Post-Wildfire Watershed Recovery Coordination

Lessons Learned from the Feather River Watershed Working Group – Northern California

October 2024

Executive Summary

This document was developed by the members of the Feather River Watershed Working Group (working group) in Northern California to document lessons learned while coordinating post-wildfire recovery activities as they relate to impacts to the watershed and water quality. This is a multi-disciplinary working group of local, state, and federal agencies, as well as tribal representatives and non-governmental organizations, in the impacted area. Agencies who contributed to this document include the Governor's Office of Emergency Services, State Water Resources Control Board (State Water Board) and Central Valley Regional Water Quality Control Board (Central Valley Water Board), California Department of Water Resources (DWR), California Department of Fish and Wildlife (CDFW), and Butte County Government Offices (BCGO).

The Upper Feather River Watershed spans 2.3 million acres, providing drinking water to approximately 27 million Californians. Since 2018, over 1.3 million acres (about 57%) of its landscape burned in multiple wildfires, including the 2018 Camp Fire (153,336 acres), 2020 North Complex Fire (318,935 acres), 2021 Dixie Fire (963,309 acres).

During post-wildfire watershed recovery activities, the working group developed various processes to coordinate more effectively during recovery and restoration activities. This document describes these processes, their agencies' respective roles, and provides context on lessons learned throughout multiple years of coordination. By sharing this information, the working group members hope that it will aid those in other parts of the state in their wildfire coordination if or when wildfire impacts their areas.

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List of Acronyms and Abbreviations

BAER:	Burned Area Emergency Response
BMPs:	Best Management Practices
CAL FIRE:	California Department of Forestry and Fire Protection
Cal OES:	Governor's Office of Emergency Services
CalWater:	California Water Services
CDFW:	California Department of Fish and Wildlife
Central Valley Water Board:	Central Valley Regional Water Quality Control Board
CFSC:	California Fire Safe Councils
DOM:	Division of Operations and Maintenance
DRA:	Division of Regional Assistance
DWR:	California Department of Water Resources
FEMA:	Federal Emergency Management Agency
HABs:	Harmful Algal Blooms
NGO:	Non-Governmental Organizations
NRO:	Northern Regional Office
NWS:	National Weather Service
PAHs:	Polycyclic Aromatic Hydrocarbons
POC:	Point of Contact
PCBs:	Polychlorinated Biphenyls
RCD:	Resource Conservation District
State Parks:	California Department of Parks and Recreation
State Water Board:	State Water Resources Control Board
SWP:	State Water Project
TKN:	Total Kjeldahl Nitrogen
TOC:	Total Organic Carbon
US EPA:	United States Environmental Protection Agency
USFS:	United States Forest Service
USGS:	United States Geological Survey
VARs:	Values-at-Risk
Water Boards:	State Water Resources Control Board and Central Valley Regional Water Quality Control Board
WERT:	Watershed Emergency Response Team
Working group:	Feather River Watershed Working Group
WQS:	Water Quality Section
WUI:	Wildland-Urban Interface

I. Introduction

The upper portion of the Feather River Watershed spans 2.3 million acres in Northern California, and includes all of Plumas County, and portions of Sierra, Butte, Lassen, and Yuba Counties. The watershed is filled with numerous streams, rivers, lakes, wet meadows, and reservoirs, which all flow into Lake Oroville before entering the lower portion of the Feather River Watershed.

The upper Feather River Watershed is unique for California in that it is more biodiverse than Yellowstone or Yosemite National Parks and is a nationally recognized hotspot for wildlife conservation. The meadows and forests in the watershed sustain numerous plant and wildlife species, including 2,200 plant species (one-third of California's plant diversity), 38 rare or threatened wildlife species, and 75% of wildlife species in the Sierra Nevada.[1]

The watershed is also home to many small and medium sized communities who rely on local water supplies as a source for drinking and irrigation water. Furthermore, millions of people downstream of Lake Oroville are supplied drinking water that originates from the Feather River, either entirely or after a confluence with other rivers. This includes the 27 million Californians who receive water from the State Water Project, approximately two-thirds of California's population, for which Lake Oroville serves as the primary storage facility in Northern California.[2]

[1] Source: https://www.frlt.org/our-work/.
[2] Source: http://featherriver.org/#:~:text=The%20Upper%20Feather%20River%20IRWM,Mount%20Lassen%20to%20Sierra%20Valley.

