfs)
300
250
200
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0
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70
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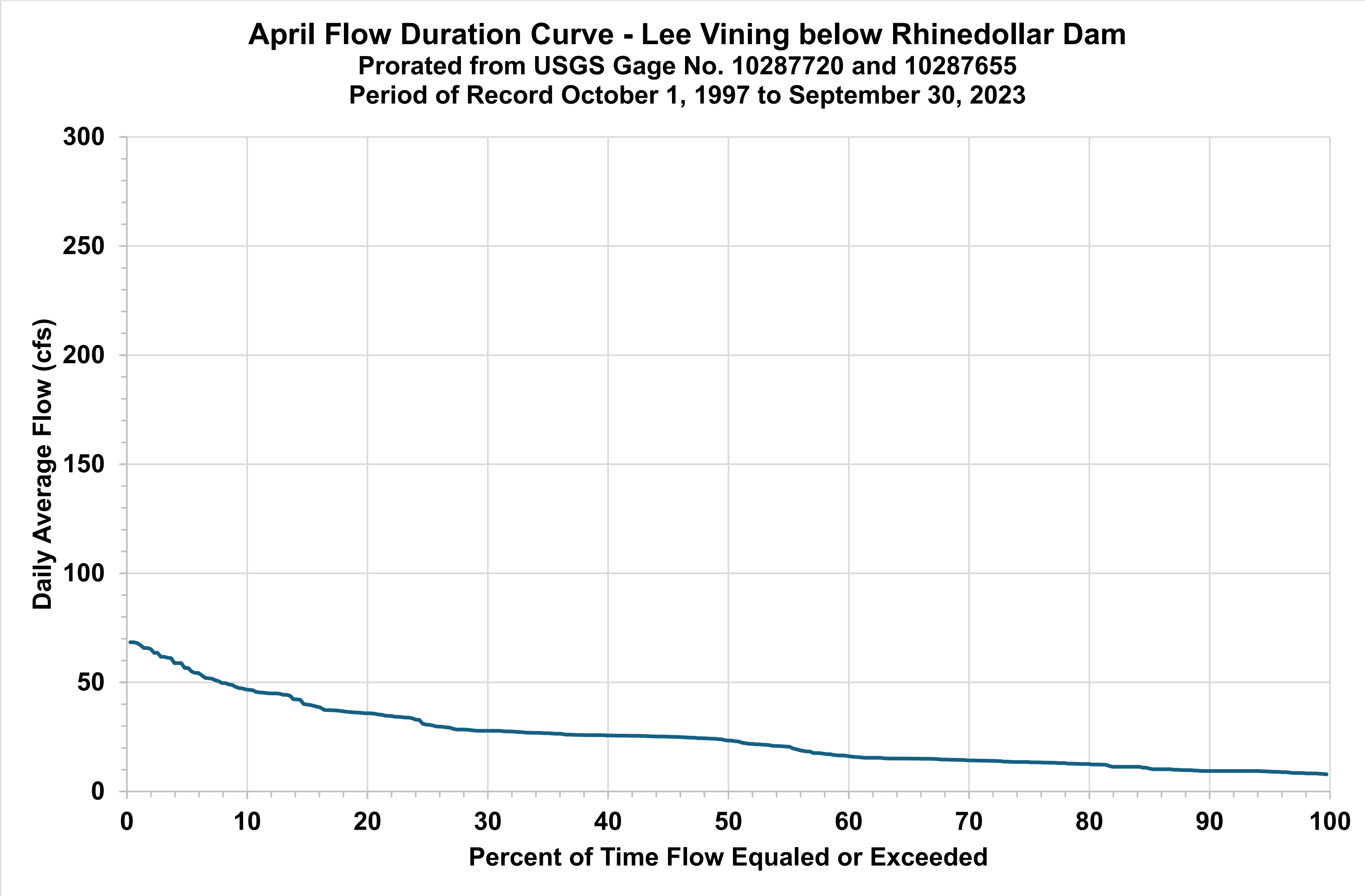
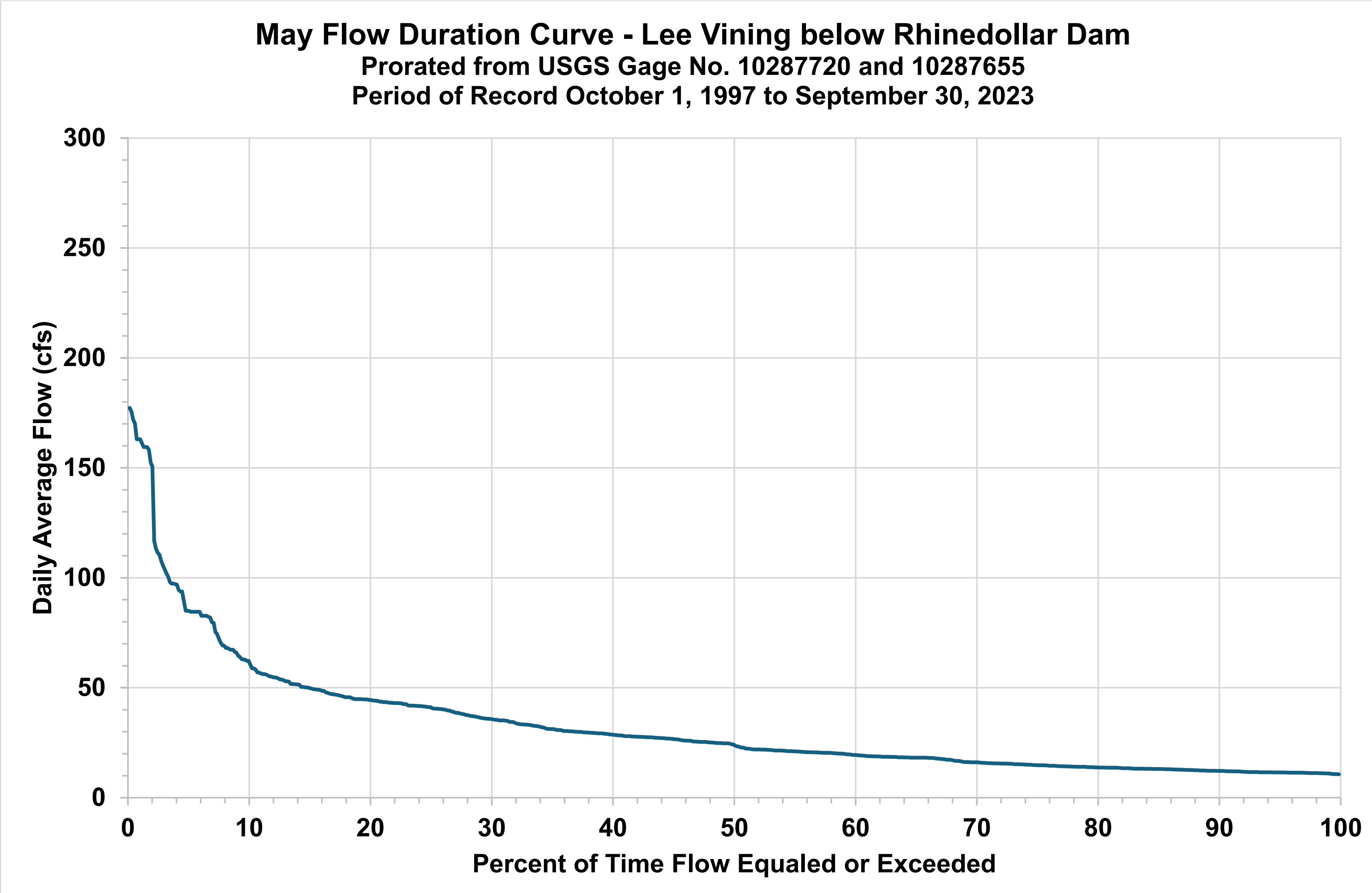
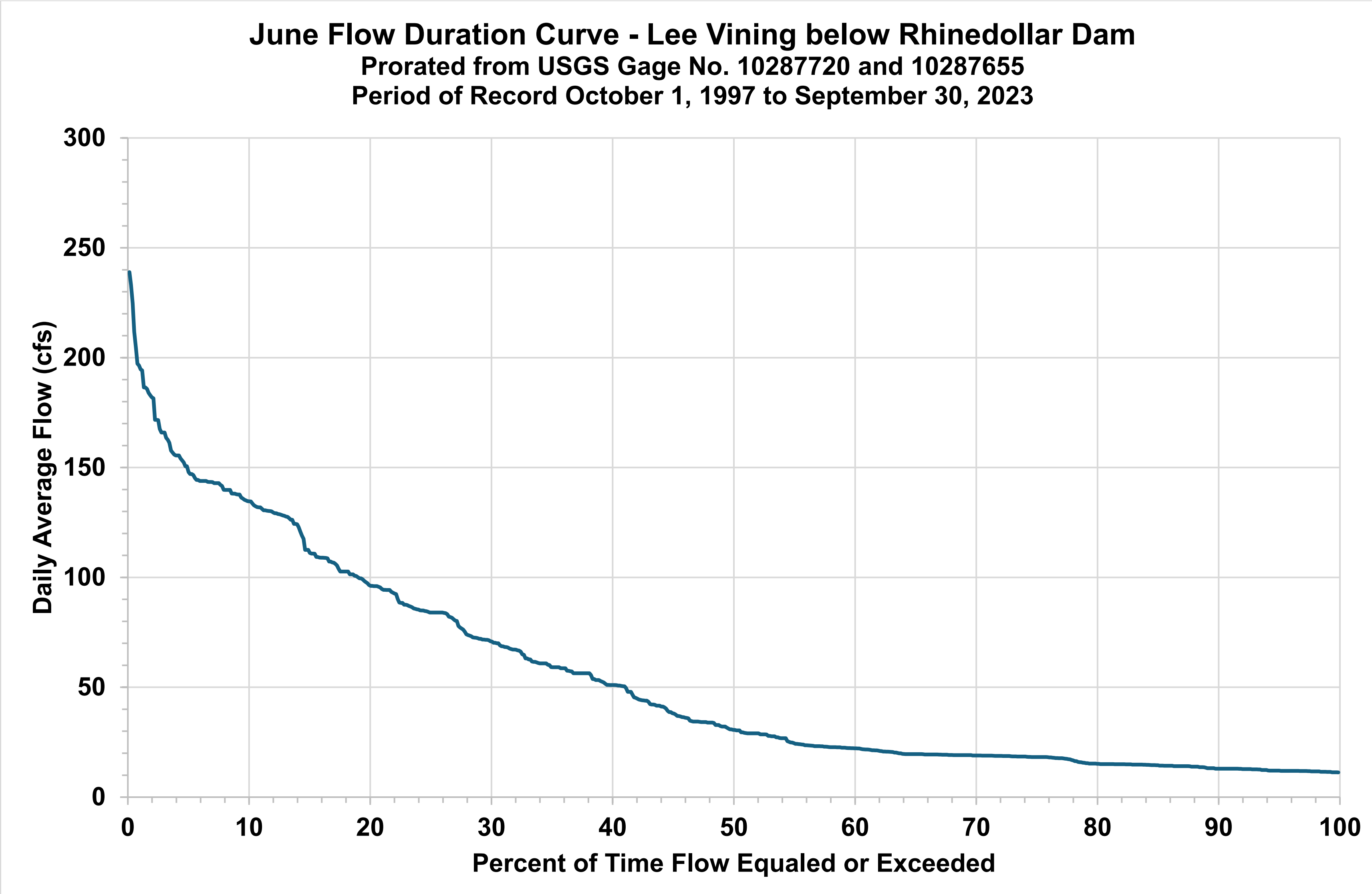
90
100
Percent of Time Flow Equaled or Exceeded


April Flow Duration Curve - Lee Vining below Rhinedollar Dam
Prorated from USGS Gage No. 10287720 and 10287655
Period of Record October 1, 1997 to September 30, 2023
Daily Average Flow (cfs)
300
250
200
150
100
50
0
0
10
20
30
40
50
60
70
80
90
100
Percent of Time Flow Equaled or Exceeded


May Flow Duration Curve - Lee Vining below Rhinedollar Dam
Prorated from USGS Gage No. 10287720 and 10287655
Period of Record October 1, 1997 to September 30, 2023
Daily Average Flow (cfs)
300
250
200
150
100
50
0
0
10
20
30
40
50
60
70
80
90
100
Percent of Time Flow Equaled or Exceeded


June Flow Duration Curve - Lee Vining below Rhinedollar Dam
Prorated from USGS Gage No. 10287720 and 10287655
Period of Record October 1, 1997 to September 30, 2023
Daily Average Flow (cfs)
300
250
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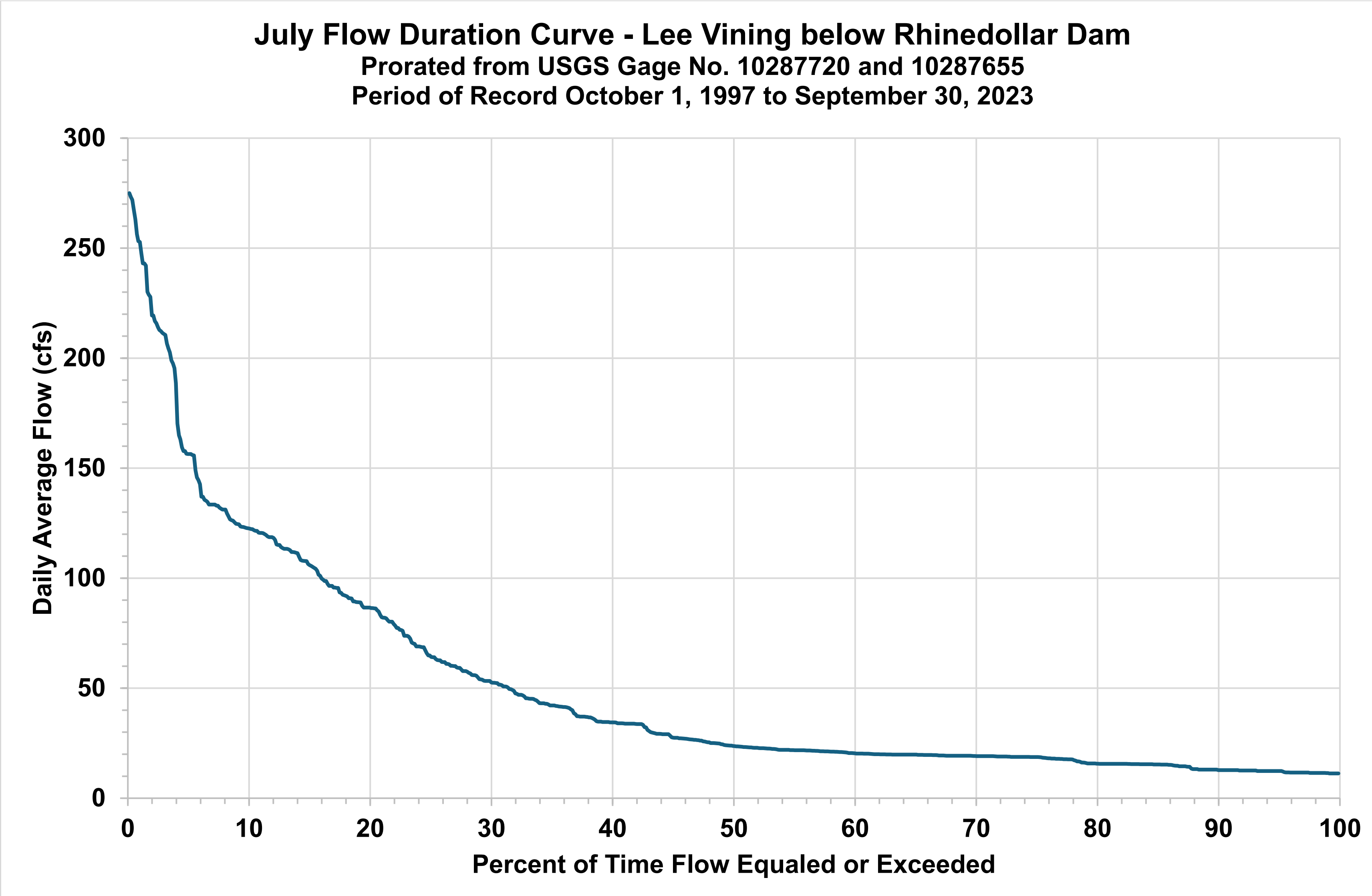
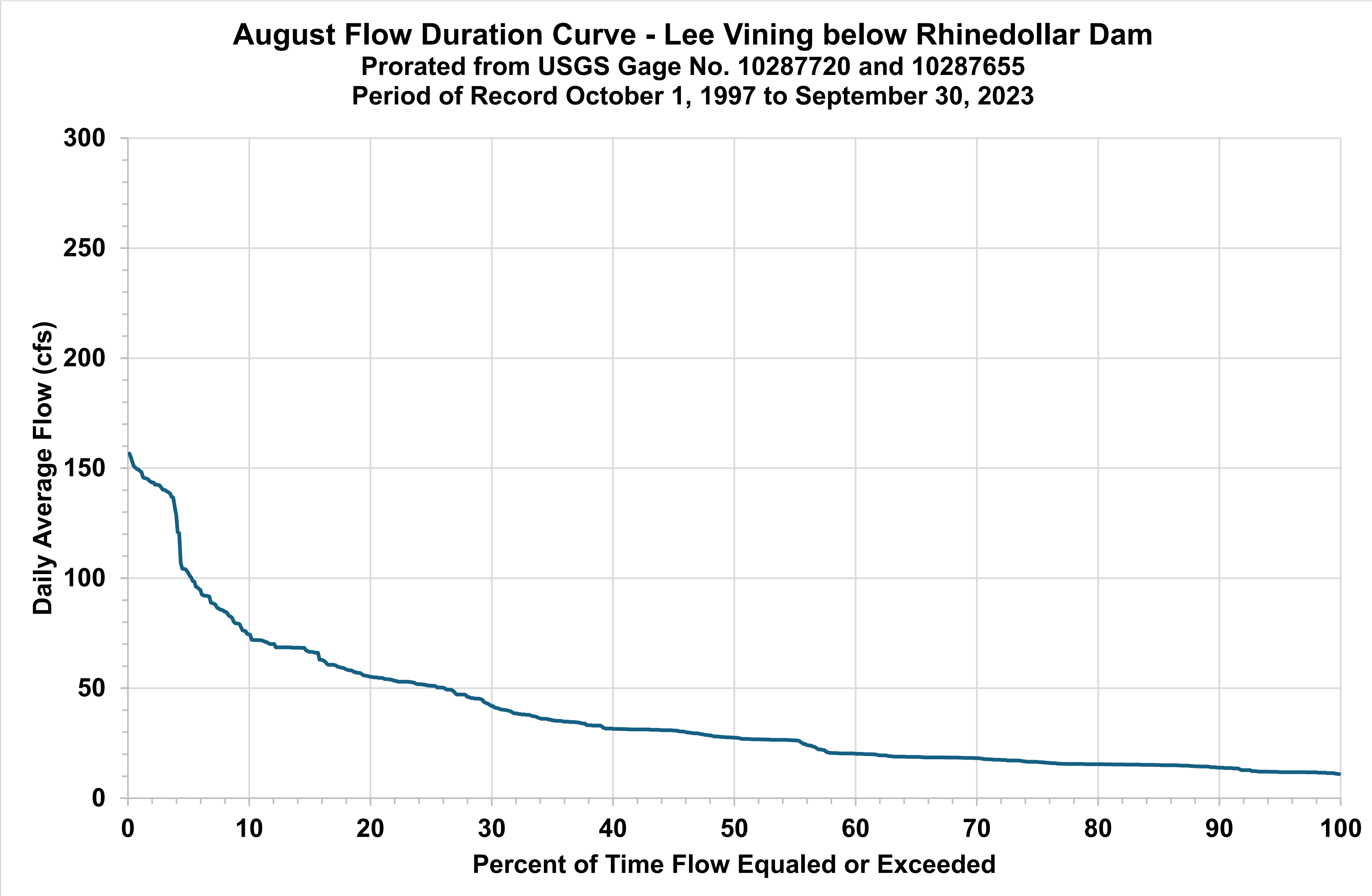
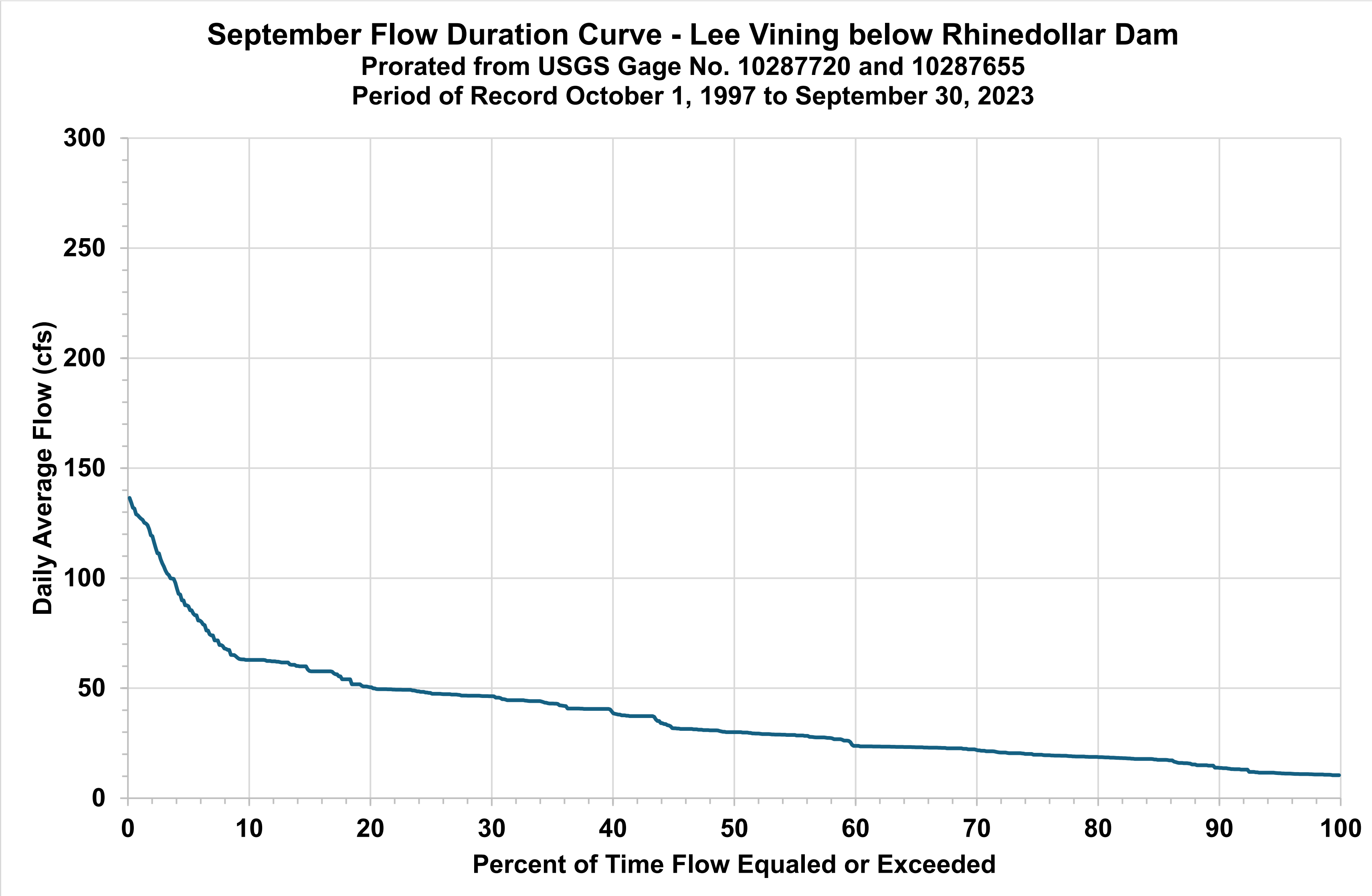
90
100
Percent of Time Flow Equaled or Exceeded


July Flow Duration Curve - Lee Vining below Rhinedollar Dam
Prorated from USGS Gage No. 10287720 and 10287655
Period of Record October 1, 1997 to September 30, 2023
Daily Average Flow (cfs)
300
250
200
150
100
50
0
0
10
20
30
40
50
60
70
80
90
100
Percent of Time Flow Equaled or Exceeded


August Flow Duration Curve - Lee Vining below Rhinedollar Dam
Prorated from USGS Gage No. 10287720 and 10287655
Period of Record October 1, 1997 to September 30, 2023
Daily Average Flow (cfs)
300
250
200
150
100
50
0
0
10
20
30
40
50
60
70
80
90
100
Percent of Time Flow Equaled or Exceeded


September Flow Duration Curve - Lee Vining below Rhinedollar Dam
Prorated from USGS Gage No. 10287720 and 10287655
Period of Record October 1, 1997 to September 30, 2023
Daily Average Flow (cfs)
300
250
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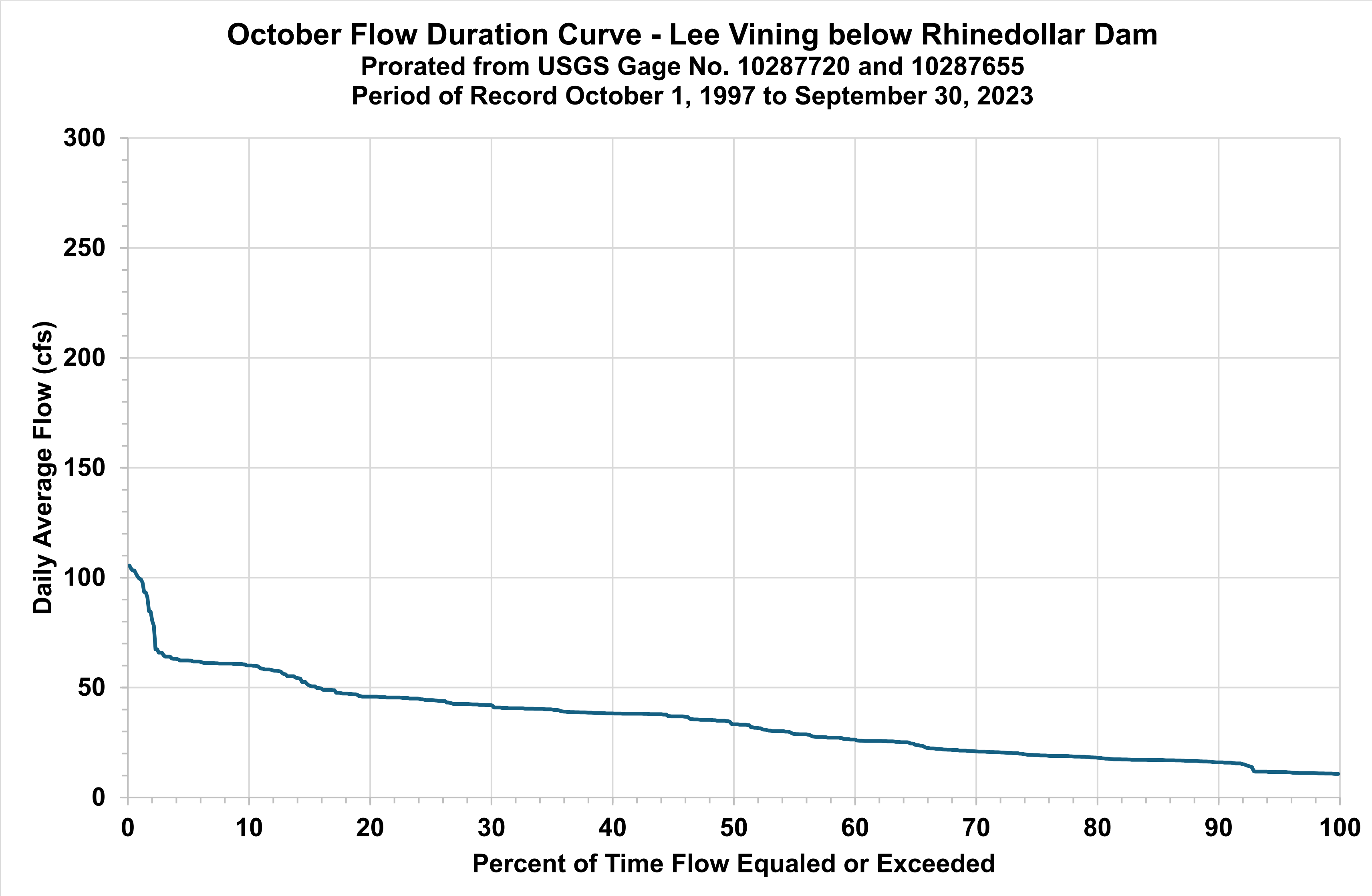
90
100
Percent of Time Flow Equaled or Exceeded


October Flow Duration Curve - Lee Vining below Rhinedollar Dam
Prorated from USGS Gage No. 10287720 and 10287655
Period of Record October 1, 1997 to September 30, 2023
Daily Average Flow (cfs)
300
250
200
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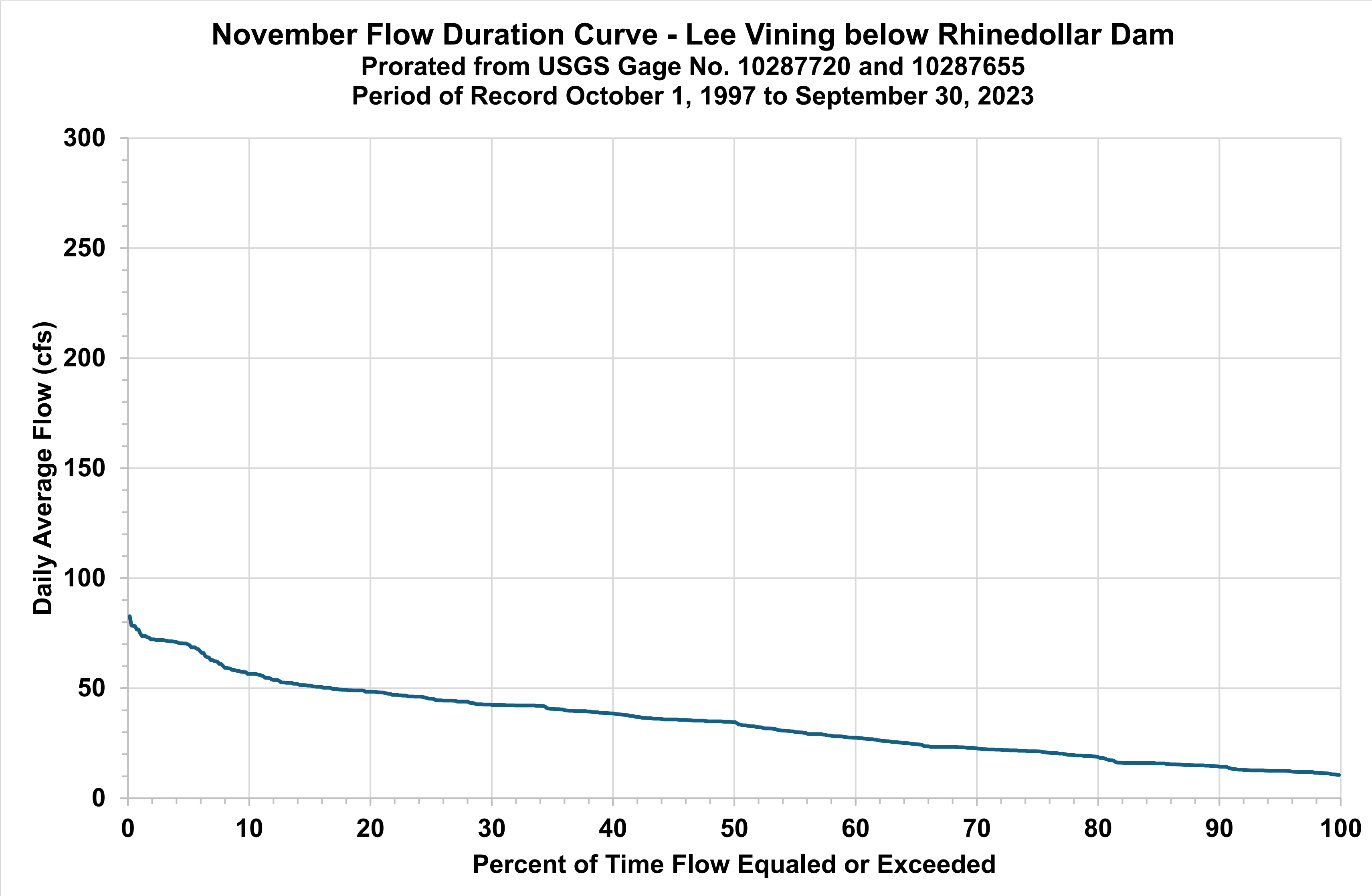
90
100
Percent of Time Flow Equaled or Exceeded


