

Butte Creek DeSabla-Centerville Hydro Project - Decommission or Retool? Salmon Want to Know (We do too!)

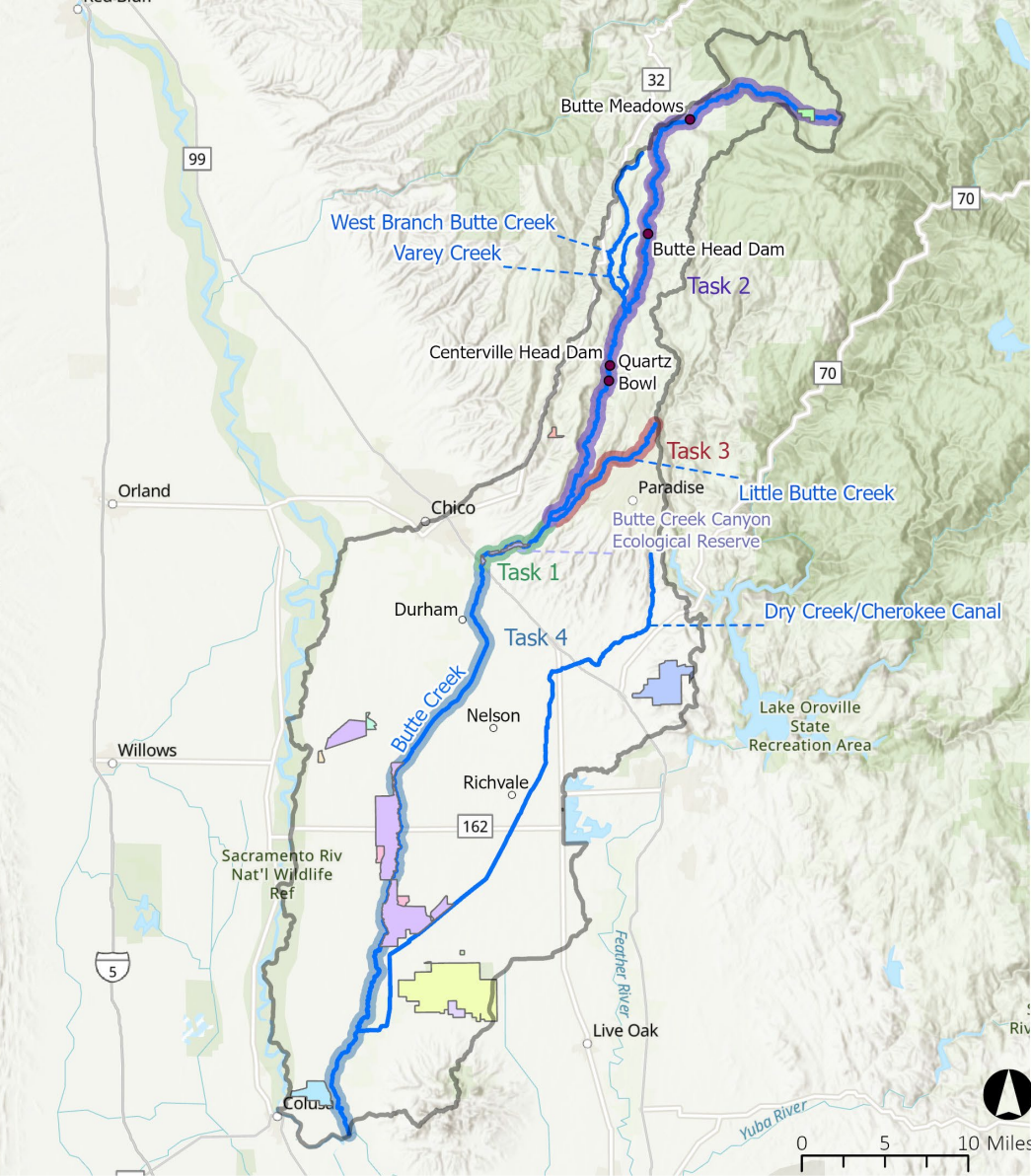


Photo collage by Michael Smith 2008

Allen Harthorn
Friends of Butte Creek

Butte Creek Canyon Town Hall
August 24, 2023

G:\Shares\GIS\Business_Development\Butte Creek Grant Figures\APRX\proposal_figures_nick.aprx



Legend

- Locality
 - Point of Interest
 - ▭ Butte Watershed
 - ▬ River Centerline
- Wildlife Reserves**
- ▭ Angel Slough Conservation Easement
 - ▭ Butte Creek Canyon Ecological Reserve
 - ▭ Butte Creek House Ecological Reserve
 - ▭ Colusa Bypass Wildlife Area
 - ▭ Conservation Easement
 - ▭ Feather River Fish Hatchery
 - ▭ Gray Lodge Wildlife Area
 - ▭ Little Butte Creek Conservation Easement
 - ▭ Little Chico Canyon
 - ▭ North Butte Road Conservation Easement
 - ▭ North Table Mountain Ecological Reserve
 - ▭ Pennington Road Conservation Easement
 - ▭ Upper Butte Basin Wildlife Area



