A bald eagle (*Haliaeetus leucocephalus*) observed in Capay Reach on 2023 Creek Walk.

Photo courtesy of Andrew Rayburn (2023)

2023 Cache Creek Annual Status Report

Prepared by the Cache Creek Technical Advisory Committee and the Yolo County Natural Resources Division

FINAL DRAFT

FEBRUARY 13, 2024

THIS REPORT WAS RECEIVED AND FILED BY THE YOLO COUNTY BOARD OF SUPERVISORS ON FEBRUARY 13, 2024, PER MINUTE ORDER NO. 24-16.

BOARD OF SUPERVISORS
Yolo County, California

To: Comm. Svcs. ✓
Fin. Svcs. ✓

CONSENT CALENDAR

Excerpt of Minute Order No. 24-16 Item No. 9, of the Board of Supervisors' meeting of February 13, 2024.
MOTION: Provenza. SECOND: Villegas. AYES: Vixie Sandy, Provenza, Barajas, Villegas, Frerichs.

9. Receive and file the 2023 Cache Creek Annual Status Report. (No general fund impact) (Lindbo/Sabatini)

Took the following action on Consent:

A. Received and filed the 2023 Cache Creek Annual Status Report;

B. Directed staff to submit the finalized report to the Chief Clerk of the California State Assembly by February, 15, 2024, pursuant to Assembly Bill No. 1585, Chapter 7 of the Statues of 2010 and Government Code Section 9795; and

C. Directed staff to work with the Cache Creek Technical Advisory Committee to integrate and prioritize the recommendations contained in the 2023 Report into the Fiscal Year 23/24 and 24/25 budgets, as appropriate.

Cache Creek Annual Status Report

for the 2023 Water Year

(October 1, 2022 – September 30, 2023)

Cache Creek Technical Advisory Committee

Paul Frank,
P.E., CED
Hydraulic Engineer

Mark Tompkins,
Ph.D., P.E.
Fluvial Geomorphologist
TAC Chair

Andrew Rayburn,
Ph.D., ESA, SER
Riparian Biologist

This report was developed in consultation with the Yolo County's Natural Resources Division.

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Acronyms and Terms

CCAP	Cache Creek Area Plan
CCIP	Cache Creek Improvement Program
CCRMP	Cache Creek Resources Management Plan
CCTAC	Cache Creek Technical Advisory Committee
cfs	cubic feet per second
CFT	Channel Form Template
DO	dissolved oxygen
IWC	invasive weed control
OCMP	Off-Channel Mining Plan
OHV	off-highway vehicle
RM	river mile
TKN	Total Kjeldahl Nitrogen
TSS	total suspended solids
VELB	Valley Elderberry Longhorn Beetle

1. Introduction & Overview

1.1 Cache Creek Area Plan History

Mining has occurred within the Cache Creek channel since before the beginning of the 20th century. Mining operations increased dramatically following World War II. Between the booming post-war economy and the construction of the national highway system, the demand for high-quality aggregate material, like the material naturally found in Cache Creek, increased exponentially. In the mid-1970s, in response to increased public interest in the environmental ramifications of in-channel mining, as well as the general degradation of the riparian environment along Cache Creek, Yolo County turned its attention towards the development of a comprehensive resource management plan for Lower Cache Creek.

For over 20 years, and with the input of numerous stakeholder groups, advisory committees, and public participation, the County toiled to identify an appropriate balance between the mining of aggregate resources, encouragement and preservation of agricultural productivity, protection of water resources, and the enhancement and protection of the riparian environment. The result of this effort is the Cache Creek Area Plan ("CCAP"); a scientifically based management solution that balances a diverse range of concerns with the overriding vision of enhancing the variety of resource needs for the region. The CCAP was formally adopted by the Yolo County Board of Supervisors in 1996.

The CCAP program is administered by the Natural Resources Division of the Yolo County Department of Community Services. The program is funded by fees paid by participating mining operators for each ton of aggregate sold. More information regarding the Gravel Mining Fee Ordinance can be found in Title 8, Chapter 11 of the Yolo County Code.

The CCAP is comprised of two separate, though complementary, plans: the Off-Channel Mining Plan ("OCMP") and the Cache Creek Resources Management Plan ("CCRMP"). The plan area is approximately 14.5 miles along both banks of lower Cache Creek, spanning from the Capay Dam to the town of Yolo, near Interstate 5 (Figure 1-1).

The OCMP is a mining plan that restricts the location and extent of off-channel mining in Yolo County to approximately 2,123 acres through 2068. The OCMP governs the mining of aggregate resources (e.g., sand and gravel) outside of the channel banks of Cache Creek and the 100-year floodplain and provides for a minimum 200-foot riparian corridor. The OCMP provides a policy framework and regulations to ensure balanced management of the off-channel corridor of lower Cache Creek. The regulations that accompany this plan generate the resources (including land dedications, funding, and adaptive management) necessary to implement the plan's vision.

The Cache Creek Resources Management Plan, adopted August 20, 1996, and amended August 15, 2002, and December 17, 2019, eliminated in-channel commercial mining (i.e., mining inside of the boundaries of the CCRMP in-channel area, generally comprised of the active channel and banks) and established the Cache Creek Improvement Program ("CCIP") to implement on-the-ground projects to improve and/or maintain channel stability and restore riparian habitat. The CCRMP provides a policy and regulatory framework for restoration of 14.5 miles of lower Cache Creek and includes specific implementation standards. The CCIP is the implementation plan for the CCRMP and identifies categories of projects (bank stabilization, channel maintenance, revegetation, and habitat restoration) and general templates and standards for construction.

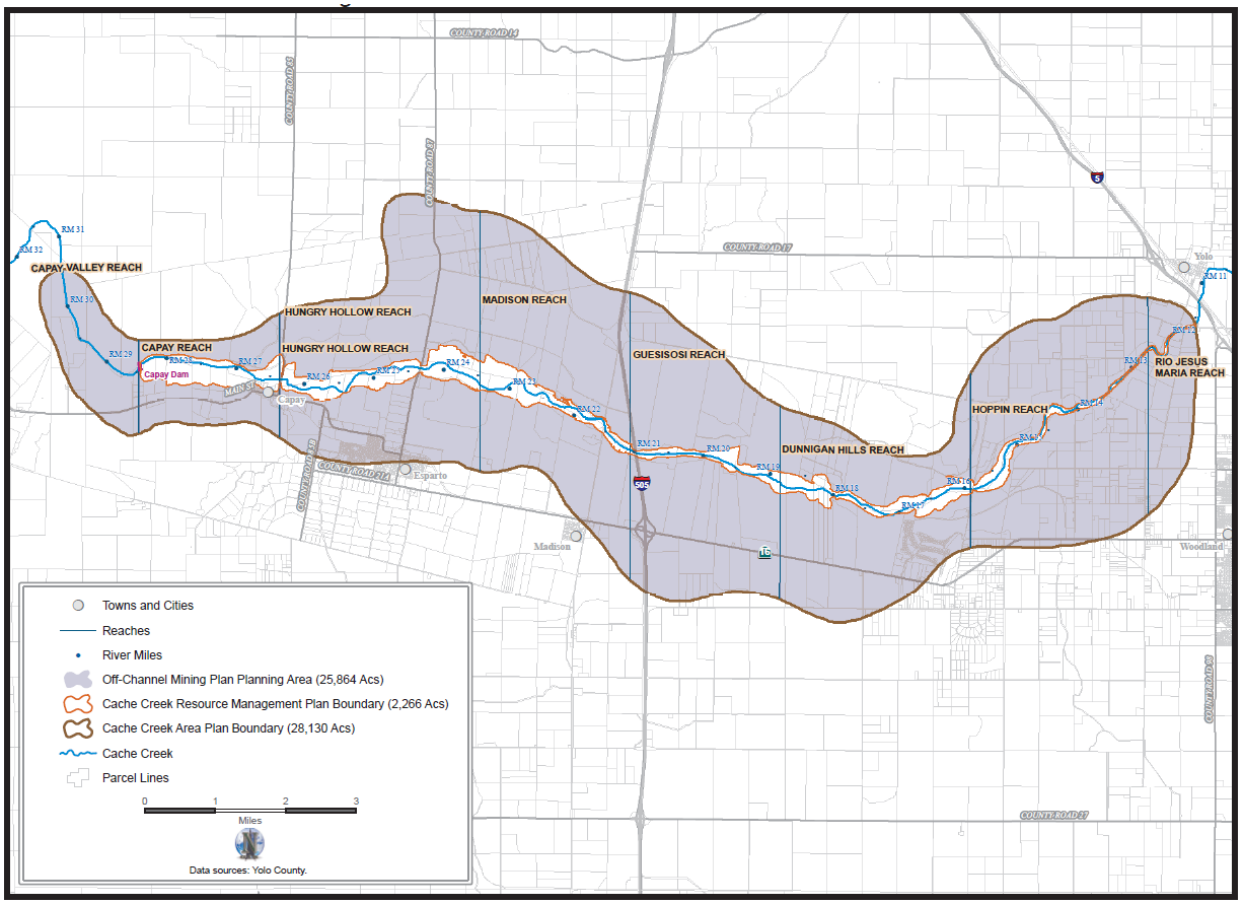


Figure 1-1. Programmatic boundaries of the Cache Creek Area Plan.

For additional information on CCAP implementation activities that occurred in 2023, please refer to Appendix B.

As a management plan that recognizes Cache Creek and its resources as a dynamic system, the CCRMP is not a static vision of management of the creek. The program is designed to evolve and adapt in response to new creek conditions and improved understanding of creek processes.

1.2 Purpose of the Annual Report

Section 6.6 of the CCIP requires that the Cache Creek Technical Advisory Committee ("CCTAC" or "Cache Creek TAC") produce an annual report in January of each year for the Board of Supervisors that describes the data collected and analysis conducted as a part of the program's annual monitoring program (more on the monitoring program can be found in Section 1.3). The annual report serves as a regular opportunity for the Cache Creek TAC to step back and take a larger perspective in looking at the creek and at the CCRMP with a critical eye for improvement. Although this is a complex and ambitious project, it is designed to be adaptive, so that monitoring requirements and management techniques can appropriate address the ever-changing riparian environment.

To be effective, the annual report should not be seen as a chronicle of success or a lackluster recitation of dry data; it must reflect thoughtful self-evaluation. Is information being used? Are other forms of monitoring needed? Is there unnecessary or less-than-useful monitoring that can be eliminated or consolidated? Given the limited budget of the CCIP, are activities being carried out in a cost-effective manner and are the most important priorities being emphasized? Are objectives being met? Are the policy and technical assumptions still valid?

Fundamental questions such as these should underlie the annual report, so that recommendations made by the CCTAC take into account the long-term benefit of the creek and the community. Review of the report by the Board of Supervisors will provide the necessary policy direction, as well as provide an ongoing public forum for focusing the County's attention on the unique issues that concern Cache Creek.

1.3 Purpose of Annual Monitoring Program

The purpose of the CCIP monitoring program is to provide dependable, up-to-date channel condition data that the CCTAC can use to support recommendations for management of the creek. In particular, the results of monitoring will be used to evaluate the need for improvement projects, annual channel maintenance, and hazard response. The data obtained during the monitoring program will be used directly in the design of these projects and activities. The objectives of the CCIP monitoring program are to:

- Improve present estimates of average annual inflowing sediment load.
- Improve the present understanding of creek hydrology, including flood-frequency, flow-duration, and channel storage/loss relationships.
- Estimate inflowing sediment load on an annual basis.

- Monitoring changes in channel form and topography, including those directly associated with improvement project and channel maintenance activities.

- Monitor changes in vegetation and riparian habitat annually.

- Monitor bridge, levees, and other infrastructure to detect and prevent damage.

- At the end of each runoff season, the Cache Creek TAC is required to make an annual inspection of the creek to document channel conditions. This event is commonly referred to as the "Creek Walk." The Cache Creek TAC traverses the length of the creek over a three-day period and notes specific conditions of the creek including:

- Evidence of changes in channel dimensions or bank erosion.

- Evidence of bed degradation or aggradation.

- Significant chances in the location or sizes or bars and other channel features.

- Degree of channel armoring and bed material imbrication.

- Vegetation located within the center portion of the channel (within 100 feet of the low flow channel), including type, density, and size.

- Conditions at bridges along levees and other major infrastructure.

- Potentially hazardous conditions involving public safety or property damage.

- General hydraulic condition of the channel base on qualitative comparison with previous years (e.g., restrictions due to vegetative growth, changes in bed form, etc.).

- General evaluation of channel and bank stability on a reach-by-reach basis.

- Identification of areas where vegetation may be getting so thick as to adversely alter flow direction or reduce channel capacity.

The CCTAC held is annual Creek Walk from June 21-23, 2023. The Creek Walk was attended by County staff, representatives from mining operators and partner agencies, as well as members of the public. Observations made by the Cache Creek TAC during the 2023 Creek Walk can be found attached as Appendix A.

Information gathering and landowner participation are critical components in the implementation of the CCRMP and CCIP. The monitoring mandated by the program provides data on stream flow, water quality, erosion, and vegetation that guides creek management recommendations made by the three-member Technical Advisory Committee. The CCTAC provides recommendations based on data, trend analysis, and field observations.

The CCRMP and CCIP recommendations are designed to be adaptive, so that monitoring requirements and management techniques can appropriately address the ever-changing channel and riparian environment of Cache Creek.

1.4 Cache Creek Technical Advisory Committee

The Cache Creek Technical Advisory Committee was established to: (1) provide scientific and technical review and oversight for all projects conducted under the CCIP, and (2) collect and evaluate scientific data on hydrologic, hydraulic, sediment transport, and biological conditions within the CCRMP area. The CCTAC is a three-person interdisciplinary group comprised of a hydraulic engineer, a fluvial geomorphologist and riparian biologist. The additional responsibilities of the TAC are outlined on pages 5 through 7 of the CCIP.

The 2023 Cache Creek TAC was staffed, through contracts with the County, by the following subject matter experts:

TAC Riparian Biologist: Andrew Rayburn, Ph.D., ESA, SER

Dr. Rayburn obtained a B.A. in Biology from Austin College, a M.S. in Ecology and Evolutionary Biology from Iowa State University, and a Ph.D. in Ecology from Utah State University. He is a Certified Senior Ecologist (Ecological Society of America) and a Certified Ecological Restoration Practitioner (Society for Ecological Restoration) with 20+ years of experience in applied ecology with a focus on ecological restoration, invasive species control, landscape assessment, geospatial analysis, and both riparian and upland ecosystems.

TAC Fluvial Geomorphologist: Mark Tompkins, P.E., Ph.D.

Dr. Tompkins completed his undergraduate and Master's degrees from the University of Illinois and earned his Ph.D. in Environmental Planning from University of California, Berkeley. He is a registered Civil Engineer and has over 20 years of consulting experience in fluvial geomorphology, river restoration, flood management, hydrology, hydraulics, sediment transport, fisheries biology, environmental planning, and water resources engineering. Dr. Tompkins also serves as the CCTAC Chair.

TAC Hydraulic Engineer: Paul Frank, P.E., CED

Mr. Frank is an ecological engineer experienced in river corridor, wetland, and watershed management planning, analysis, and implementation. He has 20+ years of engineering consulting experience practicing hydraulic, hydrologic, and flood analysis and modeling; fish passage design; sediment transport and fluvial geomorphology; and ecosystem conservation, restoration, and assessment planning. Mr. Frank has experience with designing and constructing multi-objective river and wetland design projects in North America, Europe, Asia, and the Middle East. He is a state-wide recognized expert in hydraulic and sediment transport analysis and modeling, having developed models for hundreds of miles of river systems throughout California.

1.5 Summary of Significant Findings

Based on monitoring, analysis, regulatory requirements, and professional experience, the CCTAC have made the following findings. This document refers to reaches and river miles ("RM") to describe the physical location of observations and recommendations. A map of Cache Creek showing river mile markers is provided as Figure 1-2.

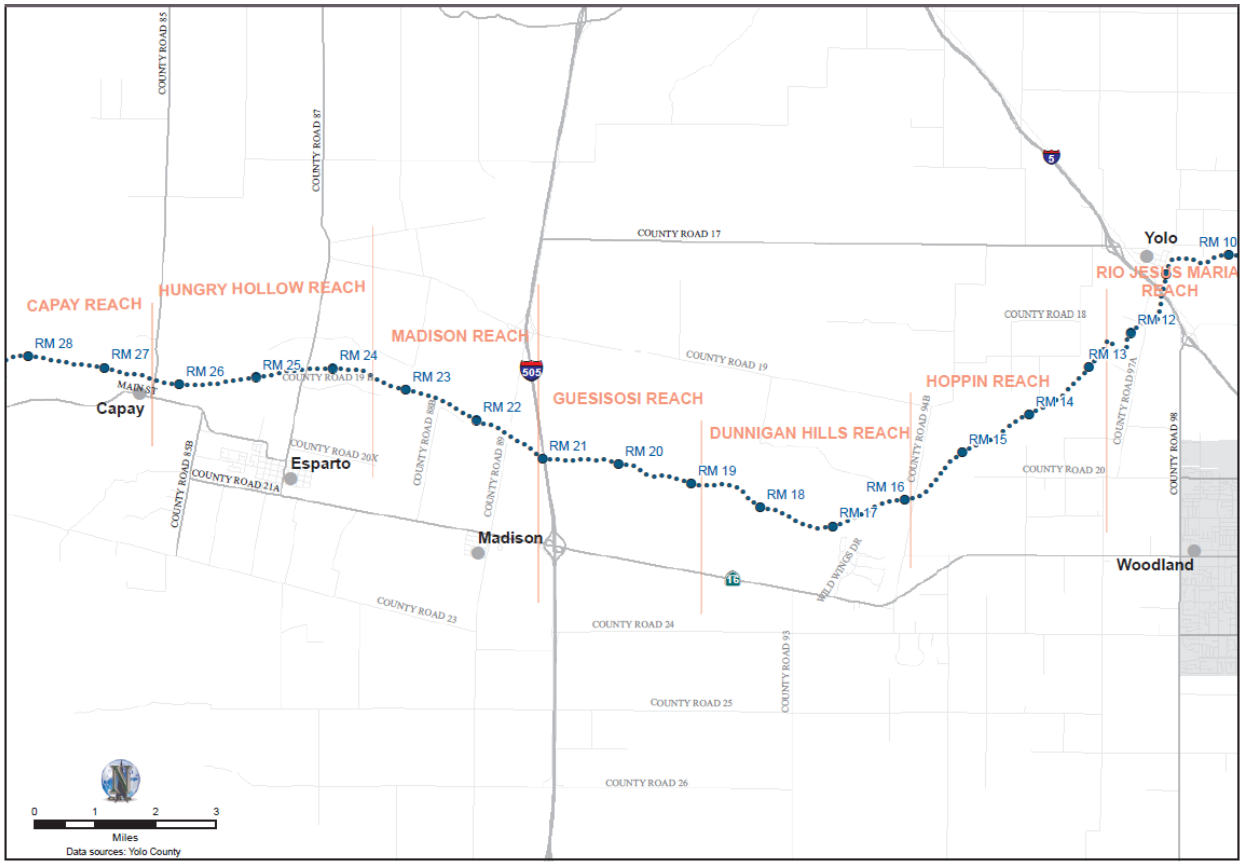


Figure 1-2. Lower Cache Creek's river miles and reaches.

1.5.1 Hydrologic and Water Quality Findings

The 2023 Water Year was generally fairly wet for the State of California, which recovered from previous drought years due largely to significant snowfall in the Sierra and a series of storms in January and March 2023. For Cache Creek, which is not affected by snow as is the greater Sacramento Valley, the water year was "above normal" to "wet." The largest precipitation event of the year occurred March 14-15 and generated flows of approximately 12,000 cubic feet per second ("cfs") at Rumsey and 10,000 cfs at Yolo, which represents approximately a 2-year return interval peak. Two additional events in March produced flow events of 6,000 to 8,000 cfs, while a series of storms in January generated approximately five peak events between 4,000 to 9,000 cfs. These seven events represent approximately "average" annual peak flow events. While individual flow event magnitudes were not remarkable in Water Year 2023, the number of events at, or just above, the annual flow event was notable. Such flows are beneficial for ecosystem benefits, while not creating hazardous flood or erosion conditions.

1.5.2 Geomorphology Findings

Water Year 2023 was much wetter than the Critically Dry water years in 2021 and 2022 in the Cache Creek basin. However, Water Year 2023 was quite different with respect to geomorphic conditions than the most recent wet water years in 2017 and 2019 because peak flow magnitudes were relatively low. The peak flow at the Yolo USGS streamflow gage reached 9,936 cfs in March 2023, well below the threshold of 20,000 cfs required for significant sediment transport and channel change in Cache Creek. Therefore, while delivery and transport of sediment to, and through, the CCRMP area in Water Year 2023 was the fifth highest over the last 19 years, channel change due to erosion, scour, and deposition was localized and mostly relatively minor. The most obvious change in Lower Cache Creek geomorphic conditions after the peak flows was the combination of removed in-channel and riparian vegetation, and deposition of fresh sediment on channel bar surfaces.

Because of the relatively moderate channel change in Water Year 2023, the recommendations developed by the Cache Creek TAC did not change substantially from recommendations made in 2018, 2019, 2020, 2021, or 2022. One notable exception is the recommendation for conditions at Huff's Corner at the downstream end of the CCRMP area. High flows in Water Year 2023 coincided with recently excavated and unvegetated conditions from the CCTAC-recommended island removal project in this reach and caused significant erosion, scour, and deposition at the site. While channel change like this is expected at newly constructed sites, conditions at Huff's Corner should be closely monitored in Water Year 2024, especially if wet conditions return. In addition, because Water Year 2023 did result in significant sediment transport, the TAC geomorphologist recommends that a comprehensive review of current recommendations be completed in Water Year 2024 after the high flow season and before the 2024 Creek Walk. The

purpose of this review is to focus Creek Walk observations on expected areas of significant change and need for revised recommendations.

1.5.3 Biological Resources Findings

The distribution, extent, and condition of native vegetation in 2023 was generally similar to conditions observed in 2022. Native vegetation recovery in areas previously impacted by off-highway vehicle (OHV) use was again noted in 2023, as was increasing herbaceous vegetation adjacent to pools created by intact beaver dams in some locations. There were four notable exceptions regarding the condition of native vegetation in 2023 compared to 2022: (1) further reductions of in-channel vegetation in the same areas noted in 2021–2022 due to winter 2022-2023 flows; (2) additional evidence of drought-stressed vegetation, although there was some vegetative regrowth in areas noted in 2021–2022; (3) significant negative impacts to mature native vegetation due to fire in several locations, and (4) minor loss of native trees in one location due to scour and bank erosion resulting from winter 2022-2023 flows.

Non-native and invasive plant species remain widespread along Lower Cache Creek, and continue to be one of greatest constraints to further recovery of native habitat. As in recent years, arundo, tamarisk, Ravenna grass, and other non-native species were frequently observed and are potentially re-establishing and spreading in some locations. As in 2022, some evidence of continued treatment of arundo and tamarisk was observed, although some plants were starting to resprout. Many additional non-native and invasive species (e.g., Himalayan blackberry, perennial pepperweed, and tree tobacco) remain common along Lower Cache Creek and should be prioritized for treatment and monitoring when and where feasible. After treatment of non-native and invasive species, native woody and herbaceous species should be planted whenever possible to enhance habitat and reduce the potential for re-invasion.

Many common and special-status species of wildlife, invertebrates, and fish were again observed by the Cache Creek TAC, Cache Creek Conservancy staff, and volunteer observers during the 2023 Creek Walk. Swainson's hawks (State threatened) were observed in six of the seven reaches, and a occupied nest was observed in the Dunnigan Hills Reach. Bald eagles (State fully protected) were observed at two locations in the upstream portion of the Capay Reach, and a white-tailed kite (State fully protected) was observed in the Hoppin Reach. Three active colonies of bank swallows (State threatened) were observed in the Hoppin Reach, and numerous other potential bank swallow colony sites were also observed starting in the Hungry Hollow Reach and downstream to the Hoppin Reach. A total of 48 unique bird species were observed in 2023 including acorn woodpecker, ash-throated flycatcher, blue grosbeak, Bullock's oriole, great horned own, green heron, lesser nighthawk, marsh wren, red-tailed hawk, song sparrow, and yellow-headed blackbird. Western pond turtles (State species of special concern) were observed in deeper pool in the Capay, Guesisosi, and Dunnigan Hills reaches. Some pools appeared to be the result of significantly increased beaver activity first observed in 2022 and attributed to

reduced OHV activity. Beaver dams were frequently observed starting in the Guesisosi Reach and in other downstream reaches. Other wildlife species observed included Columbian black-tailed deer, black-tailed jackrabbit, California ground squirrel, coyote, garter snake, river otter, and fishes including bluegill, common carp, green sunfish, and largemouth bass.

Significant opportunities for habitat enhancement and restoration are essentially unchanged since 2019, including upland areas on the north bank from RM 26.8–27.8, the PG&E "Palisades" site (RM 26.8), Capay Open Space Park (RM 26.3), the Hayes "Bow-Tie" property (RM 20.0), the Millsap property (RM 18.5), the Moore Siphon repair site (RM 18.0), Wild Wings Open Space Park (RM 17.0), the Correll and Rodgers properties (RM 13.7), the Capay Organic creek frontage (RM 27.9) identified in 2019, and off-channel pits in the Dunnigan and Hoppin reaches (e.g., on the north bank from RM 15.0–15.4). Based on 2017 and 2018 Creek Walk observations, the long-term resilience of revegetation and restoration projects within or adjacent to the active channel should be carefully considered prior to implementation, since such projects can be negatively impacted or completely removed by high flows. Passive restoration (e.g., streamflow enhancement and invasive species treatment) may be a more cost-effective approach for in-channel or near-channel locations subject to high flows.

1.6 Summary of 2023 Recommendations

The key recommendations made by the Cache Creek TAC in this report are summarized below. Recommendations from the previous Annual Status Reports that remain applicable are listed in Chapter 5. If accepted by the Yolo County Board of Supervisors, the 2023 recommendations will be merged with the previous year's recommendations and the CCTAC will be tasked with prioritizing all the recommendations for review and/or implementation going forward. Natural Resources Division staff will coordinate with the CCTAC and relevant stakeholders to ensure the recommendations are implemented.

1.6.1 Hydrologic and Water Quality Recommendations

The CCTAC Hydraulic Engineer recommends the following:

- Capay Dam – Remedies to prevent future damage of the dam and movement of the dam's concrete pads into the channel should be undertaken – a long-term CCTAC recommendation.

- Retaining Wall Downstream of Capay Dam – Erosion behind the recent emergency bank stabilization wall appears to be continuing to occur and should be investigated and addressed.

- PG&E Palisades – The erosion control blanket and all associated infrastructure should be removed. As of 2023, PG&E is working on implementing the removal, but progress appears stalled.

- Erosion sites identified (Jensen Bend, Granite Esparto, Esparto Bridge) should continue to be monitored in the future for any new erosion.

- Implement remedial actions at the Huff's Corner project site after damage during 2022/2023 flows.

- Consideration should be given to removal of bank protection weirs particularly downstream of the Esparto Bridge. These weirs are eroding, are used by illicit off-highway vehicle use, and could be replaced by more modern approaches to bank stabilization.

- A large pile of gravel is perched above the creek bank at the Teichert Esparto site near River Mil 22.9. The stability of the pile and failed bank stabilization measures (i.e., K-rail, etc.) should evaluated for risk of slumping of gravels into the creek.

1.6.2 Geomorphology Recommendations

As in previous years, geomorphology recommendations for Water Year 2023 are in three general categories: monitoring, evaluation, and implementation.

Monitoring is recommended at multiple sites including:

- RM 28.3 (near Capay Dam)

- RM 26.7

- RM 20.8 (near CEMEX)

- RM 18.8, RM 18.2 (near Moore's Siphon)

- RM 17.8

- RM 15.4 (near Teichert Woodland)

- RM 12

Monitoring at these locations should focus on lateral channel migration, sediment deposition, and erosion.

The Cache Creek TAC Geomorphologist updated the recommendation for Huff's Corner monitoring and continues to recommend previous evaluation and implementation actions as described below:

- Accelerate voluntary implementation of previously recommended bar skimming projects at RM 24.6 – 25 and RM 20.1 – 20.5.

- Reinitiate voluntary bar skimming project evaluation at RM 21.6

- Evaluate the potential for additional bar skimming at RM 21 and RM 22.

- Complete removal of the PG&E Palisades infrastructure (RM 26.9) from Cache Creek.

- Notify bridge owners of scour and deposition at bridge piers and abutments, and continued succession of riparian vegetation upstream and downstream of bridges.

- Continue detailed monitoring and assessment of channel treatments at locations of 2017 channel migration and erosion (RM 26, 25.5, 23.5, 22, 21.5, and 18).

- Conduct additional, more detailed monitoring of erosion, scour, deposition, and related channel change during and after high flows at Huff's Corner (RM 11.6); Determine the need to implement channel maintenance measures to prevent excessive channel change.

- Following the 2019 approval of the CCAP Update, assess Channel Form Template (CFT) with respect to 2019 topographic conditions at RM 26.0, RM 25.5, RM 23.5, RM 22, RM 21.8, RM 21.4, RM 18.2, and anywhere else the active channel has migrated near or beyond the CFT. Also, complete administrative and/or technical changes to the CFT based on the results of this assessment.

- Yolo County, Cache Creek TAC, Cache Creek Conservancy, Yolo County Resources Conservation District, and Yolo County Flood Control and Water Conservation District should work together to develop a comprehensive invasive species removal, ecosystem restoration, flood management and water supply bundle of projects based on prior Cache Creek TAC recommendations and submit additional Proposition 1 (and other) grant proposals to fund such projects in Water Year 2024.

1.6.3 Biological Resources Recommendations

Recommendations regarding biological resources from the CCTAC Riparian Biologist are grouped into four general categories: native vegetation monitoring and management (Section 4.1.5), habitat restoration (Section 4.2.3), invasive species monitoring and management (Section 4.3.2), and special-status species (Section 4.4.2).

- Recommendations regarding **native vegetation** focus on monitoring approaches intended to understand changes in native vegetation, as well as management actions required (if any) to maintain desirable flow conditions.

- Recommendations regarding **habitat restoration** highlight high-priority potential projects, the importance of including native understory species, the need for post-implementation monitoring, the importance of planting native species on invasive species treatment sites, and the potential for increased surface flows and strategic channel maintenance projects to accelerate native habitat recovery. A new recommendation was added in 2021 regarding opportunities to incorporate native plant species of cultural importance to the Yocha Dehe Wintun Nation into revegetation and restoration projects.

- Recommendations regarding **invasive species monitoring and management** include expanding the list of priority species and the areas in which treatments are implemented, the importance of a formal monitoring program to track invasive species, the need to remove treated biomass from the CCRMP area if feasible, the importance of planting native species on invasive species treatment sites, and the ongoing need to leverage invasive species treatment within the CCRMP area to support additional mapping and treatment upstream of Capay Dam.

- Recommendations regarding **special-status species** focus on the need for additional monitoring and documentation of both rare and common species, documentation of observations, and the potential for increased surface flows to benefit Western pond turtles and other native plant and wildlife species.

2. Hydrology and Water Quality

This chapter describes the water quality, watershed hydrology, and flood monitoring prescribed by the Cache Creek Resources Management Plan and the Cache Creek Improvement Plan.

The 2023 water year was generally fairly wet for the State of California, which recovered from previous drought years due largely to significant snowfall in the Sierra and a series of storms in January and March 2023. For Cache Creek, which is not affected by snow as is the greater Sacramento Valley, the water year was "above normal" to "wet." The largest precipitation event of the year occurred March 14-15 and generated flows of approximately 12,000 cubic feet per second ("cfs") at Rumsey and 10,000 cfs at Yolo, which represents approximately a 2-year return interval peak. Two additional events in March produced flow events of 6,000 to 8,000 cfs, while a series of storms in January generated approximately five peak events between 4,000 to 9,000 cfs. These seven events represent approximately average annual peak flow events. While individual flow event magnitudes were not remarkable in Water Year 2023, the number of events at, or just above, the annual flow event was notable. Such flows are beneficial for ecosystem benefits, while not creating hazardous flood or erosion conditions.

2.1 Water Quality

Section 3.4-3 of the CCRMP requires water quality sampling at least once per year at the upstream and downstream ends of the CCRMP area during the "first flush" flow event. The CCRMP water quality monitoring program continues to use the services of the Yolo County Flood Control and Water Conservation District, under the supervision of the TAC Hydraulic Engineer and County Natural Resources Division staff, to conduct the surface water quality monitoring. The program's water quality monitoring results are included in the Water Resources Information Database (WRID), a shared resource that is managed by the Yolo County Flood Control and Water Conservation District and available for public review by contacting the District.

The program's water quality monitoring is performed to characterize trends in water quality over time and capture potential effects of gravel mining and other adjacent landowner activities on the health of the creek. The monitoring is not part of any regulatory program, and no regulatory actions are taken as a result of sampling analyses. However, each year's samples are compared against applicable regulatory limits to provide context for the levels observed and identify which constituents are present at elevated levels. The most applicable suite of limits is found in *The Water Quality Control Plan for the California Regional Water Quality Control Board Central Valley Region* (otherwise known as the "Basin Plan"). The Basin Plan outlines water quality standards intended to protect beneficial uses of surface waters to comply with the California Water Code.

2.1.1 Water Year 2023 Sampling Event

The first significant flows of the water year occurred on January 5, 2023, and the water quality sampling event for 2023 was conducted on this date, capturing the first flow event that created continuous flows throughout the CCAP area. Samples were collected a few hours before the peak flow reached Yolo when flows at that gage were approximately 2,000 to 3,000 cfs. These samples represent a true "first flush" unlike typical years where local runoff is generated throughout tributaries of Cache Creek (such as Gordon Slough) days or weeks before flows begin to go over Capay Dam and enter Lower Cache Creek from the upstream watershed. Surface water data is coded and categorized in the WRID as shown in Table 2-1.

Table 2-1. CCRMP water quality sampling locations and site codes.

Site Name	Site Code
Cache Creek at Capay Bridge	CC10
Cache Creek Upstream of Gordon Slough	CC11
Gordon Slough near Cache Creek	CC12
Cache Creek at Stephen's Bridge	CC13
Cache Creek at I-5 Bridge	CC14

*samples collected and analyzed in all years

‡ samples and analysis reduced in 2016 and eliminated in 2019

2.1.2 Water Quality Review

This report describes trends and significant changes in water quality observed in the water year 2023 water quality monitoring data. This year's sampling occurred on one of the best "first flush" events in years due to relatively little rain prior to a very wet January during which we sampled the first major storm which also produced the first "flow through" the entire CCRMP area.

Potentially due to the nature of this year's hydrology (relatively dry conditions punctuated by powerful January storms), Gordon Slough did not emerge as the site with consistently higher concentrations of many contaminants as has been the case in previous years.

2.1.3 Water Quality Summary for Key Contaminants

Boron

Boron is a naturally occurring contaminant in the Cache Creek watershed and Yolo County is one of the counties in California with the highest levels of boron in groundwater wells. While boron is not a regulated contaminant, many agricultural crops are sensitive to boron concentrations and boron can cause toxicity in drinking water. California's drinking water standard for boron is 1,000 µg/l, while the winter limit in the Basin Plan is 2.6 mg/l.