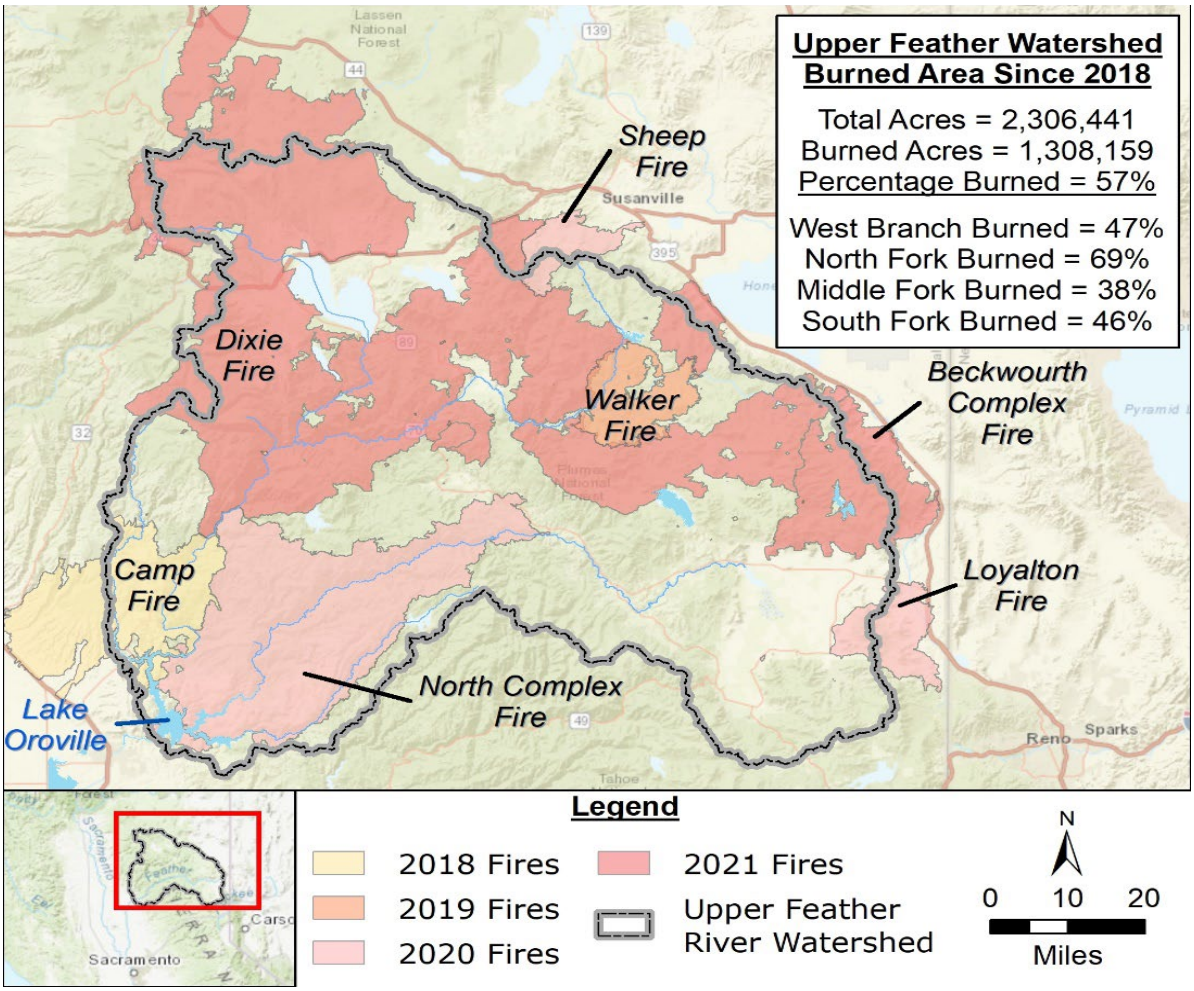

Photo 1: A map of the Upper Feather River Watershed Burned Area since 2018, provided by Daniel Wisheropp, Dept. of Water Resources

The Upper Feather River Watershed has seen over 1.3 million acres (about 57%) of its landscape impacted by wildfire due to the 2018 Camp Fire, 2020 North Complex Fire, 2021 Dixie Fire, and other small fires within the watershed.