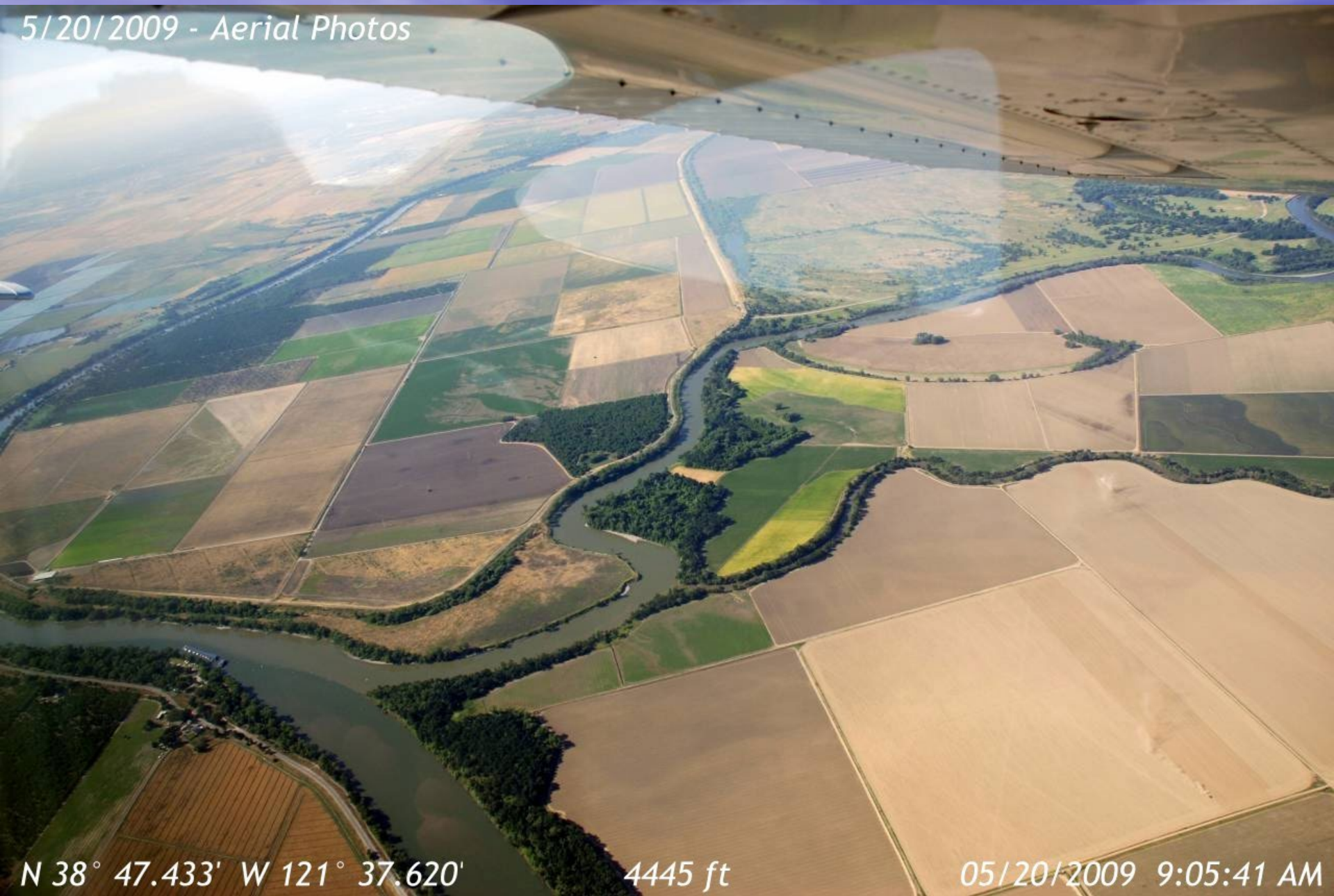
Sutter Bypass Butte Creek

5/20/2009 - Aerial Photos



Photo by Zeke Lunder

5/20/2009 - Aerial Photos



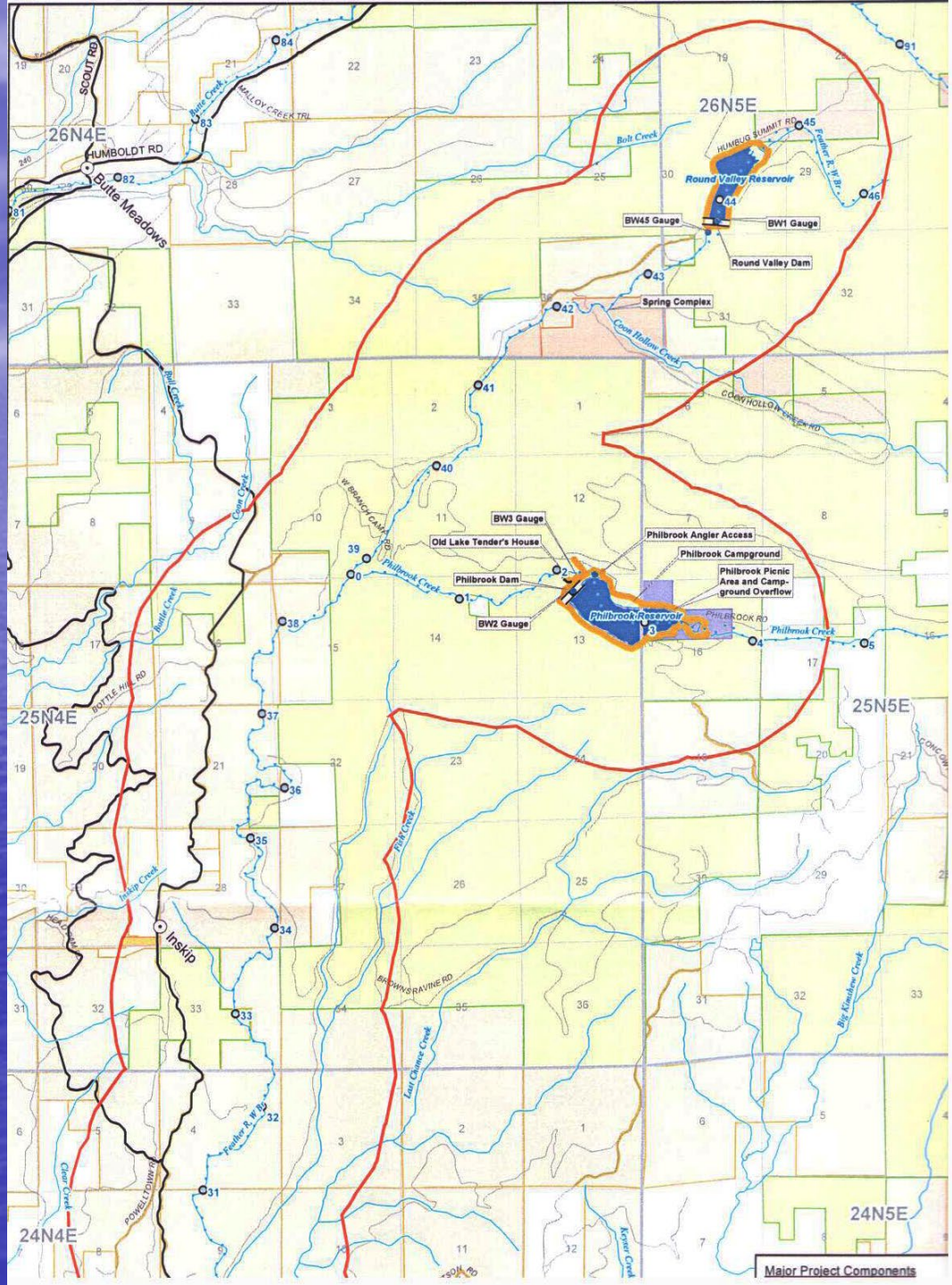
N 38° 47.433' W 121° 37.620'