Borax, a compound of boron that is commercially mined, was historically mined near Clear Lake in the Cache Creek watershed; therefore, elevated levels of boron in Cache Creek are not unexpected. However, during the 2023 water year, boron concentrations were at the low end of historical trends and all other sample values were below the Basin Plan maximum. Importantly, the high value for boron at the I-5 Bridge from 2022 was not repeated and appears to have been an isolated anomaly. Figure 2-1 displays historical boron measurements with this year's values

Dissolved Oxygen

Oxygen is required by invertebrates, fish, and many other kinds of wildlife found in Cache Creek. Oxygen dissolves in water from the atmosphere and from photosynthesis of algae and plants growing in the water. It is used up by respiring animals and microorganisms decomposing organic matter. Therefore, dissolved oxygen ("DO") can fluctuate in Cache Creek based on many factors including sunlight (which increases photosynthesis and oxygen production), turbidity in the water (which shades the water, reducing light penetration and photosynthesis), and amount of organic material (which increases microbial activity and depletes oxygen. Figure 2-2 illustrates historical Dissolved Oxygen measurements with this year's values.

In the 2023 Water Year, DO concentrations were at the high end of historical ranges, and followed the typical trend of the lowest value (the only one not meeting Basin Plan minimum for spawning) observed in Gordon Slough. All samples were above the Basin Plan minimum for warm water fish and spawning.

Nitrate

Nitrate is common form of nitrogen found in surface waters where there is the presence of oxygen. It is a nutrient that can cause algae blooms at high concentrations. Nitrate levels were relatively similar to previous years, with the Gordon Slough sample lower than observed in many of the last eight years. Figure 2-3 displays historical measurements of nitrate with this year's values.

Orthophosphate

Orthophosphate is a common form of phosphorus in surface waters. Like nitrate, it is a nutrient that can encourage algae blooms at high concentrations. Orthophosphate were similar to those seen over the last five years with Gordon Slough continuing to exhibit the highest concentration. This indicates that Gordon Slough is a local source of orthophosphate to Cache Creek. This is further backed up by the fact that in 2023 the lowest concentration was found at Capay Dam (upstream end of the CCRMP area), while the concentration at I-5 was in between that and the

concentration at Gordon Slough. Figure 2-4 displays historical measurements of orthophosphate with this year's values.

Total and Dissolved Mercury

Mercury was sampled in 2023 for the first time in several years. The in-channel water quality monitoring program inadvertently dropped mercury sampling from the laboratory orders beginning in 2019.

Mercury concentrations – both total and dissolved – were in line with historic averages at Gordon Slough and I-5 but were elevated at Capay Bridge. In fact, the 1.1 ug/L concentration reported for total mercury was the highest in the program dataset. Dissolved mercury levels were similar to historic averages. Figure 2-5 and Figure 2-6 display historic measurements of total mercury and dissolved mercury, respectively., with this year's values.

Because mercury data have not been collected since 2018, recent trends cannot be identified but it is concerning that total mercury at Capay Bridge was so elevated this year. Mercury should continue to be analyzed in samples going forward.

Total and Fecal Coliforms

Coliforms are bacteria present in surface water that has contacted soil. Fecal coliforms are specific to the gut and feces of warm-blooded animals. Therefore, measurements of total and fecal coliform indicate the degree to which water has been impacted by human or livestock waste.

Total coliform counts in 2023 were within ranges seen in years since 2018 when limitations of laboratory maximum reporting values were addressed (making data from 2000-2017 not representative). Values for Gordon Slough and I-5 decreased from 2022, while the concentration at Capay Bridge went up slightly. Overall, total coliform level seen between 2018-2023 are higher than those seen between 2006 - 2010. Figure 2-7 displays historical measurements of total coliforms with this year's values.

Fecal coliforms were lower than we observed in 2022 which had been a notable year for elevated levels. The most likely source of total and fecal coliform bacteria in Cache Creek is fecal material from the intestinal tracts of wildlife, livestock, pets, or humans in the watershed. Fecal coliform bacteria multiply rapidly after introduction, especially during warm, low flow summer conditions. The Capay Bridge site had the highest levels, mirroring total coliform counts. Also, similar to total coliforms, fecal coliforms have been seen at higher levels during 2018-2023 than observed in 2006-2010. Figure 2-8 displays historical measurements of fecal coliforms with this year's values.

Total Kjeldahl Nitrogen

Total Kjeldahl Nitrogen ("TKN") is a nitrogen species that combines ammonia plus organic nitrogen. In surface waters it generally represents all nitrogen other than nitrate/nitrite. TKN concentrations were generally typical of previous years although the concentration detected at Capay Bridge was among the highest seen by the program. This isolated, elevated sample does not warrant specific concern at this time. Because ammonia continues to be either not detected (such as the I-5 sampling location) or detected at very low concentrations (such as at the other sampling sites), elevated organic nitrogen at Capay Bridge sampling site was likely the cause of the high TKN concentration. Organic nitrogen in environmental waters is often derived from algae or animal waste. Figure 2-9 displays historical TKN measurements with this year's values.

Total Suspended Solids

Total Suspended Solids ("TSS") is a measure of particles in water that includes both organic (e.g., algae) and inorganic (e.g., sediment) matter. In a flowing stream such as Cache Creek, that does not typically accumulate floating algae growth, it helps indicate the presence of eroded fine sediments that are carried by the flow. This year, TSS levels were high relative to historical averages at Capay Bridge while other sites exhibited concentrations in line with historical averages. As with last year's sample, because sampling occurred during the rising limb of the flow event near the peak, elevated TSS at Capay may reflect the presence of eroded sediments. However, concentrations downstream were low to average at I-5, casting doubt on this conclusion. Since this year's data do not reflect any historical trends there is no concern about these data. Figure 2-10 displays historical TSS measurements with this year's values.

[the following 5 pages contain Figures 2-1 through 2-10]

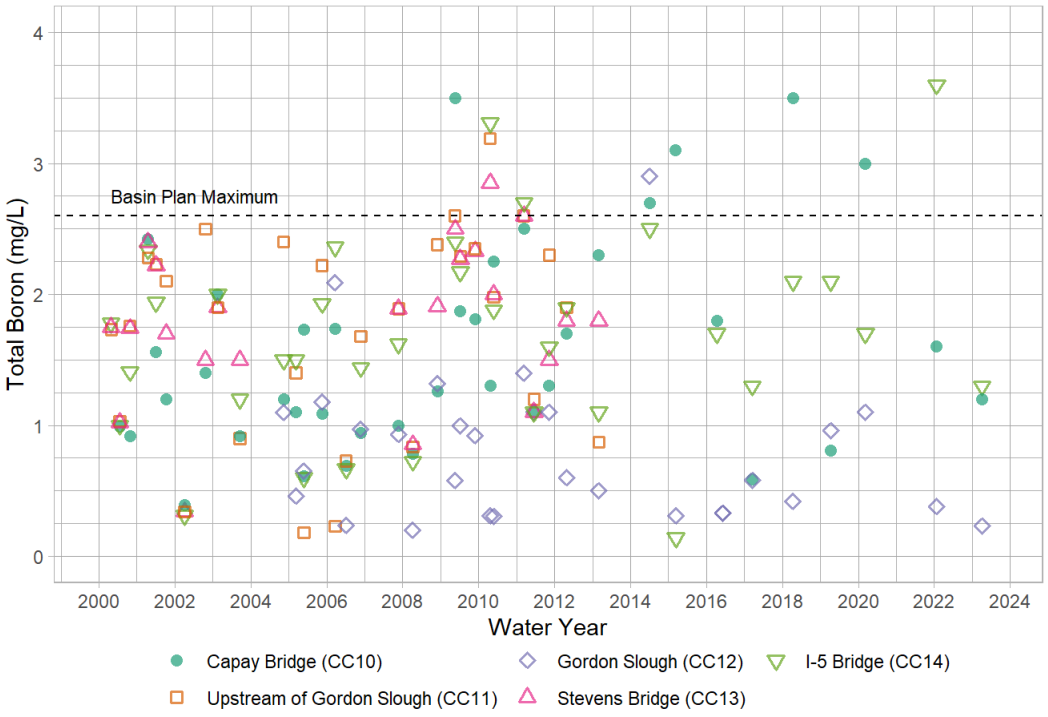


Figure 2-1. Lower Cache Creek Boron measurements.

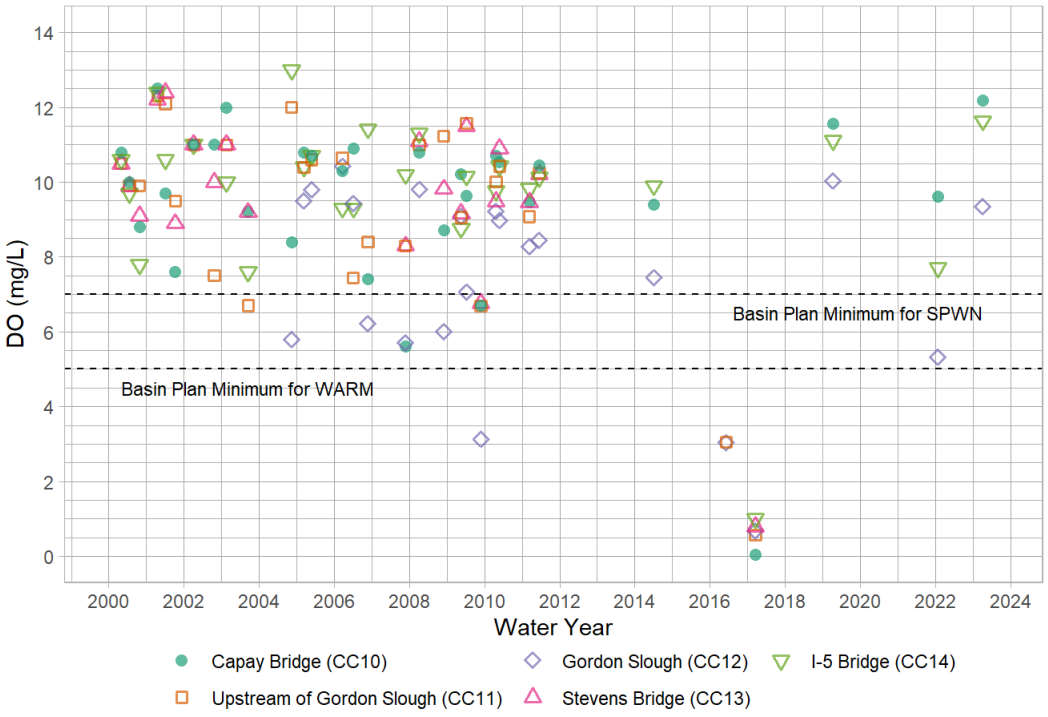


Figure 2-2. Lower Cache Creek Dissolved Oxygen measurements.

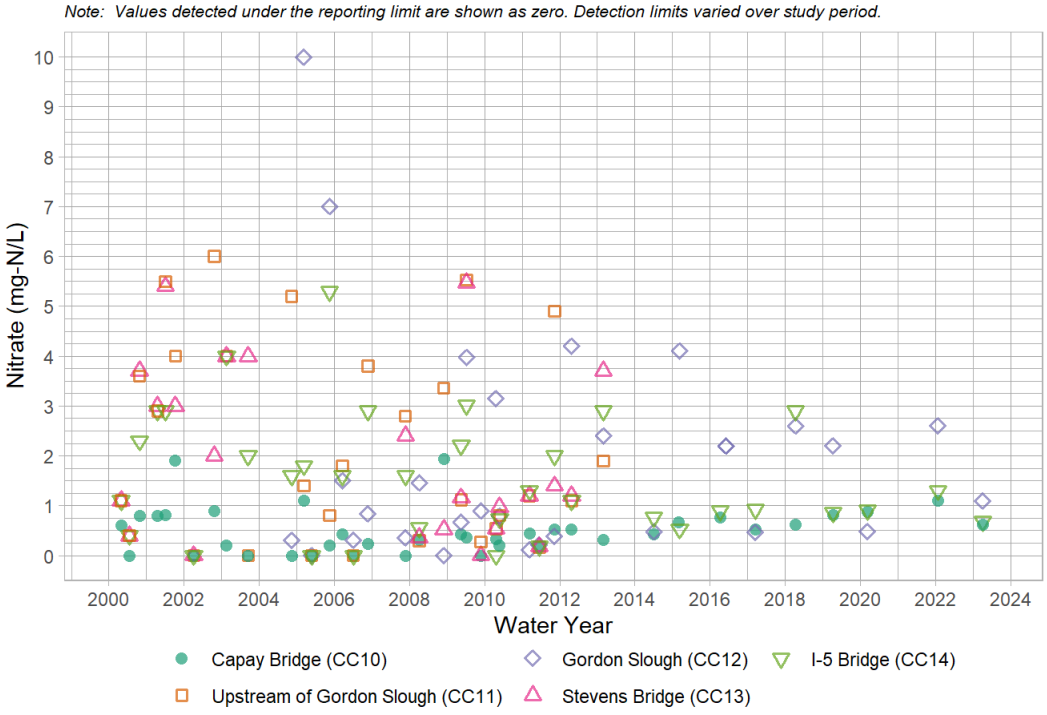


Figure 2-3. Lower Cache Creek Nitrate measurements.

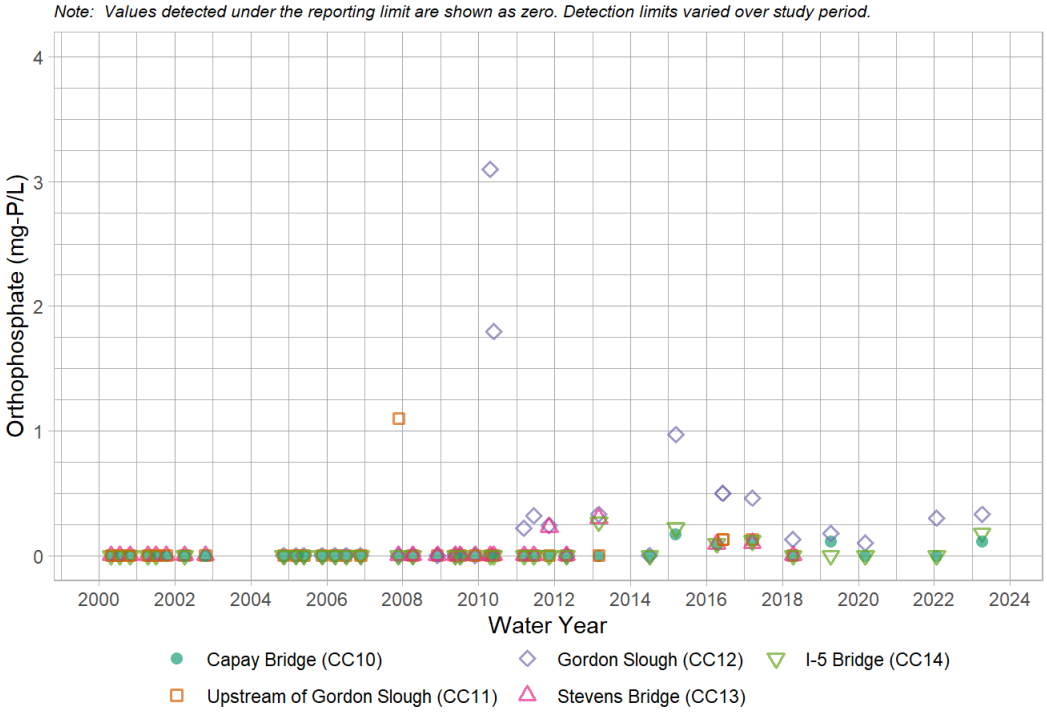


Figure 2-4. Lower Cache Creek Orthophosphate measurements.

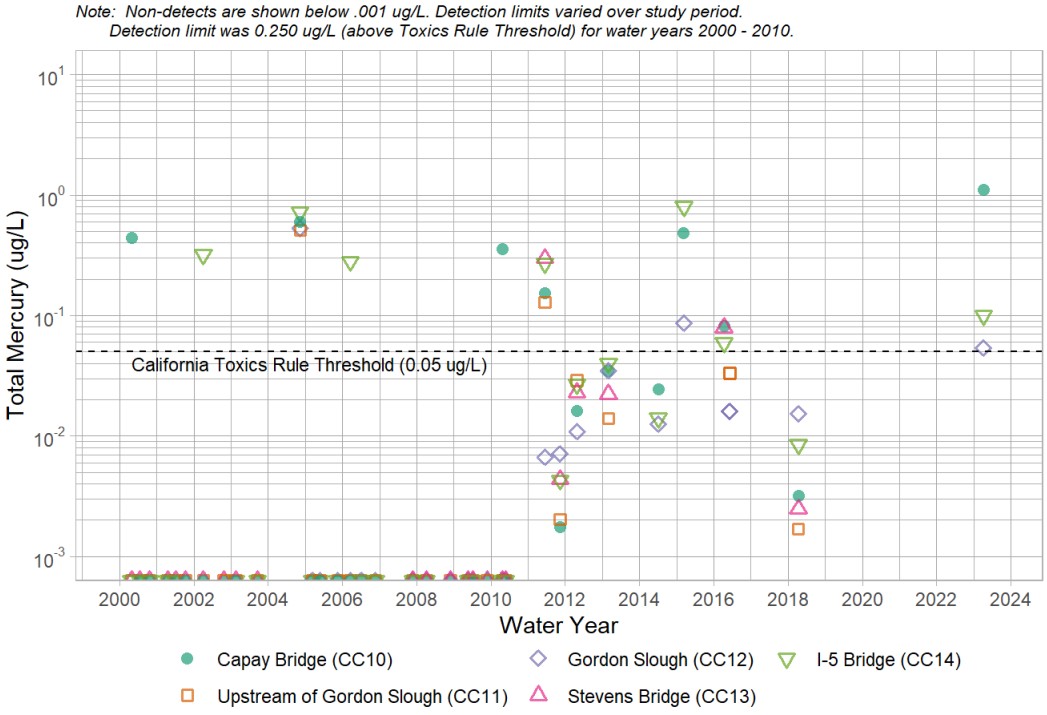


Figure 2-5. Lower Cache Creek Total Mercury measurements.

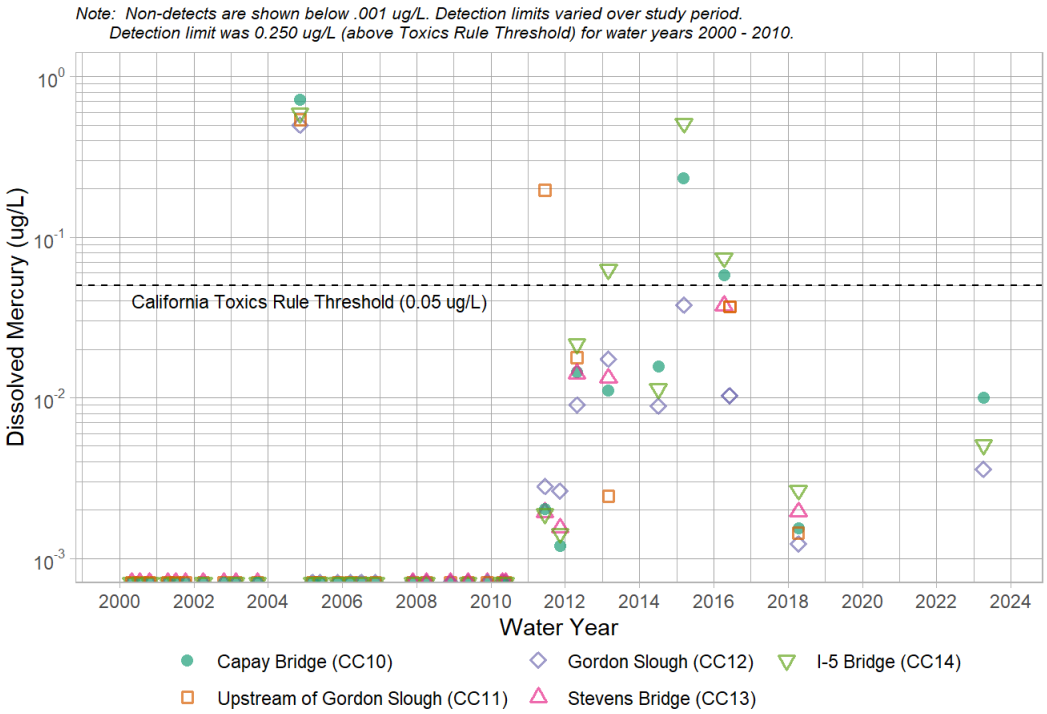


Figure 2-6. Lower Cache Creek Dissolved Mercury measurements.

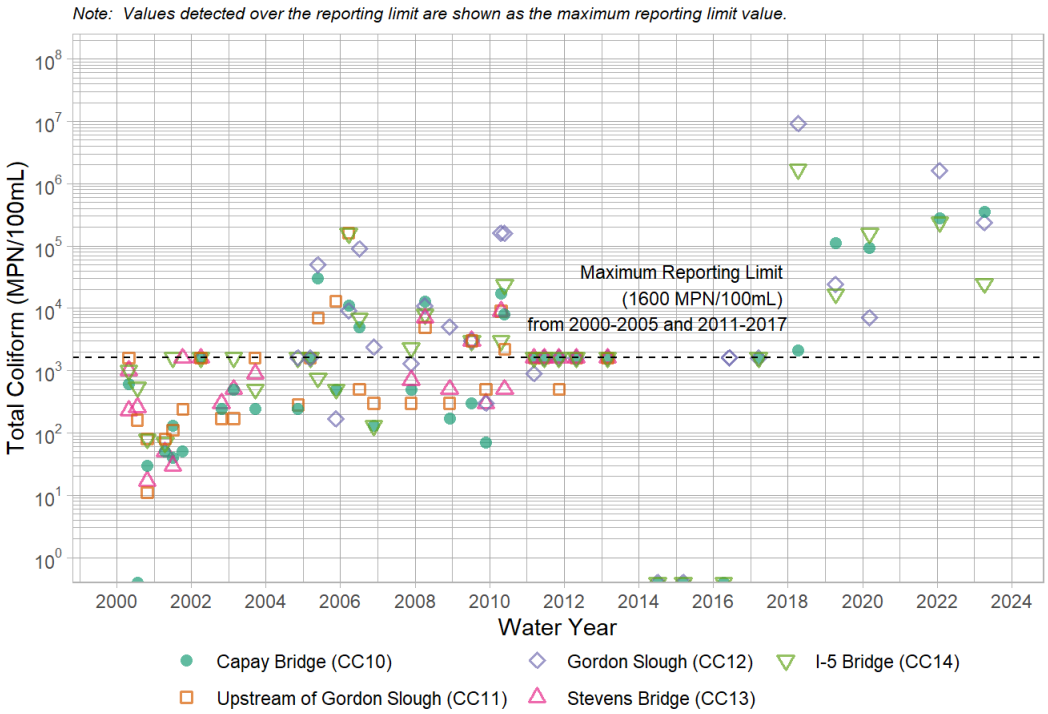


Figure 2-7. Lower Cache Creek Total Coliform measurements.

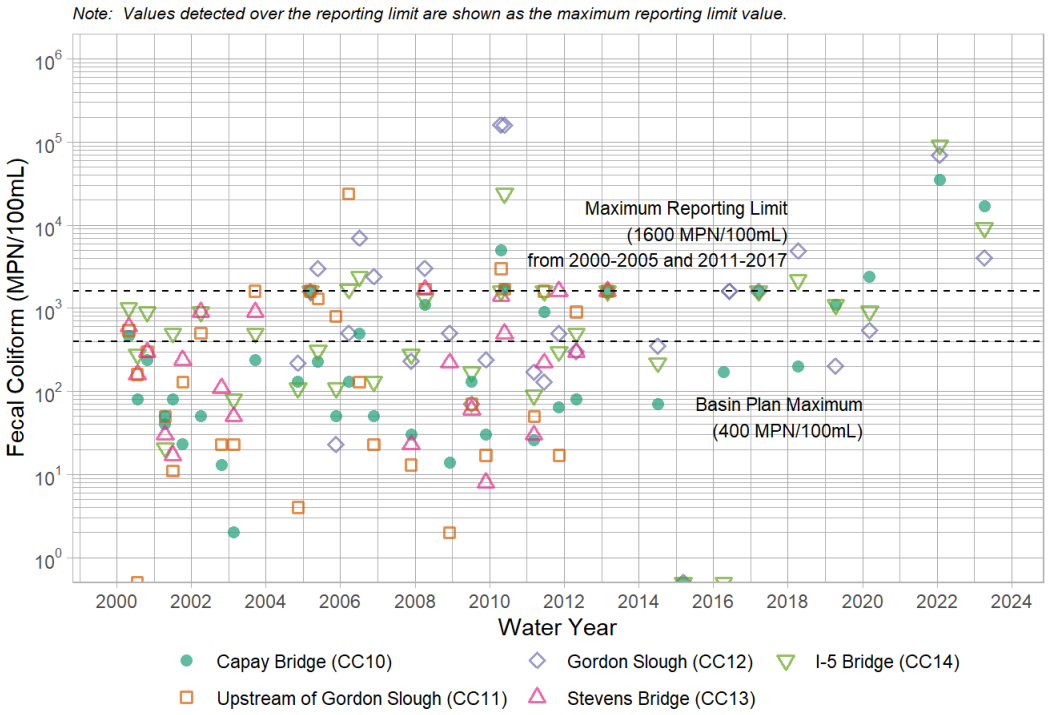


Figure 2-8. Lower Cache Creek Fecal Coliform measurements.

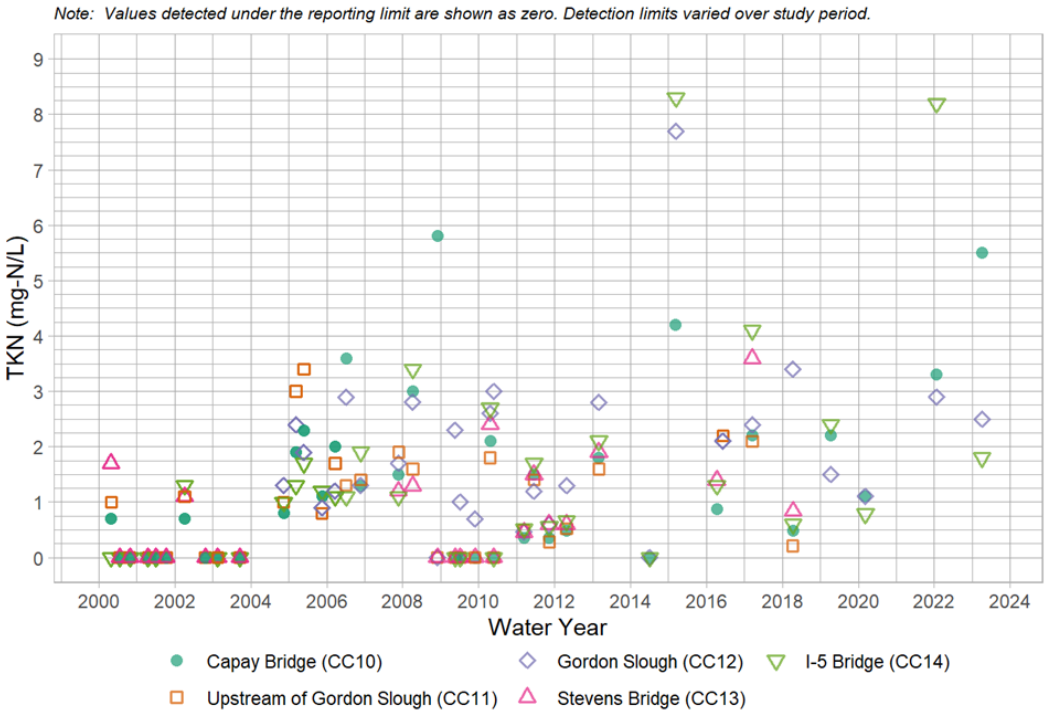


Figure 2-9. Lower Cache Creek Total Kjeldahl Nitrogen measurements.

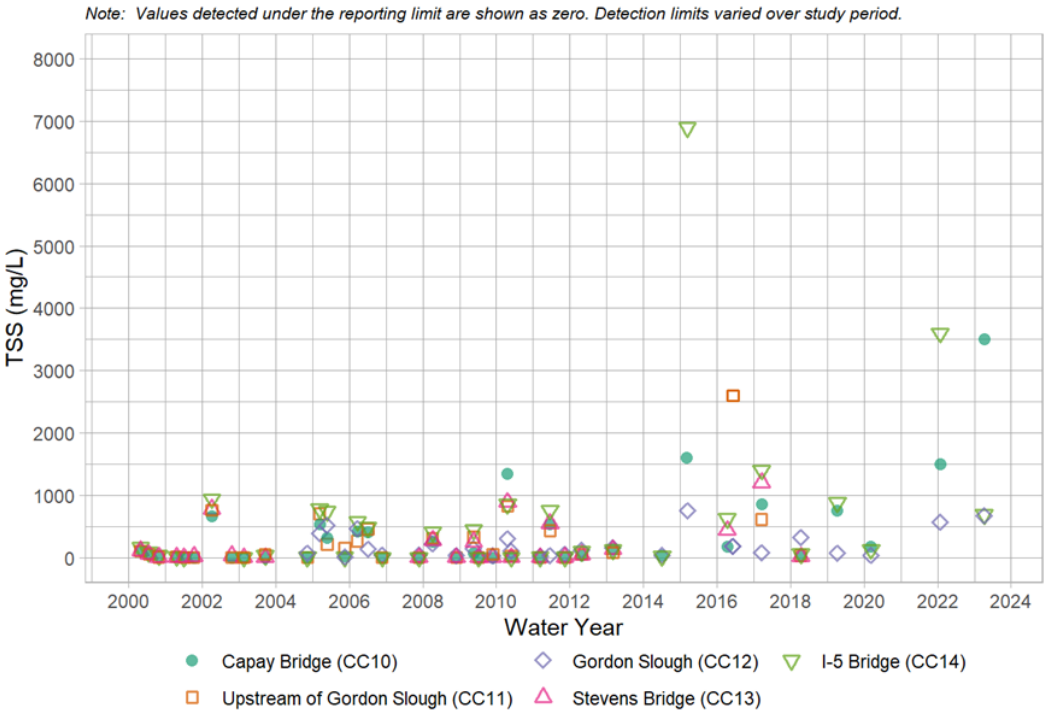


Figure 2-10. Lower Cache Creek Total Suspended Solids measurements.

Vehicle Boneyard / Abandoned Vehicles Water Quality Risk

The County has been engaged in code enforcement activities for many years at a private property on the south bank of Cache Creek approximately 1,500 feet upstream of the Capay Bridge (County Road 85). The property is referred to as the "Vehicle Boneyard" because of the number of non-operative vehicles and vehicle parts located in the floodplain.

In previous years, the TAC determined that between 2002 and 2005, bank erosion adjacent to the Vehicle Boneyard had substantially reduced the distance between the channel and the junkyard. During the 2022 Creek Walk, the TAC Hydraulic Engineer did not notice substantive new erosion at the site but continues to recommend continued monitoring of the distance between the creek and the boneyard, especially after high peak flows, until the subject vehicles have been removed.

In 2023, the abandoned/disabled vehicles, construction materials and debris, and other deleterious waste were again observed on the creek overbank near river mile 25.4 (note this is a corrected river mile location from last year's report). These abandoned vehicles and waste materials present a similar hazard to the "Boneyard" site, but they are closer to the creek itself. The TAC Hydraulic Engineer recommends the County consider available enforcement actions against this property owner.

Figure 2-11. Abandoned vehicles near RM 25.4.

2.2 Summary of Annual Water Discharge Data

Peak flows in Cache Creek are an important driver of sediment transport processes, as well as water quality conditions in the CCRMP area. The CCIP requires that the TAC monitor hydrology at the upstream and downstream ends of the CCRMP area. This annual report summarizes this monitoring, with a focus on observations and conditions not already documented in previous annual reports.

The 2023 water year had numerous events that produced peak flows in the annual to 2-year return interval range. The largest storm produced peak flows of 11,200 cfs at Rumsey and 9,940 cfs at Yolo on March 14 and 15, 2023, respectively. Many other events occurred in January and March that exceeded 4,000 cfs at each gage. Figure 2-12 compares instantaneous flows at Rumsey (upstream) and Yolo (downstream) gages during the 2023 Water Year.

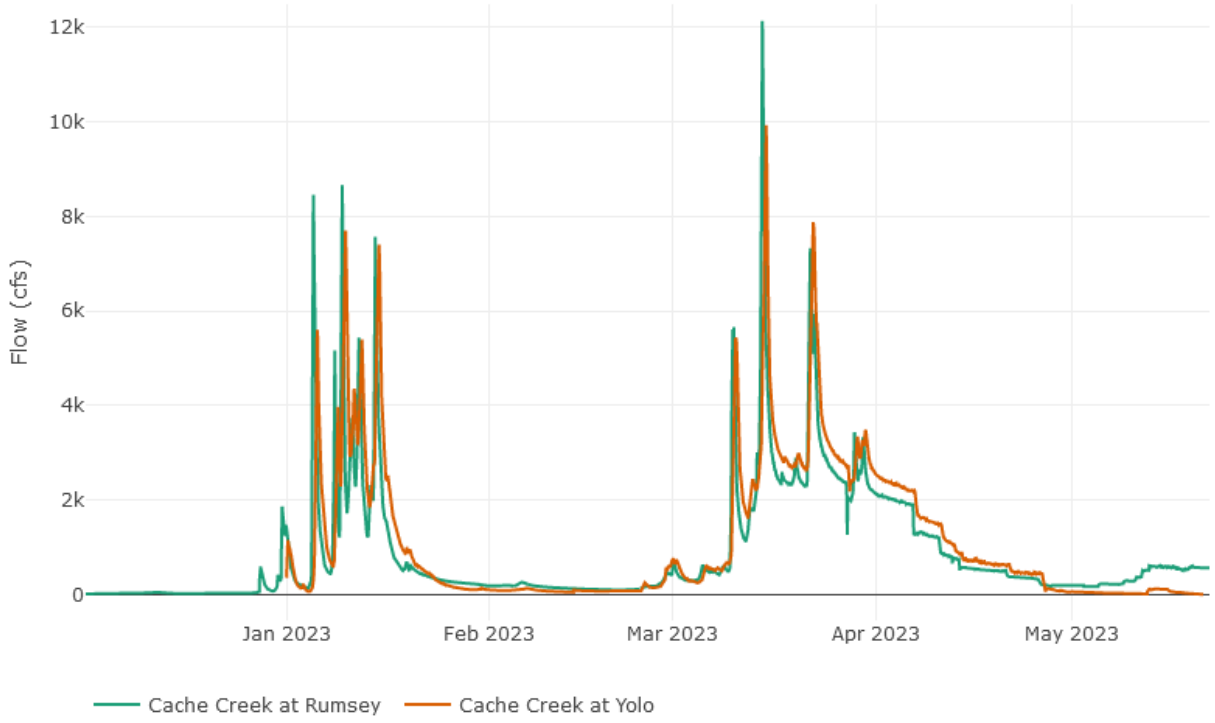


Figure 2-12. Instantaneous flows in Water Year 2023 at Rumsey and Yolo flow gages.