The Feather River Watershed Working Group is comprised of governmental agencies (local, state, and federal), tribal representatives, and key partners such as drinking water suppliers and local non-governmental organizations that have a vested interest in watershed recovery. The working group was established to coordinate post-wildfire watershed recovery and water quality monitoring between the respective agencies, and support community and partner engagement on water quality issues in the post-wildfire environment.

The working group first convened to support the post-wildfire efforts of the 2018 Camp Fire in Paradise, California, which remains the deadliest and most destructive wildfire in California's history. The wildfire began November 8, 2018, and burned 153,336 acres,

destroyed more than 18,000 structures, and claimed the lives of at least 85 people before it was fully contained on November 25, 2018. Both the towns of Paradise and Concow were devastated, with 95% of their structures destroyed by wildfire. The towns of Magalia and Butte Creek Canyon also experienced extensive levels of destruction.

In 2020, the working group continued coordination for the North Complex Fire, which burned not far from the Camp Fire burn scar. The North Complex Fire began August 17, 2020, and ultimately burned 318,935 acres, destroyed 2,455 structures, and claimed 16 lives before full containment on December 3, 2020. Like the 2018 Camp Fire, the towns of Berry Creek and Feather Falls were nearly destroyed, with very few buildings left standing.

In 2021, the working group was faced with yet another wildfire in the watershed – the Dixie Fire. This fire started on July 13, 2021, and remains the single largest (non-complex) wildfire in California's history, burning 963,309 acres, destroying 1,329 structures, and claiming one life before full containment on October 25, 2021. The wildfire devastated small towns and communities, including Greenville, Canyondam, and Warner Valley, as well as 73,240 acres (69%) of Lassen Volcanic National Park[3].

Over the last five years, the working group has been faced with multiple challenges and coordination needs for wildfires across the watershed and the associated impacts to communities, wildlife, and water quality in the burn scars. At least five towns or communities were severely impacted by wildfire, and approximately 752,331 acres (33% of the watershed's landscape) burned at a moderate- to high-burn severity. The working group is now documenting these experiences so that others may benefit from the lessons learned throughout these coordination efforts. Please see Attachment A for contact information for the agencies who contributed to this document.

II. Effects of Wildfire on Watersheds

Wildfire can impact watersheds and water quality in a variety of different ways, and the scale and duration of water quality impacts and watershed response depend on a few key factors:

- The extent and burn severity of a wildfire
- The location of the wildfire (pure forested area, wildland-urban interface, etc.)
- The number and type of buildings, facilities, vehicles, and other anthropogenic sources combusted during a wildfire

[3] Not all 73,240 acres experienced fire impacts; 18% of the area in the fire footprint in the park remain unchanged after the fire, Read more on the park website: https://www.nps.gov/lavo/learn/nature/dixie-fire-effects.htm

- Subsequent precipitation events within the burn scar that can cause erosion and sedimentation, and landslides/debris flows
- Recovery activities post-wildfire can create additional disturbance and impacts to resources if not properly mitigated for

Moderate to high burn severity wildfires are much more likely to create erosion and sedimentation issues in the post-wildfire environment, leading to water quality impacts and changes to the natural hydrology of a watershed. Additionally, wildfires that occur in the wildland-urban interface (WUI) present an increased risk of producing pollutants associated with burned structures and other anthropogenic sources such as vehicles, electronics, appliances, etcetera during precipitation events after the wildfire. Even in strictly forested environments, large wildfires with moderate to high burn severity can still degrade water quality and negatively impact associated beneficial uses such as fish habitat, drinking water supplies, and recreation.