November Flow Duration Curve - Lee Vining below Rhinedollar Dam
Prorated from USGS Gage No. 10287720 and 10287655
Period of Record October 1, 1997 to September 30, 2023
Daily Average Flow (cfs)
300
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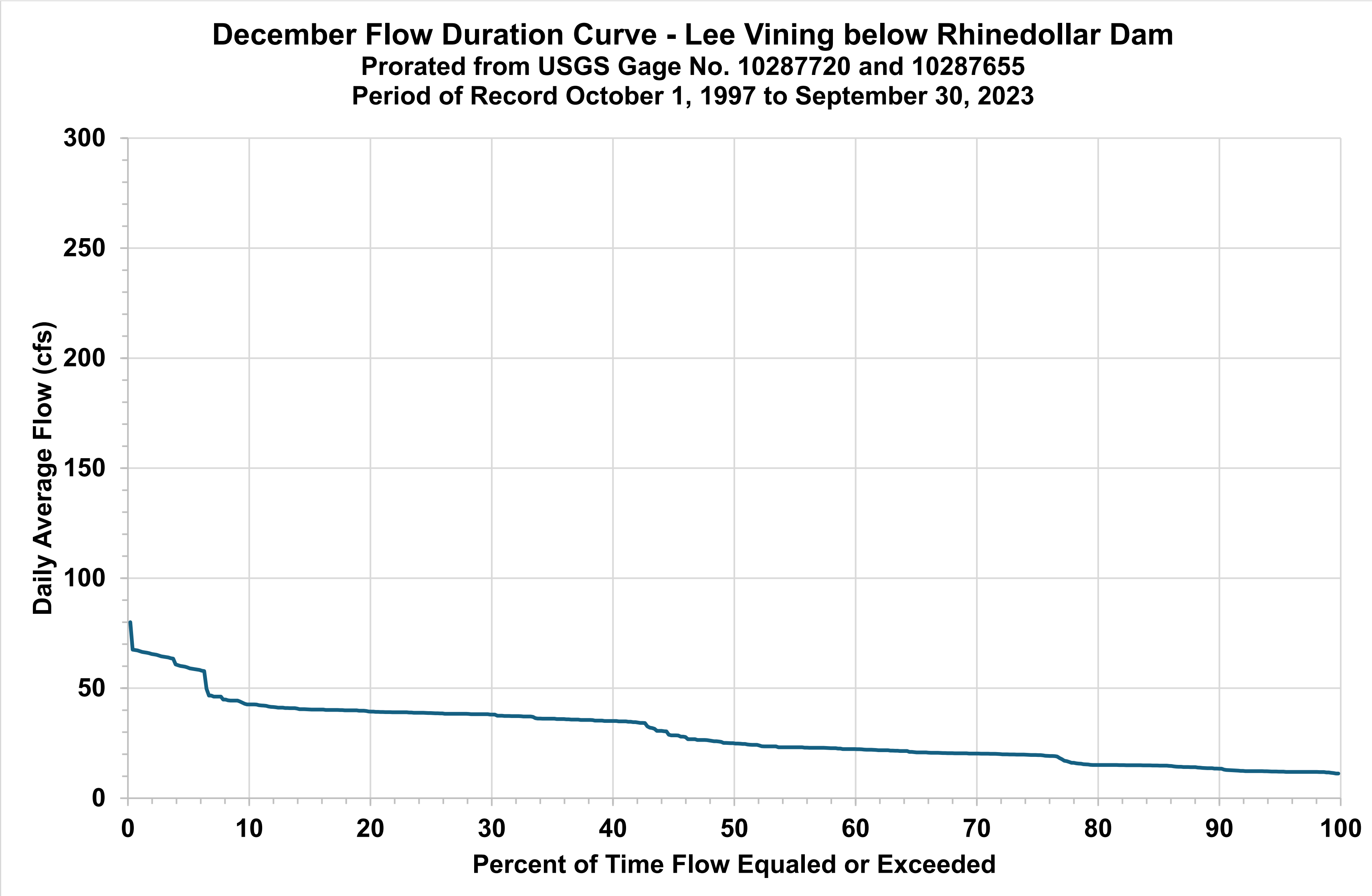
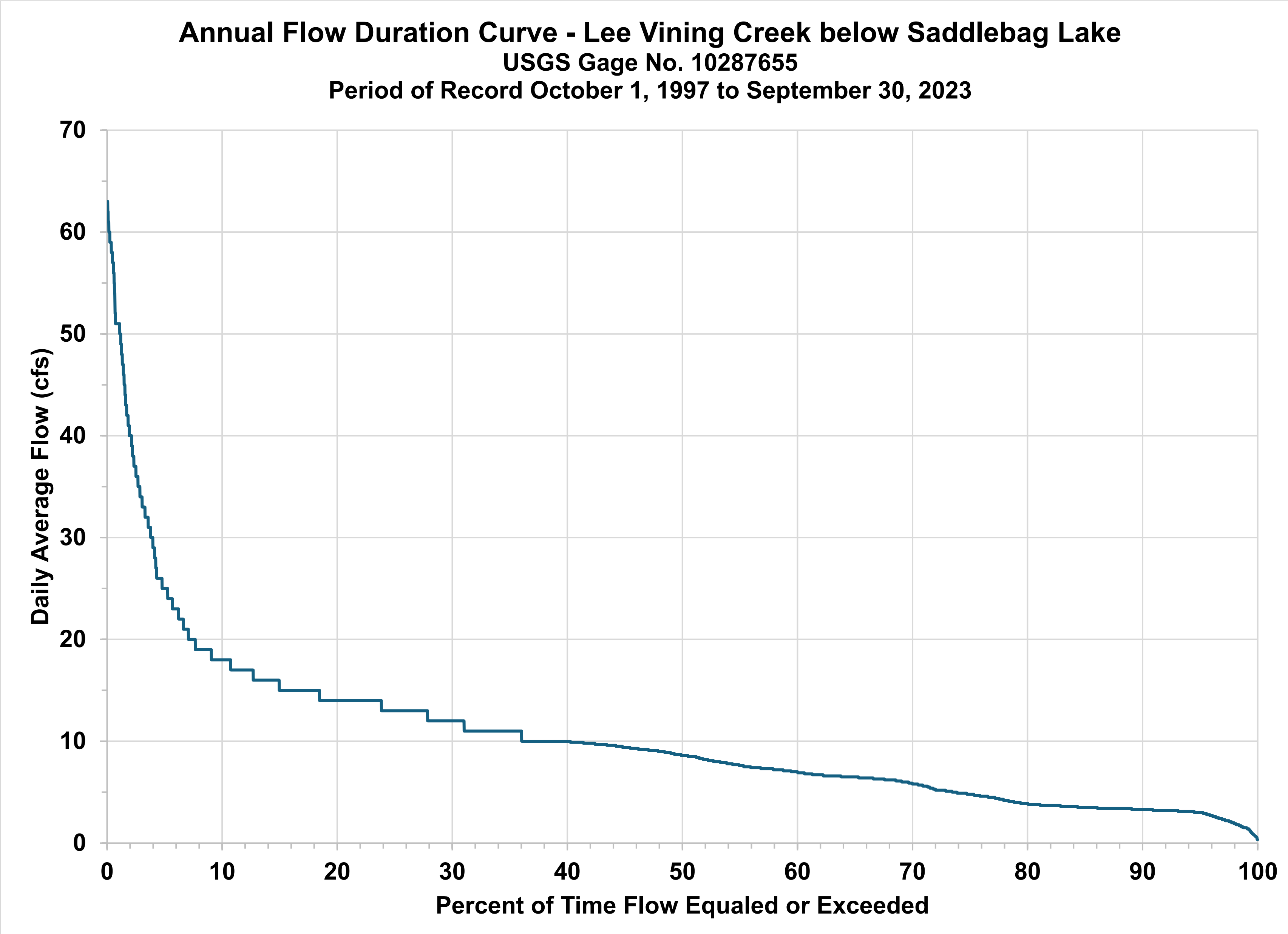
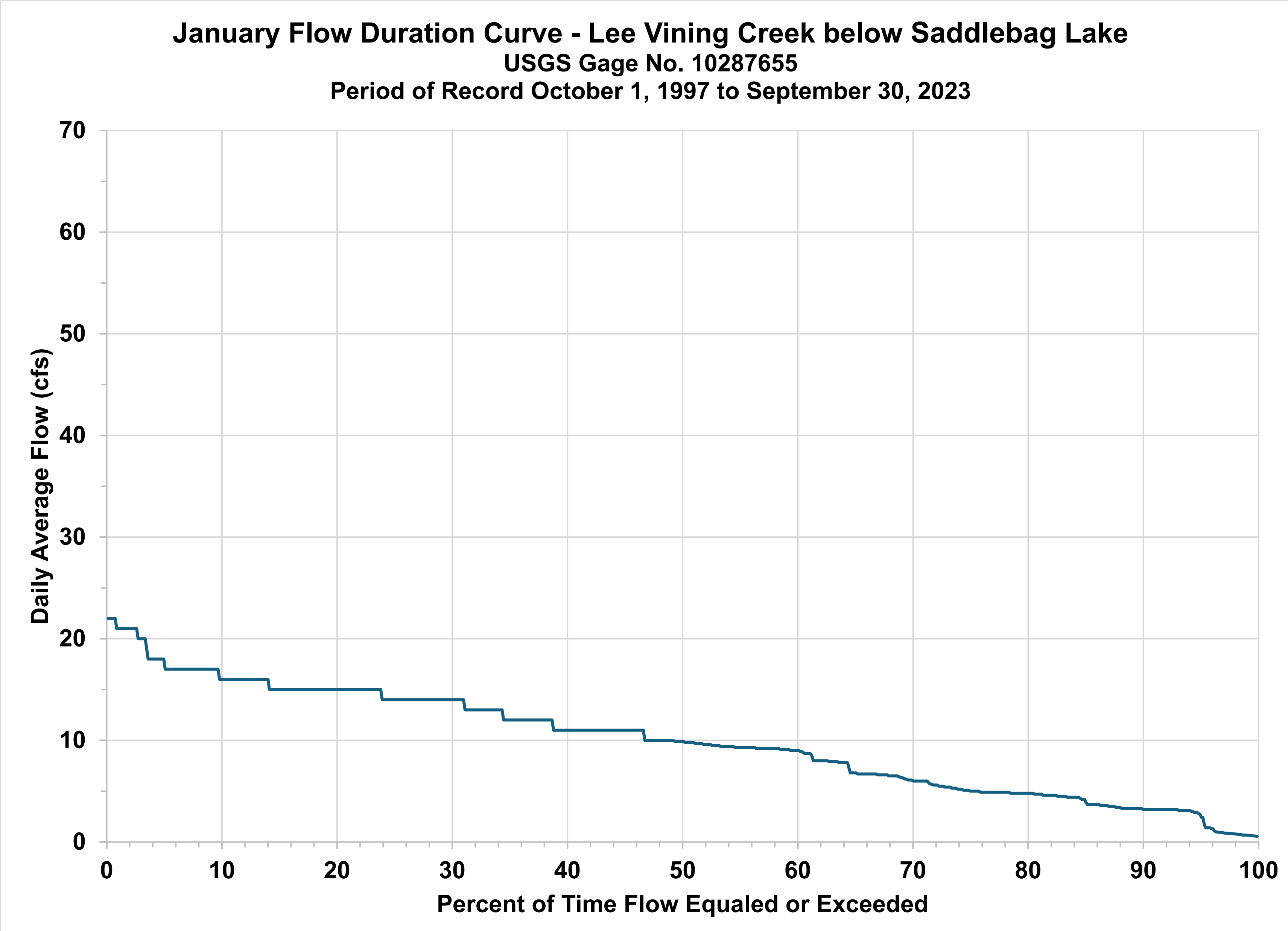
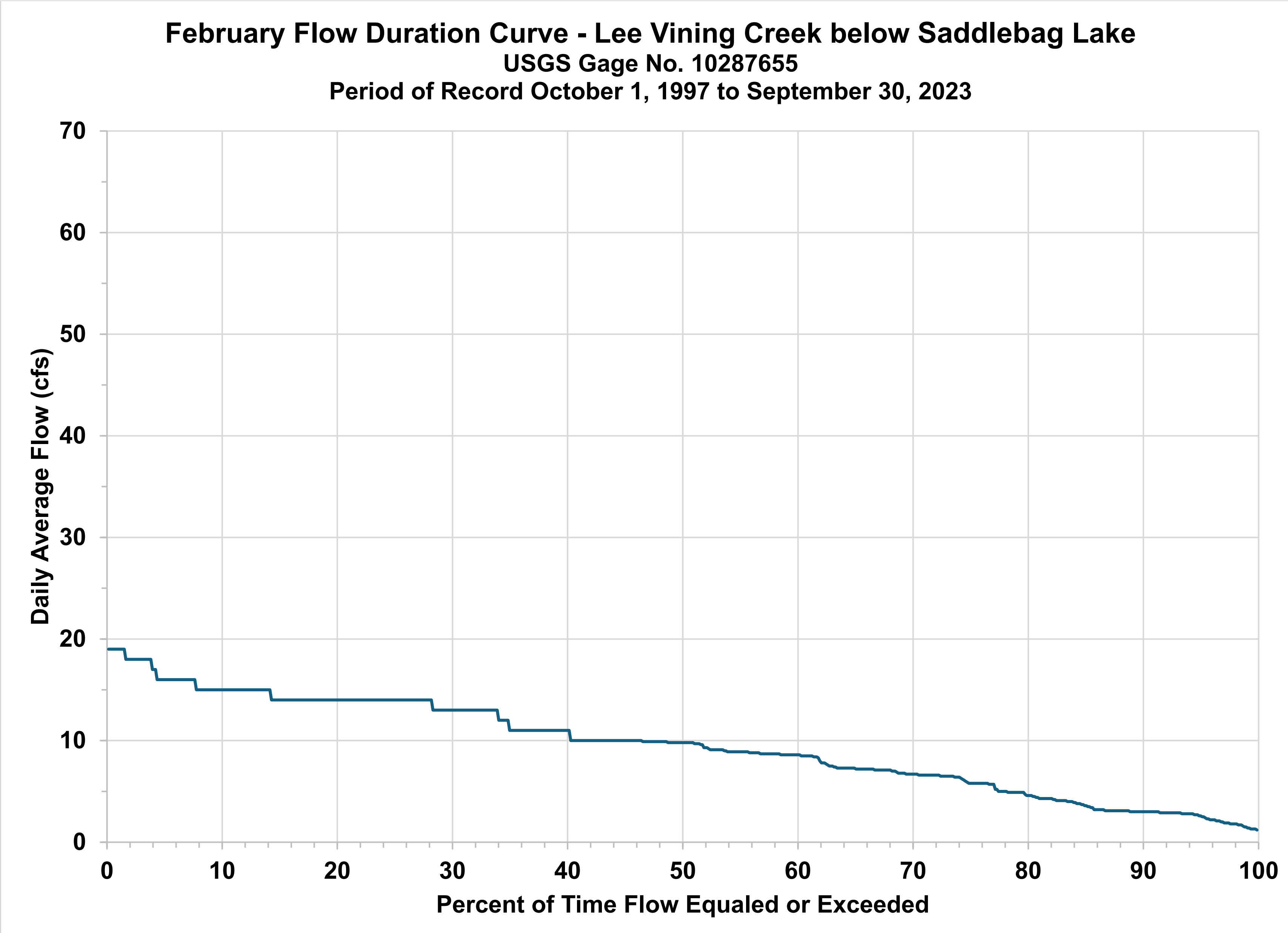
90
100
Percent of Time Flow Equaled or Exceeded

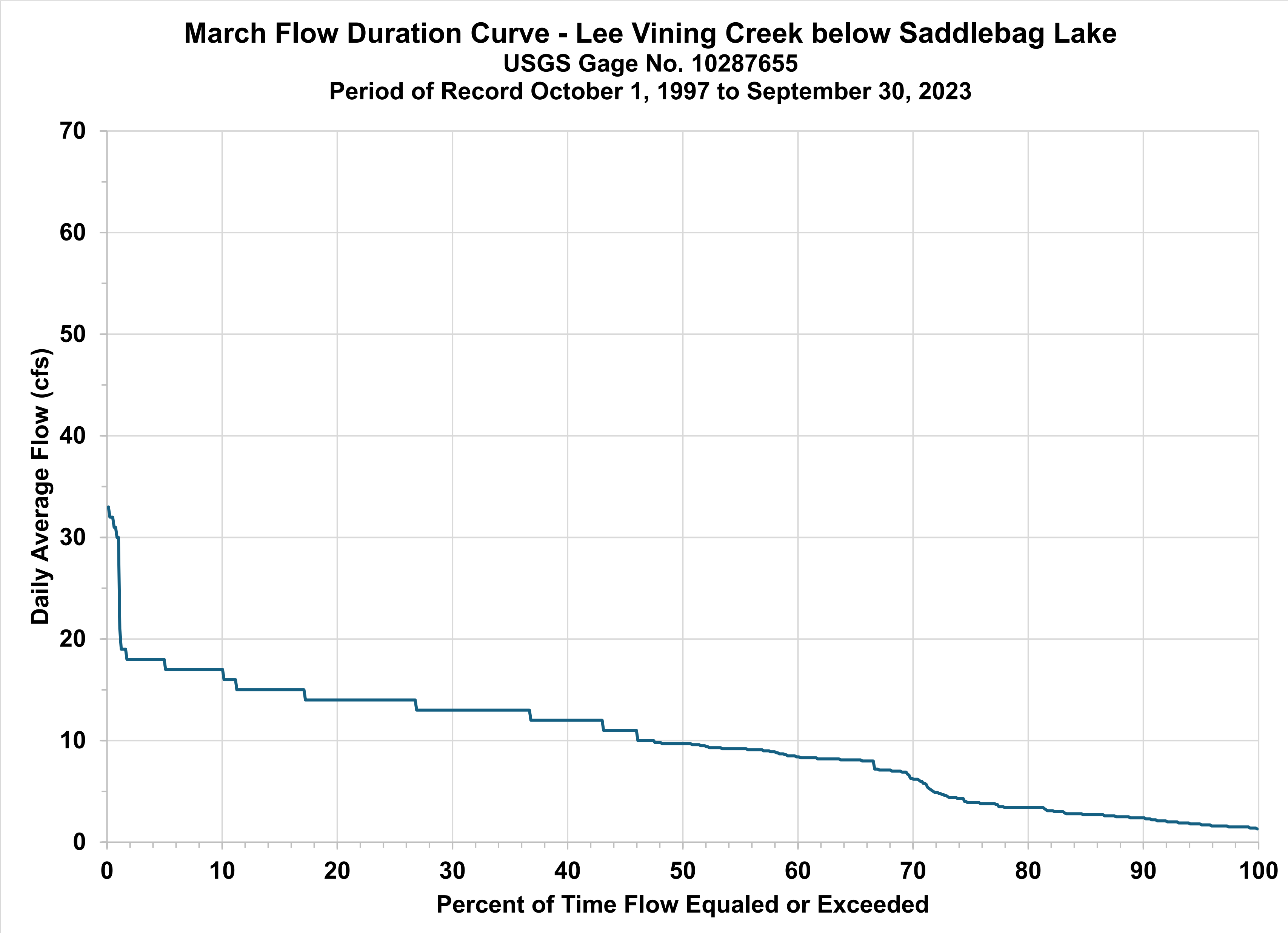

December Flow Duration Curve - Lee Vining below Rhinedollar Dam
Prorated from USGS Gage No. 10287720 and 10287655
Period of Record October 1, 1997 to September 30, 2023
Daily Average Flow (cfs)
300
250
200
150
100
50
0
0
10
20
30
40
50
60
70
80
90
100
Percent of Time Flow Equaled or Exceeded

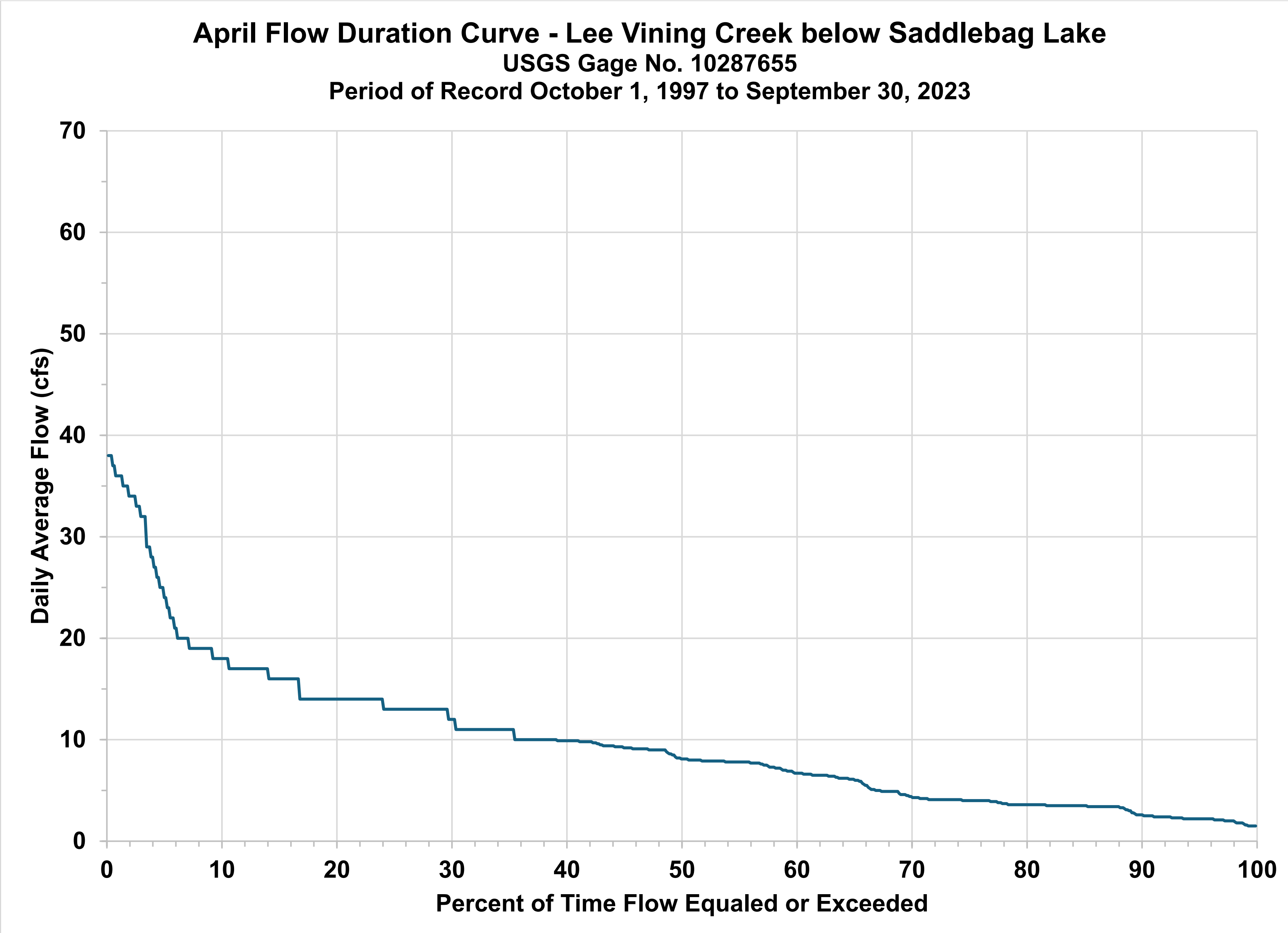
SADDLEBAG LAKE

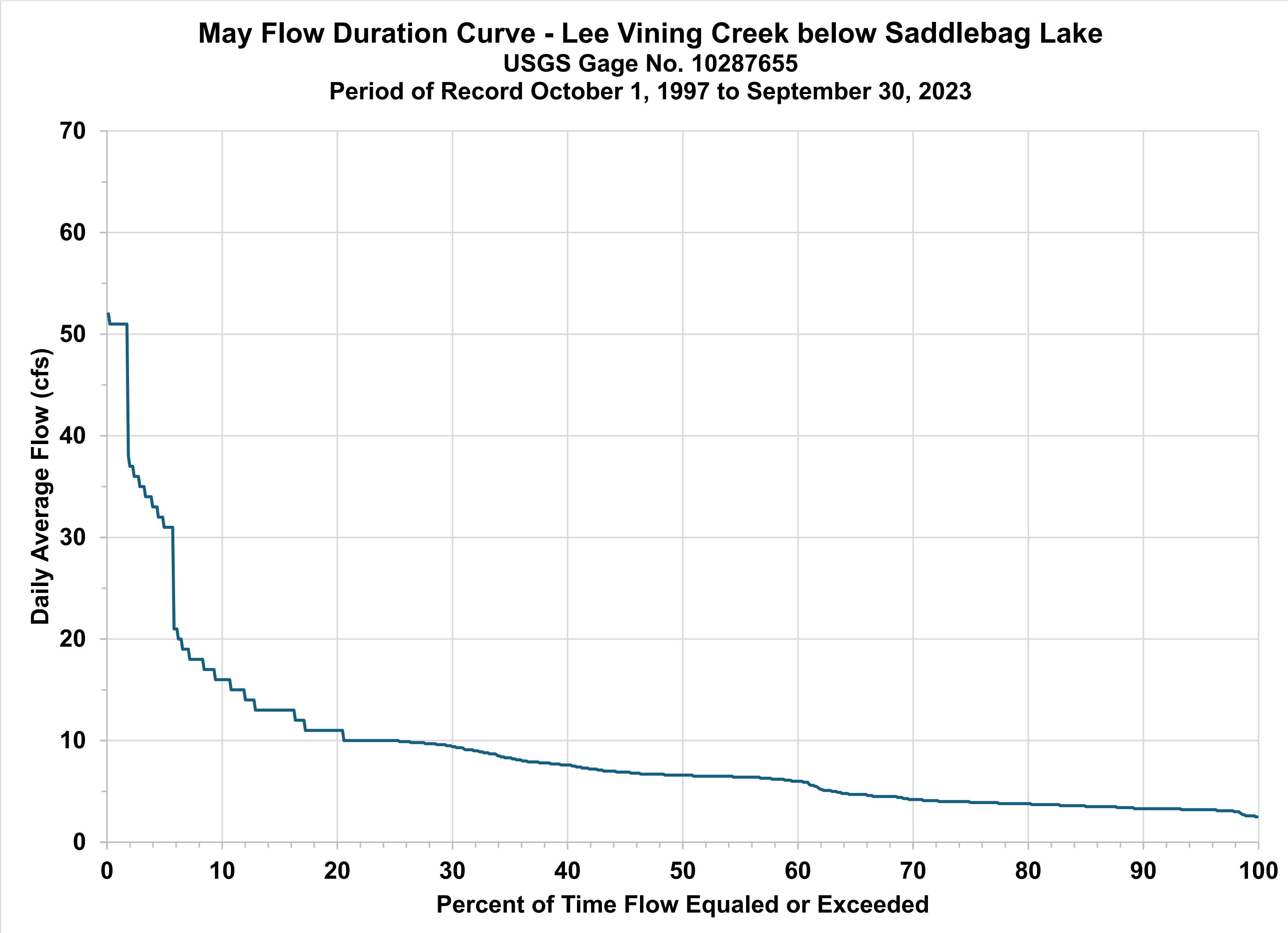

Annual Flow Duration Curve - Lee Vining Creek below Saddlebag Lake
USGS Gage No. 10287655
Period of Record October 1, 1997 to September 30, 2023
Daily Average Flow (cfs)
70
60
50
40
30
20
10
0
0
10
20
30
40
50
60
70
80
90
100
Percent of Time Flow Equaled or Exceeded

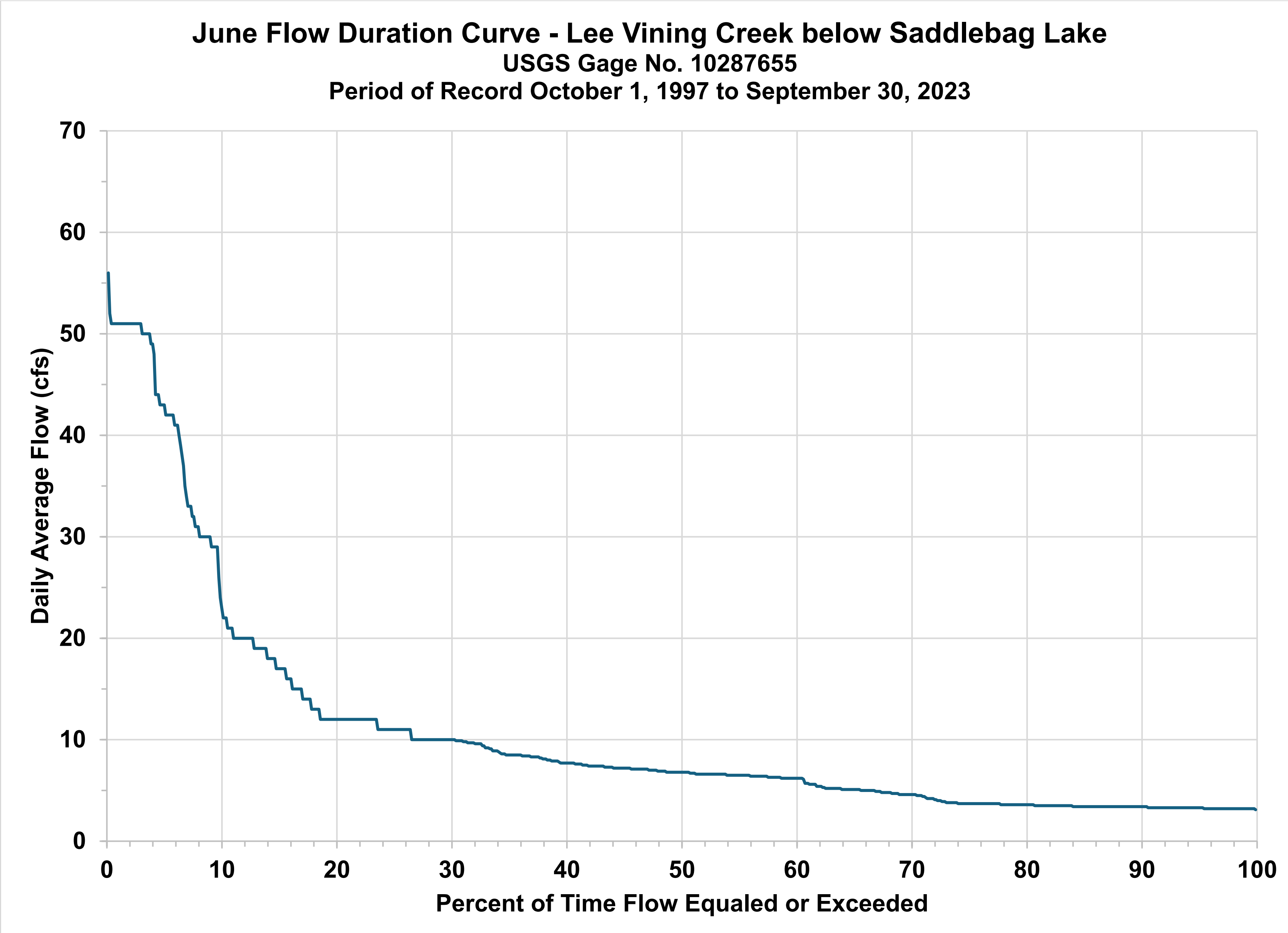

January Flow Duration Curve - Lee Vining Creek below Saddlebag Lake
USGS Gage No. 10287655
Period of Record October 1, 1997 to September 30, 2023
Daily Average Flow (cfs)
0
10
20
30
40
50
60
70
0
10
20
30
40
50
60
70
80
90
100
Percent of Time Flow Equaled or Exceeded

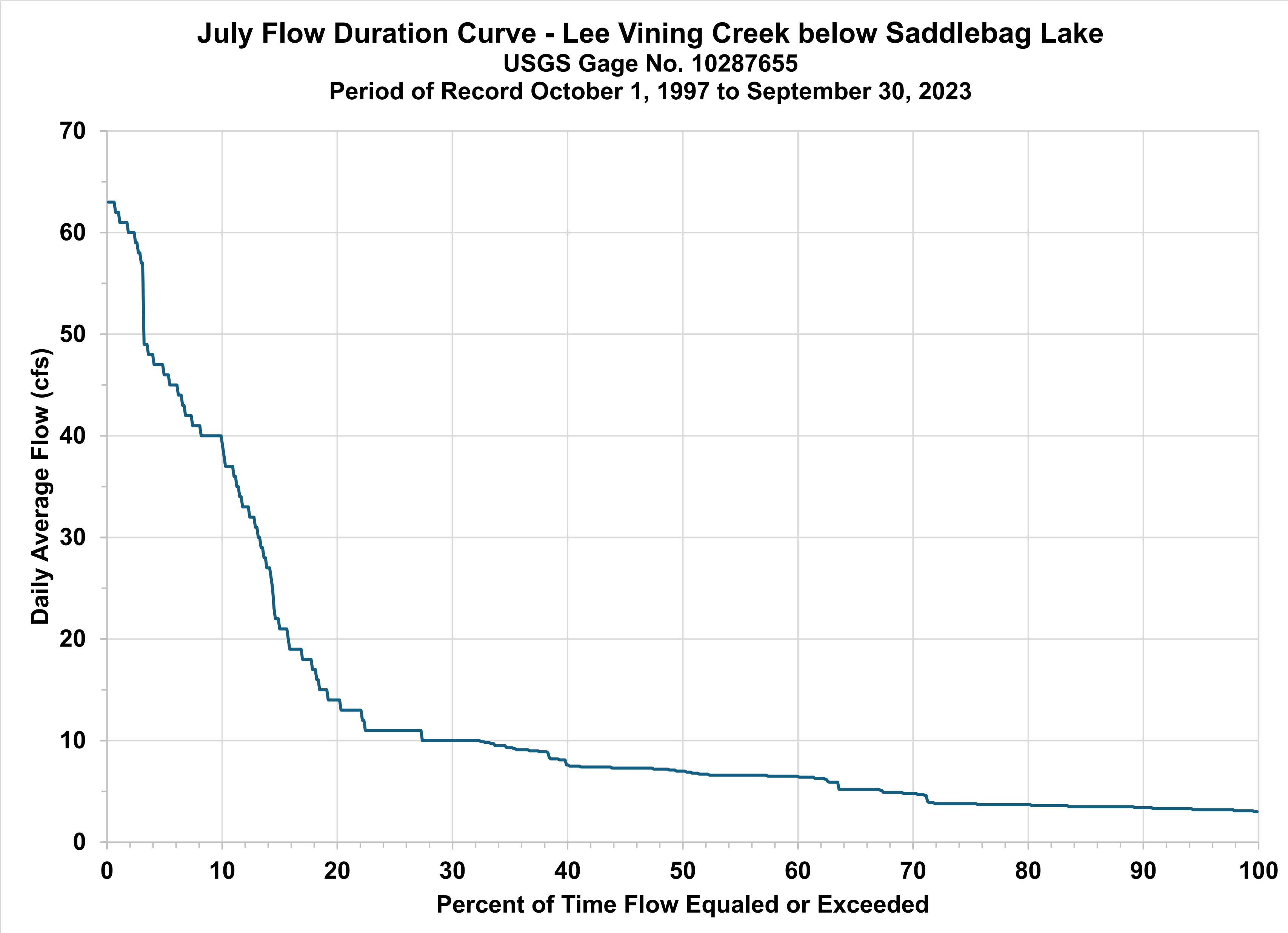

February Flow Duration Curve - Lee Vining Creek below Saddlebag Lake
USGS Gage No. 10287655
Period of Record October 1, 1997 to September 30, 2023
Daily Average Flow (cfs)
0
10
20
30
40
50
60
70
0
10
20
30
40
50
60
70
80
90
100
Percent of Time Flow Equaled or Exceeded

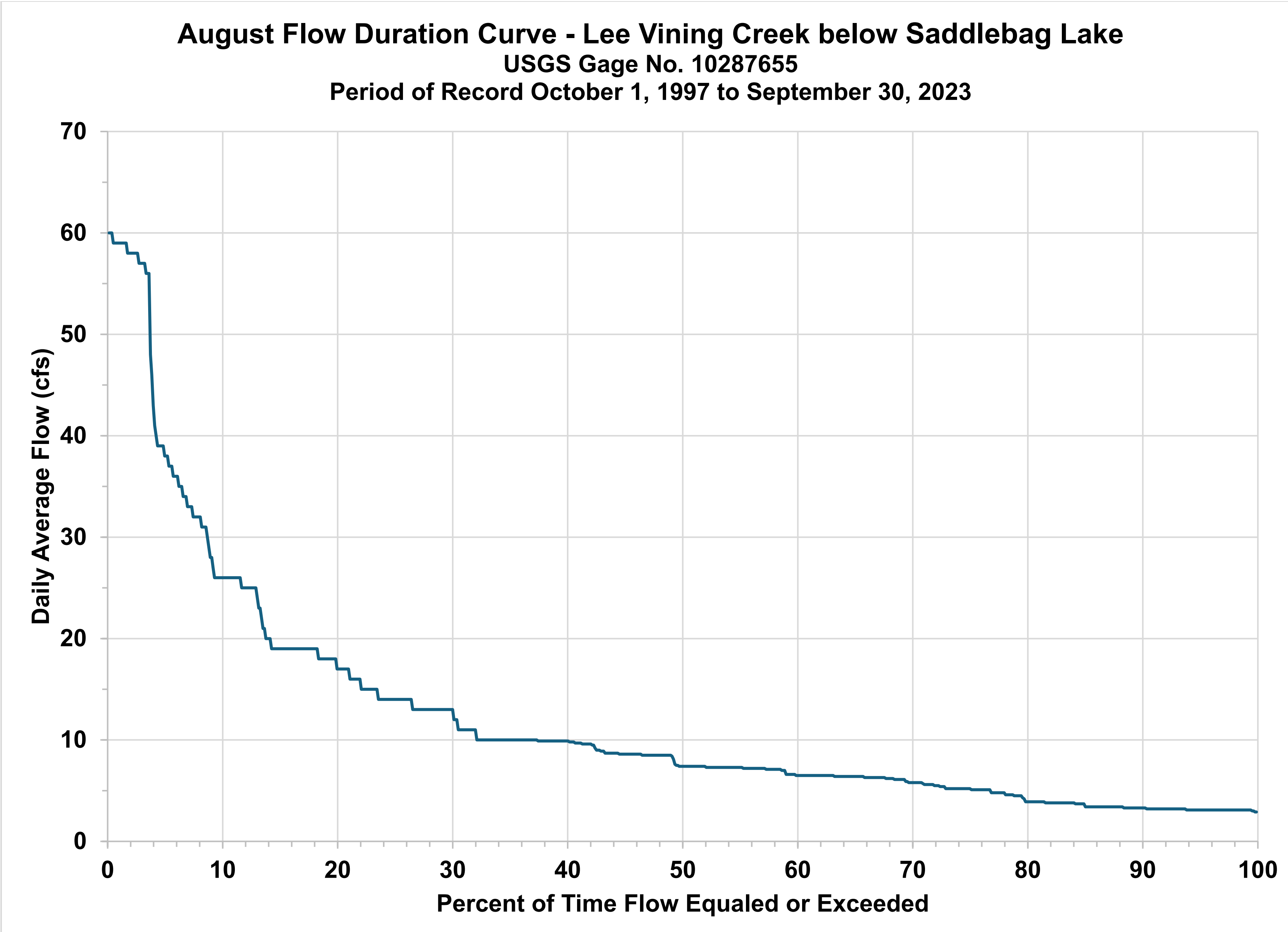

March Flow Duration Curve - Lee Vining Creek below Saddlebag Lake
USGS Gage No. 10287655
Period of Record October 1, 1997 to September 30, 2023
Daily Average Flow (cfs)
70
60
50
40
30
20
10
0
0
10
20
30
40
50
60
70
80
90
100
Percent of Time Flow Equaled or Exceeded