2.3 Bridge Crossing and Other Infrastructure Observations

This section describes observations regarding bridge crossings and other infrastructure made during the 2023 Creek Walk.

Capay Dam

This year's inspection of the Capay Dam, and its apron and energy dissipation blocks, did not reveal any noticeably new damage or movement. Cracks in the surficial concrete are evident throughout the apron, and as has been the case for several years, many concrete energy dissipation blocks have fallen into the channel. The concrete blocks continue to affect the creek and should be removed from its bed.

Figure 2-13. Capay Dam and apron. (2023)

Capay Dam Site Emergency Bank Repair Retaining Wall

The emergency retaining wall structure built in 2017 immediately downstream of the Capay Dam continues to exhibit signs that water is running off behind the wall and compromising its integrity, and in 2023, this process seemed to be noticeably degraded over previous years, likely due to the heavy January and March rains. Significant quantities of soil have been scoured from behind the wall, presumably due to overland runoff from behind the wall, rather than from flows in the creek itself (Figure 2-14). This erosion will eventually compromise the access road adjacent to the irrigation canal if not addressed. Given the continued loss of soil behind the wall, this appears to be an issue needing action from the Yolo County Flood Control and Water Conservation District.

Figure 2-14. View of soil erosion behind Bank Repair Wall at Capay Dam. (2023)

PG&E Palisades

No new signs of damage or erosion were observed at the PG&E palisades and erosion control blanket were observed despite the relatively significant flows in 2023 (Figure 2-15). The increasing trend in vegetation growth observed in the last few years continued this year. The long-planned removal project has still not occurred, and the Cache Creek TAC continues to recommend that this removal occur as soon as possible. Continued monitoring of the site in the aftermath of the removal will be important to document changes to the creek.

Figure 2-15. Current state of erosion control blanket at PG&E Palisades site. (2023)

Capay Bridge (County Road 85)

No significant new scouring was observed at the Capay Bridge, although the significant vegetation growth of 2022 had been removed by the flows of early 2023 (Figure 2-16). As was predicted last year, the 2-year flow that occurred during 2023 was enough to remove last year's vegetation although new vegetation was growing in its place from the spring growing season after heavy flows subsided in late March.

Figure 2-16. Photo showing Capay Bridge and limited vegetation growth after elevated flows from January and March. (2023)

Car in Bank at River Mile 25.9

This car, first observed in 2021 but not in 2022, was again observed during this year's creek walk – indicating it had been obscured by vegetation growth in 2022.

Appropriate enforcement action should be taken against the landowner and the car removed as it can contribute detrimental contaminants to the creek.

Figure 2-17. Photo showing car in the streambank at RM 25.9. (2023)

Waste Disposal at River Mile 25.4

In 2021, new rubble (waste concrete and similar materials) armoring was observed at the bend along the right bank of the creek near River Mile 25.4. This site has been an active erosion site for several years and likely the placement of such armoring is intended to arrest the bank erosion. In 2023, it did not appear as though new waste had been deposited but none of the vehicles or materials observed in 2022 had been removed. Figure 2-18 shows conditions at this site in 2023.

Figure 2-18. Photo showing outside bend with staged soil stockpiles gone, and new fill on bank. (2023)

New Soil Fill Material at River Mile 25.4

In 2023, apparently new soil fill on the streambank at the right side bend at River Mile 25.4 (coincident with the waste disposal described above) was observed. This fill appears to have been related to staging of soil stockpiles and earthmoving that occurred on this property in 2022. During the Creek Walk in 2022, stockpiles of soil above the bank were captured in photos (Figure 2-19) and these stockpiles were gone as of 2023, indicating that this material was likely used to fill the bank (refer above to Figure 2-18).

Figure 2-19. Photo showing outside bend with staged soil stockpiles from 2022 Creek Walk.

Because the fill material did not appear to have been planted with vegetation or stabilized in any way, it is likely that the material will be carried away by winter flows. Given the apparent extent of earthmoving activities on the overbank area visible in Google Earth imagery (Figure 2-20) this fill action may have been undertaken to dispose of or otherwise manage soils. Such fine soil material has the potential to create deposition and water quality issues downstream.

Figure 2-20. Google Earth imagery from October 2022 showing significant stockpiles of soil and earthmoving activities.

Esparto Bridge (County Road 87)

In some previous years after high flows, the Esparto Bridge has shown evidence of significant scour, including exposure of steel piles below the concrete piers. No change was noted in 2023 even though greater magnitudes of flow occurred this year versus 2022 (Figure 2-21). Conditions at the bridge reflected little vegetation due to minor scouring flows, although scouring of sediment below the previous year's bed elevation was not noted.

Figure 2-21. Esparto Bridge Piers with no significant change from last year. (2023)

Teichert Gravel Pile at River Mile 22.9

Bank erosion over several years has occurred near River Mile 22.9 at the Teichert Esparto plant. As the bank has retreated northwards, it has resulted in a large pile of gravel being perched immediately above the creek with potential for it to slump into the creek. Furthermore, K-rails have been placed at the toe of the slope (Figure 2-22) to protect the bank. These K-rails have shifted and are not performing any stabilization function.

Figure 2-22. K-rails at toe of retreating bank with gravel pile at RM 22.9. (2023)

Interstate 505 Bridge

No significant changes were observed at the I-505 Bridge. Some shifting of the channel bed sediments and removal of vegetation were noted, but these are in line with expectations after the flows of winter 2023 (Figure 2-23).

Figure 2-23. Photo showing I-505 Bridge piers. (2023)

Illicit Gravel Extraction at River Mile 18.5

Near the Moore's Siphon at River Mile 18.5 during the 2022 Creek Walk we discovered that a significant quantity of streambed gravel (i.e., dozens of cubic yards) had been extracted from the channel by excavator or bulldozer with scrape marks evident. The holes left from this excavation were still evident in 2023 but a thin layer of sand had deposited on top (Figure 2-24).

Figure 2-24. Photo showing illicit gravel removal site at RM 18.5. (2023)

Stephen's Bridge (County Road 94B)

Similar to other bridges, no significant changes occurred at Stephen's Bridge in 2023 with the exception of slightly less vegetation due to scouring during 2023 flows (Figure 2-25).

Figure 2-25. Photo showing Stephen's Bridge piers. (2023)

New Bank Scour at River Mile 15.7

In 2023, we observed what appeared to be new erosion on the left (looking downstream) bank, with evidence of bank swallow nesting (Figure 2-26). Compared to photographs from a similar location last year, this erosion appeared new. Since, at this time it does not threaten structures above the creek and seems to be facilitating habitat for the bank swallow, there is no concern at this time. However, this spot should be photographed in subsequent years to document evolution of the bank.

Figure 2-26. Apparently new bank erosion and bank swallow activity. (2023)

2.4 Recommendations

1. **Capay Dam Concrete Energy Dissipation Structures and Apron Cracking**

This is a repeat recommendation from prior years. Large concrete slab pads were included in the construction of the Capay Dam apron expansion project. Unfortunately, these pads were not secured to the dam apron. Additional movement of concrete pads off the apron was observed this year, as well as surficial cracking and sloughing. The TAC Hydraulic Engineer recommends

that remedies to prevent future damage and movement of these concrete pads into the channel be undertaken, and inspection of the sloughing concrete by a qualified professional for recommendations on the long-term effects of this process.

2. Emergency Bank Stabilization Retaining Wall at Capay Dam

Repeated from previous years, we observed erosion of fill from behind the emergency bank stabilization project built in 2017 near the Capay Dam to repair a failure than threatened the adjacent access road and irrigation canal. The erosion appears to originate from local runoff behind the wall rather than flows in Cache Creek itself and in 2023 appears to be continuing to advance. The TAC Hydraulic Engineer recommends that the Yolo County Flood Control and Water Conservation District evaluate the erosion and implement remedies.

3. PG&E Palisades and Erosion Control Blanket

The erosion control blanket and steel piles at the PG&E Palisades site continue to represent a barrier to natural function of Cache Creek. PG&E is currently working to remove the blanket and piles. Until this project is implemented, it remains the CCTAC's recommendation that the erosion control blanket and all associated infrastructure be removed and the palisades either be removed entirely or cut at, or below, ground level and revegetation/natural stabilization project be implemented.

4. Creek Monitoring of Erosion and Other Issues

As described above, the flows of water year 2023 were a welcome change from previous dry years and peak flows never reached significantly damaging levels. Listed below are notable sites that have suffered damage in past years with recommendations for ongoing monitoring or actions.

- **Jensen Bend (River Mile 25.4)**: The apex of the southward meander bend at the Jensen property has had significant debris dumped into the creek and abandoned vehicles have been placed within 100 feet of the top of bank. This waste disposal is deleterious to the creek ecosystem and presents a water quality hazard when fluid leaks from the vehicles. The TAC Hydraulic Engineer recommend Yolo County take any available enforcement action against the property owner to effect removal of the waste to outside of the creek and its overbank.

  In 2023, it appears that significant quantities of soil material will placed onto the streambank at this bend that could have deleterious effects on the creek. This fill placement was potentially done without the required permits from regulatory agencies

such as USACE, California Department of Fish and Wildlife, and Regional Water Quality Control Board and without approvals through the CCAP/CCRMP. The County should determine what if any enforcement actions are appropriate.

- **Granite Esparto (River Miles 24.8 – 24.4):** The north bank of the channel immediately upstream of the Esparto Bridge was recently stabilized by Granite Construction and there was no evidence of recent erosion this year. It should be continually monitored.

- **Weirs Downstream of Esparto Bridge (River Mile 24.0):** OHV activity has historically denuded bank stabilization weirs although ATV activity was formally banned in 2022 and evidence of reduced used was observed. However, consideration should be given to removal of these features (see recommendation below).

- **Huff's Corner (River Mile 11.6):** The Huff's Corner project was constructed in 2022 and removed a significant quantity of accumulated sediment that had formed and island in the middle of the channel. Vegetation had "armored" the island so that it was no longer able to be scoured by high flows. The project disposed of approximately half of the accumulated sediment and used the other half to construct a habitat terrace on the right bank. The combination of early elevated flows in December and completion of construction in November led to some erosion of the terrace, leaving some unanchored erosion control matting. The TAC Hydraulic Engineer recommends remedial actions be installed in 2024.

5. **Consider removal of some bank stabilization weirs and replacement with more modern approaches to bank stabilization.**

The bank stabilization weirs downstream of the Esparto Bridge between River Miles 24.10 and 23.90 had become a significant OHV use area during 2020-2021. The banning and enforcement of ATV activity appeared to have reduced this issue during 2023. The TAC Hydraulic Engineer continues to recommend evaluating this site as a pilot project to remove the weirs and replace them with a different bank protection scheme, such as a vegetated terrace to bolster the bank toe, that could provide habitat value and remove the attraction for OHV enthusiasts.

6. **Address the failed bank stabilization measures and perched gravel pile at the Teichert Esparto Plant near River Mile 22.9.**

The TAC Hydraulic Engineer recommends that the stability of the bank at this location be evaluated, especially considering the presence of the large pile of gravel above the bank at the Teichert plant. This pile could already be contributing gravel to the creek and any further retreat of the bank could create conditions that deposit a significant quantity of gravel into the creek

bed in an uncontrolled fashion. The K-rails that have been installed (c. 2019) at the toe are not currently providing any benefit and are a detriment to habitat conditions.

The bank retreated here in winter of 2016-2017 and while it has not significantly retreated since, it has likely slowly continued to erode and could erode further when a significant flow event (e.g., 10-year return interval or higher) occurs. The bank appears to have retreated past the Channel Form Template line. Some remedial action is required to remove the risk of gravel discharge, to remove the K-rails, and determine if any further bank protection action is required to ensure compliance with mining permits and the Channel Form Template.

3. Geomorphology

3.1 Summary of Annual Sediment Discharge Data

Sediment transport in creeks is correlated with flow. As flow increases, sediment transport increases. Sediment transport calculations for Water Year 2023 in the CCRMP area use sediment transport rating curves developed from pre-1996 measured suspended sediment data in Cache Creek. In general, the sediment component of most interest to the Cache Creek TAC is the material deposited in the channel (CCIP, p. 34). This is typically comprised of the sand and gravel component of the total sediment load, also called the bedload. However, it is very important to note that excavation from prior in-channel mining (before 1996) created physical conditions in some reaches of Cache Creek conducive to deposition of fine sediments in addition to bedload.

Figure 3-1 shows the bedload (Q_b) and suspended load (Q_s) volumes calculated for Water Years 2005 through 2023. The Q_b and Q_s values were calculated using both approved and provisional USGS flow data. USGS suspended sediment transport data were only available for water years 2013 through 2019.

The critically dry drought conditions in Water Years 2021 and 2022 were followed by a wet Water Year 2023. While Water Year 2023 was designated as "wet," flows in Cache Creek were moderately high for long periods as opposed to the shorter, more extreme flows in the previous wet Water Years 2017 and 2019. This resulted in total sediment transport of 440,105 tons in 2023.

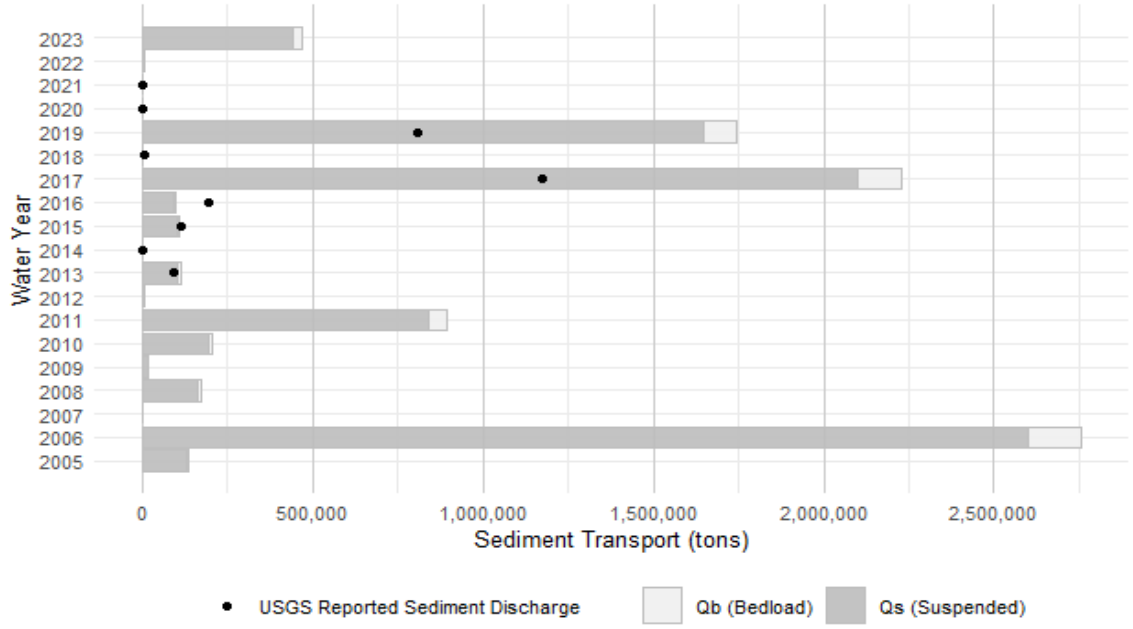


Figure 3-1. Suspended load (Qs) and bedload (Qb) in Cache Creek from Water Year 2005 through 2023.

Figure 3-2 shows a typical reach of Cache Creek in 2022 and 2023 with significant changes in sediment patterns and geomorphic features typical throughout Cache Creek after Water Year 2023 winter flows. Changes included removal of in-channel vegetation, migration of the active channel, erosion of channel banks, and deposition of gravel bars.

Figure 3-2. Looking upstream of CR 94B in Water Year 2022 (left) and 2023 (right) showing typical changes in geomorphic conditions and riparian vegetation adjacent to and in the active channel.

Table 3-1 displays a ranked summary of suspended load (Q_s), bedload (Q_b), and total sediment transported to and through the CCRMP reach over the last 19 water years. Total sediment transport in Water Year 2023 increased to 440,105 tons (compared to zero in 2021 and 2022), and significantly increased the total sediment load over the past 19 years. Just five Water Years (2006, 2017, 2019, 2011, and 2023) have transported more than 90% of all the sediment over this period. Water Year 2023 was the fifth highest annual sediment transport over the last 19 years. The total sediment transported between 2005 and 2023 is approximately 8,945,108 tons.

Table 3-1. Calculated suspended and bedload sediment transport totals. (2005-2023)

Water Year	Q_s (tons/year)	Q_b (tons/year)	Total Transport	Percent of Total	USGS Reported Sediment Discharge (tons/year)
2006	2,600,959	156,058	2,757,017	30.8	N/A
2017	2,099,524	125,971	2,225,496	24.9	1,173,399
2019	1,646,773	98,806	1,745,579	19.5	808,853
2011	841,136	50,468	891,604	10.0	N/A
2023	**440,105**	**26,406**	**466,511**	**5.2**	**N/A**
2010	192,179	11,531	203,710	2.3	N/A
2008	161,006	9,660	170,666	1.9	N/A
2005	128,903	7,734	136,637	1.5	N/A
2013	103,913	6,235	110,148	1.2	90,637
2015	101,509	6,091	107,600	1.2	112,721
2016	93,179	5,591	98,770	1.1	192,944
2009	16,968	1,018	17,986	0.2	N/A

2022	5,323	319	5,643	0.1	N/A
2012	3,934	236	4,171	0.0	N/A
2007	1,999	120	2,119	0.0	N/A
2018	1,010	61	1,070	0.0	3,106
2020	274	16	291	0.0	N/A
2014	86	5	92	0.0	711
2021	0	0	0	0.0	N/A

Q_b estimated as six percent of the suspended sediment load.
USGS Reported Sediment Discharge includes provisional data.

3.2 Evidence of Changes in Channel Dimensions or Bank Erosion (Bank Retreat)

Unlike Water Years 2021 and 2022, significant channel change occurred in Water Year 2023. The peak flow in Water Year 2023 of approximately 12,139 cfs at Rumsey and 9,936 cfs at Yolo in March 2023, combined with periods of sustained flows above 2,000 cfs in January, March, and April 2023 resulted in significant mobilization and redistribution of sediment within the Cache Creek channel. The persistent periods of moderately high flow in Water Year 2023 caused relatively minor erosion, scour, and channel migration throughout Cache Creek. However, because the peak flows were relatively small (less than a two-year recurrence interval), erosion, scour, and channel migration were less extensive than in previous wet water years. Figure 3-3 is a view upstream of County Road 85 in 2022 and 2023, where nearly all of the in-channel and near-channel riparian vegetation was eroded away by the peak flows in 2023, and significant sediment deposition occurred in the channel.

Figure 3-3. Looking upstream of CR-85 in Water Year 2022 (left) and 2023 (right) showing loss of vegetation, sediment deposition, and minor erosion, scour, and channel migration in Water Year 2023.

Figure 3-4 and Table 3-2 summarize locations with current and recent past evidence of channel change and provides recommendations for each location. It is important to remember that some bank retreat is beneficial, allowing natural channel processes to occur and valuable habitat to form. Beneficial bank retreat can provide regeneration of riparian habitat, bank swallow habitat,

and diversity of in-channel habitat (like pool and riffle habitat) that might not exist otherwise. Therefore, bank retreat from prior years that does not threaten CCAP boundaries does not necessarily require treatment. While the wet conditions in Water Year 2023 did cause some erosion, scour, and channel migration in all reaches of Cache Creek, changes were relatively minor because of a lack of extreme peak flows. The recommendations in Table 4-2 this year remain the same as in Water Year 2022. However, recommendations for potential action should be revisited during the Winter of 2023 if extreme peak flows occur as channel conditions are much more conducive to further change than in the past several years. Visit https://flowwest.shinyapps.io/cache-creek/ to explore the CCTAC Geomorphologist recommendations in more detail.

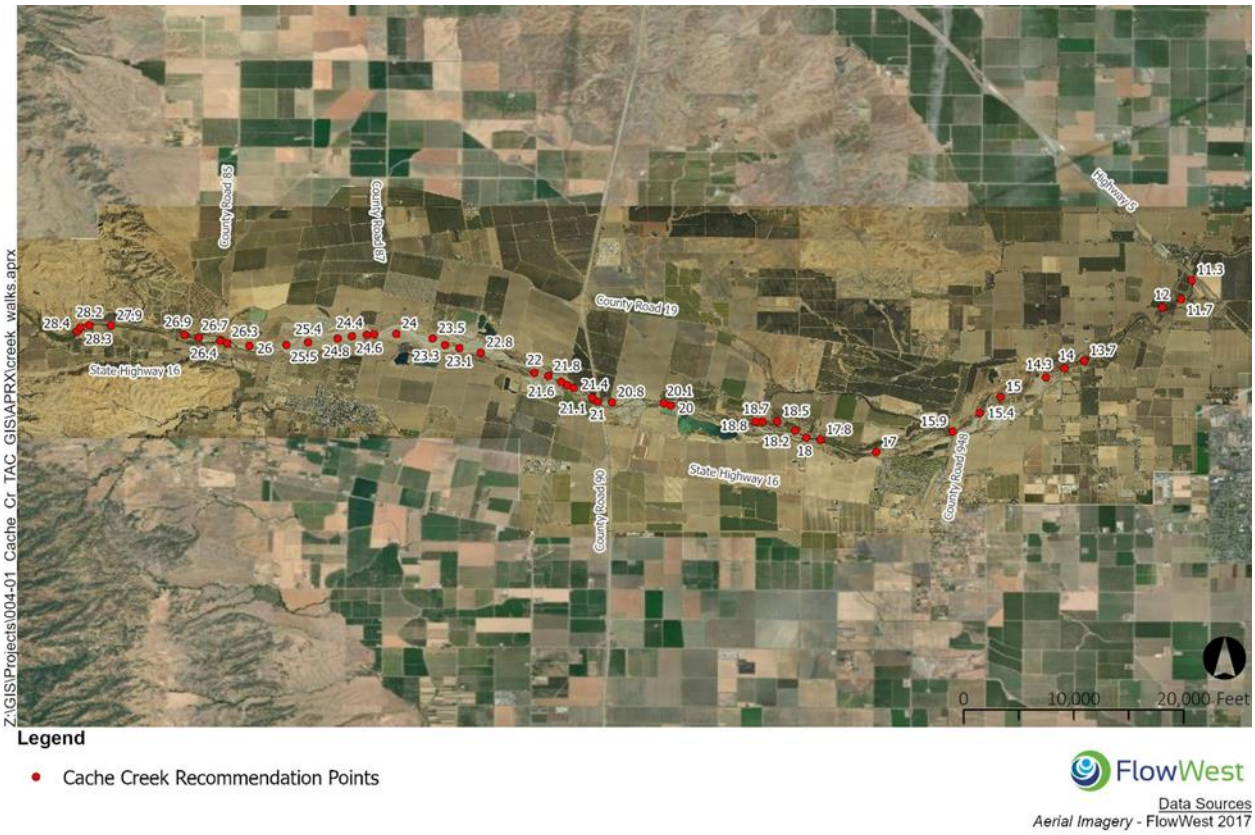


Figure 3-4. Locations of CCTAC Geomorphologist recommendations for Water Year 2023.

Table 3-2. Summary of channel change tracking. (2020-2023)

RM	Location Description	2020	2021	2022	2023	Recommendation
RM 28.2-28.4	Near Capay Dam	No change	No change	No change	Minor erosion, scour, and vegetation loss	Notify dam owner and repair left bank erosion behind concrete wall.
RM 26.9	PG&E "Palisades" Pipe Crossing	No change	No change	No change	Minor erosion, scour, and vegetation loss	Accelerate coordination with PG&E on removal of concrete pillow bed armoring.

RM 26.7	Upstream end of left bank bar	No change	No change	No change	Minor erosion, scour, and vegetation loss	Monitor
RM 26.4	Near Capay Bridge	No change	No change	No change	Minor erosion, scour, and vegetation loss	Notify bridge owner of channel change at bridge.
RM 26.3	Mid-channel near Capay Bridge	No change	No change	No change	Minor erosion, scour, and vegetation loss	Notify bridge owner of channel change at bridge.
RM 26.0	Hungry Hollow	No change	No change	No change	Minor erosion, scour, and vegetation loss	Reassess proposed CFT location and evaluate need for treatment.
RM 25.4 - 25.5	Near Jensen Property	No change	No change	No change	Minor erosion, scour, and vegetation loss	Reassess proposed CFT location and evaluate need for treatment.
RM 24.6 - 25.1	Near Granite Capay	No change	No change	No change	Minor erosion, scour, and vegetation loss	Accelerate implementation of proposed gravel bar skimming project.
RM 23.5	Madison Reach	No change	No change	No change	Minor erosion, scour, and vegetation loss	Reassess proposed CFT location and evaluate need for treatment.
RM 23.1	Madison Reach	No change	No change	No change	Minor erosion, scour, and vegetation loss	Repair bank at captured tailings pile, consider potential for gravel bar skimming project, and reassess proposed CFT location.
RM 22.0	Near Syar	No change	No change	No change	Minor erosion, scour, and vegetation loss	Reassess proposed CFT location, evaluate need for treatment, and consider potential for gravel bar skimming project.
RM 21.8	Near Syar	No change	No change	No change	Minor erosion, scour, and vegetation loss	Reassess proposed CFT location, evaluate need for treatment, and consider potential for gravel bar skimming project.
RM 21.6	Near the Old Madison Bridge	No change	No change	No change	Minor erosion, scour, and vegetation loss	Reassess proposed CFT location, evaluate need for treatment, and consider potential for gravel bar skimming project.
RM 21.4	Downstream from the Old Madison Bridge	No change	No change	No change	Minor erosion, scour, and vegetation loss	Reassess proposed CFT location, evaluate need for treatment, and consider potential for gravel bar skimming project.
RM 21.1	Upstream of 505 Bridge	No change	No change	No change	Minor erosion, scour, and vegetation loss	Notify bridge owner of channel change at bridge, reassess proposed CFT location, and evaluate need for treatment.

RM 20.8	Near CEMEX right bank protection	No change	No change	No change	Minor erosion, scour, and vegetation loss	Monitor
RM 20.1 - 20.5	Near CEMEX conveyor belt	No change	No change	No change	Minor erosion, scour, and vegetation loss	Accelerate implementation of proposed gravel bar skimming project.
RM18.8-18.7	Dunnigan Hills Reach	No change	No change	No change	Minor erosion, scour, and vegetation loss	Continue to monitor
RM18.2-18.0	Upstream of Moore's Siphon	No change	No change	No change	Minor erosion, scour, and vegetation loss	Reassess proposed CFT location and evaluate need for treatment.
RM 17.8	Dunnigan hills	No change	No change	No change	Minor erosion, scour, and vegetation loss	Continue to monitor
RM 15.9	Near CR 94B	No change	No change	No change	Minor erosion, scour, and vegetation loss	Notify bridge owner of channel change at bridge and monitor.
RM 15.4	Near Teichert Woodland	No change	No change	No change	Minor erosion, scour, and vegetation loss	Continue to monitor
RM 15.0	Near Teichert Woodland	No change	No change	No change	Minor erosion, scour, and vegetation loss	Continue to monitor
RM 14.0	Near Woodland Reiff Breach	No change	No change	No change	Minor erosion, scour, and vegetation loss	Implement levee breach channel enhancement / stabilization
RM 12	Rio Jesus Maria Reach	No change	No change	No change	Minor erosion, scour, and vegetation loss	Continue to monitor
RM 11.3	Near Huff's Corner	No change	No change	No change	Minor erosion, scour, and vegetation loss	Assess need to remove fine sediment deposited along bar.

Note: **Orange** boxes denote observations of channel change. **Blue** boxes denote areas recommended for evaluation and possible action. **Green** boxes denote project implementation. Observations from 2020 to 2022 are presented in grey to differentiate them from observations made during the current Water Year.

3.3 Evidence of Bed Degradation or Aggradation and Significant Changes in the Locations or Sizes of Bars and Other Channel Features

"Bar skimming" has been identified as a possible management action for areas where significant channel bed aggradation has occurred (CCIP p. 20). Bar skimming is the removal of channel bed sediment (generally gravel and coarser material) that has deposited and created significant mid-channel bars in Cache Creek. Gravel bar skimming can reduce erosion and scour potential and increase flow conveyance capacity. The CCIP authorizes gravel bar skimming as a routine channel maintenance activity to maintain hydraulic capacity and reduce the probability of excessive and damaging bank erosion. All bar skimming proposals must be reviewed and approved by the Cache Creek TAC and be designed to limit excavation volumes in balance with sediment supply volumes transported through lower Cache Creek, as well as to protect and enhance creek ecosystem and geomorphic conditions, where possible. Sediment deposition in bars or other channel forms reduces channel capacity and increases flow energy acting on the channel bed and banks. Depending on the location of the gravel bar, erosive pressure on one or both creek banks

may increase as deposited sediment accumulates. In addition, gravel bars may become vegetated, further reducing flood capacity. The CCIP encourages gravel bar skimming in areas where the gravel bar could potentially reduce flood capacity required for effective flood management or in areas where the bar may affect bank stability.

The potential bar skimming locations identified Table 3-2 above have not changed since 2017. These locations include Granite Capay (RM 24.6 – 25.1) and CEMEX (RM 20.1 – 20.5). Each of these locations changed in Water Year 2023 due to relatively minor erosion, scour, and deposition, with accumulations of new fine and coarse sediment typical at each location. Therefore, the need to consider bar skimming at the locations in Table 3-2 remains.

3.4 Bridge Conditions

The CCIP directs the Cache Creek TAC to "monitor bridges, levees, and other infrastructure to detect and prevent damage" (CCIP, p. 33). Responsibility for the maintenance and repair of public bridges is held by other agencies (e.g., Caltrans or Yolo County Community Services Department). Current conditions at the bridges were observed and documented during the 2023 Creek Walk and compared to observations made in previous years.

The general geomorphic conditions at bridges in Water Year 2023 did not change substantially compared to conditions noted in Water Year 2022, except for the removal of some riparian vegetation that had encroached into the active channel during the recent dry years and localized erosion, scour, and sediment deposition. It appears that the combination of vegetation loss and channel change at, and adjacent, to bridges in Water Year 2023 did not significantly change flow conveyance capacity or direction of flow through bridges. Geomorphic conditions and vegetation should continue to be monitored in future years to ensure that additional erosion or scour from high flows does not compromise bridge conditions. Table 3-3 and Figure 3-5 summarize bridge condition observations and recommendations for Water Year 2023. The primary recommendation is to inform bridge owners of riparian vegetation loss and localized erosion, scour, and deposition, and monitor conditions going into Water Year 2024.

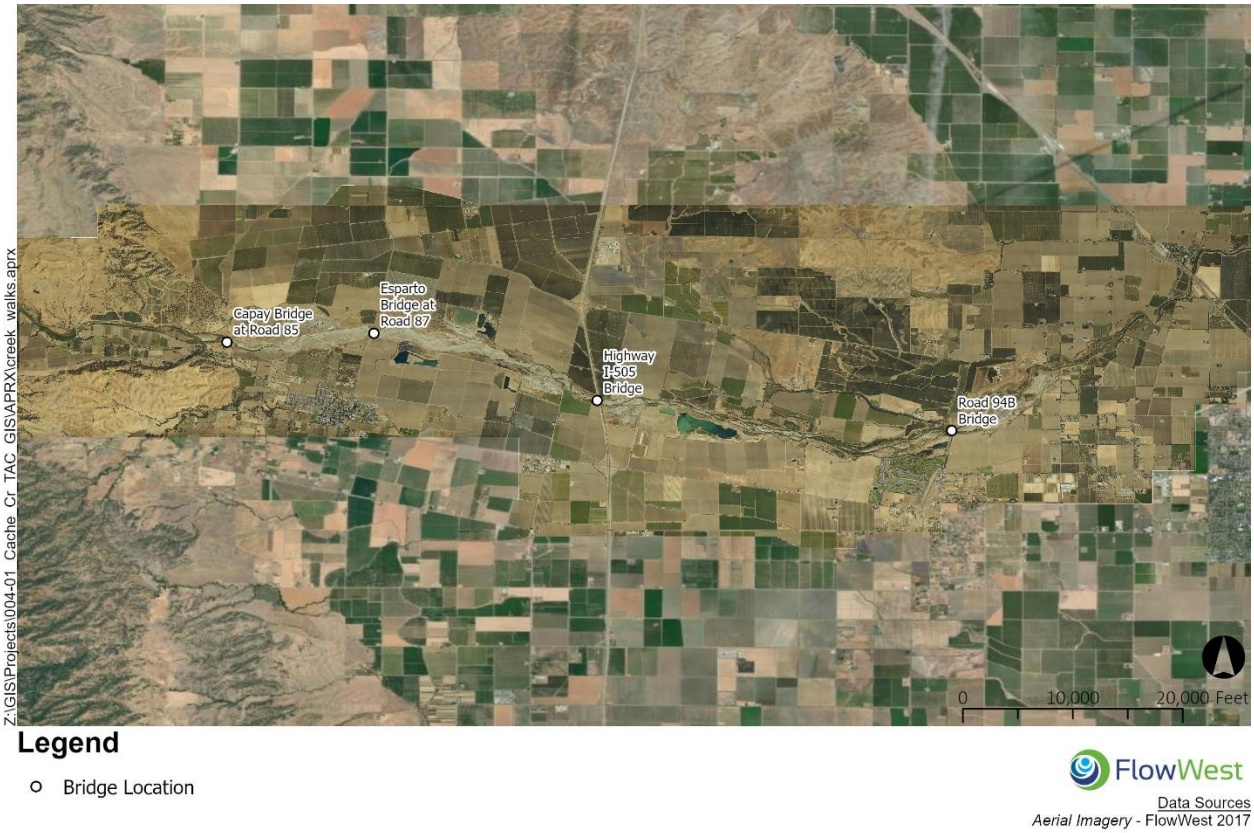


Figure 3-5. Locations of CCTAC Geomorphologist bridge inspections for Water Year 2023.

Table 3-3. Summary of observations of bridge conditions. (2020-2023)

Location	General Conditions	2020	2021	2022	2023	Recommendations
Capay Bridge at Road 85 (RM 26.35)	2007 CalTrans report: "no scour." Some erosion of the south bank upstream of the bridge in 2010, with no observable consequences to the bridge.	No significant change since 2019	No significant change since 2020	No significant change since 2021	**Minor vegetation removal and localized erosion, sour, and deposition.**	Inform bridge owner and monitor vegetation establishment in Water Year 2024.
Esparto Bridge at Road 87 (RM 24.35)	2006 CalTrans report: "signs of aggradation." Observed in 2010. Tendency for erosion on the north side, and the northern-most pier is slightly undercut.	No significant change since 2019	No significant change since 2020	No significant change since 2021	**Minor vegetation removal and localized erosion, sour, and deposition.**	Inform bridge owner and monitor vegetation establishment in Water Year 2024.
Highway I-505 Bridge (RM 21.0)	2005 CalTrans report: "Scour holes at each pier." 2010: two-ten feet of sediment build up (aggradation) around the two southern bridge	No significant change since 2019	No significant change since 2020	No significant change since 2021	**Minor vegetation removal and localized erosion, sour, and deposition.**	Inform bridge owner and monitor vegetation establishment in Water Year 2024.

	bays, with vegetation growing on the deposited material.					
Road 94B Bridge (RM 15.9)	2007 CalTrans report: "Abutment 1 is undermined up to 18 inches." Relatively stable channel conditions in 2010.	No significant change since 2019	No significant change since 2020	No significant change since 2021	**Minor vegetation removal and localized erosion, sour, and deposition.**	Inform bridge owner and monitor vegetation establishment in Water Year 2024.