A. Impacts to Water Quality

Common changes in water quality after a wildfire include:

- Increases in nutrient levels (nitrates, nitrites, phosphorus, etc.)
- Increases in presence of metals, both naturally occurring and anthropogenic (iron, aluminum, manganese, and others)
- Increases in presence of Polycyclic Aromatic Hydrocarbons (PAHs)
- Increases in water temperatures from loss of vegetative cover
- Increases in sediment (both suspended load and bed load, turbidity, etc.)
- Increases in algae growth (potential cyanotoxin producers)
- Decreases in dissolved oxygen levels
- Changes in pH
- Changes in conductivity

B. Impacts to Hydrology and Channel Morphology

Changes in hydrology and channel morphology are also common after a wildfire, and these changes can often have negative impacts on the local ecosystem and downstream resources. Some of these impacts are described below.

i. Slope Instability

After a moderate to high burn severity wildfire, there is a higher risk for slope failures, which can transport sediment, ash, and debris into stream channels. This can negatively impact water quality and alter the morphology of stream channels. Channels can be disconnected from floodplains, experience alterations to their beds

and banks, and other morphological changes that can impact habitat for fish and other species, and the overall ecologic function of the area.

ii. Precipitation Events after Wildfire

Subsequent precipitation events that occur over the burn scar can also cause varying degrees of watershed response and water quality concerns depending on duration and intensity of the precipitation, and the length of the wet season. Many pollutants attach to suspended particles such as sediment and enter surface waters as runoff. High flows can transport sediment-bound pollutants and debris (both vegetative and anthropogenic) to nearby waterways, which can accumulate downstream in larger waterways and reservoirs. This effect is amplified with larger burn scars and higher burn severities.

Post-wildfire precipitation events also tend to produce more runoff compared to similarly sized pre-fire events. This is in large part due to hydrophobic soil conditions and a loss of water retention in the watershed caused by wildfire. This increased runoff presents threats of flooding and mud and debris flows. Additionally, historical flood models that relate storm size to potential flood threats may be inaccurate post-wildfire because of changes within the watershed.

iii. Harmful Algal Blooms

Algae and cyanobacteria can produce harmful compounds, such as toxins and taste and odor compounds, that cause health risks to humans and animals. When blooms pose a risk to humans, animals, and the environment, they are referred to as harmful algal blooms (HABs).[4] Algal blooms, including HABs, can occur more frequently after a wildfire. This increase is due to the influx of nutrients and other materials into surface waters that are common after a wildfire. These nutrients can create conditions conducive for algae to bloom. Both naturally occurring nutrients in soils and anthropogenic sources from burned debris can contribute to these events.

C. Recovery Projects

After a wildfire in the WUI, structural debris and hazardous trees (trees that pose a risk to public safety or infrastructure) must be removed. When these activities occur near surface waters, the ground disturbing activities and use of heavy equipment in sensitive riparian areas can create discharge to nearby surface waters if not properly mitigated for. The working group members worked closely with those conducting this work to ensure that water quality Best Management Practices (BMPs) were utilized to protect debris sites (e.g., burned homes, businesses, or other human infrastructure) from producing runoff before the debris could be removed. The

[4] For more information on HABs visit: https://mywaterquality.ca.gov/habs/

members continued to work closely with the debris removal teams to ensure that the work being conducted utilized the appropriate BMPs to ensure secondary impacts to water quality were not created during post-wildfire recovery operations.
Working group members who represent state and federal agencies were often asked to provide technical guidance or expertise to local governments and the public in relation to rebuilding after the wildfire. In some instances, guidance on how to conduct work in such a way to avoid or minimize new impacts to water quality was requested. In other circumstances, permitting of projects was required, and expedited approvals were needed. While these activities were not part of the working group scope members often found themselves participating in this additional coordination role. Overall, working group members anticipate the need for continued involvement in future wildfire coordination efforts.

III. Working Group Organization

The working group has remained flexible in nature, allowing for the expansion of membership, and impacted areas within the watershed as needed. The agencies actively participating as of July 2024, or who participated in the working group in the past, are identified below. How the working group organized itself and identified coordination needs is also discussed in this section.

