

FINDING OF EMERGENCY

Executive Summary

The Sacramento-San Joaquin Delta (Bay-Delta) watershed, California, and the entire western United States are experiencing a significant drought in the wake of one of the driest periods on record, driven by climate change and extreme dry hydrologic conditions over the past three years. Water supply in many parts of California, including the Mill Creek and Deer Creek watersheds, is insufficient to meet a significant portion of water demands, including ecological needs. Addressing the severe water shortage in the Mill Creek and Deer Creek watersheds requires continued urgent action to ensure water supplies are and will remain available to meet minimum instream flows for fish and to prevent the inefficient irrigation of domestic lawns.

Mill Creek and Deer Creek are tributaries to the Sacramento River located in Tehama County that support multiple self-sustaining natural populations of anadromous salmonids. These watersheds have been identified as high-priority tributaries for the protection and recovery of wild populations of Central Valley spring-run Chinook salmon (CV SR salmon) which are listed as threatened under the federal Endangered Species Act (ESA) and the California ESA, and California Central Valley steelhead (CCV steelhead) which are listed as threatened under the federal ESA. The National Marine Fisheries Service (NMFS) and California Department of Fish and Wildlife (CDFW) have recognized that protecting and restoring these populations as significant to the recovery of these threatened species. As a result of low precipitation for the third straight year, hydrologic conditions are very dry in the Sacramento Valley and continued immediate action is needed to protect threatened fish species in Mill and Deer creeks.

The State Water Resources Control Board (State Water Board) finds that an emergency exists due to severe drought conditions. Continued action is needed to prevent the unreasonable use of water diverted from priority water bodies that provide habitat for threatened and endangered species in light of limited water availability during the drought. The State Water Board will need to continue to curtail water diversions in order of water right priority, except to the extent water is needed for minimum human health and safety needs, when natural flows decrease so that water is available to provide minimum flows for migration of state and federally listed fish in the two Sacramento River tributaries, Mill Creek and Deer Creek. The proposed amendment to the drought emergency regulation as adopted in September 2021 allows the Deputy Director of the State Water Board's Division of Water Rights (Division) to approve a petition for limited diversions to provide water for livestock survival during a scheduled pulse flow if no other water is available (stockponds, groundwater wells, hauled water). Local cooperative solutions or voluntary agreements that provide equivalent protection for sensitive fisheries may be implemented as an alternative to implementing the proposed

emergency regulation upon readoption. Additionally, it is necessary to prohibit an existing practice of excessive water application for lawn irrigation due to water needs for other economic and ecological uses in this severe drought.

This document makes findings and provides evidence of the continued emergency drought conditions in the Mill Creek and Deer Creek watersheds, the State Water Board's response to the drought conditions in these watersheds (including outreach on voluntary efforts and on the proposed regulation), and the status of CV SR salmon and CCV steelhead. It further makes findings and provides evidence regarding the need for readopting the emergency regulation, which includes an overview of the water rights framework, the need for emergency protective minimum fishery flows, descriptions of the watersheds, provision for limited stockwater diversions during pulse flow events, and need to limit inefficient water uses during current drought conditions. The document's informative digest section summarizes existing laws and regulations and provides a policy overview and discussion of the effect of the regulation proposed for readoption. The document concludes with a list of information relied upon, statements on California Environmental Quality Act (CEQA) exemption, and a summary of fiscal costs. The Fiscal Impact Statement is included as Attachment 1.

As such, the document meets the requirements for a digest described in Government Code section 11346.5, subdivision (a)(3).

Governor Newsom's Drought Emergency Proclamations

On April 21, 2021, Governor Gavin Newsom declared a drought state of emergency under the provisions of the California Emergency Services Act (Gov. Code, section 8550 et. seq.), in Mendocino and Sonoma counties due to drought conditions in the Russian River watershed ([April 2021 Proclamation](#)). The April 21, 2021 proclamation directs state agencies to take immediate actions to bolster drought resilience across the state.

On May 10, 2021, Governor Newsom expanded the drought proclamation to include counties within the Klamath River, Sacramento-San Joaquin Delta (Delta watershed), and Tulare Lake watersheds ([May 2021 Proclamation](#)). To ensure critical instream flows for species protection in the Klamath River and Sacramento-San Joaquin Delta Watersheds (Delta), the May 2021 Proclamation directs the State Water Board and the California Department of Fish and Wildlife (CDFW) to evaluate the minimum instream flows and other actions needed to protect salmon, steelhead, and other native fishes in critical stream systems in the State and to work with water users and other parties on voluntary measures to implement those actions. To the extent voluntary actions are not sufficient, the Proclamation directs the State Water Board, in coordination with CDFW, to consider emergency regulations to establish minimum drought instream flows. The May 2021 Proclamation also directs the State Water Board to consider emergency

regulations to curtail water diversions when water is not available at water right holders' priority of right or to protect releases of stored water in the Delta watershed. For purposes of approving these emergency regulations, the May 2021 Proclamation suspends CEQA (Pub. Resources Code, § 21000 et seq.) (CEQA).

On July 8, 2021, Governor Newsom further expanded the emergency proclamation to include nine additional counties (Inyo, Marin, Mono, Monterey, San Luis Obispo, San Mateo, Santa Barbara, Santa Clara, and Santa Cruz) ([July 2021 Proclamation](#)), putting a total of 50 of the state's 58 counties under a drought state of emergency. Governor Newsom also signed Executive Order N-08-21 on July 8, 2021, urging all Californians to voluntarily reduce their water use by 15 percent compared to 2020 levels ([July 2021 Executive Order](#)). The July 2021 Executive Order encourages Californians to take actions to conserve water, such as irrigating landscapes more efficiently, fixing leaks, and installing water-efficient showerheads. The July 2021 Executive Order also directs the State Water Board to monitor progress on voluntary conservation in the coming months.

On October 19, 2021, Governor Newsom expanded the emergency proclamation statewide, including eight counties not previously included (Imperial, Los Angeles, Orange, Riverside, San Bernadino, San Diego, San Francisco and Ventura) ([October 2021 Proclamation](#)), making the drought state of emergency in effect statewide. The October 2021 proclamation required additional drought emergency planning measures for local water supply agencies.

On March 28, 2022, Governor Newsom issued Executive Order [N-7-22](#), following the driest three-month period (January-March) to begin a year in the State's recorded history. The order affirmed the continued state of drought emergency for California, affirmed and extended authorities under prior drought proclamations, and required additional actions regarding drinking water supplies and water reliability, as well as groundwater recharge projects.

On September 22, 2021, the State Water Board [adopted a drought emergency regulation](#) on Mill Creek and Deer Creek that went into effect on October 4, 2021, when it was approved by the Office of Administrative Law and filed with the Secretary of State ([Cal. Code Regs., tit. 23, §§ 876.5-879](#)). The drought emergency regulation sets and protects minimum instream flows, provides exceptions to curtailment for minimum human health and safety needs, and limits inefficient lawn monitoring. On October 11, 2021, the State Water Board issued curtailment orders in the [Mill Creek](#) and [Deer Creek](#) watersheds to protect minimum instream flows for threatened fish.

The current drought emergency regulation is set to expire in October 2022. However, due to ongoing drought conditions, the State Water Board is proposing to make minor amendments and extend the emergency regulation one additional year. The proposed

drought emergency regulation with amendments will be considered by the State Water Board at its August 16, 2022 meeting.

Emergency Defined

Water Code section 1058.5 grants the State Water Board the authority to adopt emergency regulations in certain drought years in order to: “prevent the waste, unreasonable use, unreasonable method of use, or unreasonable method of diversion, of water, to promote water recycling or water conservation, to require curtailment of diversions when water is not available under the diverter’s priority of right, or in furtherance of any of the foregoing, to require reporting of diversion or use or the preparation of monitoring reports.” Section 1058.5 applies to regulations “adopted in response to conditions which exist, or are threatened, in a critically dry year immediately preceded by two or more consecutive below normal, dry, or critically dry years or during a period for which the Governor has issued a proclamation of a state of emergency under the California Emergency Services Act (Chapter 7 (commencing with Section 8550) of Division 1 of Title 2 of the Government Code) based on drought conditions.” As described above, the May 2021 Proclamation declared a state of emergency covering the Sacramento-San Joaquin Delta watershed based on drought conditions.

Emergency regulations adopted under Water Code section 1058.5 remain in effect for up to one year and may be renewed if the Board finds that drought conditions as defined remain in effect. Section 1058.5, subdivision (b) provides that, notwithstanding Government Code sections 11346.1 and 11349.6, the Board’s finding of emergency in connection with an emergency regulation promulgated under section 1058.5 is not subject to review by the Office of Administrative Law (OAL).

Government Code section 11346.1, subdivision (a)(2), requires that, at least five working days prior to submission of the proposed emergency action to OAL, the adopting agency provide a notice of the proposed emergency action to every person who has filed a request for notice of regulatory action with the agency. After submission of the proposed emergency to OAL, OAL must allow interested persons five calendar days to submit comments on the proposed emergency regulations as set forth in Government Code section 11349.6.

The information contained within this finding of emergency provides information to support the State Water Board’s emergency rulemaking under Water Code section 1058.5 and also meets the applicable requirements of Government Code sections 11346.1 and 11346.5.

Evidence of Emergency

As of July 19, 2022, after three consecutive years of low precipitation, the United States Drought Monitor reports that 97 percent of California is experiencing severe drought, with 60 percent of California experiencing extreme drought (USDM, 2022). Within the Delta watershed, conditions have been extraordinarily dry, with a third year in a row of

dry conditions leading to depleted reservoirs and dry soils. Despite large storms in October and December 2021 and late spring storms in 2022, precipitation patterns for water year 2022 remained well below normal, resulting in the driest January through April period on record based on precipitation (NOAA 2022). As of July 2022, cumulative precipitation for Water Year 2022 was approximately 79 percent of average across the Northern Sierra watershed (41.2 inches) (DWR, 2022a). Although Water Year 2022 has had higher levels of precipitation in some parts of the state than Water Year 2021, it has not been adequate to alleviate drought conditions throughout the state.

In most years, California receives about half of its precipitation in the months of December, January, and February, with much of that precipitation falling as snow in the Sierra Nevada mountains. A handful of large winter storms can make the difference between a wet year and a dry one. In normal years, the snowpack stores water during the winter months and releases it through melting in the spring and summer to replenish rivers and reservoirs. Despite significant storm events in October and December 2021, 2022 had the driest January through March period on record. This year's snowpack was the 5th smallest snowpack on record dating back to 1950. The statewide snowpack was 10.2 inches on April 1, which was 37% of the April 1 average based on the automated snow sensor network. This April's water supply forecast, which incorporates this data, indicated a third continuous year of drought conditions. In 2022, the Northern Sierra Snowpack peaked in January, a full three months early (DWR, 2022b).

The proclamations Governor Newsom has issued declaring a drought emergency accelerated the state's drought response. The May 2021 Proclamation recognizes, among other things, that changes to water supplies and diversions might be necessary to protect salmon and steelhead, to maintain water supplies, and protect water quality. Additionally, the May 2021 Proclamation directs the State Water Board to adopt and available in the Sacramento-San Joaquin Delta Watershed, which includes the Mill Creek and Deer Creek Watersheds.

The extremely low precipitation conditions in the watershed combined with diversions in Mill Creek and Deer Creek have resulted in adverse instream habitat conditions for threatened salmonid species during the spring of 2021. For example, during May 2021 in Deer Creek and during June 2021 in Mill Creek, instream flows dropped below the critical bare minimum flow levels (50 cfs) that the National Marine Fisheries Service (NMFS) and CDFW identified as necessary for adult salmonid migration. In response to drought conditions in 2021, the State Water Board adopted an emergency regulation for the curtailment of diversions in the Delta Watershed in August 2021. Recognizing the impact of the continued drought on sensitive fisheries, NMFS and CDFW recommended that State Water Board also adopt an emergency regulation in 2021 (NMFS, 2021a; CDFW, 2021a) to provide minimum instream flows for CV SR salmon and California CCV steelhead on Mill and Deer creeks. Pursuant to this request, the State Water

Board adopted emergency regulation for Mill and Deer creeks in September 2021. The emergency regulation went into effect on October 4, 2021, when it was approved by the Office of Administrative Law and filed with the Secretary of State (Cal. Code Regs., tit. 23, §§ 876.5–879). The continuation of extremely dry conditions in 2022, combined with a minimal snowpack has extended these current drought conditions on Mill and Deer creeks and the State Water Board proposes to readopt the emergency regulation with the proposed amendments.

Due to ongoing drought conditions, the State Water Board re-adopted the emergency regulation for the curtailment of diversions for the Delta Watershed in July, 2022. Additionally, in April and June of 2022, CDFW and NMFS, respectively, recommended the State Water Board readopt the 2021 drought emergency regulation for Mill and Deer creeks to ensure that bare minimum instream flow levels are provided to allow for salmon migration during this drought emergency (CDFW 2022c, NMFS 2022).

As recognized in Water Code section 106.3, access to water for human consumption, cooking and sanitation is a basic human right. Cities, counties, and water districts across the state have enacted drought emergency measures to conserve supplies. Fire risk is also greatly increased throughout the state due to the drought. Preliminary data from the California Department of Forestry and Fire Protection show that over 9,900 fires burned in California in 2020, which is roughly 40 percent more fires than the five-year average (CAL FIRE, 2021). The 2021 fire season was also severe with a total of 8,835 fires that burned over 2,500,000 acres, which was 158 percent more than the 5-year average (CAL FIRE 2022).

Need for the Regulation

Immediate action is needed to prevent the unreasonable use of water due to limited water availability during the drought. The State Water Board will need to curtail water diversions when natural flows decrease so that water is available for: (1) minimum flows for migration of state and federally listed fish in priority water bodies; (2) minimum health and safety needs; and (3) senior water right users. Protection of these critical needs also necessitates action to prevent unreasonable excessive lawn irrigation practices during the current water shortage emergency.

Water Rights Framework

In order to best understand the need for the regulation and how it will be applied, a very generalized overview of water rights is provided below. Two main types of water rights constitute the vast majority of diversions in California: riparian rights and appropriative rights. A riparian water right generally provides a right to use the natural flow of a water body to which the land is riparian. Broadly speaking, riparian land is land that touches a lake, river, stream, or creek. Water can only be diverted under a riparian right when that water is used on the riparian parcel on land that drains back to the lake, river, stream, or

creek from which the water was taken. Riparian rights remain with the property when it changes hands, although parcels severed from the adjacent water source generally lose their right to the water. Only the natural flow of water can be diverted under a riparian right. Water that is imported into a watershed from another river, stream, or creek cannot be used under a riparian right. Water cannot be stored during a wet time for use during a drier time under a riparian right. Neither can water released from an upstream storage reservoir be used by a downstream user under a riparian right. Riparian rights generally have a senior (higher relative priority) right to natural flows as against appropriative rights, and water generally must be available to fulfill the needs of all riparian water right holders before an appropriator may divert. This is not always the case, however. An appropriative right predating the patent date of riparian lands has seniority relative to the riparian right. The priorities of riparian right holders are correlative vis-à-vis each other; during a drought all share the shortage proportionally. Because a riparian right only allows the use of natural flow, it is possible to have water available under a riparian right during wetter years or months and not during drier years or months when natural flows are no longer available, including cases where stream flow is being supported by releases of previously stored water. This is particularly the case in dry years such as the current drought.

On the other hand, an appropriative water right is generally needed for water that is diverted for use on non-riparian land or to store water for use when it would not be available under natural conditions. An appropriative right holder can use natural flows, and non-natural flows like imported water from other watersheds, or irrigation return flows. Prior to 1914, appropriative water rights were acquired by putting water to beneficial use. The exact priority date of a pre-1914 appropriation can vary depending on circumstance, but depends on either posting notice under the then applicable procedures of the Civil Code, clearly initiating the means necessary to divert, or actually diverting. An appropriative water right that was acquired before 1914 is called a pre-1914 appropriative water right and is not subject to the permitting authority of the State Water Board. Appropriative water rights obtained after 1914 require a water right permit and subsequently a license issued by the State Water Board or its predecessors. Similar to pre-1914 water rights, the seniority of post-1914 appropriative water rights are based on a first-in-time concept with the date of seniority typically established by the date of the application for the permit. A water right permit confers the State Water Boards (or its predecessor's) authorization to develop a water diversion and use project. The right to use water is obtained through actual beneficial use of water within the limits described in the permit. A water right license is issued once full beneficial use of water has been made and other conditions of a water right permit are met and constitutes the confirmation by the State Water Board (or its predecessor) of the water right. As between appropriators, junior water right holders may only divert where there is sufficient water to completely fulfill the needs of more senior appropriators.

When the amount of water available in a surface water source is not sufficient to support the needs of existing water right holders, junior appropriators must cease diversion in favor of more senior rights. However, it is not always clear to a junior diverter whether there is sufficient flow in the system to support their diversion and senior water uses downstream. It can also be difficult to determine whether releases of stored water are abandoned flows that may be diverted or whether those flows are not available for diversion because they are being released for downstream purposes. Similarly, it can be difficult for a riparian to know if water is natural flow or stored or imported water and whether, when and to what extent correlative reductions in water use are needed due to the need to share limited supplies amongst riparians. As part of administrating water rights, the State Water Board may curtail water diversions based on California's water rights priority system.

The State Water Board has continuing authority under Water Code sections 100 and 275 to enforce the requirements of the California Constitution, Article X, § 2, which directs that the water resources of the state be put to beneficial use to the fullest extent, and that water not be wasted or unreasonably used. It further provides that rights to the use of water are limited to such water as is reasonably required for the beneficial use served, and does not extend to the waste, unreasonable use, unreasonable method of use, or unreasonable method of diversion of the water.

The reasonable use doctrine expressed in California Constitution Article X, section 2 applies to the diversion and use of both surface water and groundwater, and it applies irrespective of the type of water right held by the diverter or user. (*Peabody v. Vallejo* (1935) 2 Cal.2d 351, 366-367.) What constitutes an unreasonable use, method of use, or method of diversion depends on the facts and circumstances of each case. (*People ex rel. State Water Resources Control Board v. Forni* (1976) 54 Cal.App.3d 743, 750.) Under the reasonable use doctrine, water right holders may be required to endure some inconvenience or to incur reasonable expenses. (*Id.* at pp. 751-752.) In applying the reasonable use doctrine, the Board must consider the demands of both instream uses (such as fisheries habitat, navigation, and recreation) and off-stream uses (such as irrigation, domestic use, and commercial use). (*National Audubon Society v. Superior Court* (1983), 22. Cal.3d 419, 443-444.) The State Water Board may determine particular uses are not reasonable by regulation, including by exercising the emergency authority under Water Code section 1058.5 to adopt minimum drought emergency flows to protect critical fisheries or for meeting minimum human health and safety needs, and to establish that diversions for other uses that interfere with meeting such flows or needs are unreasonable. (*Stanford Vina Ranch Irrigation. Co v. State of California* (2020) 50 Cal.App.5th 976)

Diverting water when it is unavailable under a right holder's priority of right constitutes an unauthorized diversion and a trespass against the state. Violations could be subject

to an Administrative Civil Liability (ACL) under the Water Code, or referred to the Attorney General. Administrative cease and desist orders and court injunctions may also be issued to require that diversions stop. An ACL for an unauthorized diversion may impose liability up to \$1,000 a day plus \$2,500 per acre foot of water that is illegally diverted for violations during the current drought. The State Water Board may also issue administrative cease and desist orders and request court injunctions to require that diversions stop.

Need for Emergency Protective Flows in Mill Creek and Deer Creek

In July of 2022, the State Water Board re-adopted an emergency regulation amending and renewing title 23, division 3, chapter 2, article 24 of the California Code of Regulations for the Delta watershed to 1) protect senior diverters, 2) protect releases of previously stored water, 3) ensure continued access to water supplies for minimum human health and safety, and 4) obtain information from water users to implement the regulation. While the Mill Creek and Deer Creek watersheds are within the Delta watershed, the amendments to article 24 do not address the specific fishery needs in Mill Creek and Deer Creek. The Superior Court of Tehama County has adjudicated water rights on both Mill Creek and Deer Creek; however, the adjudications of water rights for both creeks similarly do not account for the protection of fish and wildlife public trust beneficial uses in times of water shortage. As a result, neither the emergency regulation adopted by the Board that apply generally to the Delta watershed nor the adjudications prevent water right holders and claimants from diverting all available water from Mill Creek and Deer Creek, regardless of instream flow needs.

In this particular case, application of the reasonable use doctrine requires consideration of the benefits of diverting water for current uses from the identified water bodies and the potential for harm to the protected species from such diversions under the current drought conditions. The purpose of the regulation proposed for readoption is to protect ESA and CESA -listed species in this extremely dry year in high-priority streams by maintaining minimum streamflow for adult salmonid passage during critical migration periods, providing pulses of flow at times to ensure successful migration, and maintaining minimum streamflow for out-migrating juvenile fish. Without protection of these flows, there are no guarantees that the flows will remain instream and not be diverted, which could have catastrophic consequences for the listed species.

In 2014 and 2015, the State Water Board adopted emergency regulations for curtailment of diversions due to insufficient flow for specific fisheries for Mill, Deer, and Antelope Creeks. The emergency regulations established drought emergency minimum flow requirements for the protection of CCV steelhead and CV SR salmon (OAL, 2014; State Water Board, 2015a). NMFS, in consultation with CDFW, has identified Mill, Deer, and Antelope creeks as priority watersheds for sustaining CV SR salmon and CCV

steelhead. NMFS also identified minimum flows in Mill, Deer, and Antelope creeks below which significant harm to the species would occur. These flows establish a minimum flow needed for passage of migrating fish to and from spawning and rearing grounds in the watersheds above major diversions in the lower watersheds. Drought emergency minimum flow requirements in the 2015 drought emergency regulation for curtailment of diversions due to insufficient flow for specific fisheries were similar to those adopted in 2014, with clarifications and edits made by the Board to the regulation and minor adjustments to the minimum flows and flow periods based on an assessment of the 2014 implementation of the emergency regulation (State Water Board, 2015a).