3.5 Summary of Changes in Channel Topography and Form

The CCIP describes one of the objectives of the annual monitoring program as the observation and assessment of "changes in channel form and topography" (CCIP p. 33). This information is used to locate areas of aggradation and degradation in the creek (CCIP p. 39). A summary of changes in channel topography and form was provided in Table 3-2 in Section 3.2 above.

3.6 Location and Volume of Annual Sediment Replenishment

3.6.1 Volumetric Change Analysis

The flow trigger of 20,000 cfs for collection of new topographic data on lower Cache Creek was not reached in Water Year 2023; therefore, no volumetric change analysis was conducted this year. As discussed in the previous sections, high flows in Water Year 2023 were relatively low, and while significant sediment transport did occur this year, it only resulted in minor and localized erosion, scour, and channel change.

3.7 Channel Maintenance Activities

The CCIP (Section 4.2, starting on page 20) describes typical channel maintenance activities that can be implemented to achieve improved equilibrium channel conditions and protect and enhance channel and riparian habitats. The ccTAC reviewed all of the recommended channel maintenance activities listed in the CCIP and identified sites where various maintenance activities could be implemented to achieve the objectives of the CCIP. Some of the recommended channel maintenance activities in Table 3-4 and Figure 3-6 are also described in the summary of channel changes in Table 3-2 above.

Again, because erosion, scour, deposition, and channel change were localized and relatively minor in Water Year 2023, the recommendations for 2023 remain mostly the same as in 2022. Conditions at the recently completed island removal project at Huff's Corner (RM 11.6) did change substantially because of the prolonged high flow conditions immediately after major in-channel work and before establishment of riparian vegetation. Conditions at this site should be

carefully monitored in Water Year 2024 and addressed if excessive channel change begins to occur. Visit https://flowwest.shinyapps.io/cache-creek/ to explore the CCTAC Geomorphologist channel maintenance recommendations in more detail.

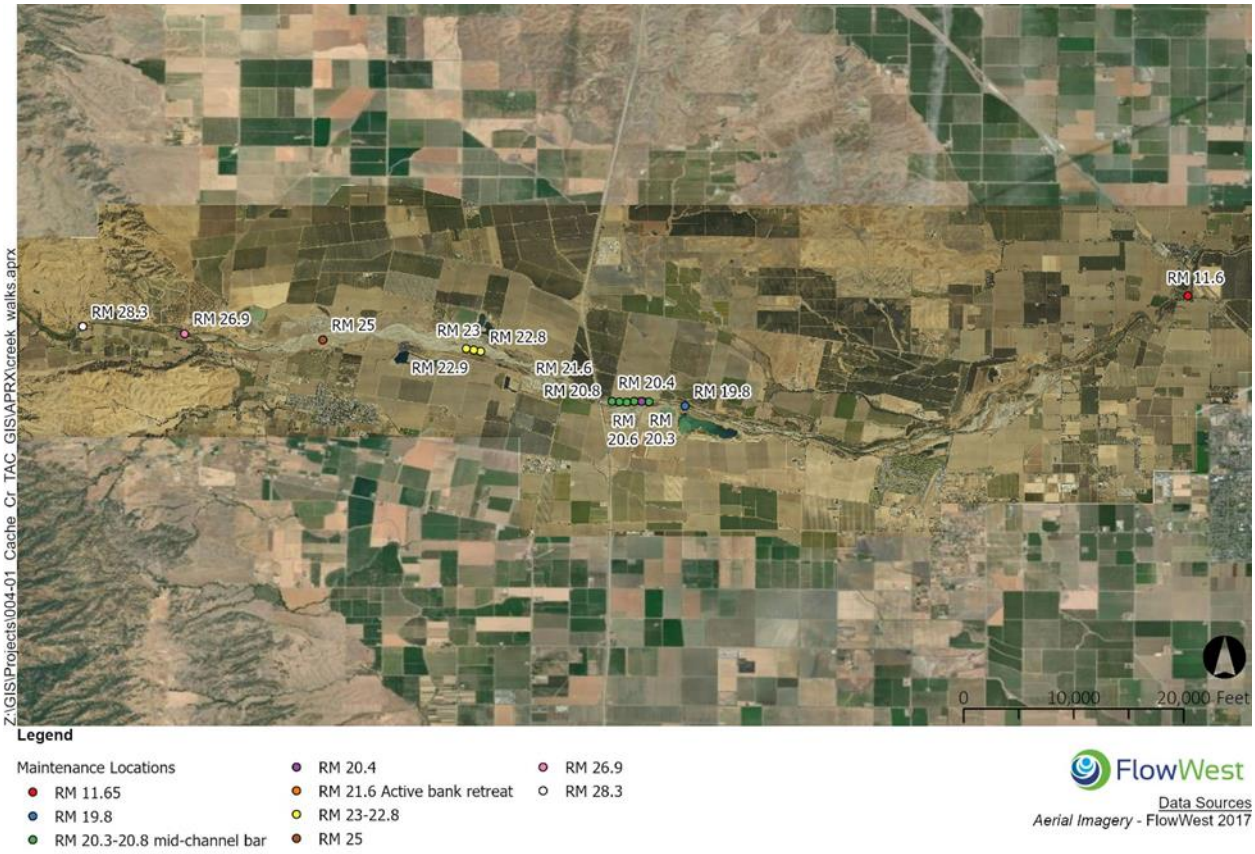


Figure 3-6. CCTAC Geomorphologist channel maintenance locations for Water Year 2023.

Table 3-4. Summary of recommended channel maintenance activities. (2020-2023)

Site	Description	2020	2021	2022	2023	Recommendation
RM 28.3	Removal of concrete rubble in creek channel.	No significant change.	No significant change.	No significant change.	**Localized erosion, scour, deposition, and vegetation removal.**	Monitor in conjunction with monitoring of repaired left bank.
RM 26.9	Removal of exposed webbing at the PG&E Palisades site.	No significant change.	No significant change.	No significant change.	**Localized erosion, scour, deposition, and vegetation removal.**	Accelerate coordination of palisades removal with PG&E.
RM 25.0	Removal of mid-channel gravel bar to alleviate pressure on the north bank in this vicinity.	No significant change.	No significant change.	No significant change.	**Localized erosion, scour, deposition, and vegetation removal.**	Reevaluate and accelerate implementation of Granite Capay gravel bar skim plans initiated in 2015.

RM 23.0-22.8	Monitoring of levee erosion site.	No significant change.	No significant change.	No significant change.	**Localized erosion, scour, deposition, and vegetation removal.**	Evaluate and implement treatment for left bank erosion site and evaluate potential value of gravel bar skimming project.
RM 21.6 active bank retreat	Mid-channel experimental bar skimming to relieve erosive pressure on the north bank.	No significant change.	No significant change.	No significant change.	**Localized erosion, scour, deposition, and vegetation removal.**	Evaluate the need to treat left bank erosion and migration sites.
RM 20.3 - 20.8 mid-channel bar	Removal of mid-channel gravel bar to alleviate pressure on the south bank in this vicinity.	No significant change.	No significant change.	No significant change.	**Localized erosion, scour, deposition, and vegetation removal.**	Evaluate the need to treat left bank erosion and re-activate CEMEX gravel bar skim plans initiated in 2014.
RM 20.4	Protection against further bank toe erosion on bank.	No significant change.	No significant change.	No significant change.	**Localized erosion, scour, deposition, and vegetation removal.**	Incorporate into CEMEX gravel bar skim plans (if reactivated) initiated in 2014.
RM 19.8	Protection against further bank toe and slope erosion.	No significant change.	No significant change.	No significant change.	**Localized erosion, scour, deposition, and vegetation removal.**	Monitor and consider as part of the CEMEX gravel bar skim plans, if reactivated.
RM 11.65	Removal of the bar near Huff's Corner.	No significant change.	No significant change.	Bar removed November 2022.	**Major erosion, scour, and deposition at island removal site.**	Monitor channel change from high flows and evaluate need for stabilization maintenance measures.

Note: Table entries with RM and descriptions in "red" are also described in Table 3-2.

4. Biological Resources

Biological resources along lower Cache Creek include native vegetation, wildlife, invertebrates, and fish. Lower Cache Creek is a hotspot of native biodiversity in a landscape mostly developed and converted to agricultural and urban land uses. In addition to native trees, shrubs, and herbaceous plant species, at least 233 common and special-status native species of wildlife, invertebrates, and fish have been observed within the CCRMP and broader-scale CCAP areas over the past two decades since CCAP adoption. Non-native and invasive species are also assessed within the biological resource framework because of the negative impacts they have on native species, habitats, and channel dynamics. For example, invasive plants species such as arundo (*Arundo donax*), tamarisk (*Tamarix* spp.), perennial pepperweed (*Lepidium latifolium*), and non-native annual grasses displace native vegetation, degrade wildlife habitat, increase wildfire risk, impact creek flows, and diminish outdoor experiences for people. Additional influences on biological resources along Lower Cache Creek include human land use, climate, soil, groundwater dynamics, outdoor recreation pressure including off-highway vehicles ("OHVs"), and the timing, magnitude, and extent of surface flows, as well as flow effects on sediment transport and deposition.

4.1 Native Vegetation

The distribution and extent of native riparian and upland vegetation within the CCRMP area reflect the dynamic geomorphologic and hydrologic processes of Cache Creek, regional climate, competition with non-native species, between plants and wildlife, and both past and present human influences. Lower Cache Creek's position in the broad Central Valley Plain, low channel gradient, annual lateral channel movement, and channel braiding provide for a dynamic mosaic of riverine, riparian, wetland, and upland habitat types. Soil moisture, depth to groundwater, the presence of surface water in the low-flow channel, scour of established and newly planted or newly recruited vegetation by high flows, competition with non-native and invasive species, short- and long-term climate fluctuations (e.g., drought), and suitable soil substrates are the major limiting factors for establishment and maintenance of native riparian vegetation including riparian forests, willow scrub, and herbaceous communities (Fig. 4-1). In more upland areas on upper banks and higher terraces, factors such as depth to groundwater, available soil moisture, grazing, fire, and competition with invasive species are the major limiting factors in establishment and persistence of native vegetation including oak woodlands and grasslands (Fig. 4-1). In recent years, OHV damage has also been increasingly impacting both in-channel and upland vegetation (Section 4.1.2). As of 2022, however, OHV activity and associated damage to native plants and wildlife habitat (e.g., beaver dams) has greatly diminished (Section 4.1.2).

4.1.1 Current Condition of Native Vegetation

The 2023 assessment of biological resource conditions along Lower Cache Creek, including native vegetation, was based primary on observations made during the 2023 Creek Walk in addition to ancillary observations made by various CCRMP stakeholders, project site descriptions, and reports. Aerial photography was not collected in 2021, 2022, or 2023 since flows during the 2020–2021, 2021–2022, and 2022–2023 winters did not exceed the CCIP's trigger of 20,000 cfs that requires aerial data to be collected. GIS-based analysis of imagery collected in 2019 continues, with the goal of estimating the acreage of primary vegetation cover types (riparian forest, oak woodland, dense scrub, scattered scrub, and herbaceous) and producing maps showing the distribution and extent of these cover types as of 2019. As described below in Section 4.1.2, the distribution, extent, and condition of native vegetation along Lower Cache Creek in 2023 was relatively similar to 2022, with the exception of reductions of in-channel vegetation in select areas due to scour from 2022–2023 winter flows, persistent and potentially increasing evidence of drought-stressed vegetation in other areas, loss of mature native woody vegetation to fire in several locations, and minor loss of native trees due to scour and bank erosion resulting from winter 2022-2023 flows.

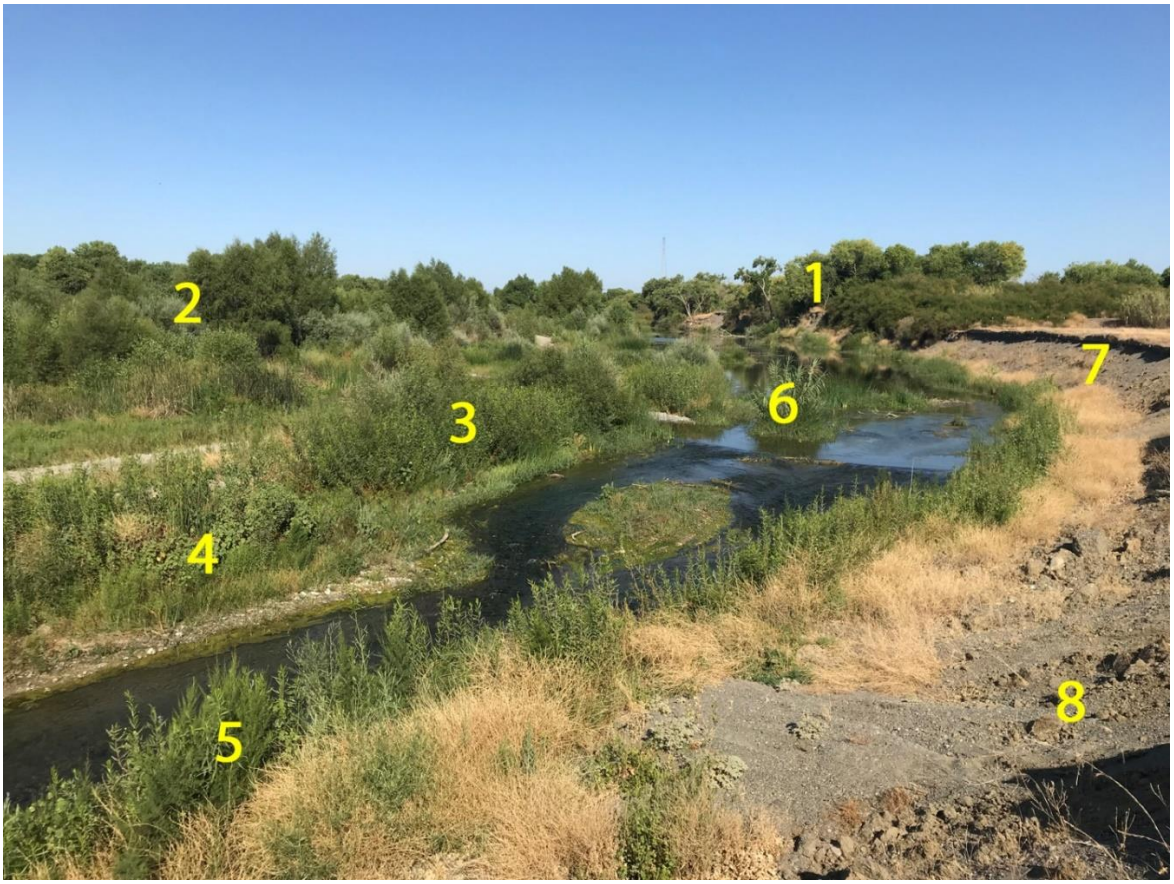


Figure 4-1. Representative Photograph of Lower Cache Creek Channel showing a typical mix of vegetation. (2020) (1) mature riparian forest; (2) developing riparian forest; (3) dense shrub scrub; (4) establishing woody and herbaceous vegetation; (5) invasive tamarisk; (6) invasive arundo; (7) herbaceous annual vegetation above and below the slope; and (8) bare ground.

4.1.2 Changes in Native Vegetation

As the 2020 Creek Walk was modified to account for the COVID-19 pandemic with reduced vegetation observations, additional attention was given to the condition of vegetation during the 2021 Creek Walk to re-establish full monitoring and to ensure adverse conditions are not created. As observed during the 2021 Creek Walk and inferred from the lack of high flows during winter 2020–2021 and the absence of extreme drought conditions, the condition of native vegetation along Lower Cache Creek in 2021 was generally unchanged compared to 2020. Three exceptions to this trend were noted in 2021: (1) increasing in-channel vegetation in select areas; (2) increasing evidence of drought-stressed vegetation in other areas; and (3) increased damage to native vegetation from OHV use (Yolo County 2021). During the 2022 Creek Walk, the distribution, extent, and condition of native vegetation along Lower Cache Creek was observed to be relative similar compared 2021 in most locations, with four notable exceptions: (1) continued increase of in-channel vegetation in the same areas noted in 2021; (2) more significant evidence of drought-stressed vegetation in the same areas noted in 2021 as well as additional areas observed in 2022; (3) signs of native vegetation recovery in areas previously impacted by OHV use; and (4) a slight increase in herbaceous vegetation adjacent to pools created by intact beaver dams in several locations. As noted from 2019–2022, native vegetation conditions have been relatively stable since significant flows and accompanying channel migration in winter 2016–2017 resulted in substantial loss of riparian forest and other native vegetation types (Yolo County 2020, Yolo County 2021, Yolo County 2022). Notably, high flows during winter 2018–2019 did not have the same impact on native vegetation, likely because sediment buildup and associated channel migration was relatively minimal.

During the 2023 Creek Walk, the distribution, extent, and condition of native vegetation along Lower Cache Creek was observed to be generally similar compared to 2022 in most locations. Native vegetation recovery in areas previously impacted by OHV use was again noted in 2023, as was increasing herbaceous vegetation adjacent to pools created by intact beaver dams in some locations. There were four notable exceptions regarding the condition of native vegetation in 2023 compared to 2022, which are detailed below: (1) further reductions of in-channel vegetation in the same areas noted in 2021–2022 due to winter 2022-2023 flows; (2) additional evidence of drought-stressed vegetation, although there was some vegetative regrowth in areas noted in 2021–2022; (3) significant negative impacts to mature native vegetation due to fire in several locations, and (4) minor loss of native trees in one location due to scour and bank erosion resulting from winter 2022-2023 flows.

First, instead of the continued re-establishment and expansion of in-channel native vegetation observed from 2018–2022, it was observed in 2023 that in-channel vegetation had been reduced or removed entirely by winter 2022-2023 flows in some locations including upstream and downstream of the County Road 85 bridge (RM 26.0–26.4) in the Hungry Hollow reach (Fig. 4-2). As noted in 2019–2022 Annual Reports, patches of native woody species such as mulefat

(*Baccharis salicifolia*), willows (*Salix* spp.), and cottonwoods (*Populus fremontii*) were persisting and expanding in locations that were previously completely scoured during the 2017–2018 winter season high flows; e.g., upstream and downstream of the County Road 85 (RM 26.0–26.4) and Interstate 505 bridges (RM 19.8–20.8), and also at the PG&E "Palisades" site (RM 26.9). It was also noted in 2022 that decreased OHV traffic appeared to be facilitating native vegetation recovery in previously impacted locations, including upstream of the County Road 85 bridge (RM 26.4). In the likely event that in-channel vegetation once again increases in some locations in future years, it should be possible to preserve, and even promote, some establishing native vegetation during future channel maintenance activities (e.g., bar skimming), which would accelerate vegetation recovery in those reaches and balance native vegetation removed during channel maintenance. Since increasing in-channel vegetation can potentially create adverse conditions (e.g., by directing flows into adjacent banks, leadings to bank undercutting and erosion), locations with increasing vegetation should continue to be monitored annually to determine if active management is required.

Figure 4-2. In-channel vegetation upstream of County Road 85 bridge at RM 26.3 in the Hungry Hollow reach in 2022 (left), and in 2023 (right). Note significantly reduced vegetation in 2023 due to relatively high winter 2022-2023 flows. Note also persistent impacts of drought conditions on both north and south banks in both years.

Second, stressed and dying native vegetation was again observed at several locations in six of the seven reaches, presumably due to ongoing drought stress and a lack of soil moisture (Fig. 4-3). The contrast between these areas and areas of persistent or increasing native vegetation described above was more pronounced in 2023 compared to 2022 or 2021, and it still appears that ongoing drought conditions are having a widespread negative impact native vegetation along Lower Cache Creek. Dead or dying mature trees and shrubs most likely attributable to drought conditions were observed at RM 26.5 (Capay Reach), from RM 25.9–26.0 (Hungry Hollow Reach), from RM 23.8–23.9 (Hungry Hollow Reach), from RM 21.1–21.8 (Madison Reach), from RM 20.2–20.9 (Guesisosi Reach), at RM 19.2 (Guesisosi Reach), and at numerous locations in the Hoppin Reach from RM 14.0–14.7 and from RM 13.0–13.8. However, some patches of vegetation thought to be dead or dying in 2022 shows signed of regrowth and recovery in 2023, such as at

RM 21.3 (Madison Reach), at RM 19.2 (Guesisosi Reach), and at RM 14.4 (Hoppin Reach). This was not entirely unexpected, as native riparian plant species such as willows and cottonwoods have a remarkable ability to resprout after drought or fire.

Figure 4-3. Stressed and dying native woody vegetation, likely due to a lack of soil moisture resulting from ongoing drought conditions. Photos from RM 26.5 in the Capay Reach (upper left), RM 26.0 in the Hungry Hollow Reach (upper right), RM 25.9 in the Hungry Hollow Reach (lower left), and RM 23.8 in the Hungry Hollow Reach (lower right).

Third, significant negative impacts to mature native trees due to fire was observed in some locations during the 2023 Creek Walk. While fire is a natural, albeit generally infrequent, process in California riparian ecosystems, fires along Lower Cache Creek are often the result of landowner activities and can damage or kill native trees and shrubs that could take decades to recover or restore from planted seedlings. In particular, damage to native vegetation from fire was observed on the north bank from RM 28.2–28.3 in the Capay Reach, although some trees were observed to be resprouting (Fig. 4-4). Native woody vegetation on the south bank at RM 26.0 in the Hungry Hollow Reach might also have been damaged or killed due to fire in recent years, in addition to drought.

Figure 4-4. Dead and/or severely-impacted vegetation scorched by fire on the north bank between RM 28.2–28.3 in the Capay Reach. Note the black walnuts (Juglans californica) beginning to resprout (right), demonstrating the resilience of native riparian vegetation to severe disturbance.

Fourth, minor loss of several cottonwood trees resulting from winter 2022-2023 flows was observed on the south bank at RM 15.1 in the Hoppin Reach (Fig. 4-5). Bank erosion is a natural process in a dynamic river system with periodic high flows, erodible soils, and lateral channel migration, which creates habitat for wildlife (e.g., riparian bank swallow [*Riparia riparia*]) and zones of establishment for native vegetation such as willows and cottonwoods. Within the CCRMP area, the ecological benefits of bank erosion must be balanced with the need to stabilize banks to protect adjacent land, roads, structures, and communities.

Figure 4-5. Native cottonwood trees displaced from the south bank into the main stream channel (RM 15.1 in the Hoppin Reach) by bank erosion resulting from winter 2022-2023 flows.

While significant damage to native vegetation from OHV use was not observed in 2023, increased evidence of OHV activity was observed in 2023 compared to 2022 (Fig. 4-6). OHV tracks were observed from RM 25.2-25.3 (Guesisosi Reach), at RM 22.2 (Madison Reach), at RM 18.4 (Dunnigan Hills Reach), and at RM 16.5 near the Cache Creek Nature Preserve. In addition, two OHV vehicles were observed operating in-channel at RM 14.2 in the Hoppin Reach. Notably, significant OHV activity was observed to have occurred adjacent to potential bank swallow habitat (suitable but unoccupied) at RM 15.3 in the Hoppin Reach. OHV tracks were also observed in Hoppin Reach at RM 15.2, adjacent to an occupied killdeer (*Charadrius vociferus*) nest with at least one fledgling. As bank-nesting and ground-nesting birds respectively, both bank swallows and killdeer are especially sensitive to vehicle use and other human activities, which can disturb, injure, or kill both juvenile and adult birds. Lesser nighthawks (*Chordeiles acutipennis),* another native ground-nesting bird found along Lower Cache Creek, are also sensitive to vehicle use and other human activities.

In 2021, it was noted that the negative impacts of OHV use on native vegetation were more readily observable than in years past. OHV use directly impacts vegetation by crushing and dislodgement (especially establishing seedlings), and further impacts vegetation through soil disturbance and erosion, soil compaction, and when OHV users use chainsaws and other tools to actively clear vegetation when making unauthorized access roads. OHV use can also disturb, injure, or kill wildlife, especially during sensitive times of the year such as nesting and breeding seasons. In addition, active restoration may be required to repair OHV damage to habitat, and OHV use can also damage revegetation or restoration sites, reducing success and increasing costs.

During the 2021 Creek Walk, vegetation damage and soil disturbance from OHV use was frequently observed in numerous locations (Yolo County 2021). Vegetation damage was especially pronounced within the Dunnigan Hills Reach, at sites near the Cache Creek Nature Preserve. Impacts were significant enough that the conclusion in the 2021 Annual Report was that OHV use has become a significant barrier to achieving the long-term goals of the CCRMP program, such as the stated goal in CCRMP Section 4.2-1 to “provide for a diverse, native riparian ecosystem that is self-sustaining and capable of supporting native wildlife.” Observed made during the 2022 Creek Walk suggested that new restrictions on OHV use in Lower Cache Creek were having a positive effect on native vegetation and potentially wildlife including beaver and native birds (Yolo County 2022). Observations made in 2023 suggested the same, and ongoing OHV activity within the CCRMP should be closely monitored and discouraged to avoid negative impacts to biological resources along Lower Cache Creek.

Figure 4-6. OHV tracks observed in the Dunnigan Hills Reach during the 2023 Creek Walk at RM 18.4 (left) and at RM 16.5 (right).

While change is a defining characteristic of Lower Cache Creek and other Central Valley riverine and riparian systems that are subject to irregular flows and climatic conditions, many areas along the creek are relatively stable with similar conditions observed annually. Some areas, especially in more gravelly reaches such as Hungry Hollow, Madison, and Guesisosi, remain devoid of vegetation due to annual scour, exposure, and a lack of establishment (Fig. 4-7).

Figure 4-7. Representative photographs of two locations at which establishment and persistence of native vegetation is severely constrained by site conditions. (left: downstream of County Road 87 bridge in the Hungry Hollow reach; right: Madison Reach). Photos from 2020; sites were in a similar condition in 2021, 2022, and 2023.

Conversely, other areas along Lower Cache Creek have reached an apparent successional climax as healthy, mature riparian forest and exhibit little year-to-year change (e.g., RM 17.2; Fig. 4-8). These locations are typically characterized by relatively high soil moisture with groundwater at or near the surface, as well as protection from high flows and associated scour due to relatively

stable channel morphology. In other locations, assumptions about vegetation stability have actually been disproven in recent years. For example, the well-developed riparian forest habitat on the south bank at RM 21.1 was assumed in years past to represent the realistic "best-case" maximum habitat recovery that can be expected for in-channel, dynamic, gravelly portions of the Hungry Hollow, Madison, and Guesisosi reaches. In these areas, native vegetation appears to be severely constrained by high flows followed by the complete absence of surface water, gravelly soils, and near-complete exposure to the harsh summer sun. However, mature woody trees and shrubs at RM 21.1 were observed to have been significantly impacted by drought conditions in 2021, 2022, and again in 2023 (Fig. 4-8), and the long-term persistence of this vegetation patch is now uncertain.

Figure 4-8. Healthy, stable mature riparian forest on the north bank at RM 17.2 in the Dunnigan Hills Reach (right), and drought-stressed mature riparian forest on the south bank at RM 21.1 in the Guesisosi Reach (right).

4.1.3 Notable Remnant Native Species

In addition to native vegetation described above, large patches of presumably remnant creeping wildrye (*Elymus triticoides*; a native perennial grass) were noted in years along the upper terraces on the south bank of the creek between RM 13.6–13.7, RM 14.6–14.7, RM 17.6 near the south bank, on upper north banks under trees at RM 27.1 and RM 27.4, and at RM 27.7 on the north bank. In 2023, patches of creeping wildrye were confirmed to still be present at RM 27.4 and RM 13.6, and these patches would serve as excellent seed sources for future restoration projects. Large patches of native mugwort (*Artemisia douglasiana*) are also present in many locations along the creek, as are scattered patches of sedges (*Carex* spp.), wild rose (*Rosa californica*) and California wild grape (Vitis californica). Some years ago, a single buckbrush (*Ceanothus cuneatus*) shrub was found on the south edge of the Millsap property, on the north bank uplands between RM 18.4–18.5. Although it is not known if this shrub is still present, buckbrush should still be considered as a suitable species for future restoration projects. Blue elderberry (*Sambucus nigra* ssp. *caerulea*) shrubs are also abundant throughout the CCRMP area (Section 5.4; Rayburn 2017, Rayburn 2018).

4.1.4 Vegetation Monitoring

Vegetation monitoring is necessary to quantify vegetation trends (e.g., notable losses and gains in riparian habitat, shifts in habitat composition, and overall effects of the CCRMP and elimination of in-channel gravel mining). In terms of annual monitoring, the spatially-referenced field photo log updated by the Cache Creek TAC Riparian Biologist during the 2022 Creek Walk was again updated during the 2023 Creek Walk. The photo log is used as a basis during the annual Creek Walk in combination with mobile mapping applications to discern annual changes in vegetation and habitat conditions in the CCRMP area, with photo updates and new reference locations added to document current conditions.

Acquisition of aerial photography and other data (e.g., topographic data via LiDAR) can occur annually if needed, but is required by the CCIP to be acquired every five years and after major flow events with peak flows >20,000 cfs. The County has continued to implement new methods and tools over the past decade, including UAVs, high-resolution orthophotography, multi-band imagery, and LiDAR data. It is now possible to cost effectively and reliably obtain sub-meter resolution aerial photography and topographic data for the entire CCRMP area, and these data are important components of the biological resource monitoring program. As noted above, aerial imagery and LiDAR data were last acquired in 2019 by a contractor using UAV platforms as a result of >20,000 cfs flows in winter 2018–2019. The TAC Riparian Biologist is exploring approaches (including research partnerships) for automating the classification of vegetation (versus the manual classification currently performed) from this imagery to increase efficiency.

Long-term vegetation monitoring integrates annual observations and the results of other analyses. Assessments of long-term monitoring data, leading to updated recommendations and adaptive management strategies, occur during CCRMP/CCAP updates and other similar efforts. As a component of the 2016 CCAP Update, a 20-year retrospective analysis of biological resources was performed to determine changes and trends in native and non-native vegetation, wildlife, invertebrates, and fish. A standardized methodology for long-term vegetation monitoring was developed in 2016 and presented in the final report (Yolo County 2017a) and continues to be used as of 2023.

4.1.5 Recommendations Regarding Native Vegetation

Integrating across the preceding sections, the following recommendations are made regarding native vegetation monitoring and management within the CCRMP area:

1. The standardized vegetation monitoring methodology developed in 2016 should continue to be used for subsequent assessment of changes and trends in native vegetation within the CCRMP area, in addition to the annual Creek Walk. Additional vegetation monitoring

techniques, such as permanent monitoring plots, should be considered to answer priority management questions, potentially in collaboration with university researchers.

2. LiDAR data should continue to be collected whenever high-resolution aerial photography is acquired (e.g., at the minimum five-year intervals and when flows exceed 20,000 cfs).

3. Monitoring of woody vegetation damage due to beavers should continue during annual Creek Walks, and, if necessary, selective tree protection methods should be used to protect native woody vegetation.

4. Methods for automatic classification of vegetation from remotely-sensed imagery should be explored to increase the efficiency and replicability of the process.

5. Monitoring and assessment of OHV impacts on native vegetation should receive increased attention during annual Creek Walks.

4.2 Restoration Opportunities and Observations on Current and Past Projects

4.2.1 Potential Habitat Enhancement and Restoration Sites

In general, relatively few areas along Lower Cache Creek remain available for riparian habitat expansion as most of the channel is deeply entrenched, bound by levees in some locations, subject to scour during high flow events, restricted by adjacent land uses, and/or characterized by shallow, gravelly soils underlain by relatively deep groundwater (e.g., Hungry Hollow and Madison reaches). However, a number of priority potential habitat enhancement and restoration opportunities have been identified over the past decade. A continued focus should be made on locations where active habitat enhancement or full restoration are realistically feasible, and sustainable with limited management through reliance on natural river processes. Passive restoration (e.g., control of invasive species) remains a viable approach for other areas. For active restoration projects, local ecotypic plant materials should be used, and a high degree of species diversity should be prioritized when designing planting palettes. In addition, County and Cache Creek Conservancy staff should collaborate with the Yocha Dehe Wintun Nation to develop a list of culturally-important native plant species that can be included in planting palettes for enhancement and restoration projects.

Active restoration is recommended on upper banks, terraces, and the surrounding uplands, but observations from the past four years strongly suggest that active restoration on lower banks or on the channel floor may not persist through high flows. For example, 2016–2017 high flows removed a 2010 planting of trees and grasses on the south bank at RM 20.7 in the Guesisosi Reach (Yolo County 2017b). Thus, encouraging passive restoration of native woody vegetation

on lower banks and/or the channel floor (through invasive species removal, streamflow enhancement, and strategic channel maintenance projects) is likely a more cost-efficient and effective means of accelerating native vegetation recovery in these areas. The Cache Creek TAC continues to collaborate with County staff and other stakeholders on feasibility assessments regarding potential streamflow enhancement and channel maintenance projects.

One of the locations with the most potential for active habitat restoration is a series of off-channel former mining pits on the north bank from approximately RM 15.0–15.4 in the Dunnigan Hills and Hoppin reaches (Fig. 4-9). Substantial native woody vegetation has established in some these areas, although the understory is dominated by arundo, tamarisk, perennial pepperweed, and other invasive species. Restoration would include invasive species removal, and the planting of a native understory in addition to shrubs and trees. During high flow years, these areas are hydraulically connected to Cache Creek leading to significant inundation that should favor riparian habitat establishment. A portion of this area, described below, has been in the process of being restored by Teichert for the past four years (see Section 4.2.2) and could serve as a model for further restoration of the surrounding upstream and downstream areas.

Figure 4-9. Potential restoration sites at off-channel mining pits on the north bank from RM 15.0–15.4 in the Hoppin Reach. Photos are from 2022 and show view upstream (left) and downstream (right). Conditions were essentially unchanged in 2023.

In addition, the PG&E "Palisades" site (RM 26.9 – 27.0) remains a high-priority habitat restoration site that is now slated for debris removal and revegetation as has been recommended in recent annual reports. As the project proceeds, annual monitoring of the area will be a priority for contractors, the Cache Creek TAC, County staff, and Cache Creek Conservancy staff. The Millsap property (north bank at RM 18.4) also remains a good candidate for a combined restoration/public access project. Habitat restoration goals at the Millsap site could include oak woodland restoration, a native grassland understory, further control of invasive species, and the eventual establishment of public trails and interpretive features.