4445 ft

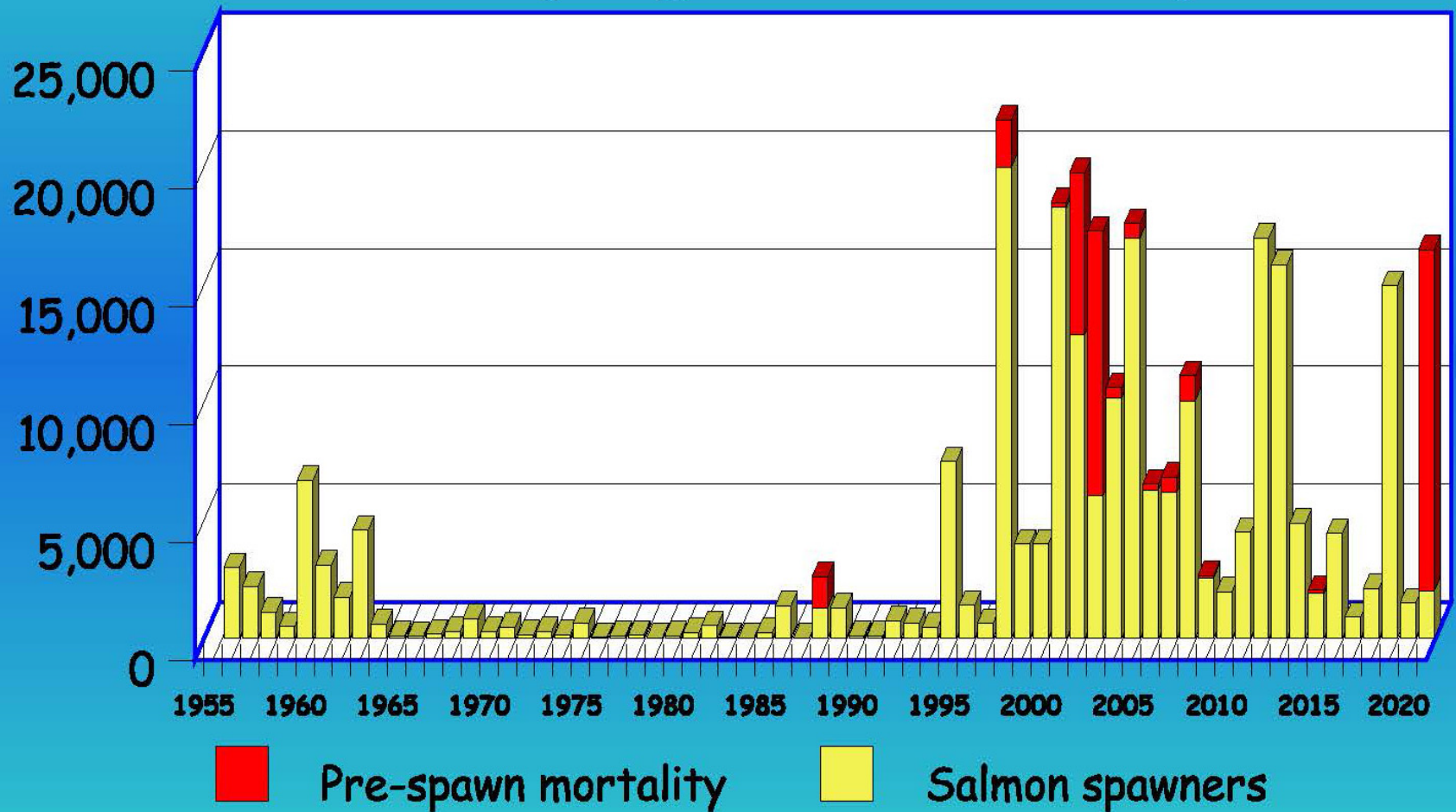
05/20/2009 9:05:41 AM

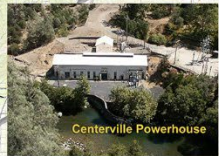
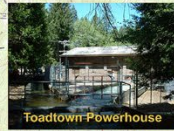
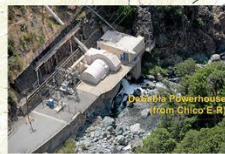
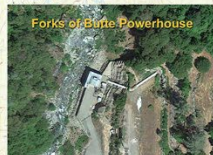
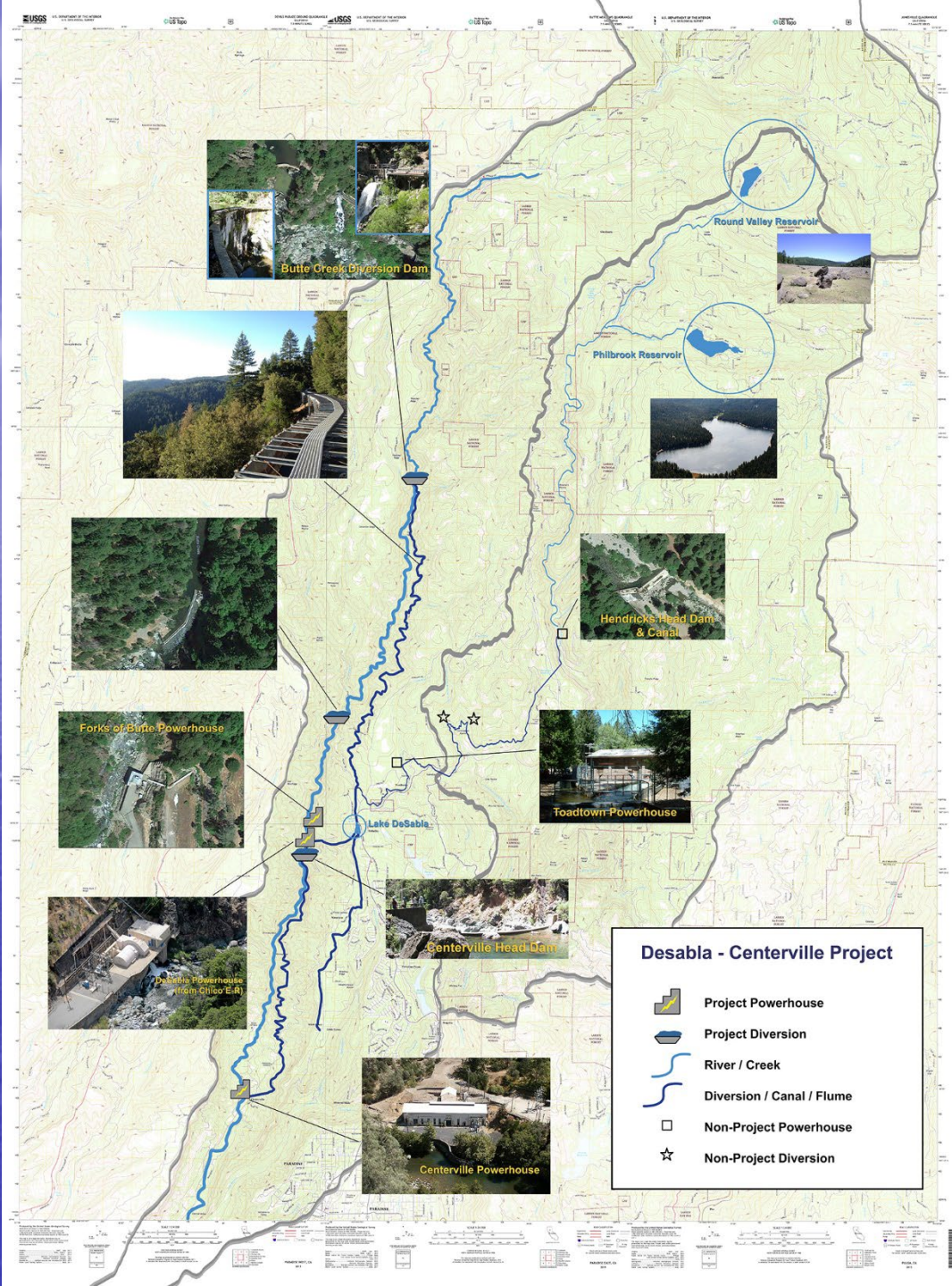
Photo by Zeke Lunder