In 2014, drought emergency minimum instream flow requirements were provided for CV SR salmon and CCV steelhead through voluntary agreements in Mill and Antelope Creeks during May and June 2014 and from October 15 through December 31, 2014. Drought emergency minimum instream flow requirements were required for Deer Creek under the emergency regulation. A curtailment order was issued to Deer Creek diverters on June 5 through June 24, 2014, to provide for the drought emergency minimum instream flow requirements (State Water Board, 2014a). A subsequent curtailment order was issued to Deer Creek diverters on October 14, 2014, which required water right holders and claimants to bypass the required instream flows for CV SR salmon and CCV steelhead from October 15, 2014 through February 28, 2015 (State Water Board, 2014b).

In 2015, drought emergency minimum instream flow requirements were provided for CV SR salmon and CCV steelhead under voluntary agreements in Mill Creek. Drought emergency minimum instream flow requirements were required for Antelope and Deer Creeks under the emergency regulation. A curtailment order was issued to Antelope Creek diverters on April 3, 2015, which required water right holders and claimants to provide for the required instream flows from April 3, 2015 through May 29, 2015 (State Water Board, 2015b, 2015c). A subsequent curtailment order was issued to Antelope Creek diverters on October 31, 2015, which required water right holders and claimants to provide for the required instream flows from November 1, 2015 through December 29, 2015 (State Water Board, 2015d). A curtailment order was likewise issued to Deer Creek diverters on April 17, 2015, which required water right holders and claimants to bypass the required instream flows from April 17 through June 3, 2015 (State Water Board, 2015e, 2015f). A subsequent curtailment order was issued to Deer Creek diverters on October 23, 2015, which required water right holders and claimants to bypass the required instream flows from October 23 through December 29, 2015 (State Water Board, 2015g).

Fish passage data provided by CDFW (2021c) suggests the instream flows provided during the drought emergency in 2014 and 2015 resulted in successful fish passage. The effects of drought emergency flows implemented during 2014 and 2015 on the CV

SR salmon and CCV steelhead passage are discussed in the **Description and Effect of Proposed Regulation**.

In 2021, the State Water Board, in coordination with CDFW and NMFS, held Mill and Deer Creek watershed meetings with stakeholders to discuss possible measures to protect CCV steelhead and CV SR salmon during the 2021 drought year. The Mill Creek watershed meeting occurred on April 23, 2021, and the Deer Creek watershed meeting occurred on May 6, 2021. During the watershed meetings, State Water Board staff requested that Mill and Deer Creek diverters document proposed voluntary actions that could be implemented this year to protect threatened fish species. In response to this request, Stanford Vina Ranch Irrigation Company (SVRIC) provided an *Outline of Key Terms for Drought Year 2021 Actions on Deer Creek* to the State Water Board, CDFW, and NMFS staff on May 12, 2021 (SVRIC, 2021). Los Molinos Mutual Water Company (LMMWC) provided an *Outline of Key Terms for Drought Year 2021 Actions on Mill Creek* to the State Water Board, CDFW, and NMFS staff on May 14, 2021 (LMMWC, 2021). Both Outlines propose flow measures, temperature dependent actions, channel restoration projects, environmental permits, and requested funding from the State of California.

The State Water Board provided written responses on June 28, 2021 to SVRIC and LMMWC identifying that revisions to the Outlines are necessary to adequately protect threatened fish species, which was consistent with the responses to these documents provided by CDFW and NMFS (CDFW, 2021b; NMFS, 2021b, 2021c; State Water Board, 2021a, 2021b). The written responses also identify that in the absence of sufficient voluntary measures, the State Water Board may consider drought emergency regulations to establish minimum drought instream flows that provide short-term fisheries protection on Mill and Deer creeks. The State Water Board has not received any revised Outlines from SVRIC or LMMWC.

The 2021 drought emergency regulation imposed similar minimum flow requirements to the emergency regulation adopted in 2015 on Mill and Deer creeks, in response to similarly dire drought emergency conditions. On July 30, 2021, and August 9, 2021 NMFS and CDFW, respectively, submitted memoranda to the State Water Board regarding 2021 drought emergency minimum instream flows to protect threatened fish species in Mill and Deer creeks (NMFS 2021a; CDFW 2021a). The memoranda request drought emergency minimum flows for Mill and Deer creeks that are consistent with the baseflows identified in the 2015 emergency regulation.

On September 22, 2021, the State Water Board adopted an emergency regulation titled Curtailment of Diversions on Mill and Deer creeks due to Insufficient Flow for Specific Fisheries (State Water Board 2021c). The Regulation added sections 876.5, 876.7, and 878.4, and amended sections 878.1 and 879 in title 23, division 3, chapter 2, article 24

of the California Code of Regulations. The Regulation was approved by the Office of Administrative Law and went into effect on October 4, 2021. The Regulation establishes drought emergency minimum flow requirements for the protection of specific runs of federal- and state-listed anadromous fish in Mill Creek and Deer Creek similar to flows adopted during the 2014/2015 drought. The Regulation provides that diversions from Mill Creek and Deer Creek are unreasonable if those diversions will cause flows to drop below specified minimum flows. Under the Regulation, diversions are curtailed as appropriate to maintain those minimum flows, with the exception of diversions necessary for minimum human health and safety needs. The diversion or use of water in violation of the Regulation is an unreasonable diversion or use and a violation of Water Code section 100. On October 11, 2021, curtailment orders were issued for all water right holders and claimants on Mill Creek (State Water Board 2021d) and Deer Creek (State Water Board 2021e).

In February 2022, the State Water Board, in coordination with CDFW and NMFS, held Mill and Deer creek watershed meetings with stakeholders to discuss possible interim and long-term measures to protect CCV steelhead and CV SR salmon. The Mill Creek watershed meeting occurred on February 9, 2022, and the Deer Creek watershed meeting occurred on February 24, 2022. During the watershed meetings, State Water Board staff requested that Mill and Deer creek diverters document proposed voluntary actions that could be implemented to protect threatened fish species. In response, LMMWC submitted an Outline of Key Issues pertaining to Mill Creek on February 17, 2022 to the State Water Board (LMMWC 2022). Similarly, CDFW submitted an Outline for Mill Creek on February 22, 2022 (CDFW 2022a). Stanford Vina Ranch Irrigation Company (SVRIC) submitted an Outline of Key Issues pertaining to Deer Creek on March 23, 2022 to the State Water Board (SVRIC 2022). Similarly, CDFW submitted an Outline for Deer Creek on March 30, 2022 (CDFW 2022b).

The water users on Mill and Deer creeks identified two pathways of potential agreement, including channel modifications and/or drilling additional conjunctive use wells for additional groundwater pumping to offset surface water diversions. However, both pathways could not be in place before the 2021 emergency regulation expires in October, 2022 and may not provide the same level of minimum protection as the emergency regulation.

On April 11, 2022, CDFW requested that the State Water Board consider readoption of the Emergency Regulation (CDFW 2022c). On June 28, 2022, NMFS requested the State Water Board consider readoption of the Emergency Regulation and identified potential funding sources for projects on Mill and Deer creeks (NMFS 2022). In response, State Water Board staff sent a message through the Mill and Deer Drought email distribution list alerting water users and interested parties of the available funding sources and deadlines for seeking funding (State Water Board 2022).

The current drought emergency regulation for Mill and Deer creeks is set to expire in October 2022. Due to the continuation of dry conditions in 2022 and possibly into 2023, readoption of the emergency regulation is being proposed, with minor proposed amendments.

NMFS and CDFW have not requested drought emergency minimum instream flows for Antelope Creek. Actions are not needed on Antelope Creek at this time since CDFW issued a Lake and Streambed Alteration Agreement (LSAA) in 2020 pursuant to Fish and Game Code section 1602 for the operation and maintenance of the Edwards Dam diversions on Antelope Creek (CDFW, 2020). The LSAA provides for minimum instream flows for the protection of fish passage consistent with the minimum base flows required by the 2015 emergency regulation. In addition, the LSAA provides for additional flows during the summer months, thus providing for year-round instream flows. The LSAA provides for the protection of fish passage in Antelope Creek for 5 years, with an option for long-term renewal, so the State Water Board has concluded that emergency regulations are not necessary for Antelope Creek in 2022.

Status of Species

Since settlement of the Central Valley in the mid-1800s, populations of native Chinook salmon (*Oncorhynchus tshawytscha*) and steelhead (*O. mykiss*) have declined dramatically (Moyle, 2002). California's salmon resources began to decline in the late 1800s, and continued to decline in the early 1900s, as reflected in the decline of commercial harvest. The total commercial catch of Chinook salmon in 1880 was 11 million pounds, by 1922 it had dropped to 7 million pounds, and reached a low of less than 3 million pounds in 1939 (Lufkin 1996, as cited in NMFS, 2014). Twenty- eight evolutionarily significant units (ESUs) and distinct population segments (DPSs) of salmonids have been listed under the ESA by NMFS on the West Coast of the United States since 1989 (NMFS, 2014).

The Central Valley is made up of four distinct geological zones that create different watershed systems, which in turn are the basis for diverse fisheries (NMFS, 2014). These varying habitats supported different life history strategies leading to genetically distinct populations of salmon and steelhead. Central Valley salmon and steelhead developed different life history strategies by evolving with habitat factors that reflected differences in these watersheds such as: the availability of cold water, adequate substrate, cover, and flow. Fish ecologists believe that this variability in life history traits was caused by the limitations on or availability of habitat features between watersheds, and geographic isolation of populations, which led to genetic separation and to independent salmonid populations within the Central Valley.

Although CV SR salmon were probably the most abundant salmonid in the Central Valley under historical conditions, large dams eliminated access to almost all historical

habitat, and CV SR salmon populations have suffered the most severe declines of any of the four Chinook salmon runs in the Sacramento River Basin (Fisher, 1994 as cited in NMFS, 2014). The Central Valley, as a whole, is estimated to have supported CV SR salmon runs up to 600,000 fish between the late 1880s and 1940s. However, from 1970 through 2012, CV SR salmon run size estimates have fluctuated from highs near 30,000 to lows near 3,000 (NMFS, 2014). During 2011-2020, average annual CV SR salmon escapement was 10,641 fish, ranging from 1,591 fish in 2017 to 23,810 fish in 2013 (Azat, 2021; Figure 1).

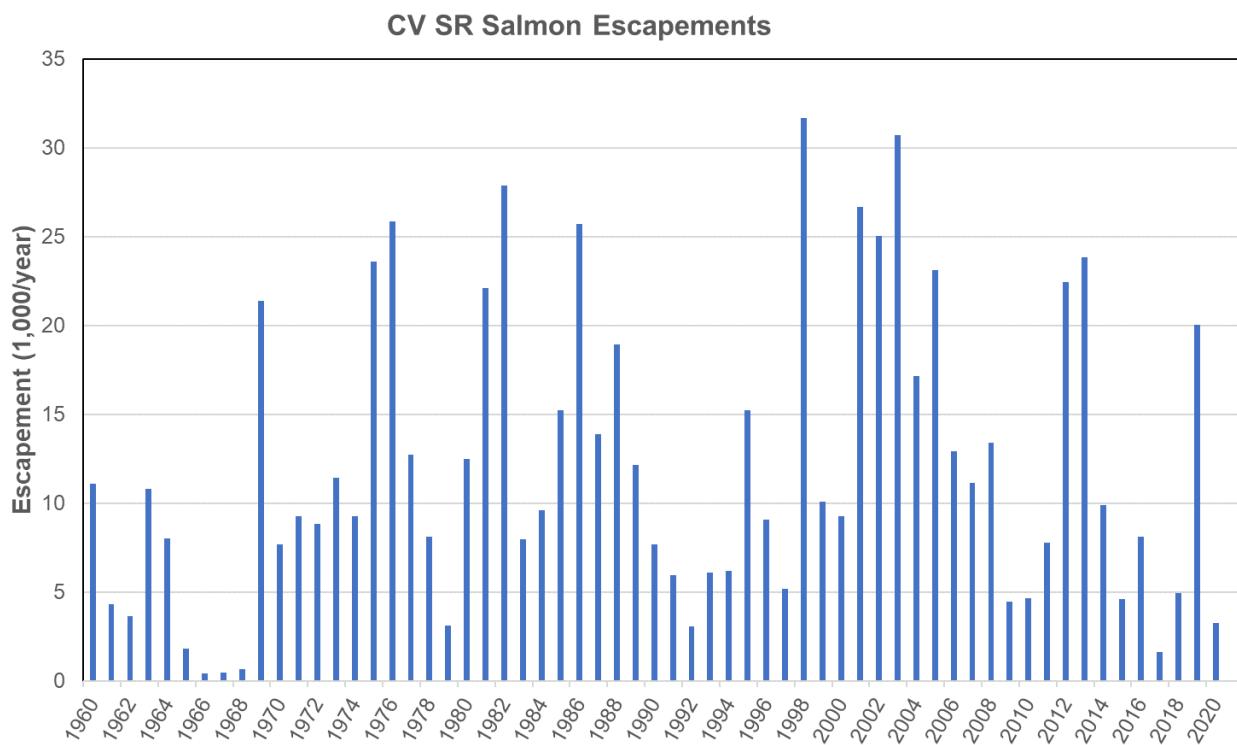


Figure 1. Annual escapement of CV SR salmon (1960-2020).

CV SR salmon, were listed as threatened pursuant to both the federal ESA and the California ESA in 1999 (64 FR 50394).

Both listings found that the CV SR salmon ESU was in danger of extinction because native CV SR salmon have been extirpated from all tributaries in the San Joaquin River Basin, which represented a large portion of the historic range and abundance of the ESU as a whole (NMFS, 1998). Moreover, the only streams considered to support self-sustaining independent CV SR salmon populations at that time were Mill Creek, Deer Creek, and Butte Creek (tributaries to the Sacramento River) (NMFS, 2014). These populations were considered relatively small with sharply declining trends. Hence, demographic and genetic risks due to small population sizes were considered to be

high. NMFS also determined that habitat problems were the most important source of ongoing risk to this ESU (NMFS, 1998).

In 1998 NMFS listed CCV steelhead as endangered (63 FR 13347) and reaffirmed the listing in 2006 (71 FR 8330). NMFS concluded that the CCV steelhead ESU was in danger of extinction because of habitat degradation and destruction, blockage of freshwater habitats, water allocation problems, the pervasive opportunity for genetic introgression resulting from widespread production of hatchery steelhead and the potential ecological interaction between introduced stocks and native stocks. Historic CCV steelhead run sizes are difficult to estimate due to the lack of data, but abundance may have approached one to two million adults annually; however, by the early 1960s, it was estimated to have declined to about 40,000 fish, and fewer than 10,000 fish in 1996 (NMFS, 2014).

Extensive extirpation of historical populations has placed the Chinook salmon ESUs and CCV steelhead DPS in threat of extinction. The proximate problem afflicting these populations is that their historical spawning and rearing areas are largely inaccessible (NMFS, 2014). Threats to CCV steelhead are similar to those for Chinook salmon and fall into three broad categories: loss of historical spawning habitat; degradation of remaining habitat; and threats to the genetic integrity of the wild spawning populations from hatchery steelhead production programs in the Central Valley. Key stressors identified for CV SR salmon and CCV steelhead include: elevated water temperatures, which affect adult migration and holding, and low flows, which affect adult attraction and migratory cues (CDFW 2017a; 2017b).

The Deer Creek and Mill Creek Watersheds have been identified as high-priority tributaries for the protection and recovery of wild populations of CV SR salmon and CCV steelhead (NMFS, 2014). The watersheds have been rated as having high "biotic integrity" defined as "the ability to support and maintain a balanced, integrated, adaptive community of organisms having a species composition, diversity, and functional organization comparable to that of the natural habitat of the region." (Moyle and Randall, 1996, as cited in Armentrout et al., 1998).

Adult CV SR salmon enter Mill Creek and Deer Creek as sexually immature fish from late February through early-August, quickly migrate through the lower creeks, move into the deep pools of the upper watersheds, and hold over the summer (Figure 2).

Spawning occurs between mid-August and early October in the upper watersheds (CDFW 2017a, 2017b). CV SR salmon fry may emerge over a six-month period, from November through March. After emergence, the majority of juvenile emigration occurs from November through March, and there appears to be a second emigration period for juveniles that over-summer and out-migrate in the fall during high flow events (NMFS, 2016). Juvenile salmon monitoring data using rotary screw traps indicate two juvenile

migration periods from mid-October to mid-January and from mid-March to mid-June (CDFW, 2021c).

Adult CCV steelhead enter Mill Creek and Deer Creek from late-September through June, with peak runs in the fall (October-November) and late winter/early spring (January-March) (CDFW 2017a, 2017b). Spawning has been observed late winter through spring in both creeks. Juvenile steelhead emigrate down the creeks to the Sacramento River from late fall to early June (NMFS 2016).

Species/ Life Stage	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Spring-run Chinook Salmon												
Adult												
Juvenile												
Fall-run Chinook Salmon												
Adult												
Juvenile												
Late Fall-run Chinook Salmon												
Adult												
Juvenile												
Steelhead												
Adult												
Juvenile												

Figure 2. Adult migration and juvenile presence timing for salmonids in Mill Creek and Deer Creek. Shading indicates timing span, with darker shading indicating months of peak movement. Adopted from CDFW (2017a, 2017b).

The Mill Creek and Deer Creek Watersheds support adult and juvenile life-stages of fall-run and late-fall run Chinook salmon (CDFW, 2017a; CDFW, 2017b). In the past decade, average escapement of fall-run Chinook salmon has been about 3-fold higher than CV SR salmon in Mill Creek and about 1.3-fold higher in Deer Creek. A recent scientific study also suggests that the lower reaches of Mill Creek and Deer Creek are important juvenile rearing habitats for the federally-endangered Sacramento River winter-run Chinook salmon (Phillis et al. 2018). The research demonstrated 44-65% of returning winter-run adults reared as juveniles in habitats other than the mainstem Sacramento River, including Mill Creek and Deer Creek. This recent study demonstrates that maintaining adequate aquatic habitat conditions in Mill Creek and Deer Creek is important for the conservation and protection of winter-run Chinook salmon, as well as other runs of Central Valley Chinook salmon.

Mill Creek – Adult Escapement

The Mill Creek CV SR salmon adult escapement averaged 882 fish from 1960 to 2003, with a low population estimate of 61 fish in 1993 and a high population estimate of 3,500 fish in 1975 (CDFW, 2017a; Azat, 2021). However, the population declined during the recent decade down to an average of 343 fish from 2011 to 2020 and a range from 80 fish in 2020 to 768 fish in 2012 (Figure 3). Of particular concern is that the average adult CV SR salmon escapement in Mill Creek during 2015-2020, after the 2012-2016 drought period, was 162 fish with a low of 80 fish in 2020. Escapement in 2021 showed some improvement at 620 fish (Figure 3); however, the overall population trend suggests that the population is still at risk.

Adult escapement of CCV steelhead observed in Mill Creek averaged about 1,100 fish in both 1953 and 1965 surveys; however, present numbers have dropped dramatically, only reaching the low hundreds (CDFW 2017a). Average adult CCV steelhead count from the 2014-2015 season to the 2020-2021 season was 215 fish ranging from 68 fish in 2016-2017 to 431 fish in 2018-2019 (Table 1).

Deer Creek – Adult Escapement

Deer Creek adult CV SR salmon escapement averaged 1,311 fish during the 1963 to 2000 period, with a low population estimate of 84 fish in 1989 and a high population estimate of 8,500 fish in 1975 (Azat, 2021). Recently, the average population size declined down to 420 fish from 2011-2020, ranging from 90 fish in 2020 to 830 fish in 2014 (Figure 3). Of particular concern is that the average adult CV SR salmon escapement in Deer Creek during 2015-2020, after the 2012-2016 drought period, was 275 fish with a very low fish count of 90 fish in 2020. Similar to Mill Creek, escapement was estimated to improve slightly in 2021 to 282 (Figure 3); however, the overall population trend suggests that the population is still at risk.

Historically CCV steelhead have not been well studied in Deer Creek (CDFW 2017b). Average adult escapement of CCV steelhead in Deer Creek from the 2014-2015 season to 2020-2021 season was 191 fish ranging from 50 fish in 2016-2017 to 437 fish in 2018-2019 (Table 1).

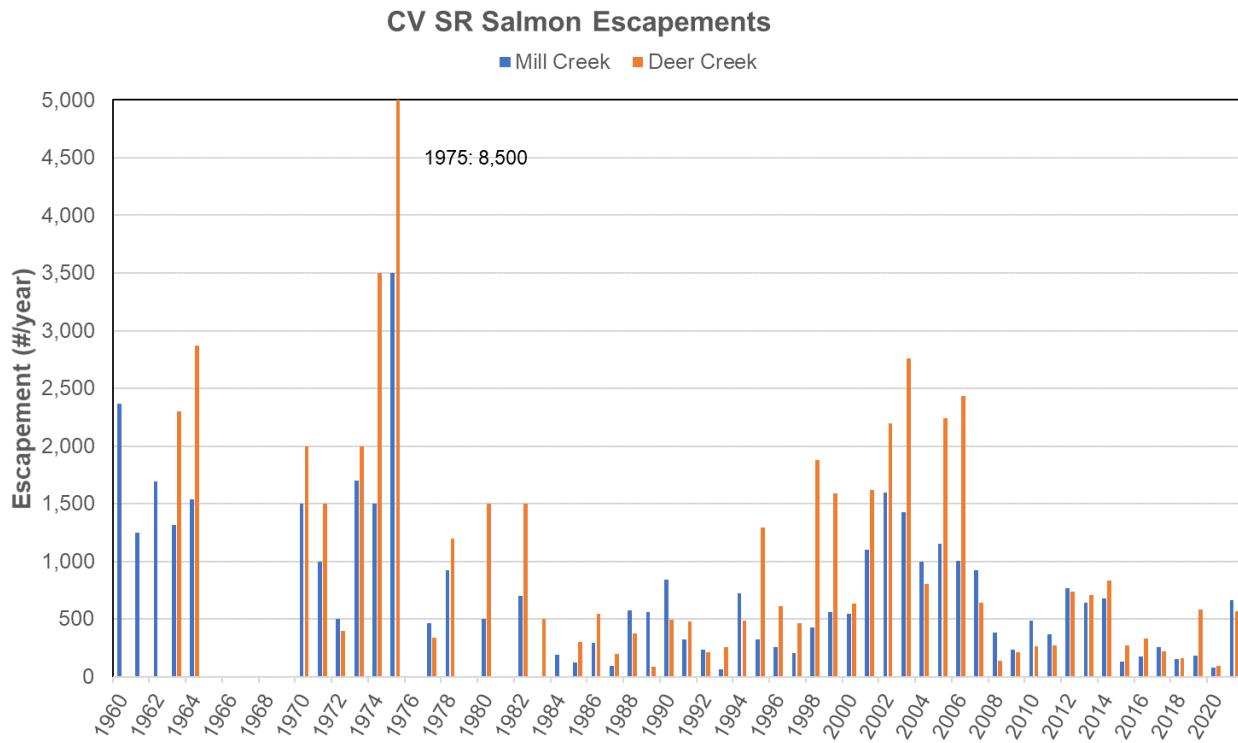


Figure 3. Adult CV SR salmon escapements in Mill Creek and Deer Creek.