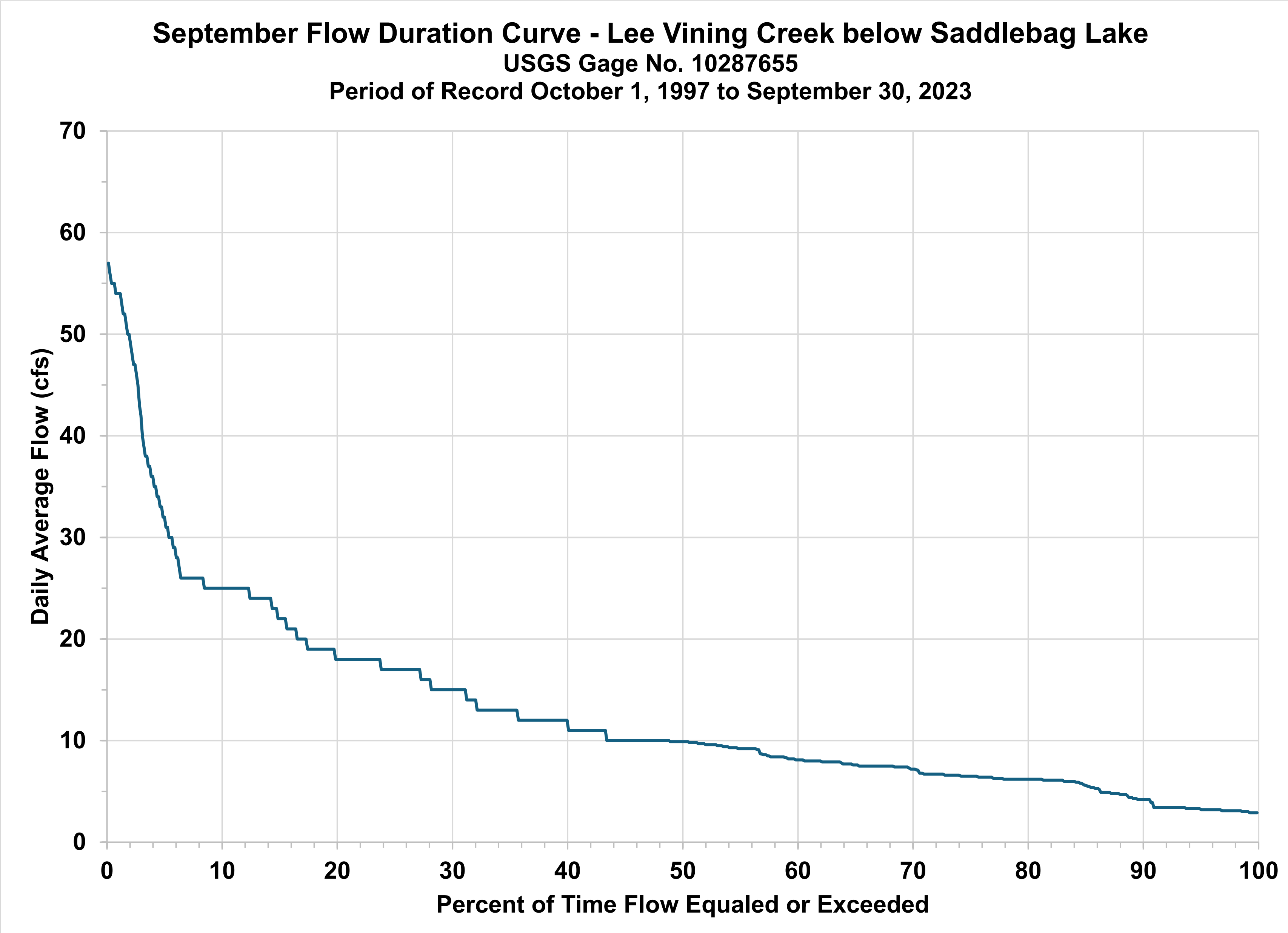

April Flow Duration Curve - Lee Vining Creek below Saddlebag Lake
USGS Gage No. 10287655
Period of Record October 1, 1997 to September 30, 2023
Daily Average Flow (cfs)
70
60
50
40
30
20
10
0
0
10
20
30
40
50
60
70
80
90
100
Percent of Time Flow Equaled or Exceeded

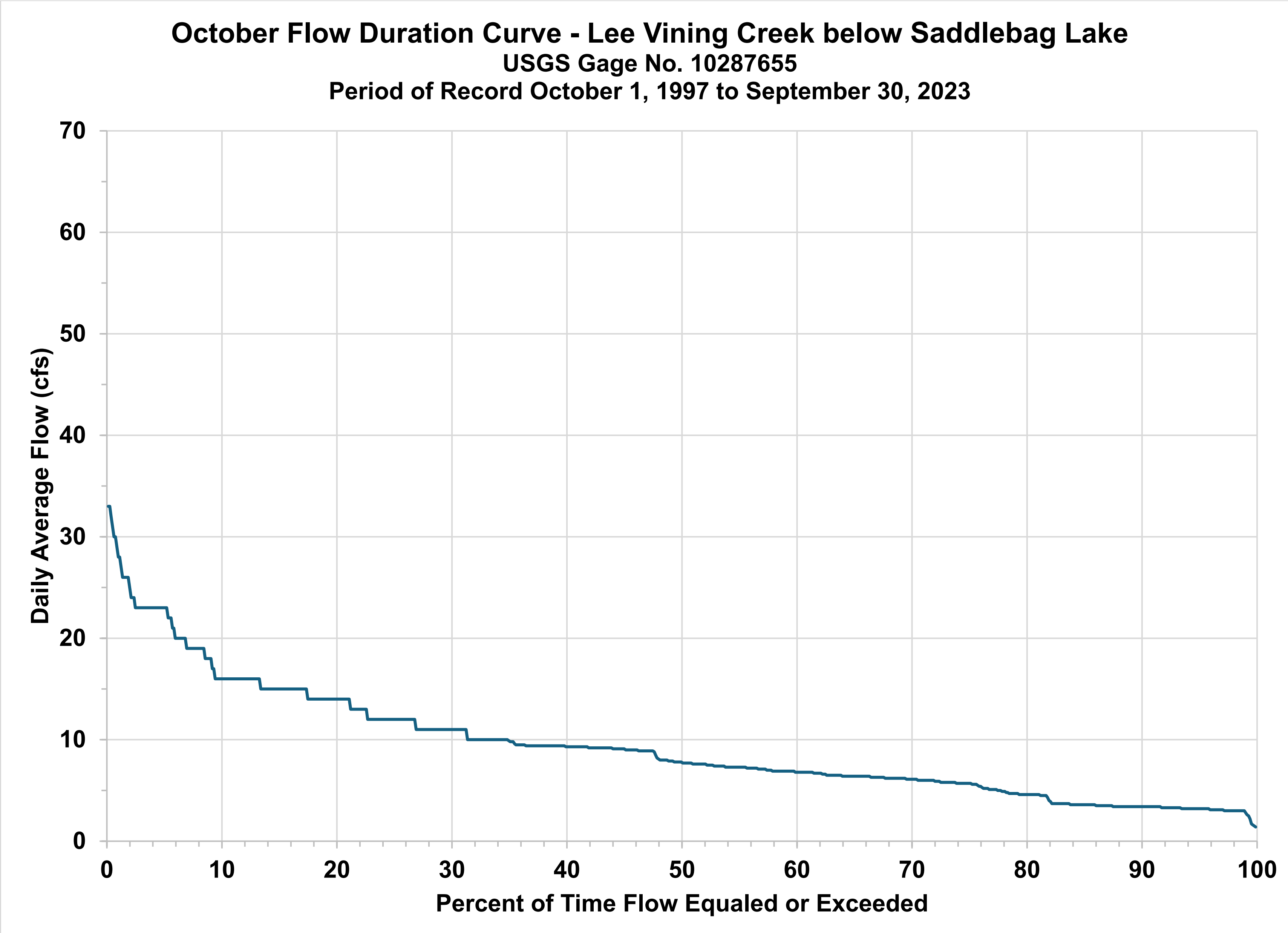

May Flow Duration Curve - Lee Vining Creek below Saddlebag Lake
USGS Gage No. 10287655
Period of Record October 1, 1997 to September 30, 2023
Daily Average Flow (cfs)
0
10
20
30
40
50
60
70
0
10
20
30
40
50
60
70
80
90
100
Percent of Time Flow Equaled or Exceeded

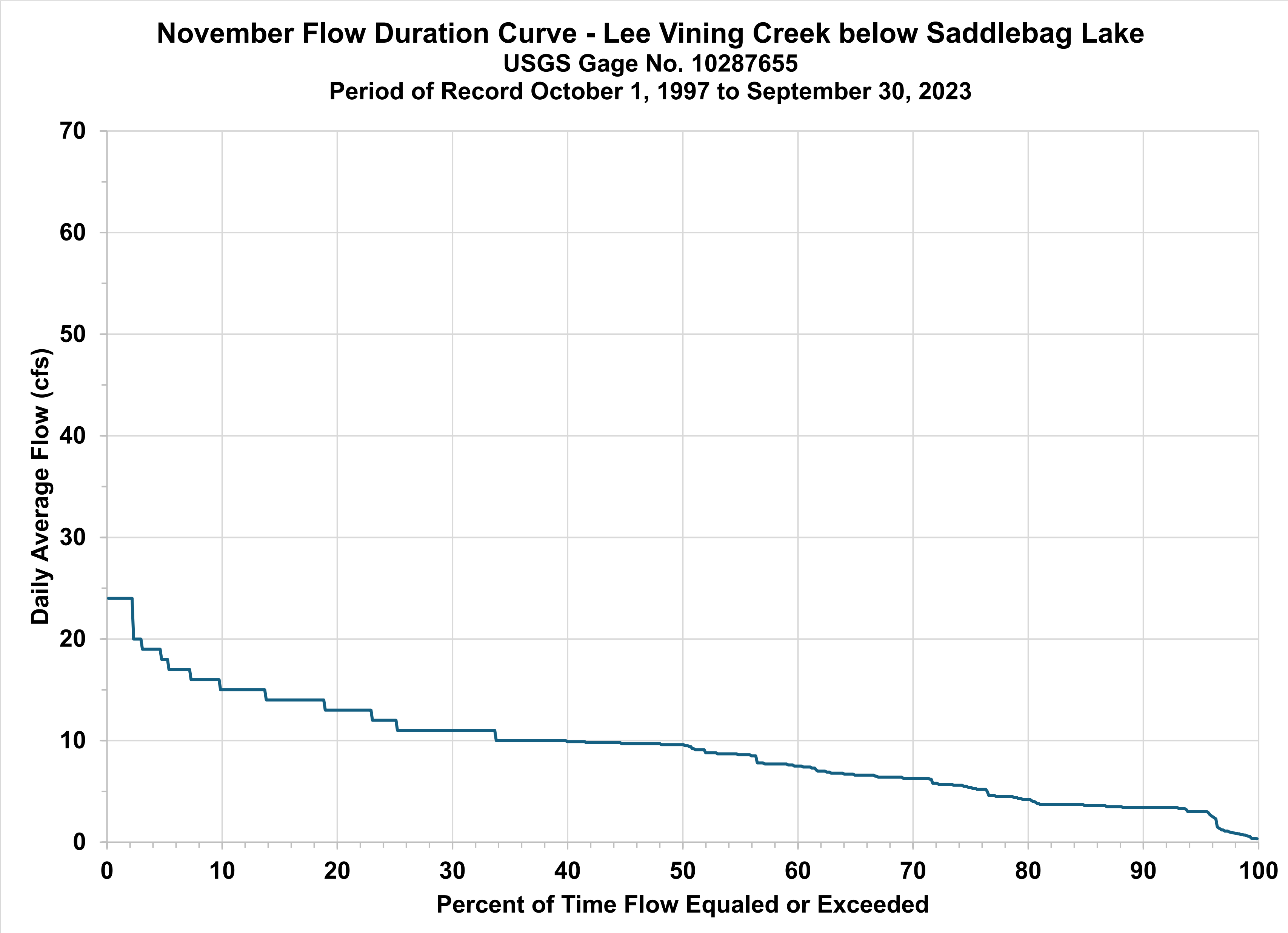

June Flow Duration Curve - Lee Vining Creek below Saddlebag Lake
USGS Gage No. 10287655
Period of Record October 1, 1997 to September 30, 2023
Daily Average Flow (cfs)
Percent of Time Flow Equaled or Exceeded
0
10
20
30
40
50
60
70
80
90
100

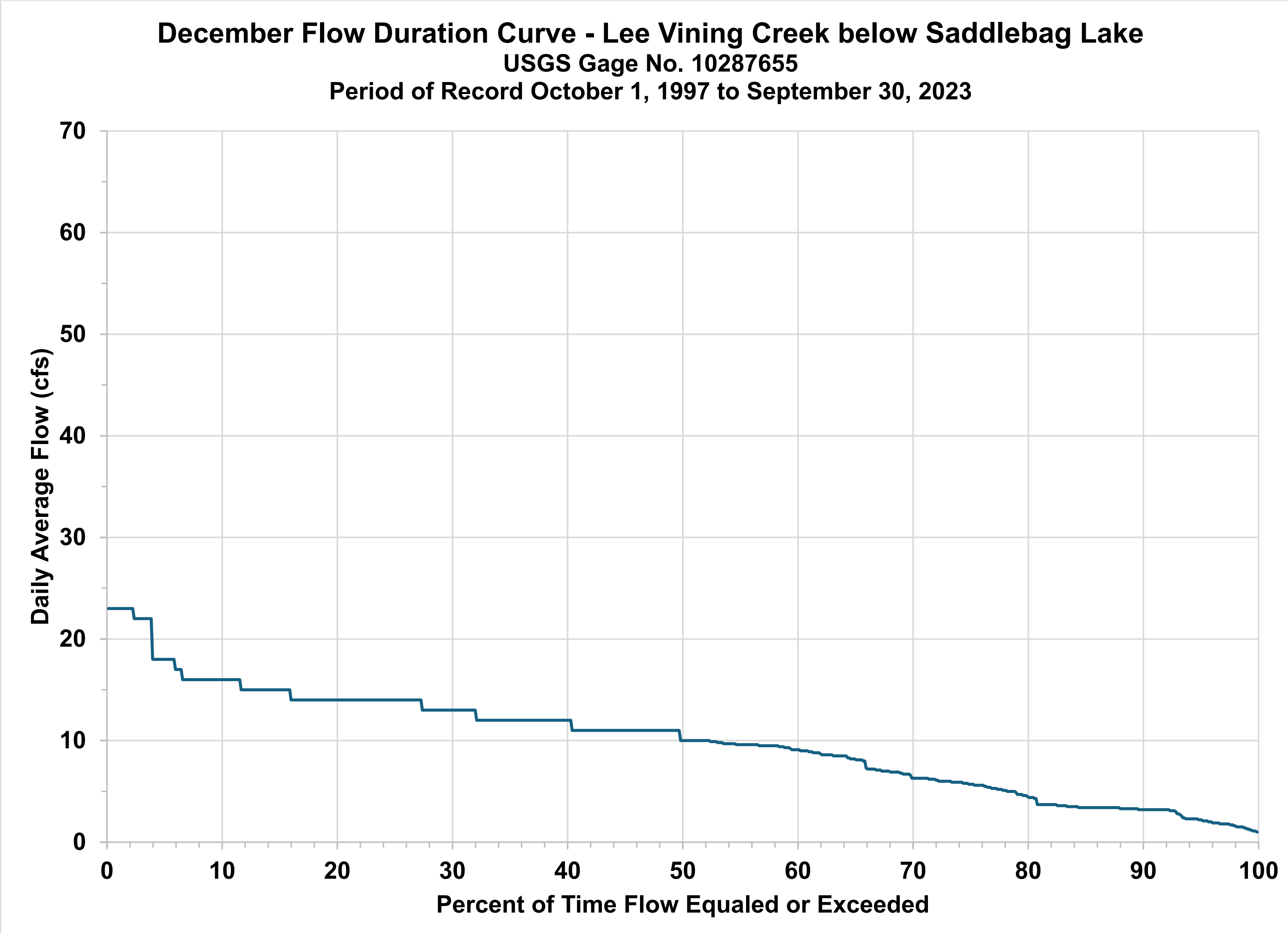

July Flow Duration Curve - Lee Vining Creek below Saddlebag Lake
USGS Gage No. 10287655
Period of Record October 1, 1997 to September 30, 2023
Daily Average Flow (cfs)
70
60
50
40
30
20
10
0
0
10
20
30
40
50
60
70
80
90
100
Percent of Time Flow Equaled or Exceeded


August Flow Duration Curve - Lee Vining Creek below Saddlebag Lake
USGS Gage No. 10287655
Period of Record October 1, 1997 to September 30, 2023
Daily Average Flow (cfs)
Percent of Time Flow Equaled or Exceeded
0
10
20
30
40
50
60
70
80
90
100

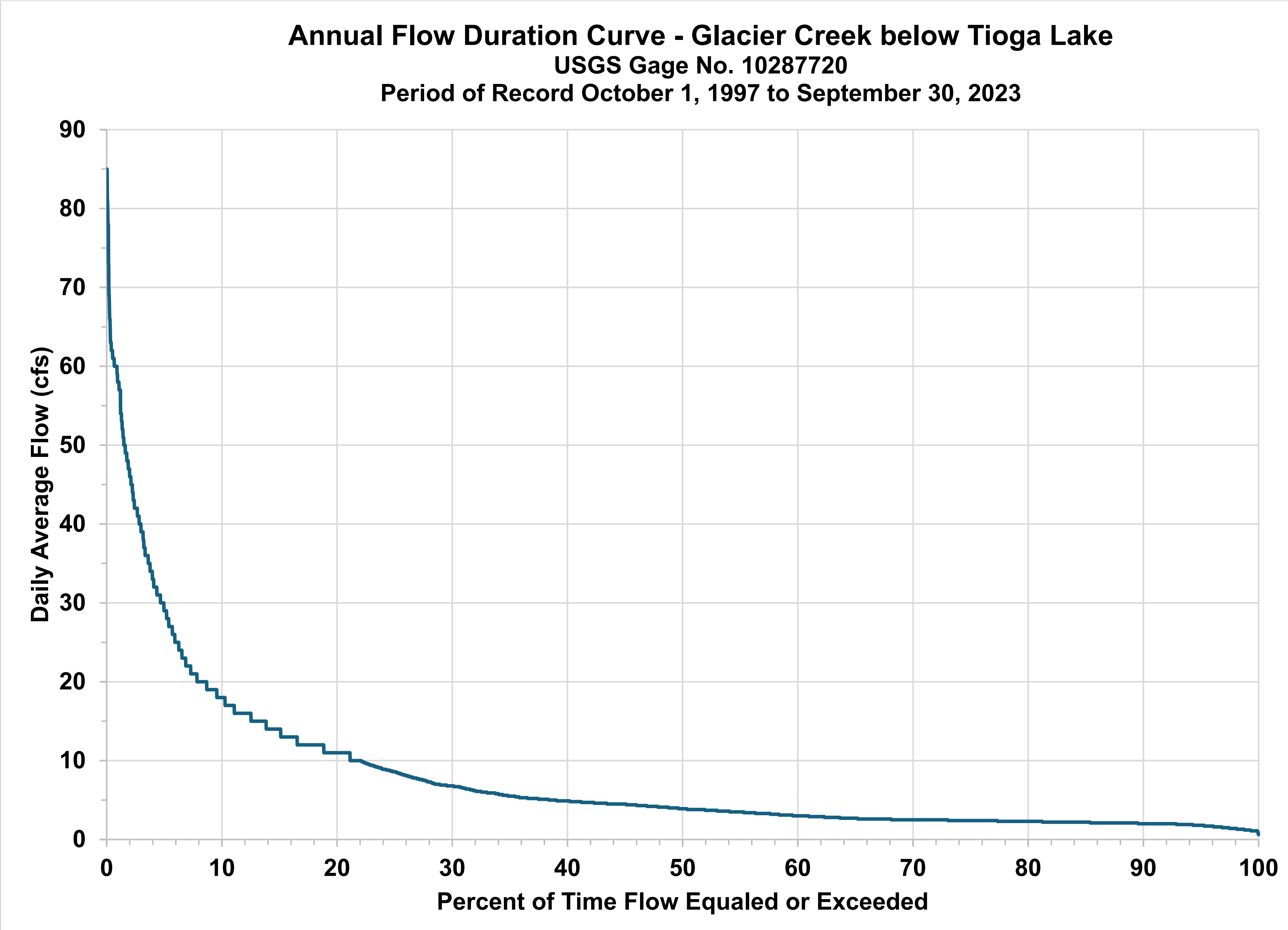

September Flow Duration Curve - Lee Vining Creek below Saddlebag Lake
USGS Gage No. 10287655
Period of Record October 1, 1997 to September 30, 2023
Daily Average Flow (cfs)
0
10
20
30
40
50
60
70
0
10
20
30
40
50
60
70
80
90
100
Percent of Time Flow Equaled or Exceeded

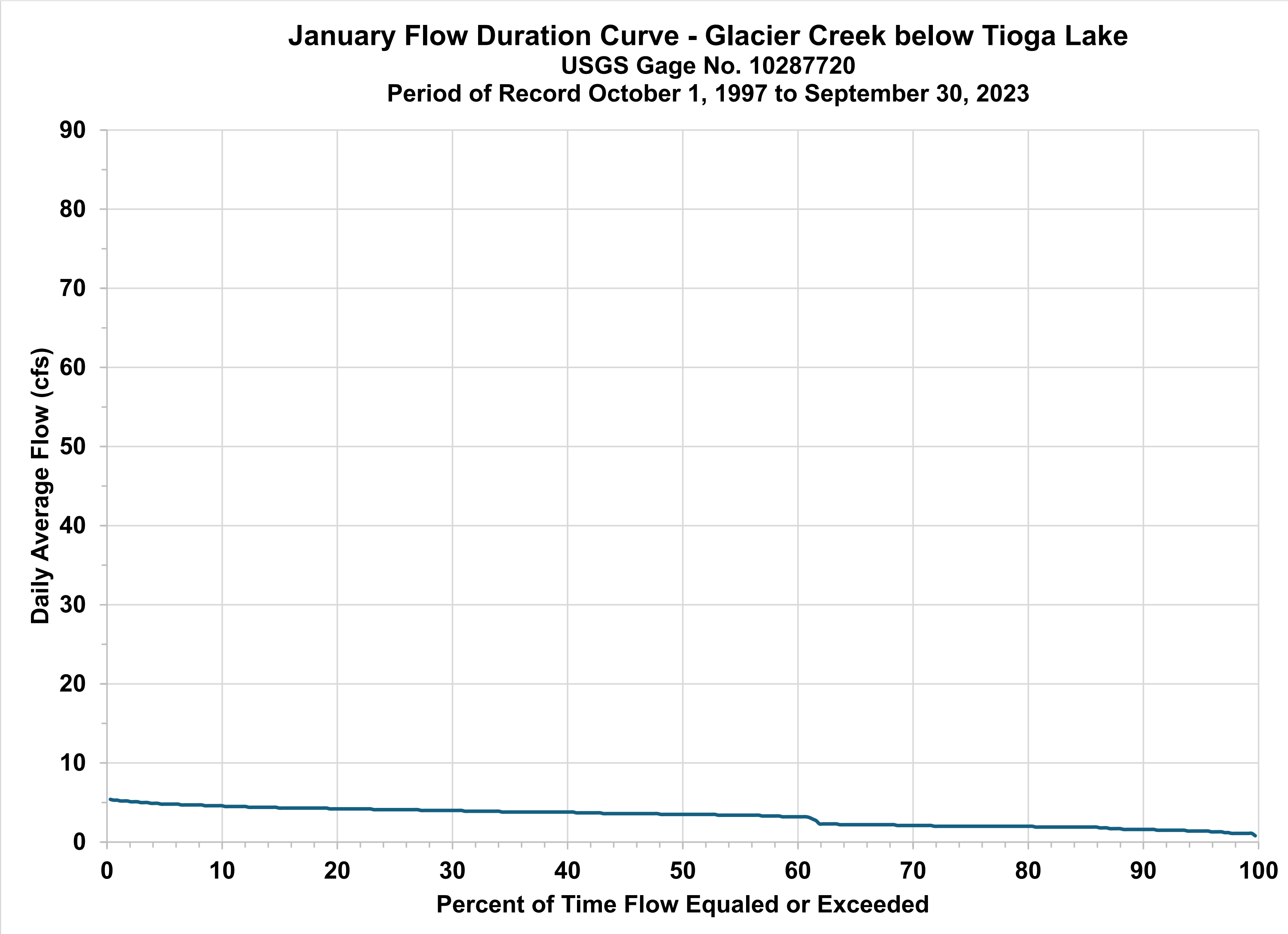

October Flow Duration Curve - Lee Vining Creek below Saddlebag Lake
USGS Gage No. 10287655
Period of Record October 1, 1997 to September 30, 2023
Daily Average Flow (cfs)
0
10
20
30
40
50
60
70
0
10
20
30
40
50
60
70
80
90
100
Percent of Time Flow Equaled or Exceeded

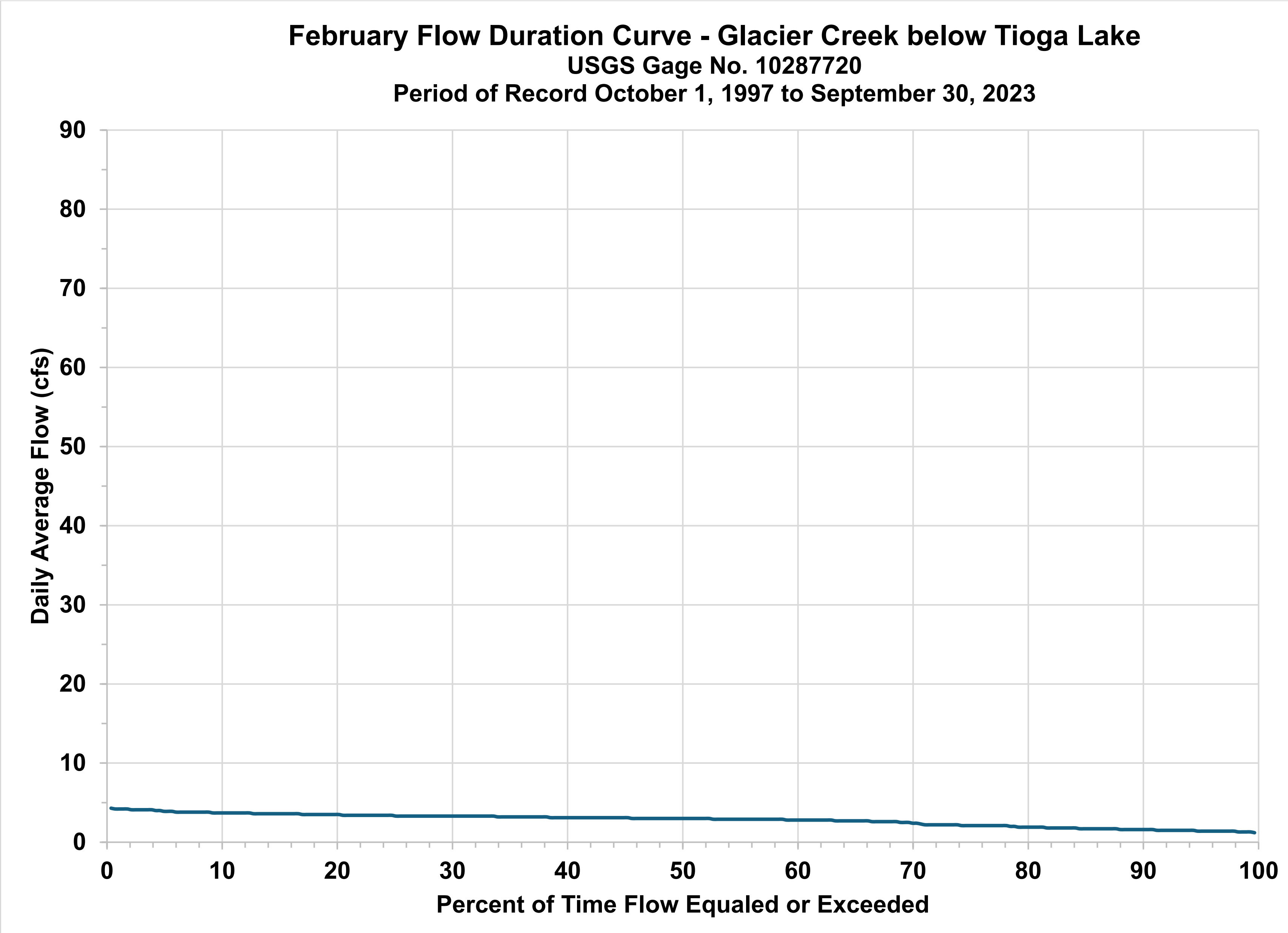

November Flow Duration Curve - Lee Vining Creek below Saddlebag Lake
USGS Gage No. 10287655
Period of Record October 1, 1997 to September 30, 2023
Daily Average Flow (cfs)
70
60
50
40
30
20
10
0
0
10
20
30
40
50
60
70
80
90
100
Percent of Time Flow Equaled or Exceeded

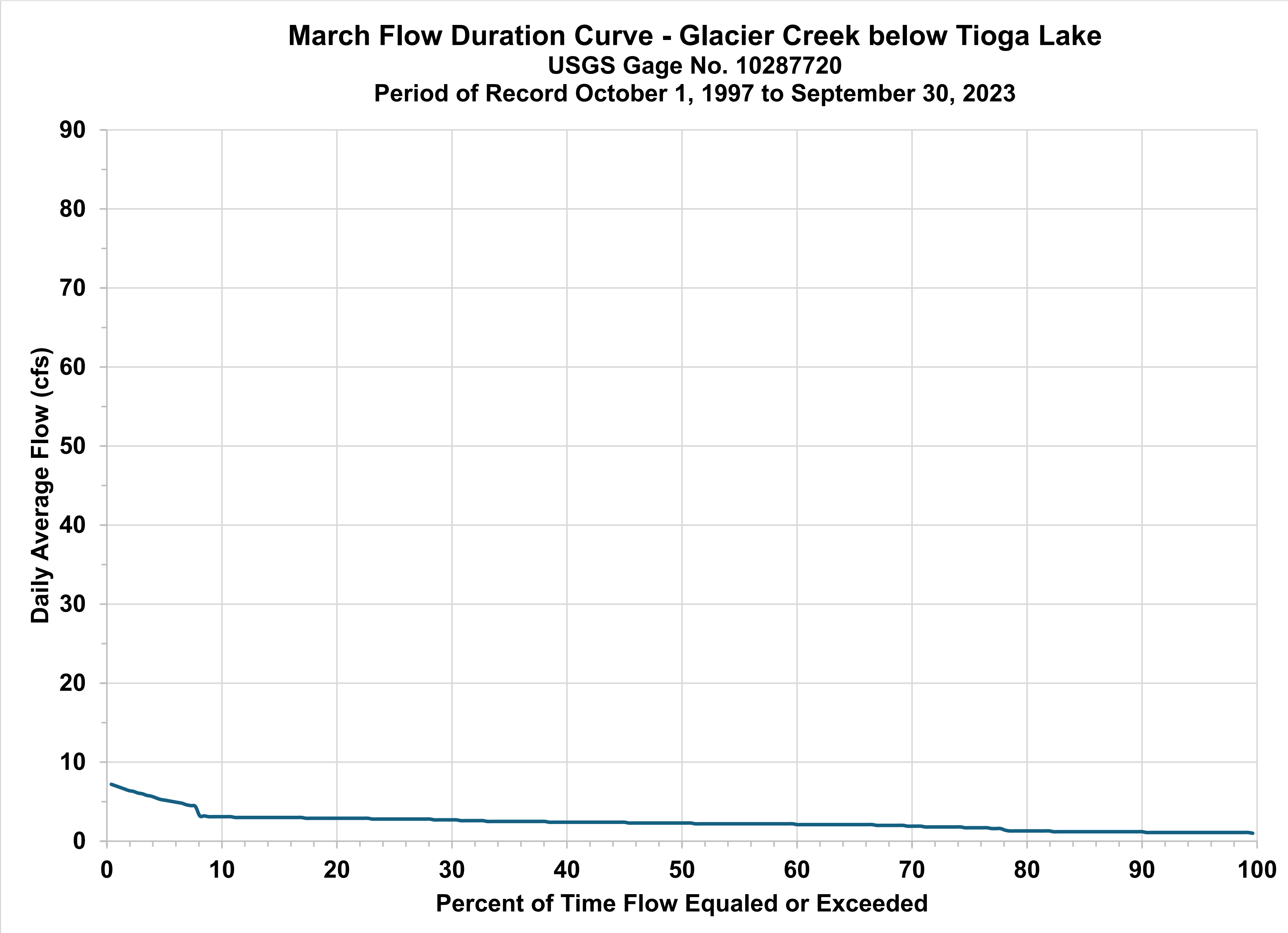

December Flow Duration Curve - Lee Vining Creek below Saddlebag Lake
USGS Gage No. 10287655
Period of Record October 1, 1997 to September 30, 2023
Daily Average Flow (cfs)
Percent of Time Flow Equaled or Exceeded
0
10
20
30
40
50
60
70
80
90
100

TIOGA LAKE


Annual Flow Duration Curve - Glacier Creek below Tioga Lake
USGS Gage No. 10287720
Period of Record October 1, 1997 to September 30, 2023
Daily Average Flow (cfs)
0
10
20
30
40
50
60
70
80
90
0
10
20
30
40
50
60
70
80
90
100
Percent of Time Flow Equaled or Exceeded


January Flow Duration Curve - Glacier Creek below Tioga Lake
USGS Gage No. 10287720
Period of Record October 1, 1997 to September 30, 2023
Daily Average Flow (cfs)
Percent of Time Flow Equaled or Exceeded
0
10
20
30
40
50
60
70
80
90
100


February Flow Duration Curve - Glacier Creek below Tioga Lake
USGS Gage No. 10287720
Period of Record October 1, 1997 to September 30, 2023
Daily Average Flow (cfs)
90
80
70
60
50
40
30
20
10
0
0
10
20
30
40
50
60
70
80
90
100
Percent of Time Flow Equaled or Exceeded