Upper West Branch Feather River









Butte Creek Spring Run Salmon Population



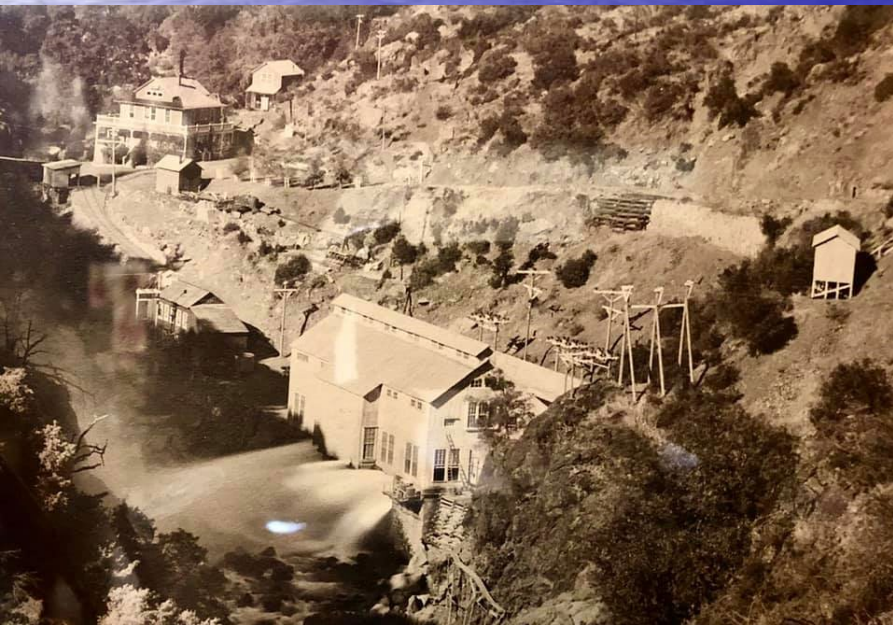


Desaba - Centerville Project

-  Project Powerhouse
-  Project Diversion
-  River / Creek
-  Diversion / Canal / Flume
-  Non-Project Powerhouse
-  Non-Project Diversion

DeSabra-Centerville Hydro Timeline

1907 Centerville PH operational-From the Library of Congress: The Centerville installation of the Francis turbine generation unit in 1907 was only the fifth Francis turbine installed on the Pacific Coast, and the first relatively high head turbine installed in the west, representing an innovative approach to long distance, high-voltage transmission. The success of the Centerville project encouraged further high head turbine installations throughout California and contributed significantly to the development and expansion of hydroelectric power generation throughout the nation.



DeSabra Powerhouse in 1910. Caretaker home is in the upper left of the picture.

Hendricks Head Dam-West Branch Feather River 3200 feet elevation





Butte Head Dam 2912 feet elevation

Butte Canal: Instream flow release gate



Butte Canal Elevated Sections



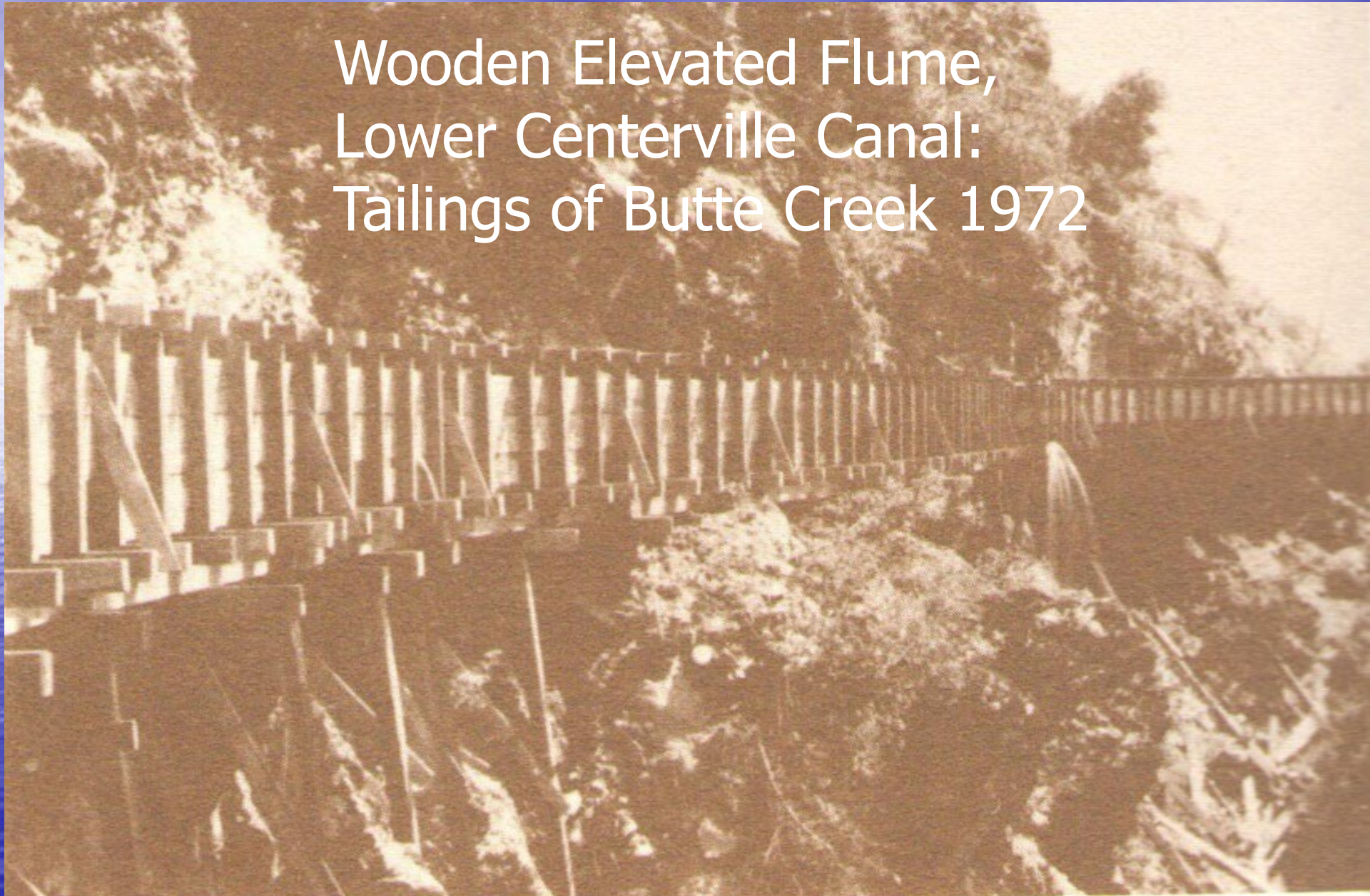


Centerville Head Dam 1150 feet elevation



Centerville Head Dam, Early 1900's: Tailings of Butte Creek, 1972

Wooden Elevated Flume,
Lower Centerville Canal:
Tailings of Butte Creek 1972







Lower Centerville Canal in 2017 (above)