A. Participating Agencies

State Agencies

- Governor's Office of Emergency Services
- State Water Board & Central Valley Water Board
- California Department of Water Resources
- California Department of Fish and Wildlife
- California Department of Parks and Recreation

Federal Agencies

- United States Environmental Protection Agency
- United States Forest Service

Local Agencies

- Butte County Government Offices
- Plumas County Government Offices

Local Water Purveyors

- California Water Services
- South Feather Power & Water

- Thermalito Water & Sewer

Tribal Governments

- Enterprise Rancheria

Non-Governmental Organizations

- Sierra Institute

B. Lead Agency Roles

The lead agencies for the working group, their respective authorities, and how they participate in this effort are described below.

i. Governor's Office of Emergency Services

The California Governor's Office of Emergency Services (Cal OES) is the lead state agency for disaster response and recovery. Pursuant to the Emergency Services Act and the Disaster Assistance Act, Cal OES directs other state agencies to perform disaster response and recovery operations through mission tasks and reimburses local agencies for costs associated with their response and recovery operations. Cal OES also administers all disaster reimbursement funding from the Federal Emergency Management Agency (FEMA). Cal OES plays several key roles in post-wildfire watershed recovery.

Through its Watershed Mitigation, Coordination, and Outreach Unit, Cal OES leads the State Watershed/Debris Flow Task Force (Task Force), which unifies the work of state and federal agencies on post-wildfire watershed and debris flow concerns. Specifically, the Task Force oversees the deployment of emergency protective measures (such as compost socks and straw wattles) around burned structures to prevent structural ash from entering surface waters. The Task Force also develops risk mitigation strategies for Values at Risk (VARs) identified by CAL FIRE Watershed Emergency Response Teams.

Secondly, through its Debris Operations Unit, Cal OES leads the Debris Task Force, which directs the State Consolidated Debris and Hazard Tree Removal Program. The Program, which is operated jointly by Cal OES and the California Environmental Protection Agency, removes debris from burned structures and burned hazard trees that threaten public improved property. The Program is only authorized in specific, large-scale disasters. In smaller disasters, Cal OES may provide technical assistance and funding to local agencies performing post-wildfire debris and hazard tree removal.

ii. State Water Resources Control Board and Central Valley Regional Water Quality Control Board

The State Water Board and the nine Regional Water Boards are collectively known as the Water Boards. The State Water Board's mission is to ensure the highest reasonable quality for waters of the State, while allocating those waters to achieve the optimum balance of beneficial uses. The mission of the Regional Water Boards is to develop and enforce water quality objectives and implementation plans that will best protect the beneficial uses of the State's waters, recognizing local differences in climate, topography, geology, and hydrology. Both the Central Valley Regional Water Board and the State Water Board have programs that lead and/or participate in the working group.

As the Regional Water Board with regulatory authority over water quality in the Feather River Watershed, the Central Valley Water Board is a lead participant in the working group. It is the largest of the nine Regional Water Boards in California, stretching from the Oregon border to the northern tip of Los Angeles County - about 60,000 square miles or nearly 40 percent of the state. The Central Valley Water Board conducts post-wildfire water quality monitoring, advises on water quality concerns, coordinates any public messaging on water quality when needed, and provides technical guidance and support to the working group members.

The State Water Board facilitates the working group meetings and coordination through its Emergency Management Program. The working group was started by the Central Valley Water Board, and facilitation was later transferred to the State Water Board when the Emergency Management Program was established. One of the roles of the Emergency Management Program is to coordinate wildfire response, recovery, and restoration activities across the Water Boards. The State Water Board also has participation from its Division of Water Rights in case questions arise regarding water rights associated with wildfire recovery, and Division of Drinking Water in case of questions regarding drinking water issues.

iii. California Department of Water Resources

The California Department of Water Resources (DWR) manages California's water resources in cooperation with other agencies and provides emergency response. Two areas of focus are the operation of the State Water Project (SWP), the monitoring of local water resources and quality throughout the state, and collaborating to achieve sustainable water management.