March Flow Duration Curve - Glacier Creek below Tioga Lake
USGS Gage No. 10287720
Period of Record October 1, 1997 to September 30, 2023
Daily Average Flow (cfs)
Percent of Time Flow Equaled or Exceeded
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10
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30
40
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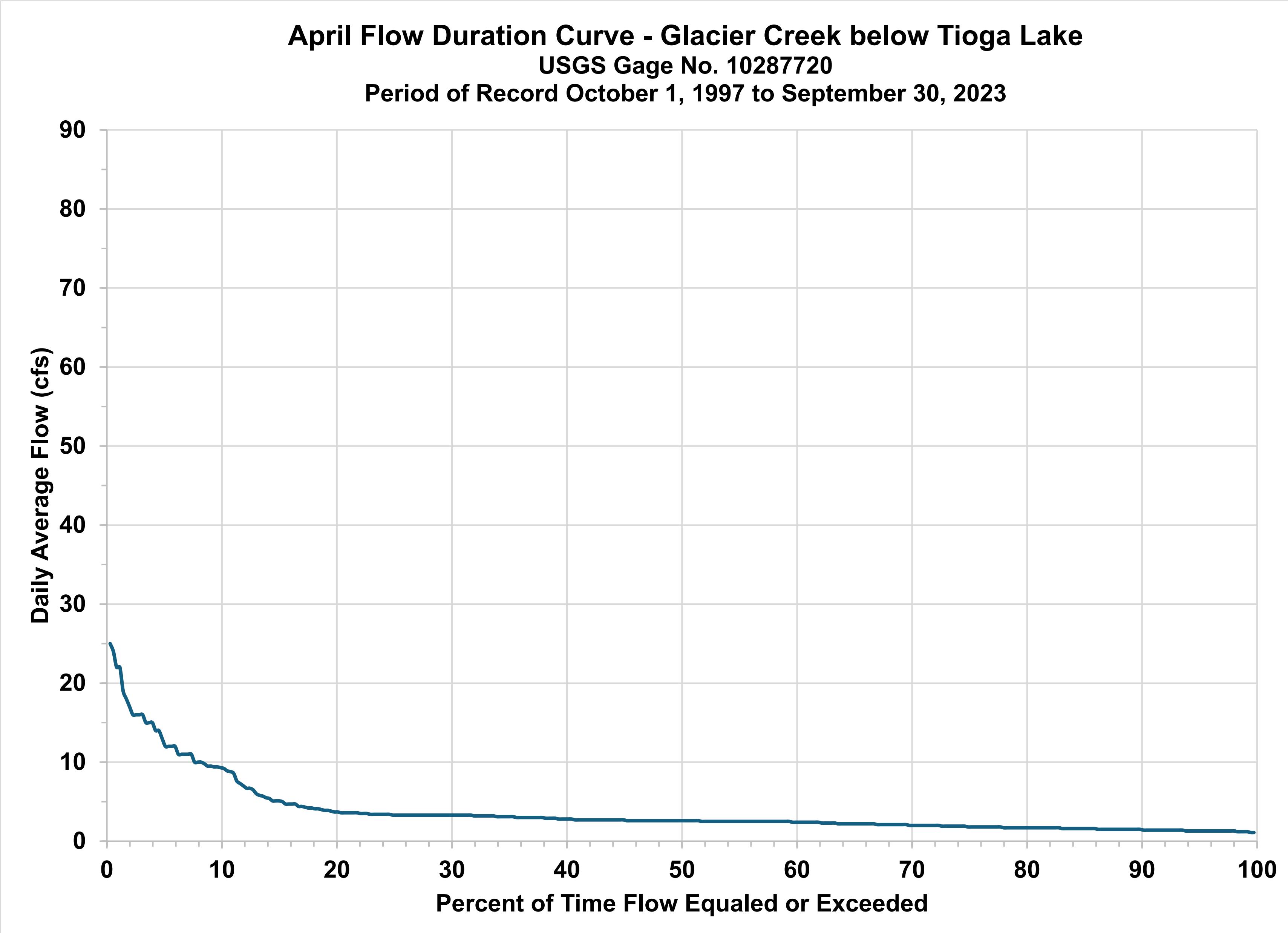
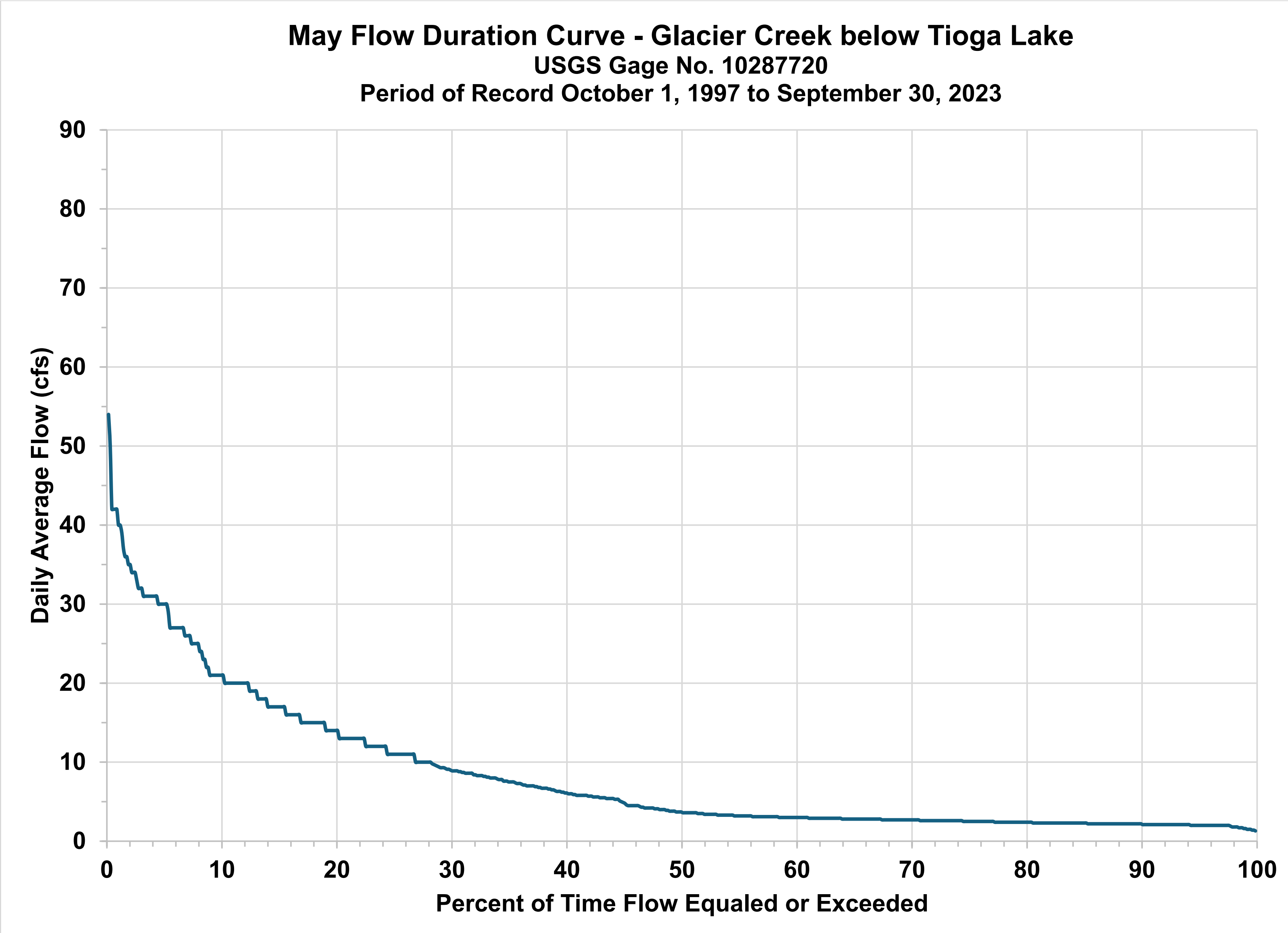
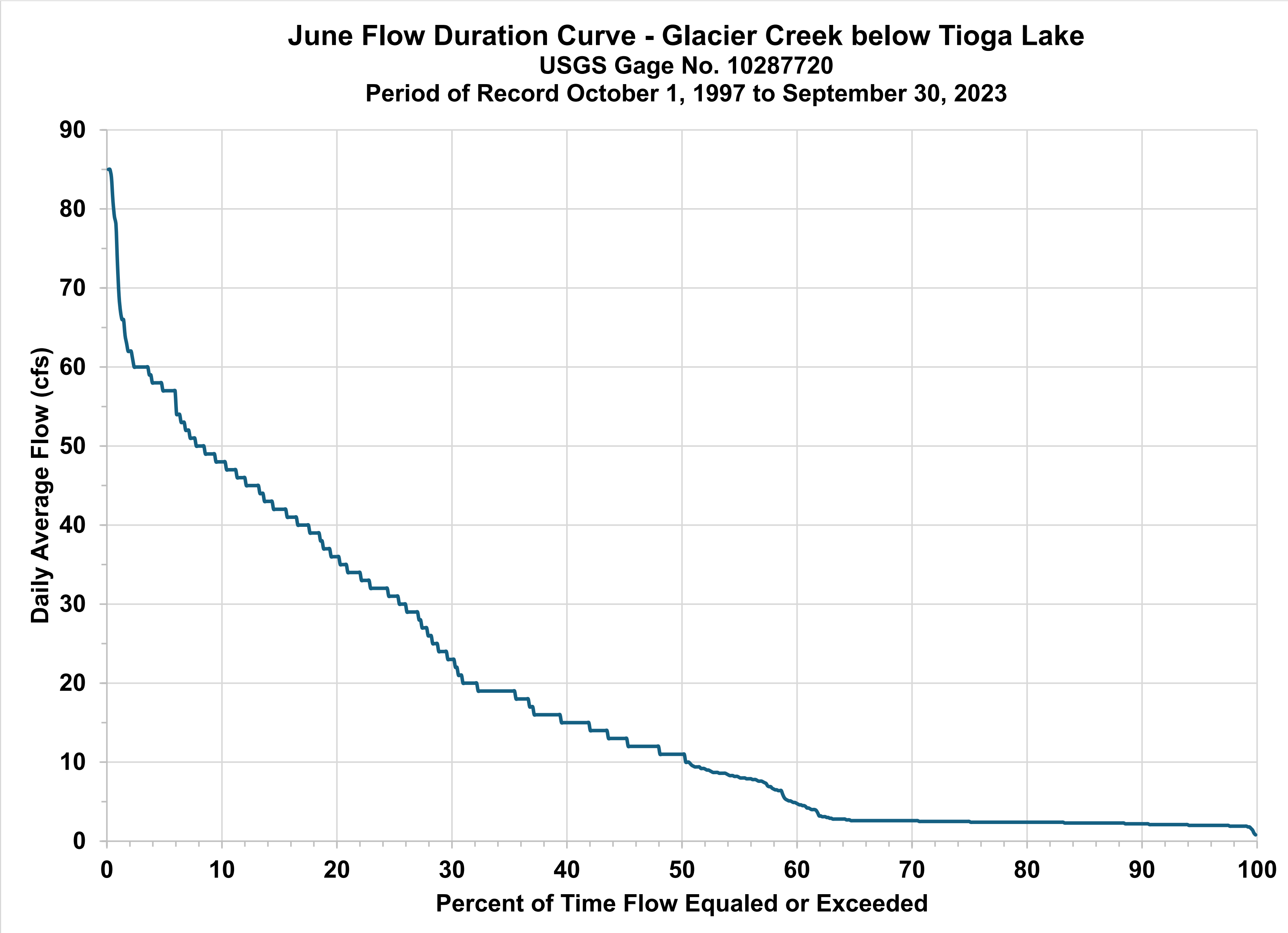
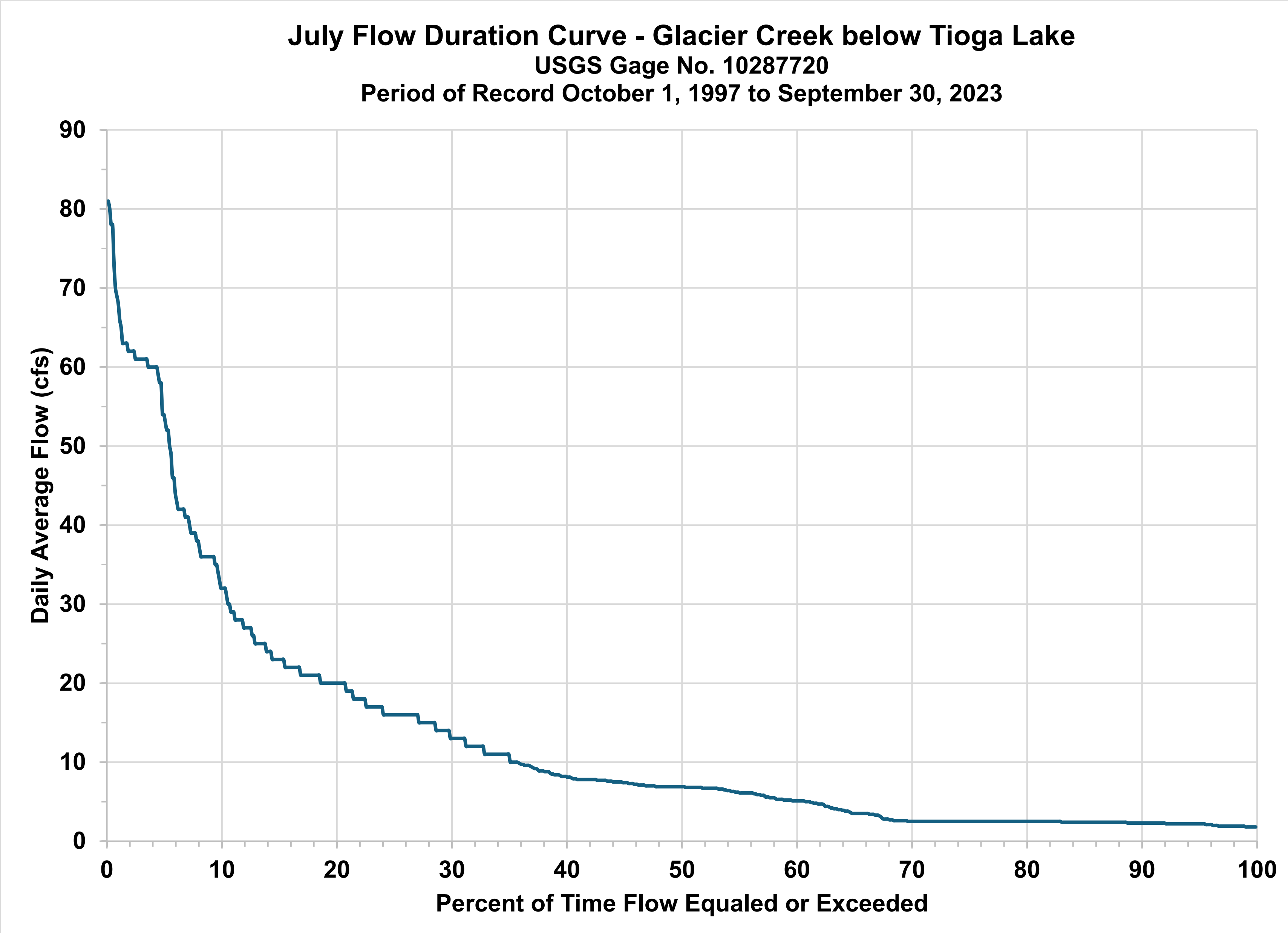
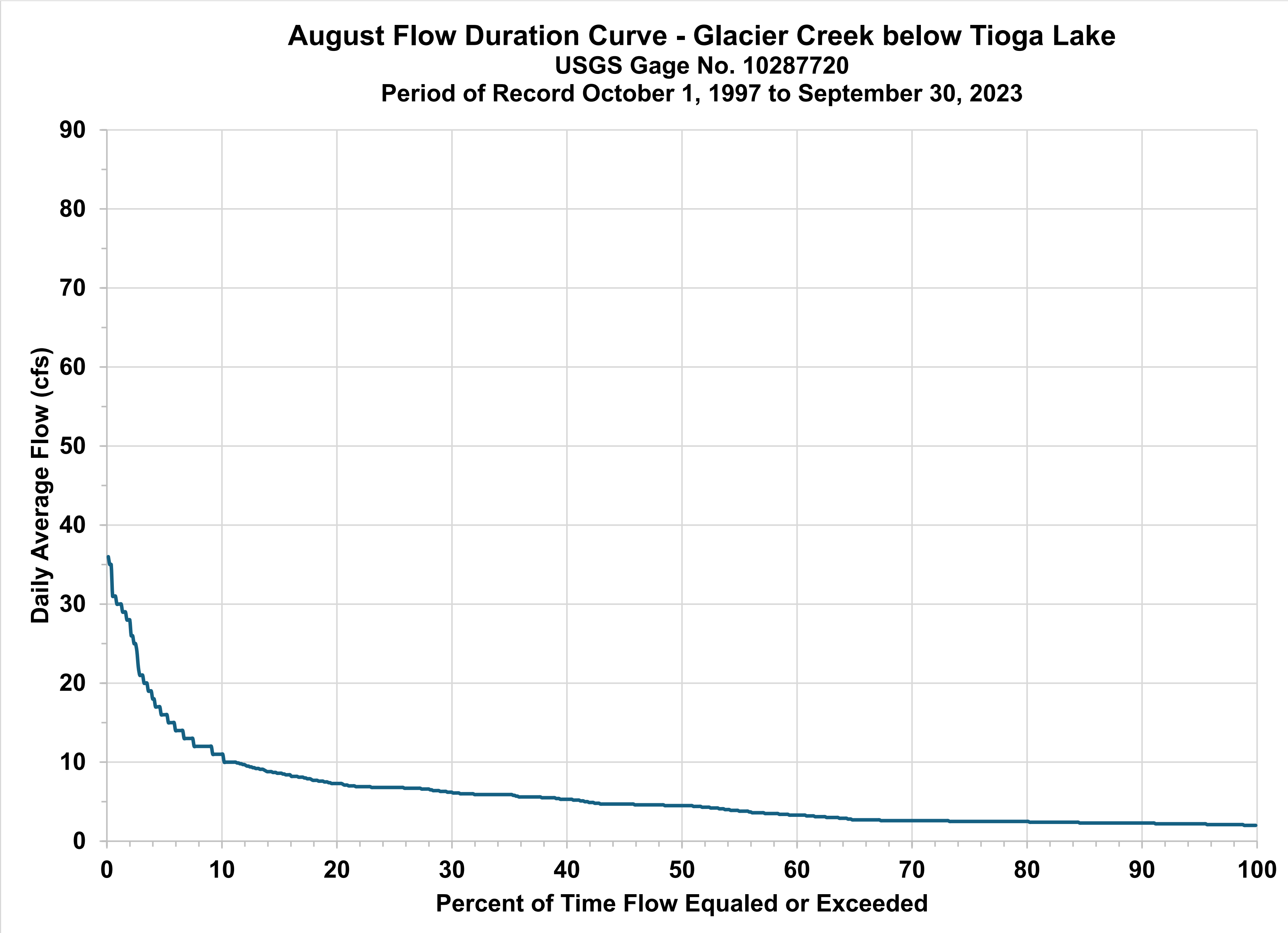
70
80
90
100


April Flow Duration Curve - Glacier Creek below Tioga Lake
USGS Gage No. 10287720
Period of Record October 1, 1997 to September 30, 2023
Daily Average Flow (cfs)
90
80
70
60
50
40
30
20
10
0
0
10
20
30
40
50
60
70
80
90
100
Percent of Time Flow Equaled or Exceeded


May Flow Duration Curve - Glacier Creek below Tioga Lake
USGS Gage No. 10287720
Period of Record October 1, 1997 to September 30, 2023
Daily Average Flow (cfs)
Percent of Time Flow Equaled or Exceeded
0
10
20
30
40
50
60
70
80
90
100


June Flow Duration Curve - Glacier Creek below Tioga Lake
USGS Gage No. 10287720
Period of Record October 1, 1997 to September 30, 2023
Daily Average Flow (cfs)
Percent of Time Flow Equaled or Exceeded
0
10
20
30
40
50
60
70
80
90
100


July Flow Duration Curve - Glacier Creek below Tioga Lake
USGS Gage No. 10287720
Period of Record October 1, 1997 to September 30, 2023
Daily Average Flow (cfs)
Percent of Time Flow Equaled or Exceeded
0
10
20
30
40
50
60
70
80
90
100


August Flow Duration Curve - Glacier Creek below Tioga Lake
USGS Gage No. 10287720
Period of Record October 1, 1997 to September 30, 2023
Daily Average Flow (cfs)
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10
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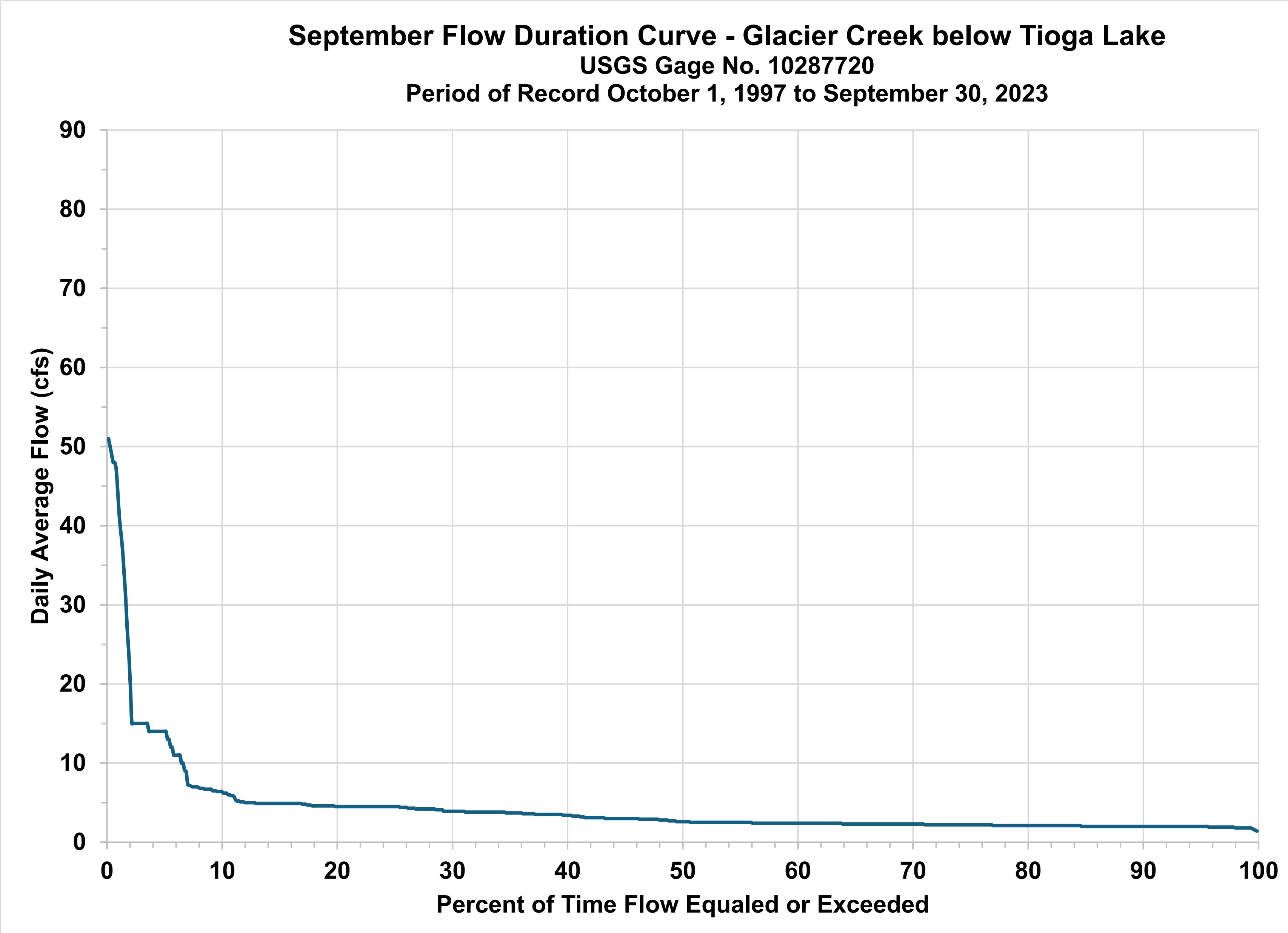
90
100
Percent of Time Flow Equaled or Exceeded


September Flow Duration Curve - Glacier Creek below Tioga Lake
USGS Gage No. 10287720
Period of Record October 1, 1997 to September 30, 2023
Daily Average Flow (cfs)
90
80
70
60
50
40
30
20
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0
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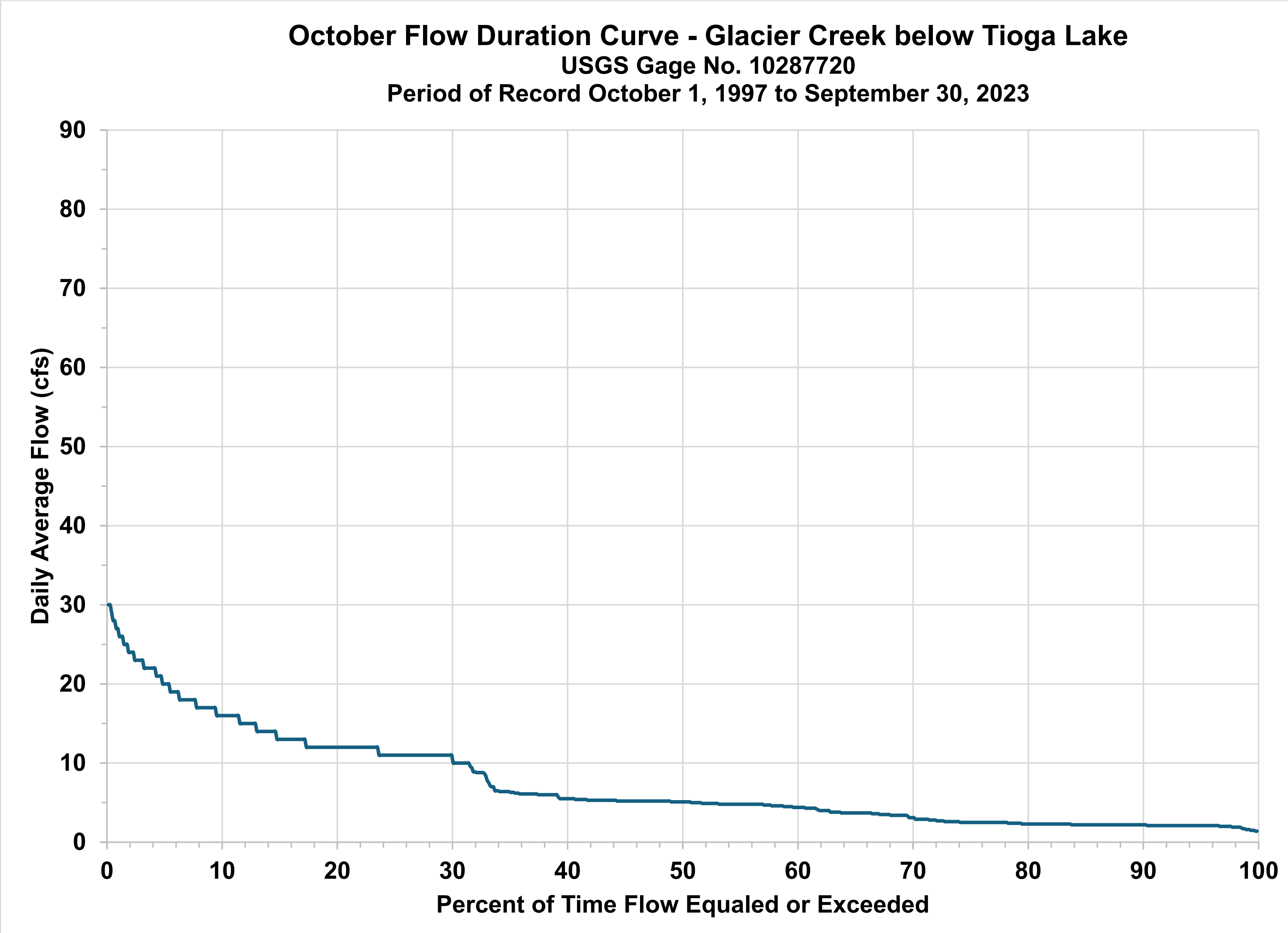
10
20
30
40
50
60
70
80
90
100
Percent of Time Flow Equaled or Exceeded


October Flow Duration Curve - Glacier Creek below Tioga Lake
USGS Gage No. 10287720
Period of Record October 1, 1997 to September 30, 2023
Daily Average Flow (cfs)
90
80
70
60
50
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30
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0
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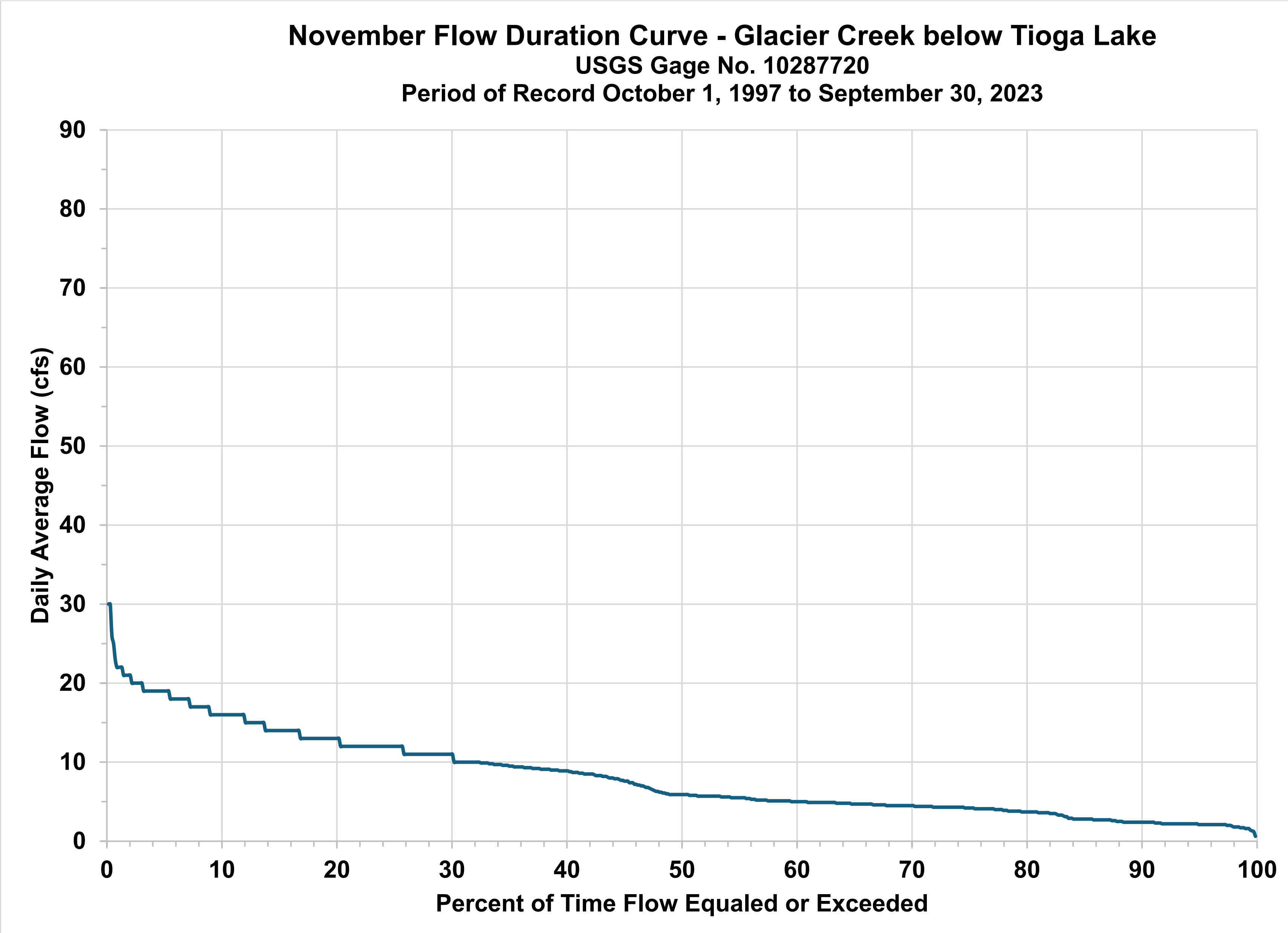
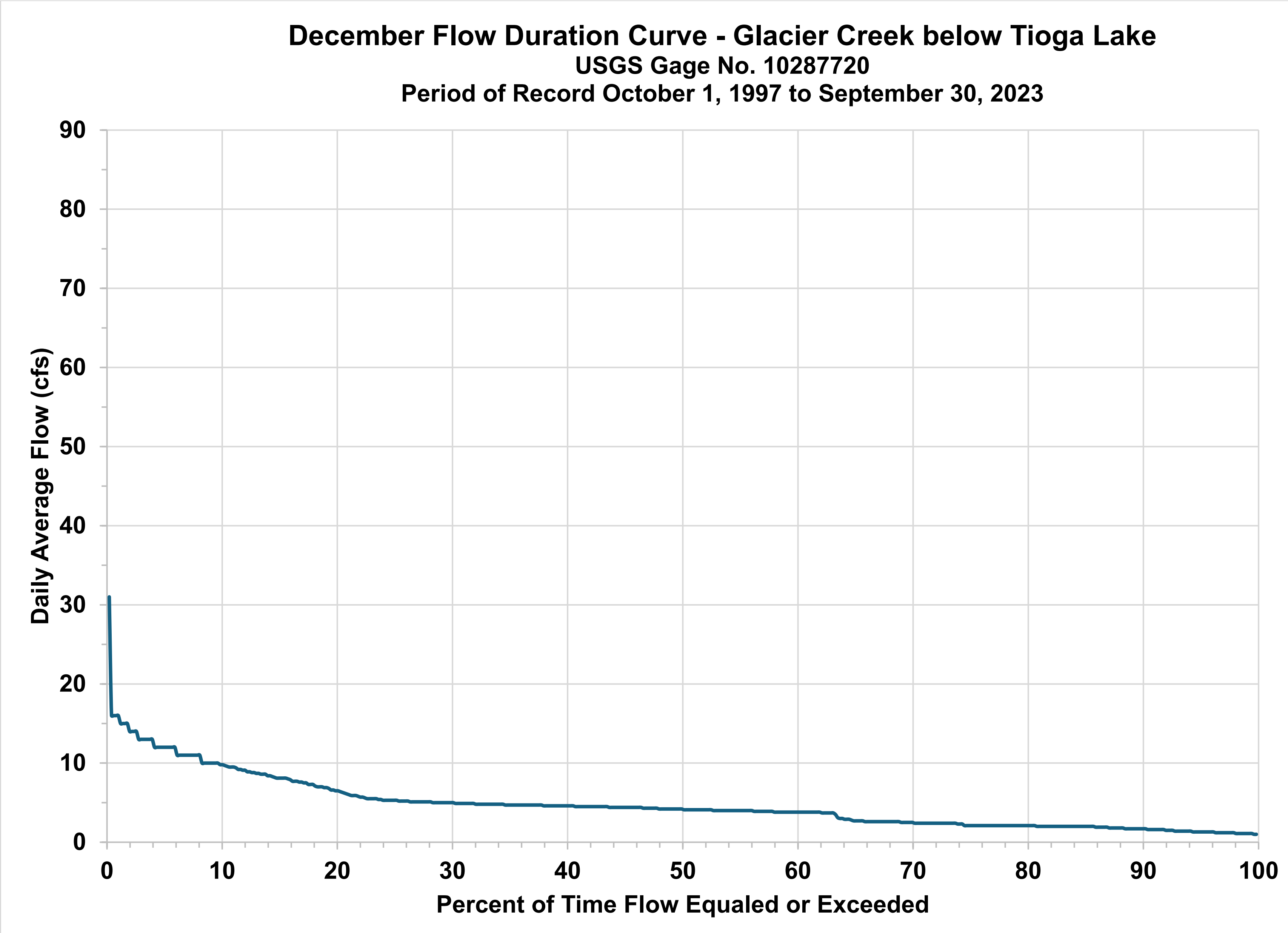
20
30
40
50
60
70
80
90
100
Percent of Time Flow Equaled or Exceeded


November Flow Duration Curve - Glacier Creek below Tioga Lake
USGS Gage No. 10287720
Period of Record October 1, 1997 to September 30, 2023
Daily Average Flow (cfs)
0
10
20
30
40
50
60
70
80
90
0
10
20
30
40
50
60
70
80
90
100
Percent of Time Flow Equaled or Exceeded


December Flow Duration Curve - Glacier Creek below Tioga Lake
USGS Gage No. 10287720
Period of Record October 1, 1997 to September 30, 2023
Daily Average Flow (cfs)
90
80
70
60
50
40
30
20
10
0
0
10
20
30
40
50
60
70
80
90
100
Percent of Time Flow Equaled or Exceeded

APPENDIX E.3
HABITAT-FLOW ANALYSIS

SOUTHERN CALIFORNIA EDISON

LEE VINING HYDROELECTRIC PROJECT

(FERC PROJECT NO. 1388)

HABITAT-FLOW ANALYSIS

January 2025

SOUTHERN CALIFORNIA EDISON

LEE VINING HYDROELECTRIC PROJECT
(FERC PROJECT NO. 1388)

HABITAT-FLOW ANALYSIS

Southern California Edison
2244 Walnut Grove Avenue
Rosemead, CA 91770

January 2025

Support from:

Kleinschmidt

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List of Acronyms and Abbreviations

FERC	Federal Energy Regulatory Commission
LADWP	Los Angeles Department of Water and Power
Project	Lee Vining Hydroelectric Project (FERC Project No. 1388)
SCE	Southern California Edison [Company]
SI	Suitability Index
WUA	weighted usable area

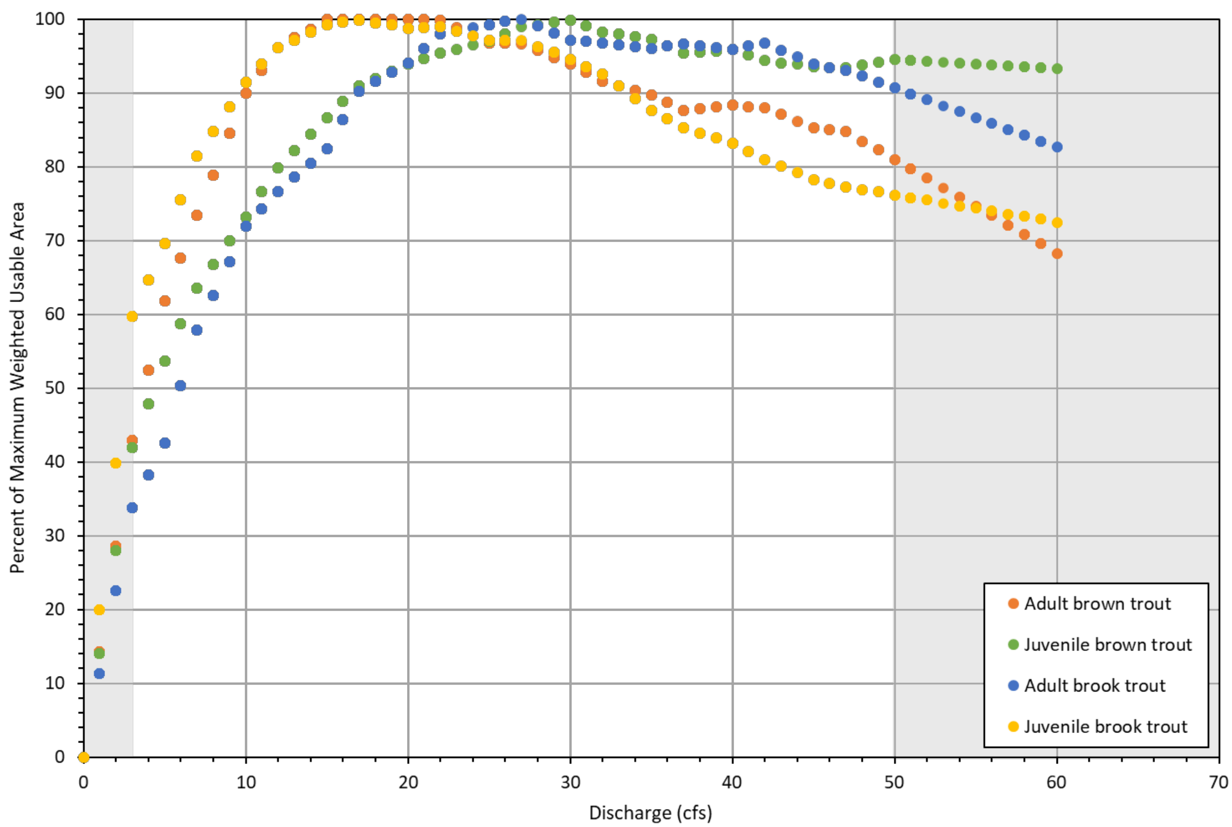
1.0 HABITAT-FLOW ANALYSIS FOR LEE VINING CREEK

The Lee Vining Hydroelectric Project (Project; Federal Energy Regulatory Commission [FERC] Project No. 1388) includes four Project-affected stream reaches that support coldwater game fish species: upper Lee Vining Creek between Saddlebag Dam and the confluence of Slate Creek, upper Lee Vining Creek between the confluence of Slate Creek and Ellery Lake, lower Lee Vining Creek between Poole Powerhouse and the Los Angeles Department of Water and Power's (LADWP) Lee Vining Creek Diversion Dam, and Glacier Creek between Tioga Dam and its confluence with Lee Vining Creek. Project-affected stream reaches support coldwater nonnative trout species, including self-sustaining populations of brook trout (*Salvelinus fontinalis*) and brown trout (*Salmo trutta*), and sterile, nonreproducing rainbow trout (*Oncorhynchus mykiss*) stocked by the California Department of Fish and Wildlife. Project operations have the potential to affect the quantity of aquatic habitat related to streamflow. The following methods were used to estimate habitat in Project-affected stream reaches.