Lower Centerville Canal 2023 (right)





Centerville Powerhouse 520 feet elevation

Centerville PH Update 2015

Powerhouse originally started in 1906

- Main Turbine offline since early 2010
- Repairs completed 2011
- Start-up attempted Feb. 2011
- Penstock pressure fluctuations indicate failing integrity
- Both units taken offline
- Project decommissioning in near future (hopefully)

Water Management Adaptations to Prevent Loss of Spring-Run Chinook Salmon in California under Climate Change

**Lisa C. Thompson; Marisa I. Escobar; Christopher M.
Mosser; David R. Purkey; David Yates;
and Peter B. Moyle
UC Davis and the Stockholm Institute**

“The most important conclusion of this work is that long-term survival of SRCS in Butte Creek is unlikely in the face of climate change and that simple changes to water operations are not likely to dramatically change vulnerability to extinction.”

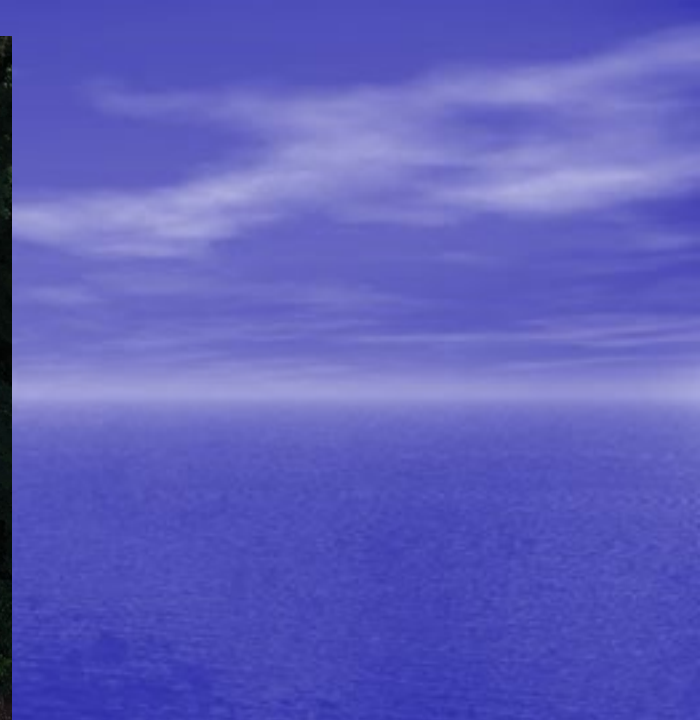
Salmon Pool July 12, 2003



Salmon Pool August 12, 2003

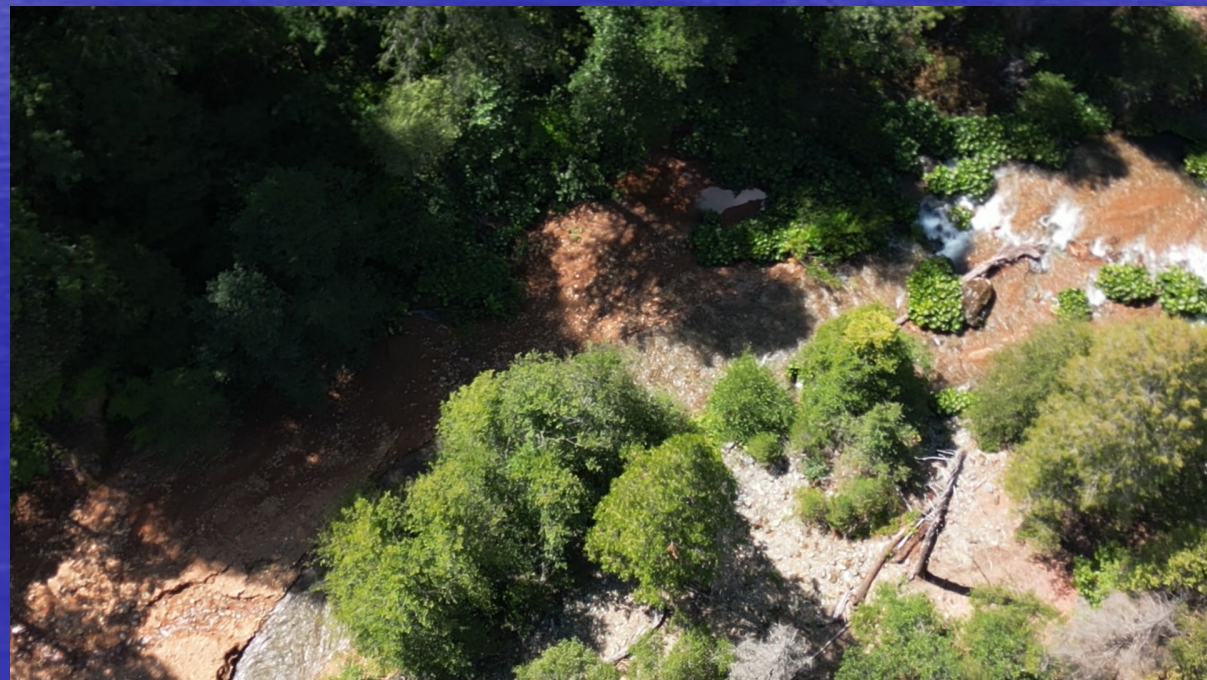




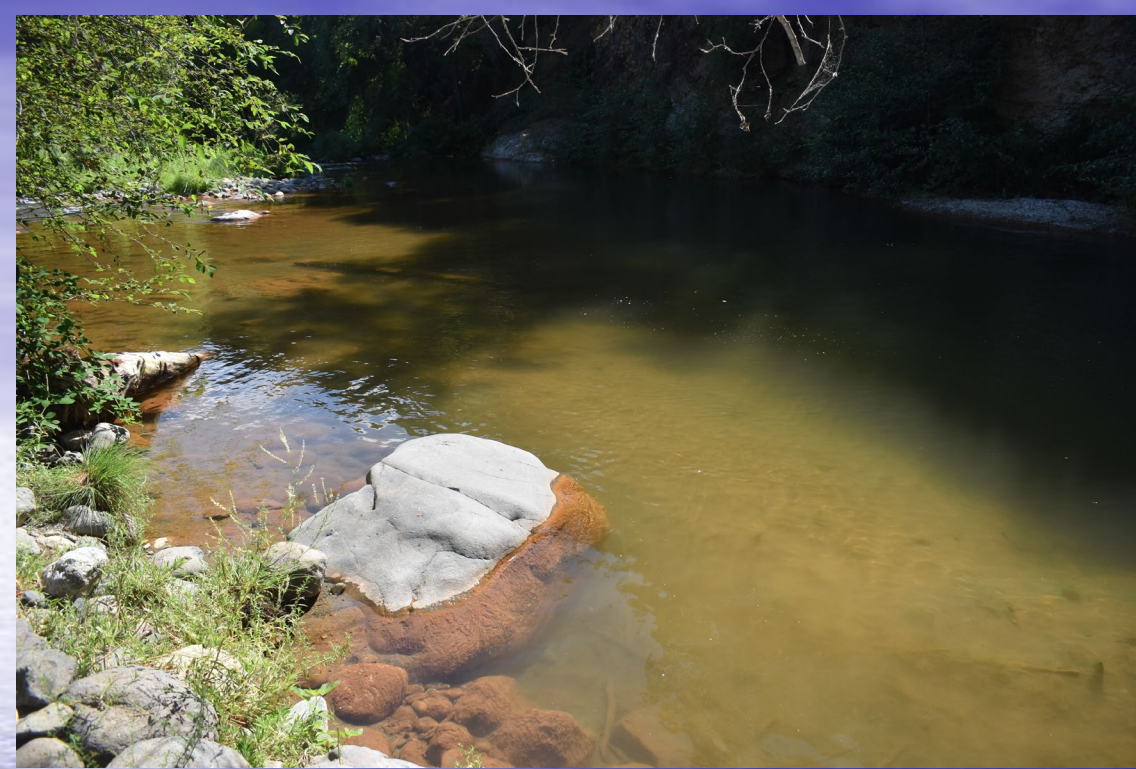


Video clips from August 19th
New debris bar (above)
Downstream water quality
with continuing erosion
(right)

Justin Cox, Kory Eldridge
Suave Aerial Solutions