Table 1. CCV Steelhead adult population estimates in Mill Creek and Deer Creek

Year	Deer Creek	Mill Creek
1953 and 1965*		1100
2010-2011*		118
2011-2012*		113
2012-2013*		122
2013-2014*		303
2014-2015	281	247
2015-2016	56	190
2016-2017	50	68
2017-2018	143	213
2018-2019	437	431
2019-2020	267	238
2020-2021	102	118

Data provided by CDFW (2021c; 2022d); *Data obtained from CDFW (2017a).

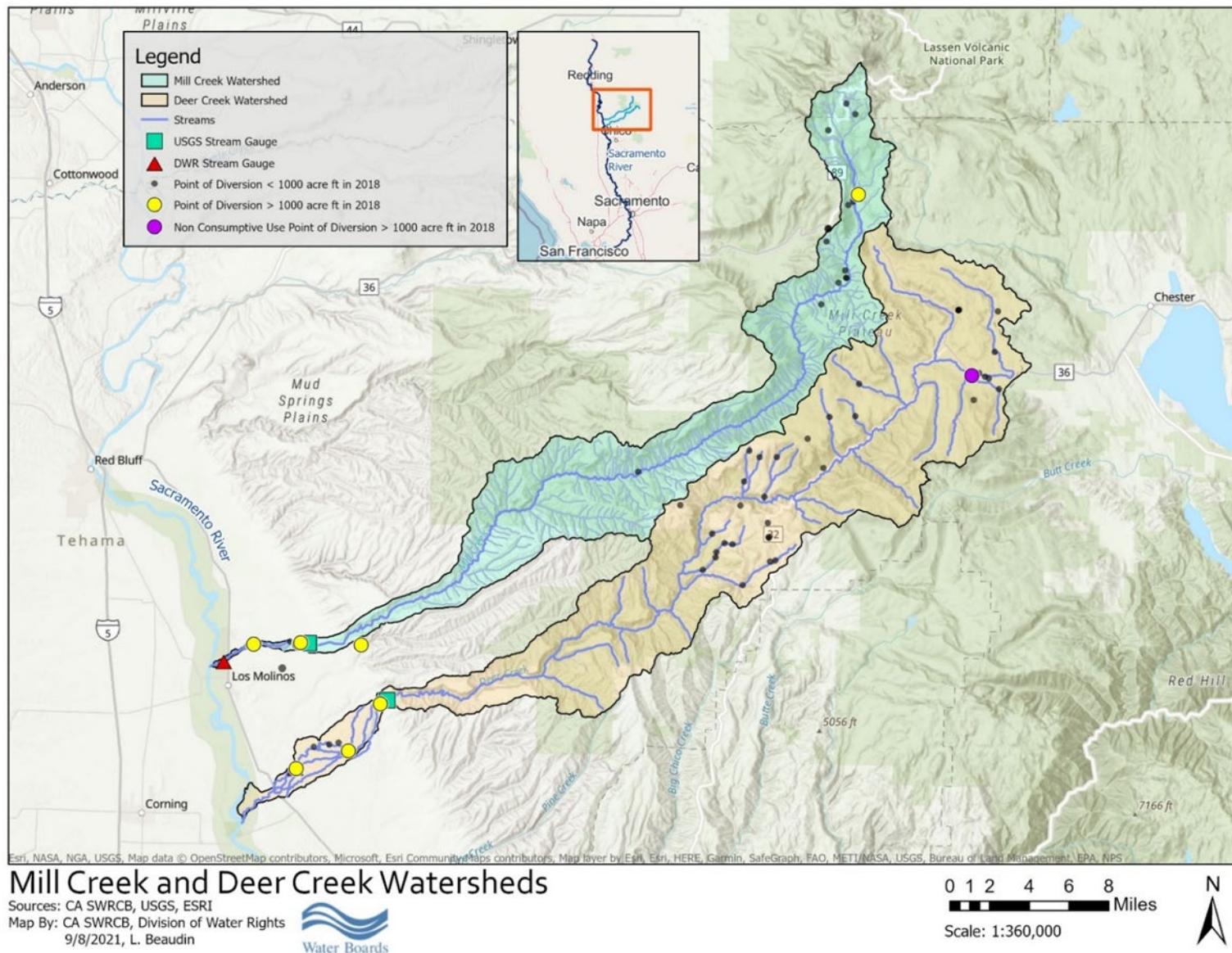


Figure 4: Mill and Deer Creek Watersheds

Watershed Descriptions

Figure 4 provides a map of the Mill and Deer Creek watersheds. Watershed descriptions for Mill and Deer creeks are also provided below.

Mill Creek – Watershed Description

The Mill Creek watershed is approximately 134 square miles, contains nearly 60 river miles, and ranges in elevation from 8,000 feet in Lassen National Park to 200 feet at the confluence with the Sacramento River. Mill Creek is one of three Sacramento River tributaries supporting a self-sustaining wild population of CV SR salmon. Mill Creek also supports populations of fall-run Chinook salmon, and all life history stages of steelhead. Mill Creek contains the highest elevation of CV SR salmon spawning activity in California at approximately 5,300 feet, and the creek is one of the few undammed streams in California where fish still have access to the upper stream reaches. Current anadromous fish populations in the watershed are not influenced by the presence of Federal, state, or private fish hatcheries. CV SR salmon and CCV steelhead critical habitat was designated in 2005, which included habitat in Mill Creek (OFR, 2005).

Mill Creek is vulnerable to inadequate instream flows, particularly during drought years. Adequate streamflow during salmonid migration periods will support the survival of adult CV SR salmon and CCV steelhead by increasing critical passage riffle depth and reducing water temperatures in Mill Creek.

Mill Creek is characterized as having a high potential to support a viable independent population of CV SR salmon and CCV steelhead because of its extensive suitable spawning and rearing habitat (NMFS, 2014). Habitat used for holding and spawning is located at high elevations and is considered to be high quality (CDFG, 1998). Mill Creek is considered a conservation stronghold for CV SR salmon and has a high potential for sustaining a population at a low risk of extinction with implementation of key recovery actions (NMFS 2014). Mill Creek contains holding and spawning habitat to support a CV SR salmon population greater than 2,500, and hatchery influence is low in Mill Creek (NMFS 2014). Lindley et al. (2007) classified the Mill Creek CV SR salmon population as having a moderate risk of extinction; however, in recent years, the abundance of the Mill Creek population has been in steep decline, and the extinction risk may be trending toward moderate to high (NMFS 2014).

There are two major water diversion dams on Mill Creek, Upper Diversion Dam (river mile (RM) 5.4) and Ward Diversion Dam (RM 2.8), both operated by LMMWC (Figure 4). There are two gauging stations collecting flow and water temperature data in lower Mill Creek. The U.S. Geological Survey (USGS) operates the upstream gauge ([USGS 11381500](#); CDEC Station ID: [MLM](#) for Mill Creek near Los Molinos), which is located above both the major diversions at RM 5.8. The downstream gauge (CDEC Station ID:

[MCH](#) for Mill Creek below HWY 99) is operated by DWR and is located below both major diversions at RM 0.8.

Upper Mill Creek, upstream of the Upper Diversion Dam, provides ideal cold water holding pools and spawning habitat for CV SR salmon and CCV steelhead. However, agricultural stream diversion in lower Mill Creek can result in insufficient stream flows and elevated stream temperature which can limit the ability of adult salmon and steelhead to migrate into the upper watershed. Inadequate flows also impede adult fall-run and late fall-run Chinook salmon migration and impact outmigration of juvenile Chinook salmon and steelhead (CDFW 2017a).

Based on an Electronic Water Rights Information Management System (eWRIMS) database query, there are 22 active water right records within the Mill Creek watershed. These water rights and claims reported a total annual diversion amount of approximately 40,000 acre-feet in 2018. The Superior Court of Tehama County adjudicated the water rights in Mill Creek in 1920. This decree apportions all flows in Mill Creek up to 203 cfs and appoints LMMWC as watermaster (Tehama County Superior Court Decree #3811, 1920). Flow records show that diversions in lower Mill Creek have the potential to entirely eliminate streamflow in June-September of a normal water year, and also at other times of year in drought conditions.

Deer Creek – Watershed Description

Deer Creek also supports one of three remaining self-sustaining populations of threatened CV SR salmon (Lindley et al., 2007), and is considered essential to the recovery and perpetuation of wild stocks of CCV steelhead in the Central Valley (Reynolds et al., 1993; McEwan and Jackson, 1996). Deer Creek originates near the summit of Butt Mountain (7,320 feet elevation), flows in a southwesterly direction for approximately 60 miles to the Sacramento River (180 feet elevation), and drains 229 square miles (NFMS, 2014; see Figure 1). Deer Creek contains approximately 42 miles of anadromous fish habitat with approximately 25 miles of adult spawning and holding habitat, most of which is located on public lands managed by Lassen National Forest. While no major water storage facilities exist on Deer Creek, three diversion dams along the lower 10 miles of the creek, as well as two natural falls, can be passage barriers to migrating fish depending on flows. The Upper Deer Creek Falls constitutes the limit of anadromy for CV SR salmon; however, the Upper Deer Creek Falls fish ladder is operational during the time steelhead would be migrating upstream in normal years (NMFS, 2014; Amentrout et al., 1998). CV SR salmon and CCV steelhead critical habitat was designated in 2005, which included habitat in Deer Creek (OFR, 2005).

There are three diversion dams in lower Deer Creek between the canyon mouth and the Sacramento River confluence (NMFS 2014): Deer Creek Irrigation District (DCID) Diversion Dam near the canyon mouth (RM 11.8); SVRIC Diversion Dam at RM 5.0, and the Cone-Kimball Diversion located on a side channel adjacent to RM 8.2 (Figure

4). Two gauging stations collect streamflow and water temperature data in Deer Creek. The USGS operates the upstream gauging station ([USGS 11383500](#); CDEC station ID: [DCV](#) for Deer Creek near Vina), which is located at the mouth of the canyon at RM 12.3, above all major diversions and represents unimpaired flow for Deer Creek. DWR operates the downstream gauging station (CDEC station ID: [DVD](#) for Deer Creek below Stanford Vina Dam), which is located below all of the diversions just below the SVRIC Diversion Dam at RM 5.0.

Upper Deer Creek, upstream of the DCID diversion and the canyon mouth, provides ideal cold water holding pools and spawning habitat for CV SR salmon and CCV steelhead. However, agricultural stream diversions in lower Deer Creek can result in insufficient stream flows and elevated stream temperature which can limit the ability of adult salmon and steelhead to migrate into the upper watershed. Inadequate flows also impede adult fall-run and late fall-run Chinook salmon migration and impact the outmigration of juvenile Chinook salmon and steelhead (CDFW 2017b).

Based on an eWRIMS database query, there are 43 active water right records within the Deer Creek watershed. These water rights and claims reported a total annual diversion amount of approximately 32,000 acre-feet in 2018. The Tehama County Superior Court adjudicated water rights on lower Deer Creek in 1923 by dividing 100% of Deer Creek's natural flows, with approximately 66% allocated to SVRIC, approximately 33% allocated to DCID, and 1% to a third holder (Tehama County Superior Court Decree No. 4189, 1923). One study has assessed diversions as follows: during the irrigation period, typically from May through October, DCID diverts an average of 29 cfs at the DCID Dam, and the remaining flow can be diverted by SVRIC at Cone-Kimball Dam (5 cfs average) and Stanford Vina Dam (70 cfs average), reducing flow in the lower five miles of Deer Creek to less than 5 cfs at times of intensive irrigation (Tompkins and Kondolf, 2007). In critically dry years, these diversions and resulting low flows may occur earlier in the year, especially if the irrigation season starts earlier.

Similarity of Watersheds

Deer Creek and Mill Creek are eastside tributaries to the Sacramento River (NMFS, 2014) (Figure 4). The watersheds are contiguously located within the southernmost extension of the Cascade Range (Armentrout, 1998) and southwest of Lassen Peak. The Tuscan formation, comprised primarily of mudflows with andesitic plugs, dominates the geology of the watersheds (Guffanti et al., 1989). The Tuscan Formation is overlain by voluminous flows of rhyolite which form Mill Creek and Lost Creek Plateaus in the Mill Creek and Deer Creek watersheds. Marine sedimentary rocks have minor exposures in the watersheds, and at lower elevations the creeks cut through quaternary sediments from the Sacramento Valley. Soils generated in the watersheds are andesitic soils and rhyolitic soils.

While the Mill Creek watershed has higher elevations than the Deer Creek watershed (8,200 feet and 7,320 feet, respectively) both watersheds contain relatively undisturbed habitat in their upper reaches. Both watersheds receive a portion of precipitation as snow, with Mill Creek generally receiving the greatest amount of precipitation as snow due to its higher elevations. Glacial processes have shaped some of the landforms at the higher elevations of the watersheds. The upper portion of Mill Creek is a glacial valley, and glacial deposits have been mapped at the headwaters of Deer Creek on Butt Mountain (Lydon, 1968, as cited in Armentrout, 1998). Both watersheds are relatively narrow and initially flow through meadows and dense forests before descending through steep rock canyons into the Sacramento Valley (NMFS, 2009; Armentrout, 1998). The geology and geomorphology of the upper reaches of the Deer and Mill creek watersheds produce exceptional fish habitat.

The lower reaches of both watersheds are made up of alluvial fan deposits with evidence of stream meandering and multiple distributaries (TCRCD, 2010; Kondolf, 2001; CALFED, 2000). The lower watersheds contain alternating pools and riffles of gravel sized sediment (TCRCD, 2010; Berens, 2002; Kondolf, 2001). Deer Creek's and Mill Creek's upper alluvial reaches are able to meander but are bound by wide bluffs of older cemented river gravels, typically 800 feet for Mill Creek and 1,000-2,000 feet for Deer Creek. Downstream of the bluffs evidence of the multiple channels characteristic of alluvial fans can be observed (Kondolf et al., 2001; CALFED, 2000). The 25,000 feet alluvial reach of Mill Creek compares in sediment size and downstream change in sediment size with the upper 25,000 feet of Deer Creek, measured from where it leaves its confined upper basin (Kondolf et al., 2001).

Mill Creek still has active distributaries; however, the North Fork Mill Creek distributary is only active during high flows. Historical aerial photographs, taken in 1939, show the lower portion of Deer Creek was sinuous, with small-scale bends, point bars, and alternating pools and riffles (CALFED 2000). Today Deer Creek has 16 kilometers of levees resulting in the straightening of channels, the abandoning of natural distributaries and increased gravel flushing (Berens, 2002; MacWilliams et al., 2004). The similar sedimentary and geomorphic characteristics of the lower watersheds of Deer Creek and Mill Creek create comparable fish passage environments.

Runoff patterns for both watersheds are similar (NMFS, 2014; Armentrout, 1998). The two watersheds have peak flows that are dominated by rain on snow events (December- February) with later snowmelt peaks (mid-March-May) and low flows during the summer. Mean June flows upstream of major diversions in the drought years of 1977, 2014, and 2015 in Deer and Mill creeks ranged from 66-75 cfs and 98-106 cfs, respectively. Deer Creek and Mill Creek watersheds typically produce over 200,000 acre-feet of water per year (Armentrout, 1998; CDEC, 2021).

Upper reaches of both streams, upstream of major agricultural diversions, provide excellent cold water holding pools and spawning habitat for salmonids (CDFW, 2017a, 2017b). However, agricultural stream diversions in lower reaches can result in insufficient stream flows and elevated stream temperature which can limit the ability of adult salmon and steelhead to migrate into the upper watershed. Inadequate flows also impede adult fall-run and late fall-run Chinook salmon migration and impact outmigration of juvenile Chinook salmon and steelhead (CDFW 2017a, 2017b).

Mill Creek and Deer Creek support multiple self-sustaining natural populations of anadromous salmonids, including ESA-listed CV SR salmon and CCV steelhead. In these tributary systems, adult CV SR salmon migration typically occurs from March through July with a peak in migration during April through June, and CV SR salmon juveniles are typically present from October through June, with a peak in out-migration in January and February (NMFS, 2009). Adult CCV steelhead are typically present in these tributary systems during February through June and October through December, and juveniles can be present year-round (NMFS, 2009).

Mill Creek and Deer Creek share much of the same geology and geomorphology in their upper watersheds, in addition to similar runoff patterns. The typical nature of the region leads the State Water Board to conclude that studies and findings of flows and fish habitat characteristics in one of the watersheds may be applied to the others.

Informative Digest

Summary of Existing Laws and Regulations

A general description of the following is set forth below: existing law governing water rights; the water right priority system; and the constitutional prohibition against the waste, unreasonable diversion, unreasonable method or diversion, or unreasonable use of water.

Under existing law, the State Water Board may take enforcement action to prevent unauthorized diversions of water or violations of the terms and conditions of water rights permits and licenses. Diverting water when it is unavailable under a water right holder's priority of right constitutes an unauthorized diversion and a trespass against the state. Violations are subject to Administrative Civil Liability (ACL) under the Water Code. (Wat. Code, § 1052.) Administrative cease and desist orders and court injunctions may also be issued to require that diversions stop. (Wat. Code, § 1831.) An ACL order for an unauthorized diversion may impose liability up to \$1,000 a day plus \$2,500 per acre foot of water that is illegally diverted for violations during the current drought. The same enforcement mechanisms exist for violations of permit and license terms and conditions such as standard permit Term 91. For the State Water Board to take an enforcement action, each illegal diversion may be investigated and charged separately, and water

right holders may request a full evidentiary hearing on issues that include availability of water under the water right holder's priority, and the administrative decision is then subject to review in the courts.

Under existing law, the State Water Board also may initiate administrative proceedings to prevent the unreasonable use of water. (Wat. Code, § 275.) The State Water Board lacks authority, however, to take direct enforcement action against the unreasonable use of water. The State Water Board must first determine whether a given diversion or use is unreasonable, either in a State Water Board order or decision or in a regulation, and direct the diverter or user to cease the unreasonable diversion or use. In the event that the State Water Board has issued an order or decision, the State Water Board may issue a cease and desist order to enforce the order or decision. (Wat. Code, § 1831, subd. (d)(3)). If the cease and desist order is violated, the State Water Board may impose administrative civil liability. (Wat. Code, § 1845, subd. (b)(1).) In the event that the State Water Board has adopted a regulation, the State Water Board may issue a cease and desist order and simultaneously impose administrative civil liability in response to violations of the regulation. (Wat. Code, §§ 1058.5, subd. (d), 1846, subd. (a)(2).)

Description and Effect of the Proposed Regulation

The emergency regulation proposed for readoption continues the drought emergency minimum flows necessary to maintain fish passage in two priority tributaries to the Sacramento River for protection of threatened CV SR salmon and CCV steelhead. Under the proposed regulation, the State Water Board would curtail diverters in these watersheds in order of water right/claim priority as necessary to maintain a reasonable assurance of meeting the minimally protective flows, and the needs of more senior water right holders. The requirement to curtail when water in excess of drought emergency minimum flows is unavailable would constitute both a regulatory requirement and a condition of all permits and licenses in the affected watersheds. The proposed regulation also establishes procedures for important exceptions to priority-based curtailments in order to protect public health and safety.

Proposed Emergency Regulation Section 876.5

Proposed section 876.5 would establish drought emergency minimum flow levels in Deer Creek and Mill Creek to allow for migratory passage of adult and juvenile CV SR salmon and CCV steelhead. The description and rationale for the flows is detailed below.

The State Water Board recognizes that the drought emergency minimum flows described below do not represent optimal passage conditions for Chinook salmon and steelhead under these drought conditions and these minimum passage flows will result in stressful passage conditions for salmonids. The State Water Board has identified the

need for these drought emergency minimum flows during this drought period due to the potential for flows to be lowered by diversions below critical minimum levels needed for protection of the fisheries and a lack of developed alternative water supplies that water users may instead rely upon. All water users should take measures this year and in future years to implement conservation measures and to develop alternative water supplies, since it is likely more protective and appropriate minimum flows for similar water shortage conditions will be established in the future.

A new amendment proposed as part of the Board's readoption would allow the Deputy Director to approve a petition for limited diversion of water for livestock survival during a scheduled pulse flow if no other water supply alternatives are available (i.e. stockpond supplies, groundwater, or hauled water).

Emergency Minimum Instream Base Flows and Pulse Flows if Adult CV SR Salmon and Adult CCV Steelhead are Present October 15 through June 15 on Mill Creek and Deer Creek

Adult Base Flows: The State Water Board has determined that the drought emergency minimum base flows recommended by NMFS and CDFW of 50 cfs or full inflow without diversions in Mill Creek and Deer Creek are necessary to provide adequate protection of adult CV SR salmon and CCV steelhead under the existing drought conditions from October 15 through June 15. This determination is based on a review of the best available science and information discussed below.