Other high-priority sites for habitat enhancement and restoration include upland areas on the north bank in the Capay Reach from RM 26.8–27.8 (Fig. 4-8), the Hayes "Bow-Tie" property on the north bank at RM 20.0 in the Guesisosi Reach, the Wild Wings Open Space Park on the south bank at RM 17.0 in the Dunnigan Hills Reach, the primary slough running through the Cache Creek Nature Preserve property at RM 16.1 in the Dunnigan Hills Reach, and the Correll-Rodgers pits on the south bank at RM 13.9 in the Hoppin Reach that could potentially be hydraulicly reconnected to the main river channel, at least to degree to facilitate habitat restoration (Fig. 4-10). In addition, a private landowner (Capay Organic, a third-generation family-owned organic farm on the banks of lower Cache Creek) expressed a desire in 2019 to Cache Creek Conservancy staff to scope a habitat restoration project along the south bank at RM 27.9 – a priority area for restoration given the abundance of non-native species including arundo and tamarisk.

Figure 4-10. Potential restoration sites on upland portions of the north bank at RM 27.5 (left) and RM 27.8 (right) in the Capay Reach. Photos are from 2022, and conditions were essentially unchanged in 2023.

Figure 4-11. Potential restoration site at the Correll-Rodgers pit on the south bank at RM 13.9 in the Hoppin Reach. Photo is from 2022, and conditions were essentially unchanged in 2023 with exception of increased soil moisture and more robust understory vegetation.

4.2.2 Status of Past and Current Habitat Enhancement and Restoration Projects

Restoration projects within the CCRMP range from grass plantings, mitigation plantings of woody vegetation including blue elderberry as habitat for the federally-threatened valley elderberry longhorn beetle (VELB; *Desmocerus californicus dimorphus*), habitat enhancement through managed fire, and full restoration projects that include invasive species control, understory establishment, and planting of native shrubs and trees. These active enhancement and restoration approaches are complemented by more passive approaches including invasive species control and managed inundation from high creek flows.

In 2023, the Cache Creek TAC again observed the current state of the completed restoration project at Capay Open Space Park just downstream of the County Road 85 bridge in the Hungry Hollow reach. In 2016, a California Natural Resources Agency (CNRA) River Parkways grant application was successful for Capay Open Space Park, which included habitat restoration as a significant component. In 2021, it was observed that the project is on a trajectory for success, although the site presents unique challenges related to rocky soils and native plant establishment. However, in 2022 it was observed that a large fire (reportedly resulting from ignition during mowing) had damaged a portion of the site, including woody vegetation. The site was observed to be relatively stable and largely recovered from fire in 2023.

Native grasses were planted in October 2020 on a large bank stabilization site adjacent to Granite's operations on the north bank at RM 24.5, and these grasses appear to be persisting to some degree even under drought conditions. Previously, a 2010 planting of native grasses and shrubs on the south bank at RM 20.7 in the Guesisosi Reach was lost due to scouring high flows in winter 2016–2017. In 2019, a substantial construction project was initiated to repair the irrigation infrastructure of the Moore Siphon at RM 18.0–18.1 in the Dunnigan Hills Reach. Construction is complete, but the site has yet to be revegetated as of June 2023, although both native and non-native vegetation has continued to establish on the project site. The Cache Creek TAC also observed the wetland portion of the Cache Creek Nature Preserve on the north bank at RM 16.5 in the Dunnigan Hills Reach a year after a prescribed burn that was conducted in April 2022. The resulting removal of thatch appears to have stimulated new wetland vegetation growth and reintroduced a degree of habitat heterogeneity that should benefit birds and other wildlife (Fig. 4-12).

Figure 4-12. The results of a prescribed burn of wetlands at the Cache Creek Nature Preserve at RM 16.5 in the Dunnigan Hills Reach in 2022 (left) and a year later in 2023 (right).

As mentioned above, an off-channel mining pit on the north bank at RM 15.1 is in year four of restoration by Teichert (Fig. 4-13; see also Yolo County 2018), and the *Haller/Muller Habitat Enhancement Project* has the potential to be a model for restoration of similar areas in the future (e.g., the Correll-Rodgers properties at RM 13.7). A former aggregate mine, the 3.8-acre site was reclaimed in 1998 and remains within the active floodplain of Lower Cache Creek. The relatively flat basin dominated by non-native and invasive species was regraded to create a series of terraces that were planted with diverse native overstory and understory species. A seasonal wetland should develop at the lowest grade, with native vegetation transitioning from mesic (e.g., cottonwood, willow, California blackberry) to xeric (e.g., Valley oak, blue elderberry, coyote brush) up the slope. The site will fill with at least some water during high-flow events, but will otherwise remain relatively dry for most of the year. Long-term monitoring will ensure that native vegetation successfully establishes, and that non-native and invasive species are adequately controlled. This restoration site is just to the southeast of an older Teichert reclamation site – Teichert Muller "90" – that was last observed during the 2022 Creek Walk, on which native vegetation seemed to be persisting in the face of drought conditions (Fig. 4-13).

Figure 4-13. Teichert-led restoration projects in the Hoppin Reach: the four-year old Haller/Muller Habitat Enhancement Project at RM 15.1 (2023 photo; left), and the Teichert "Muller 90" site just to the northwest (2022; right). Planted native vegetation on both project sites is persisting through sustained drought conditions.

The status of two blue elderberry mitigation sites in the Hoppin Reach was also evaluated during the 2022 Creek Walk. As described in Section 4-4 below, blue elderberry is a special-status plant since it serves as the sole host for the federally-threatened Valley elderberry longhorn beetle (VELB). When elderberry shrubs are impacted by channel stabilization and other types of priority projects on Lower Cache Creek, mitigation is required, and new patches of elderberry shrubs are established (along with other associated native plant species) to provide suitable habitat for VELB. The first elderberry mitigation site is on the Granite Woodland Reiff property on the north bank at RM 14.5 and appeared in 2022 to be in good condition overall after being planted in 2020 (Fig. 4-12). The second, more recent elderberry mitigation site was planted in late 2021 and is on the Correll property, on the south bank at RM 13.7 (Fig. 4-12). The condition of elderberry shrubs was once again challenging to assess in 2023 given their seedling form and the abundance of non-native vegetation covering the site. Increased control of non-native vegetation is recommended for this site. The site was also partially impacted by high flows in winter 2022-2023, and it is recommended that future VELB mitigation sites be located in areas less likely to be impacted during high flow years.

Figure 4-14. Elderberry mitigation sites at RM 14.5 (left; planted in 2020 and photo from 2022) and at RM 13.7 (right; planted in late 2021, and photo from 2023).

In 2022, the Cache Creek TAC also briefly observed a small, historical tree mitigation planting on the north bank at RM 14.4 in the Hoppin Reach; most trees had established and appeared to be persisting through drought conditions.

4.2.3 Recommendations Regarding Habitat Restoration

The following recommendations are made regarding habitat restoration within the CCRMP area:

1. Priority restoration sites should continue to be the focus of grant development, planning efforts, and implementation. These sites include: the Capay Organic creek frontage (RM 27.9), the PG&E "Palisades" site (RM 26.9–27.0), Capay Open Space Park (RM 26.3), the Hayes "Bow-Tie" property (RM 20.0), the Millsap property (RM 18.5), Wild Wings Open Space Park (RM 17.0), portions of the Cache Creek Nature Preserve (RM 16.1), off-channel mining pits from RM 15.0–15.4, and the Correll and Rodgers properties (RM 13.9).

2. The TAC should prioritize allocating sufficient time during annual Creek Walks to visit and assess current and recently completed enhancement and restoration projects along Lower Cache Creek.

3. County and Cache Creek Conservancy staff should collaborate with Yolo County RCD, Yolo County Flood Control & Water Conservation District, gravel operators, and other stakeholders to maintain a database of completed, current, and planned habitat enhancement and restoration projects within the CCRMP area. The database should include spatially-explicit project area boundaries, copies of restoration plans and other implementation details, implementation dates, performance criteria, and contact information for project implementers.

4. Native understory species (forbs, grasses, and sedges) should be included in all revegetation and restoration projects in addition to native trees and shrubs.

5. A minimum of three years of effectiveness monitoring, based on established performance criteria (e.g., at least 70% survival of woody species, at least 50% cover of herbaceous species) should be a mandatory component of any future revegetation or restoration project within the CCRMP area. If performance criteria are not achieved, remedial action should be taken on the part of the project implementer.

6. Invasive species treatment projects should be considered as habitat enhancement projects, and bundled with habitat restoration projects whenever possible to increase project footprints and impacts for grant applications.

7. Revegetation or restoration using native woody and herbaceous species should be a standard practice following invasive species treatment.

8. The long-term resilience of revegetation and restoration projects within or adjacent to the active channel should be carefully considered prior to implementation, since such projects can be negatively impacted or completely removed by high flows.

9. Opportunities to increase spring and summer surface flows should continue to be explored to accelerate native vegetation recovery (e.g., passive restoration).

10. Strategic implementation of channel maintenance projects could also accelerate vegetation recovery by increasing flow capacity and promoting vegetation establishment.

11. County and Cache Creek Conservancy staff should collaborate with the Yocha Dehe Wintun Nation to develop a list of culturally-important native plant species that can be included in planting palettes for revegetation and restoration projects.

4.3 Invasive Plant Species Monitoring and Management

4.3.1 Distribution and Extent of Non-Native and Invasive Plant Species

Invasive arundo, tamarisk, and Ravenna grass (*Saccharum ravennae*) have long been priority species for control efforts within the CCRMP area due to their well-documented negative impacts on biological resources including displacement of native vegetation, degradation of wildlife habitat, high rates of evapotranspiration that reduce available soil moisture, fine sediment accumulation, and flow redirection. On-going mechanical and chemical treatment of these species has been the focus of the Cache Creek Conservancy's Invasive Weed Control (IWC) Program since 2006. Prior to 2016, there was not a framework for quantitative assessment of

the IWC Program's effectiveness at reducing these three priority invasive species due to a lack of spatial data on the species' distribution and extent. In addition, it was unclear if additional invasive species should be prioritized for treatment as recommended in annual reports dating back to the early 2000s. In 2016, the Cache Creek TAC Riparian Biologist completed a comprehensive invasive species mapping and prioritization project to address these data and information gaps. The goal of this project was to assess the distribution and extent of these species to inform adaptive management of the creek's biological resources. Details are available in the full report (Rayburn 2016a) and are summarized in the 2017 Cache Creek Annual Status Report (Yolo County 2017b).

Results of the 2016 project confirmed that arundo, tamarisk, and Ravenna grass were still found throughout the CCRMP area in the form of (1) resprouts from previously-treated plants and patches, (2) newly-established plants that likely resulted from propagules dispersed downstream from large patches above Capay Dam, (3) plants and patches in secluded locations away from the main channel, and (4) large stands on properties to which access has not been granted by landowners. Results also supported the expansion of the Tier 1 (high priority) invasive species list for lower Cache Creek to include Himalayan blackberry (*Rubus armeniacus*), perennial pepperweed, poison hemlock (*Conium maculatum*), bull thistle (*Cirsium vulgare*), milk thistle (*Silybum marianum*), Italian thistle (*Carduus pycnocephalus*), tree of heaven (*Ailanthus altissima*), tree tobacco (*Nicotiana glauca*), and yellow starthistle (*Centaurea solstitialis*).

The recommendation was also made to create a second tier (medium priority) of species including barb goatgrass (*Aegilops triuncialis*), common teasel (*Dipsacus fullonum*), edible fig (*Ficus carica*), fennel (*Foeniculum vulgare*), medusahead (*Elymus caput-medusae*), purple loosestrife (*Lythrum salicaria*), and yellow flag iris (*Iris pseudacorus*), as well as a third tier (lower priority) of species including eucalyptus (*Eucalyptus* spp.), fan palm (*Washingtonia robusta*), oleander (*Nerium oleander*), pampas grass (*Cortaderia selloana*), and stinkwort (*Dittrichia graveolens*). Other non-native species that occur within the CCRMP, but which have not yet been identified as priorities for control include Russian thistle (*Salsola tragus*), white horehound (*Marrubium vulgare*), various filaree species (*Erodium* spp.), shortpod mustard (*Hirschfeldia incana*), and various other non-native grasses including smilo grass (*Stipa miliacea* var. *miliacea*), wild oat (*Avena fatua*), soft chess (*Bromus hordeaceus*), ripgut brome (*Bromus diandrus*), and wild rye (*Festuca perennis*). These species ideally should be controlled when and where possible, but are so widespread that elimination or even containment within the CCRMP is likely infeasible in many locations.

Through a separate contract from the Yolo County RCD, the Cache Creek TAC Riparian Biologist then conducted a similar project along the five river miles immediately upstream of Capay Dam (Rayburn 2016b). Downstream dispersal of invasive species from this area had been identified as a contributing factor to invasive species abundance in the CCRMP area. No large-scale invasive species control had been implemented in this area, so the focus of this second project was to

map priority invasive species to inform planning and funding of control efforts. Extensive patches of arundo, tamarisk, and Ravenna grass were mapped during this project, and the data continue to serve as impetus for grant development to address this issue.

In 2018, the primary observation related to invasive species during the Creek Walk was that arundo and tamarisk were re-establishing in many locations on or adjacent to the channel floor beginning at RM 22.9 and continuing downstream (Yolo County 2018). At some locations, these new plants occurred in isolation, while in other locations they were intermixed with newly establishing native vegetation. Numerous areas of significant reestablishment were noted, and purple loosestrife was also observed to more abundant than ever before, especially between RM 17.6–18.0 and RM 27.9–28.1. Other priority invasive species such as perennial pepperweed, Himalayan blackberry, barb goatgrass, and various thistles were commonly observed throughout the seven reaches of lower Cache Creek as in years past. Two additional species, purple starthistle (*Centaurea calcitrapa*) and canary grass (*Phalaris* spp.), were also recommended to be added to the medium priority tier of the three-tier invasive species priority framework based on baseline assessments for the *Haller/Muller Restoration Project* (Section 4.2.1).

In 2019, it was observed that high flows during winter 2018–2019 had minimal negative impacts on arundo, tamarisk, and other invasive species within or along the banks of the main channel. In fact, observations showed that non-native and invasive species had increased substantially since 2018 within and adjacent to the main channel in many reaches (Yolo County 2019). For example, beginning at the Capay Dam, both new recruits and mature plants of arundo and tamarisk were observed as isolated plants and larger patches in many locations on the channel floor and adjacent banks through all seven reaches of lower Cache Creek. Increased establishment and expansion of these two species was also noted in 2018, and high flows in winter 2018–2019 may have actually promoted further recruitment and growth of these two priority species. Included in the 2019 annual report was a summary of the priority areas observed in 2019 that needed treatment to control expanding patches of either arundo and tamarisk. New recruits and mature individuals of Ravenna grass were also observed in 2019 to be widespread in the Dunnigan Hills Reach. These three species are intended to be the priority targets of the IWC program. Other key observations made in 2019 included that:

- purple loosestrife was more abundant that observed in past years, both in areas documented previously and in new locations;
- Himalayan blackberry and common teasel were present in numerous locations along lower Cache Creek including the Cache Creek Nature Preserve where treatment should be prioritized;
- tree tobacco was also abundant along lower Cache Creek, especially on disturbed areas and eroding banks;

- water primrose (*Ludwigia* spp.; likely creeping water primrose, *Ludwigia peploides*) was much more abundant than in years past;

- barbed goatgrass and medusahead patches were still present where rangelands grade into the CCRMP area within the Capay reach; and,

- numerous other species listed on the CCRMP priority list (Table 4-1) remain common through the CCRMP area, including bull thistle, Italian thistle, milk thistle, perennial pepperweed, poison hemlock, and yellow starthistle.

Based on observations of non-native and invasive species made in 2018 and 2019, new recommendations were made in the 2019 Annual Report to:

- implement a monitoring and treatment program (including off-channel areas) for purple loosestrife - an aggressive invader of wetlands and riparian areas - before the species spreads further within the CCRMP area;

- add water primrose as a medium-priority species to the three-tier non-native and invasive species priority list (Table 4-1); and

- conduct a capacity assessment of the Conservancy's IWC program to determine if the program is adequately resourced and structured to meet present and future needs related to non-native and invasive species management within the CCRMP area.

The three-tier list of priority non-native and invasive species was also updated to reflect California Invasive Species Council (Cal-IPC) and California Noxious Status rankings for each species, in addition to their rank within the CCRMP framework (Table 4-1). No additional updates to the list are proposed in 2023.

Table 4-1. Current (2023) table of priority non-native and invasive species within the CCRMP area.

Common Name	Scientific Name	CCRMP Rank	Cal-IPC Rank[1]	California Noxious Status[2]
Arundo	*Arundo donax*	High	High	-
Bull thistle	*Cirsium vulgare*		Moderate	-
Himalayan blackberry	*Rubus armeniacus*		High	-
Italian thistle	*Carduus pycnocephalus*		Moderate	C list
Milk Thistle	*Silybum marianum*		Limited	-
Perennial pepperweed	*Lepidium latifolium*		High	B list
Poison hemlock	*Conium maculatum*		Moderate	-
Ravenna grass	*Saccharum ravennae*		Moderate	-

Tamarisk	*Tamarix* spp.		High	-
Tree of heaven	*Ailanthus altissima*		Moderate	-
Tree tobacco	*Nicotiana glauca*		Moderate	-
Yellow starthistle	*Centaurea solstitialis*		High	C list
Barbed goatgrass	*Aegilops triuncialis*	Medium	High	B list
Canary grass	*Phalaris aquatica*		Moderate	-
Common teasel	*Dipsacus fullonum*		Moderate	-
Edible fig	*Ficus carica*		Moderate	-
Fennel	*Foeniculum vulgare*		Moderate	-
Medusahead	*Elymus caput-medusae*		High	C list
Purple loosestrife	*Lythrum* spp.		High	B list
Purple starthistle	*Centaurea calcitrapa*		Moderate	B list
Water primrose	*Ludwigia* spp.		High	-
Yellow flag iris	*Iris pseudacorus*		Limited	-
Eucalyptus	*Eucalyptus* spp.	Low	Limited	-
Fan palm	*Washingtonia robusta*		Moderate	-
Oleander	*Nerium oleander*		-	-
Pampas grass	*Cortaderia selloana*		High	-
Stinkwort	*Dittrichia graveolens*		Moderate	-

[1] https://www.cal-ipc.org/plants/inventory/

[2] https://plants.usda.gov/java/noxious?rptType=State&statefips=06

In 2021, observations made during the Creek Walk confirmed that non-native and invasive species remain abundant along Lower Cache Creek. Established stands and newly-recruiting individuals of arundo and tamarisk were observed in all seven reaches. Ravenna grass was less common but still abundant in places with the Capay, Hungry Hollow, Guesisosi, Dunnigan Hills, and Hoppin reaches. Purple loosestrife was not observed (likely due to the timing of flowering), but was presumably still present along Lower Cache Creek. Thick patches of tree tobacco were also observed in some locations, as in years past.

In 2022, observations made during the Creek Walk once again confirmed that non-native and invasive species remained abundant along Lower Cache Creek; however, it was also observed that significant progress is being made on invasive species control by the Cache Creek Conservancy-especially regarding arundo and tamarisk. For example, large stands of arundo have been treated in the Capay Reach (e.g., RM 27.0) and were observed to be dead or dying, and many stands of tamarisk were observed to be in similar condition in the Guesisosi Reach (e.g., RM 20.9). Poison hemlock, pepperweed, and non-native thistles had also been treated at a heavily invaded site at RM 15.7 in the Hoppin Reach. These were encouraging developments, as invasive species management remains of the most important strategies for promoting native

vegetation recovery, enhancing habitat for wildlife, and preventing vegetative obstructions to channel flow.

Similarly, in 2023, observations made during the Creek again confirmed that non-native and invasive species remain abundant along Lower Cache Creek (Fig. 4-15). In addition, many patches of invasive species appear to be once again spreading, especially tamarisk. Individuals and patches of arundo, tamarisk, Ravenna grass, and other invasive species were commonly observed in many locations across the seven creek reaches of the CCRMP, with specific locations documented in the photo log. In addition, while many patches of treated Arundo and tamarisk observed in 2022 were still dead in 2023 (Fig. 4-16), some were observed to be resprouting. Both of these species are known to at times require several subsequent years of herbicide application to ensure eradication. A single individual plant of purple loosestrife was also observed at RM 18.0 in the Dunnigan Hills Reach. It is strongly recommended that significant invasive species management continue to be prioritized along Lower Cache Creek to protect and enhance biological resources.

Figure 4-15. Stands of invasive tamarisk at RM 28.3 (left) and Arundo at RM 26.5 (right) in the Capay Reach.

Figure 4-16. Treated strands of invasive arundo at RM 28.1 (left) and RM 27.4 (right) in the Capay Reach.

4.3.2 Recommendations for Invasive Plant Species Management

The following recommendations are made to balance cost-effective non-native and invasive species monitoring and management with the goals and objectives associated with CCRMP implementation.

1. Tier 1 (high priority) species should continue to be prioritized for treatment based on their extent, distribution, and impacts. Treatment of tier 2 (medium priority) and tier 3 (lower priority) species should be conducted when and where feasible.

2. Cache Creek Conservancy and County staff should jointly conduct an annual capacity assessment of the Conservancy's IWC program to determine if the program is adequately structured and resourced to meet present and future needs related to non-native and invasive species management within the CCRMP area.

3. The annual "Creek Spray" program and other IWC program efforts should be expanded over time to include additional priority species (e.g., purple loosestrife) and areas not immediately adjacent to the main channel. Spatially-explicit methods should be used to monitor the location and status (e.g., treated or not) of non-native and invasive species, and the database should be updated annually.

4. Woody and wood-like biomass of treated invasive species should be either burned on site or transported out of the area whenever feasible. Arundo and tamarisk biomass does not readily degrade after treatment and creates dense debris piles that have inhibited native vegetation establishment in some areas and also mobilized during high flows.

5. Invasive species treatment should be followed as soon as feasible by revegetation of treated sites using local native species to reduce erosion and re-invasion of invasive species. Passive restoration – treating invasive species and assuming that native vegetation will establish without the need for seeding or planting – is challenging along Lower Cache Creek because of the abundance of invasive species that readily colonize disturbed areas, such as perennial pepperweed.

    a. Besides native trees (cottonwood, black willow, box elder, Valley oak, buckeye) and shrubs (e.g., wild rose, blue elderberry, quailbush), a cost-effective mix of competitive native herbaceous species should be developed for revegetation or restoration of treated areas. Such a mix would be kept in bulk supply for widespread application, and would likely include creeping wildrye, mugwort, various sedges or rushes, pollinator-supporting species such as milkweeds, and other species.

    b. Removal of invasive species that provide resources for native wildlife (e.g., tree tobacco, which hummingbirds utilize as nectar resources) should be balanced with replacement by local native species that provide the same wildlife benefits (e.g., hummingbird sage).

6. Comprehensive field-based monitoring of invasive species should be regularly conducted across the CCRMP area using methods summarized in Rayburn (2016a). This scale of monitoring would allow for a broader evaluation of the effectiveness of invasive species control efforts across the region, as well as identification of new priority species or areas in which rapid spread of invasive species is occurring. Alternatively, reach-scale monitoring may also suffice and could be aligned with annual treatment of priority reaches.

7. Invasive species mapping and treatment efforts within the CCRMP area should be leveraged to support additional mapping and treatment efforts upstream of Capay Dam to target source populations that continue to disperse downstream to lower Cache Creek. Opportunities for collaboration with the Yolo County Resource Conservation District (Yolo RCD), the Bureau of Land Management, and private landowners (e.g., the Yocha Dehe Wintun Nation) on invasive species mapping and treatment projects should continue to be prioritized.

4.4 Special-Status Species

4.4.1 Observations of Special-Status Species and Additional Data

Special-status species are those classified as California State Species of Species Concern (SSC), State Fully Protected (SFP), State Threatened (ST), State Endangered (SE), Federally Threatened (FT), and Federally Endangered (FE). A wide range of special-status species have been observed

on lower Cache Creek, including birds, herpetofauna (amphibians and reptiles), mammals, insects, and fish (Table 4-2). The master list of special-status species observed within the CCRMP area was last updated in 2018 with the addition of six bird species (Table 4-2). Five are special status in California: American white pelican (*Pelecanus erythrorhynchos*; [SSC]), Black tern (*Chlidonias niger*; SSC), least bittern (*Ixobrychus exilis*; SSC), willow flycatcher (*Empidonax traillii*; SE), and yellow breasted chat (*Icteria virens*; SSC). Olive-sided flycatcher (*Contopus cooperi*; SSC) was previously observed for lower Cache Creek, but had not been added to the special-status species list until 2018. No additional species-status species were observed or added to the list since 2018, but a thorough review is slated for 2024 or 2025.

Table 4-2. Master list of special-status species observed within the CCRMP area.

Common Name	Scientific Name	Status[1]
Birds		
American white pelican	*Pelecanus erythrorhynchos*	SSC
Bald eagle	*Haliaeetus leucocephalus*	SFP, SE
Bank swallow	*Riparia*	ST
Black tern	*Chlidonias niger*	SSC
Burrowing owl	*Athene cunicularia*	SSC
Golden eagle	*Aquila chrysaetos*	SFP
Least bittern	*Ixobrychus exilis*	SSC
Loggerhead shrike	*Lanius ludovicianus*	SSC
Long-eared owl	*Asio otus*	SSC
Northern harrier	*Circus cyaneus*	SSC
Olive-sided flycatcher	*Contopus cooperi*	SSC
Song sparrow[2]	*Melospiza melodia*	SSC
Swainson's hawk	*Buteo swainsoni*	ST
Tricolored blackbird	*Aegelaius tricolor*	SFP, SSC
Vaux's swift	*Chaetura vauxi*	SSC
White-tailed kite	*Elanus leucurus*	SFP
Willow flycatcher	*Empidonax traillii*	SE
Yellow-breasted chat	*Icteria virens*	SSC
Yellow-headed blackbird	*Xanthcephalus xanothocephalus*	SSC
Yellow warbler	*Setophaga petechia*	SSC
Herpetofauna		
California red-legged frog	*Rana aurora draytonii*	FT, SSC
Western pond turtle	*Emys marmorata*	SSC
Mammals		

American badger	*Taxidea taxus*	SSC
Ring-tailed cat	*Bassariscus astutus*	SFP
Invertebrates		
Valley elderberry longhorn beetle	*Desmocerus californicus dimorphus*	FT
Fish		
California roach	*Hesperoleucus symmetricus*	SSC
Chinook salmon[3]	*Oncorhynchus tsawytscha*	SSC
Hardhead	*Mylopharodon conocephalus*	SSC
Sacramento hitch	*Lavinia exilicauda*	SSC

[1] ST = State threatened; SE = State endangered; SSC = California bird species of special concern; SFP = State fully protected species; FT = Federally threatened; FE = Federally endangered

[2] "Modesto" population only

[3] Limited to historical observations; see Moyle et al. (1995) and Moyle and Ayers (2000)

As in years past, Swainson's hawks (*Buteo swainsoni*; ST; Fig. 4-17) were frequently observed during the 2023 Creek Walk in six of the seven reaches (Capay, Hungry Hollow, Madison, Guesisosi, Dunnigan Hills, and Hoppin). In addition, as in 2022, Swainson's hawks were observed to be nesting at a location on the Cache Creek Nature Preserve in the Dunnigan Hills Reach. Bald eagles (*Haliaeetus leucocephalus;* SFP, SE; Fig. 4-17) were observed at several locations in the Capay Reach, including an immature bald eagle at the Capay Dam. A white-tailed kite (*Elanus leucurus*; SFP) was also observed in the Hoppin Reach.

Figure 4-17. Special-status species observed during the 2023 Creek Walk included bald eagles (Haliaeetus leucocephalus; left) and Swainson's hawks (Buteo swainsoni; right).

Notably, three active riparian bank swallow (*Riparia*; ST) colonies were observed within the Hoppin Reach during the 2023 Creek Walk: a small colony on the south bank at RM 14.7 (approx. 24 holes), a larger colony on the north bank at RM 15.3 (approx. 125 holes), and potentially the largest colony observed within the last decade on the south bank at RM 15.7 (approx. 285 holes; Fig. 4-18). Biologists from the Cache Creek Conservancy assisted with verifying bank swallow presence and estimating the number of burrows, which was greatly appreciated.

Other potential bank swallow nesting locations were observed and evaluated beginning at the south bank at RM 26.0 in the Hungry Hollow Reach and downstream at numerous locations including north and south banks from RM 22.8–23.4 in the Madison Reach, various locations from RM 21.4–22.5 in the Madison Reach, the south bank at RM 19.2 in the Guesisosi Reach, north and south banks from RM 15.4–15.6 in the Hoppin Reach, north and south banks from RM 15.1–15.2 in the Hoppin Reach, and north and south banks from RM 14.3–14.7 in the Hoppin Reach. As noted in Section 4.1.2, OHV tracks were observed adjacent to potential bank swallow habitat (suitable but unoccupied) at RM 15.3 in the Hoppin Reach. Also, new bank modifications and hardening actions were observed on the south bank from RM 25.3–23.5 in the Hungry Hollow Reach that would likely prevent bank swallows from establishing an active colony, although the habitat was generally suitable otherwise.

Figure 4-18. A large, active bank swallow (Riparia riparia) colony on the south bank at RM 15.7 observed during the 2023 Creek Walk.

Western pond turtles (*Emys marmorata*; SSC) were observed at deeper pools at RM 28.1 in the Capay Reach, RM 20.1 in the Guesisosi Reach, and both RMs 17.6 and 16.9 in the Dunnigan Hills Reach. No special-status species of fish were observed during the 2023 Creek Walk; however, any fish observations made during Creek Walks are opportunistic and made in passing. At least

one Sacramento roach (*Hesperoleucus symmetricus*; SSC) was observed by a member of the 2021 Creek Walk group in a pool at RM 19.8 in the Guesisosi Reach.

As summarized in the 2016 Annual Report, the Cache Creek TAC Riparian Biologist mapped all blue elderberry shrubs throughout the CCRMP from 2015–2016 (Yolo County 2016, Rayburn 2017, Rayburn 2018). Elderberry shrubs are a special-status plant because they serve as the sole host for the federally-threatened Valley elderberry longhorn beetle (VELB; *Desmocerus californicus dimorphus*). Over 10,000 elderberry shrubs were mapped within the CCRMP area and included seedlings, resprouts, mature shrubs, and older treelike plants. Numerous seedlings, often found under the canopies of larger elderberry shrubs, strongly suggested that the elderberry population is increasing. Most elderberry shrubs were found on benches and upper terraces, with only a few scattered shrubs on the channel floor. No significant observations of elderberry shrubs were noted in 2023, beyond evaluation of mitigation plantings (Section 4.2.2). In 2022, several elderberry shrubs located on or near the channel floor were observed to be severely stressed or dying as a result of drought conditions (e.g., at RM 15.4 in the Hoppin Reach).

4.4.2 Recommendations Regarding Special-Status Species

Similar to previous years, the following recommendations are made regarding special-status species in the CCRMP area:

1. Opportunities for expanded inventory and monitoring of common and special-status wildlife, invertebrate, and fish species should be explored to provide a more complete assessment of biological resources, potentially in collaboration with university researchers.

    a. Species of particular interest include birds (bank swallow, loggerhead shrike, Northern harrier, Swainson's hawk, various owls, white-tailed kite, and yellow warbler), mammals (American badger, bobcat, Columbian black-tailed deer, coyote, mountain lion, ringtail, river otter, and Sacramento Valley red fox), reptiles (Western pond turtle), invertebrates (VELB), and fish (California roach, hardhead, and Sacramento hitch).

    b. Potential monitoring methods include game camera networks, track plates, point count or transect surveys for nesting birds, native fish surveys, and telemetry (e.g., radio collars or GPS collars).

2. All observations of special-status species should be logged annually by the Cache Creek TAC Riparian Biologist in the California Natural Diversity Data Bank (CNDDB; https://www.wildlife.ca.gov/Data/CNDDB).

3. Opportunities to increase surface flows in lower Cache Creek should be explored, since increased flows should benefit Western pond turtle and other special-status species in addition to native vegetation.

4.5 Additional Biological Resource Observations

Including special-status species described above, a total of 48 unique bird species were observed during the 2023 Creek Walk (Table 4-3). In addition to Swainson's hawks, four additional raptor species were observed: bald eagles in the Capay Reach; great horned owls (*Bubo virginianus*, Fig. 4-19) in the Madison, Dunnigan Hills, Hoppin, and Rio Jesus Maris Reaches (including an active nest at the Cache Creek Nature Preserve); white-tailed kite in the Hoppin Reach; and, red-tailed hawks *(Buteo jamaicensis*) in six of the seven reaches (all but the Rio Jesus Maria Reach).

Cliff swallows (*Petrichelidon pyrrhonota*) and swallow nests were once again present at the Capay Dam and under the County Road 85, 87, 94B, and Interstate 505 bridges as in years past, and barn swallows (*Hirundo rustica*), northern rough-winged swallows (*Stelgidopteryx ruficollis*), and tree swallows (*Tachycineta bicolor*) were also observed during the 2023 Creek Walk. Numerous other songbirds were also observed (Table 4-3), including acorn woodpecker (*Melanerpes formicivorus*), ash-throated flycatcher (*Myiarchus cinerascens*, Fig. 4-19), belted kingfisher (*Megaceryle alcyon*), blue grosbeak (*Passerina caerulea*), Bullock's oriole (*Icterus bullockii*), marsh wren (*Cistothorus palustris*), song sparrow (*Melospiza melodia*), and yellow-headed blackbird (*Xanthocephalus xanthocephalus*).

Other bird species of interest included black-crowned night heron (*Nycticorax,* Fig. 4-19), great blue heron (*Aredea herodias*, Fig. 4-19, with observations including a rookery on the south bank at RM 26.8 in the Capay Reach), great egret (*Ardea alba,* Fig. 4-19), green heron (*Butorides virescens*), and lesser nighthawk. Notably, more lesser nighthawks were observed in a greater number of locations again in 2023 compared to years prior to 2022, which was potentially the result of the significant decrease in OHV traffic since nighthawks are ground-nesting birds and are easily disturbed or injured by motorized vehicles. As in years past, Cache Creek Conservancy biologists and experienced volunteers that participated in the 2023 Creek Walk greatly increased the number of bird observations that were made, and their contributions were much appreciated.

Table 4-3. The 48 unique bird species observed during the 2023 Creek Walk.