Silt layer on all the rocks and covering the bottom



Silt covered rocks and dead crawfish



As sediment accumulates in the gills, fish respond by excessively opening and closing their gills to try to remove the silt. If irritation continues, mucus is produced to protect the gill surface, which may impede the circulation of water over gills and hence interfere with respiration (Berg 1982).







Impacts to Salmonids:

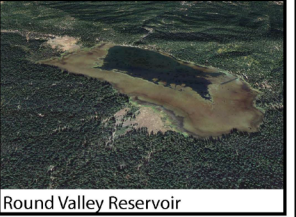
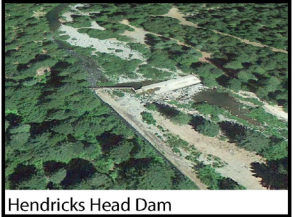
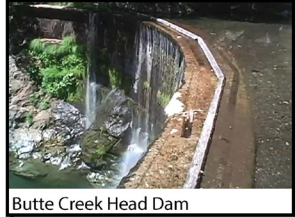
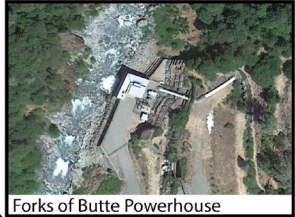
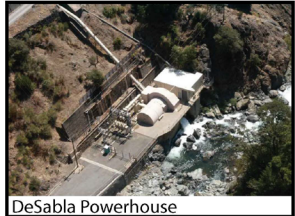
- Sediment deposits account for the greatest mortality of salmon eggs
- Sediment can reduce hyporheic upwelling reducing oxygen exchange for the eggs
- Sediment can reduce survival by infilling the interstitial spaces where the eggs hatch into alevins
- Salmonid gills are very delicate and easily affected by excess sediment
- Turbid water induces a stress response in salmonids and can lead to compromised immune systems and reduced osmoregulatory competence

Levasseur 2006; Bash 2001; Everest 1987; Berg 1982; Wedemeyer and McLeay 1981; USFWS 1998.

Upper Butte Creek (Existing Conditions)