Justification for Mill Creek Adult CV SR Salmon and Adult CCV Steelhead Base Flow
In the summer of 2021, NMFS and CDFW recommended that the State Water Board adopt, at a minimum, flow regulations similar to those adopted in 2015 considering the immediate need for action to protect Mill Creek and Deer Creek CV SR salmon and CCV steelhead (CDFW, 2021a; NMFS, 2021a). In 2014 and 2015 the State Water Board adopted emergency regulations establishing base flows of 50 cfs in Mill Creek during the drought emergency for the protection of adult salmonids during the October 15 through June 15 time period, based on recommendations by NMFS and CDFW. Both agencies acknowledged that newer information (CDFW, 2018) suggests that higher flows are necessary for the long-term protection of juvenile and adult salmonids; however, the emergency regulation flow requirements should provide emergency minimum flow protections during the current drought emergency.

The 2014 and 2015 emergency regulations' 50 cfs base flows supported adult CV SR salmon passage through lower Mill Creek. Fish passage data collected at the video monitoring station at Ward Diversion Dam showed that 679 and 127 CV SR adult salmon passed the station in 2014 and 2015, respectively (Figure 5). Overall, passage dates were similar for the two critically dry years, e.g., from February 28 to June 20 in 2014 and from March 6 to June 6 in 2015. The majority of CV SR adult salmon, 95% in

2014 and 87% in 2015, migrated upstream during the emergency regulation base flow period of April 1 to June 15. Limited CV SR salmon migration was observed once instream flows dropped below 50 cfs and after June 15. Similar CV SR salmon migration patterns, showing increased migration in response to base and pulse flows were observed in 2020 and 2021 (Figure 6).

The 2021 emergency regulations' 50 cfs base flows also supported adult CV SR salmon passage through lower Mill Creek during the spring of 2022. Frequent late season rainstorms maintained unimpaired flow levels such that the flows below diversions never reached 50 cfs until June 23. Fish passage data collected at the video monitoring station at Ward Diversion Dam showed that 232 CV SR adult salmon passed the station between March 1 to June 25. During 2022, 38% of CV SR adult salmon migrated upstream during the emergency regulation base flow period of April 1 to June 15, exhibiting a more pronounced March timing than in previous years. Limited CV SR salmon migration was observed once instream flows dropped below 50 cfs and after June 15 (Figure 6).

An Instream Flow Incremental Methodology (IFIM) instream flow study prepared by D.W. Alley & Associates in 1996 concluded that a minimum flow of 74 cfs was needed for adult spring-run and fall-run Chinook salmon passage during critically dry years, and that these drought emergency minimum flows are representative of stressful passage conditions for adult Chinook salmon. Additionally, they recommend higher minimum instream flows when additional flows are available, recognizing that higher instream flows will provide more favorable passage conditions for adult Chinook salmon.

In 2017, CDFW performed an instream flow study and produced a draft instream flow criteria to provide for the long-term protection, maintenance, and continued viability of stream-related fish and wildlife (CDFW, 2017a; CDFW, 2018). During the October-November migration period for all water year types, the instream flow recommendation is full unimpaired flow or 80% unimpaired flow if the USGS MLM gauge measurement is lower than 140 cfs. The recommended minimum instream flow criteria for December through February is 190 cfs for all water year types. The recommended flow to support CV SR salmon passage during critical water years is 180 cfs from March through May and 140 cfs in June. The minimum recommended instream flow for any water year type and month is 30 cfs.

During the fall of 2014 and 2015, adult CCV steelhead passage occurred immediately following the implementation of the emergency regulation base flows (50 cfs for adult CCV steelhead) (Figure 7). Flows higher than 50 cfs were observed at the DWR MCH gauge beginning October 15 in 2014 and October 26 in 2015. Similar patterns of adult CCV steelhead passage in response to increased stream flows in the lower Mill Creek were observed during the fall of 2019 and 2020 (Figure 8). During 2021 CCV steelhead

passage began the day that implementation of the emergency regulation base flows occurred (Figure 8). In addition to providing minimum passage flows, the flows also provide for lower temperature conditions during passage.

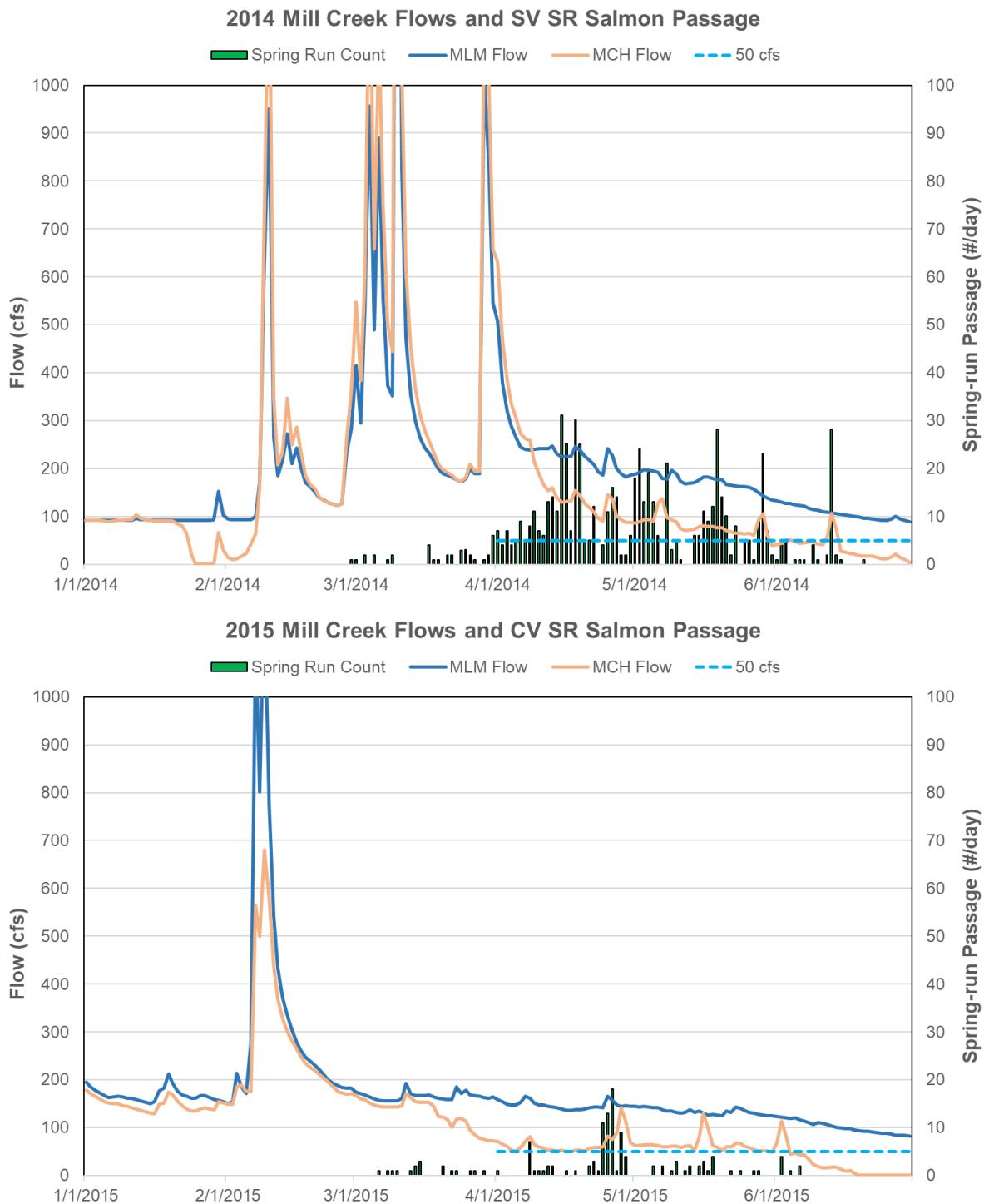
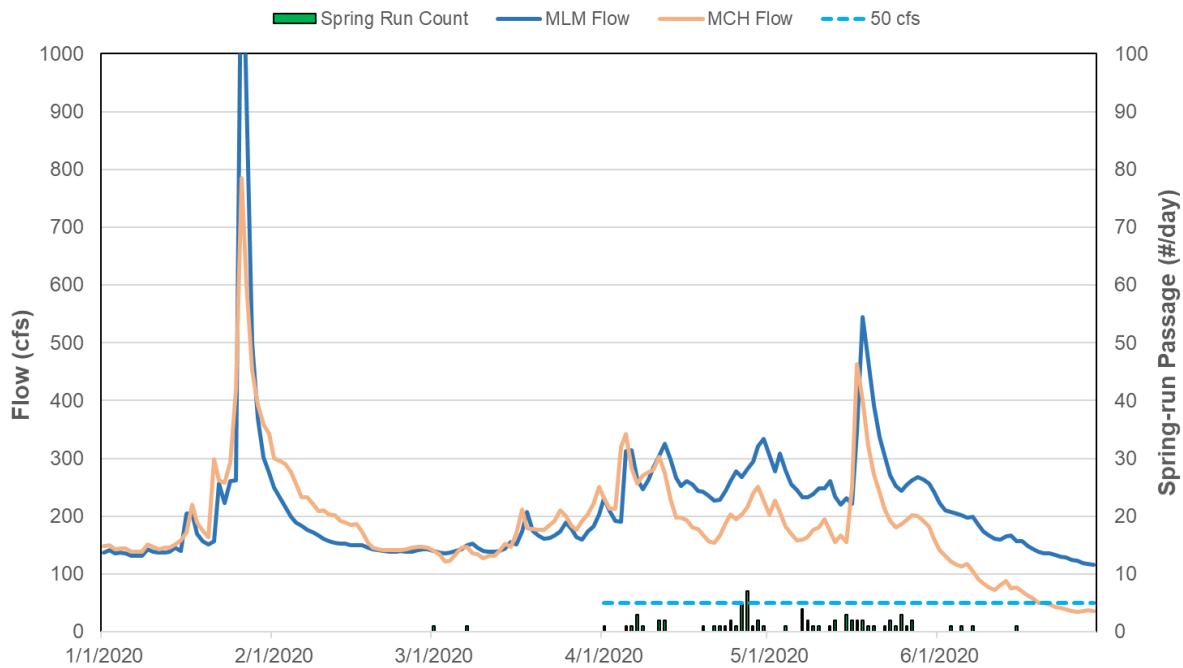
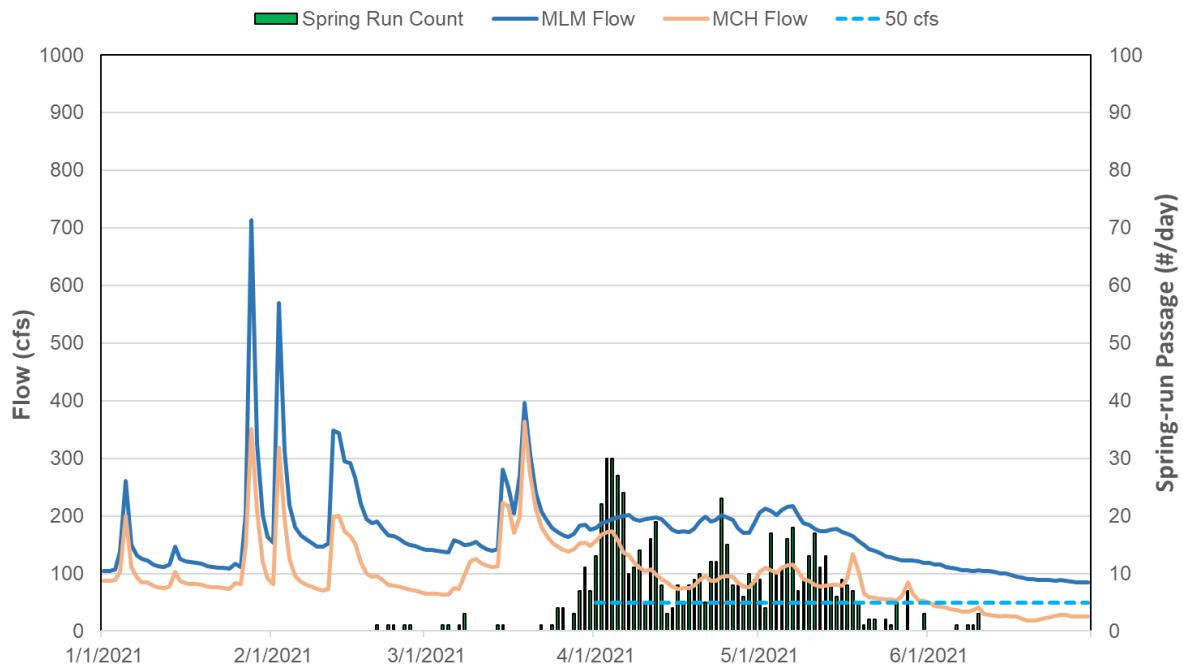


Figure 5. Daily stream flows at USGS (MLM) and DWR gauges (MCH) and adult CV SR salmon passage observed at the video station in the Mill Creek in 2014 and 2015.

2020 Mill Creek Flows and CV SR Salmon Passage



2021 Mill Creek Flows and CV SR Passage



2022 Mill Creek Flows and CV SR Passage -- Provisional

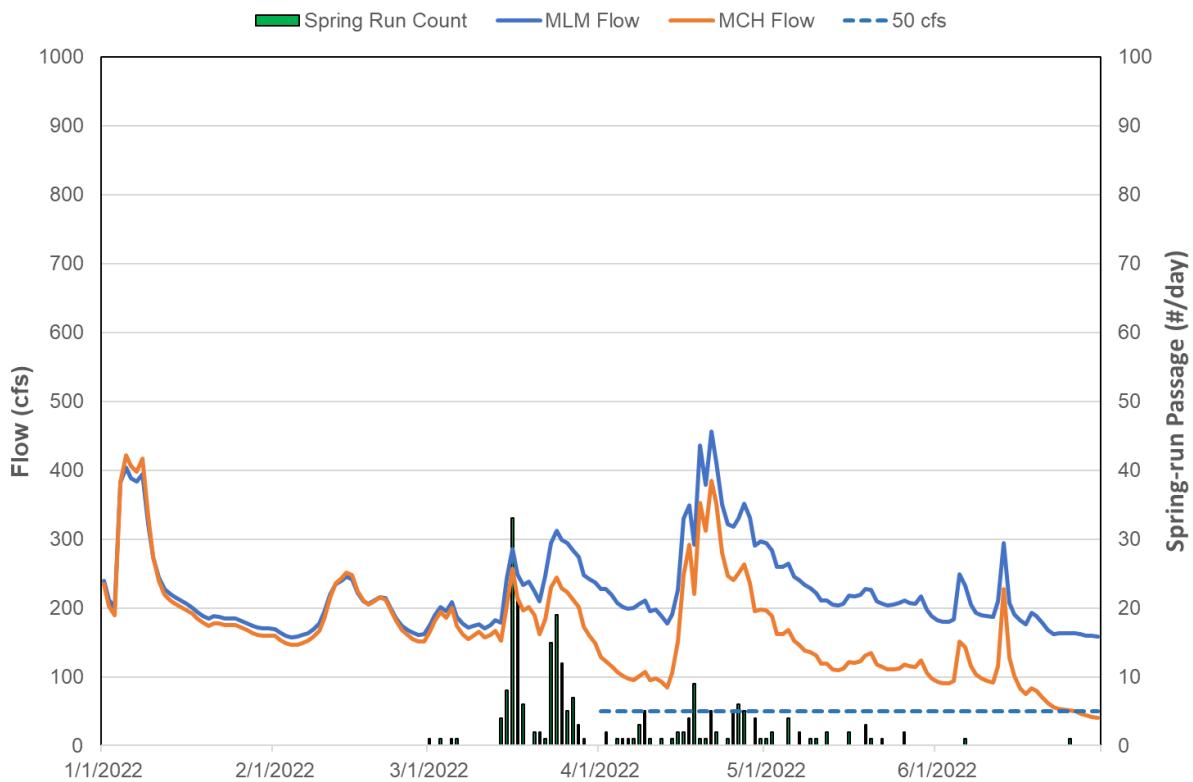


Figure 6. Daily stream flows at USGS (MLM) and DWR gauges (MCH) and adult CV SR salmon passage observed at the video station in the Mill Creek in 2020, 2021 and 2022.

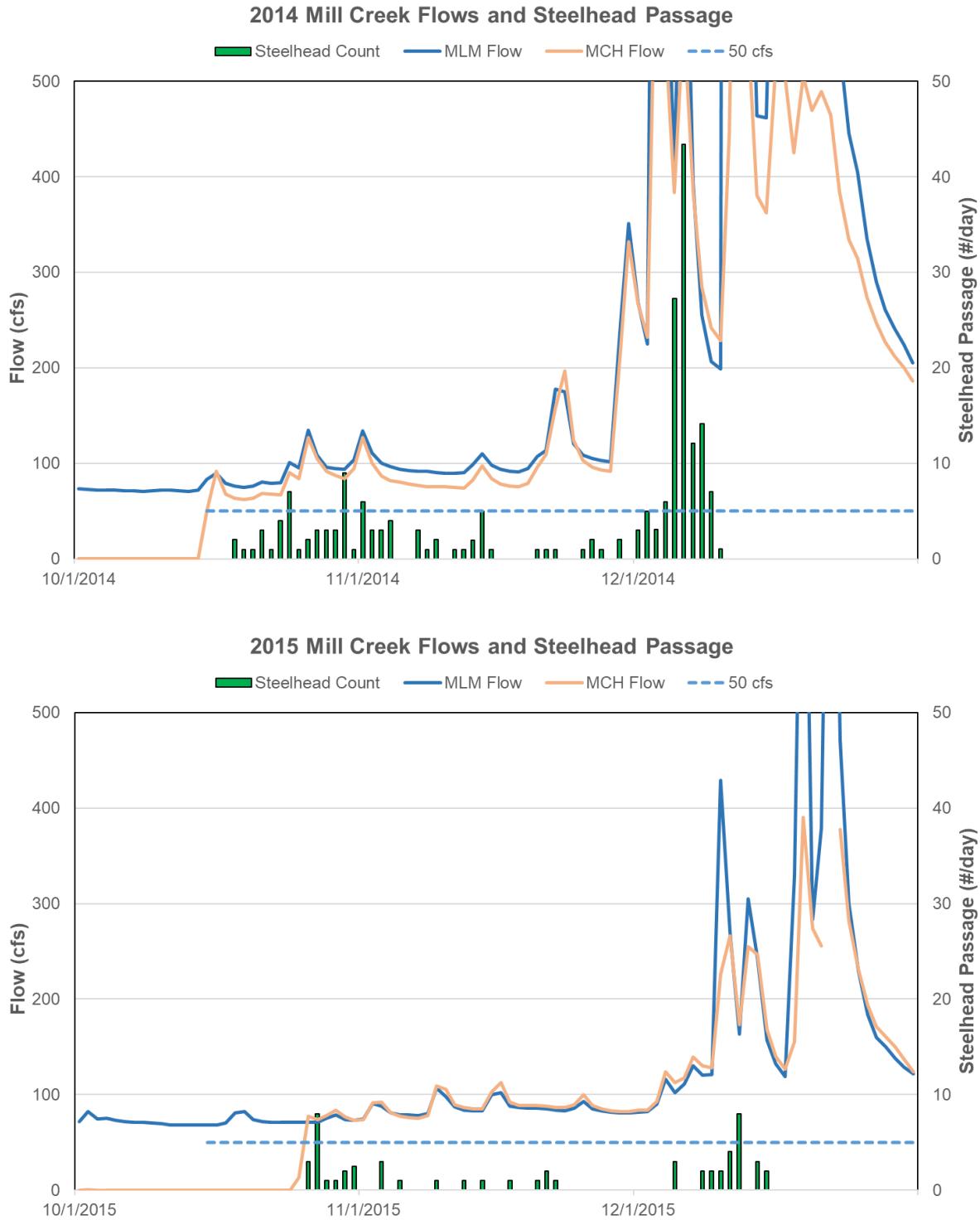
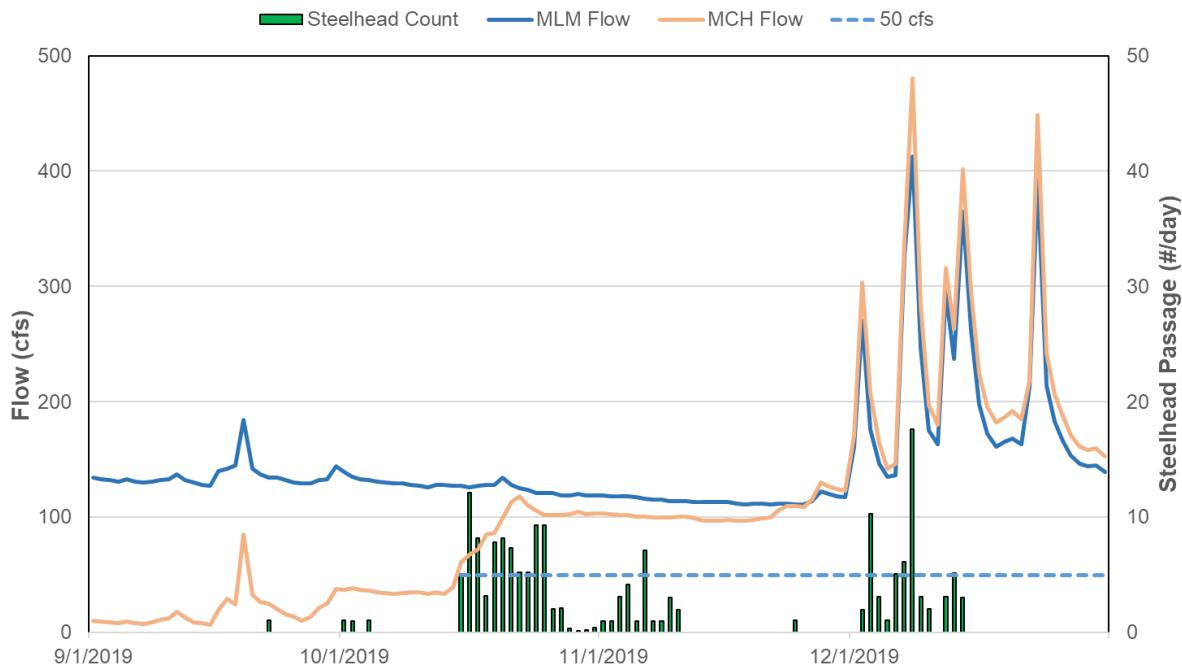
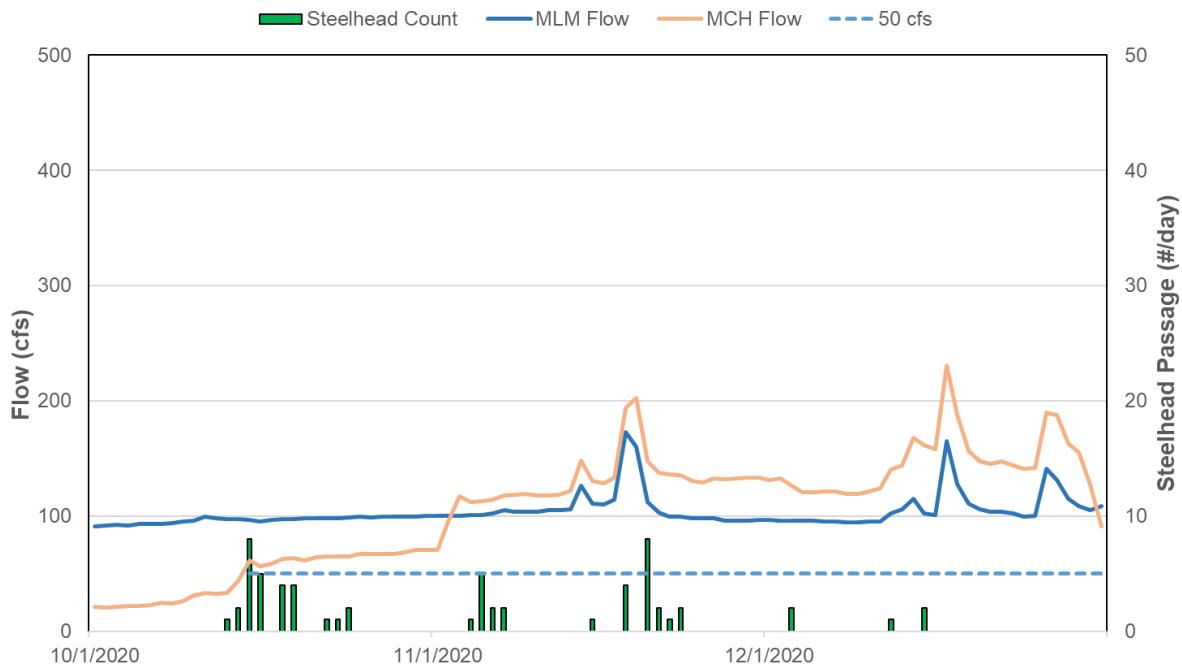


Figure 7. Daily stream flows at USGS (MLM) and DWR gauges (MCH) and adult CCV steelhead passage observed at the video station in the Mill Creek in 2014 and 2015.