1.1. WEIGHTED USABLE AREA

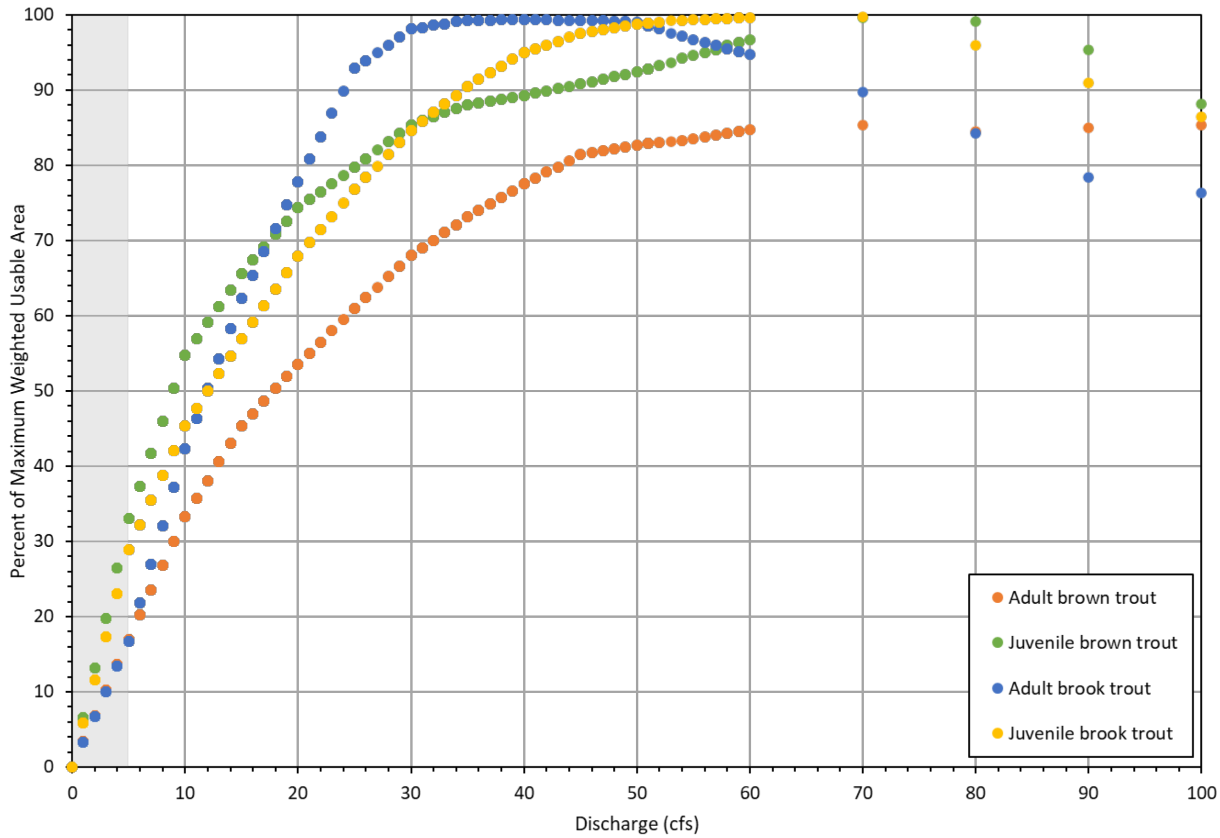
Southern California Edison (SCE) implemented an instream flow study in 1986 characterizing aquatic habitat in three distinct reaches of upper Lee Vining Creek: (1) Lee Vining Creek between Saddlebag Dam and the confluence of Slate Creek (Reach 1), (2) Lee Vining Creek between the confluence of Slate Creek and Glacier Creek (Reach 2), and (3) Lee Vining Creek between the confluence of Glacier Creek and Ellery Lake (Reach 3; EA, 1986). IFG-4 hydraulic simulation was used to evaluate the amount of trout habitat available at specific flows (EA, 1986). Calibration flows included between 3 and 50 cubic feet per second in Reach 1 and between 3 and 280 in Reaches 2 and 3. Suitability Index (SI) curves for brown, brook, and rainbow trout were provided by the U.S. Fish and Wildlife Service specifically for use in the Instream Flow and Fisheries Study (EA, 1986). SI curves were corrected to reflect relative abundance of habitat available; different SI curves were provided for locations without cover, object cover, overhead cover, and both object and overhead cover (EA, 1986). Habitat-flow relationships for brown and brook trout are also available for lower Lee Vining Creek between Poole Powerhouse and the LADWP Diversion Dam (Reach 4; Groves Energy Company, 1984). This analysis report contains the percent maximum weighted usable area (WUA) curves for reaches within the Lee Vining Creek watershed developed from original curves cited in the final Environmental Assessment for the Project (EA, 1986; FERC, 1992).

WUA curves from the original report were digitized using the automeris.io package in GitHub—a computer tool used to extract numerical data from images. The package takes plotted images and returns tabular data. The data were then graphed in Microsoft Excel to create digitized WUA curves. WUA was extrapolated to the full range of annual flows in each reach or interpolated between published values by either fitting linear or decay function to the existing data (Figures 1-1 through 1-4). All extrapolated WUA values were held to a minimum of 10 percent of maximum WUA, and the start of extrapolation is noted on each of the additional curves. WUA was interpolated between published values using the FORECAST function in Microsoft Excel, which predicts a value based on known data using a linear regression.



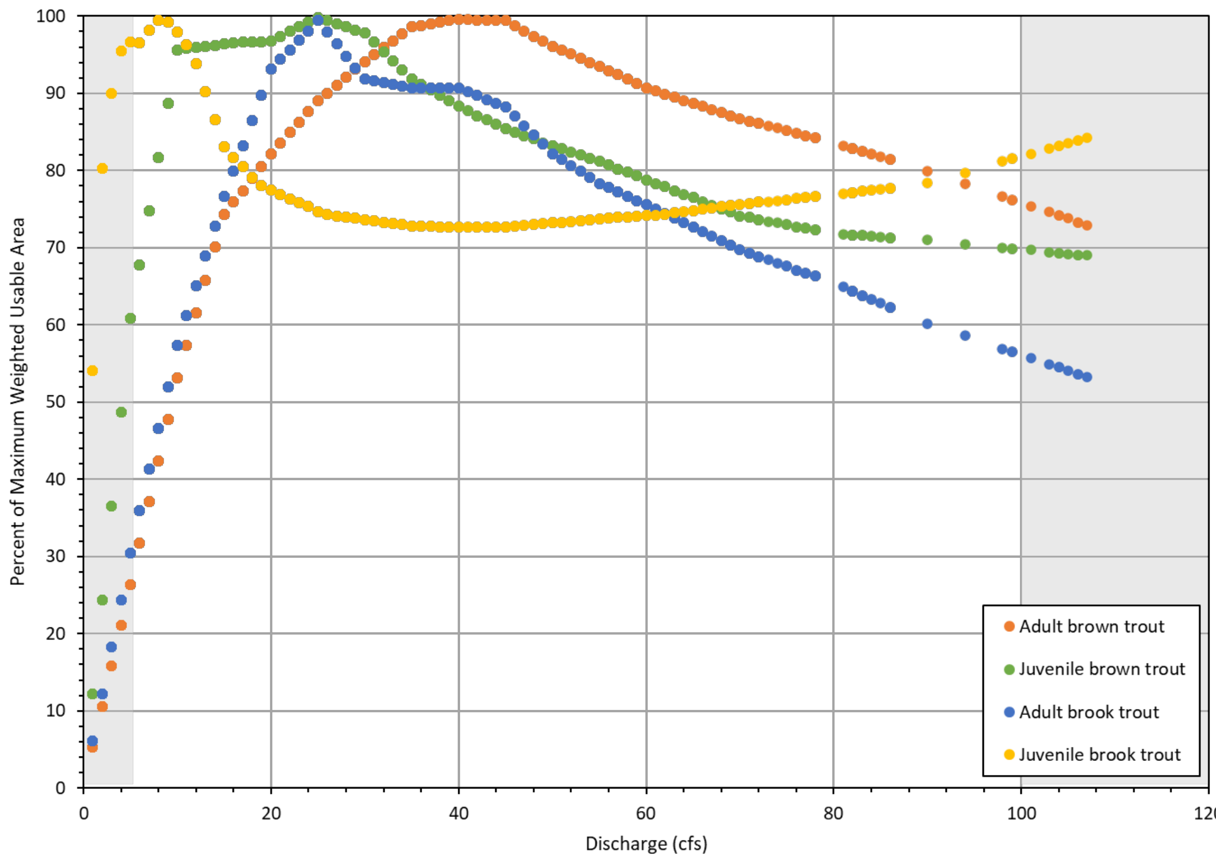
Note: Grey shading denotes regions of extrapolation beyond the range of the original 1992 WUA curves.

Figure 1-1. Percent of WUA Versus Discharge (cubic feet per second) in Lee Vining Creek Between Saddlebag Dam and the Confluence of Slate Creek.



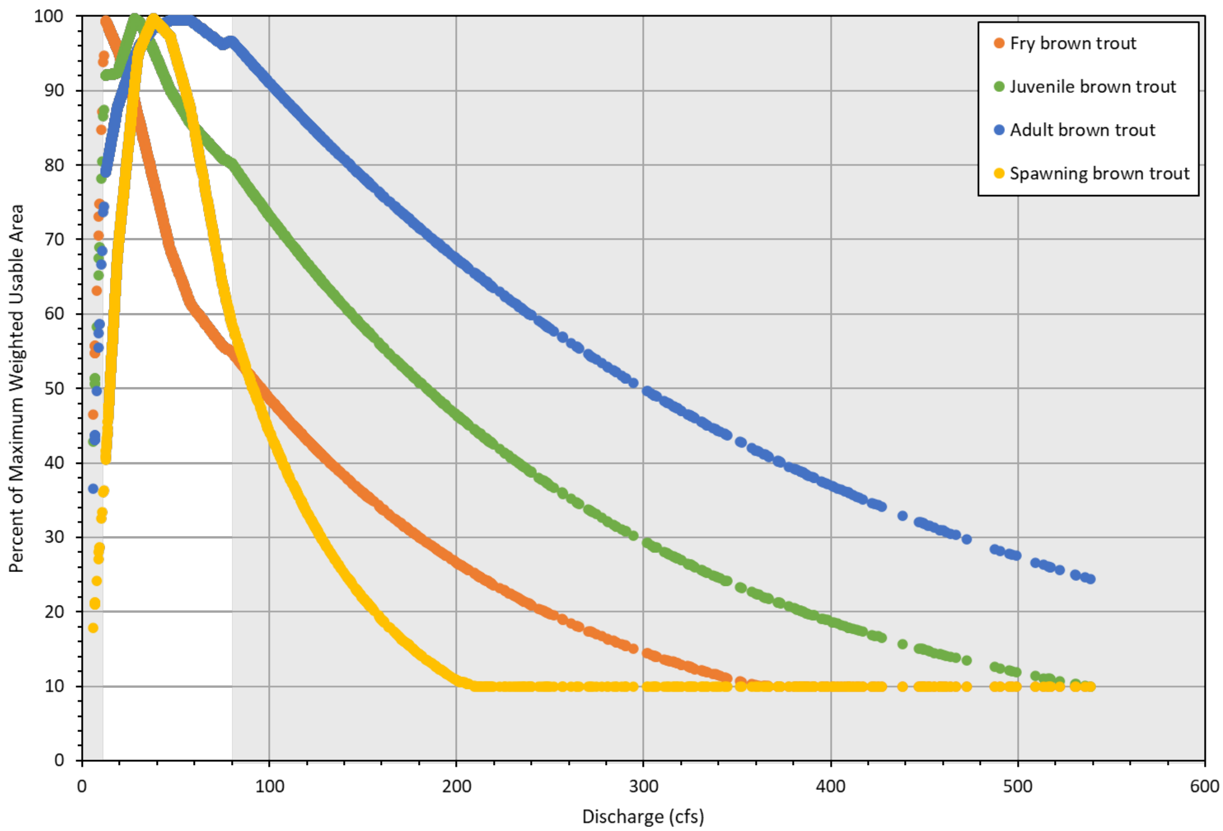
Note: Grey shading denotes regions of extrapolation beyond the range of the original 1992 WUA curves.

Figure 1-2. Percent of Maximum WUA Versus Discharge (cubic feet per second) in Lee Vining Creek Between the Confluence of Slate Creek and Glacier Creek.



Note: Grey shading denotes regions of extrapolation beyond the range of the original 1992 WUA curves.

Figure 1-3. Percent of Maximum WUA Versus Discharge (cubic feet per second) in Lee Vining Creek Between the Confluence of Glacier Creek and Ellery Lake.



Note: Grey shading denotes regions of extrapolation beyond the range of the original 1992 WUA curves.

Figure 1-4. Percent of WUA Versus Discharge (cubic feet per second) in Lee Vining Creek Between Poole Powerhouse and the LADWP Diversion Dam.

1.2. HABITAT TIME SERIES ASSESSMENT

A time series analysis of WUA as a function of streamflow was conducted for all reaches in Lee Vining Creek where habitat-flow relationships were calculated (Table 1-1). Three of the four reaches (Reaches 1, 2, and 4) are dominated by bedrock, boulder, and cobble morphology and are characterized by moderate- to high-gradient canyon sections (Study AQ-3 *Aquatic Habitat Mapping and Sediment Characterization*), which tend to prevent any significant change in habitat-flow relationships over time because of stable channel morphology. Reach 2, between the confluence with Slate Creek and the confluence with Glacier Creek, is composed of two low-gradient meadows separated by brief high-gradient canyon sections.

Table 1-1. Reach and Gaging Information for Lee Vining Creek

Reach Number	Reach Name	Gage Number	Period of Record
1	Lee Vining Creek between Saddlebag Dam and the confluence of Slate Creek	SCE Gage 354 (USGS Gage 10287655)	October 1, 2009–July 31, 2023

Reach Number	Reach Name	Gage Number	Period of Record
2	Lee Vining Creek between the confluence of Slate Creek and Glacier Creek	SCE Gage 354 (USGS Gage 10287655)	October 1, 2009–July 31, 2023
3	Lee Vining Creek between the confluence of Glacier Creek and Ellery Lake	Combined total flow for SCE Gage 354 (USGS Gage 10287655) and SCE Gage 368 (USGS Gage 10287720)	October 1, 2009–July 31, 2023
4	Lee Vining Creek between Poole Powerhouse and the LADWP Diversion Dam	LADWP Diversion Dam gage	October 10, 2013–July 31, 2023

LADWP = Los Angeles Department of Water and Power; SCE = Southern California Edison; USGS = U.S. Geological Survey

WUA as a function of streamflow over time was evaluated by water year type. Water year types are summarized by year in Table 1-2 and described in the *Operations Model (AQ-5) Final Technical Report* (included in Volume III of this Final License Application). Because the hydrologic water year begins in October, water year types were assigned from October the year prior to September of the designated water year.

Table 1-2. Water Year Type and Associated Year for Lee Vining Creek

Water Year Type	Year
Wet	2011
	2017
	2019
	2023
Normal	2009
	2010
	2016
	2018
Dry	2012
	2013
	2014
	2015
	2020
	2021
	2022

Monthly percent maximum WUA as a function of streamflow was calculated from the historical flow-habitat relationships presented above and summarized by water year type on Figures 1-5 through 1-16. The range (average, minimum, and maximum) of percent maximum WUA calculated by water year type and month is shown in Table 1-3 through Table 1-6. Time series graphs of daily percent maximum WUA as a function of streamflow were plotted by water year on Figure 1-17 through Figure 1-28.

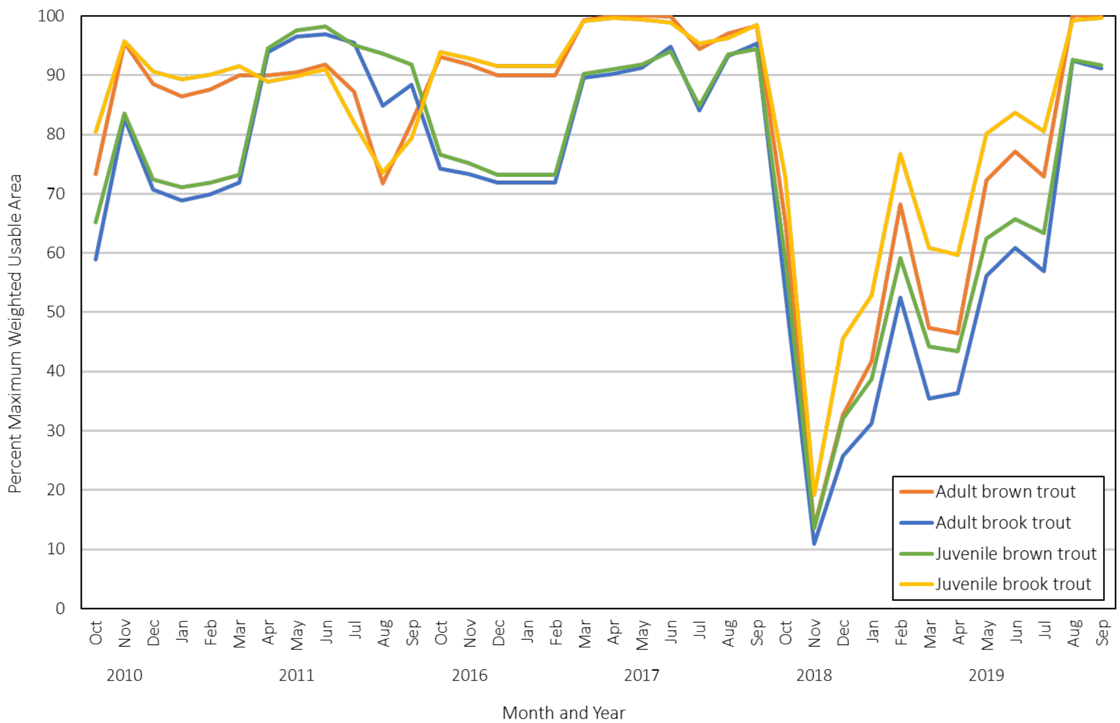


Figure 1-5. Monthly Percent Maximum WUA During Wet Water Years in Lee Vining Creek Between Saddlebag Dam and the Confluence of Slate Creek.

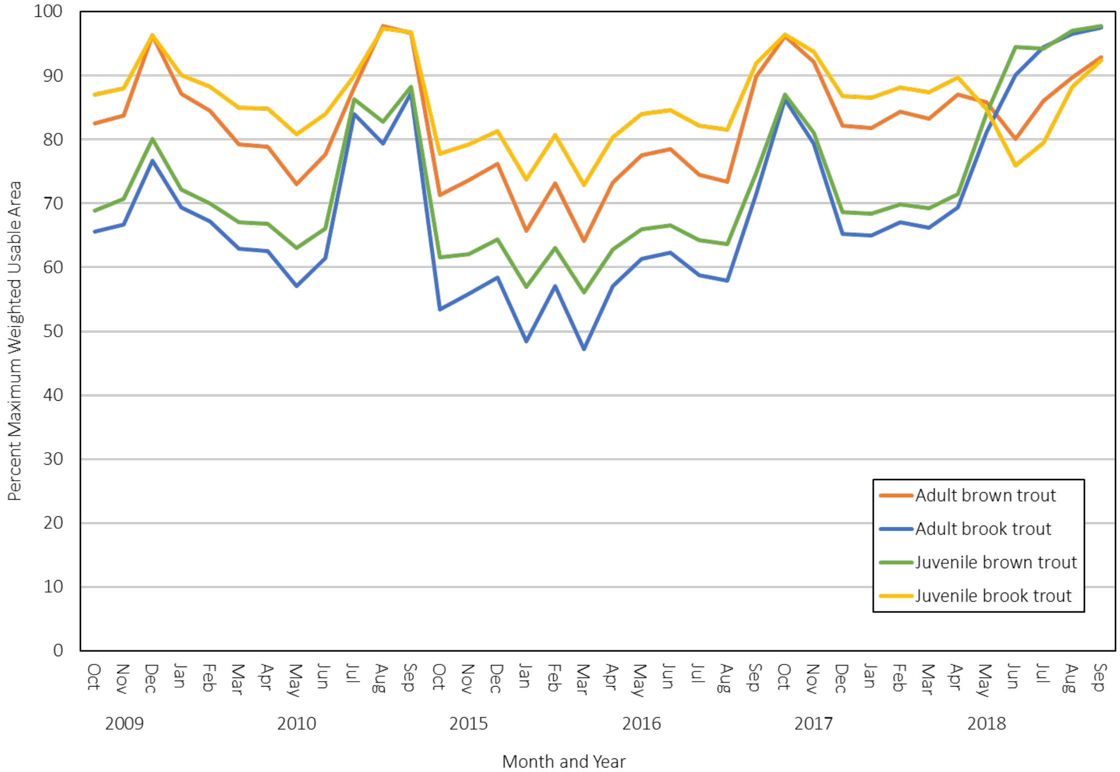


Figure 1-6. Monthly Percent Maximum WUA During Normal Water Years in Lee Vining Creek Between Saddlebag Dam and the Confluence of Slate Creek.

Figure 1-7. Monthly Percent Maximum WUA During Dry Water Years in Lee Vining Creek Between Saddlebag Dam and the Confluence of Slate Creek.

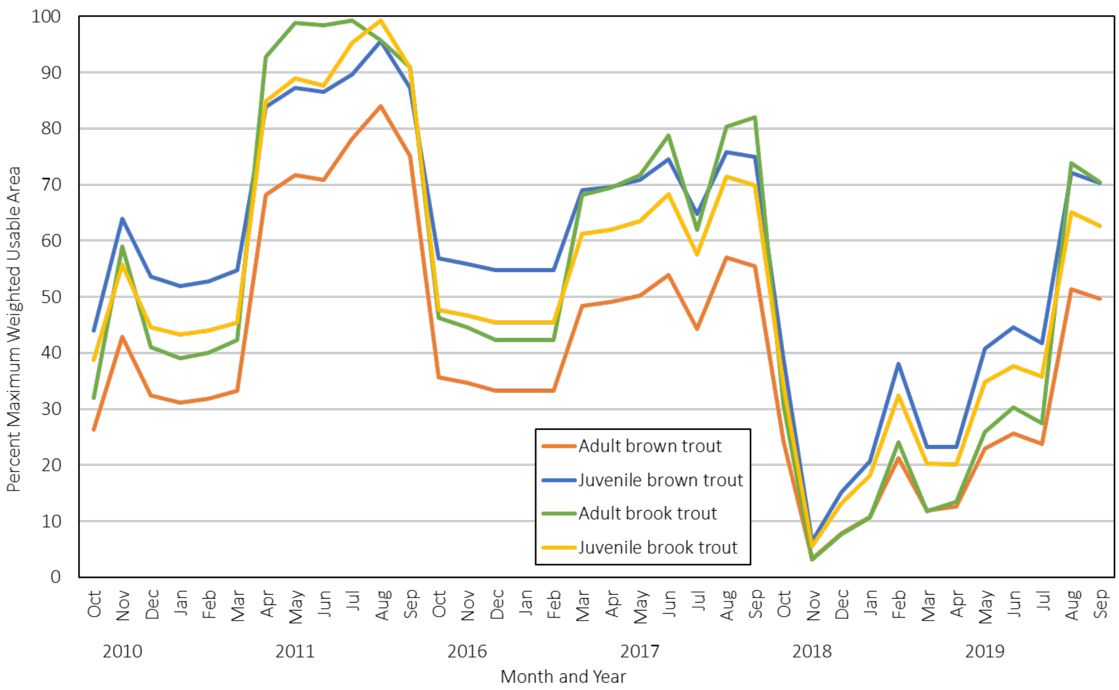


Figure 1-8. Monthly Percent Maximum WUA During Wet Water Years in Lee Vining Creek Between the Confluence of Slate Creek and Glacier Creek.

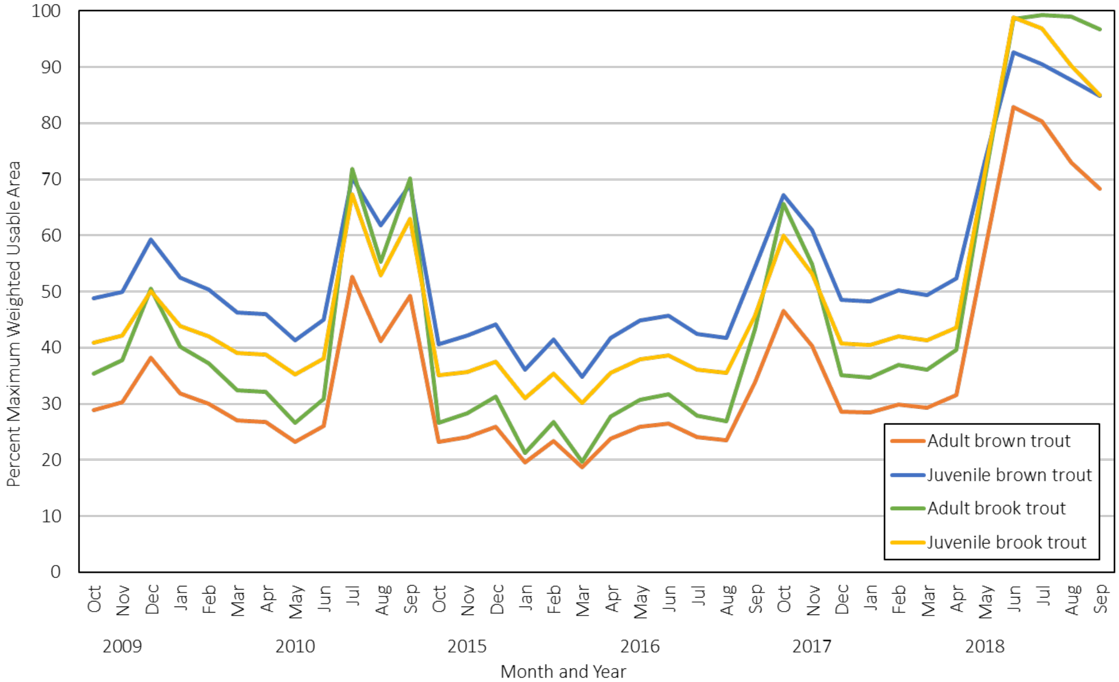


Figure 1-9. Monthly Percent Maximum WUA During Normal Water Years in Lee Vining Creek Between the Confluence of Slate Creek and Glacier Creek.

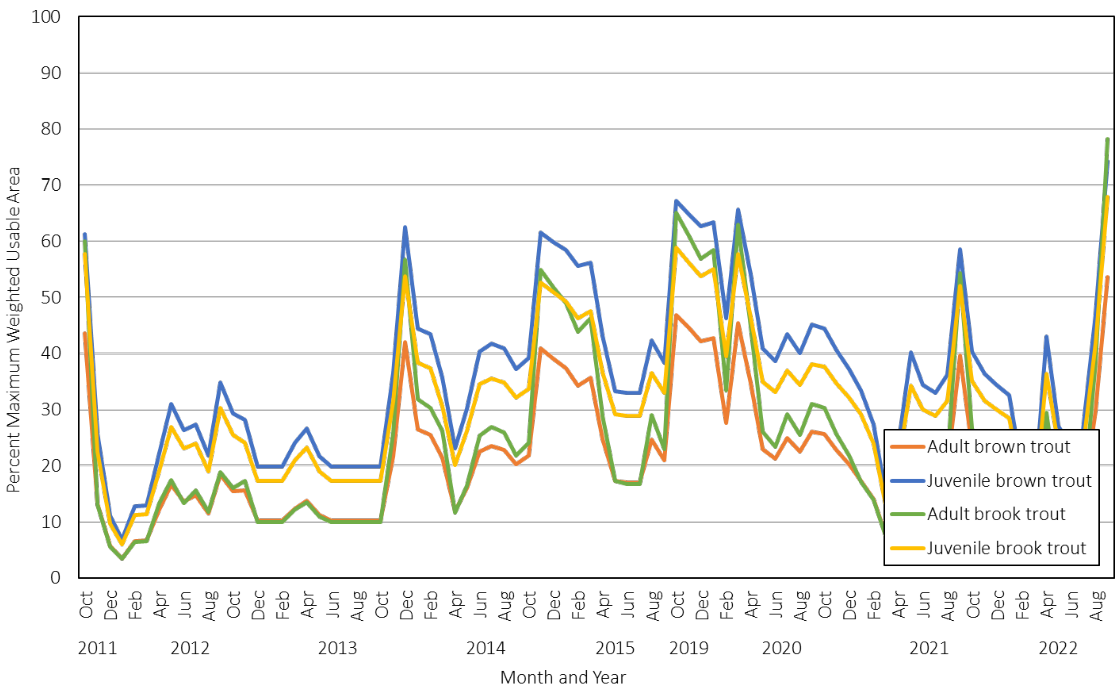


Figure 1-10. Monthly Percent Maximum WUA During Dry Water Years in Lee Vining Creek Between the Confluence of Slate Creek and Glacier Creek.

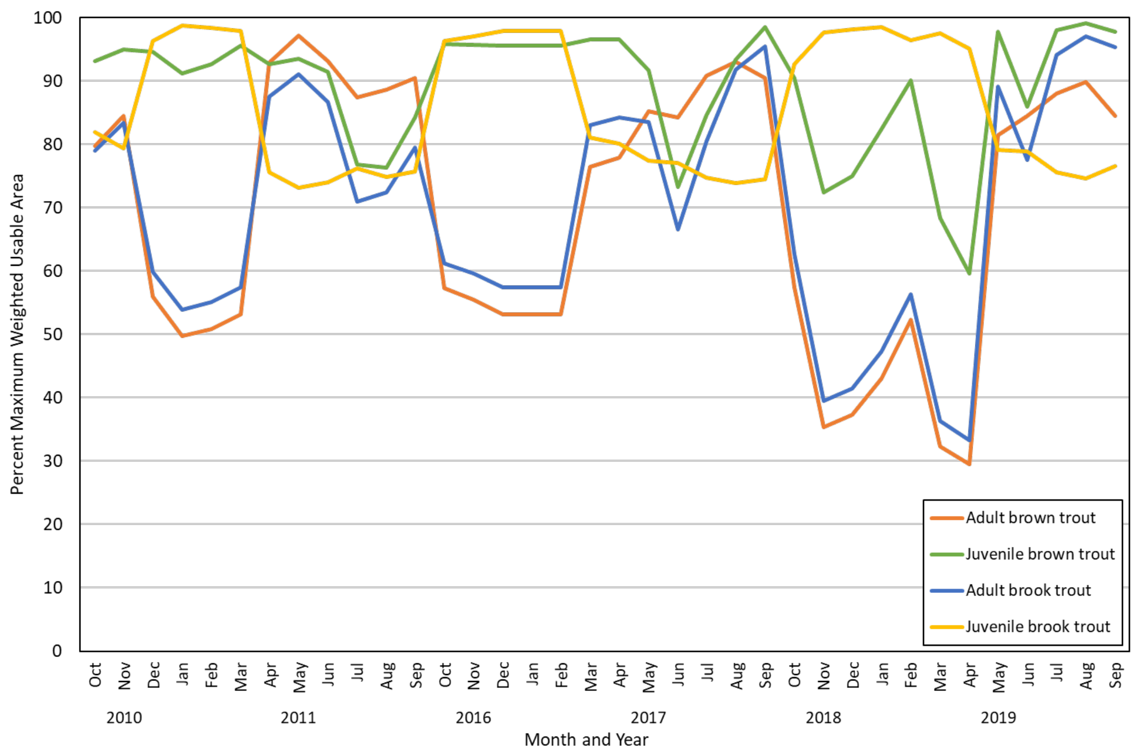


Figure 1-11. Monthly Percent Maximum WUA During Wet Water Years in Lee Vining Creek Between the Confluence of Glacier Creek and Ellery Lake.

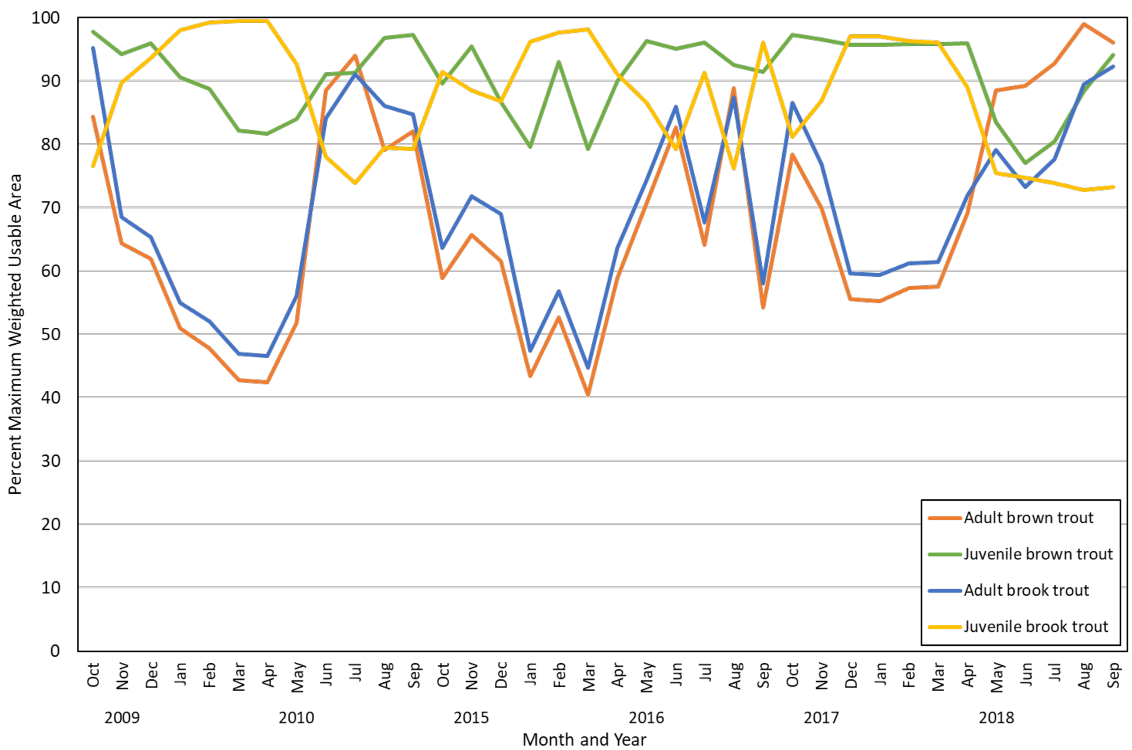


Figure 1-12. Monthly Percent Maximum WUA During Normal Water Years in Lee Vining Creek Between the Confluence of Glacier Creek and Ellery Lake.