Acorn woodpecker	California quail	Mallard
American coot	California scrub-jay	Marsh wren
Anna's hummingbird	California towhee	Mourning dove
Anna's hummingbird	Cliff swallow	Northern flicker
Ash-throated flycatcher	Common raven	Northern mockingbird
Bald eagle	Eurasian collared-dove	Northern rough-winged swallow

Barn swallow	European starling	Nuttall's woodpecker
Belted kingfisher	Great blue heron	Red-tailed hawk
Bewick's wren	Great egret	Red-winged blackbird
Black phoebe	Great horned owl	Song sparrow
Black-chinned hummingbird	Great-tailed grackle	Swainson's hawk
Black-crowned night heron	Green heron	Tree swallow
Blue grosbeak	House finch	Turkey vulture
Brown-headed cowbird	Killdeer	Western kingbird
Bullock's oriole	Lesser goldfinch	Wild turkey
Bushtit	Lesser nighthawk	Yellow-headed blackbird

Other wildlife species observed during the 2023 Creek Walk included beaver (*Castor canadensis*), black-tailed jackrabbit (*Lepus californicus*), Columbian black-tailed deer (*Odocoileus hemionus columbianus*), coyote (*Canis latrans*), desert cottontail (*Sylvilagus audbonii*), California ground squirrel (*Otospermophilus beecheyi*), garter snakes (*Thamnophis* spp.) river otter (*Lontra canadensis;* observed via scat), non-native bullfrog (*Lithobates catesbeianus*), and Western fence lizards (*Sceloporus occidentalis*). Bobcats (*Lynx rufus*) were not observed during the 2023 Creek Walk but are commonly observed at the Cache Creek Nature Preserve and along Lower Cache Creek. Non-native wild pig (*Sus scrofa*) and California black bear (*Ursus americanus californiensis*) are also occasionally spotted in the area, including a 2022 siting of a bear near the town of Capay. Several fish species were also observed during the 2023 Creek Walk, including bluegill (*Lepomis macrochirus*), common carp (*Cyprinus carpio*), green sunfish (*Lepomis cyanellus*), largemouth bass (*Micropterus salmoides*), and mosquito fish (*Gambusia affinis*).

Regarding beaver, one of the most notable observations during the 2022 Creek Walk was the significant increase in beaver activity beginning with a few downed trees at RM 20.5 in the Guesisosi Reach and continuing downstream to the Rio Jesus Maria Reach. In 2022, beaver dams and associated pools were observed at RMs 18.9 and 19.7 in the Guesisosi Reach, frequently within the Dunnigan Hills Reach (in which a beaver lodge was also observed), and at RM 15.8 in the Hoppin Reach. None of these beaver dams were observed to be creating adverse conditions, nor were beaver impacts on woody vegetation overly harmful. Conversely, the deep pools and pool-and-riffle complexes formed by these dams were observed to be providing habitat for fish, amphibians including western pond turtle, a wide variety of birds including green and great blue herons, and mammals including black-tailed deer. It was noted that pools resulting from beaver dams may serve as the sole source of available water for wildlife in warmer months, and may also be maintaining soil moisture for native plant species. The potential that beaver pools were contributing to groundwater recharge was also noted. It was concluded that was very likely that the significant decrease in OHV activity resulting from new restrictions was resulting in the dramatic increase in beaver dams and resulting pools, as OHV damage to beaver dams has been a frequent occurrence over at least the last decade. This was identified as a positive factor

influencing the continued recovery of biological resources within the CCRMP, which would be closely monitored by the Cache Creek TAC in the years to come.

Figure 4-19. Various native bird species observed during 2023 Creek Walk. Left column, top to bottom: ash-throated flycatcher (Myiarchus cinerascens), California scrub jay (Aphelocoma california), great blue heron (Aredea herodias), and great egret (Ardea alba). Right column, top to bottom: black-crowned night heron (Nycticorax nycticorax), black phoebe (Sayornis nigricans), great horned owl (Bubo virginianus), and northern flicker (Colaptes auratus) feeding young.

Observations made during the 2023 Creek Walk further reinforced these conclusions regarding the relationship between beaver, native vegetation, available surface water, OHV use, other wildlife, and potential groundwater recharge. In 2023, both beaver and beaver dams were observed at a frequency similar to 2022, with dams observed beginning at RM 19.4 in the Guesisosi Reach and then at RMs 18.6, from 18.0–18.1, 17.8, 17.6, and from 17.2–17.3 (Fig. 4-20). None of these beaver dams were observed to be creating adverse flow conditions, nor were beaver impacts on woody vegetation overly harmful. Pools resulting from beaver dams were observed to be frequently used by native wildlife, and pools seemed to be having a positive impact on native vegetation. No OHV damage to beaver dams was observed, nor was any reported by Cache Creek Conservancy staff.

Figure 4-20. Beaver dams and resulting pools observed during the 2023 Creek Walk at RM 17.3 (upper left), RM 17.8 (lower left) RM 18.0 (upper right) and RM 18.6 (lower right) in the Dunnigan Hills Reach.

4.6 References

Rayburn, A.P. 2016a. Lower Cache Creek Invasive Species Mapping and Prioritization Project. Prepared for the Cache Creek Conservancy.

Rayburn, A.P. 2016b. Capay Valley Invasive Species Mapping and Prioritization Project. Prepared for the Yolo County Resource Conservation District.

Rayburn, A.P. 2017. Abundance and distribution of blue elderberry (*Sambucus nigra* ssp. *caerulea*) on lower Cache Creek. Prepared for the Yolo County Administrator's Office.

Rayburn, A.P. 2018. Status and distribution of blue elderberry (*Sambucus nigra* ssp. *caerulea*) on lower Cache Creek: implications for adaptive floodplain management. *San Francisco Estuary and Watershed Science* 16(3).

Yolo County. 2016. 2016 Cache Creek Annual Status Report. Prepared by the Cache Creek Technical Advisory Committee for the Yolo County Administrator's Office.

Yolo County. 2017a. 2017 Technical Studies and 20-year Retrospective for the Cache Creek Area Plan. Prepared for the Yolo County Administrator's Office.

Yolo County. 2017b. 2017 Cache Creek Annual Status Report. Prepared by the Cache Creek Technical Advisory Committee for the Yolo County Administrator's Office.

Yolo County. 2018. 2018 Cache Creek Annual Status Report. Prepared by the Cache Creek Technical Advisory Committee for the Yolo County Administrator's Office.

Yolo County. 2019. 2019 Cache Creek Annual Status Report. Prepared by the Cache Creek Technical Advisory Committee for the Yolo County Administrator's Office.

Yolo County. 2020. 2020 Cache Creek Annual Status Report. Prepared by the Cache Creek Technical Advisory Committee for the Yolo County Administrator's Office.

Yolo County. 2021. 2021 Cache Creek Annual Status Report. Prepared by the Cache Creek Technical Advisory Committee for the Yolo County Administrator's Office.

Yolo County. 2022. 2022 Cache Creek Annual Status Report. Prepared by the Cache Creek Technical Advisory Committee for the Yolo County Administrator's Office.

5. Status of Prior Recommendations

Beginning in 2011, the Cache Creek Annual Status Report has provided a prioritized list (high, medium, and low) of programmatic and channel improvement recommendations. These recommendations are based on the geomorphic, hydrologic, and biological assessments of Cache Creek and are pursuant to the goals, policies, and actions of the CCRMP. The physical observations and data collected this Water Year were combined with recommendations from prior years and formed the analytical basis for the Cache Creek TAC's 2023 recommendations summarized in Section 1.6 of the Introduction and Overview. Any new recommendations from this 2023 report will be added to this list once the report is reviewed and accepted by the Yolo County Board of Supervisors.

The status of prior recommendations, **as of January 2024**, can be found below.

5.1 High Priority Recommendations

1. **Coordinate with full Cache Creek TAC, County staff, Cache Creek Conservancy staff, Yolo RCD staff, and landowners to identify areas and sites best suited for natural regeneration (passive restoration) and active restoration of riparian and upland habitat.**

    - Recommendation made by Riparian Biologist in 2011
    - Status: In Progress (see recommended sites in Annual Report)
    - Level of Effort: Medium

2. **Significantly increase monitoring and management of non-native and invasive plant species, prioritizing Tier 1 (high priority) species including Arundo and tamarisk.**

    - Recommendation made by Riparian Biologist in 2021
    - Status: In Progress
    - Level of Effort: High

3. **Continue to participate in the implementation of the Cache Creek Watershed Wide Invasive Management Plan.**

    - Recommendation made by Riparian Biologist in 2011
    - Status: In Progress
    - Level of Effort: Low

4. **Remove fine sediment accumulation north of "island" to reduce erosive pressure on south bank at RM 11.7 (upstream from Huff's Corner on north side).**

    - Recommendation made by Fluvial Geomorphologist in 2014
    - Status: Complete – Monitoring and Maintenance Underway
    - Level of Effort: High

5. **Implement proposed bar skimming projects at RM 24.6 – 25 and RM 20.1 – 20.5.**

    - Recommendation made by Fluvial Geomorphologist in 2017
    - Status: RM 24.6-25 = Planning and Design In Progress; RM 20.1-20.5 = Stalled
    - Level of Effort: High

6. **Consider potential bar skimming projects at RM 23.1, RM 22, RM 21.8, RM 21.6, and RM 21.4.**

    - Recommendation made by Fluvial Geomorphologist in 2017
    - Status: Not Started
    - Level of Effort: High

7. **Evaluate need for treatment (channel management) at I-505 crossing where over 100 feet of north bank erosion occurred in 2017.**

    - Recommendation made by all TAC members in 2017
    - Status: In Progress
    - Level of Effort: Medium

8. **Reassess proposed Channel Form Template (CFT) location and evaluate need for treatment (in-stream maintenance) at RM 26.0, RM 25.4-25.5, RM 22.0, RM 21.8, RM 21.6, RM 21.1, and RM 18.0-18.12.**

    - Recommendation made by Fluvial Geomorphologist in 2017
    - Status: In Progress
    - Level of Effort: Medium

9. **Implement spatially-explicit monitoring to track location and status (e.g., treated or not) of non-native and invasive plant species.**

- Recommendation made by Riparian Biologist in 2017
- Status: In Progress
- Level of Effort: Medium

10. **Survey water surface elevation profiles of Cache Creek at high flows (30,000+ cfs) to assist in calibrating the 2D Hydraulic Model.**

    - Recommendation made by Hydraulic Engineer in 2017
    - Status: In Progress
    - Level of Effort: Medium

11. **Monitor erosion sites at Jensen Bend (RM 25.4); Granite Esparto (RM 24.8-24.4); Esparto Bridge Pier Scour (RM 24.4); Bank Erosion across from Teichert Esparto Site (RM 23.3); Teichert Esparto Aggregate Pile Site (RM 22.8); Payne Property (RM 22.0); and Woodland Reiff Levee Erosion (RM 14.3). Monitor and consider enforcement actions against waste disposal around RM 25.4.**

    - Recommendation made by the Hydraulic Engineer in 2019 and updated in 2022
    - Status: In Progress
    - Level of Effort: Medium

12. **Cache Creek Conservancy and County staff should jointly conduct a capacity assessment of the Conservancy' Invasive Weed Control program to determine if the program is adequately resources to meet present and future needs related to invasive species control within the CCRMP area.**

    - Recommendation made by the Riparian Biologist in 2019
    - Status: In Progress
    - Level of Effort: Medium

13. **Notify the Yolo County Flood Control and Water Conservation District of the need to evaluate the erosion at the emergency bank stabilization retaining wall immediately downstream of the Capay Dam, and implement remedies.**

    - Recommendation made by the Hydraulic Engineer in 2019
    - Status: In Progress
    - Level of Effort: Medium

5.2 Medium Priority Recommendations

1. **Implement water temperature monitoring by placing water temperature data loggers in each reach.**

    - Recommendation made by Hydraulic Engineer in 2011.
    - Status: Not Started
    - Level of Effort: Low

2. **In collaboration with university researchers, non-profit scientists, and/or private consultants, implement monitoring of wildlife (e.g., birds, mammals, reptiles, and amphibians), insects (e.g., VELB), and fish to complement vegetation monitoring.**

    - Recommendation made by Riparian Biologist in 2011 and updated in 2022.
    - Status: In Progress
    - Level of Effort: Medium

3. **Explore opportunities to increase surface water flows in Cache Creek to improve conditions for native and riparian vegetation.**

    - Recommendation made by Riparian Biologist in 2013.
    - Status: In Progress
    - Level of Effort: Medium

4. **PG&E site (RM 26.9) – erosion control blanket and all associated infrastructure should be removed; the palisades should either be removed entirely or cut at ground level or below; remove exposed webbing; and revegetation/natural stabilization project be implemented.**

    - Recommendation made by Fluvial Geomorphologist in 2014; Updated by Hydraulic Engineer in 2019
    - Status: Flood Hazard Development Permit Approved, Construction Pending
    - Level of Effort: Medium

5. **Capay Dam damage due to flows in December 2014 be addressed and corrective actions implemented to prevent similar future damage. The December event was approximately**

a 2-3 year return event and this structure should not have sustained this damage for such a small magnitude flow event.

- Recommendation made by Hydraulic Engineer in 2015
- Status: In Progress
- Level of Effort: Low

6. **Burn or otherwise remove biomass from treated invasive species within the CCRMP where feasible, and plant native species on all invasive species treatment sites where feasible to prevent reinvasion and accelerate recovery of native vegetation.**

    - Recommendation made by Riparian Biologist in 2015 and updated in 2022
    - Status: In Progress
    - Level of Effort: Medium

7. **Implement best management practices for planning, implementation, and evaluation of habitat enhancement and restoration projects (e.g., include native understory species, implement effectiveness monitoring).**

    - Recommendation made by Riparian Biologist in 2017
    - Status: In Progress
    - Level of Effort: Medium

8. **Reinitiate voluntary bar skimming project evaluation at RM 21.6.**

    - Recommendation made by Fluvial Geomorphologist in 2019
    - Status: Not Started
    - Level of Effort: Medium

9. **Detailed monitoring and assessment of channel treatments at locations of 2017 channel migration and erosion (RM 26, 25.5, 23.5, 22, 21.5, and 18).**

    - Recommendation made by Fluvial Geomorphologist in 2017
    - Status: Ongoing at annual Creek Walks
    - Level of Effort: Medium

10. **Yolo County, Cache Creek TAC, Cache Creek Conservancy, Yolo County Resource Conservation District, and Yolo County Flood Control and Water Conservation District should work together to develop a comprehensive invasive species removal, ecosystem restoration, flood management and water supply bundle of projects based on prior Cache Creek TAC recommendations and submit additional Proposition 1 (and other) grant proposals to fund such projects in Water Year 2023.**

    - Recommendation made by Fluvial Geomorphologist in 2019
    - Status: Revising previous unfunded proposals for new funding programs
    - Level of Effort: Medium

11. **Perform regular evaluation of the CCAP water quality monitoring program.**

    - Recommendation made by the Hydraulic Engineer starting in 2020
    - Status: In Program
    - Level of Effort: Medium

12. **Consider removal of some bank stabilization weirs and replacement with more modern approaches to bank stabilization.**

    - Recommendation made by the Hydraulic Engineer starting in 2021
    - Status: Not implemented. Requires funding for planning, design, and implementation.
    - Level of Effort: High

13. **Conduct focused monitoring of OHV impacts on native vegetation and wildlife (e.g., beaver), as well as vegetation recovery on sites previously impacted by OHV activities.**
    - Recommendation made by Riparian Biologist starting in 2021
    - Status: In Progress
    - Level of Effort: Low

5.3 Low Priority Recommendations

1. **Evaluate modifications to the berm separating the upstream and downstream cells at Correll Rodgers (RM 13.7)**

    - Recommendation made by Fluvial Geomorphologist in 2012
    - Status: Complete – no current action required

- Level of Effort: Medium

2. **Continue to monitor beaver activity in relation to potential impacts on native vegetation and wildlife, flows, and channel capacity.**

    - Recommendation made by Riparian Biologist in 2015
    - Status: In Progress
    - Level of Effort: Low

3. **Notify bridge owners and assess need for in-stream or channel bank maintenance immediately after Water Years with peak flows exceeding 20,000 cfs.**

    - Recommendation made Fluvial Geomorphologist in 2017
    - Status: Ongoing as follow up after annual Creek Walks
    - Level of Effort: Low

4. **Evaluate the potential for additional bar skimming at RM 21 and RM 22.**

    - Recommendation made Fluvial Geomorphologist in 2017
    - Status: In Progress
    - Level of Effort: Low

APPENDIX A

2023 CREEK WALK
CACHE CREEK TAC OBSERVATIONS

RM	REACH	OBSERVER	COMMENT	PRIORITY LEVEL
28.4	Capay	Rayburn, A. (BIO)	Three bald eagles (BAEA; two immature, one adult)	Observation
28.4	Capay	Rayburn, A. (BIO)	Vegetation at dam; note water is high behind dam	Observation
28.4	Capay	Rayburn, A. (BIO)	Cliff swallows (CLSW) at dam	Observation
28.3	Capay	Rayburn, A. (BIO)	Vegetation below dam	Observation
28.3	Capay	Tompkins, M. (GEO)	Left bank looking upstream at Capay Dam. More mature vegetation downstream of dam.	Observation
28.3	Capay	Tompkins, M. (GEO)	Right bank at concrete wall. Continued erosion behind wall.	Monitoring Required
28.3	Capay	Frank, P. (HYDRO)	Looking at Capay dam from northside	Observation
28.3	Capay	Frank, P. (HYDRO)	Looking at stream banks, just downstream of the dam	Observation
28.3	Capay	Frank, P. (HYDRO)	Looking at upstream end of flood district wall, major hole at upstream edge, but hard to see because of dense vegetation growth	Monitoring Required
28.3	Capay	Frank, P. (HYDRO)	Looking behind emergency repair wall at approximately 12 to 15 foot deep hole behind the top of the wall	Action Required
28.3	Capay	Frank, P. (HYDRO)	Downstream end of emergency repair wall showing scour holes behind wall	Action Required
28.2	Capay	Rayburn, A. (BIO)	Dead or dying oak from fire	Observation

28.2	Capay	Rayburn, A. (BIO)	Tamarisk	Monitoring Required
28.2	Capay	Rayburn, A. (BIO)	Vegetation in channel	Observation
28.2	Capay	Rayburn, A. (BIO)	Vegetation recovering from fire	Observation
28.2	Capay	Tompkins, M. (GEO)	Downstream of concrete wall. Some erosion and vegetation growth.	Observation
28.2	Capay	Frank, P. (HYDRO)	Stakes in the ground, just downstream of emergency repair wall, documenting the bank erosion	Monitoring Required
28.1	Capay	Rayburn, A. (BIO)	Treated arundo	Monitoring Required
28.1	Capay	Rayburn, A. (BIO)	Burned vegetation	Observation
28.1	Capay	Rayburn, A. (BIO)	Burned vegetation, recovering	Monitoring Required
28.1	Capay	Rayburn, A. (BIO)	Swainson's hawk (SWHA)	Observation
28.0	Capay	Rayburn, A. (BIO)	Ravenna grass	Monitoring Required
28.0	Capay	Rayburn, A. (BIO)	Western pond turtle	Observation
28	Capay	Tompkins, M. (GEO)	Steep concrete bank. No major change.	Observation

28	Capay	Frank, P. (HYDRO)	Grouted riprap embankment	Observation
27.9	Capay	Rayburn, A. (BIO)	Bald eagle (BAEA)	Observation
27.8	Capay	Rayburn, A. (BIO)	Treated tamarisk	Observation
27.8	Capay	Rayburn, A. (BIO)	Potential restoration site	Observation
27.6	Capay	Rayburn, A. (BIO)	Swainson's hawk (SWHA)	Observation
27.6	Capay	Tompkins, M. (GEO)	High water near top of canal.	Monitoring Required
27.5	Capay	Tompkins, M. (GEO)	Introduction spot in the shade.	Observation
27.5	Capay	Tompkins, M. (GEO)	Participants: Elisa, Casey, Ben, Mark, Paul, Drew, Jason, Charlie Tschudin, Alex, Dwight, Sarah, Nathan, Jordan Ferreira, Greg, Felicia, Lee Ann, Lynne.	Observation
27.4	Capay	Rayburn, A. (BIO)	Treated arundo	Monitoring Required
27.4	Capay	Tompkins, M. (GEO)	Upstream of PG&E Palisades. No major change.	Observation
27.4	Capay	Frank, P. (HYDRO)	Prior Arundo burn site; no Arundo visible this year	Observation
27.3	Capay	Rayburn, A. (BIO)	Creeping wildrye (remnant native species)	Observation

27.3	Capay	Rayburn, A. (BIO)	Potential restoration site	Observation
26.9	Capay	Rayburn, A. (BIO)	Perch and bluegill	Observation
26.8	Capay	Rayburn, A. (BIO)	Red-tailed hawk (RTHA)	Observation
26.8	Capay	Rayburn, A. (BIO)	Potential restoration site	Observation
26.8	Capay	Rayburn, A. (BIO)	Historic oak planting mitigation site	Monitoring Required
26.8	Capay	Rayburn, A. (BIO)	Palisades looking upstream	Monitoring Required
26.8	Capay	Rayburn, A. (BIO)	Palisades lookingdownstream	Monitoring Required
26.8	Capay	Rayburn, A. (BIO)	Red-tailed hawk (RTHA)	Observation
26.8	Capay	Rayburn, A. (BIO)	Otter scat	Observation
26.8	Capay	Rayburn, A. (BIO)	Great blue heron (GBHE) rookery	Observation
26.8	Capay	Tompkins, M. (GEO)	PG & E Palisades. No major change at the Palisades. Some downstream gravel bar growth.	Monitoring Required
26.8	Capay	Frank, P. (HYDRO)	PG&E Palisades no significant change other than additional vegetation growth	Monitoring Required

26.7	Capay	Rayburn, A. (BIO)	Great blue heron (GBHE) rookery	Observation
26.6	Capay	Rayburn, A. (BIO)	2 red-tailed hawks (RTHA)	Observation
26.6	Capay	Frank, P. (HYDRO)	Sediment observation	Observation
26.5	Capay	Rayburn, A. (BIO)	Looking upstream	Observation
26.5	Capay	Rayburn, A. (BIO)	Several lesser nighthawks nighthawks (LENI)	Observation
26.5	Capay	Tompkins, M. (GEO)	Upstream of Capay Open Space. No major change. Significant flow.	Observation
26.5	Capay	Tompkins, M. (GEO)	Palisades sackcrete concrete pillow mobilzed from upstream and deposited on bar.	Monitoring Required
26.5	Capay	Frank, P. (HYDRO)	Sediment observation	Observation
26.5	Capay	Frank, P. (HYDRO)	Sediment observation	Observation
26.4	Capay	Rayburn, A. (BIO)	Drought-stressed trees	Monitoring Required
26.4	Capay	Rayburn, A. (BIO)	Arundo	Monitoring Required
26.4	Capay	Rayburn, A. (BIO)	Tamarisk and arundo	Monitoring Required

26.4	Capay	Frank, P. (HYDRO)	Buoy	Observation
26.3	Capay	Frank, P. (HYDRO)	Looking down stream at Capay bridge	Observation
26.3	Hungry Hollow	Rayburn, A. (BIO)	Vegetation looking downstream	Monitoring Required
26.3	Hungry Hollow	Rayburn, A. (BIO)	Vegetation looking downstream	Monitoring Required
26.3	Hungry Hollow	Rayburn, A. (BIO)	Cliff swallows (CLSW) at bridge	Observation
26.3	Hungry Hollow	Tompkins, M. (GEO)	County Road 85. Significant scour and loss of vegetation.	Observation
26.3	Hungry Hollow	Frank, P. (HYDRO)	Capay bridge pier number one	Observation
26.3	Hungry Hollow	Frank, P. (HYDRO)	Capay Bridge left abutment	Observation
26.3	Hungry Hollow	Frank, P. (HYDRO)	Capay bridge pier number two, and right abutment	Observation
26.3	Hungry Hollow	Frank, P. (HYDRO)	Looking up stream at Capay bridge	Observation
26.2	Hungry Hollow	Rayburn, A. (BIO)	Capay Open Space Park restoration site	Monitoring Required
26.2	Hungry Hollow	Rayburn, A. (BIO)	Swainson’s hawk (SWHA)	Observation

26.2	Hungry Hollow	Rayburn, A. (BIO)	Looking upstream	Observation
26.2	Hungry Hollow	Tompkins, M. (GEO)	At Capay Open Space. Less vegetation.	Observation
26.0	Hungry Hollow	Rayburn, A. (BIO)	Scattered tamarisk	Monitoring Required
26.0	Hungry Hollow	Rayburn, A. (BIO)	Lesser nighthawk (LENI)	Observation
26.0	Hungry Hollow	Rayburn, A. (BIO)	Dead trees, maybe from drought	Observation
26	Hungry Hollow	Tompkins, M. (GEO)	Downstream of Capay Open Space. Less vegetation, but no major channel change.	Observation
26	Hungry Hollow	Frank, P. (HYDRO)	Eroding bank with exposed concrete and potentially erosion control fabric being exposed.	Monitoring Required
25.9	Hungry Hollow	Rayburn, A. (BIO)	Tamarisk	Monitoring Required
25.9	Hungry Hollow	Rayburn, A. (BIO)	Drought-stressed trees	Observation
25.9	Hungry Hollow	Rayburn, A. (BIO)	Potential bank swallow (BANS) habitat (no holes or birds)	Monitoring Required
25.9	Hungry Hollow	Tompkins, M. (GEO)	Fresh fine sediment deposit.	Observation
25.9	Hungry Hollow	Frank, P. (HYDRO)	New car in streambank	Monitoring Required

25.9	Hungry Hollow	Frank, P. (HYDRO)	Potentially new bank erosion on the right bank with exposed fabric	Monitoring Required
25.8	Hungry Hollow	Rayburn, A. (BIO)	Vegetation looking upstream	Observation
25.8	Hungry Hollow	Rayburn, A. (BIO)	Abundant tamarisk	Monitoring Required
25.8	Hungry Hollow	Tompkins, M. (GEO)	Large fresh deposit gravel bar.	Observation
25.8	Hungry Hollow	Frank, P. (HYDRO)	Looking up stream at right bank check against prior photos for new erosion. Gravel bar in center of channel appears to be growing.	Action Required
25.7	Hungry Hollow	Rayburn, A. (BIO)	Beaver (CCC observation earlier in year)	Observation
25.6	Hungry Hollow	Frank, P. (HYDRO)	Looking down stream from new sand bar	Observation
25.5	Hungry Hollow	Rayburn, A. (BIO)	Vegetation looking upstream	Observation
25.5	Hungry Hollow	Tompkins, M. (GEO)	Upstream of Granite plant. Large fresh gravel bar deposits. Much more flow than previous years.	Observation
25.4	Hungry Hollow	Rayburn, A. (BIO)	Bank modification by landowner	Monitoring Required
25.4	Hungry Hollow	Rayburn, A. (BIO)	Bank modification by landowner	Monitoring Required
25.4	Hungry Hollow	Tompkins, M. (GEO)	Upstream of Granite left bank. Possible bank erosion. Significantly more flow.	Monitoring Required

25.4	Hungry Hollow	Frank, P. (HYDRO)	Jensen Bend somehow it almost looks like a new soil fill was placed on the bank need to check previous photos. The soil is very dark brown looks different than past	Action Required
25.4	Hungry Hollow	Frank, P. (HYDRO)	Waste concrete armoring	Monitoring Required
25.3	Hungry Hollow	Rayburn, A. (BIO)	Bank modification by landowner	Monitoring Required
25.3	Hungry Hollow	Rayburn, A. (BIO)	Arundo	Monitoring Required
25.3	Hungry Hollow	Rayburn, A. (BIO)	OHV tracks	Monitoring Required
25.3	Hungry Hollow	Frank, P. (HYDRO)	Appears to be new fill placed into the stream bank, dark brown soil	Monitoring Required
25.3	Hungry Hollow	Frank, P. (HYDRO)	Waste concrete rubble in channel	Monitoring Required
25.3	Hungry Hollow	Frank, P. (HYDRO)	Concrete rubble in channel and scour hole	Monitoring Required
25.2	Hungry Hollow	Rayburn, A. (BIO)	Tamarisk	Monitoring Required
25.2	Hungry Hollow	Rayburn, A. (BIO)	Truck or OHV tracks	Monitoring Required
25.2	Hungry Hollow	Rayburn, A. (BIO)	Vehicle "boneyard" on bank	Monitoring Required
25.2	Hungry Hollow	Tompkins, M. (GEO)	At Granite plant left bank. Large fresh gravel bar. Less vegetation and more flow.	Observation

25.2	Hungry Hollow	Frank, P. (HYDRO)	Junkyard above channel still there	Monitoring Required
25.2	Hungry Hollow	Frank, P. (HYDRO)	New sand and fine gravel bar	Observation
25.0	Hungry Hollow	Rayburn, A. (BIO)	Tamarisk	Monitoring Required
24.9	Hungry Hollow	Rayburn, A. (BIO)	Tamarisk	Monitoring Required
24.9	Hungry Hollow	Tompkins, M. (GEO)	At Granite plant. Vigorous mulefat growth at toe of slope. Continued significant flow.	Observation
24.8	Hungry Hollow	Rayburn, A. (BIO)	Water	Observation
24.7	Hungry Hollow	Rayburn, A. (BIO)	Tamarisk	Monitoring Required
24.7	Hungry Hollow	Rayburn, A. (BIO)	Looking downstream	Observation
24.7	Hungry Hollow	Tompkins, M. (GEO)	At Granite. Large fresh bars. Water starting to go subsurface.	Observation
24.7	Hungry Hollow	Tompkins, M. (GEO)	Last day for antique hiking boots.	Observation
24.7	Hungry Hollow	Frank, P. (HYDRO)	Bank stabilization project	Observation
24.6	Hungry Hollow	Rayburn, A. (BIO)	Arundo	Monitoring Required

24.6	Hungry Hollow	Frank, P. (HYDRO)	Granite bank stabilization project	Observation
24.5	Hungry Hollow	Tompkins, M. (GEO)	Downstream of Granite. Main channel shifted to right bank.	Observation
24.5	Hungry Hollow	Tompkins, M. (GEO)	Large wood deposited at head of large gravel bar.	Observation
24.4	Hungry Hollow	Tompkins, M. (GEO)	Granite left bank repair. Active channel has migrated away from repair site.	Observation
24.3	Hungry Hollow	Rayburn, A. (BIO)	Looking upstream	Observation
24.3	Hungry Hollow	Rayburn, A. (BIO)	Looking downstream	Observation
24.3	Hungry Hollow	Rayburn, A. (BIO)	Cliff swallows (CLSW) at bridge	Observation
24.3	Hungry Hollow	Rayburn, A. (BIO)	Red-tailed hawk (RTHA)	Observation
24.3	Hungry Hollow	Tompkins, M. (GEO)	County Road 87. Channel has shifted from left bank to right bank. Cleared vegetation with fresh fine sediment deposits.	Observation
24.3	Hungry Hollow	Frank, P. (HYDRO)	Esparto bridge pier number one	Observation
24.3	Hungry Hollow	Frank, P. (HYDRO)	Esparto bridge pier #2	Observation
24.3	Hungry Hollow	Frank, P. (HYDRO)	Esparto bridge piers number three and four	Observation

24.3	Hungry Hollow	Frank, P. (HYDRO)	Esparto bridge piers five and six	Observation
24.3	Hungry Hollow	Frank, P. (HYDRO)	Esparto bridge pier number seven	Observation
24.2	Hungry Hollow	Frank, P. (HYDRO)	Looking upstream at Esparto bridge, no evidence of any new erosion or undercutting more than likely new deposition of gravel and sand during winter 2023	Observation
24.1	Hungry Hollow	Rayburn, A. (BIO)	Vegetation looking upstream	Observation
24.0	Hungry Hollow	Rayburn, A. (BIO)	OHV tracks	Monitoring Required
24	Hungry Hollow	Frank, P. (HYDRO)	Eroding weir tips	Observation
23.9	Hungry Hollow	Rayburn, A. (BIO)	Bank	Observation
23.9	Hungry Hollow	Tompkins, M. (GEO)	Grading on right bank. Unknown object.	Monitoring Required
23.9	Hungry Hollow	Frank, P. (HYDRO)	Eroding weir tips	Observation
23.8	Hungry Hollow	Rayburn, A. (BIO)	Drought-stressed trees	Observation
23.8	Hungry Hollow	Frank, P. (HYDRO)	Cute frog	Observation
23.5	Hungry Hollow	Tompkins, M. (GEO)	Upstream of Syar. Wide open gravel bar.	Observation

23.5	Hungry Hollow	Frank, P. (HYDRO)	Tompkins boots action required	Action Required
23.4	Hungry Hollow	Rayburn, A. (BIO)	Tamarisk	Monitoring Required
23.3	Madison	Rayburn, A. (BIO)	Potential bank swallow (BANS) habitat (no holes or birds)	Monitoring Required
23.3	Madison	Frank, P. (HYDRO)	Looking south at cut bank on right side	Observation
23.2	Madison	Frank, P. (HYDRO)	Looking south at cut right bank	Observation
22.8	Madison	Rayburn, A. (BIO)	Potential bank swallow (BANS) habitat (no holes or birds)	Monitoring Required
22.8	Madison	Tompkins, M. (GEO)	Teichert gravel pile eroding into creek.	Monitoring Required
22.8	Madison	Frank, P. (HYDRO)	Teichert gravel pile perched above creek bank	Action Required
22.7	Madison	Rayburn, A. (BIO)	Potential bank swallow (BANS) habitat (3 NRWS birds, 2 holes)	Monitoring Required
22.7	Madison	Rayburn, A. (BIO)	Tamarisk	Monitoring Required
22.5	Madison	Tompkins, M. (GEO)	Near Syar. Fine sediment deposition. No major change.	Observation
22.3	Madison	Rayburn, A. (BIO)	Mature native vegetation	Observation

22.3	Madison	Frank, P. (HYDRO)	sediment observation, and Tompkins boots	Observation
22.1	Madison	Rayburn, A. (BIO)	Dirtbike tracks	Monitoring Required
22.1	Madison	Rayburn, A. (BIO)	Tamarisk	Monitoring Required
22.1	Madison	Tompkins, M. (GEO)	Syar. Silt and sand on gravel bar.	Observation
22.0	Madison	Rayburn, A. (BIO)	Drought-stressed trees	Observation
22.0	Madison	Rayburn, A. (BIO)	Potential bank swallow (BANS) habitat (no holes or birds)	Monitoring Required
22.0	Madison	Frank, P. (HYDRO)	Looking at Payne property on left bank	Observation
21.9	Madison	Frank, P. (HYDRO)	Looking at Payne property on the left Bank	Observation
21.8	Madison	Rayburn, A. (BIO)	OHV tracks	Monitoring Required
21.7	Madison	Rayburn, A. (BIO)	Potential bank swallow (BANS) habitat (no holes or birds)	Monitoring Required
21.6	Madison	Rayburn, A. (BIO)	Lesser nighthawk (LENI)	Observation
21.5	Madison	Rayburn, A. (BIO)	Red-tailed hawk (RTHA)	Observation

21.4	Madison	Rayburn, A. (BIO)	Reduced OHV	Observation
21.4	Madison	Rayburn, A. (BIO)	Drought	Observation
21.4	Madison	Rayburn, A. (BIO)	OHV	Monitoring Required
21.4	Madison	Rayburn, A. (BIO)	Swainson's hawk (SWHA)	Observation
21.4	Madison	Tompkins, M. (GEO)	At Syar. Fine sand deposit.	Observation
21.4	Madison	Tompkins, M. (GEO)	More fine sediment deposition.	Observation
21.4	Madison	Frank, P. (HYDRO)	Trash on bank and old erosion scallop	Observation
21.3	Madison	Rayburn, A. (BIO)	Potential bank swallow (BANS) habitat (no holes or birds)	Monitoring Required
21.3	Madison	Frank, P. (HYDRO)	Looking at right bank training structure and concrete rubble stabilization	Observation
21.2	Madison	Rayburn, A. (BIO)	Recovering vegetation	Observation
21.1	Madison	Rayburn, A. (BIO)	Tamarisk resprouting	Monitoring Required
21.1	Madison	Tompkins, M. (GEO)	Upstream 505. Large gravel bar. Vegetation cleared.	Observation