2019 Mill Creek Flows and Steelhead Passage



2020 Mill Creek Flows and Steelhead Passage



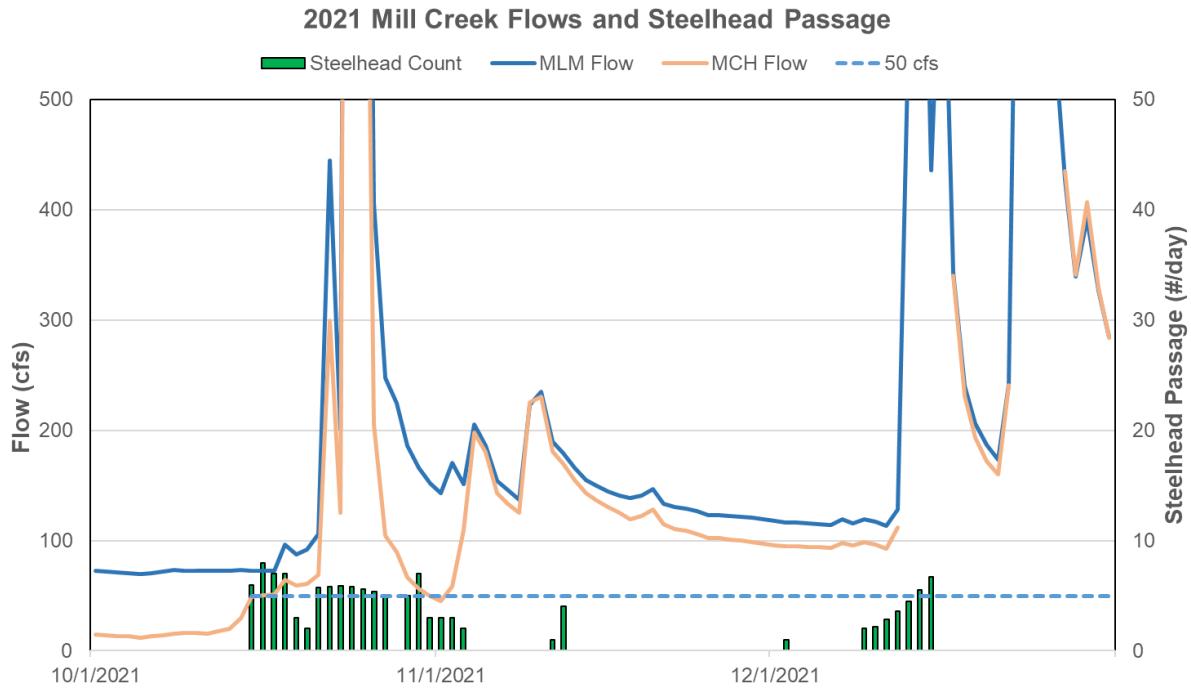


Figure 8. Daily stream flows at USGS (MLM) and DWR gauges (MCH) and adult CCV steelhead passage observed at the video station in the Mill Creek in 2019, 2020 and 2021.

Daily stream flow data collected at both MLM and MCH stations in Mill Creek from January 1999 to June 2022 were analyzed to assess whether the proposed drought emergency regulation flows would be needed to provide minimal instream flows to allow for passage of CV SR salmon and CCV steelhead in Mill Creek. This time period represents the period of available quality flow data at both gauging stations and also reflects the hydrological conditions in recent decades. During the January 1999 to June 2022 time period, daily stream flows at the USGS 11381500 gauging station (MLM), located just upstream of significant water diversions, were greater than 50 cfs 100 percent of the time from October 15 to June 15 (Figure 9). However, daily flows at the DWR gauging station (MCH), located further downstream below major diversions, were frequently lower than 50 cfs, especially during October and June (Figure 10). Average monthly flows at MCH during November 1 through May 31 were mostly (>99%) greater than 50 cfs; therefore, there is a high probability that the 50 cfs minimum flow requirement can be met during this time period without reductions of diversions, even with historical diversion patterns. However, mean daily flows have been below 50 cfs for 27% and 62% of the time during June and October, respectively, indicating that meeting the 50 cfs emergency base flow during this drought period is unlikely without reduced diversions. Such depletion of stream flows in lower Mill Creek occurred during previous severe drought years. For example, while June average monthly flows at the USGS MLM upstream gauge were above 100 cfs during 2014 (107 cfs) and 2015 (101 cfs), average flows were mostly depleted (34 cfs in 2014 and 21 cfs in 2015) at the downstream DWR MCH gauging location.

During the months of June and October, the flow requirement of 50 cfs will be relaxed if adult salmonids are not present and in need of higher flows. However, if adult salmonids are present, indicating a need for higher flows, then this requirement will be implemented.

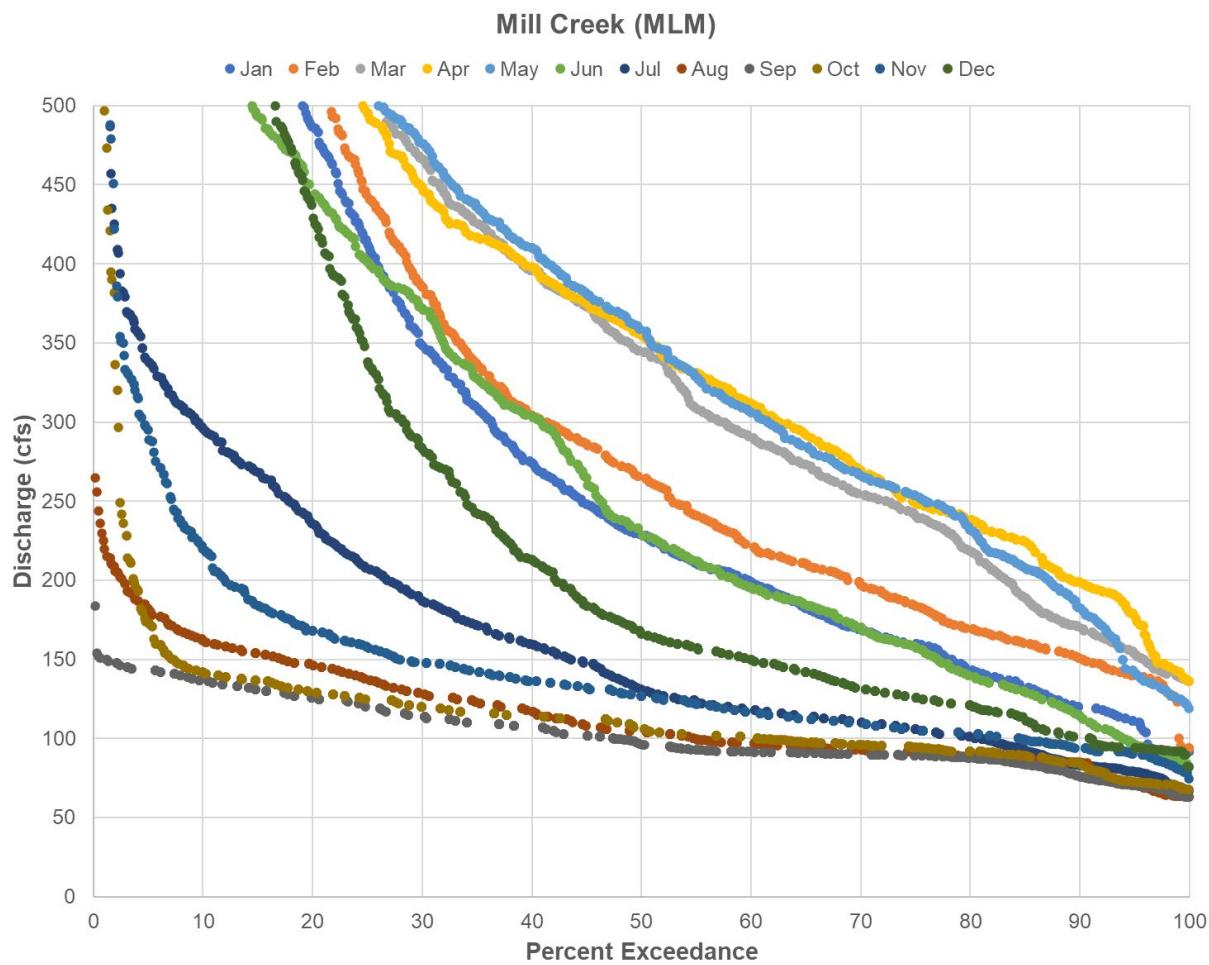


Figure 9. Daily flow exceedance plots at the USGS 11381500 gauging station (MLM) in Mill Creek. Data period: January 1999 – June 2022.

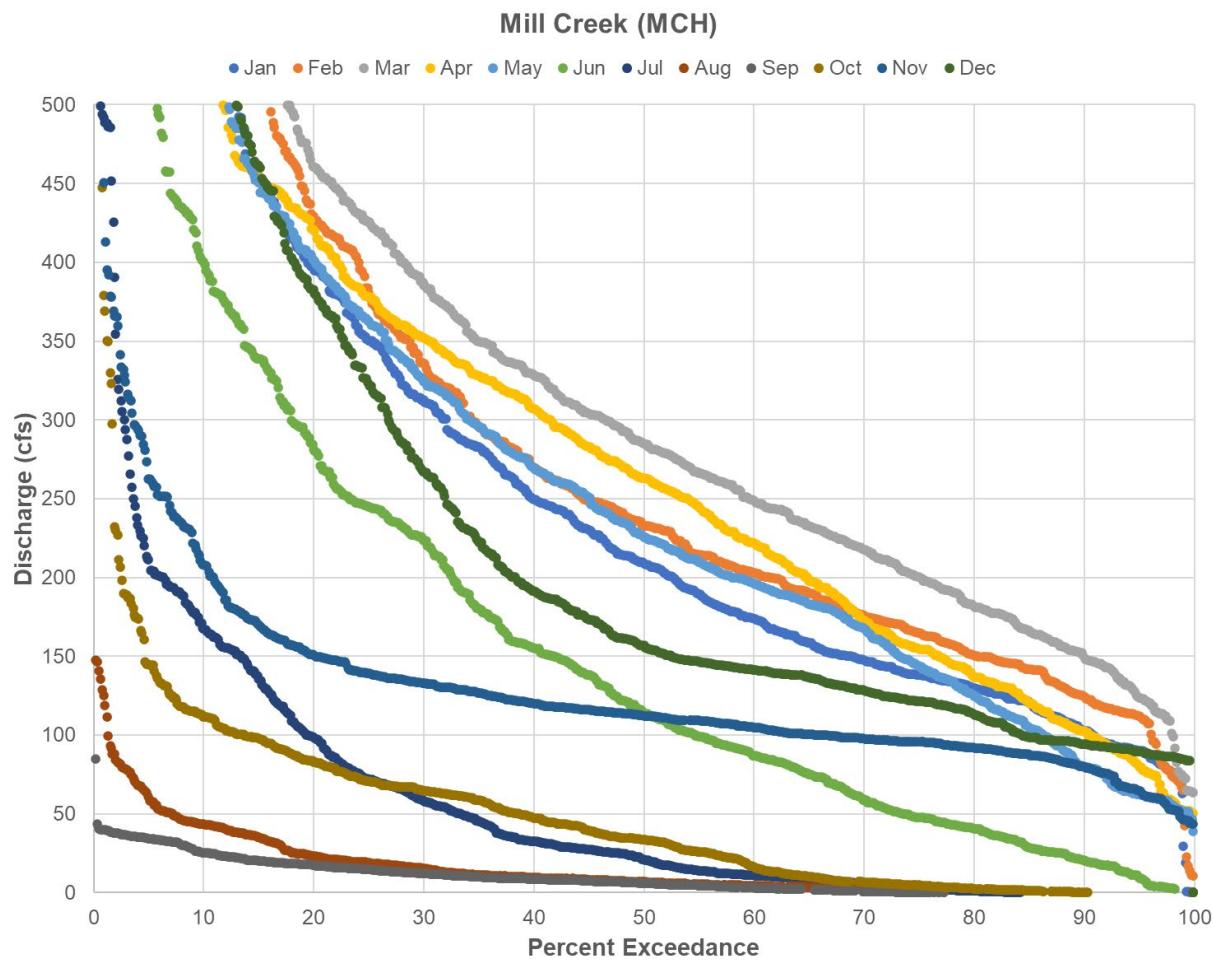


Figure 10. Daily flow exceedance plots at the DWR gauging station (MCH) in Mill Creek. Data period: January 1999 – June 2022.

Justification for Deer Creek Adult CV SR Salmon and Adult CCV Steelhead Base flow

As noted, NMFS and CDFW recommended that the State Water Board readopt, at a minimum, flow regulations similar to those adopted in 2015 and 2021 considering the immediate need for action to protect Mill Creek and Deer Creek CV SR salmon and CCV steelhead (CDFW, 2021a; NMFS, 2021a; CDFW 2022c; NMFS 2022). Like for Mill Creek in 2014, 2015, and 2021, the State Water Board adopted emergency regulations establishing base flows of 50 cfs in Deer Creek during that drought emergency for the protection of adult salmonids during the October 15 through June 15 time period.

The 2014 and 2015 emergency regulations' 50 cfs base flows supported adult CV SR salmon passage through lower Deer Creek. Fish passage data collected at the video monitoring station at the SVRIC Diversion Dam showed that 830 and 268 CV SR adult salmon passed the station in 2014 and 2015, respectively (Figures 11). Overall, passage dates were similar for the two critically dry years, e.g., from February 27 to June 4 in 2014 and from February 21 to June 4 in 2015. The majority of CV SR adult salmon, 76% in 2014 and 64% in 2015, migrated upstream during the emergency regulation base flow period of April 1 to June 15. Limited CV SR salmon migration was observed once instream flows dropped below 50 cfs and after June 15.

CV SR salmon migration patterns observed in 2020, 2021 and 2022 were similar to those in 2014 and 2015 (Figure 12). During 2021, 614 CV SR adult salmon were observed passing the SVRIC Diversion Dam. Due to "intolerable" temperature conditions during the summer of 2021 (CDFW 2022d), the final escapement estimate for Deer Creek CV SR salmon dropped to 282, evidenced by the limited spawning success in redd surveys. Temperature-dependent pre-spawning mortality appeared to be a major factor in this digression.

During 2022, the 2021 emergency regulations' 50 cfs base flows supported adult CV SR salmon passage through lower Deer Creek. Fish passage data collected at the video monitoring station at the SVRIC Diversion Dam showed that 383 CV SR adult salmon passed the station in 2022 (Figure 12). Passage dates were similar to 2014 and 2015, extending from March 3 to June 11. The majority of CV SR adult salmon, 64%, migrated upstream during the emergency regulation base flow period of April 1 to June 15. No CV SR salmon migration was observed once instream flows dropped below 50 cfs after June 15.

In 2007, as part of the Deer Creek Flow Enhancement Program, CDFW developed an adult upstream fish transportation flow objective of 50 cfs in Deer Creek. This minimum preliminary flow objective was derived from the comparable east-side streams in the Northern Sacramento Valley, such as Mill Creek (DCID, 2007). Due to the similarities in the geology, geomorphology, and hydrology of Deer Creek and Mill Creek, the State Water Board has concluded that comparison between these two watersheds is justified.

As part of a field and aerial photography review of passage and stream conditions in the lower Deer Creek, researchers identified multiple locations with 0.5 feet or less water depth at 49 cfs (Kopp and Demko, 2014). Overall, the assessment identified 6 locations in the creek that would have water depths 1 foot or less at 49 cfs; however, it appeared that all but one location would be passable for adult and juvenile salmonids at flows less than 50 cfs.

In 2017, CDFW performed an instream flow study for Deer Creek (CDFW, 2017b); however, CDFW has not yet produced an instream flow criteria recommendation. Nevertheless, the empirical analyses suggest similarities in the instream flow needs between Deer Creek and Mill Creek. For example, the instream flow study conducted by CDFW for the Deer Creek concluded that a flow of 145 cfs is required to achieve the smallest increment of two feet of stream width meeting the 0.9 feet depth criteria for Chinook salmon passage, which is similar to what was found for Mill Creek (140 cfs, CDFW, 2017a). Likewise, a flow of 75 cfs was required to generate the smallest increment of two feet stream width meeting the 0.7 feet depth criteria for adult CCV steelhead migration, which is similar to the 90 cfs needed in Mill Creek. Implementation of the 50 cfs base flow requirement in Deer Creek should support adult CV SR salmon migration during critical drought periods; however, this base flow is not adequate for the long-term management of the species.

During the fall of 2014 and 2015, adult CCV steelhead passage occurred immediately following the implementation of the emergency regulation base flows (50 cfs for adult CCV steelhead) at Deer Creek (Figure 13). Flows higher than 50 cfs were observed at the DWR DVD gauge beginning October 16 in 2014 and October 23 in 2015. Similar patterns of adult CCV steelhead passage in response to increased stream flows during fall were observed at Deer Creek in 2019, 2020 and 2021, with 2021 fall flows being provided per curtailments under the emergency regulation (Figure 14).