The operation of the SWP is led by the Division of Operations and Maintenance (DOM), headquartered in Sacramento but operated day-to-day by its Field Divisions. In the case of this working group, including operations at Lake Oroville and in the

Feather River watershed, that work is under the jurisdiction of the Oroville Field Division. The involvement of DOM in post-wildfire monitoring began after the Camp Fire when the proximity of the burn to Lake Oroville caused concern in DWR and among water users.

Lake Oroville is the largest storage facility in the SWP and serves as the initial regulating waterbody for downstream exports as well as providing a source for drinking water to local communities. While there had been fires in the watershed before, the heightened awareness surrounding the Camp Fire required a more thorough investigation by DOM into possible impacts to local and downstream water users. During subsequent years and wildfires, DOM has remained active in post-wildfire monitoring in the Feather River watersheds. Additionally, DOM has been active in monitoring wildfire-affected watersheds upstream of other SWP facilities throughout the state.

DWR's monitoring and preservation of local water resources is managed by four regional offices under the Division or Regional Assistance (DRA). In the case of this working group, it is the Northern Region Office (NRO) that became involved with the working group during the Camp Fire emergency.

NRO's Water Quality Section (WQS) has a decades-long history of collecting ambient water quality data from Northern California water bodies, rivers, and creeks, in addition to groundwater samples. WQS staff were able to quickly plan and sample historic DWR stations in Butte Creek Canyon while the Camp Fire was still active. Pre-rain sampling was performed to provide baseline water quality conditions before any debris flows impacts from precipitation events could be detected.

Additionally, aquifer water quality testing and data collection was performed by WQS staff to monitor potential groundwater contamination due to the Camp Fire. A report of initial findings is available and additional testing may occur at a future date as plumes can take an unknown number of years to migrate to the Sacramento Valley from Paradise.

DWR's water quality expertise can be underutilized during urban wildfire emergencies because the affected local agency may not be aware of threats to safe drinking water supplies and environmental health. These emergency response resources should be requested through Cal OES during an active/ declared emergency so the cost of emergency assistance from DWR can be reimbursed.

iv. California Department of Fish and Wildlife

The California Department of Fish and Wildlife (CDFW) has a mission to manage California's diverse fish, wildlife, and plant resources, and the habitats upon which they depend, for their ecological values and for their use and enjoyment by the public. CDFW's role in this working group is to assist lead agencies, other resources agencies, and contractors in minimizing impacts to wildlife species and their habitat, while conducting emergency cleanup and monitoring activities.

v. Butte County Government Offices

Butte County's vision is to ensure basic health, safety, and protection of its people; to facilitate commerce and trade and promote a high quality of life; to promptly resolve issues; and provide useful and effective service utilizing both public and private partnerships. It is Butte County's goal to protect local water resources, including water quality, through partnerships and working groups that manage, monitor, and advise on resource management activities. Butte County's role in this working group is to provide local representation, historical knowledge, and data regarding water quality monitoring activities conducted by the County and in partnership with other local agencies and organizations.

C. Working Group Organization

While not all of the factors described below were considered when the working group was initially organizing itself, after multiple years of coordination and learning experiences, the working group will consider them when determining organizational needs in the future:

- Percentage of burn severity in the moderate to high burn severity categories. The percentage of moderate to high burn severity is important, as a larger percentage of burn severity in these categories can lead to increased erosion, and higher risks for debris flows and flooding, which can cause negative impacts to water quality.
- Location and quantities of destroyed structures (residential and/or commercial), damage/destruction to hiking trails, roads, etc., that may require construction and/or ground disturbing activities. These activities can create additional disturbance and water quality impacts if not properly mitigated for, and some may require various permits.
- VARs identified in the USFS Burned Area Emergency Response (BAER) and/or CAL FIRE Watershed Emergency Response Team (WERT) reports. VARs are the values or resources at risk of damage or loss by post-wildfire geologic and/or hydrologic hazards. These reports provide valuable information on the types of secondary impacts that may occur after wildfire.