LEGEND

-  Dam
-  Powerhouse
-  Tunnel
-  Canal
-  Stream
-  Tributary Diversion

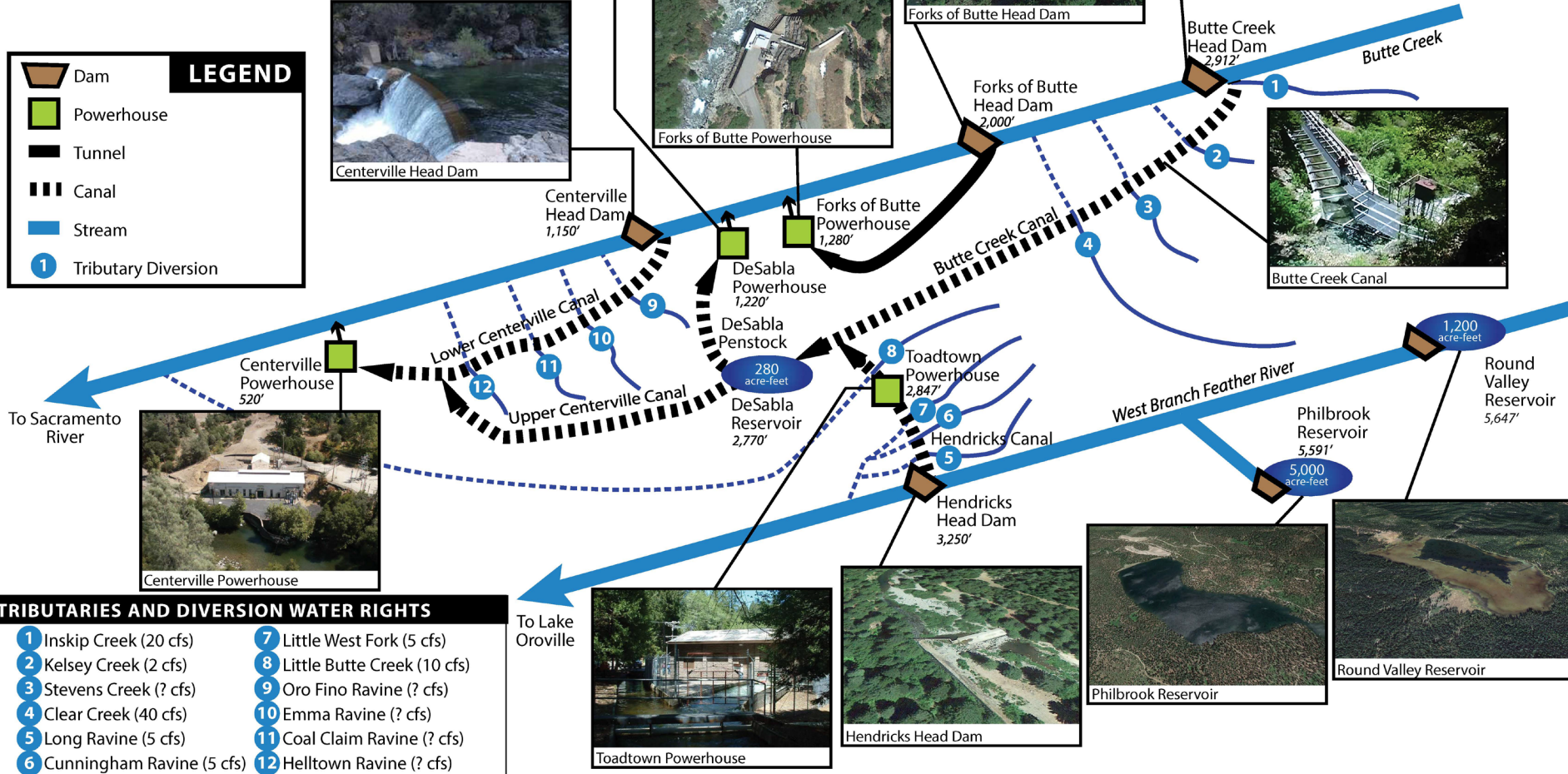


To Sacramento River

To Lake Oroville

TRIBUTARIES AND DIVERSION WATER RIGHTS

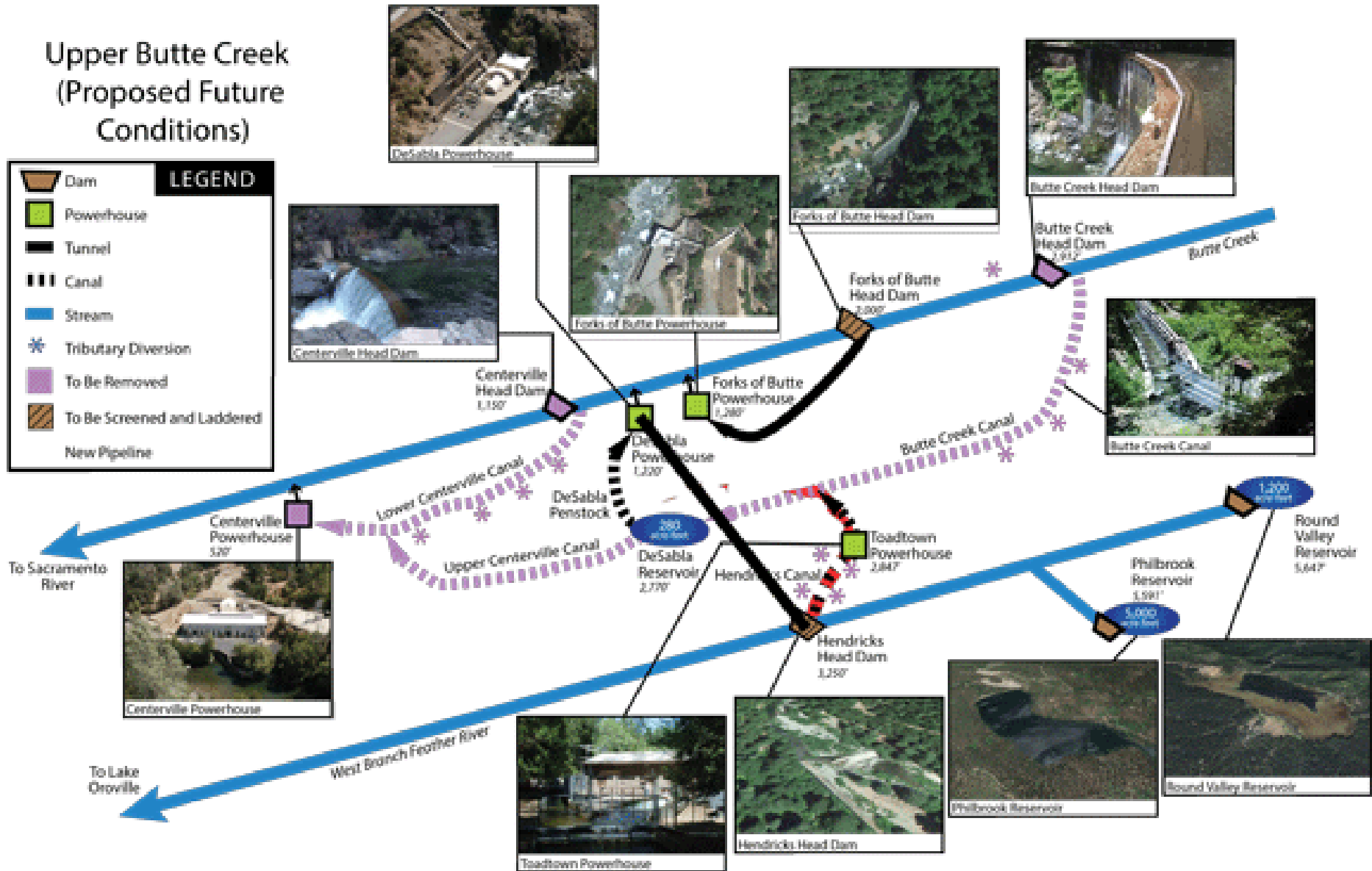
1 Inskip Creek (20 cfs)	7 Little West Fork (5 cfs)
2 Kelsey Creek (2 cfs)	8 Little Butte Creek (10 cfs)
3 Stevens Creek (? cfs)	9 Oro Fino Ravine (? cfs)
4 Clear Creek (40 cfs)	10 Emma Ravine (? cfs)
5 Long Ravine (5 cfs)	11 Coal Claim Ravine (? cfs)
6 Cunningham Ravine (5 cfs)	12 Helltown Ravine (? cfs)



Upper Butte Creek (Proposed Future Conditions)

LEGEND

- Dam
- Powerhouse
- Tunnel
- Canal
- Stream
- Tributary Diversion
- To Be Removed
- To Be Screened and Laddered
- New Pipeline



Butte Creek Retool

Using tunnels (bold white lines) to deliver the valuable West Branch Feather River water would eliminate over 20 miles of unstable canals and expand habitat for Spring Run Chinook Salmon at the same time.