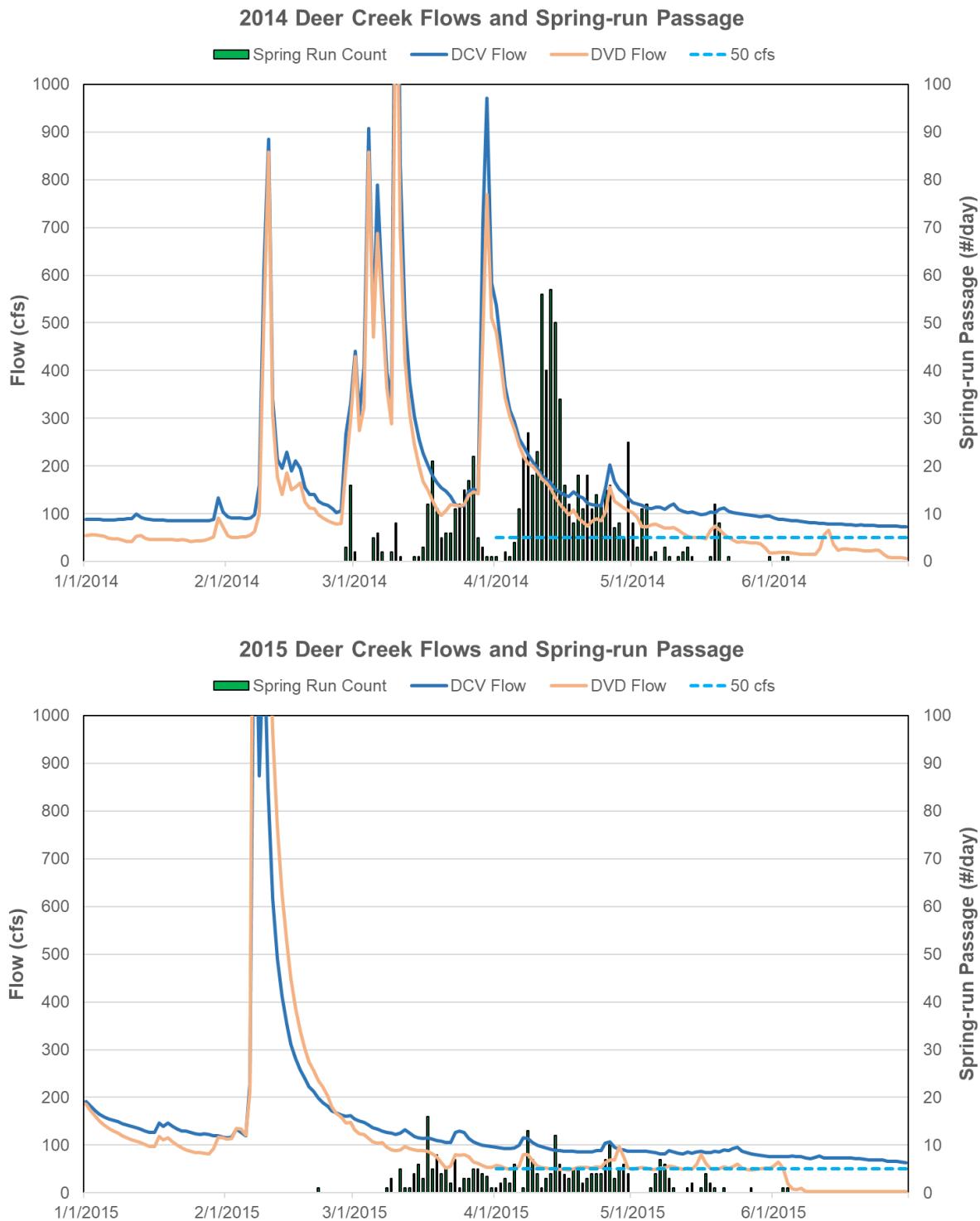
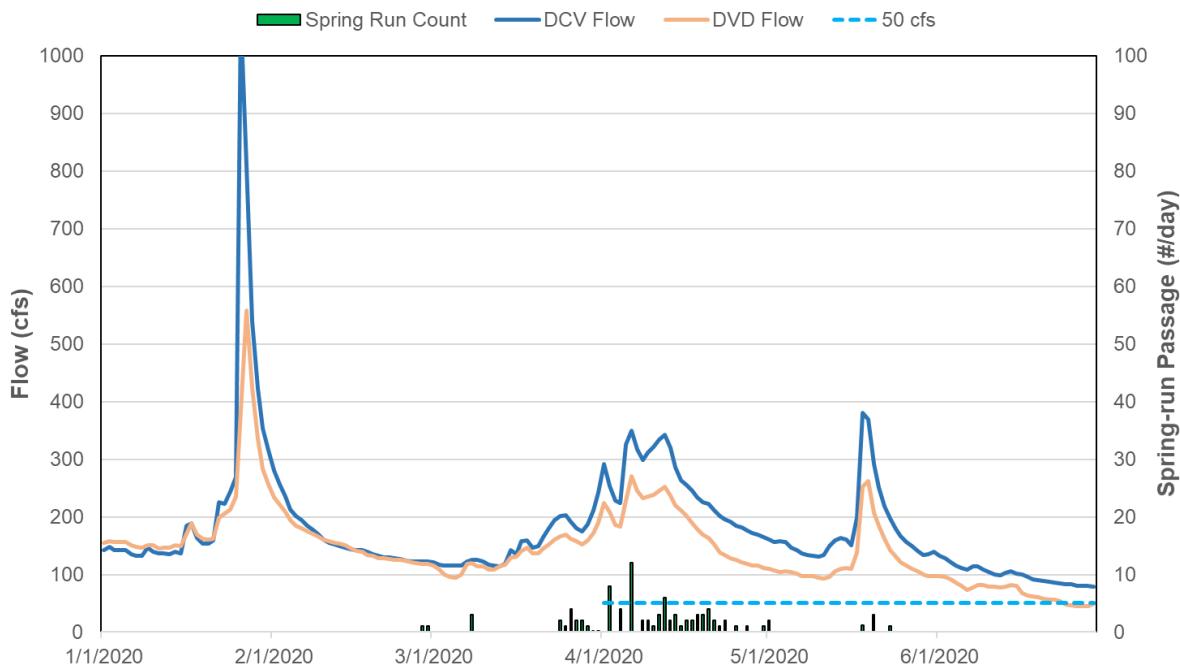
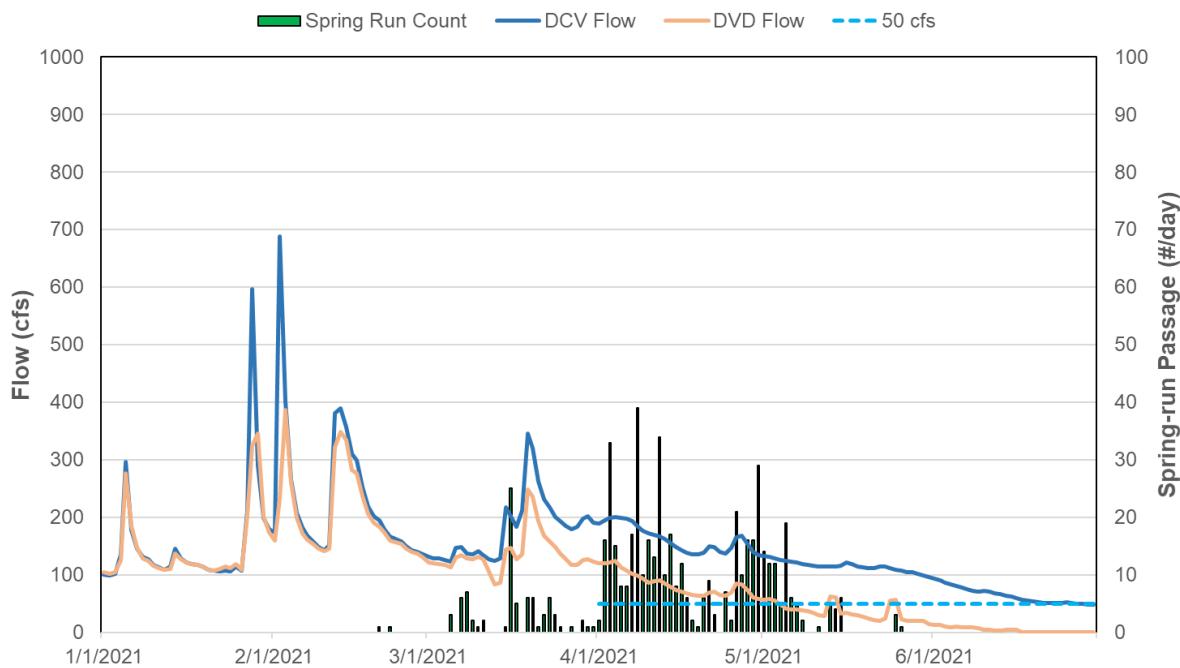


Figure 11. Daily stream flows at USGS (DCV) and DWR gauges (DVD) and adult CV SR salmon passage observed at the video station in the Deer Creek in 2014 and 2015.

2020 Deer Creek Flows and Spring-run Passage



2021 Deer Creek Flows and Spring-run Passage



2022 Deer Creek Flows and Spring-run Passage -- Provisional

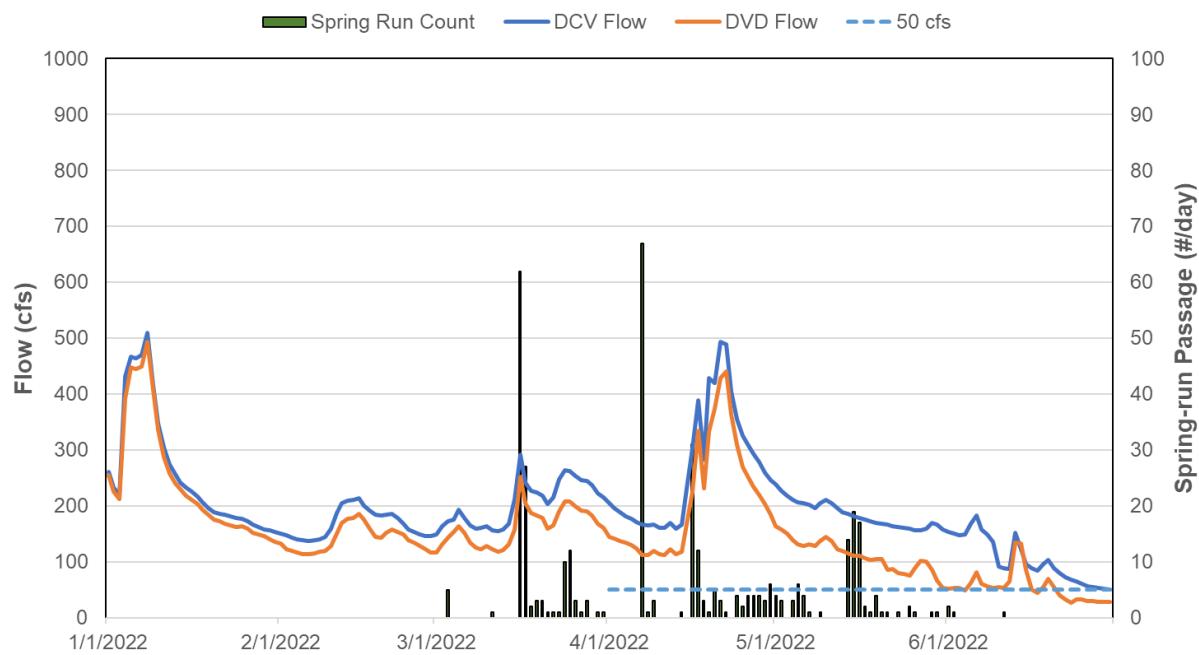


Figure 12. Daily stream flows at USGS (DCV) and DWR gauges (DVD) and adult CV SR salmon passage observed at the video station in the Deer Creek in 2020, 2021 and 2022.

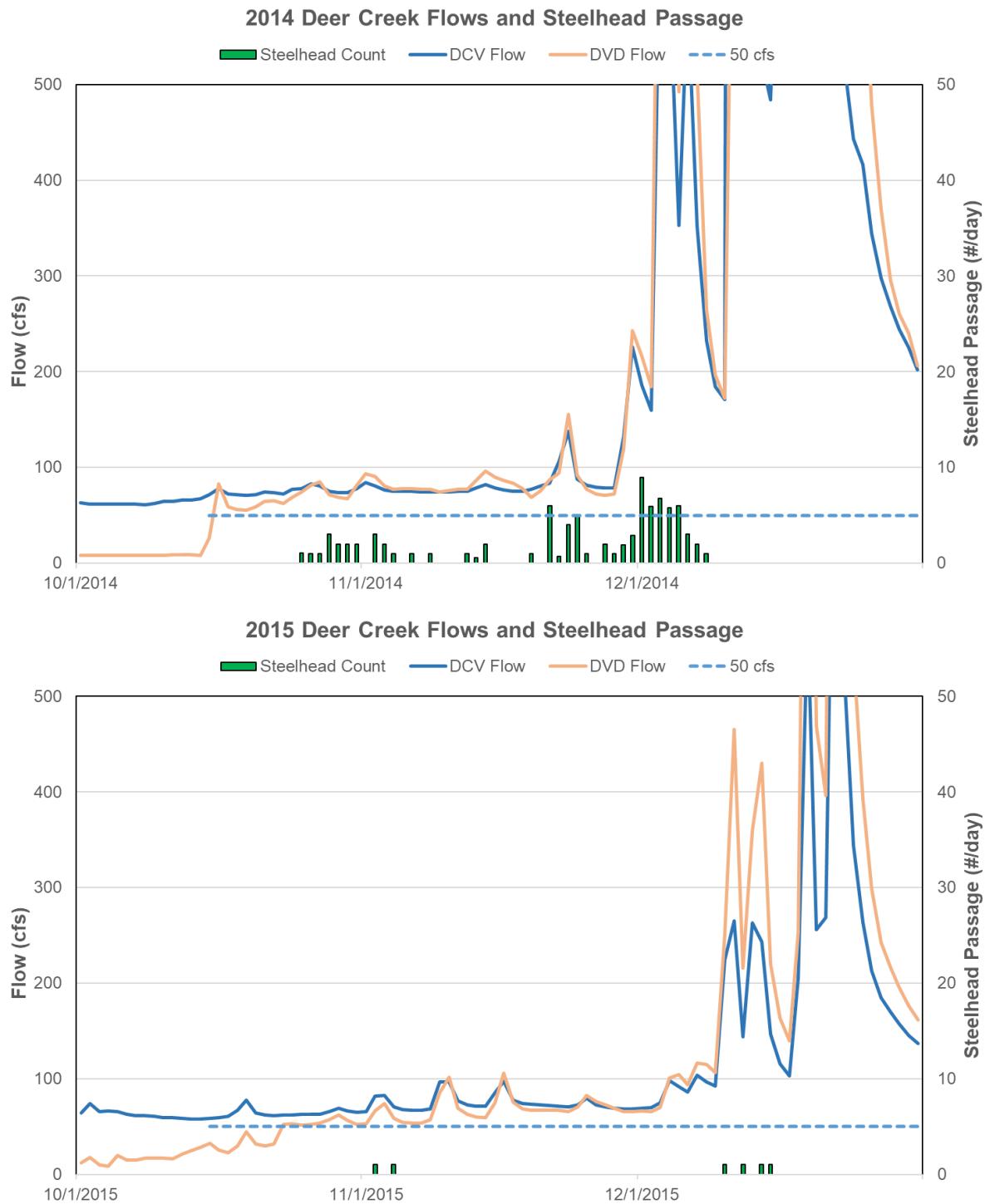
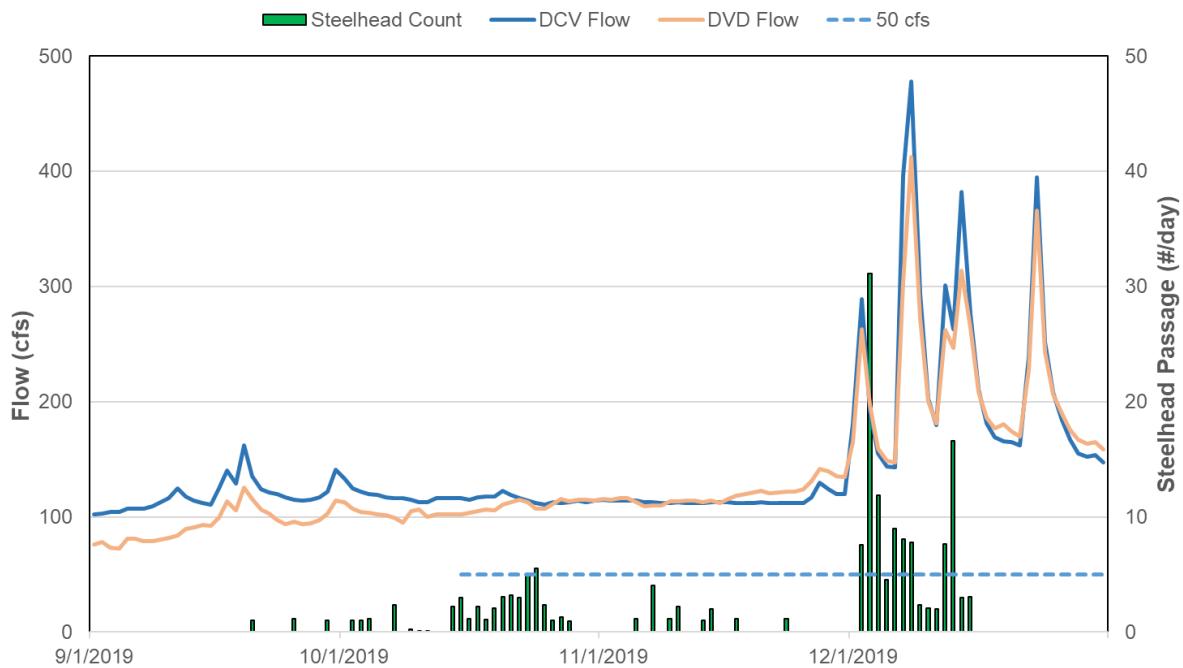
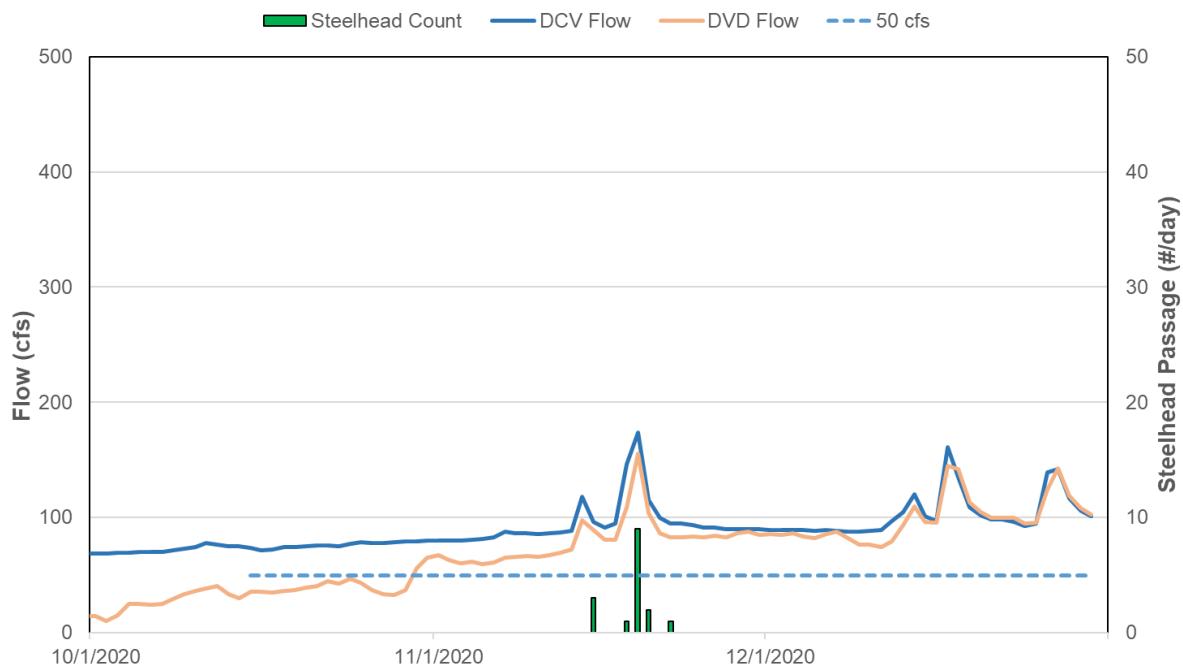


Figure 13. Daily stream flows at USGS (DCV) and DWR gauges (DVD) and adult CCV steelhead passage observed at the video station in the Deer Creek in 2014 and 2015.

2019 Deer Creek Flows and Steelhead Passage



2020 Deer Creek Flows and Steelhead Passage



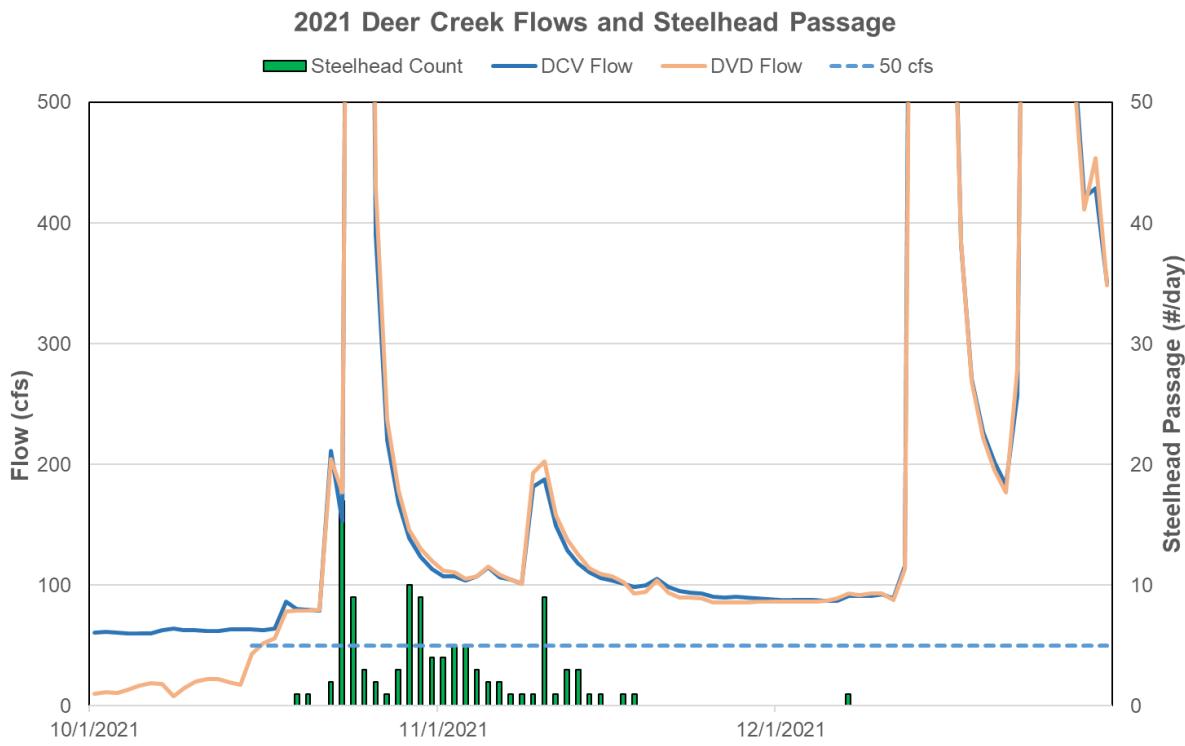


Figure 14. Daily stream flows at USGS (DCV) and DWR gauges (DVD) and adult CCV steelhead passage observed at the video station in the Deer Creek in 2019, 2020 and 2021.

Daily stream flow data collected at DCV and DVD gauging stations from October 1998 to June 2022 were analyzed to assess whether the proposed drought emergency regulation flows would be needed to provide minimal instream flows to allow for passage of CV SR salmon and CCV steelhead in Deer Creek. This time period represents the period of available quality flow data at both gauging stations and also reflects the hydrological conditions in recent decades.