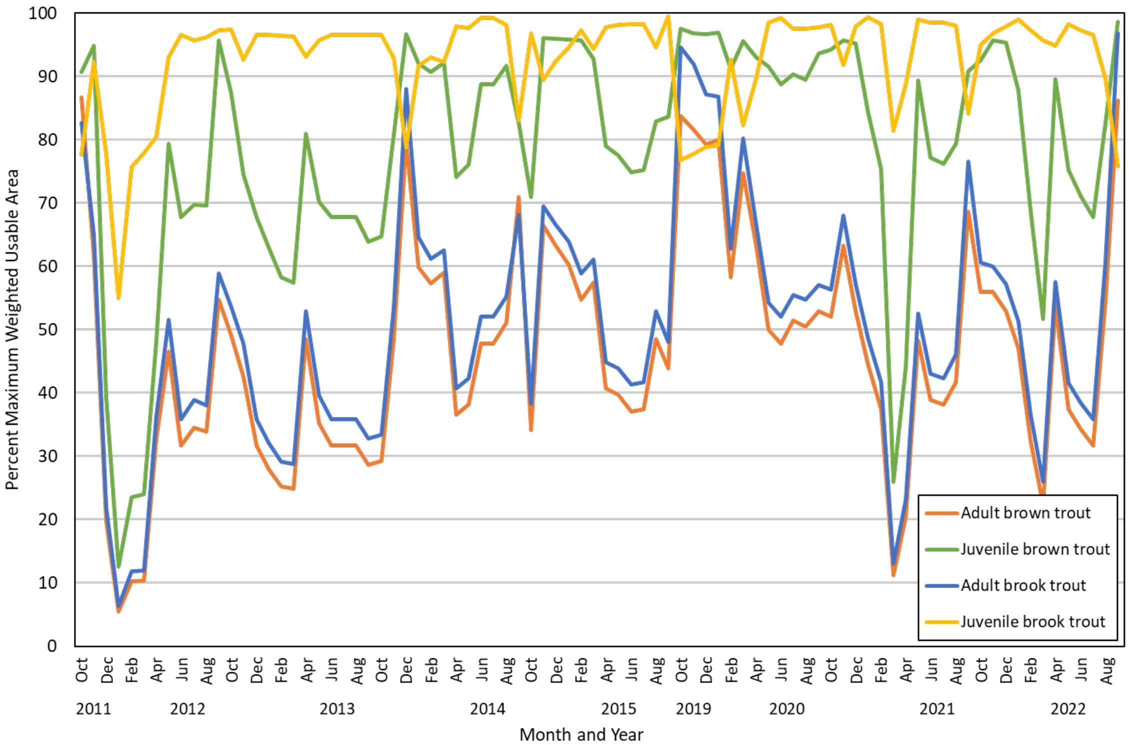


Figure 1-13. Monthly Percent Maximum WUA During Dry Water Years in Lee Vining Creek Between the Confluence of Glacier Creek and Ellery Lake.

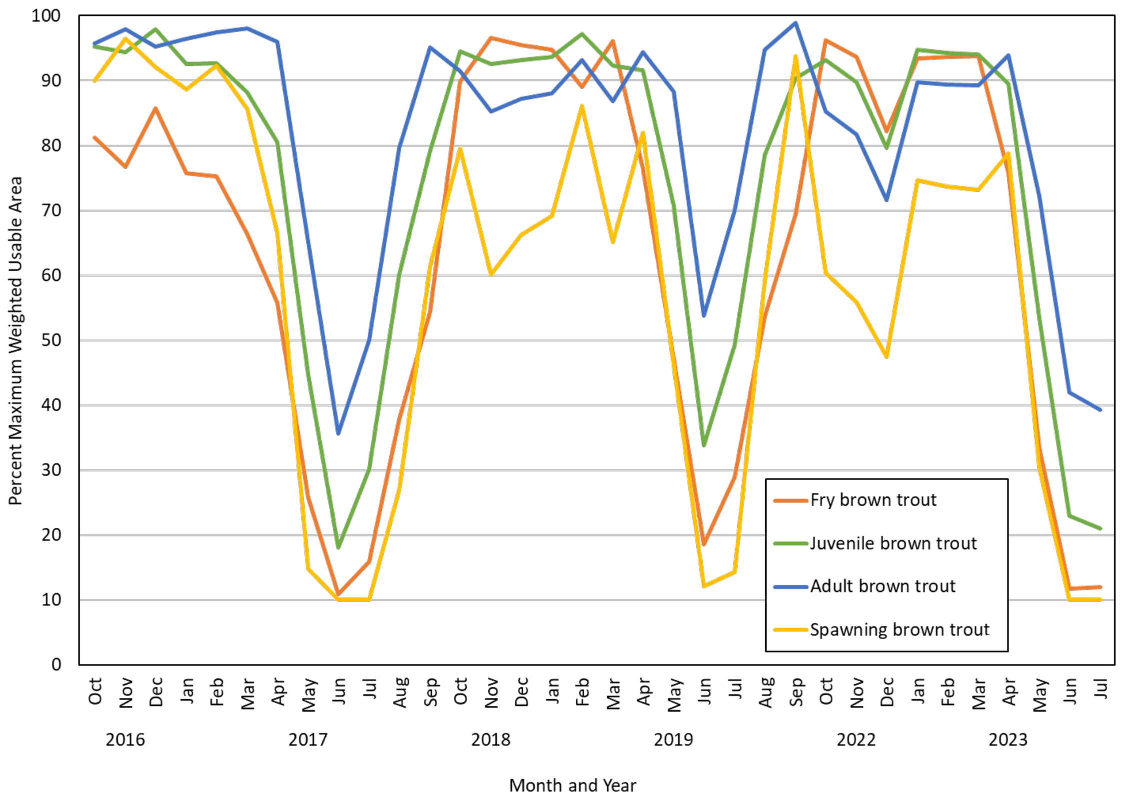


Figure 1-14. Monthly Percent Maximum WUA During Wet Water Years in Lower Lee Vining Creek Between Poole Powerhouse and the LADWP Diversion Dam.

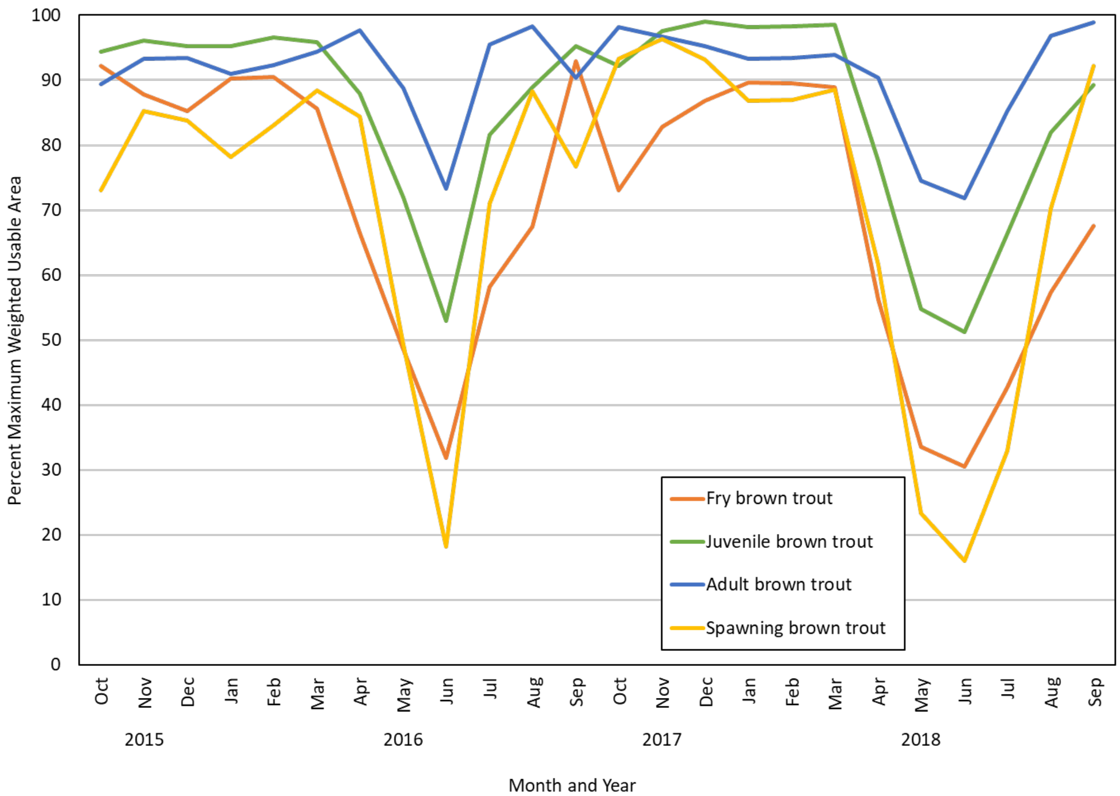


Figure 1-15. Monthly Percent Maximum WUA During Normal Water Years in Lower Lee Vining Creek Between Poole Powerhouse and the LADWP Diversion Dam.

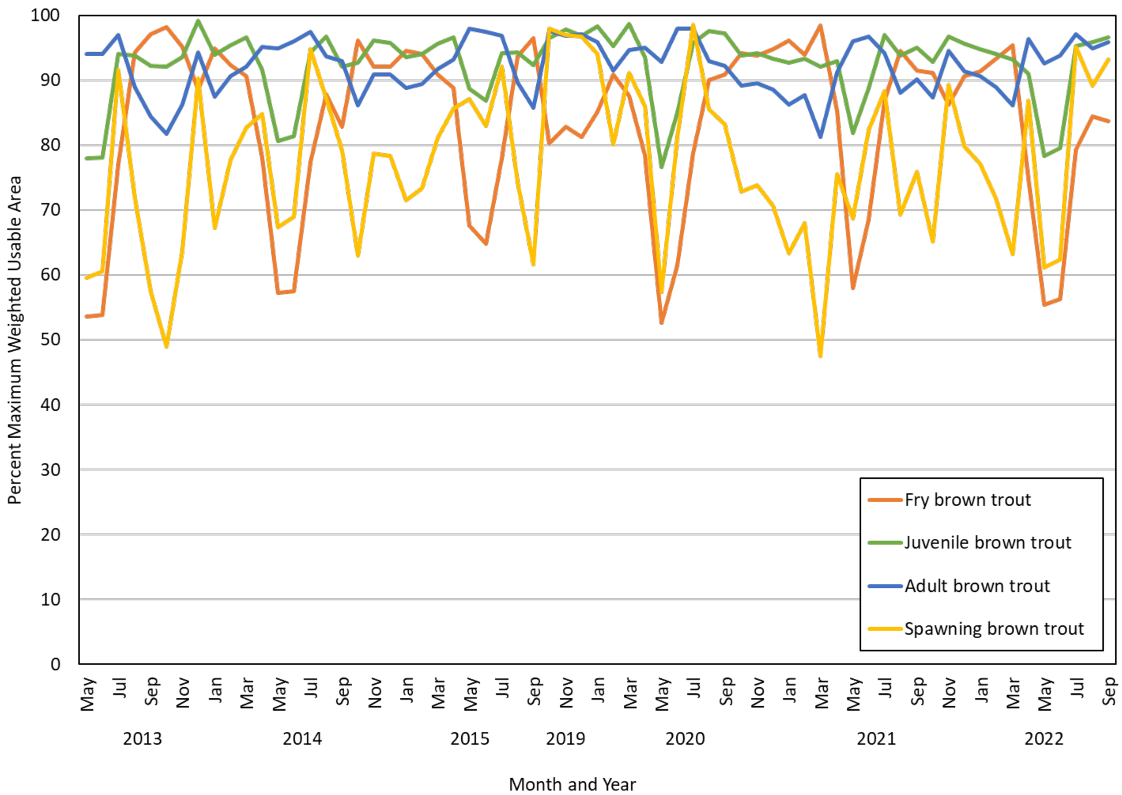


Figure 1-16. Monthly Percent Maximum WUA During Dry Water Years in Lower Lee Vining Creek Between Poole Powerhouse and the LADWP Diversion Dam.

Table 1-3. Minimum, Maximum, and Average Percent Maximum WUA for Lee Vining Creek Between Saddlebag Dam and the Confluence of Slate Creek

Month	Percent Maximum WUA			
	Adult Brown Trout (*Salmo trutta;* Average [Minimum to Maximum])	**Juvenile Brown Trout (Average [Minimum to Maximum])**	**Adult Brook Trout (*Salvelinus fontinalis*; Average [Minimum to Maximum])**	**Juvenile Brook Trout (Average [Minimum to Maximum])**
Wet Water Year Types				
Jan	73 (14–90)	61 (14–73)	57 (11–72)	78 (20–92)
Feb	82 (43–90)	68 (42–73)	65 (34–72)	86 (60–92)
Mar	79 (29–100)	69 (28–93)	66 (23–93)	84 (40–100)
Apr	79 (29–100)	76 (28–98)	73 (23–98)	83 (40–100)
May	88 (68–100)	84 (59–99)	81 (50–97)	90 (76–100)
Jun	90 (68–100)	86 (59–100)	84 (50–99)	91 (76–99)
Jul	85 (68–100)	81 (59–96)	79 (50–98)	86 (76–100)
Aug	90 (68–100)	93 (77–100)	90 (74–99)	90 (73–100)

Month	Percent Maximum WUA			
	Adult Brown Trout (*Salmo trutta;* Average [Minimum to Maximum])	**Juvenile Brown Trout (Average [Minimum to Maximum])**	**Adult Brook Trout (*Salvelinus fontinalis*; Average [Minimum to Maximum])**	**Juvenile Brook Trout (Average [Minimum to Maximum])**
Sep	93 (72–100)	93 (67–98)	92 (63–100)	92 (74–100)
Oct	77 (14–100)	67 (14–98)	62 (11–100)	82 (20–100)
Nov	67 (0–100)	57 (0–93)	56 (0–93)	69 (0–100)
Dec	70 (29–90)	59 (28–73)	56 (23–72)	76 (40–92)
Normal Water Year Types				
Jan	78 (52–96)	66 (48–80)	61 (38–77)	83 (65–96)
Feb	81 (68–85)	68 (59–70)	64 (50–67)	86 (76–88)
Mar	76 (52–85)	64 (48–70)	59 (38–67)	82 (65–88)
Apr	80 (52–90)	67 (48–73)	63 (38–72)	85 (65–92)
May	79 (68–93)	71 (59–98)	67 (50–96)	83 (76–94)
Jun	79 (73–85)	76 (64–95)	71 (58–92)	82 (76–88)
Jul	83 (73–100)	82 (64–100)	79 (58–100)	84 (77–100)
Aug	87 (73–100)	81 (64–99)	78 (58–97)	89 (82–100)
Sep	93 (73–100)	87 (64–100)	85 (58–100)	94 (82–100)
Oct	83 (62–100)	73 (54–97)	68 (43–99)	87 (70–100)
Nov	83 (52–100)	71 (48–94)	67 (38–94)	87 (65–100)
Dec	85 (52–98)	71 (48–82)	67 (38–79)	88 (65–97)
Dry Water Year Types				
Jan	64 (14–100)	56 (14–95)	50 (11–98)	71 (20–100)
Feb	59 (14–100)	52 (14–89)	45 (11–86)	68 (20–100)
Mar	56 (14–100)	50 (14–92)	45 (11–92)	64 (20–100)
Apr	61 (29–99)	54 (28–84)	47 (23–81)	70 (40–98)
May	60 (43–79)	54 (42–67)	45 (34–63)	71 (60–85)
Jun	59 (43–73)	52 (42–64)	43 (34–58)	69 (60–82)
Jul	60 (43–100)	54 (42–94)	45 (34–94)	70 (60–99)
Aug	64 (43–100)	57 (42–95)	49 (34–96)	73 (60–100)
Sep	73 (43–100)	65 (42–95)	59 (34–98)	80 (60–100)
Oct	71 (43–100)	64 (42–100)	58 (34–100)	79 (60–100)
Nov	72 (29–100)	63 (28–87)	57 (23–83)	79 (40–99)

Month	Percent Maximum WUA			
	Adult Brown Trout (*Salmo trutta;* Average [Minimum to Maximum])	**Juvenile Brown Trout (Average [Minimum to Maximum])**	**Adult Brook Trout (*Salvelinus fontinalis*; Average [Minimum to Maximum])**	**Juvenile Brook Trout (Average [Minimum to Maximum])**
Dec	70 (14–99)	61 (14–84)	55 (11–81)	76 (20–98)

WUA = weighted usable area

Table 1-4. Minimum, Maximum, and Average Percent Maximum WUA for Lee Vining Creek Between the Confluence of Slate Creek and Glacier Creek

Month	Percent Maximum WUA			
	Adult Brown Trout (*Salmo trutta;* Average [Minimum to Maximum])	**Juvenile Brown Trout (Average [Minimum to Maximum])**	**Adult Brook Trout (Average [Minimum to Maximum])**	**Juvenile Brook Trout (Average [Minimum to Maximum])**
Wet Water Year Types				
Jan	25 (3–33)	42 (7–55)	31 (3–42)	36 (6–45)
Feb	29 (10–33)	49 (20–55)	35 (10–42)	41 (17–45)
Mar	31 (7–52)	49 (13–73)	41 (7–75)	42 (12–66)
Apr	43 (7–76)	59 (13–89)	59 (7–99)	56 (12–93)
May	48 (20–76)	66 (37–89)	66 (22–99)	62 (32–93)
Jun	50 (20–80)	69 (37–90)	69 (22–99)	65 (32–97)
Jul	49 (20–82)	65 (37–92)	63 (22–99)	63 (32–99)
Aug	64 (36–85)	81 (57–97)	83 (46–99)	79 (48–100)
Sep	60 (27–84)	77 (46–95)	81 (32–99)	74 (39–100)
Oct	29 (3–62)	47 (7–81)	36 (3–94)	40 (6–78)
Nov	27 (0–52)	42 (0–73)	36 (0–75)	36 (0–66)
Dec	25 (7–33)	41 (13–55)	30 (7–42)	34 (12–45)
Normal Water Year Types				
Jan	27 (14–38)	46 (26–59)	32 (13–50)	38 (23–50)
Feb	28 (20–30)	47 (37–50)	34 (22–37)	40 (32–42)
Mar	25 (14–30)	43 (26–50)	29 (13–37)	37 (23–42)
Apr	27 (14–33)	47 (26–55)	33 (13–42)	39 (23–45)
May	36 (20–83)	53 (37–93)	42 (22–99)	48 (32–99)
Jun	45 (24–83)	61 (42–93)	54 (27–99)	58 (36–99)
Jul	52 (24–82)	68 (42–92)	66 (27–99)	67 (36–99)

Month	Percent Maximum WUA			
	Adult Brown Trout (*Salmo trutta;* Average [Minimum to Maximum])	**Juvenile Brown Trout (Average [Minimum to Maximum])**	**Adult Brook Trout (Average [Minimum to Maximum])**	**Juvenile Brook Trout (Average [Minimum to Maximum])**
Aug	46 (24–77)	64 (42–89)	60 (27–99)	60 (36–94)
Sep	50 (24–76)	69 (42–89)	70 (27–99)	65 (36–93)
Oct	33 (17–61)	52 (33–80)	43 (17–93)	45 (29–77)
Nov	32 (14–54)	51 (26–74)	40 (13–78)	44 (23–68)
Dec	31 (14–41)	51 (26–61)	39 (13–54)	43 (23–52)
Dry Water Year Types				
Jan	22 (3–57)	37 (7–77)	27 (3–84)	32 (6–72)
Feb	18 (3–47)	32 (7–67)	21 (3–65)	28 (6–59)
Mar	19 (3–50)	32 (7–71)	24 (3–72)	27 (6–64)
Apr	19 (7–43)	34 (13–63)	22 (7–58)	29 (12–55)
May	17 (10–27)	32 (20–46)	18 (10–32)	28 (17–39)
Jun	16 (10–24)	31 (20–42)	17 (10–27)	27 (17–36)
Jul	17 (10–54)	32 (20–74)	18 (10–78)	28 (17–68)
Aug	20 (10–55)	35 (20–76)	23 (10–81)	31 (17–70)
Sep	27 (10–57)	44 (20–77)	34 (10–84)	39 (17–72)
Oct	27 (10–71)	43 (20–87)	33 (10–99)	38 (17–88)
Nov	25 (7–45)	42 (13–66)	31 (7–62)	36 (12–57)
Dec	25 (3–43)	41 (7–63)	32 (3–58)	35 (6–55)

WUA = weighted usable area

Table 1-5. Minimum, Maximum, and Average Percent Maximum WUA for Lee Vining Creek Between the Confluence of Glacier Creek and Ellery Lake

Month	Percent Maximum WUA			
	Adult Brown Trout (*Salmo trutta;* Average [Minimum to Maximum])	**Juvenile Brown Trout (Average [Minimum to Maximum])**	**Adult Brook Trout (*Salvelinus fontinalis*; Average [Minimum to Maximum])**	**Juvenile Brook Trout (Average [Minimum to Maximum])**
Wet Water Year Types				
Jan	49 (32–57)	53 (36–61)	90 (68–96)	98 (96–100)
Feb	52 (37–70)	56 (41–73)	93 (75–96)	98 (87–100)
Mar	54 (21–81)	59 (24–90)	87 (49–97)	92 (78–100)

Month	Percent Maximum WUA			
	Adult Brown Trout (*Salmo trutta;* Average [Minimum to Maximum])	**Juvenile Brown Trout (Average [Minimum to Maximum])**	**Adult Brook Trout (*Salvelinus fontinalis*; Average [Minimum to Maximum])**	**Juvenile Brook Trout (Average [Minimum to Maximum])**
Apr	67 (21–99)	68 (24–96)	83 (49–98)	84 (73–100)
May	88 (62–100)	88 (65–99)	94 (79–100)	77 (73–94)
Jun	87 (48–100)	77 (52–98)	84 (69–99)	77 (73–99)
Jul	89 (48–99)	82 (52–99)	86 (69–100)	76 (73–99)
Aug	90 (86–100)	87 (69–99)	90 (74–100)	74 (73–76)
Sep	88 (57–100)	90 (61–98)	94 (78–99)	76 (73–96)
Oct	65 (37–99)	68 (41–99)	93 (75–100)	90 (73–100)
Nov	58 (32–99)	61 (36–99)	88 (68–100)	91 (73–100)
Dec	49 (32–66)	53 (36–69)	88 (68–96)	97 (90–100)
Normal Water Year Types				
Jan	50 (32–62)	54 (36–65)	89 (68–96)	97 (94–99)
Feb	53 (42–62)	57 (47–65)	93 (82–96)	98 (94–100)
Mar	47 (32–62)	51 (36–65)	86 (68–96)	98 (94–100)
Apr	57 (32–99)	61 (36–99)	89 (68–100)	93 (73–100)
May	70 (32–100)	70 (36–99)	88 (68–100)	85 (73–100)
Jun	87 (53–100)	81 (57–98)	88 (73–99)	77 (73–98)
Jul	84 (57–100)	79 (61–99)	89 (77–100)	80 (73–96)
Aug	89 (37–100)	88 (41–99)	93 (75–100)	76 (73–98)
Sep	77 (37–100)	78 (41–98)	94 (75–99)	83 (73–99)
Oct	74 (42–92)	82 (47–99)	95 (82–100)	83 (74–100)
Nov	67 (42–85)	72 (47–96)	95 (82–98)	88 (76–100)
Dec	60 (32–86)	65 (36–97)	93 (68–99)	92 (76–98)
Dry Water Year Types				
Jan	46 (5–91)	51 (6–98)	76 (12–99)	88 (54–100)
Feb	39 (5–82)	43 (6–93)	72 (12–97)	93 (54–100)
Mar	37 (5–82)	40 (6–93)	63 (12–97)	89 (54–100)
Apr	42 (11–91)	46 (12–98)	73 (24–99)	92 (74–100)
May	42 (26–88)	47 (31–98)	80 (61–99)	97 (75–100)
Jun	38 (32–48)	43 (36–52)	77 (68–89)	98 (97–100)

Month	Percent Maximum WUA			
	Adult Brown Trout (*Salmo trutta;* Average [Minimum to Maximum])	**Juvenile Brown Trout (Average [Minimum to Maximum])**	**Adult Brook Trout (*Salvelinus fontinalis*; Average [Minimum to Maximum])**	**Juvenile Brook Trout (Average [Minimum to Maximum])**
Jul	39 (32–86)	43 (36–97)	77 (68–99)	97 (76–100)
Aug	45 (26–88)	49 (31–98)	80 (61–99)	96 (75–100)
Sep	58 (26–100)	63 (31–99)	87 (61–100)	91 (73–100)
Oct	56 (26–100)	60 (31–96)	85 (61–98)	91 (73–100)
Nov	60 (32–91)	65 (36–98)	91 (68–99)	91 (74–100)
Dec	54 (5–82)	59 (6–93)	84 (12–97)	89 (54–100)

WUA = weighted usable area

Table 1-6. Minimum, Maximum, and Average Percent Maximum WUA for Lower Lee Vining Creek Between Poole Powerhouse and the LADWP Diversion Dam

Month	Percent Maximum WUA			
	Fry Brown Trout (*Salmo trutta;* Average [Minimum to Maximum])	**Juvenile Brown Trout (Average [Minimum to Maximum])**	**Adult Brown Trout (Average [Minimum to Maximum])**	**Spawning Brown Trout (Average [Minimum to Maximum])**
Wet Water Year Types				
Jan	88 (47–98)	94 (71–100)	91 (84–99)	77 (40–99)
Feb	86 (55–98)	95 (80–100)	93 (83–99)	84 (54–100)
Mar	85 (55–99)	92 (81–99)	91 (80–99)	75 (44–99)
Apr	69 (37–96)	87 (59–100)	95 (79–99)	76 (23–99)
May	35 (10–64)	56 (20–87)	75 (39–99)	30 (10–90)
Jun	14 (10–42)	25 (10–66)	44 (24–85)	11 (10–32)
Jul	19 (10–43)	33 (11–66)	53 (26–85)	11 (10–32)
Aug	46 (21–59)	69 (39–84)	87 (60–98)	43 (10–78)
Sep	62 (40–87)	85 (64–99)	97 (83–99)	78 (29–99)
Oct	89 (50–99)	94 (75–100)	91 (81–99)	77 (47–100)
Nov	89 (58–99)	92 (58–100)	88 (50–99)	71 (24–100)
Dec	88 (47–99)	90 (43–100)	85 (37–99)	69 (18–100)
Normal Water Year Types				
Jan	90 (70–98)	97 (91–100)	92 (82–99)	82 (50–99)
Feb	90 (83–96)	97 (92–99)	93 (87–97)	85 (64–97)

Month	Percent Maximum WUA			
	Fry Brown Trout (*Salmo trutta;* Average [Minimum to Maximum])	**Juvenile Brown Trout (Average [Minimum to Maximum])**	**Adult Brown Trout (Average [Minimum to Maximum])**	**Spawning Brown Trout (Average [Minimum to Maximum])**
Mar	87 (64–96)	97 (87–100)	94 (88–99)	89 (67–100)
Apr	61 (20–87)	83 (37–99)	94 (58–99)	73 (10–100)
May	41 (21–71)	63 (39–92)	82 (60–99)	36 (10–98)
Jun	31 (19–44)	52 (36–68)	73 (57–87)	17 (10–35)
Jul	50 (34–79)	74 (55–96)	90 (76–99)	52 (19–99)
Aug	62 (49–88)	85 (74–100)	98 (92–99)	79 (45–99)
Sep	80 (59–96)	92 (84–98)	95 (86–99)	84 (63–100)
Oct	83 (59–99)	93 (84–100)	94 (80–99)	83 (43–100)
Nov	85 (66–94)	97 (88–99)	95 (90–99)	91 (75–100)
Dec	86 (49–98)	97 (74–100)	94 (82–99)	89 (45–99)
Dry Water Year Types				
Jan	92 (64–98)	95 (87–100)	90 (83–99)	75 (52–100)
Feb	93 (79–98)	94 (92–100)	90 (83–98)	74 (54–99)
Mar	93 (80–99)	95 (92–100)	89 (79–98)	73 (40–99)
Apr	81 (41–99)	93 (64–100)	94 (80–99)	84 (29–100)
May	57 (37–89)	81 (60–99)	95 (80–99)	67 (24–100)
Jun	60 (42–88)	83 (65–100)	96 (84–99)	73 (31–100)
Jul	80 (53–93)	95 (78–100)	97 (91–99)	93 (54–100)
Aug	91 (62–97)	95 (86–100)	91 (85–99)	80 (59–100)
Sep	90 (59–98)	94 (84–100)	90 (82–99)	75 (50–100)
Oct	92 (49–99)	94 (74–100)	88 (80–99)	70 (43–100)
Nov	90 (72–99)	96 (92–100)	92 (81–99)	81 (47–100)
Dec	89 (66–97)	96 (89–100)	92 (84–99)	83 (56–100)

WUA = weighted usable area

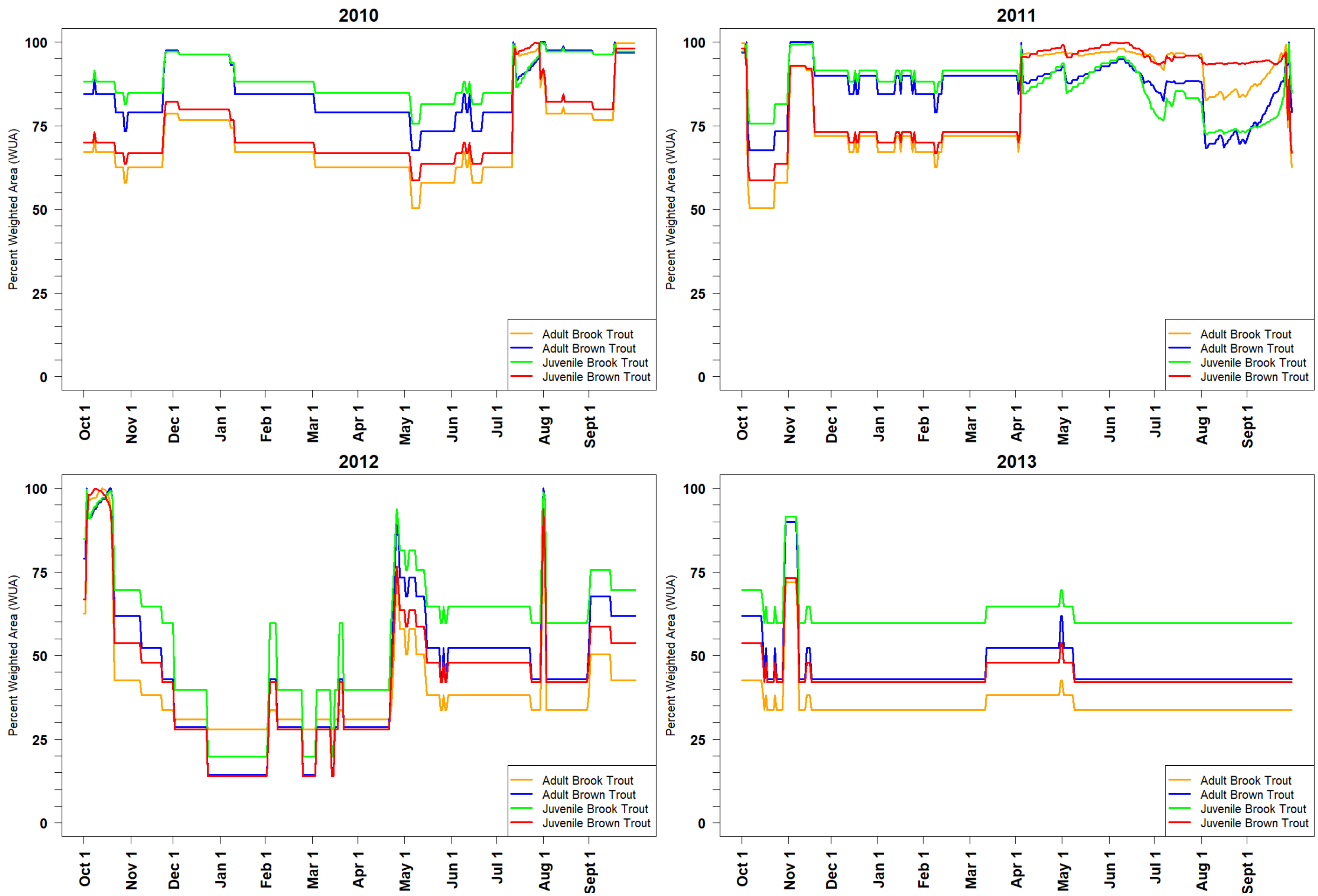


Figure 1-17. Daily percent maximum WUA in Lee Vining Creek Between Saddlebag Dam and the Confluence of Slate Creek from Water Year 2010 to 2013.

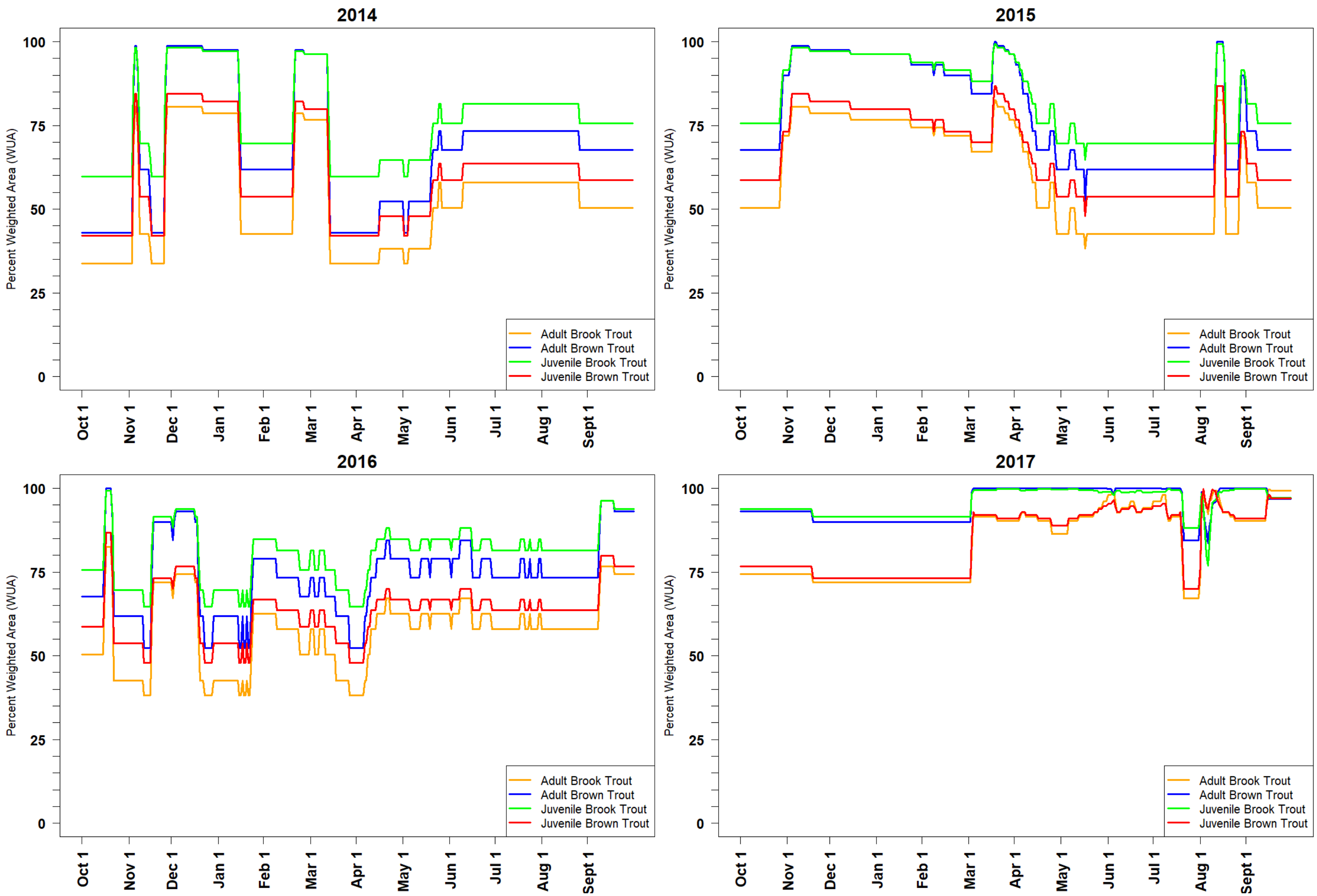


Figure 1-18. Daily percent maximum WUA in Lee Vining Creek Between Saddlebag Dam and the Confluence of Slate Creek from Water Year 2014 to 2017.