- Utilizing the existing expertise and work functions within the affected and interested groups and government agencies to share and allocate staff resources readily available.

Understanding this information can help inform whether inter-agency coordination (and to what degree) is needed to address water quality concerns in the impacted areas, and other actual or potential impacts to the watershed as the community and the environment recover.

After each of the above referenced wildfires, the working group met weekly to coordinate water quality monitoring, public messaging, and any other watershed-wide concerns that arose during post-wildfire recovery operations. As the post-wildfire recovery operations progressed, and the need to coordinate as frequently was reduced, the working group scaled back the meeting frequency to bi-weekly, and later to monthly. However, even outside of active wildfire recovery needs, the working group continues to meet monthly. Continuing to meet regularly allows the working group members to remain in contact with one another and ensure all necessary participants and their vested interests are represented. Maintaining the monthly meeting makes it much quicker to pull the group back together for more frequent meetings if or when a fire comes back to the area and update one another on their response and recovery coordination needs.

D. Identification of Impacts and Needed Monitoring

After multiple years of coordination, the working group members have found the resources described below to be helpful for identifying post-wildfire water quality monitoring needs. While the working group did not use all these resources at the time, the members will be using them moving forward, as they are helpful when identifying monitoring and coordination needs associated with a wildfire.

- BAER and WERT reports (burn severity information, VARs, etc.),
- United States Geological Survey (USGS) Debris Flow Modeling,
- Coordination with the Cal OES Watershed/Debris Flow Task Force,
- National Weather Service (NWS) resources and forecasting materials for debris flows and flooding in burn scars,
- Locations and concentrations of damaged/destroyed structures, and
- Evaluation of impacts to jurisdictional areas, and/or sites/facilities/etc. owned or operated by the workgroup members.

E. Development of a Charter and Organizational Documents

The working group members developed a charter and a response coordination spreadsheet to maintain organization during active wildfire and post-wildfire recovery coordination efforts. The working group updates the documents as needed.

i. Workgroup Charter

This document is the guiding document that the workgroup members refer to and has remained internal to working group members and management at their respective agencies. The working group's charter includes:

- The purpose of the workgroup (why is it being established)
- The scope of the workgroup (what will the group address)
- A list of participating agencies
- High-level talking points each agency will refer to regarding questions from the public, with Points of Contact (POCs) for public engagement (media inquiries addressed separately)
- A POC for each subject area the workgroup will be supporting (e.g., POCs for "safe to swim" inquiries, drinking water inquiries, groundwater well inquiries, infrastructure inquiries, etc.)

ii. Media Response Coordination

The working group also created a resource that outlines how the members will respond to media inquiries related to the scope of work identified in the workgroup's charter. This resource has detailed information about each workgroup participant and their role in the workgroup, and which members need to be consulted with when there is engagement with the media. The resource also includes a flow chart for how information should flow both for incoming media inquiries, and outgoing public messaging efforts.

IV. Working Group Implementation

A. Coordinate Monitoring/Sampling Activities

As resources are often limited for many agencies, it was helpful to coordinate a joint monitoring effort to allow for coverage over a larger area than could be done alone. At each scheduled meeting, working group members shared updates on their monitoring/sampling efforts and discussed any concerns or issues that may have arisen during these activities. The members would try to conduct their sampling on the same day or as close to the same day at their different locations to ensure conditions were similar across the sampling areas. In the future, the working group will continue to conduct joint monitoring efforts, as it has been effective for collecting data across the

impacted area. Please see Attachment B for a list of constituents the Water Boards sampled for after these wildfires.

B. Public Engagement

Community engagement has been one of the key drivers for this coordination effort. The working group members wanted to be able to connect with the impacted communities and provide up to date information on water quality and watershed concerns after the wildfires. There were a variety of outreach efforts to share this information which includes but is not limited to virtual Q&A sessions held live on social media platforms, formal media releases, and announcements in public newsletters maintained by some of the working group member agencies. The working group will continue to use these mediums and others to engage with the public when new information is available about water quality in the watershed and have found these methods of sharing information to be effective. In the future, the working group may consider the addition of in-person community outreach if or when wildfire returns to the watershed.