During the October 1998 to June 2022 time period, daily stream flows at the USGS 11383500 gauging station (DCV), located upstream of significant water diversions, were greater than 50 cfs 100 percent of the time from October 15 to June 15 (Figure 15). However, daily flows at the DWR gauging station (DVD), located further downstream below major diversions, were frequently lower than 50 cfs, especially during October and June (Figure 16). Average monthly flows at DVD during December 1 through May 31 were mostly greater than 50 cfs 100% of time; therefore, there is a high probability that the 50 cfs minimum flow requirement can be met during this time period without reductions of diversions, even with historical diversion patterns. Daily flows during November were greater than 50 cfs more than 97% of time. However, mean daily flows have been below 50 cfs for 53% and 52% of the time during June and October, respectively, indicating that meeting the 50 cfs drought emergency base flow during this drought period is unlikely without reduced diversions. Such depletion of stream flows in Deer Creek occurred during previous severe drought years. For example, while June average monthly flows at the upstream USGS DCV gauge were above 50 cfs during 2014 (79 cfs) and 2015 (72 cfs), average flows were mostly depleted (22 cfs in 2014 and 9 cfs in 2015) at the downstream DWR DVD gauging location. If adult salmonids are present indicating a need for higher flows, then this requirement will be implemented.

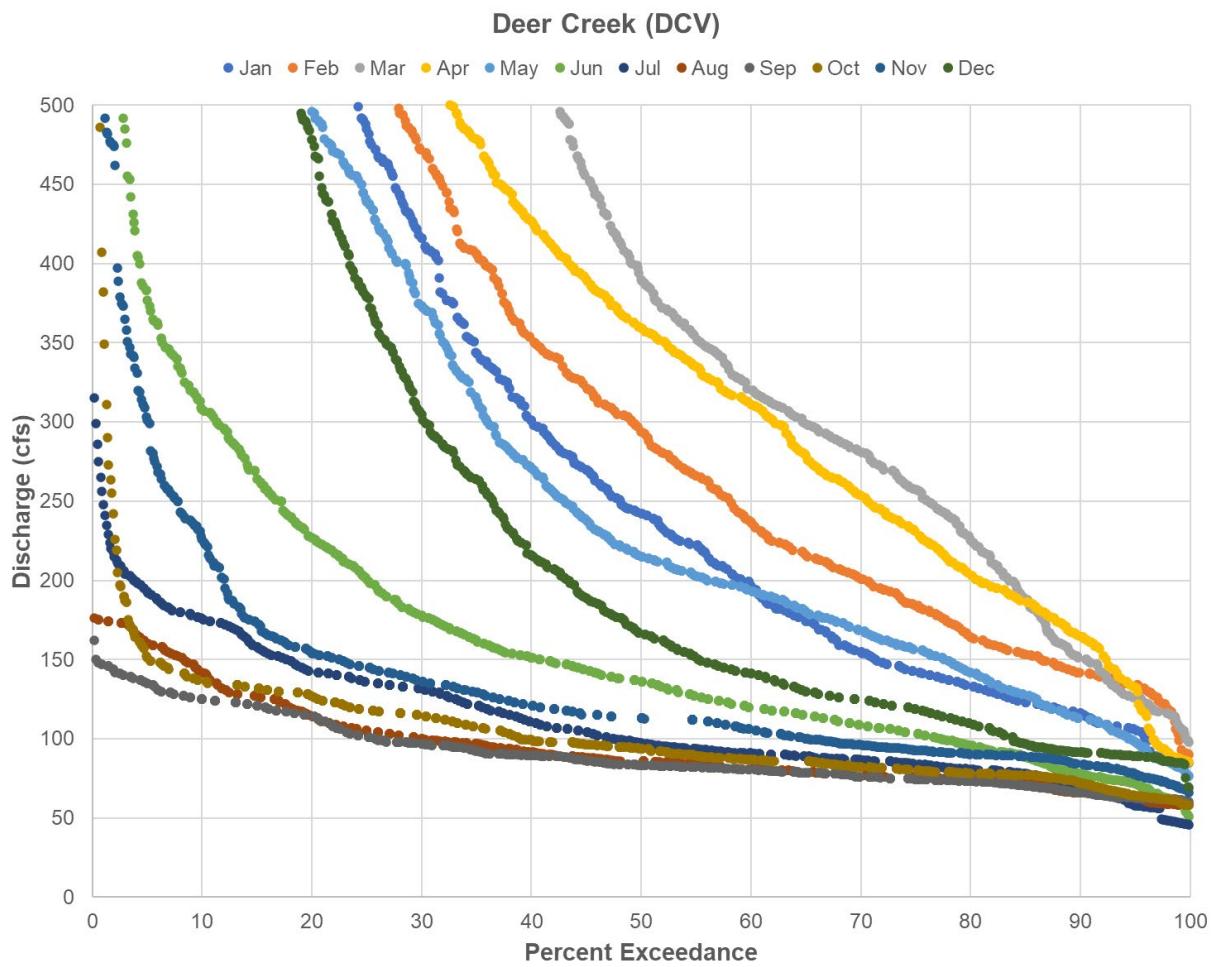


Figure 15. Daily flow exceedance plots at the USGS 11383500 gauge (DCV) in Deer Creek. Data period: October 1998 – June 2022.

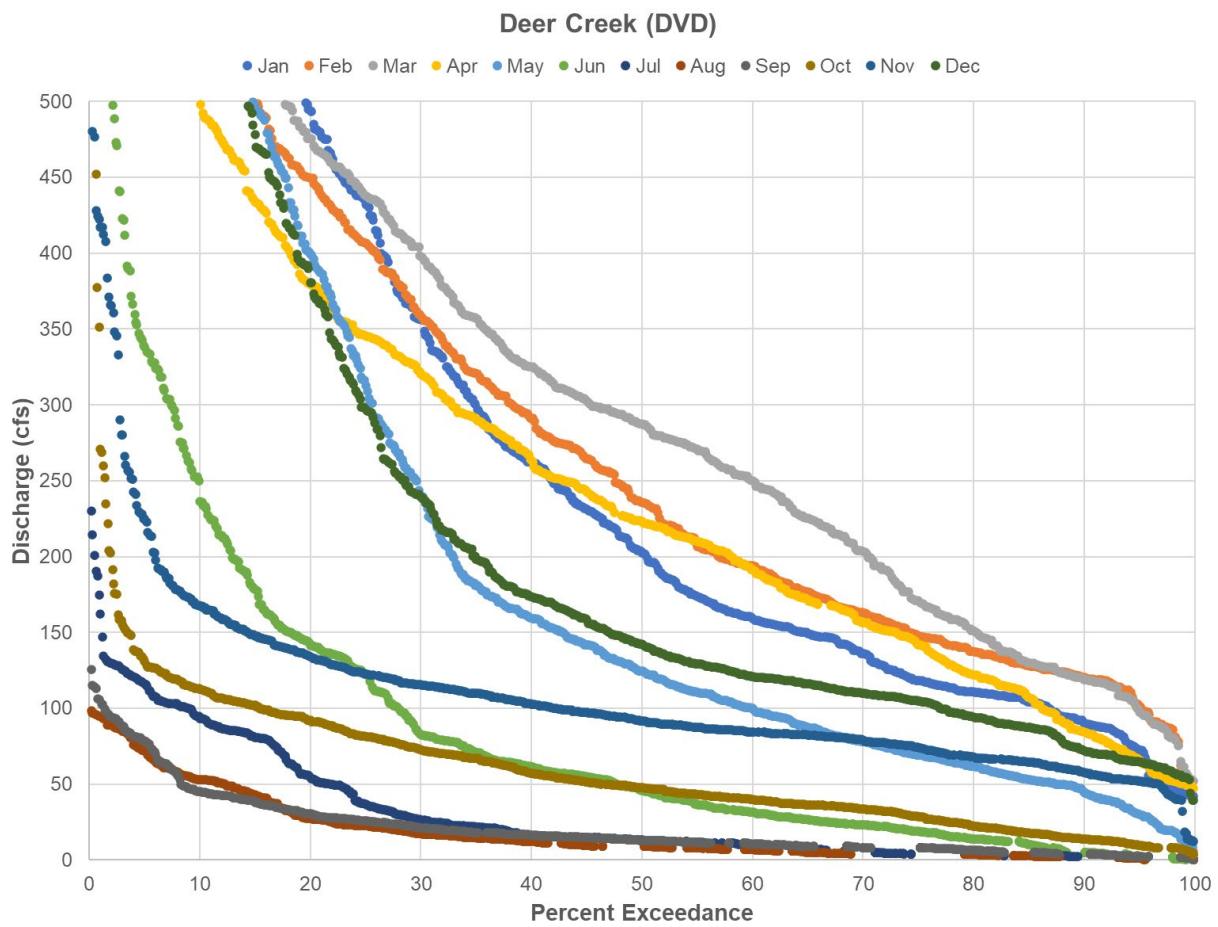


Figure 16. Daily flow exceedance plots at the DWR gauge (DVD) in Deer Creek.
Data period: October 1998 – June 2022.

Adult Pulse Flows: A pulse flow is a substantial increase in river discharge over a period of days or weeks, which, among other benefits, provides fishes with an opportunity and physical cues to move to seasonal habitats. Pulse flows help juvenile fish to swim towards the ocean and trigger adult fish to swim towards their native spawning habitats. Additionally, pulse flows can result in water temperature reductions or provide fish access to floodplain habitats, both of which can benefit native fishes. Historically in the Central Valley, relatively low-magnitude natural pulse flows occurred from late autumn until early spring in response to rainfall, followed by snow melt-driven pulses from spring through early summer (Zeug et al., 2014). Under the proposed and prior emergency regulations on Mill and Deer creeks, pulse flows can be implemented by requiring short duration bypasses (i.e. limitations on diversions) of higher flow volumes than the base flow amounts (State Water Board 2014b, State Water Board 2015a, State Water Board 2021c).

The State Water Board has determined that the pulse flows recommended by CDFW, in consultation with NMFS, of full inflow without diversions in Mill Creek and Deer Creek exceeds the pulse flow volume necessary to provide adequate protection of Adult CV SR salmon under the existing drought conditions during April 1 to June 15 in Mill Creek and Deer Creek. The State Water Board has determined that pulse flows of 100 cfs or full natural flow without diversions, whichever is less, in Mill Creek and Deer Creek (April 1-June 15) are necessary to balance beneficial uses existing under these drought conditions. These pulse flows provided positive responses to salmon migration in 2014 and 2015, and again during 2021 and 2022. (CDFW 2014b; CDFW 2021c; CDFW 2022d)

The proposed and prior emergency regulation also includes a flow ramp down period at the end of a pulse flow as required by the Deputy Director if requested by CDFW or NMFS. A ramp down period for pulse flows is a common fisheries management practice and aids in the prevention of stranding of fish (Nagrodska et al., 2012). Pulse flows may be implemented when adult CV SR salmon are observed in the lower reaches of Deer Creek or Mill Creek, upon request by CDFW or NMFS. This requirement applies to each pulse flow event indicated above. The flow ramp down period is part of the pulse flow period. When required, pulse flows are in lieu of and not in addition to base flow requirements for the duration of the pulse flow. The pulse flow duration will last a minimum of 24 hours to a maximum of 72 hours determined by the presence of fish observed and desired migration movements upstream. The duration will be determined by the Deputy Director in consultation with CDFW and NMFS. This determination is based on a review of the best available science and information discussed below.

Justification for Mill Creek and Deer Creek Adult CV SR Salmon Pulse Flow

CDFW, in consultation with NMFS, recommended providing three pulse flows on Deer Creek and two pulse flows on Mill Creek between April 1, 2022, and June 15, 2022, as

an additional flow action necessary to protect listed salmonids during drought conditions (CDFW 2022e; CDFW, 2022f). Salmonids have evolved to take advantage of natural pulse flow events to successfully complete their freshwater migration. Elevated water levels, in the form of pulses that represent natural hydrology, are a major cue for the upstream migration of adult fish. With the uncertainties of flow availability during drought conditions, managed pulse flows are a critical fisheries management tool to utilize in impaired stream reaches (CDFW 2014a; NMFS 2014a).

CDFW has documented the association between pulse flow events and increased numbers of adult CV SR salmon migrating in Mill Creek during periods of drought. For example, in May 2013 CDFW coordinated a cessation of diversions at Ward Dam with the LMMWC to temporarily increase the lower Mill Creek flow from 55 cfs to 94 cfs (CDFW, 2014a). During the three-day pulse flow event, thirty-two adult CV SR salmon were observed passing through a video monitoring station. Coordinated and natural pulse flow events during the 2014 and 2015 drought period were associated with increased upstream migration of adult CV SR salmon (CDFW, 2017a) (Figure 5). In 2014, 13% of the CV SR salmon run in Mill Creek (88 fish) passed during pulse flows (CDFW, 2014b). Two small flow pulses were provided in Mill Creek on May 18 and 28, 2021, with average daily flows of 134 cfs and 85 cfs, respectively, that resulted in increased CV SR salmon passage (CDFW 2021c) (Figure 6). During the spring of 2022, the unimpaired flows on Mill Creek were elevated by storm events that provided natural pulse flows, precluding the need for the implementation of emergency regulation pulse flows to support CV SR upstream migration. A juvenile pulse flow was implemented on June 12 and coincided with a precipitation event, resulting in an average daily flow of 227 cfs at MCH on June 13 (Figure 6).

Similar to Mill Creek, pulse flow events on Deer Creek are associated with increased CV SR salmon migration. For example, during 2014 and 2015, CDFW coordinated pulse flow events that facilitated upstream adult salmonid passage (CDFW 2017b; Figures 5 and 11). In addition, two small flow pulses were provided in Deer Creek during the spring of 2021 with average daily flows of 62 cfs and 56 cfs on May 13 and May 25, respectively, resulting in increased CV SR salmon passage (Figure 12). During the spring of 2022, two flow pulses were implemented that resulted in average daily flows of 101 cfs and 134 cfs on May 27 and June 12, respectively. Adult fish movement in response to the May pulse was observed (CDFW 2022d) (Figure 12). The June pulse flow event did not appear to facilitate fish movement, likely due to the majority of the fish emigrating earlier in the season due to late spring storms.

Based on this information, the State Water Board has determined that a spring pulse flow of 100 cfs following a base flow period of 50 cfs is expected to facilitate adult CV SR salmon migration on Mill and Deer creeks, while minimizing impacts to other beneficial uses of water. The State Water Board has determined that the number and

timing of pulse flow events should be determined through an evaluation of the relevant environmental and biological factors to allow for more flexibility and to maximize the beneficial use of water.

Emergency Minimum Instream Base Flows and Pulse Flows if Juvenile CV SR Salmon or Juvenile CCV Steelhead are Present and Adult CV SR Salmon and/or Adult CCV Steelhead are not Present from October 15 through June 30 on Mill Creek and Deer Creek

Juvenile Base Flows: The State Water Board has determined that the emergency minimum base flow recommended by NMFS in consultation with CDFW of 20 cfs or full inflow without diversions in Mill Creek and Deer Creek (October 15-June 30) are necessary to provide adequate protection of juvenile CV SR salmon and CCV steelhead under the existing drought conditions. This determination is based on a review of the best available science and information discussed below.

Justification for Mill Creek Juvenile CV SR Salmon and Juvenile CCV Steelhead Base Flow

NMFS and CDFW have recommended a base flow of 20 cfs during this drought emergency for the protection of juvenile salmonids in Mill Creek during the October 15 through June 30 time period.

A critical riffle assessment conducted in 1995 (D.W. Alley & Associates, 1996) concluded that 27 cfs is expected to provide good juvenile passage conditions in the lower 5.25 miles of Mill Creek. Additionally, the study conducted by D.W. Alley & Associates (1996) found that it was appropriate to assume that CCV steelhead and CV SR salmon juveniles would out-migrate at comparable sizes, and that 27 cfs is appropriate for both species.

Juvenile salmonid monitoring data using rotary screw traps on Mill Creek (CDFW, 2021c) indicate that there are two primary CV SR salmon juvenile migration periods, from mid-October to mid-January and from early-March to mid-June. CCV steelhead also have similar migration periods. CV SR salmon originating from tributary systems such as Mill Creek exhibited slow growth rates and delayed outmigration timing resulting from low water temperatures in high elevation rearing habitats. Inadequate flows might impact outmigration of juvenile Chinook salmon and steelhead (CDFW 2017a). The delayed growth and outmigration timing often occurs during periods of low flows and elevated water temperatures in the lower reaches. Low streamflow in lower Mill Creek was identified as a major limiting factor affecting successful passage to the mainstem Sacramento River and survival of CV SR salmon juveniles (Notch et al., 2020). While emergency drought base flows of 50 cfs were provided, CV SR salmon juveniles out-migrating during 2014 and 2015 had the lowest survival rates among the 5-year study period from 2013 to 2017 (Notch et al., 2020).

CDFW (2012) collected daily rotary screw trap data on Mill Creek juvenile spring-run and fall-run Chinook out-migrants over the period of 1996-2009 and found that mean daily flows above 20 cfs were typical during juvenile outmigration.

Based on the flow data analyzed (January 1999 – June 2022), average daily stream flows at the USGS gauge 11381500 (MLM) were greater than 20 cfs 100 percent of the time during October-June (Figure 9). However, at the DWR gauge (MCH) which is located below major water diversions, monthly average flows were below 20 cfs 10 percent of the time during June and 40 percent of the time during October; daily average flows were higher than 20 cfs during November-May (Figure 10). Therefore a 20 cfs flow requirement for juvenile salmonid migration from November 1 through May 31 has a high probability of being met under historical diversion patterns. However, during June and October, it is more likely that diversion reductions will be necessary to meet flow objectives under severe drought conditions.

Justification for Deer Creek Juvenile CV SR Salmon and Juvenile CCV Steelhead Base Flow

NMFS and CDFW have recommended a base flow of 20 cfs during this drought emergency for the protection of juvenile salmonids in Deer Creek during the October 15 through June 30 time period.

Juvenile salmonid monitoring data using rotary screw traps in Deer Creek (CDFW, 2021c) indicate that there are two primary CV SR salmon juvenile migration periods, from mid-October to mid-January and from early-March to mid-June. CCV steelhead also have similar migration periods. It is assumed that the base flow requirements for lower Deer Creek to sustain adequate passage and survival for out-migrating juveniles is similar to those for Mill Creek, given the similarities in stream hydrology and distribution of salmonid spawning and rearing habitats. During October 1998 – June 2022, average daily stream flows at the USGS gauge 11383500 (DCV) were greater than 20 cfs in 100 percent of the time during October-June (Figure 15). However, at DWR gauge (DVD), which is below significant valley diversions, average monthly flows were below 20 cfs 3 percent of the time during May, 27 percent during June, and 16 percent during October; flows were greater than 20 cfs in other months (Figure 16). Therefore a 20 cfs flow requirement from November 1 through May 31 has a high probability of being met under historical diversion patterns, but during June and October it is more likely that diversion reductions will be necessary under severe drought conditions.

Juvenile Pulse Flows: The State Water Board has determined that pulse flows of 100 cfs or full flow without diversions, whichever is less, in Mill Creek and Deer Creek (June 1-June 15) are necessary to provide adequate protection of juvenile CV SR salmon and juvenile CCV steelhead under the existing drought conditions. Pulse flows may be

required when juvenile CV SR salmon or CCV steelhead are observed in the lower reaches of Deer Creek or Mill Creek. When required, pulse flows are in lieu of and not in addition to base flow requirements for the duration of the pulse flow. A flow ramp down period at the end of a pulse flow may be included if requested by CDFW or NMFS. The flow ramp down period is part of the pulse flow period. The pulse flow duration will last a minimum of 24 hours to a maximum of 48 hours determined by the presence of fish observed and desired migration movements downstream into the Sacramento River. The pulse flows are designed to push juvenile salmonids out of each tributary and into the Sacramento River before curtailments are ceased and low streamflow conditions affect instream habitat connectivity with the Sacramento River. The duration will be determined by the Deputy Director in consultation with CDFW and NMFS. This determination is based on a review of the best available science and information discussed below.

Justification for Mill Creek and Deer Creek Juvenile CV SR Salmon and Juvenile CCV Steelhead Pulse Flows

NMFS and CDFW have recommended that the State Water Board adopt pulse flow requirements in Mill Creek and Deer Creek for juvenile CV SR salmon and CCV steelhead similar to those adopted in 2015. Pulse flow events provide short-term benefits to juvenile Chinook out-migrants and are hypothesized to synchronize downstream movement of juveniles (Jager and Rose 2003). Mill Creek and Deer Creek are often completely or nearly dewatered during the late spring and summer. The pulse flow events are necessary to cue the juveniles to migrate out of the creeks prior to losing connectivity to the Sacramento River. A ramp down period for pulse flows is common practice and aids in the prevention of stranding of fish (Nagrodska, et al., 2012). Juvenile outmigration data from several other Delta tributary watersheds indicates that pulse flow events tend to prompt juvenile Chinook outmigration (Demko and Cramer, 1995; CDFW, 2004; Montgomery et al., 2009).

Flow pulses help to sustain adequate passage conditions for and survival of outmigrating juvenile salmonids during drought emergency conditions. Despite the emergency drought base flows of 50 cfs provided during 2014 and 2015, outmigrating CV SR salmon juvenile suffered the highest mortality rates in lower Mill Creek among a 5-year study period from 2013-2017 (Notch et al., 2020). The low juvenile outmigration survival was attributed to the low stream flows and elevated water temperature in the lower Mill Creek reach. Flows much higher than the 50 cfs base flows would be needed to ensure successful passage and to maintain high survival rates during the juvenile salmonid outmigration period, which contributes to sustainable spawning adult populations (Notch, 2017; Notch et al., 2020). Higher flows provided as flow pulses could improve juvenile outmigration conditions. During the spring of 2022, late-season

rainstorms resulted in naturally elevated flow pulses and cool water temperatures to facilitate the outmigration of salmonid smolts (CDFW 2022d).

Proposed Emergency Regulation Section 876.7

Proposed section 876.7 would prohibit, for the duration of the emergency regulation, inefficient domestic lawn watering irrigation practices in the Mill Creek and Deer Creek watersheds. There are several alternatives to the flood irrigation of domestic lawns that could be employed in the Mill Creek and Deer Creek watersheds. Cessation of inefficient flood irrigation of domestic lawns will help to maximize the beneficial use of water during this period of extreme drought. For purposes of this regulation, inefficient surface water use for domestic lawn watering means the application of more than 18.5 gallons per day per 100 square feet, which is the quantity identified in California Code of Regulations, title 23, section 697 as reasonably necessary to support a new water right application.