21.1	Madison	Frank, P. (HYDRO)	Looking down stream at 505 bridge	Observation
21.0	Guesisosi	Rayburn, A. (BIO)	"Barometer" vegeation patch, slight recovery	Observation
21.0	Guesisosi	Tompkins, M. (GEO)	Edge of left bank bar. Active channel migration towards left bank.	Observation
21.0	Guesisosi	Frank, P. (HYDRO)	Car in embankment at 505 bridge abutment	Observation
21.0	Guesisosi	Frank, P. (HYDRO)	505 bridge pier number one upstream scour holes but otherwise here looks good	Observation
20.9	Guesisosi	Rayburn, A. (BIO)	Swainson's hawk (SWHA) nest occupied	Observation
20.9	Guesisosi	Rayburn, A. (BIO)	Cliff swallows (CLSW)	Observation
20.9	Guesisosi	Rayburn, A. (BIO)	Green sunfish in pool	Observation
20.9	Guesisosi	Rayburn, A. (BIO)	Vegetation looking downstream	Observation
20.9	Guesisosi	Frank, P. (HYDRO)	505 bridge pier number two	Observation
20.9	Guesisosi	Frank, P. (HYDRO)	505 bridge piers number three and four - thalweg is in between number two and number three this year	Observation
20.9	Guesisosi	Frank, P. (HYDRO)	Looking up screen at 505 Bridge	Observation

20.8	Guesisosi	Rayburn, A. (BIO)	Swainson’s hawk (SWHA)	Observation
20.8	Guesisosi	Rayburn, A. (BIO)	OHV tracks	Monitoring Required
20.8	Guesisosi	Rayburn, A. (BIO)	Arundo	Monitoring Required
20.8	Guesisosi	Tompkins, M. (GEO)	Sand deposit.	Observation
20.7	Guesisosi	Rayburn, A. (BIO)	Tamarisk	Monitoring Required
20.6	Guesisosi	Rayburn, A. (BIO)	2 Swainson's hawks (SWHA)	Observation
20.6	Guesisosi	Rayburn, A. (BIO)	Lesser nighthawk (LENI)	Observation
20.6	Guesisosi	Tompkins, M. (GEO)	Cemex mid-channel bar.	Observation
20.6	Guesisosi	Tompkins, M. (GEO)	Possible new steep slope erosion right bank.	Monitoring Required
20.6	Guesisosi	Tompkins, M. (GEO)	Slumped bank chunk from fresh undercutting of toe.	Monitoring Required
20.5	Guesisosi	Rayburn, A. (BIO)	Recovering vegetation	Observation
20.5	Guesisosi	Rayburn, A. (BIO)	Persistent vegetation	Observation

20.5	Guesisosi	Frank, P. (HYDRO)	Looking at CEMEX bank stabilization	Observation
20.4	Guesisosi	Rayburn, A. (BIO)	Arundo	Monitoring Required
20.4	Guesisosi	Rayburn, A. (BIO)	Scattered tamarisk and arundo	Monitoring Required
20.4	Guesisosi	Rayburn, A. (BIO)	Abundant tamarisk and arundo	Monitoring Required
20.4	Guesisosi	Tompkins, M. (GEO)	Along Cemex. Increased sediment and plant diversity.	Observation
20.4	Guesisosi	Frank, P. (HYDRO)	looking at CEMEX bank stabilization project	Observation
20.3	Guesisosi	Rayburn, A. (BIO)	Tamarisk	Monitoring Required
20.3	Guesisosi	Rayburn, A. (BIO)	Abundant tamarisk	Monitoring Required
20.3	Guesisosi	Rayburn, A. (BIO)	Drought-stressed trees	Observation
20.3	Guesisosi	Rayburn, A. (BIO)	Arundo	Monitoring Required
20.2	Guesisosi	Rayburn, A. (BIO)	Swainson's hawk (SWHA)	Observation
20.2	Guesisosi	Rayburn, A. (BIO)	Vegetation looking downstream, some recovery	Observation

20.2	Guesisosi	Rayburn, A. (BIO)	Lesser nighthawks (LENI)	Observation
20.1	Guesisosi	Rayburn, A. (BIO)	Recovering willows	Observation
20.1	Guesisosi	Rayburn, A. (BIO)	Treated arundo	Monitoring Required
20.1	Guesisosi	Tompkins, M. (GEO)	Downstream Cemex. Sand deposit in lee downstream of log.	Observation
20.1	Guesisosi	Frank, P. (HYDRO)	Looking at the left Bank. From previous observations about bank erosion into Orchard, significant riparian vegetations present and thalweg is on the right side now	Observation
20.0	Guesisosi	Rayburn, A. (BIO)	Western pond turtle	Observation
20.0	Guesisosi	Rayburn, A. (BIO)	Green heron (GRHE)	Observation
20.0	Guesisosi	Rayburn, A. (BIO)	Tamarisk	Monitoring Required
20.0	Guesisosi	Frank, P. (HYDRO)	Western pond turtle	Observation
19.9	Guesisosi	Rayburn, A. (BIO)	Pools	Observation
19.8	Guesisosi	Rayburn, A. (BIO)	Mature vegetation	Observation
19.8	Guesisosi	Rayburn, A. (BIO)	Treated tamarisk	Monitoring Required

19.8	Guesisosi	Frank, P. (HYDRO)	CEMEX bank stabilization project	Observation
19.7	Guesisosi	Rayburn, A. (BIO)	Mature hallery forest	Observation
19.7	Guesisosi	Rayburn, A. (BIO)	Vegetation looking upstream	Observation
19.7	Guesisosi	Rayburn, A. (BIO)	Vegetation looking downstream	Observation
19.7	Guesisosi	Rayburn, A. (BIO)	Pool	Observation
19.7	Guesisosi	Tompkins, M. (GEO)	Downstream Cemex. Narrowing channel. Diverse channel forms.	Observation
19.6	Guesisosi	Rayburn, A. (BIO)	Pair of red-tailed hawks (RTHA)	Observation
19.6	Guesisosi	Tompkins, M. (GEO)	Remnant beaver dam. Eroded gravel bar.	Observation
19.5	Guesisosi	Rayburn, A. (BIO)	Arundo debris pile	Monitoring Required
19.4	Guesisosi	Rayburn, A. (BIO)	Vegetation debris	Observation
19.4	Guesisosi	Rayburn, A. (BIO)	Beaver dam	Observation
19.4	Guesisosi	Tompkins, M. (GEO)	Large wood snag piles deposited at tree trunks.	Observation

19.3	Guesisosi	Rayburn, A. (BIO)	Swainson's hawk (SWHA)	Observation
19.3	Guesisosi	Tompkins, M. (GEO)	Large beaver dam.	Observation
19.2	Guesisosi	Rayburn, A. (BIO)	Recovering vegetation	Observation
19.2	Guesisosi	Rayburn, A. (BIO)	Potential bank swallow (BANS) habitat (no holes or birds)	Observation
19.2	Guesisosi	Frank, P. (HYDRO)	Protruding pipe at CEMEX bank	Observation
19.1	Guesisosi	Rayburn, A. (BIO)	Pool	Observation
18.9	Guesisosi	Rayburn, A. (BIO)	OHV tracks	Observation
18.9	Guesisosi	Tompkins, M. (GEO)	OHV use.	Monitoring Required
18.8	Guesisosi	Rayburn, A. (BIO)	Arundo and tamarisk	Monitoring Required
18.7	Dunnigan Hills	Rayburn, A. (BIO)	Swainson's hawk (SWHA)	Observation
18.6	Dunnigan Hills	Rayburn, A. (BIO)	Pair of red-tailed hawks (RTHA)	Observation
18.6	Dunnigan Hills	Rayburn, A. (BIO)	Tamarisk	Monitoring Required

18.6	Dunnigan Hills	Rayburn, A. (BIO)	Beaver dam	Observation
18.6	Dunnigan Hills	Rayburn, A. (BIO)	Tamarisk	Monitoring Required
18.6	Dunnigan Hills	Tompkins, M. (GEO)	Some good bank erosion for habitat.	Observation
18.5	Dunnigan Hills	Tompkins, M. (GEO)	Large persistent beaver dam.	Observation
18.2	Dunnigan Hills	Rayburn, A. (BIO)	OHV tracks	Monitoring Required
18.2	Dunnigan Hills	Rayburn, A. (BIO)	OHV tracks	Monitoring Required
18.2	Dunnigan Hills	Tompkins, M. (GEO)	Questionable excavation from last year. Some filling and extension downstream. May have captured part of the main flow.	Action Required
18.2	Dunnigan Hills	Frank, P. (HYDRO)	Illicit excavation site from 2022. there is a light dusting of sand from this winter over the pit	Monitoring Required
18.1	Dunnigan Hills	Rayburn, A. (BIO)	Swainson's hawk (SWHA)	Observation
18.0	Dunnigan Hills	Rayburn, A. (BIO)	Beaver dam	Observation
18.0	Dunnigan Hills	Rayburn, A. (BIO)	Purple loosestrife	Monitoring Required
18.0	Dunnigan Hills	Rayburn, A. (BIO)	New beaver dam	Observation

18.0	Dunnigan Hills	Rayburn, A. (BIO)	Moore's Siphon	Monitoring Required
17.9	Dunnigan Hills	Rayburn, A. (BIO)	Beaver dam	Observation
17.9	Dunnigan Hills	Rayburn, A. (BIO)	Moore's Siphon	Monitoring Required
17.9	Dunnigan Hills	Rayburn, A. (BIO)	OHV trail regrowing	Monitoring Required
17.9	Dunnigan Hills	Rayburn, A. (BIO)	OHV trail	Monitoring Required
17.9	Dunnigan Hills	Tompkins, M. (GEO)	Moore’s Siphon. Vegetation coming back in denuded areas.	Observation
17.9	Dunnigan Hills	Tompkins, M. (GEO)	Right bank at Moores Siphon.	Observation
17.8	Dunnigan Hills	Rayburn, A. (BIO)	Cottonwood forest for enhancing	Observation
17.7	Dunnigan Hills	Rayburn, A. (BIO)	Red-tailed hawk (RTHA)	Observation
17.7	Dunnigan Hills	Rayburn, A. (BIO)	Beaver chew	Observation
17.7	Dunnigan Hills	Rayburn, A. (BIO)	Ravenna grass	Monitoring Required
17.7	Dunnigan Hills	Rayburn, A. (BIO)	Vegetation looking upstream	Observation

17.7	Dunnigan Hills	Rayburn, A. (BIO)	Vegetation looking downstream	Observation
17.7	Dunnigan Hills	Rayburn, A. (BIO)	Beaver dam	Observation
17.7	Dunnigan Hills	Tompkins, M. (GEO)	Beaver dam.	Observation
17.6	Dunnigan Hills	Rayburn, A. (BIO)	Swainson's hawk (SWHA)	Observation
17.5	Dunnigan Hills	Rayburn, A. (BIO)	Western pond turtle	Observation
17.5	Dunnigan Hills	Rayburn, A. (BIO)	New beaver dam	Observation
17.5	Dunnigan Hills	Tompkins, M. (GEO)	Partial beaver dam and fresh riparian vegetation along point bar.	Observation
17.4	Dunnigan Hills	Rayburn, A. (BIO)	Scattered tamarisk and arundo	Monitoring Required
17.4	Dunnigan Hills	Rayburn, A. (BIO)	Largemouth bass	Observation
17.4	Dunnigan Hills	Rayburn, A. (BIO)	Tamarisk and arundo	Monitoring Required
17.3	Dunnigan Hills	Rayburn, A. (BIO)	Abundant mature tamarisk and arundo	Monitoring Required
17.3	Dunnigan Hills	Rayburn, A. (BIO)	Beaver	Observation

17.3	Dunnigan Hills	Tompkins, M. (GEO)	Narrow channel and bar.	Observation
17.2	Dunnigan Hills	Rayburn, A. (BIO)	Beaver slide	Observation
17.2	Dunnigan Hills	Rayburn, A. (BIO)	Beaver dam complex	Observation
17.2	Dunnigan Hills	Tompkins, M. (GEO)	Big beaver dam at upstream end of massive left bank gravel bar.	Observation
17.1	Dunnigan Hills	Rayburn, A. (BIO)	Beaver dam complex	Observation
17.0	Dunnigan Hills	Rayburn, A. (BIO)	Mature vegetation	Observation
17.0	Dunnigan Hills	Rayburn, A. (BIO)	Vegetation looking downstream	Observation
16.9	Dunnigan Hills	Tompkins, M. (GEO)	Upstream of Cache Creek Conservancy.	Observation
16.8	Dunnigan Hills	Rayburn, A. (BIO)	Western pond turtle	Observation
16.8	Dunnigan Hills	Rayburn, A. (BIO)	Vegetation looking upstream	Observation
16.8	Dunnigan Hills	Rayburn, A. (BIO)	Potential restoration site	Observation
16.7	Dunnigan Hills	Rayburn, A. (BIO)	Potential restoration site	Observation

16.5	Dunnigan Hills	Rayburn, A. (BIO)	Vegetation looking upstream	Observation
16.5	Dunnigan Hills	Rayburn, A. (BIO)	OHV tracks	Monitoring Required
16.5	Dunnigan Hills	Rayburn, A. (BIO)	OHV tracks	Monitoring Required
16.5	Dunnigan Hills	Tompkins, M. (GEO)	South channel bridge alternate channel.	Observation
16.5	Dunnigan Hills	Tompkins, M. (GEO)	Conveyor bridge main channel.	Observation
16.5	Dunnigan Hills	Frank, P. (HYDRO)	Looking upstream from conveyor bridge	Observation
16.5	Dunnigan Hills	Frank, P. (HYDRO)	Looking down stream from conveyor bridge	Observation
16.5	Dunnigan Hills	Frank, P. (HYDRO)	Looking upstream from conveyor bridge	Observation
16.5	Dunnigan Hills	Frank, P. (HYDRO)	Looking downstream from conveyor bridge	Observation
16.3	Dunnigan Hills	Rayburn, A. (BIO)	Swainson's hawk (SWHA)	Observation
16.2	Dunnigan Hills	Rayburn, A. (BIO)	Cache Creek Nature Preserve wetland	Observation
16.2	Dunnigan Hills	Rayburn, A. (BIO)	Bullfrog	Observation

16.2	Dunnigan Hills	Tompkins, M. (GEO)	No annotation.	Observation
16.2	Dunnigan Hills	Tompkins, M. (GEO)	No annotation.	Observation
16.2	Dunnigan Hills	Tompkins, M. (GEO)	No annotation.	Observation
16.2	Dunnigan Hills	Tompkins, M. (GEO)	No annotation.	Observation
16.1	Dunnigan Hills	Rayburn, A. (BIO)	Slough	Observation
16.1	Dunnigan Hills	Tompkins, M. (GEO)	Bank repair project site.	Monitoring Required
16.0	Dunnigan Hills	Rayburn, A. (BIO)	Great horned owl (GHOW) nest	Observation
16.0	Dunnigan Hills	Rayburn, A. (BIO)	Swainson's hawk (SWHA) nest occupied	Observation
16.0	Dunnigan Hills	Tompkins, M. (GEO)	Along Gordon Slough - Conservancy project to restore vegetation.	Observation
15.9	Dunnigan Hills	Frank, P. (HYDRO)	Gordon Slough, input to creek and looking upstream	Observation
15.9	Dunnigan Hills	Frank, P. (HYDRO)	looking down stream at 94b bridge	Observation
15.8	Dunnigan Hills	Rayburn, A. (BIO)	Grassland management site	Observation

15.8	Hoppin	Rayburn, A. (BIO)	Vegetation looking upstream	Observation
15.8	Hoppin	Rayburn, A. (BIO)	Cliff swallows (CLSW)	Observation
15.8	Hoppin	Rayburn, A. (BIO)	Cliff swallows (CLSW)	Observation
15.8	Hoppin	Rayburn, A. (BIO)	Vegetation looking downstream	Observation
15.8	Hoppin	Rayburn, A. (BIO)	OHV tracks	Observation
15.8	Hoppin	Tompkins, M. (GEO)	At Conservancy. No major change.	Observation
15.8	Hoppin	Tompkins, M. (GEO)	Bridge. Lost young vegetation.	Observation
15.8	Hoppin	Frank, P. (HYDRO)	94B bridge. pier Number one.	Observation
15.8	Hoppin	Frank, P. (HYDRO)	94b bridge pier number two.	Observation
15.8	Hoppin	Frank, P. (HYDRO)	94B bridge pier number three	Observation
15.8	Hoppin	Frank, P. (HYDRO)	Looking up stream at 94b bridge	Observation
15.7	Hoppin	Rayburn, A. (BIO)	Tamarisk	Monitoring Required

15.7	Hoppin	Rayburn, A. (BIO)	Tamarisk and arundo	Monitoring Required
15.7	Hoppin	Rayburn, A. (BIO)	Bank swallow (BANS) colony, active	Monitoring Required
15.7	Hoppin	Frank, P. (HYDRO)	Eroded right bank with evidence of new bank swallow activity. Check if this was eroded newly versus last year.	Action Required
15.6	Hoppin	Rayburn, A. (BIO)	Vegetation	Observation
15.6	Hoppin	Rayburn, A. (BIO)	OHV tracks	Monitoring Required
15.6	Hoppin	Frank, P. (HYDRO)	Looking upstream from gravel bar that looks somewhat freshly worked this year because of lack of vegetation. But probably mostly sand and small gravel deposition only.	Observation
15.5	Hoppin	Rayburn, A. (BIO)	Scattered tamarisk	Monitoring Required
15.5	Hoppin	Rayburn, A. (BIO)	Potential bank swallow (BANS) habitat (no holes or birds)	Monitoring Required
15.5	Hoppin	Frank, P. (HYDRO)	right bank at Teichert plant, looking at erosion	Observation
15.4	Hoppin	Rayburn, A. (BIO)	Potential bank swallow (BANS) habitat (no holes or birds)	Monitoring Required
15.4	Hoppin	Rayburn, A. (BIO)	OHV tracks	Monitoring Required
15.4	Hoppin	Rayburn, A. (BIO)	Potential bank swallow (BANS) habitat (no holes or birds)	Monitoring Required

15.4	Hoppin	Tompkins, M. (GEO)	Along Shiffler. Cleared bar with fine deposits.	Observation
15.4	Hoppin	Frank, P. (HYDRO)	Interesting sand dunes formation among gravel bar	Observation
15.3	Hoppin	Rayburn, A. (BIO)	Bank swallow (BANS) colony, active	Monitoring Required
15.3	Hoppin	Rayburn, A. (BIO)	OHV tracks next to BANS colony	Monitoring Required
15.3	Hoppin	Rayburn, A. (BIO)	Begin potential restoration site	Observation
15.3	Hoppin	Rayburn, A. (BIO)	Pair red-tailed hawks (RTHA)	Observation
15.3	Hoppin	Tompkins, M. (GEO)	At entrance to Teichert restoration site. Good bank erosion for bank swallows.	Observation
15.3	Hoppin	Frank, P. (HYDRO)	Looking down stream	Observation
15.2	Hoppin	Rayburn, A. (BIO)	Pair red-tailed hawks (RTHA)	Observation
15.2	Hoppin	Rayburn, A. (BIO)	Vegetation looking upstream	Observation
15.2	Hoppin	Rayburn, A. (BIO)	Vegetation looking downstream	Observation
15.2	Hoppin	Rayburn, A. (BIO)	OHV taracks next to killdeer (KILL) nest with one fledgling	Monitoring Required

15.2	Hoppin	Frank, P. (HYDRO)	Looking up stream at channel cutting through former gravel bar	Observation
15.1	Hoppin	Rayburn, A. (BIO)	Potential restoration sites	Observation
15.1	Hoppin	Rayburn, A. (BIO)	Current restoration site, year 4	Monitoring Required
15.1	Hoppin	Rayburn, A. (BIO)	Potential bank swallow (BANS) habitat (no holes or birds)	Monitoring Required
15.1	Hoppin	Rayburn, A. (BIO)	Cottonwood loss from erosion	Observation
15.1	Hoppin	Tompkins, M. (GEO)	Teichert restoration site. Started in 2019. Many elderberry drowned this winter. Curly dock upstream.	Observation
15.1	Hoppin	Tompkins, M. (GEO)	Down in Teichert restoration pilot site.	Observation
15.1	Hoppin	Frank, P. (HYDRO)	Low flow channel at Teichert restoration site, check with model, if flows of 2023 would have filled from the creek	Action Required
15.1	Hoppin	Frank, P. (HYDRO)	Looking downstream from gravel bar and dry secondary channel likely carved a bit from this year's flows	Observation
15.0	Hoppin	Rayburn, A. (BIO)	Potential restoration site	Observation
15.0	Hoppin	Rayburn, A. (BIO)	Swainson's hawk (SWHA)	Observation
15.0	Hoppin	Rayburn, A. (BIO)	Potential bank swallow (BANS) habitat (few holes)	Monitoring Required

15.0	Hoppin	Tompkins, M. (GEO)	Split channel downstream. Cleared fresh bar.	Observation
14.9	Hoppin	Rayburn, A. (BIO)	Scattered tamarisk and arundo	Monitoring Required
14.8	Hoppin	Rayburn, A. (BIO)	4 green herons (GRHE)	Observation
14.8	Hoppin	Tompkins, M. (GEO)	Green heron zone. No major change. Cleared bar with some OHV tracks.	Observation
14.6	Hoppin	Rayburn, A. (BIO)	Potential bank swallow (BANS) habitat (no holes or birds)	Monitoring Required
14.6	Hoppin	Rayburn, A. (BIO)	Scattered tamarisk	Monitoring Required
14.6	Hoppin	Rayburn, A. (BIO)	Bank swallow (BANS) colony, active	Monitoring Required
14.6	Hoppin	Rayburn, A. (BIO)	Potential bank swallow (BANS) habitat (no holes or birds)	Monitoring Required
14.6	Hoppin	Rayburn, A. (BIO)	Tamarisk and arundo	Monitoring Required
14.6	Hoppin	Tompkins, M. (GEO)	Fresh fine gravel bar. Right bank erosion with good bank swallow habitat.	Observation
14.5	Hoppin	Rayburn, A. (BIO)	Potential bank swallow (BANS) habitat (no holes or birds)	Monitoring Required
14.4	Hoppin	Rayburn, A. (BIO)	Recovering drought-stressed vegetation	Monitoring Required

14.2	Hoppin	Rayburn, A. (BIO)	Potential bank swallow (BANS) habitat (no holes or birds)	Monitoring Required
14.2	Hoppin	Rayburn, A. (BIO)	Granite Woodland Reiff	Observation
14.2	Hoppin	Rayburn, A. (BIO)	Vegetation looking downstream	Observation
14.2	Hoppin	Rayburn, A. (BIO)	Vegetation looking upstream	Observation
14.2	Hoppin	Tompkins, M. (GEO)	Along Woodland Reiff. No major change.	Observation
14.2	Hoppin	Tompkins, M. (GEO)	Woodland Reiff entrance. Connector channel stable. Extensive vegetation in Reiff basin. Drain water along left bank flowing upstream.	Observation
14.2	Hoppin	Frank, P. (HYDRO)	Looking down stream at Woodland Reiff left bank	Observation
14.1	Hoppin	Rayburn, A. (BIO)	2 OHVs in creek channel	Monitoring Required
14.1	Hoppin	Tompkins, M. (GEO)	Agricultural drain water.	Observation
14.1	Hoppin	Frank, P. (HYDRO)	ATV activity	Observation
14.0	Hoppin	Tompkins, M. (GEO)	Cleared bars.	Observation
13.8	Hoppin	Rayburn, A. (BIO)	Arundo	Monitoring Required

13.8	Hoppin	Rayburn, A. (BIO)	Looking downstream	Observation
13.8	Hoppin	Rayburn, A. (BIO)	Looking upstream	Observation
13.8	Hoppin	Rayburn, A. (BIO)	Rodgers pit	Observation
13.8	Hoppin	Tompkins, M. (GEO)	Confined reach.	Observation
13.8	Hoppin	Frank, P. (HYDRO)	Looking downstream	Observation
13.7	Hoppin	Rayburn, A. (BIO)	Pair of Swainson's hawk (SWHA) and 1 red-tailed hawk (RTHA)	Observation
13.7	Hoppin	Rayburn, A. (BIO)	VELB mitigation site	Observation
13.7	Hoppin	Rayburn, A. (BIO)	VELB mitigation site	Observation
13.7	Hoppin	Tompkins, M. (GEO)	End of water.	Observation
13.6	Hoppin	Rayburn, A. (BIO)	Pair of red-tailed hawks (RTHA)	Observation
13.5	Hoppin	Rayburn, A. (BIO)	Creeping wildrye (remnant native species)	Observation
13.5	Hoppin	Tompkins, M. (GEO)	Straight fine sediment.	Observation

13.4	Hoppin	Rayburn, A. (BIO)	Pair red-tailed hawks (RTHA)	Observation
13.4	Hoppin	Rayburn, A. (BIO)	Start of Kerr property	Monitoring Required
13.4	Hoppin	Frank, P. (HYDRO)	exposed pipe	Observation
13.3	Hoppin	Rayburn, A. (BIO)	Red-tailed hawk (RTHA)	Observation
13.3	Hoppin	Tompkins, M. (GEO)	Algae channel.	Observation
13.2	Hoppin	Rayburn, A. (BIO)	Scattered tamarisk	Monitoring Required
13.1	Hoppin	Rayburn, A. (BIO)	Scattered arundo	Monitoring Required
13.1	Hoppin	Rayburn, A. (BIO)	Tamarisk	Monitoring Required
13.1	Hoppin	Tompkins, M. (GEO)	Coyote pups. Fine gravel confined reach.	Observation
13.0	Hoppin	Frank, P. (HYDRO)	Looking down stream	Observation
12.9	Hoppin	Rayburn, A. (BIO)	Red-tailed hawk (RTHA)	Observation
12.9	Hoppin	Tompkins, M. (GEO)	Right bank scour hole at drain site.	Monitoring Required

12.9	Hoppin	Frank, P. (HYDRO)	Strange scour hole in the bank with wet soil	Monitoring Required
12.9	Hoppin	Frank, P. (HYDRO)	wet pool down stream of scour hole may or may not be from a release of water	Monitoring Required
12.8	Hoppin	Tompkins, M. (GEO)	Upstream of tight "S" bend.	Observation
12.6	Hoppin	Tompkins, M. (GEO)	Entering tight "S" bend. Silt over pea gravel.	Observation
12.6	Hoppin	Frank, P. (HYDRO)	Looking down stream	Observation
12.5	Rio Jesus Maria	Rayburn, A. (BIO)	Scattered tamarisk and arundo	Monitoring Required
12.4	Rio Jesus Maria	Tompkins, M. (GEO)	No annotation.	Observation
12.3	Rio Jesus Maria	Frank, P. (HYDRO)	Looking downstream	Observation
12.3	Rio Jesus Maria	Frank, P. (HYDRO)	Looking down stream significantly sandier bed than previous years	Observation
12.2	Rio Jesus Maria	Tompkins, M. (GEO)	No annotation.	Observation
12.2	Rio Jesus Maria	Frank, P. (HYDRO)	Looking down stream very fine gravel bed than has been typical	Observation
12.2	Rio Jesus Maria	Frank, P. (HYDRO)	Right bank barn and crumbling concrete patio	Observation

12.0	Rio Jesus Maria	Frank, P. (HYDRO)	Looking downstream	Observation
11.9	Rio Jesus Maria	Tompkins, M. (GEO)	Final straight stretch. Fine sediment on top of pea gravel.	Observation
11.9	Rio Jesus Maria	Tompkins, M. (GEO)	Upstream huffs corner. Cemented pea gravel. Great horned owl.	Observation
11.8	Rio Jesus Maria	Rayburn, A. (BIO)	3 great horned owls (GHOW)	Observation
11.8	Rio Jesus Maria	Frank, P. (HYDRO)	Looking down stream	Observation
11.6	Rio Jesus Maria	Rayburn, A. (BIO)	Huff's corner	Monitoring Required
11.6	Rio Jesus Maria	Rayburn, A. (BIO)	Huff's corner, left bank	Monitoring Required
11.6	Rio Jesus Maria	Tompkins, M. (GEO)	Upstream view of Huffs Corner erosion.	Monitoring Required
11.6	Rio Jesus Maria	Tompkins, M. (GEO)	Huffs Corner island removal.	Monitoring Required

APPENDIX B

2023 NATURAL RESOURCES DIVISION UPDATE

2023 Yolo County Natural Resources Division Update

The Cache Creek Area Plan ("CCAP") program is administered by the Natural Resources Division of the Department of Community Services. The Division is currently staffed by a Manager of Natural Resources, three Natural Resources Planners, and a part-time Senior Mining Planner.

The Natural Resources Division continues to demonstrate its commitment to delivering a program that implements the CCAP in a responsible, balanced, and efficient manner. Staff has worked cooperatively and collaboratively with program stakeholders to refine the program and adaptively respond to evolving economic and environmental conditions. Staff continues to strengthen relationships with core partners through open communication and demonstrated accountability.

Cache Creek Area Plan Implementation

This section highlights major projects that assist in the implementation actions and the goals of the CCAP, in addition to the annual monitoring program outlined in the Cache Creek TAC's Annual Status Report.

Flood Hazard Development Permits

As described in Section 8-4.201 of the County's Flood Protection ordinance, a "Flood Hazard Development Permit" means the approval required pursuant to Section 8-4.404 for proposed in-channel activities allowed under the CCRMP/CCIP that would occur within the special flood hazard area (i.e., 100-year floodplain) of Lower Cache Creek. Applications for a Flood Hazard Development Permit ("FHDP") are submitted to the Planning Division.

After deeming the application is complete, the Planning Division routes it through an agency review process. Following the agency review, the Natural Resources Division sends the application materials to the Cache Creek TAC for their review. A public TAC meeting is then held, where the TAC will give their recommendation on permit approval to the Director (e.g., the Manager of Natural Resources). A FHDP may be approved pursuant to Section 8-4.404, only if all of the following findings are made:

1. *The proposed channel modification is consistent with any County-administered general permits from agencies of jurisdiction (e.g., California Department of Fish and Wildlife, U.S. Army Corps of Engineers, Regional Water Quality Control Board); or alternatively, that all other State and Federal permits have been obtained;*

2. *That any sand and gravel removed from the channel as a result of the proposed modification is necessary for one or more of the following reasons:*

    i. *To maintain flood flow capacity,*
    ii. *To protect existing structures, infrastructure, and/or farmland*
    iii. *To minimize bank erosion, and*
    iv. *To implement the Channel Form Template;*

3. *That the proposed channel modification is consistent with the requirements of both the CCRMP, the CCIP, and Title 10, Chapter 3 of the County Code entitled Cache Creek Area Plan In-Channel Ordinance; and*

4. *That existing flooding problems are not exacerbated by the proposed channel modification.*

One Flood Hazard Development Permit was issued in 2023 – more information below.

Teichert Shifler Mining and Reclamation Project: Streambank Stabilization and Habitat Enhancement Project (ZF #2023-0014)

Project Applicant: Teichert Materials

The proposed project involves bank stabilization and habitat enhancement improvements along the right (southern) bank of Cache Creek adjacent to the Teichert Shifler mining operation. The streambank stabilization plan focuses on two components: (1) a soil backfilled and planted rock revetment, and (2) habitat enhancements, including the removal of non-native species and planting of appropriate native woody species. Implementation of the streambank stabilization plan is required before Teichert commences mining and other activities within 700 feet of the top of bank per the Teichert Shifler Mining and Reclamation Plan Permit (ZF #2018-0078) condition of approval numbers 90 and 91.

On September 5, 2023, the Cache Creek TAC unanimously recommended that the County's Floodplain Administrator issue the Flood Hazard Development Permit for the project. The permit was later issued on September 19, 2023. On November 1, 2023, the Natural Resources Division received notice from Teichert that the project had been completed. On November 6, 2023, Natural Resources Division staff visited the project site and concurred the project had been completed.

Off-Channel Mining Plan

Annual Compliance Report

By November 1st of each year, the aggregate producers that are regulated by the Cache Creek Area Plan are required to provide annual reporting of their operations to the County pursuant to Article 7 (Annual Reports) of the Off-Channel Surface Mining Ordinance ("OCSMO"). Staff uses the information contained within these reports, independent staff analysis, and field inspections, to put together an "Annual Compliance Report."

Each site's compliance is reviewed against the applicable regulations, including the State's Surface Mining and Reclamation Act ("SMARA"), the County's Off-Channel Mining Plan ("OCMP") – including the Off-Channel Surface Mining Ordinance and Surface Mining Reclamation Ordinance – and individual permit approvals and Development Agreements, including Mitigation Monitoring Plans and Conditions of Approval. This report, consistent with Section 10-4.703 of the OCSMO, is then sent to the Yolo County Planning Commission to determine compliance.

On September 14, 2023, the Yolo County Planning Commission held a public hearing and determined, via unanimous vote, that all mining operations are in substantial compliance with all applicable regulations for calendar year 2022. The staff report for that item can be accessed here.

County staff is currently reviewing the annual reports submitted by the operators for 2023.

CEMEX Phase 5 Dewatering Project (ZF #2023-0012)

On March 29, 2023, CEMEX Construction Materials, Pacific, LLC ("CEMEX") submitted an application to modify their existing mining permit (ZF #95-093) to allow limited dewatering activities at the Solanco Concrete Off-Channel Mining facility. Section 10-4.4.12 of County Code allows dewatering activities if a site-specific analysis prepared by a qualified Professional Engineering or Professional Geologist determines that the dewatering would not result in off-site impacts to groundwater or other water resources (i.e., creeks and wetlands). CEMEX's proposed dewatering consists of a pit-to-pit transfer of water from mining Phase 5 to mining Phase 4 where it would then recharge back into the aquifer.

On July 13, 2023, the Yolo County Planning Commission voted unanimously to approve the amendment to the CEMEX Mining Permit to allow limited dewatering activities subject to specified conditions. The dewatering approval will allow CEMEX to safely maximize the sand and gravel recovery to the permitting mining depth at the site in these mining phase locations. The staff report for this item can be accessed here.

Granite Capay Permit Extension (ZF #2023-0034)

On October 20, 2023, Granite Construction Company ("Granite") submitted an application for a 10-year extension of their existing Granite Capay Facility Mining and Reclamation Permit (ZF #2001-096). Entitlements for the Capay Facility were originally approved by the County on November 25, 1996, and have been amended over time. The existing permit expires on January 1, 2028. Granite is seeking a 10-year time extension to the permit to align the entitlement with the life of the remaining permitted aggregate reserves. Other than the extension of time, Granite seeks no change to any element of the approved operations or the permit. This application is currently undergoing environmental review.

Cache Creek Area Plan Funding

Implementation of CCAP is completely self-funded by revenue generated from fees collected through the Gravel Mining Fee Ordinance (see Title 10, Chapter 11 of the Yolo County Code of Ordinances). This ordinance was adopted by the Board of Supervisors in 1996, when the program was developed, and has been further amended in December 2013, December 2019 as a part of the 20-Year CCAP Update, and most recently on October 6, 2020 (Minute Order No. 20-133, Item #8).