Legend

- Area
- Coverage Area
- Feature 1
- Feature 2
- Fishermans Campsite
- Forest Ranch Community Center
- Inskip Pioneer Cemetery
- Vintage Pines Crafting

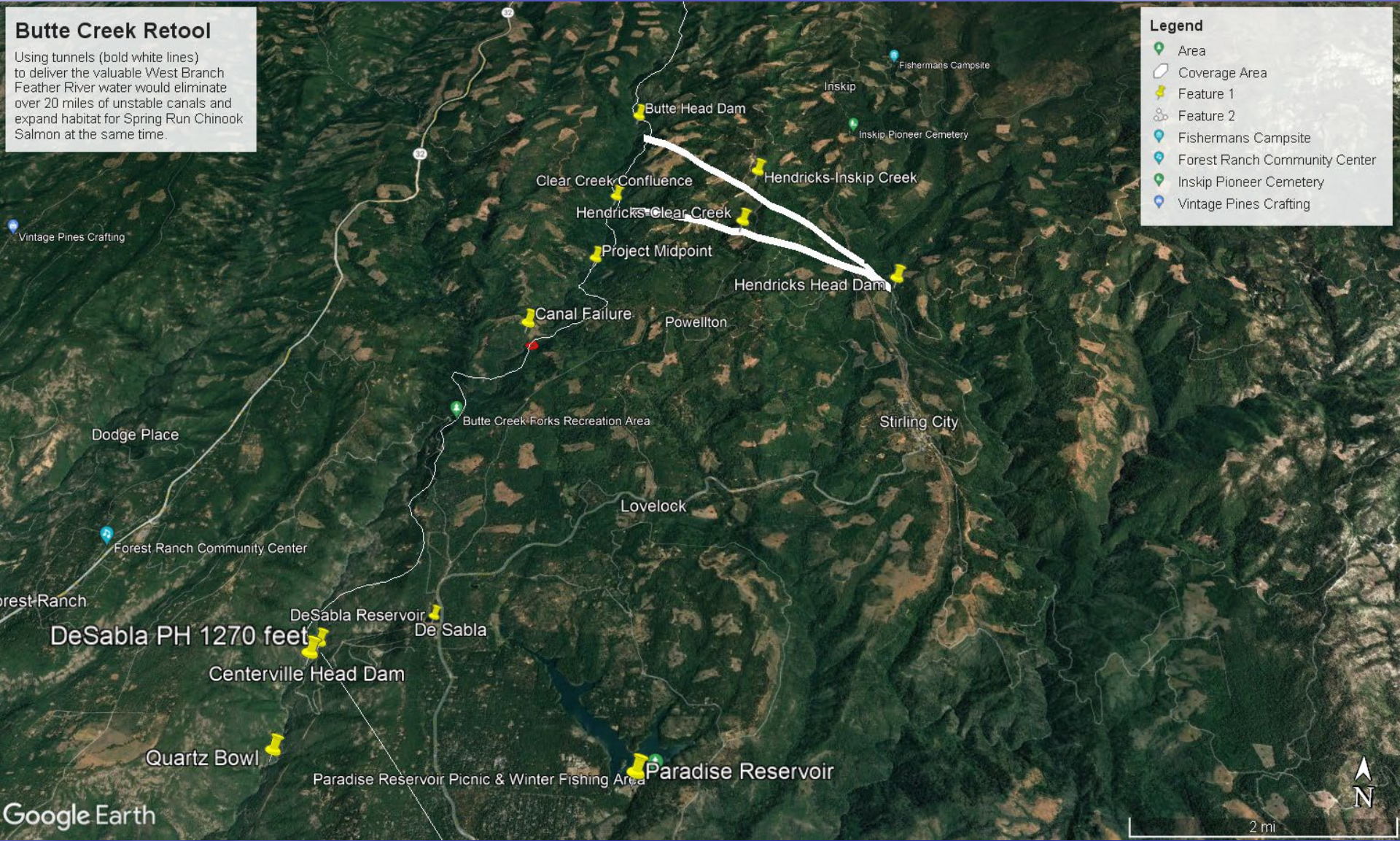




Photo by John Sherman

Butte Creek Problems and Promise

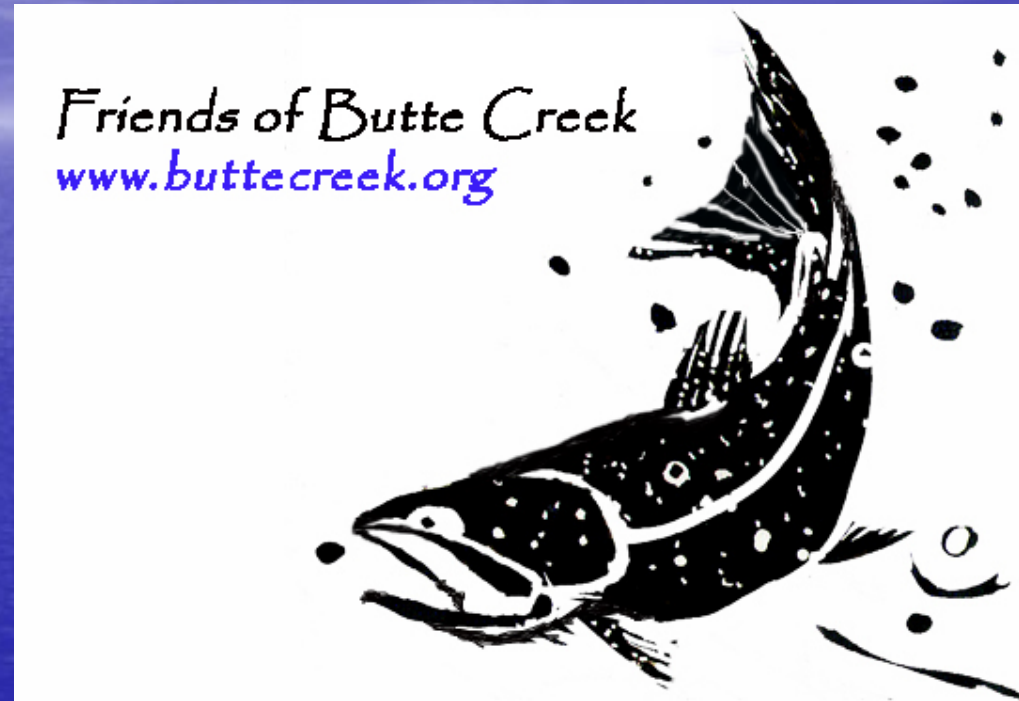
Quartz Bowl
June 2021

21,580 SRCS
returned

19,773 died
before spawning

Mostly promise, but serious
problems will persist.....

Butte Creek
DeSabra-
Centerville
Hydro Project -
Decommission
or Retool?
Salmon Want to
Know



Allen Harthorn
Friends of Butte Creek 2023

Take Action Today!

Write to the Federal Energy Regulatory Commission and share your experiences and demand the FERC hold PG&E accountable for this disaster.

Action Alerts handouts have been distributed and electronic versions are available on our website.

www.buttecreek.org

And....join our mailing list, donate if you can, and please join us for our 17th Annual Wild and Scenic Film Festival



WILD & SCENIC[®] FILM FESTIVAL

where activism gets inspired



COMMUNITY

www.buttecreek.org



Friends of Butte Creek presents the
17th Annual Wild and Scenic Film Festival
Friday October 6th, Doors open at 5:30, Films at 6:30
ARC Pavilion, 2040 Park Avenue
12 films, Silent Auction, Beer, Wine, and other beverages.



Tickets on Eventbrite, Virtual \$15, live \$20, at the door \$30