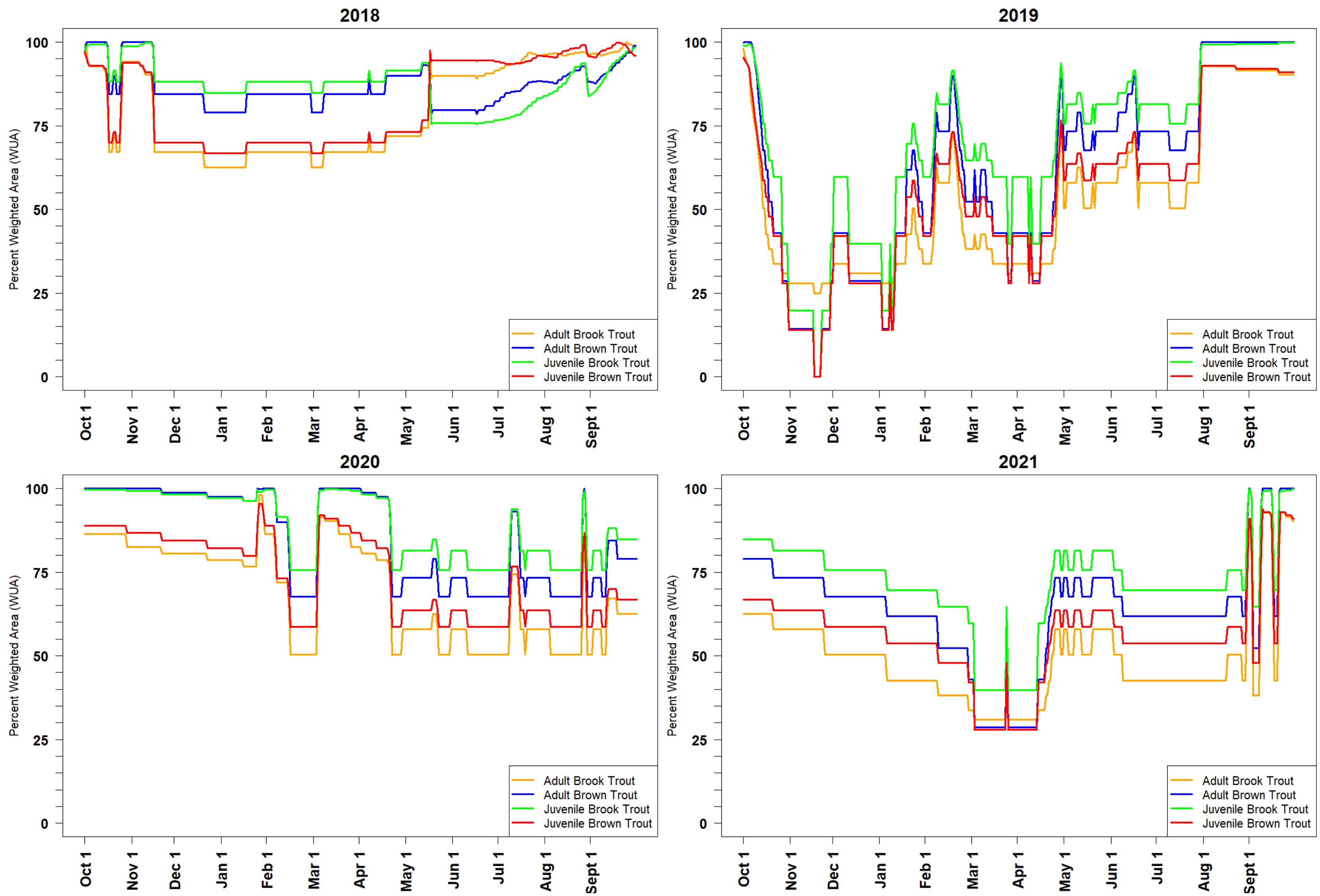


Figure 1-19. Daily percent maximum WUA in Lee Vining Creek Between Saddlebag Dam and the Confluence of Slate Creek from Water Year 2018 to 2021.

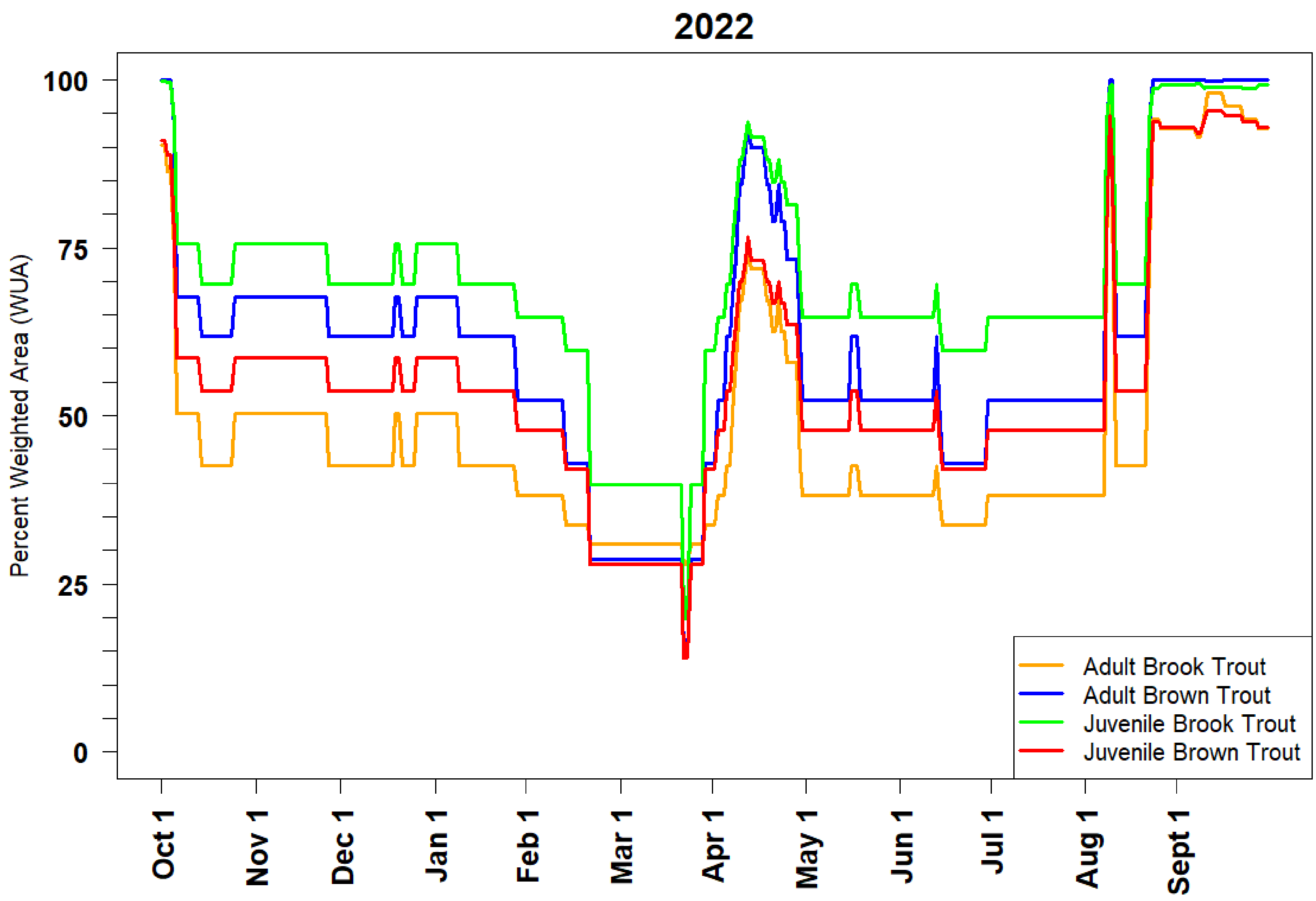


Figure 1-20. Daily percent maximum WUA in Lee Vining Creek Between Saddlebag Dam and the Confluence of Slate Creek During Water Year 2022.

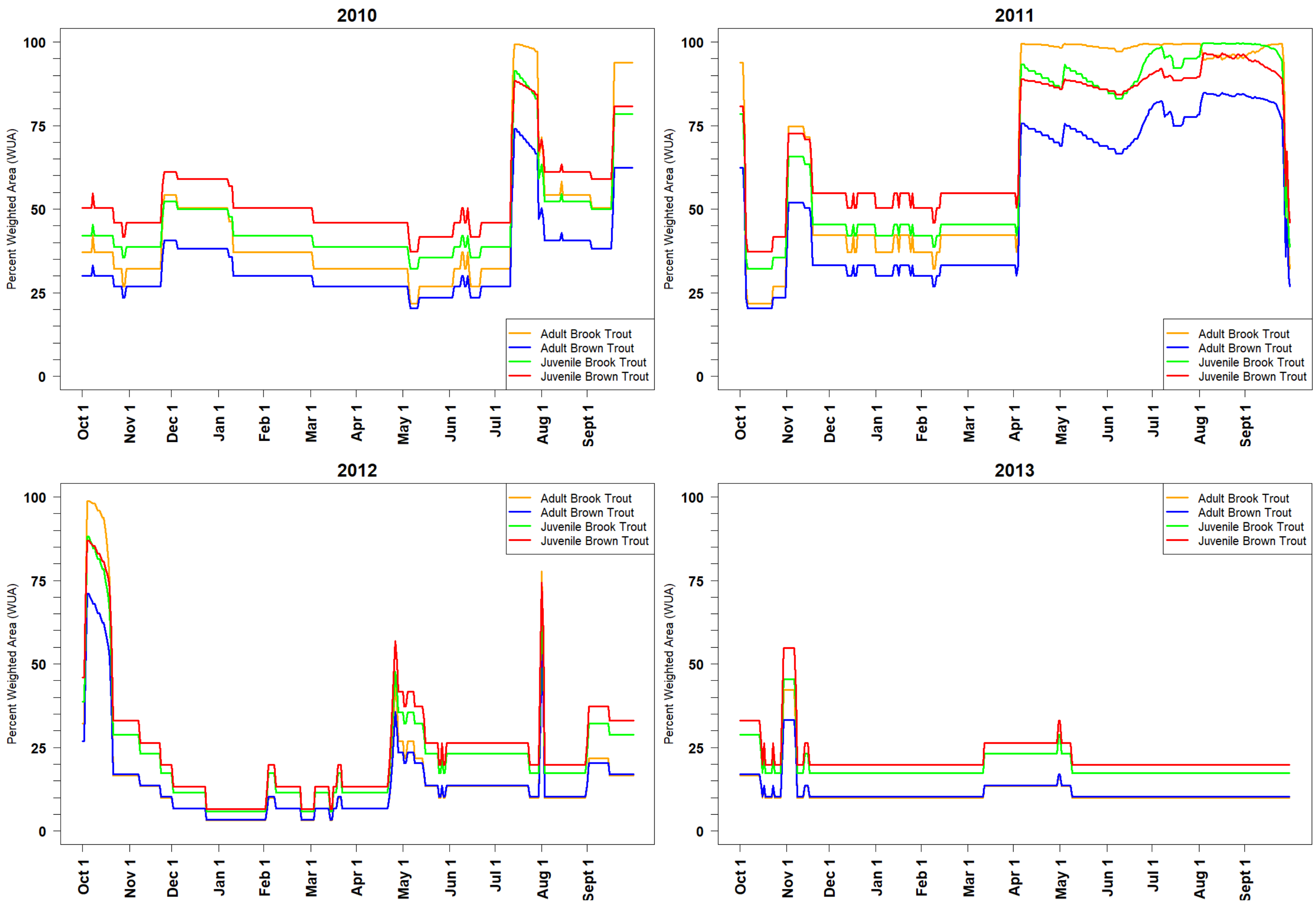


Figure 1-21. Daily percent maximum WUA in Lee Vining Creek Between the Confluence of Slate Creek and Glacier Creek from Water Year 2010 to 2013.

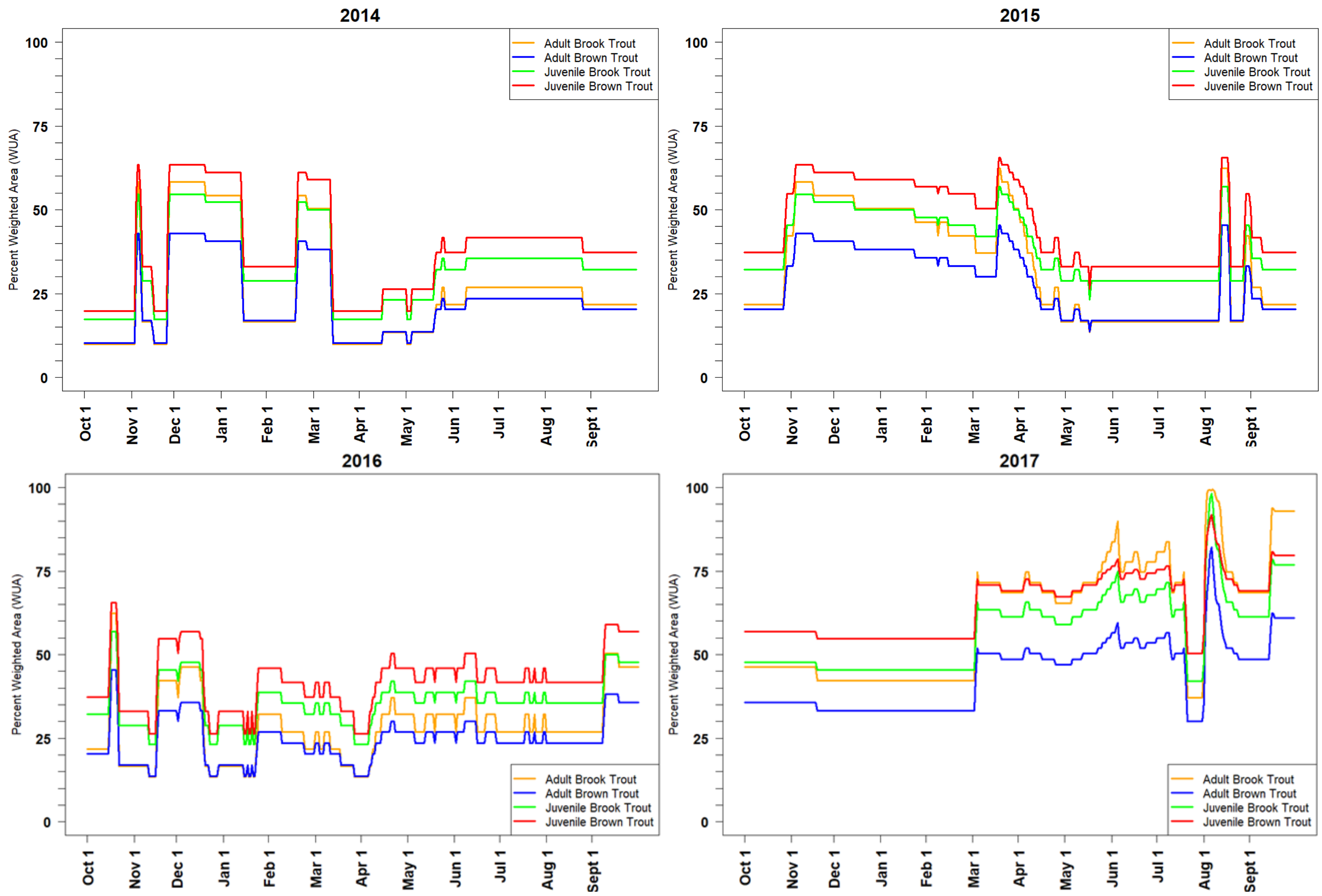


Figure 1-22. Daily percent maximum WUA in Lee Vining Creek Between the Confluence of Slate Creek and Glacier Creek from Water Year 2014 to 2017.

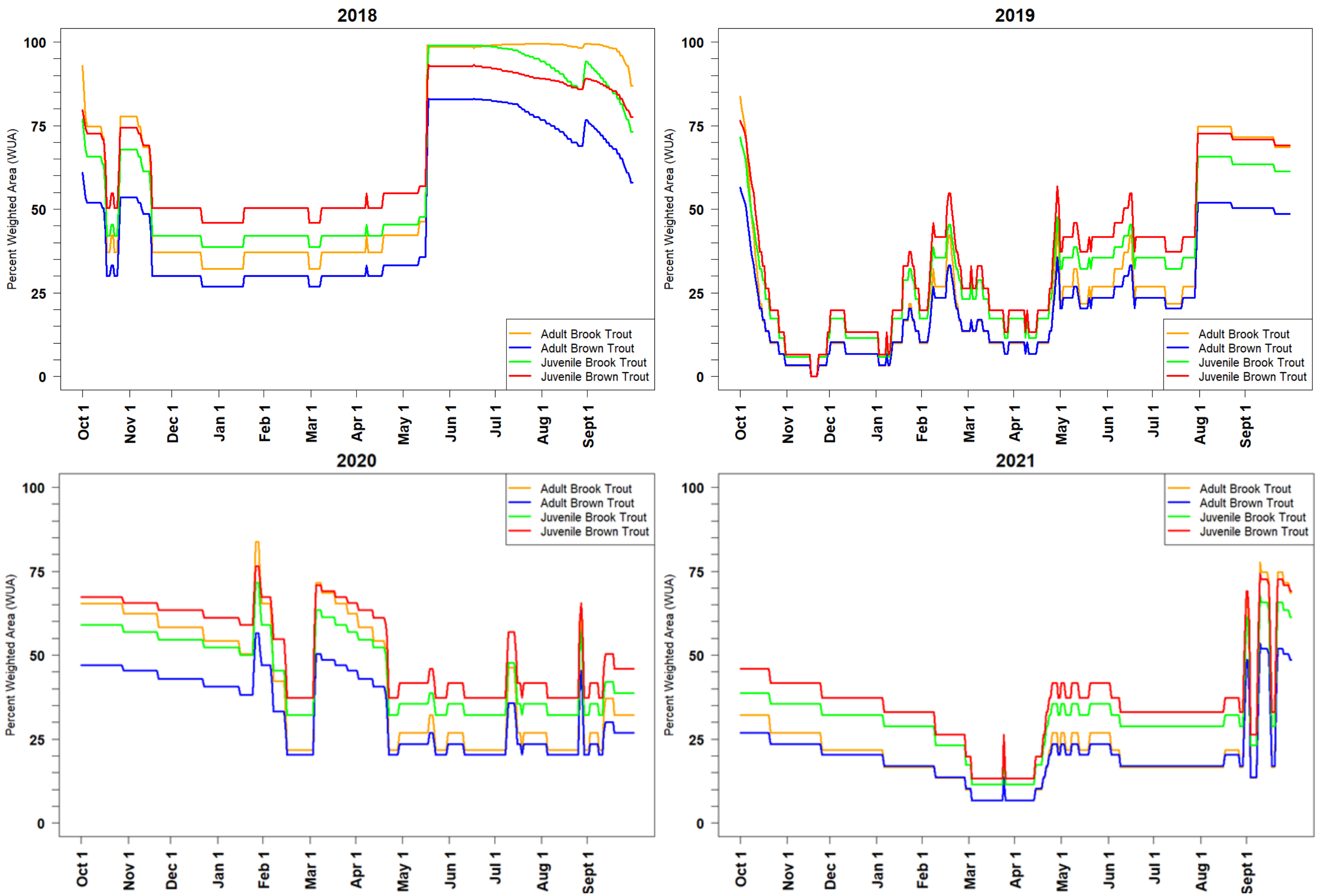


Figure 1-23. Daily percent maximum WUA in Lee Vining Creek Between the Confluence of Slate Creek and Glacier Creek from Water Year 2018 to 2021.

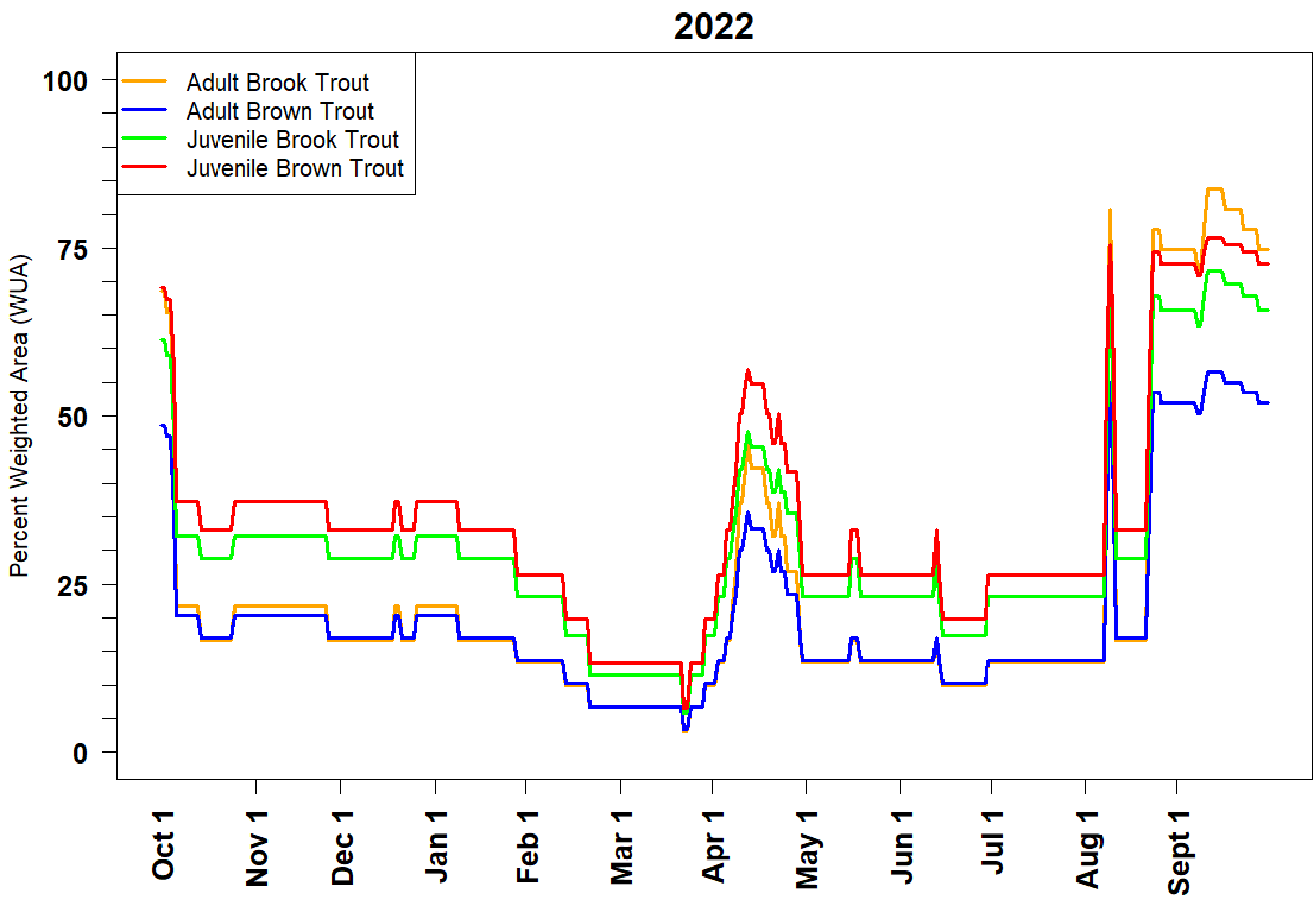


Figure 1-24. Daily percent maximum WUA in Lee Vining Creek Between the Confluence of Slate Creek and Glacier Creek During Water Year 2022.

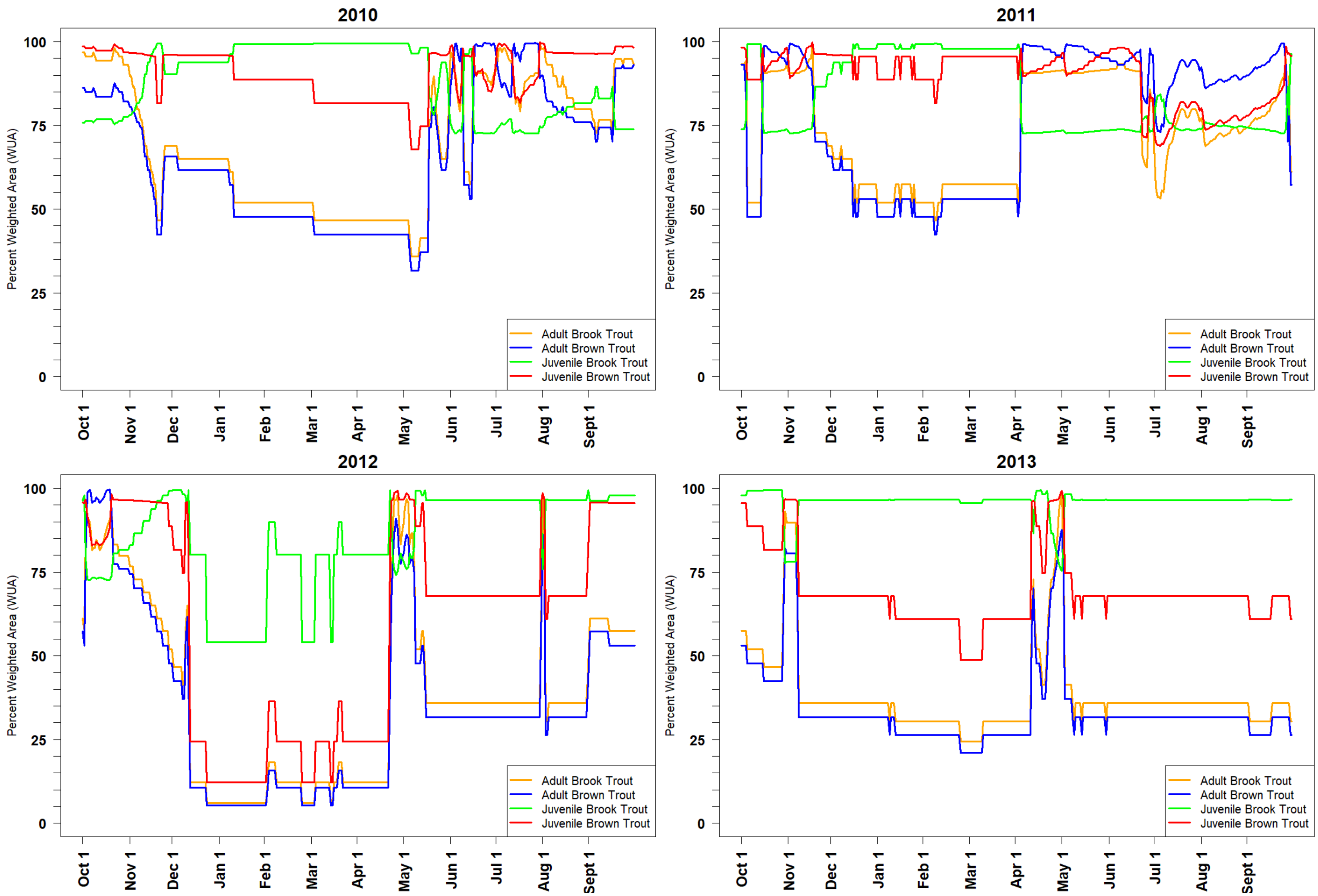


Figure 1-25. Daily percent maximum WUA in Lee Vining Creek Between the Confluence of Glacier Creek and Ellery Lake from Water Year 2010 to 2013.

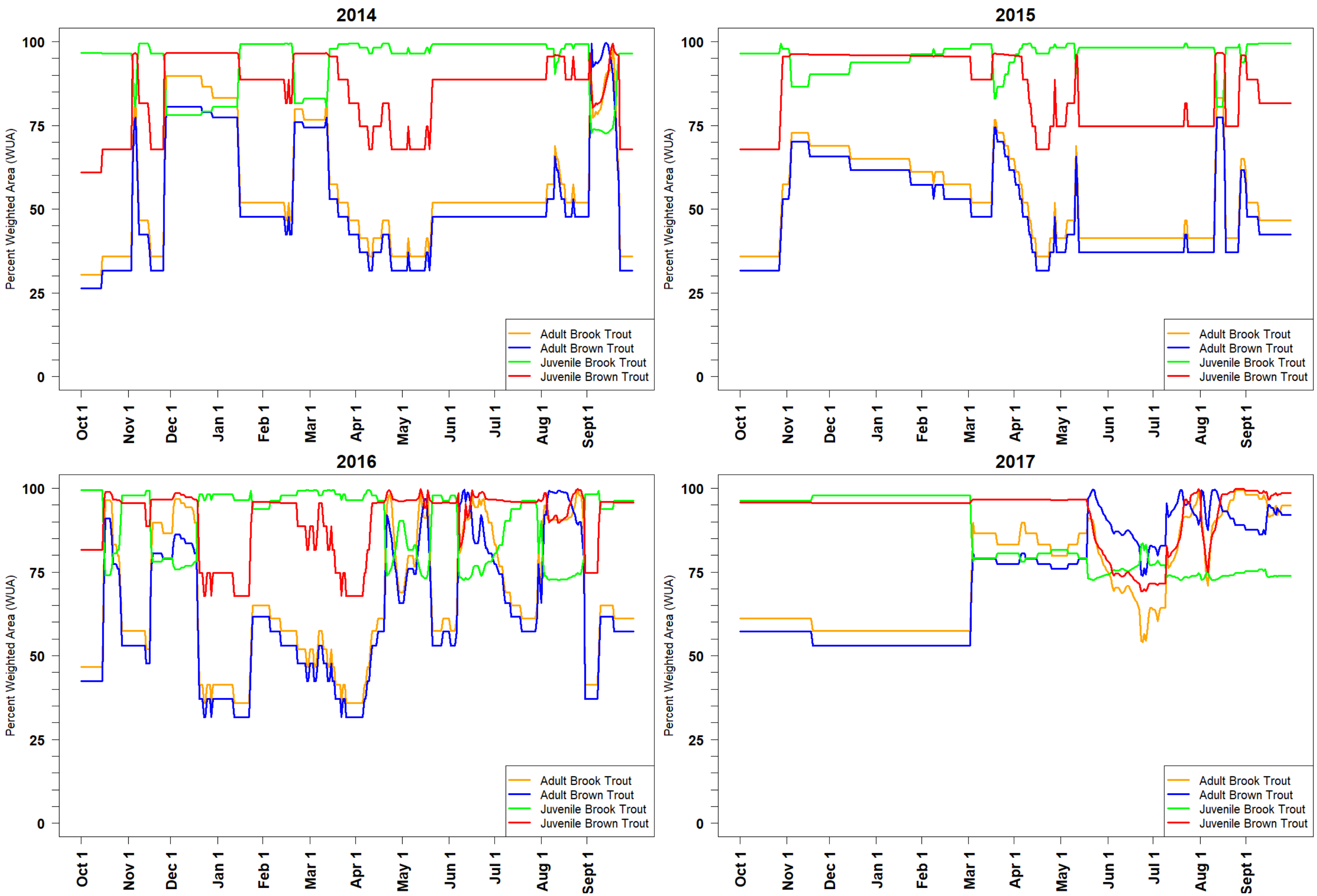


Figure 1-26. Daily percent maximum WUA in Lee Vining Creek Between the Confluence of Glacier Creek and Ellery Lake from Water Year 2014 to 2017.

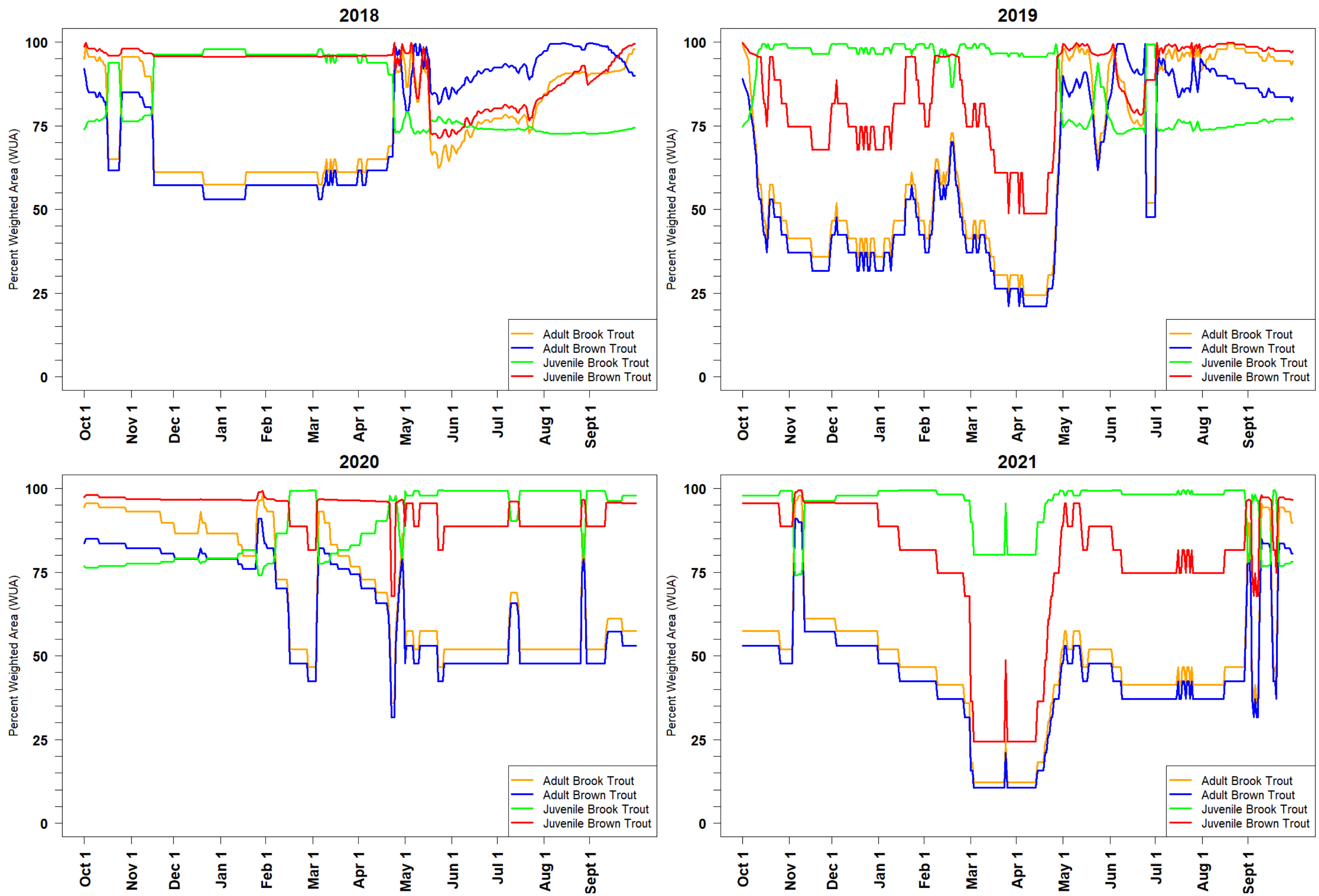


Figure 1-27. Daily percent maximum WUA in Lee Vining Creek Between the Confluence of Glacier Creek and Ellery Lake from Water Year 2018 to 2021.