C. In-person Working Group Meetings and/or Field Visits

The working group also conducted in-person meetings and/or field visits of the impacted areas. Sometimes, it is not always immediately clear to all the group members what the scope and scale of the impacts are, or how they may impact water quality. Going out into the field gives context and helps refine the priorities of the group as time passes in the watershed. Dynamic and changing weather conditions can cause new impacts that may require re-focusing the group's efforts.

Additionally, the working group found that holding in-person meetings and field visits outside of the immediate recovery window is still important. As mentioned previously, by staying connected through monthly meetings and in-person coordination, it helps maintain the connection between the participating agencies, so that if or when the need arises to coordinate a new wildfire recovery effort, the members can be pulled back together more quickly.

V. Conclusion

The working group has proven to be an effective model for the participating agencies to coordinate water quality and watershed concerns during and after a wildfire. Having a standing coordination group has allowed the agencies to develop strong professional relationships, understand each other's roles and responsibilities more clearly, and identify areas to work together on water quality and watershed health post-wildfire. This collaboration has allowed the agencies to provide a more effective and coordinated response to support communities who have been impacted by wildfire.

Attachment A: Contact Information for Working Group Members

Current as of publish date: October of 2024

AGENCY	NAME	EMAIL
Water Boards	Clint Snyder Griffin Perea Krystle Taylor	Clint.Snyder@waterboards.ca.gov Griffin.Perea@waterboards.ca.gov Krystle.Taylor@waterboards.ca.gov
CalOES	Dominic Mezzatesta Melissa Ronan	Dominic.Mezzatesta@caloes.ca.gov Melissa.Ronan@caloes.ca.gov
CDFW	Sarah Lose Jennifer Garcia	Sarah.Lose@wildlife.ca.gov Jennifer.Garcia@wildlife.ca.gov
DWR	Daniel Wisheropp Cassandra Evenson Scott McReynolds	Daniel.Wisheropp@water.ca.gov Cassandra.Evenson@water.ca.gov Scott.McReynolds@water.ca.gov
BCGO	Kelly Peterson Kamie Loeser	KPeterson@buttecounty.net KLoeser@buttecounty.net

Attachment B: List of Constituents Sampled for by the Water Boards

For questions on specifics of the parameters and water quality objectives for these analytes, please contact the Water Boards for more information.

Field Measurements

- Conductivity
- Dissolved Oxygen
- pH
- Temperature
- Turbidity

Minerals and Solids

- Alkalinity
- Calcium
- Hardness
- Sulfate
- Total Dissolved Solids
- Total Suspended Solids
- Settleable Solids
- Total Coliform
- E. coli

Nutrients

- Ammonia
- Nitrate
- Nitrate and Nitrite
- Total Kjeldahl Nitrogen (TKN)
- Orthophosphate
- Phosphorus
- Total Organic Carbon (TOC)

Total Metals

- Aluminum
- Arsenic
- Cadmium
- Chromium
- Copper
- Iron

- Lead
- Magnesium
- Manganese
- Mercury
- Nickel
- Selenium
- Zinc

Dissolved Metals

- Aluminum
- Arsenic
- Cadmium
- Chromium
- Copper
- Iron
- Lead
- Magnesium
- Manganese
- Mercury
- Nickel
- Selenium
- Zinc

Polycyclic Aromatic Hydrocarbons

- Acenaphthene
- Acenaphthylene
- Anthracene
- Benz(a)anthracene
- Benzo(a)pyrene
- Benzo(g, h, i)perylene
- Benzo(k)fluoroanthene
- Chrysene
- Dibenzo(a, h)anthracene
- Fluoranthene
- Fluorene
- Indeno(1,2,3-c,d)pyrene
- Methylnaphthalene, 1
- Methylnaphthalene, 2
- Naphthalene
- Phenanthrene

- Pyrene

Polychlorinated Biphenyls (PCBs)

- Aroclor 1016
- Aroclor 1221
- Aroclor 1232
- Aroclor 1242
- Aroclor 1248
- Aroclor 1254
- Aroclor 1260