Proposed Emergency Regulation Section 878.4

Proposed section 878.4 provides that water right holders and claimants in Mill Creek and Deer Creek watersheds subject to a curtailment order may propose local cooperative solutions or voluntary agreements with NMFS or CDFW that achieve the purposes of the curtailment process described under section 876.5 as an alternative to curtailment. Proposals must demonstrate that the cooperative solutions or voluntary agreements will not injure non-party legal users of water or result in an unreasonable impact on fish and wildlife. The Deputy Director may approve a proposal subject to conditions, including record keeping and reporting requirements. Diversions made under such proposals are subject to the terms of Article 24, including reporting, compliance, and enforcement.

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Mandate on Local Agencies or School Districts

The proposed emergency regulation does not impose a new mandate on local agencies or school districts because it does not mandate a new program or a higher level of service of an existing program. The regulation is generally applicable to public and private entities and is not unique to local government. No state reimbursement is required by part 7 (commencing with section 17500) of Division 4 of the Government Code.

Suspension of California Environmental Quality Act

As stated above, Governor Gavin Newsom issued a Proclamation on May 10, 2021, addressing the drought state of emergency in all counties in the Delta watershed. Among other things, the Proclamation suspended the California Environmental Quality Act (CEQA) as applied to the State Water Board's adoption of an emergency regulation to curtail diversions in the Delta watershed when water is not available under the diverter's priority of right, to ensure the protection of water needed for health, safety, and the environment, and to ensure critical instream flows for species protections. CEQA is therefore suspended as to adoption of this regulation. On March 28, 2022, Governor Newsom affirmed the continued state of drought emergency for California and affirmed and extended authorities under prior drought proclamations, including related to CEQA.

Cost Estimate

The fiscal effects resulting from the proposed emergency regulation are the costs that would be incurred by state and local government agencies to respond to any requirements therein, pursuant to Government Code section 11346 et seq. This Fiscal Impact Statement has been prepared in accordance with State Administrative Manual 6600-6616.

The fiscal effect on local and state government agencies as a result of the proposed emergency regulation includes: (1) the costs to complete and submit certification forms; (2) revenue losses and other costs for public water supply agencies; and (3) state and local tax revenue losses.

The State Water Board estimates the total cost to all state and local agencies due to the proposed emergency regulation will be \$319,443. The total reporting costs for all state and local agencies to complete and submit compliance certification forms are estimated to be up to \$130. Total revenue losses for public water supply agencies are estimated to be \$133,110, and additional costs for conservation and enforcement are estimated to be

\$66,550. Total state and local tax revenue losses are estimated to be \$119,663, including \$115,714 to state government and \$3,949 to local government. The total fiscal impact to state governmental agencies is estimated to be \$115,779, and the total fiscal impact to local governmental agencies is estimated to be \$203,664.

The proposed regulations are not anticipated to have a financial impact on school districts or to result in costs or savings in federal funding to the State.

Attachment 1 details how these costs were estimated.

ATTACHMENT 1: FISCAL IMPACT STATEMENT

Fiscal Effect on State and Local Government

Summary

The fiscal effects resulting from the proposed emergency regulation for Mill and Deer Creek watersheds are the costs that would be incurred by state and local government agencies to respond to any requirements therein, or otherwise due to the requirements therein and the savings to state and local government agencies, pursuant to Government Code section 11346 et seq. This Fiscal Impact Statement has been prepared in accordance with State Administrative Manual 6600-6616.

The fiscal effect on local and state government agencies as a result of the proposed emergency regulation includes: (1) the costs to complete and submit certification forms; (2) revenue losses and other costs for public water supply agencies; and (3) state and local tax revenue losses.

The State Water Board estimates the total cost to all state and local agencies (including city, county, schools, and publicly owned water suppliers) due to the proposed emergency regulation will be \$319,443. The total reporting costs for all state and local agencies to complete and submit compliance certification forms is estimated to be up to \$130. Total revenue losses for public water supply agencies are estimated to be \$133,110, and additional costs for conservation and enforcement is estimated to be \$66,550. Total state and local tax revenue losses are estimated to be \$119,663, including \$115,714 to state government and \$3,949 to local government. The total fiscal impact to state governmental agencies is estimated to be \$115,779, and the total fiscal impact to local governmental agencies is estimated to be \$203,664.

The proposed regulations are not anticipated to have a financial impact on school districts or to result in costs or savings in federal funding to the State.

Fiscal Costs of Proposed Reporting Requirements

The fiscal effect on local and state government agencies as a result of the proposed reporting requirement includes the costs to complete and submit certification forms. The time and effort required to submit the certification forms is considered an additional cost of compliance for these water right holders and claimants.

The proposed regulation would require all water right holders in Mill and Deer Creek watersheds to complete and submit a certification form upon receipt of orders, in the event they have not done so already in response to the 2021 curtailment orders. The State Water Board determined the total number of water right records held by state and local government agencies in the Mill and Deer watersheds and multiplied that number by an estimated average time to complete a simple online certification form multiplied by

an average staff cost per hour. Based on information compiled from the State Water Board's Electronic Water Rights Information Management System (eWRIMS) database, water right holders and claimants representing 65 water rights and claims (22 in Mill Creek and 43 in Deer Creek) would receive an order and would be required to submit a certification form. These diverters include one state agency (California Department of Transportation) and one local special district (Deer Creek Irrigation District), each with one water right or claim. The estimated maximum amount of time to complete the required certification form as a result of the proposed regulation is one hour of staff time per water right record at an assumed pay rate of \$65 per hour. The cost to local and state governmental agencies for this requirement is therefore up to \$130 in total, and likely less because only those that have not filled out a form in response to 2021 curtailment orders would be required to do so.

Fiscal Costs of Implementation of Drought Emergency Minimum Flows

This section presents the methods used to estimate the fiscal effects on state and local government that could result from implementation of the proposed drought emergency minimum flows. The period covered by the regulation is assumed to be one year (365 days) from date of enactment.

The fiscal effect on state and local government is comprised of the following elements:

1. A reduction in agricultural and municipal water agency revenues from lost water sales;
2. Additional costs to public agencies for conservation and enforcement; and
3. Loss in state and local tax revenue associated with reduced public agency revenues and reduced agricultural production resulting from curtailed agricultural supply.

Section 6605 of the State Administrative Manual considers local government to include cities, counties, and special districts. Deer Creek Irrigation District (DCID) is an independent special district organized under the Irrigation District Laws of the State of California (DCID, 1944), and is the only local governmental agency with a water right or claim in either the Deer Creek or Mill Creek watersheds. Some other water right holders in the watersheds, such as Stanford Vina Ranch Irrigation Company (SVRIC), Los Molinos Mutual Water Company, and Mill Creek/Lassen Mutual Water Company, are formed as Non-Profit Mutual Benefit Corporations for water services to the benefit of its members and are not considered state or local governmental agencies in this fiscal analysis. Other diverters on Mill and Deer creeks include individuals, non-governmental organizations, and private entities.

Water Supply and Demand Data

The proposed emergency regulation would impose drought emergency minimum flow requirements on Mill and Deer creeks. Compliance with the drought emergency minimum flow requirements could result in reductions in surface water diversions to

maintain the drought emergency minimum flow requirements at Mill Creek below Highway 99 (MCH) and Deer Creek below Stanford Vina Dam (DVD) gauges. The text below describes how Mill and Deer Creek stream flows measured at these gauges were compared to the drought emergency minimum flow requirements. During some months, measured flows at the MCH and DVD gauges are less than the drought emergency minimum flow requirements, and additional water would be required to remain instream under the emergency regulation. This amount of additional water is referred to as the monthly shortfall amount, measured in acre-feet (AF).

A proposed addition to the emergency regulation as adopted in 2021 would authorize the Deputy Director to approve a petition for a limited amount of diversion for livestock survival during pulse flow events in the event that alternative water supplies are not available. The exception would allow diversion of a small amount of water into irrigation ditches that could be accessed by livestock for drinking. Such diversions could not be subsequently used for irrigation purposes. The diverted flow would be allowed to return to the stream. This provision provides a possible fiscal benefit to water users that is not accounted for in this analysis, which is a conservative assumption.

Mill Creek Watershed

The Department of Water Resources' Mill Creek Below Highway 99 (MCH) gauge is located below Ward Dam and significant diversions and was used to represent the observed (impaired) streamflow in lower Mill Creek. Mean daily flow data from 2018 was compiled and a conservative 40% factor was applied to account for the assumption that flows in Mill Creek are likely lower during the current drought than 2018, which was classified as a below normal water year in the Sacramento Valley. Based on these flows, the amount of additional water that would be required to remain instream to attain the drought emergency minimum flow requirements is represented in the following table as monthly shortfall amounts.

Table A. Monthly Shortfall Amounts at MCH Gauge in Mill Creek, AF

Jan	Feb	Mar	April	May	June	July	Aug	Sept	Oct	Nov	Dec
0	0	0	0	0	284	0	0	0	246	259	0

The proposed amendments would allow the Deputy Director to moderately reduce one or more April through June pulse flow events for livestock survival if no alternative water supplies are available. This amount of water, which is expected to not exceed 24 AF total during the April through June period, would be diverted to irrigation ditches for use by livestock. However, this water cannot be used for irrigation purposes, therefore the diversion volume does not enter into the fiscal impact calculations.

Deer Creek Watershed

The Department of Water Resources' DVD gauge is located below the Stanford Vina Ranch Irrigation Company Dam and below significant diversions and was used to represent the observed (impaired) streamflow in lower Deer Creek. Mean daily flow data from 2018 was compiled and a conservative 40% factor was applied to account for the assumption that flows in Deer Creek are likely lower during the current drought than 2018. Based on these flows, the amount of additional water needed to remain instream to attain the drought emergency minimum flow requirements is represented in the following table as monthly shortfall amounts.

Table B. Monthly Shortfall Amounts at DVD Gauge in Deer Creek, AF

Jan	Feb	Mar	April	May	June	July	Aug	Sept	Oct	Nov	Dec
0	0	0	0	229	422	0	0	0	685	677	0

The proposed amendments would allow the Deputy Director to moderately reduce one or more April through June pulse flow events for livestock survival if no alternative water supplies are available. This amount of water, which is expected to not exceed 79 AF total during the April through June period, would be diverted to irrigation ditches for use by livestock. However, this water cannot be used for irrigation purposes, therefore the diversion volume does not enter into the fiscal impact calculations.

Projected Water Supply Reductions

The monthly shortfall amounts at the MCH and DVD gauge locations described above represent estimated monthly reductions in the volume of surface water that would be diverted after the drought emergency minimum flow requirements become effective.

The monthly shortfall amounts and reported water diversion data submitted by water right holders and claimants were used in combination with other water right information from the eWRIMS database to estimate the reductions in surface water diversions that could occur under the proposed emergency regulation. Currently, all diverters are required to submit annual reports of water diversion and use to the State Water Board electronically through the eWRIMS Report Management System (RMS). The annual reports are mandatory filings that document water diversion and uses made during each month of the previous calendar year, including monthly direct diversion volumes, monthly diversion to storage volumes, and monthly water use volumes. For this analysis, water demand is based on the total monthly diversion amount reported for each water right record for calendar year 2018.

Tables C and D indicate the assumed distribution among the types of entities analyzed. The volume in Table C is derived from summing the monthly shortfall volumes in Table A.

Table C. Entity Type and Estimated Annual Surface Water Supply Reduction, Mill Creek Watershed

Type of Entity	Volume, AF
Private Agriculture	789

The analysis for Deer Creek diversions (Table D) included consideration of apportionments described in a Tehama County Superior Court decree, including language indicating water diversions would be proportionally diminished during times of shortage (Tehama County Superior Court Decree No. 4189, 1923). The total annual shortfall in Table D reflects the sum of monthly shortfalls as presented in Table B, distributed across three entity types.

Table D. Entity Type and Estimated Annual Surface Water Supply Reduction, Deer Creek Watershed

Type of Entity	Volume, AF
Private Domestic	4
Local Governmental Agencies	1,331
Private Agriculture	678

Revenue Losses and Other Costs to Local Governmental Agencies

Fiscal impacts to the one local governmental agency, DCID, are assumed to result primarily from changes in water sale revenues and conservation and enforcement costs. The price of water charged by DCID is assumed in this fiscal analysis to be \$100 per AF. The quantity of water that is estimated to be curtailed is 1,331 AF, so the reduction in public agency sales is assumed to be \$133,100.

Reductions in surface water supplies available for diverters as a result of the drought emergency minimum flow requirements may be offset to some extent by increased groundwater pumping. In general, the net loss in water available for sale by public agencies is the amount of curtailed water that cannot be replaced in this fashion. However, any groundwater replacement pumping is assumed to occur from private wells rather than purchases from DCID. Accordingly, this analysis assumes no savings attributed to groundwater replacement for DCID. Groundwater replacement assumptions are factored into the change in tax revenue from reduced agricultural production analysis below.

DCID may incur costs associated with conservation and enforcement measures needed to address the overall shortage of water available for use in their service areas. The costs of implementing these measures are assumed to be \$50 per AF of net curtailed water. Table E presents the anticipated costs that may be incurred by DCID for conservation and enforcement. After accounting for the cost of \$66,550 estimated for

conservation and enforcement, DCID may experience a net revenue reduction of \$199,650.

Table E. Estimated DCID Water Sales, Water Conservation and Enforcement Costs, and Change in Net Revenue, Deer Creek Watershed

	Surface Water Supply Reduction (AF)	Cost Per AF	Total
Reduced Revenue from Water Sales	1,331	\$100	\$133,100
Conservation and Enforcement Cost	1,331	\$50	\$66,550
Net Revenue Reduction			\$199,650

Changes to State and Local Government Tax Revenues

Changes in public agency water sales and in public and private agricultural production sales (revenue) can affect government tax revenues. The impact on state and local government income tax revenues is estimated by applying an estimated tax rate to these changes in revenue. An average tax rate of \$99 per \$1,000 was estimated using an IMPLAN¹ model for the region. To estimate the allocation of tax revenues, tax rates reported from the California Department of Tax and Fee Administration were used. California's sales tax rate is 7.25 percent; local taxing districts such as Tehama County apply an additional tax of 0.5 percent (CDTFA, 2021). As such, state tax revenues represent approximately 96.7 percent of all tax collected, and local districts receive the remaining 3.3 percent.² These shares of tax revenue are applied to (1) reduction in water sales and (2) reduction in agricultural product sales.

Tax Revenue Impacts from Changed Public Agency Water Sales

Table F provides a summary of impacts on tax revenues from changes in sales by DCID. Water sales are estimated to be reduced by approximately \$133,110. Applying a 10 percent tax rate yields a change in tax revenue of \$13,310.

Table F. Tax Revenue Impacts from Changed Public Agency Water Sales, Deer Creek Watershed

	Rate	Total
Reduction in Agency Sales		\$133,100
Tax Rate	10%	
Decrease in Tax Revenues		\$13,310

¹ Economic impact analysis software - IMPLAN (<http://www.implan.com>).

² State share of tax = 7.25% / (7.25 + 0.25), or 96.7 percent.

There are no public water agencies in the Mill Creek watershed, so there is no change to tax revenues from changes in public agency water sales.

Tax Revenue Impacts from Reduced Agricultural Production

Agricultural production sales revenue by growers would be negatively affected as irrigation surface water supplies are reduced to achieve the drought emergency minimum flow requirements. Reduced agricultural production in turn would reduce associated income tax revenues. An analysis of the impact of curtailments on agricultural gross revenue was performed by multiplying the estimated agricultural revenue generated per AF of applied water by the total amount (from both public and private sources) of irrigation water reduced due to the drought emergency minimum flow requirements.

In the Mill Creek watershed, an estimated 789 AF of curtailment is anticipated. The curtailment is anticipated to occur in June, October, and November. Crop information submitted by water right holders and claimants in annual reports of water diversion and use indicate surface water diversions by private agricultural diverters were primarily used for pasture irrigation. In the Sacramento River Valley and foothills, forage (pasture and alfalfa) is typically irrigated during April through November (Macon, et al. 2020, Forero et al., 2015).

In the Mill Creek watershed, the largest diverter (Los Molinos Mutual Water Company) supplies surface water and does not own wells or storage facilities (CDM, 2003, p. 4-33). Therefore, it was conservatively assumed that there would be no replacement groundwater pumping for curtailed surface water in the Mill Creek watershed.

In a typical year, fully irrigated pasture requires about 4.5 AF per acre (Ferero et al., 2015). The value of irrigated pasture in Tehama County is estimated at \$225 per acre (Tehama County, 2019, p. 5). This is equivalent to \$50 in revenue per AF of applied water. Under these assumptions, curtailment of 789 AF is equivalent to a loss of \$109,671 in production value, using a weighted crop value of \$139 per AF for pasture and alfalfa (see Table G).

In the Deer Creek watershed, groundwater wells are used to provide a source of supply for walnut and almond orchards, and may also supply water for alfalfa and other crops. Among DCID lands, approximately 80 percent of irrigated lands are supplied by surface water (CDM, 2003, p. 4-40). In this analysis, a 20 percent groundwater replacement assumption to the surface water supply reduction is assumed to be provided by private wells among the DCID-supplied lands. For lands served by SVRIC, approximately 60 percent of the supply volume is from surface water and 40 percent from groundwater. It is common practice for many growers to use surface water for irrigation in late spring and early summer when flows are available, then shift to groundwater wells later in the

summer. For some growers with high-efficiency watering systems on orchards, groundwater may be used exclusively (NCWA, 2006, pp. 6-21 to 6-22).

Curtailment of 1,331 AF from DCID is estimated for this analysis with an estimated 20 percent of this amount assumed to be replaced by private wells owned by growers. In addition, curtailment of SVRIC diversions and a private irrigator in the amount of 678 AF are assumed with an estimated 40 percent of this amount assumed to be replaced by increased groundwater pumping from existing wells. These assumptions result in a net reduction in surface water supply in the Deer Creek watershed to all water users of 1,472 AF (see Table G)³ in May, June, October, and November.

Potentially affected crops in the Deer Creek watershed include orchards (walnuts and almonds), alfalfa, and pasture, based on crop information submitted by water right holders and claimants in annual reports of water diversion and use. The water requirement for walnuts is 3 AF per acre (Hasey et al., 2018), and the production value per acre is about \$3,367 (Tehama County, 2019, p. 1). The irrigation period is typically May through September.

Alfalfa requires 3.5 AF per acre for full irrigation (Long et al., 2020). Production value per acre in Tehama County is estimated at \$1,477 per acre based on a yield of 7.0 tons and \$211 revenue per ton (Tehama County 2019, p. 2). Although alfalfa has a lower value than walnuts per AF of applied water, the growing season for alfalfa is longer, and it may better utilize late irrigation for production of forage in late fall or new growth in early spring.

To determine the value of reduced agricultural production in the Deer Creek watershed, a weighted crop value is assumed such that curtailment affects walnut orchards in May and June and alfalfa in October and November; this represents a conservative, worst-case scenario with the highest revenue crops most significantly affected. The actual impact is likely to be less than presented here, as growers would likely prioritize water to their most valuable crops and fields. The weighted value per AF of curtailment is approximately \$648. Under these assumptions, the curtailment of 1,472 AF would lead to a reduction of up to \$953,856 in production value.

Table G provides a summary of the reduction in agricultural production in the Mill Creek and Deer Creek watersheds, and the associated tax revenue impacts. The combined total of \$106,353 represents an upper bound tax revenue impact based on the curtailment estimates presented in this analysis. Also, fiscal support to local agencies

³ 1,472 AF = 1,331 AF from DCID * (1 – 20%) + 678 AF from two private diverters * (1 – 40%).

from the state could in turn be affected, but such tax and funding relationships between the state and numerous local agencies are difficult to characterize and cannot be readily estimated. The proposed regulation is not anticipated to result in costs or savings in federal funding to the State.

Table G. Change in Tax Revenue as a Result of Reduced Agricultural Production, Mill Creek and Deer Creek Watersheds

	Mill Creek Watershed	Deer Creek Watershed
Net Change in Irrigation Supply (AF)	789	1,472
Product Gross Revenue (\$) per AF	\$139	\$648
Change in Agricultural Production (\$)	\$109,671	\$953,856
Net Change in Tax Revenues at 10% (\$)	\$10,967	\$95,386

Summary of Fiscal Impacts

Table H displays a summary of the fiscal impacts of implementing the proposed drought emergency regulation in the Mill Creek and Deer Creek watersheds. It includes the reporting costs, as well as four categories of impacts associated with reduced surface water diversions to agriculture.

Table H. Summary of Fiscal Impacts of Implementing the Proposed Drought Emergency Regulation, Mill Creek and Deer Creek Watersheds

	Mill Creek	Deer Creek	Total
Certification Form	\$65	\$65	\$130
Reduced water sales by public water district	\$0	\$133,100	\$133,100
Conservation / enforcement	\$0	\$66,550	\$66,550
Tax revenue reduction due to change in water sales	\$0	\$13,310	\$13,310
Tax revenue reduction due to change in agricultural production	\$10,967	\$95,386	\$106,353
TOTAL	\$11,032	\$308,411	\$319,443

Distribution of Fiscal Impacts between State Government and Local Government

The fiscal impacts presented above reflect the combined totals for all state and local governmental agencies. Table I presents the impacts separated for those affecting state agencies and state government in aggregate from those affecting local governments and district agencies.

Table I. Summary of Fiscal Impacts of Implementing the Proposed Drought Emergency Regulation, State and Local Governments

	State	Local	Total
Certification Form	\$65	\$65	\$130
Reduced water sales by public water district	\$0	\$133,100	\$133,100
Conservation / enforcement	\$0	\$66,550	\$66,550
Tax revenue reduction due to change in water sales	\$12,871	\$439	\$13,310
Tax revenue reduction due to change in agricultural production	\$102,843	\$3,510	\$106,353
TOTAL	\$115,779	\$203,664	\$319,443

Attachment 1 References

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http://www.cdec.water.ca.gov/cgi-progs/selectQuery?station_id=dvd&sensor_num=&dur_code=D&start_date=04%2F07%2F2014+00%3A00&end_date=now

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