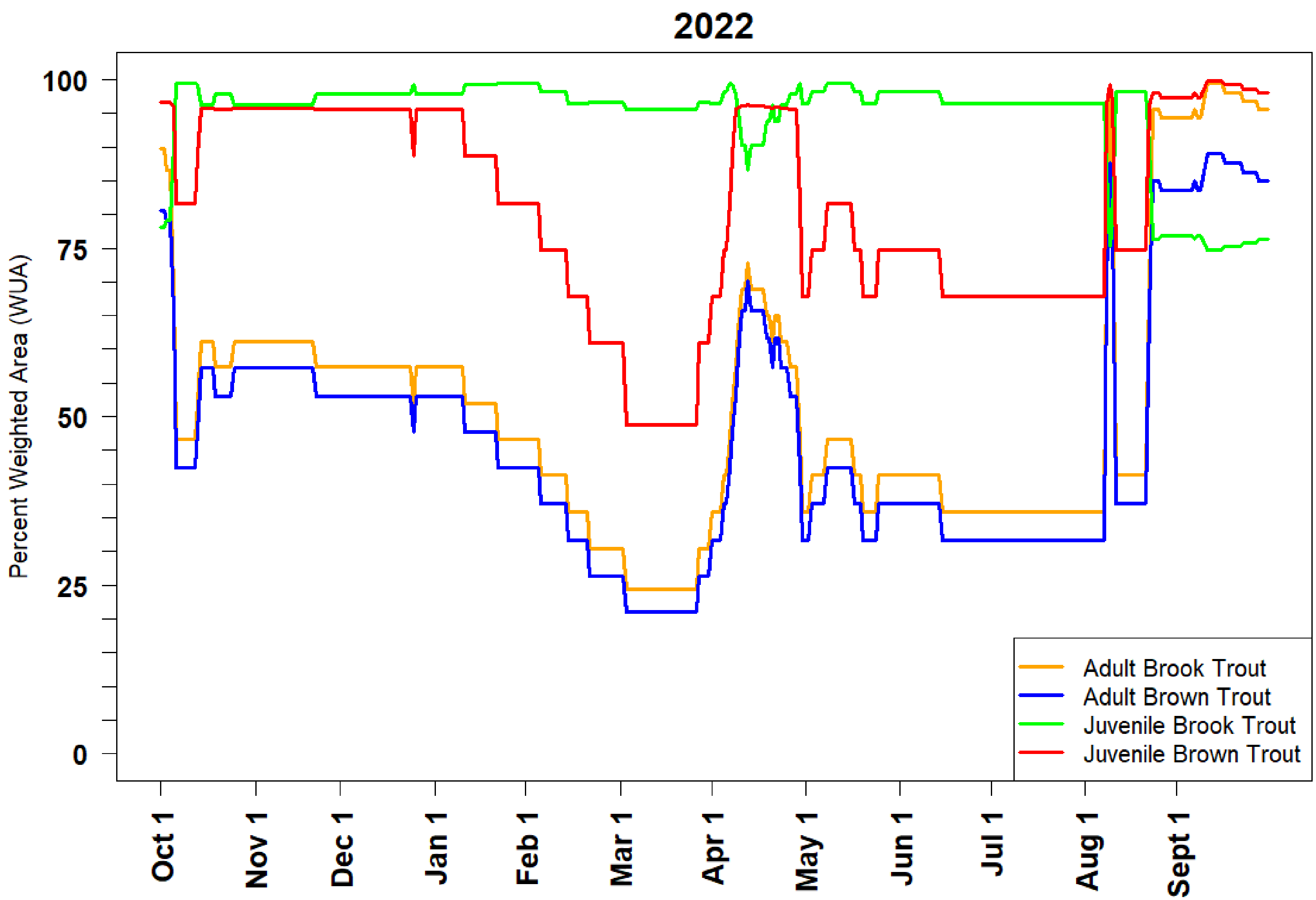


Figure 1-28. Daily percent maximum WUA in Lee Vining Creek Between the Confluence of Glacier Creek and Ellery Lake During Water Year 2022.

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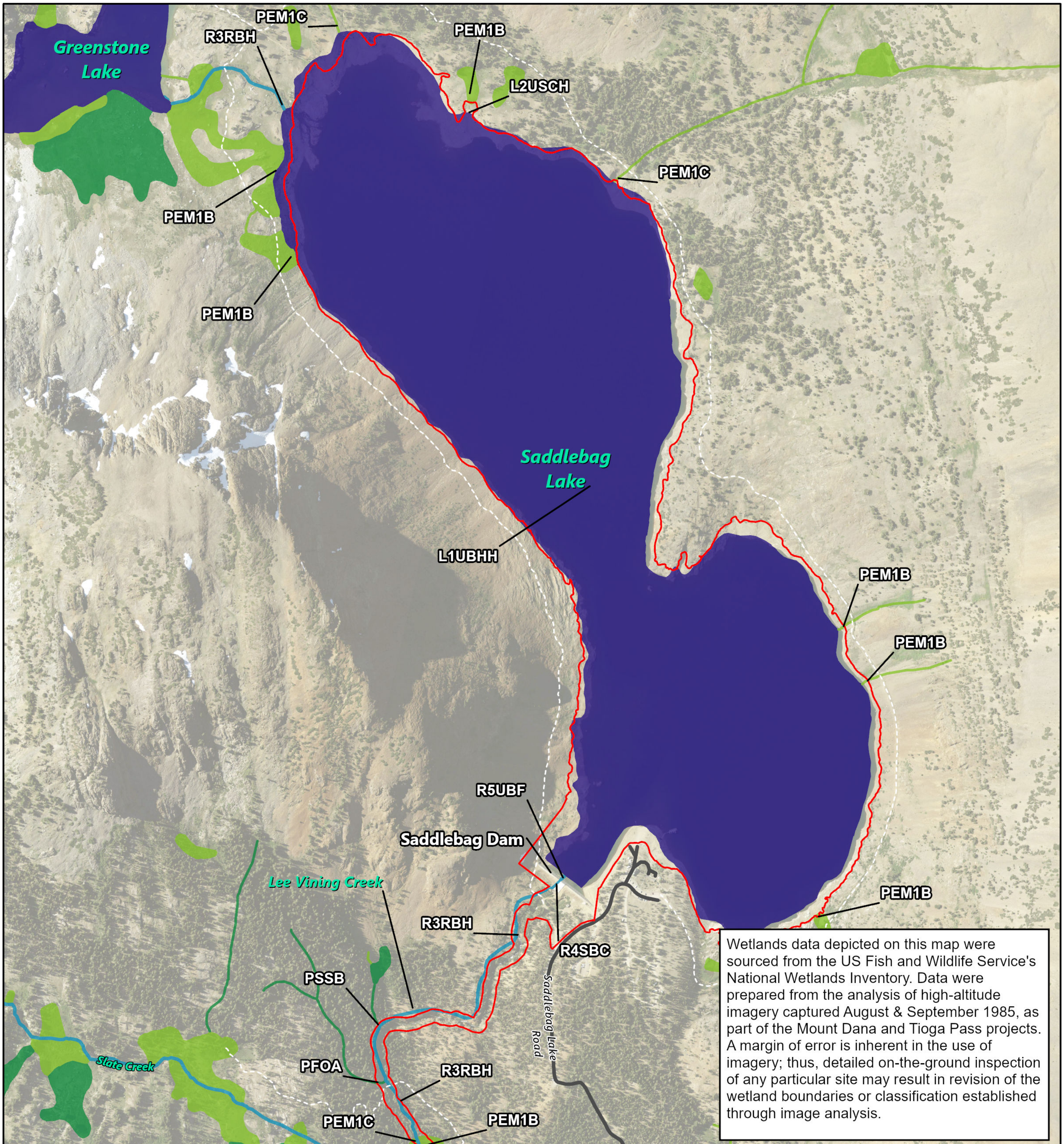
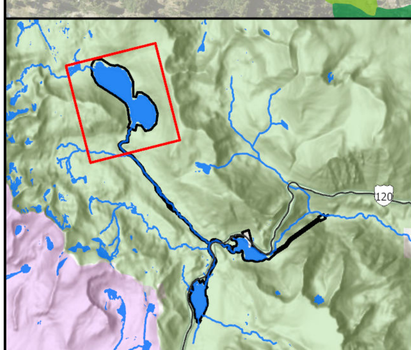
FERC (Federal Energy Regulatory Commission). 1992. *Final Environmental Assessment for Hydropower License*. Lee Vining FERC Project No. 1388-001. California. Federal Energy Regulatory Commission, Office of Hydropower Licensing, Washington, D.C. December 30.

Groves Energy Company. 1984. *Supplemental information, Keating Leggett Project No. 3272-002-California*. Sacramento, California, January 31, 1984.

APPENDIX E.4
NATIONAL WETLANDS INVENTORY MAPBOOK



Wetlands data depicted on this map were sourced from the US Fish and Wildlife Service's National Wetlands Inventory. Data were prepared from the analysis of high-altitude imagery captured August & September 1985, as part of the Mount Dana and Tioga Pass projects. A margin of error is inherent in the use of imagery; thus, detailed on-the-ground inspection of any particular site may result in revision of the wetland boundaries or classification established through image analysis.



FERC Project Boundary (P-1388)

NWI Wetland Type

- Freshwater Emergent Wetland
- Freshwater Forested/Shrub Wetland
- Lake
- Riverine

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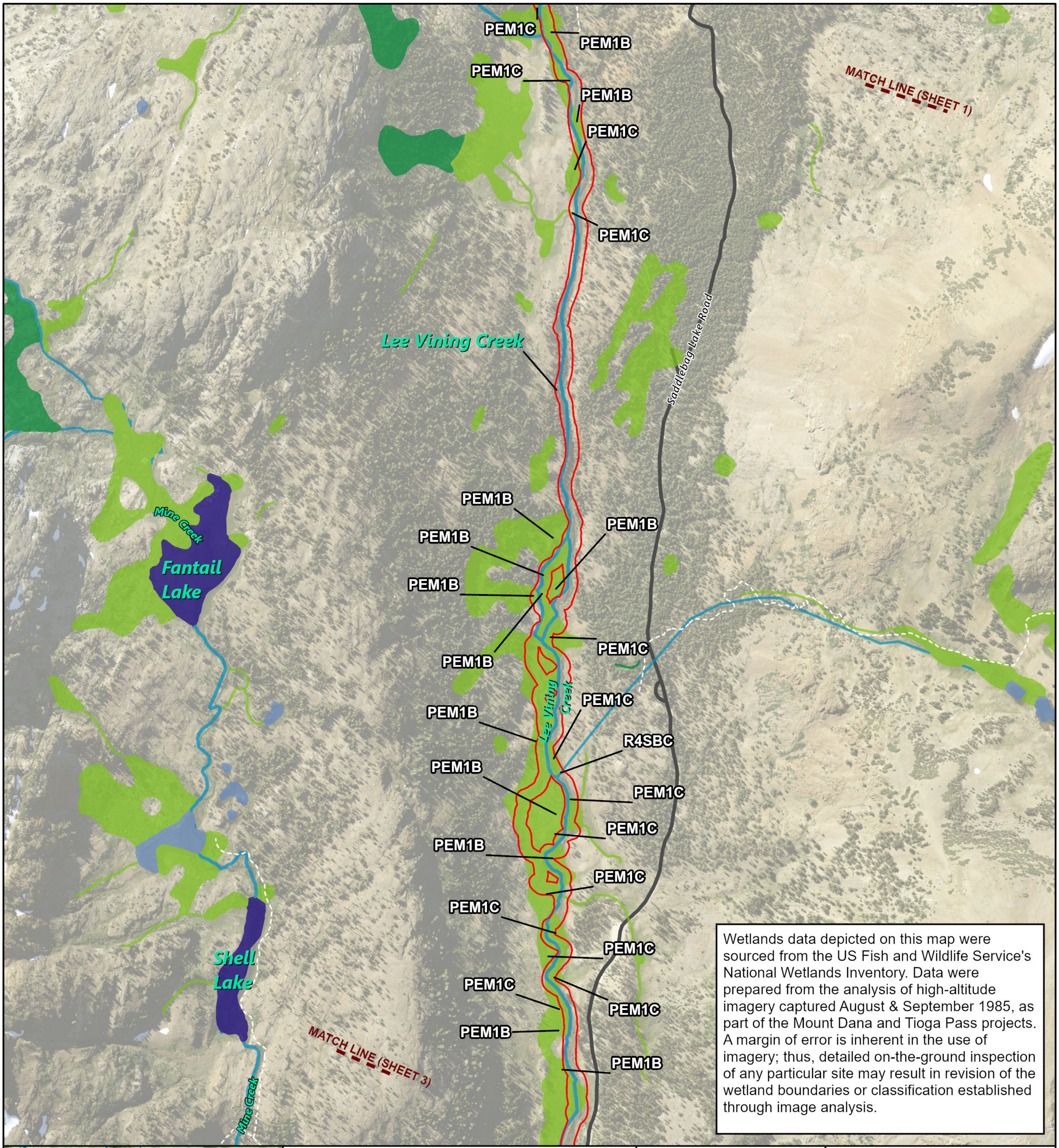
Coordinate System: NAD 1983 StatePlane California III FIPS 0403 Feet
Projection: Lambert Conformal Conic
Datum: North American 1983

0 500 1,000 Feet

National Wetlands Inventory Mapbook

Sheet 1 of 4

LEE VINING HYDROELECTRIC PROJECT
FERC PROJECT NO. 1388



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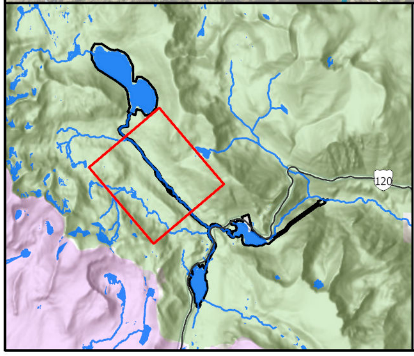

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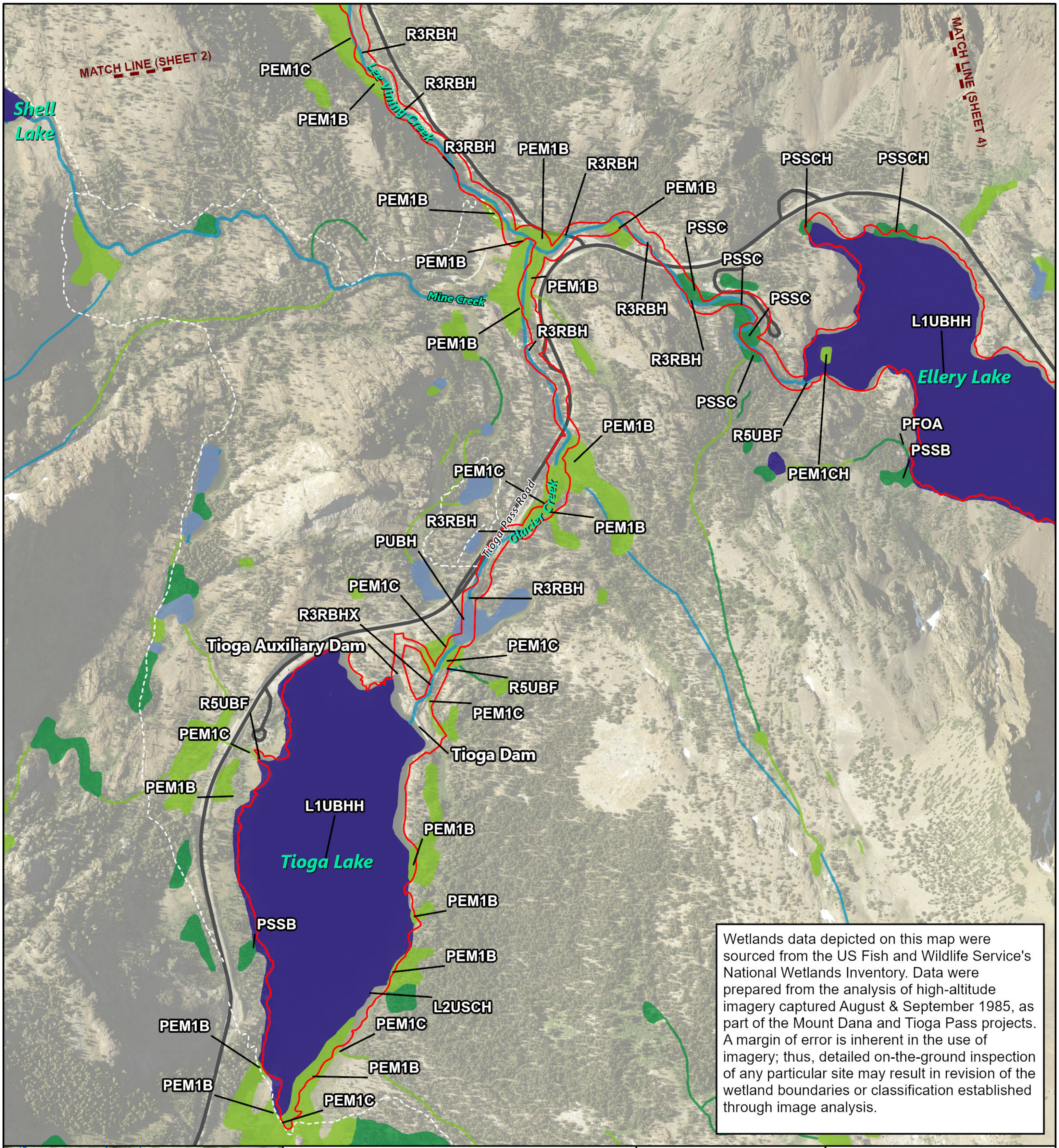
FERC PROJECT NO. 1388



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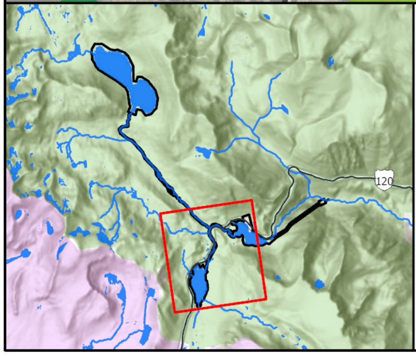

FERC Project Boundary (P-1388)

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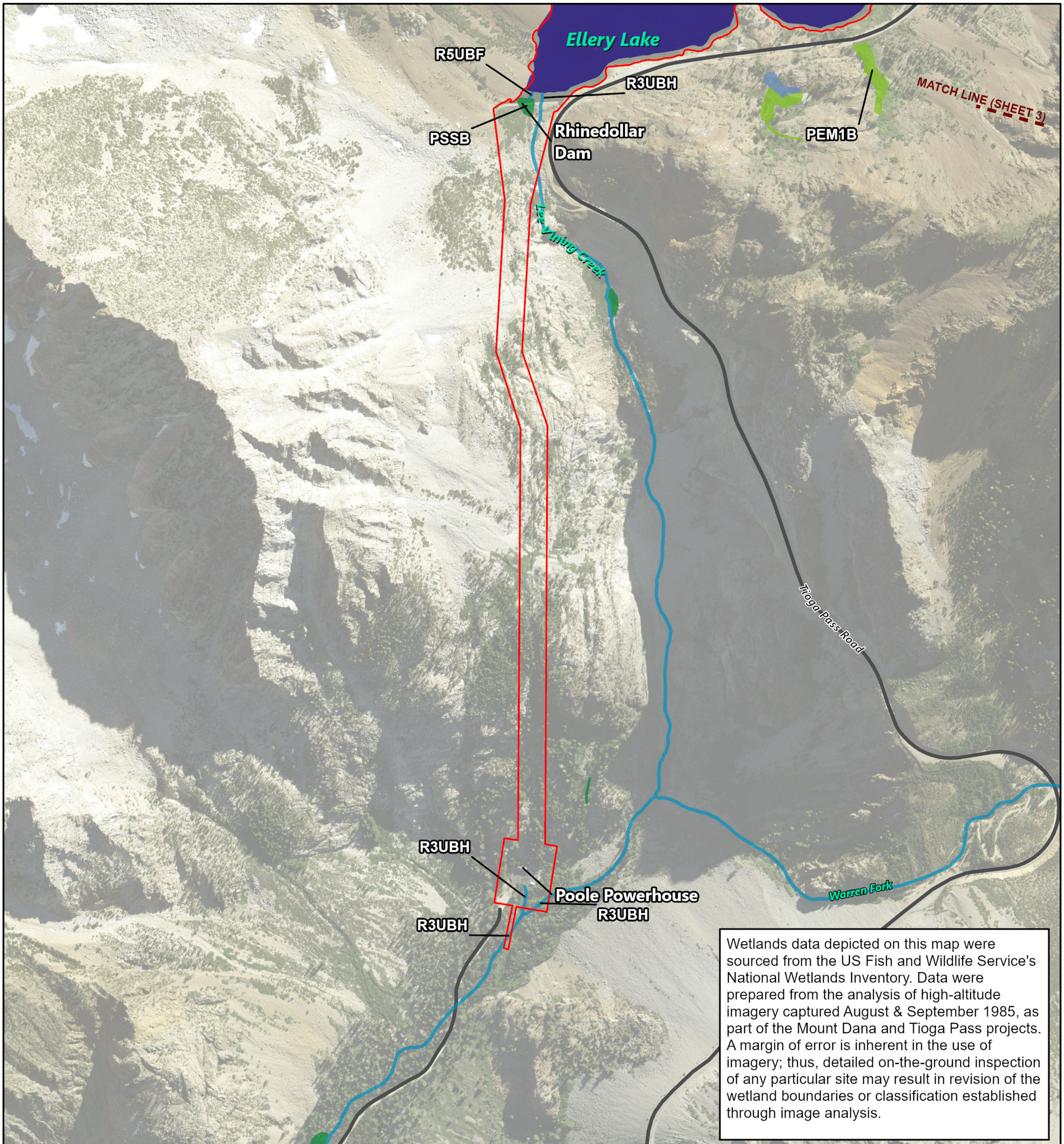
Sheet 3 of 4

LEE VINING HYDROELECTRIC PROJECT FERC PROJECT NO. 1388



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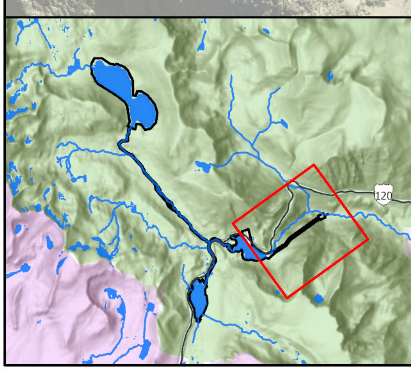

FERC Project Boundary (P-1388)

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National Wetlands Inventory Mapbook

Sheet 4 of 4

LEE VINING HYDROELECTRIC PROJECT
FERC PROJECT NO. 1388

APPENDIX E.5
WADING SUITABILITY MEMORANDUM

MEMORANDUM

To:	Southern California Edison, Matthew Woodhall – Project Manager
From:	Kleinschmidt Associates, Shannon Luoma – Project Manager
Cc:	SCE, Martin Ostendorf; KA, Finlay Anderson
Date:	January 28, 2025
Re:	Wading Suitability Relationship

1.0 WADING SUITABILITY RELATIONSHIP

During Stakeholder review of the technical reports and development of the Draft License Application, questions about Southern California Edison's (SCE's) Hydro-resource Optimization and potential impacts on recreation safety downstream of the Lee Vining Hydroelectric Project (Project) Poole Powerhouse were raised. Hydro-resource Optimization has been used at the Project since 2015 in compliance with the existing license. Since that time, no instream safety issues or concerns have been observed or reported related to Hydro-resource Optimization.

No standardized methodology for evaluating instream safety exists; however, for the purposes of this memo, two known methods are used to conduct the analysis: *Flow Requirements for Recreation and Wildlife in New Zealand Rivers – A Review* (Mosley, 1983) and *Field Manual for the Collection of Water-Quality Data* (USGS, 1997). Pedestrian wading, crossing, and swimming safety in streams are dependent upon the depth, velocity, substrate material, water temperature, air temperature, weather, pedestrian age and ability, as well as other environmental and individual concerns. The relationship between water velocity, depth, and wading suitability is discussed in *Flow Requirements for Recreation and Wildlife in New Zealand Rivers – A Review* (Mosley, 1983). The report shows easy/moderate and difficult wading conditions as a plot of depth versus velocity. These relationships can be used to assess the safety questions raised here.

Kleinschmidt Associates used the hydraulic model developed for Lower Lee Vining Creek as part of the Operations Model (AQ-5) Study to understand wading suitability for recreation downstream of Poole Powerhouse. Any results presented here should not be used as a guarantee of safety in Lower Lee Vining Creek, regardless of how Hydro-Resource optimization operations may be implemented at Poole Powerhouse.

The one-dimensional hydraulic model developed as part of the AQ-5 Study spans from below Poole Powerhouse to the waterfall near Big Bend Campground, approximately

4,200 feet downstream. The model was run at a steady state for a range of flows from the minimum flow of 27 cubic feet per second (cfs) to 200 cfs (0.5 percent exceedance), including the maximum powerhouse hydraulic capacity of 110 cfs. Note that 200 cfs flows are typically only present in spring run-off events, when Rhinedollar Dam is also spilling and when recreationists are less likely to be present in the creek due to higher flows and cold water temperatures from snowmelt. These flows were selected to represent some spill conditions but not flood conditions. The selected flows and the respective exceedance probabilities are listed in Table 1.

Table 1 Modeled Flows and Percent Annual Exceedance

Flow (cfs)	% Annual Exceedance
27	47.6%
40	29.6%
50	19.2%
60	13.9%
70	9.8%
80	8.0%
90	6.4%
105	4.7%
110 [a]	4.3%
150	1.5%
200	0.5%

[a] Maximum Poole Powerhouse hydraulic capacity

The results of velocity and depth for each flow at the five cross sections show in Figure 1 were plotted on the Mosley (1983) curve to evaluate wading suitability at each cross section at various flows, as shown in Figure 2.

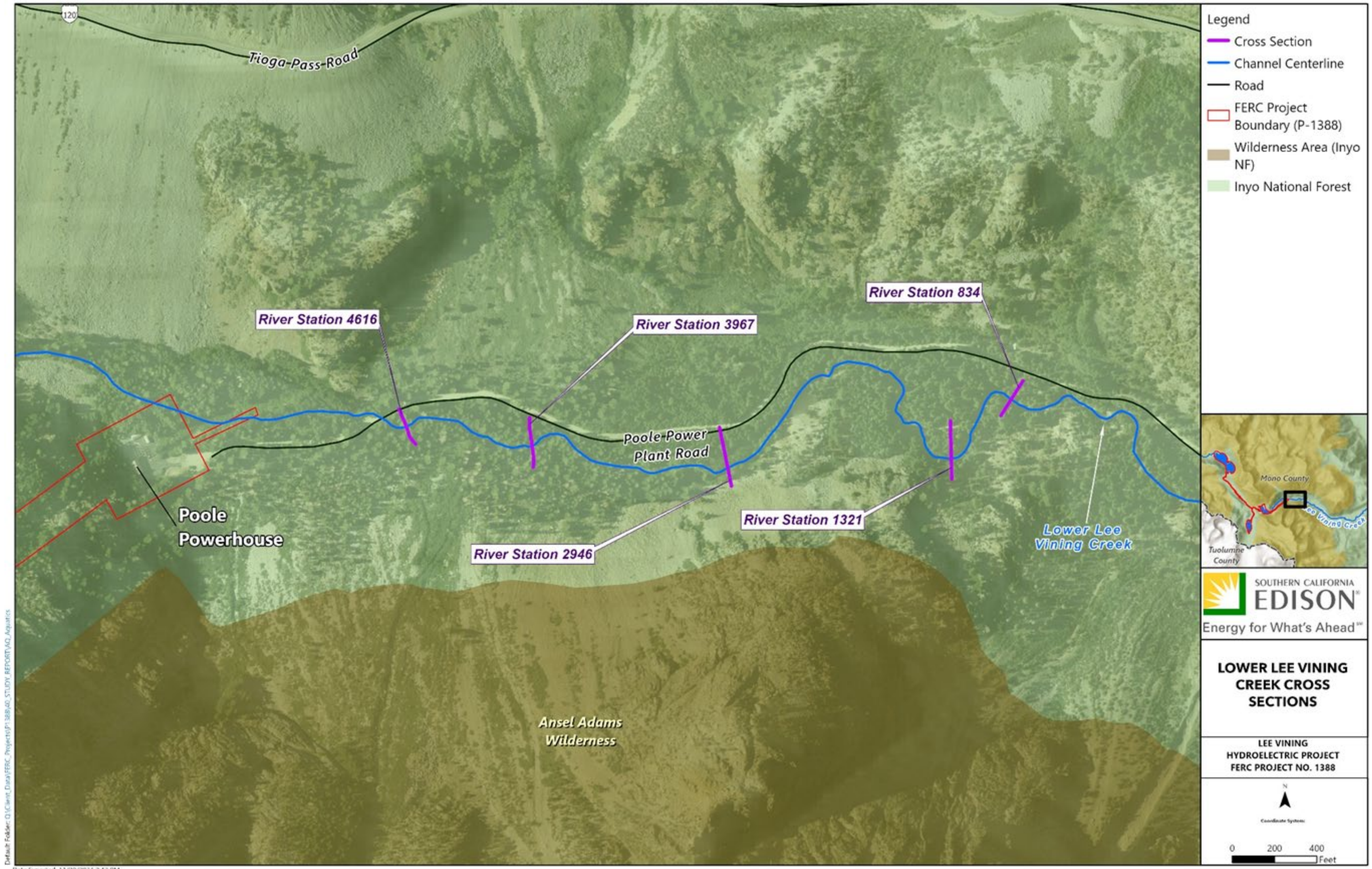
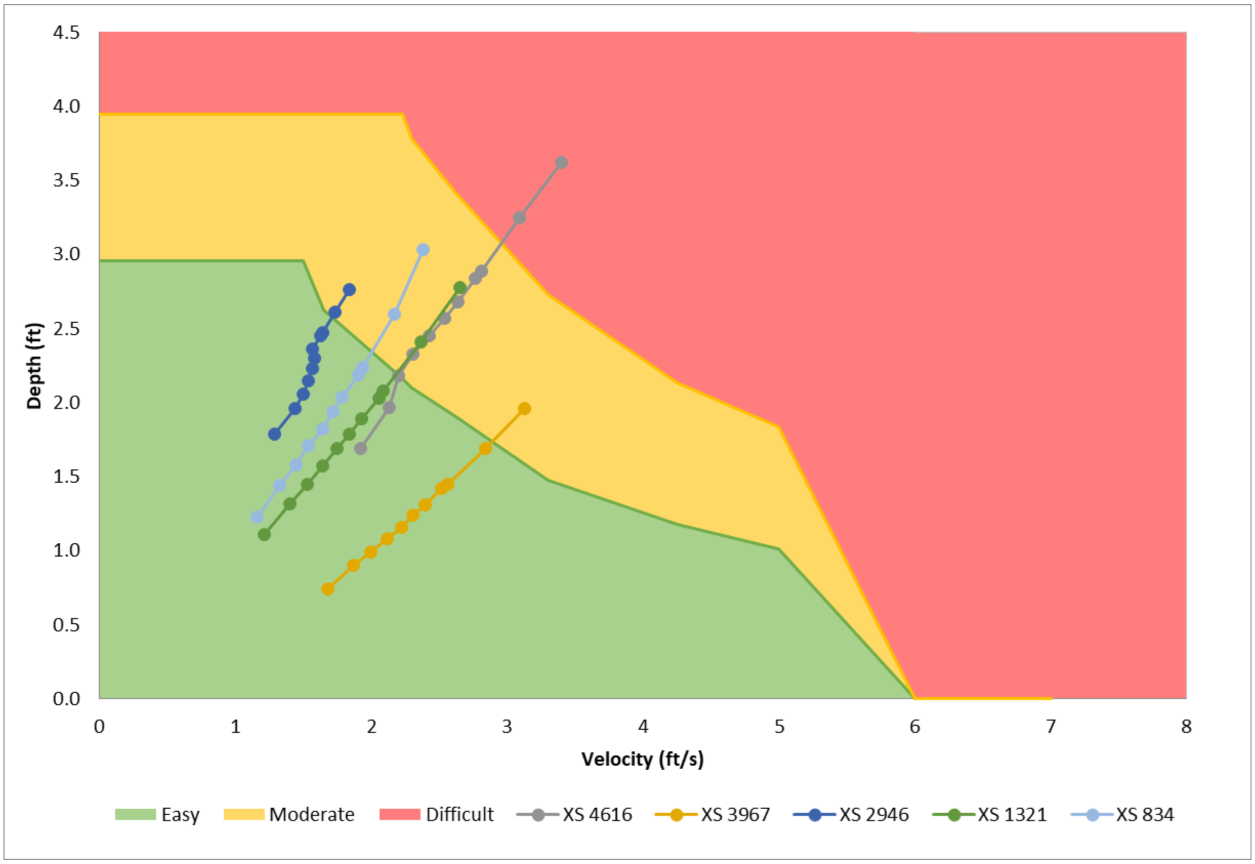


Figure 1 Selected Cross Sections on Lower Lee Vining Creek



Note: For each cross section (as indicated with an "XS" in the legend), flows increase from the bottom left to the top right. Each marker/dot on each line represents one modeled flow.

Figure 2 Wading Suitability Relationship at Various Flows at Five Cross Sections in Lower Lee Vining Creek

The results in Figure 2 indicate that the upstream-most cross section (XS 4616) shows the wading suitability changes from "easy" to "moderate" as the flows increase within the powerhouse capacity. For higher flows when spill is occurring—in any flows above 110 cfs, we assume spill is occurring—the upstream-most cross section shows conditions deteriorating to "difficult." All other cross sections show wading suitability in the "easy" category at all flows up to the maximum powerhouse capacity, but spill flows may cause "moderate" conditions in the creek. This indicates that instream wading may be more difficult closer to Poole Powerhouse during Hydro-resource Optimization events.

In addition to the Mosley (1983) curve above, modeled depth and velocity data were also compared to the U.S. Geological Survey (USGS) guidelines on safety in field activities. The guidelines suggests that wading in a stream where the depth values multiplied by the velocity values equals or exceeds 10 square feet per second (ft^2/s) is unsafe (USGS, 1997). Although this is a recommendation for field work, it provides additional context for the values reported herein. The maximum modeled depth multiplied by the velocity value in lower Lee Vining Creek is 8.1 ft^2/s at the upstream cross section for 110 cfs flow, which is less than the unsafe value identified by the USGS. However, at 200 cfs, the upstream cross section shows a depth times velocity value of 12.3 ft^2/s, which does not meet the USGS safety criteria. Table 2 shows the maximum depth times velocity values for each cross section. For clarity, cells have been highlighted with the corresponding easy-moderate-difficult color categories from Figure 2, although the USGS guidelines vary slightly from the Mosley (1983) curve.

Table 2 Depth * Velocity Values (ft^2/s) by Cross Section

Flow (cfs)	XS 4616	XS 3967	XS 2946	XS 1321	XS 834
27	3.2	1.2	2.3	1.3	1.4
40	4.2	1.7	2.8	1.8	1.9
50	4.8	2.0	3.1	2.2	2.3
60	5.4	2.3	3.3	2.6	2.6
70	6.0	2.6	3.5	3.0	3.0
80	6.5	2.9	3.6	3.3	3.3
90	7.1	3.1	3.7	3.6	3.7
105	7.9	3.6	4.0	4.2	4.2
110 [a]	8.1	3.7	4.1	4.3	4.3
150	10.0	4.8	4.5	5.7	5.6
200	12.3	6.1	5.1	7.4	7.2

[a] Maximum Poole Powerhouse hydraulic capacity

The one-dimensional Hydrologic Engineering Center River Analysis System (HEC-RAS) model produces a depth- and cross section-averaged velocity. Localized velocities and depths across the cross sections may vary, potentially affecting the results presented in this analysis. Additionally, changes in operations, channel geomorphology, vegetation, or other factors may impact pedestrian safety in lower Lee Vining Creek.

In conclusion, Hydro-resource Optimization has been used at the Project since 2015, and no instream safety issues or concerns have been observed related to Project operations. Results of this wading suitability analysis indicate that suitable wading conditions are common throughout most of lower Lee Vining Creek, even during Hydro-resource Optimization events, dependent upon individual conditions discussed above. Wading may become more difficult closer to Poole Powerhouse during Hydro-resource Optimization events. Based on this analysis, wading in the creek only reaches “difficult” levels when both Hydro-resource Optimization and spill events are occurring simultaneously, which happens less than 5 percent of the year. Poole Powerhouse’s hydraulic capacity is 110 cfs, and flows in lower Lee Vining Creek on average exceed 110 cfs only 4.3 percent of the year. Flows in lower Lee Vining Creek do occasionally meet or exceed 200 cfs, typically during spring run-off/snowmelt conditions. During flows of

200 cfs or greater, wading would not be considered safe by USGS field guidelines at the cross section closest to Poole Powerhouse.

Recreators in and adjacent to waterbodies should always be cautious, particularly when they are downstream of a dam.

2.0 REFERENCES

Mosley, M.P. 1983. “Flow Requirements for Recreation and Wildlife in New Zealand Rivers – A Review.” *Journal of Hydrology* (*New Zealand*) 22(2): 152–174.

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