The intent of this ordinance is to establish set fees amounts to be paid annually by the gravel operators for each ton of gravel sold, as well as identify how the fees will be spent.

Section 10-11.01 of the Gravel Fee Ordinance establishes five Yolo County aggregate mining fees. Those fees, and their purposes defined by Section 10-11.02, are as follows:

CCRMP Implementation Fee

The purpose of the **CCRMP Implementation (Creek Stabilization) Fee** is to fund implementation of the CCRMP and CCIP, including but not limited to:

- Design and construction of projects for channel stabilization and bridge protection.
- Design and construction/implementation of channel maintenance projects and activities.
- Monitoring, modeling, and flood watch as described in the CCIP.
- Compensation of the Technical Advisory Committee.

Maintenance and Remediation Fee

The purpose of the **Maintenance and Remediation Fee** is to fund a long-term, interest-bearing account for the following future activities:

- Remediation of problems related to mercury bioaccumulation in wildlife, should they occur.
- Remediation of hazardous materials contamination, should it occur.
- Environmental monitoring including data gathering and groundwater monitoring beyond, or as an extension of, that required by the operators under the CCAP and permits issued or extended under the CCAP, should it be necessary.
- Ongoing site maintenance of publicly held reclaimed lakes including but not limited to fencing, berms, drainage, and levees.

OCMP Administration Fee

The purpose of the **OCMP Administration Fee** is to:

- Implement the OCMP.
- Administer long-term mining permits.
- Administer development agreements.
- Inspect mining and reclamation operations.

Cache Creek Conservancy Contribution

The purpose of the **Cache Creek Conservancy Contribution (Habitat Restoration Fee)** is to fund activities that promote and facilitate the restoration, enhancement, conservation, and wise management of natural vegetation and wildlife habitat within the lower Cache Creek watershed (between Capay Dam and the Town of Yolo), consistent with the CCRMP and the Cache Creek Conservancy's mission to preserve, restore, and enhance the Cache Creek watershed.

Twenty Percent Production Exception Surcharge

The **Twenty Percent Production Exception Surcharge** fee is collected to offset additional costs anticipated with mining allowed in excess of approved annual permitting production to meet temporary increase in market demand. The revenue from this fee is divided evenly between the CCRMP Implementation fund and the Maintenance and Remediation fund.

Section 10-11.01(c) of the ordinance also sets a fee schedule that increases at a rate of 4% each year. Table 1 displays the current fee schedule. Tonnage sold during the 2023 calendar year will be subject to the $0.696 per ton fee. These fees will be collected from the operators on a quarterly basis throughout the 2024 calendar year.

Table 1. Current Gravel Mining Fee Schedule

Fee Effective	Fee per Ton	Fee Effective	Fee per Ton
Jan. 1, 2013	$0.470	Jan. 1, 2020	$0.618
Jan. 1, 2014	$0.489	Jan. 1, 2021	$0.643
Jan. 1, 2015	$0.508	Jan. 1, 2022	$0.669
Jan. 1, 2016	$0.529	**Jan. 1, 2023**	**$0.696**
Jan. 1, 2017	$0.550	Jan. 1, 2024	$0.724
Jan. 1, 2018	$0.572	Jan. 1, 2025	$0.753
Jan. 1, 2019	$0.595	Jan. 1, 2026	$0.783

The annual per ton fee is distributed amongst the four different fees (*except for the Twenty Percent Production Exception Surcharge*). The distribution of the fees is displayed in Figure 1, and the calculated fee split is displayed in Table 2.

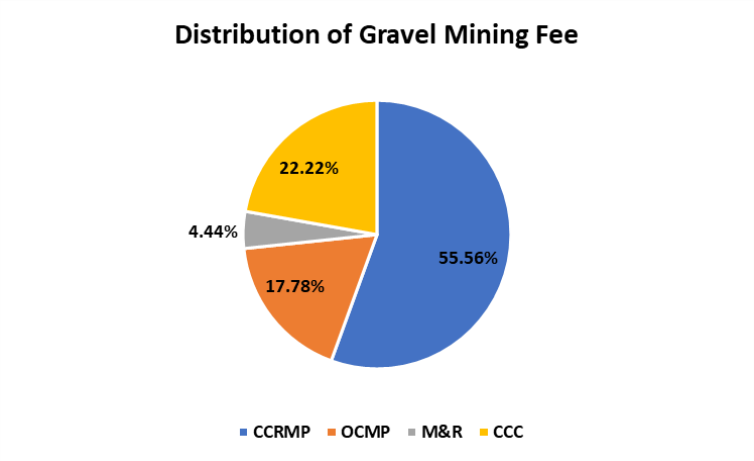


Figure 1. Distribution of Annual Per Ton Fee

Table 2. Calculated Mining Fee Split (2020-2026)

Year	Fee per Ton	CCRMP	OCMP	M & R	CCC
2020	$0.618	$0.3433	$0.1099	$0.0275	$0.1373
2021	$0.643	$0.3572	$0.1143	$0.0286	$0.1429
2022	$0.669	$0.3717	$0.1189	$0.0297	$0.1487
2023	**$0.696**	**$0.3867**	**$0.1237**	**$0.0309**	**$0.1547**
2024	$0.724	$0.4022	$0.1287	$0.0322	$0.1609
2025	$0.752	$0.4178	$0.1337	$0.0322	$0.1671
2026	$0.783	$0.4350	$0.1392	$0.0348	$0.1740

Table 3 and Figure 2 show the cumulative total amount of aggregate sold every year since the program's inception in 1997. Tonnage sold in 2022 (3,302,925 tons) represents a 3.68% increase in sales when compared to 2021 (3,185,623 tons).

Table 3. Cumulative Tonnage Sold (1997-2022)

Year	Total Tons Sold	Year	Total Tons Sold	Year	Total Tons Sold
1997	2,777,449	2007	3,530,359	2017	3,134,564
1998	3,365,199	2008	2,813,908	2018	3,147,831
1999	3,565,232	2009	2,190,454	2019	3,245,864
2000	4,177,068	2010	1,730,834	2020	3,324,791
2001	4,269,819	2011	1,869,151	2021	3,185,623
2002	5,239,823	2012	1,517,741	2022	3,302,925
2003	5,334,183	2013	2,090,247	2023	
2004	4,788,238	2014	2,156,620	2024	
2005	4,676,979	2015	2,690,800	2025	
2006	4,602,402	2016	2,624,169	2026	

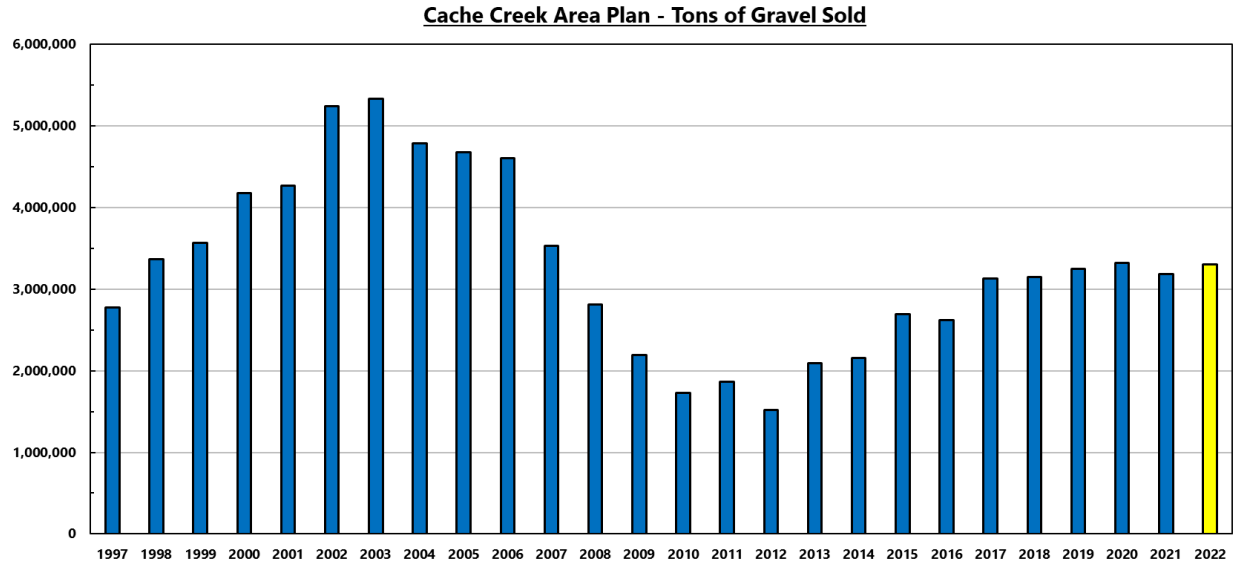


Figure 2. Bar Chart of Cumulative Tonnage Sold (1997-2022)

As of the drafting of this update, the Natural Resources Division is collecting the 2023 tonnage reports from the operators. The cumulative tonnage sold for 2023 will be available in late February 2024.

Grants

Huff's Corner Levee Raise & Channel Reconfiguration Project

	Phase I	Phase II
Project Amount:	$2,845,000	$2,477,500 (pending)
Grant Funding Amount:	$2,418,250	$2,229,750 (pending)
Funding Agency:	California Department of Water Resources	
Project Scope:	Levee repairs on the Huff's Corner levee located on the right bank of Cache Creek, approximately 2,700 feet upstream of Interstate 5, as well as erosion control and reconfiguration of the Lower Cache Creek channel.	

The in-channel reconfiguration component of the project was completed in late December 2022 before a series of winter storms caused high flows in Lower Cache Creek. These high flows caused damage to the newly constructed terraces and channel banks.

Figure 3. "Pre" and "Post" construction photos (Photo 1 – taken 10/04/22; Photo 2 – taken 01/06/23) and representative photos showing project damages from the 2022-2023 Winter Storms (Photo 3 – taken 01/20/23; Photo 4 – taken 06/02/23).

In Summer 2023, DWR presented the County with a second funding agreement ("Phase II Agreement"), in the amount of $2,477,500, so that the project could be constructed in its entirety. The original agreement did not have sufficient funding to complete the whole project due to unforeseen costs associated with construction, environmental mitigation, and securing land acquisitions/right-of-way. On September 26, 2023, the Yolo County Board of Supervisors adopted Resolution No. 23-139 accepting these funds from DWR.

The remaining portions of the project to be completed under the Phase II Agreement include: the levee raise component of the project; remediation of the "damages" to the in-channel project that resulted from the 22-23 Winter Storms; and construction of an off-site mitigation project.

As of drafting this update, the Phase II Agreement is awaiting execution by the State Department of General Services.

Partner Organizations

The following organizations (listed in alphabetical order) are important partners to the County in implementing the CCRMP and CCIP.

Cache Creek Conservancy

The Cache Creek Conservancy (CCC) is a 501(c)(3) non-profit public benefit corporation that preserves, restores and enhances the Cache Creek watershed. The CCC, created in 1996, manages land for wildlife habitat, carries out invasive weed management, implements restoration projects, and provides environmental education opportunities within the lower Cache Creek. It receives fees generated by the Cache Creek Area Plan, as well as funding from state, federal, and foundation grants.

Website: https://cachecreekconservancy.org/

California Construction and Industrial Materials Association (Yolo/Cache Creek Work Group)

The California Construction and Industrial Materials Association ("CalCIMA") is the statewide voice of the construction and industrial materials industry. In all, there are over 70 member companies that include over 500 local plants and facilities throughout the state. Specifically, the members of the Yolo/Cache Creek work group of CalCIMA are CEMEX Construction Materials Pacific, LLC., Granite Construction, Syar Industries, LLC., and Teichert Materials.

CalCIMA and the producers are active partners in the implementation of the CCAP. The original effort to develop the CCAP was initiated by the producers, who subsequently paid for the planning process. Both the industry and the County have benefited greatly from the resulting program which continues to be a model throughout the state. Producer representatives regularly attend Cache Creek TAC meetings, the annual Creek Walk, and other program related activities.

Website: https://www.calcima.org/

Yolo County Resource Conservation District

The Yolo County Resource Conservation District ("YCRCD" or "District") is a non-regulatory special district serving over 650,000 acres of diverse agricultural operations, rangeland, public open space and developed areas in Yolo County. The YCRCD's mission is to "protect, improve, and sustain the natural resources of Yolo County."

The District employs a watershed approach that allows an integrated assessment of resource inputs, outputs and impacts. Additionally, the District promotes responsible stewardship by: developing, evaluating and implementing conservation practices through cooperative land users; providing technical guidance, and on-site expertise; educating agencies and the public in resource conservation and enhancement; and, sponsoring partnerships and networks. The YCRCD also works closely with the USDA Natural Resource Conservation Service to provide technical services to the residents, landowners, agricultural producers, and government agencies of Yolo County.

Website: https://yolorcd.org/

Yolo County Flood Control and Water Conservation District

The mission of the Yolo County Flood Control and Water Conservation District ("YCFCWCD" or "District") is "to plan, develop, and manage the conjunctive use of the District's surface and groundwater resources to provide a safe and reliable water supply at a reasonable cost, and to sustain the socioeconomic and environmental well-being of Yolo County." The YCFCWCD's boundaries cover 195,000 acres of Yolo County, including the entire CCRMP area.

The District operates Clear Lake, Indian Valley Reservoir, and owns the majority of water rights for Cache Creek. As such, the YCFCWCD plays a central role in determining the flow of surface water within the Cache Creek watershed. The Capay Diversion Dam, at the upstream end of the CCRMP area, provides some of the water that the District distributes through more than 150 miles of canals and laterals. YCFCWCD also acts as an important partner in stream restoration projects. YCFCWCD manages the WRA's groundwater monitoring program that provides valuable data that helps inform the CCRMP's impacts on groundwater.

Website: https://www.ycfcwcd.org/

Yolo Habitat Conservancy

The mission of the Yolo Habitat Conservancy is to conserve natural and working landscapes, and the species on which they depend, by working with local communities and conservation partners to coordinate mitigation and implement regional habitat conservation.

The Yolo Habitat Conservancy is a joint powers agency comprised of the County of Yolo and the cities of Davis, West Sacramento, Winters, and Woodland.

The Yolo Habitat Conservancy has prepared the Yolo Habitat Conservation Plan/Natural Community Conservation Plan (Yolo HCP/NCCP), a model conservation plan to provided Endangered Species Act permits and associated mitigation for infrastructure (e.g., roads, bridges, and levees) and development activities (e.g., agricultural facilities, housing, and commercial buildings), identified for construction over the next 50 years in Yolo County. The Yolo Habitat Conservancy is also developing a voluntary, non-regulatory, Yolo Regional Conservation Investment Strategy/Local Conservation Plan (RCIS/LCP) that will

provide a framework for the conservation of natural communities and certain sensitive species not covered by the Yolo HCP/NCCP.

Website: https://www.yolohabitatconservancy.org/

Yolo Subbasin Groundwater Agency

The Yolo Subbasin Groundwater Agency ("YSGA") is charged with planning and implementing the state's Sustainable Groundwater Management Act ("SGMA") process in Yolo County. The mission of the YSGA is to "provide a dynamic, cost-effective, flexible collegial organization to ensure compliance with SGMA within the Yolo Subbasin."

The YSGA is made up of 26 members, including Yolo County, representing urban, agricultural, and environmental interests. The YSGA covers the extent of the Yolo Subbasin which covers approximately 540,700 acres, spanning nearly 845 square miles.

Website: https://www.yologroundwater.org/

APPENDIX C

2023 CACHE CREEK CONSERVANCY ANNUAL REPORT

Cache Creek Conservancy 2023 Annual Report

Information submitted on November 22, 2023, by Nancy Ullrey, (now retired) Executive Director

The Cache Creek Conservancy (CCC) is a 501(c)(3) non-profit public benefit corporation that preserves, restores and enhances the Cache Creek watershed. The CCC, created in 1996, manages land for wildlife habitat, carries out invasive weed management, implements restoration projects, and provides environmental education opportunities within the lower Cache Creek. It receives fees generated by the Cache Creek Area Plan, as well as funding from state, federal, and foundation grants.

The CCC has four full-time employees and two part-time employees. The CCC is assisted in several efforts by a core group of dedicated volunteers and by several interns from Woodland Community College; University of California, Davis; and California State University-Sacramento. Fiscal and policy oversight is conducted by a 12-member board of directors. There currently are two vacancies on the board.

Nancy Ullrey, executive director for eight and a half years, resigned her position effective December 31, 2023. The CCC Board is engaged in an executive director search at the time this report was written.

In 2023, the Cache Creek Conservancy successfully completed two grants, was awarded a new state grant, and continued its ongoing restoration work at the Cache Creek Nature Preserve and in the lower Cache Creek.

Cache Creek Nature Preserve

Environmental Enhancement and Mitigation Program Grant (EEMP). The CCC was able to close out the administrative aspect of the EEMP grant and continues to monitor the restoration project. With the 2023 winter rains, the plantings are flourishing.

Gordon Slough Repair Project (FEMA).

Repair work on Gordon Slough near the entrance to the Cache Creek Nature Preserve was finally finished on October 20, 2023.

Before repair.

The slough sustained erosion and slumping damage during the 2019 floods, a natural disaster declared by both the governor and the president. The project was originally scheduled to be done in 2020, but was delayed by the COVID shutdowns. In 2022, the shortage of contractors required the project be delayed to 2023.

During repair.

The project was funded by the Federal Emergency Management Agency (FEMA) and Glissman Excavating, of Loomis, CA, was selected in a public bid process. Total project cost was $346,367.76.

The construction project itself lasted approximately three weeks, and ended on time and on budget.

After repair.

Specifics. The damage was along the Salisbury Spillway channel and north levee. An estimated loss of 1, 456 cubic yards of soil occurred over

approximately 60 linear feet, 131 feet wide, and 5 feet high (approximately 7,500 square feet or 0.17 acres).

Glissman Excavating installed 735 cubic yards of compacted soil within the spillway channel and levee slope and installed 1,260 tons of 18-inch facing stones, 1,140 tons of half-ton rip-rap, 2,600 tons of quarter-ton riprap.

Equipment used included dump trucks, semis, two excavators, bulldozer, front-end loader, water truck, finish grader/tractor, and hydroseeding equipment.

Environmental Monitoring and Mitigation. The project requirements included biological services consisting of monitoring, mitigation measures, and reporting.

Federal and state wildlife agencies were consulted and a qualified biologist monitored the site daily. The Gordon Slough is considered habitat for four endangered or threatened species–Giant garter snake, California red-legged frog, California tiger salamander, and Valley elderberry longhorn beetle (VELB)--although none of the species were found before, during, or after the project completion.

The work included removing some overgrown invasive vegetation within the Salisbury Spillway channel to improve conveyance. The contractor also removed some non-native vegetation and trees in the project area. No elderberry shrubs were disturbed by this project.

They also planted willows as natural erosion control as mitigation against future flooding.

Future Plans. The CCC has a Lake and Streambed Alteration permit from the California Department of Fish and Wildlife to completed additional work in Gordon Slough. The CCC is seeking additional funding to remove invasive blackberry and other invasive plants within the slough within the next five years.

Leok Po Workshop and CALFIRE Grant. Due to the success of the 2022 Leok Po workshop, the CCC partnered with the Yocha Dehe Fire Department to submit a grant to CAL FIRE. In August 2023 the CCC was notified it received a $145,000 grant from CAL FIRE for California Climate Investments and Wildfire Prevention grants.

Ali Meders-Knight demonstrates how one type of basket would be carried as part of the cultural presentations during the 2023 Leok Po workshop. Photo by Christine Golden.

That same month CCC and Yocha Dehe Fire Department began planning at 2023 Leok Po workshop, which was held over the Veteran's Day weekend, November 10-12. The format was similar to the previous years with the following notable differences:

- Two new cultural experts—Ali Meders-Knight and Clint McKay—joined returning cultural experts Diana Almendariz, Danny Manning, and Dr. Melinda Adams in presenting the cultural awareness portion of the workshop.
- The cultural burn demonstration at the Cache Creek Nature Preserve included both flat land burning of native grasses but also burning uphill behind the Tending and Gathering Garden. Participants got to observe and experience the different techniques involved in burning landscapes of varying slope.
- Two additional burn days on

Danny Manning, Mountain Maidu and professional wildland firefighter, oversees burning the levee behind the Tending and Gathering Garden. Photo by Christine Golden.

November 11 & 12, were hosted by the Yocha Dehe Fire Department in Brooks. Grasses under a blue oak woodland on private tribal land was burned during those two days. Tribal cultural experts were able to enhance their knowledge and skills using a variety of cultural burn techniques with the assistance of seasoned wildland fire crews from Tribal EcoRestoration Alliance (TERA), the Redhawk wildland fire crew from Shingle Springs, and the Yolo County Prescribed Burn Association (PBA).

- Cultural presenters at the Brooks site were Danny Manning, Dr. Elizabeth Middleton, Diana Almendariz, and a premiere of a film about restoring cultural fire by the Yurok tribe in Northern California.

Attendance on the first day was 104 people. Attendance in Brooks was approximately 75 on Saturday and 40 on Sunday. Some people attended all three days. During the third day of the burn, Yocha Dehe Fire Department presented their challenge coin to the CCC representative. They presented it to the CCC because of the respectful manner in which the CCC has developed and presented information during the Leok Po workshops. This honor is cherished by the CCC staff.

Both sides of the Yocha Dehe Fire Department Challenge Coin presented to Cache Creek Conservancy on November 12, 2023.

The CCC thanks the County of Yolo for their support of the workshop, and to the funders of the project: CalFIRE, Yocha Dehe Community Fund, Teichert, Granite, Cemex, Vulcan Materials, and Ink Monkey.

Future Plans. CCC has secured two more years of funding for Leok Po workshops. In collaboration with its partner, Yocha Dehe Fire Department, future cultural burn sites will include at least one additional County property—Millsap or Granite Woodland Rieff—as well as land in the Cache Creek Nature Preserve or on tribal land.

Tending and Gathering Garden

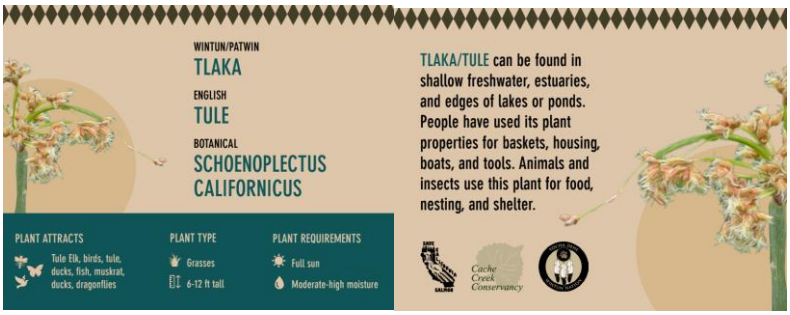
The Tending and Gathering Garden (TGG) is a garden developed to meet the specific needs of California Native American basket weavers and other cultural experts. The three-acre garden is tended using traditional Native American land management practices and no herbicide or pesticide is used. The original intention for the TGG is to be a demonstration garden providing limited source material for basket weavers.

The TGG is the focal point of two education projects: the Leok Po workshops (described above) and the Traditional Education Knowledge (TEK) workshops designed for high school students. In 2022 the TGG-TEK project started as a pilot project with funding by a private donor. With the success of the 2022 pilot project, the CCC continued the program in 2023. Nine high school students participated in the eight-week program. The lead cultural expert for the program is Diana Almendariz, a long-time TGG Steering Committee member. She was assisted by Danny Manning and other cultural experts. TEK student interns were able to experience some ecological burning alongside the undergraduate student mentors as the weather dried up, and also had the opportunity to learn about gathering techniques for various plants such as tule and sage with Diana and how to drill start fires using elderberry with Danny Manning. The internship ended with a very fun day of collecting and soaking tule to repair and enhance a tule boat, which all students got a chance to take out on the water.

Students enjoy the tule boat they built during their TGG-TEK class at the Cache Creek Nature Preserve.

Curriculum Development. The TGG-TEK has spawned interest by the larger educational community. A main focus of the TGG Steering Committee has been curriculum development. Recently they have worked on a 3rd and 4th grade curriculum development effort in partnership with the Yolo County Office of Education and Save California Salmon. The TGG curriculum development workgroup is also closely following the progress of the statewide Native American Studies Model Curriculum for the new 9th grade ethnic studies requirement.

The elementary level educational modules are designed to correlate with the 3rd and 4th grade California history learning requirements. The workgroup is close to finalizing the initial draft of the two pilot teaching modules on cattail and tule plants and their role within homeland history and culture. The curriculum will also include the history of Wintun people who lived and live on Cache Creek, plant ID cards, hands on activities, and other resources. The curriculum can be adapted in the future to be used with a wider variety of age groups, public workshops, and other events.



1 Front and Back of the tule plant card, one of 25 native plants in the educational plant ID deck.

The TGG also continues to be used by professors and students from local universities. Dr. Elizabeth Middleton's Keepers of the Flame program (UCD) uses the TGG for cultural burn demonstrations. Dr. Hulleah Tsinhnahjinnie (UCD) also routinely brings out her art students to the garden. Most recently, a CSU-Sacramento photography class and students from Cesar Chavez Community School came out to visit. Sacred Oaks Healing Center, a federal Indian Health Services (HIS) rehabilitation center for Native American youth, is another frequent visiting organization to the TGG.

Future Plans. The TGG Steering Committee and the CCC Board continue to plan for expansion of the TGG at the Cache Creek Nature Preserve. They have established a seed garden elsewhere in

the Nature Preserve that can help with native plant propagation. They also intend to burn in the "bowl" area behind the TGG (originally established to be a duck pond) and establish a "food garden."

Lower Cache Creek Weed Management Program (aka "Creek Spray")

In the 2023, the CCC successfully treated and retreated 7.28 acres of arundo across 4 reaches of Lower Cache Creek. CCC staff provided the planning, mapping and monitoring labor for the project and subcontracted Yolo County Flood Control and Water Conservation District (YCFCWCD) to provide the Qualified Herbicide Applicators License, spray equipment and spray crew. The goals for this implementation period were to survey and retreat all arundo patches not fully killed by previous years treatments. Bird nest surveys and turtle surveys are part of the project's requirements. These surveys had to be conducted at least three days prior to treatment.

Game Camera Theft

During the summer, the CCC noticed new beaver dams in creek. The beavers are extremely industrious and have made quick progress in rebuilding their dams that washed away.

CCC set up game cameras throughout the Preserve to monitor wildlife. On one camera, we've observed beavers carrying small and large branches towards the creek. On June 6, we noticed the camera was gone! On a hunch, we walked along the creek to the dam, which was about a quarter of a mile downstream.

Lo' and behold, we found the camera lying on the dam! When staff had set it up, the camera had been mounted on two wooden stakes in the mud (in retrospect, not the best choice on our end). The beavers had evidently decided the wooden stakes, and the attached camera, were the perfect addition to their dam.

The SD card was recovered and we posted the video on the Conservancy/Nature Preserve Facebook page.

Adaptative Management. The CCC hit both acreage and budget targets this season and is in general very pleased with this year's performance outcomes. One obstacle that the crew encountered while conducting treatments this year were issues of accessibility due to high water. All treatments this year were done using a 50-gallon skid sprayer with an extra-long hose installed on the back of a Honda side-by-side UTV. Although this set up was an improvement in versatility from previous year's trailer pump applications, the crew still had to occasionally skip stands that were either too far away from drivable terrain, or surrounded by deep waters. Traveling with portable backpack sprayers, and reliable waders for traversing the stream should eliminate these obstacles in future spray seasons.

Future Plans. The CCC plans to continue its participation in the Arundo Implementation Project through 2024. Initial contact has been made with the Wildlife Conservation Board about a potential future grant-funded program that includes developing a restoration plan for reaches within the lower Cache Creek that includes both invasive weed management and active restoration on some of those sites.

Outreach Programs

Because public school visits have not returned post-COVID, the CCC has developed other methods of educating students and the public about restoration and related topics. Below is a brief summary of the education and outreach efforts of the CCC in 2023.

Ecological and Environmental Internship Program

The CCC's university-level internship program is in its second year and it is thriving. In order to provide great hands-on learning experiences, each quarter is limited to 18-20 students. More than 50 applications were submitted for the fall quarter; applications for the winter quarter ends December 4 and begins in January 2024. The Internship program is made up of four distinct special project teams which applicants select participation in during the application process. Project teams are: Bird Nest Box Monitoring and Bird Habitat Enhancement, Ecological

Horticulture, Preserve Maintenance, and Wildlife Monitoring. This internship is unpaid; however, credit units are available with the support of a faculty sponsor from an intern's major department.

Wildlife interns dissect owl pellets to determine what the owls at the Nature Preserve are eating.

In 2023, there were 22 confirmed breeding species in the 2023 nesting season, the largest confirmed number in the Conservancy's records. The 2023 nest box monitoring program data (unpublished) shows that more eggs were laid and more fledglings left the boxes in 2023. The birds that use those boxes are Wood Ducks and cavity-nesting songbirds like Tree Swallow, Western Bluebird, and Ash-throated Flycatcher. Tree Swallow, by far, was our most popular nest box occupant. Bird Nest Box interns monitoring bird boxes, then nest box maintenance (e.g., painting some of the boxes, cleaning or repairing boxes) after nesting season was over. The interns monitored bird boxes at the Nature Preserve, Granite Woodland Reiff, and Capay Open Space Park.

Wildlife interns continue to monitor game cameras and conduct owl pellet dissections. We may be able to begin small mammal trapping (we are mid-discussion with a UCD faculty and grad student), with which the wildlife interns can assist.

Horticultural interns continue to assist shade and greenhouse collections, weeding, and watering in the memorial garden, and assisting staff with pretreatment invasive vegetation surveys in Cache Creek. Horticultural interns also completed setting up irrigation in the oak savannah.

Creek Clean Up

Every year the Cache Creek Conservancy participates in a creek clean up as part of the California Coastal Commission's Coastal Clean Up day on September 23, 2023.

Typically, the Cache Creek Clean Up has about 45-55 volunteers cleaning up the creek. In 2023, the Conservancy had 25 pre-registered participants.

Thanks to the 2021 Yolo County Board of Supervisors ordinance banning recreational use of OHVs in the creek, there was very little trash to pick up. What has been noticed is an increase in wildlife activity along the creek, especially beavers and river otters.

At least two beaver dams near the Cache Creek Nature Preserve have remained intact because of the ban on recreational OHV use in lower Cache Creek.

Life Enrichment

The CCC has participated in several life enrichment activities throughout 2023 which have taken place either at the Cache Creek Nature Preserve or to showcase the Nature Preserve. Below is a quick synopsis of the events.

Mobile Presentations. The CCC has done four mobile presentations to residents of Woodland skilled nursing facilities. The "Riparian Mammals" presentation is popular as residents get to see and touch pelts of the various animals that call the Nature Preserve home. A new presentation about owls was added in December.

Felicia Wang, CCC biologist, presents Riparian Mammals talk at Woodland Skilled Nursing.

Community Connections. The Nature Preserve was the site for several training sessions for Yolo County's Search and Rescue (SAR) team in 2023. It also is the site for several UC Davis graduate student projects, including the Phoebe Project and the Effect of Fire on Ticks project. In the future, the Nature Preserve may be the site of additional studies to assist environmental scientists and engineers in better understanding processes that help to restore highly impacted lands.

The CCC also promoted the Nature Preserve at several area events including the All Together Outside event at Capay Open Space Park, sponsored by Yolo County Parks and Yolo County Library; hosting the Learn to Fish event by Yolo Parks; Woodland Farmer's Market; and Woodland's Movies on Main event.

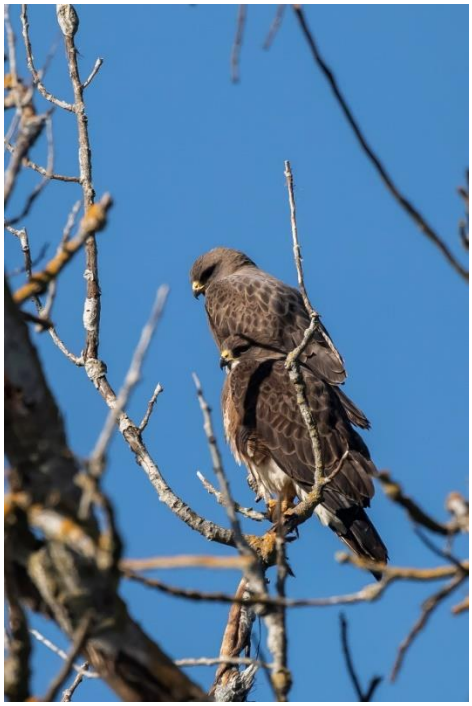
Elias Pollard and members of his Boy Scout Troop installed two bat boxes at the Cache Creek Nature Preserve for his Eagle Scout project.

The Nature Preserve continues to be the recipient of several scouts working on either an Eagle Scout or Gold Star project. This year the Nature Preserve received two new bat boxes and two

turtle traps as a result of these projects.

Another community engagement activity was the CCC's photo contest. Local photographers were invited to submit their photos for the contest. Winners were announced on Earth Day. The winning photographs (shown) are of a bobcat (Adult category) and Swainson's Hawk (professional category). All entries were taken at the Cache Creek Nature Preserve.

Bobcat by Tom Pritchard won the Adult photographer category (above) and Peri Hoke's photo of Swainson's hawks won the professional category (below).



Guided Nature Tours. In spring the CCC initiated a series of volunteer-led guided tours around the Nature Preserve. The tour was developed by volunteer Elize Van Zant, a retired National Parks Service interpretive ranger. She and volunteer Jim Harrington have led several tours throughout the spring, summer, and fall; tours average about 10-12 people per tour. Two groups—one from the State Department of Conservation (about 45 people) and the other the Davis Farm Club (about 20 people)—arranged for special tours of the Nature Preserve.

Nights at the Nature Preserve. The CCC sponsored three evening events to showcase the Nature Preserve in the early evening. There was an evening nature scavenger hunt which challenged families to see and find different animals and part of the Nature Preserve; a Bat Night where people got to learn about bats and see some bats fly out of the bat boxes on the Nature Preserve; and "Tree-trunk or Treat" at the end of October where costumed children and their parents would "travel" to different part of the Nature Preserve to seek out treats as well as participate in educational activities or crafts. All these events were well attended and well-received.

Tree-trunk or treaters lined up to answer owl questions and receive treats at this year's Tree-Trunk or Treat event.

Visitor's Center. The current Visitor's Center at the Nature Preserve closed due to storm damage in February 2023. As part of its strategic plan, the CCC Board decided to purchase a new Administration Building and put that in the location where the old Visitor's Center is and then convert the old Administration Building into a "new" Visitor's Center. Despite a great deal of team effort by the CCC staff, contractors, and the County, the CCC missed its October target installation date. The new installation date is February 2024.

Future Plans. The CCC plans to continue these outreach programs to encourage people to come out to the Cache Creek Nature Preserve. The CCC also is looking into ways it can be open on weekends but closed on weekdays to better accommodate visitors. The CCC plans to continue to work with the County to secure funding for a new Visitor's Center.