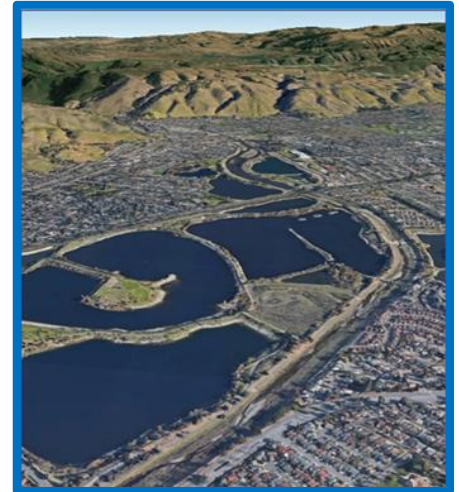


Alameda County Water District

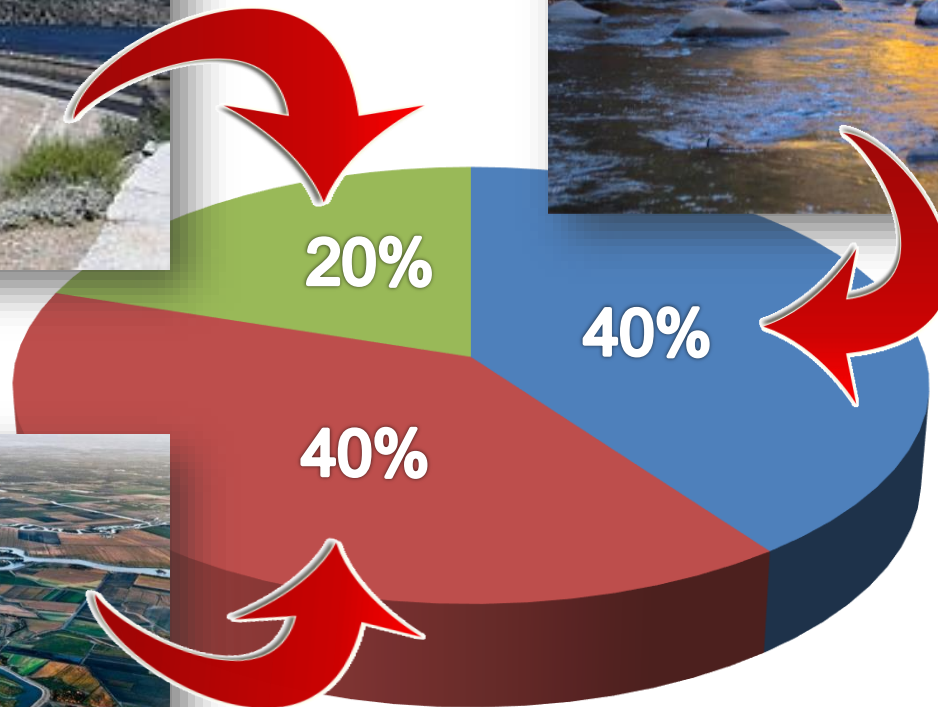
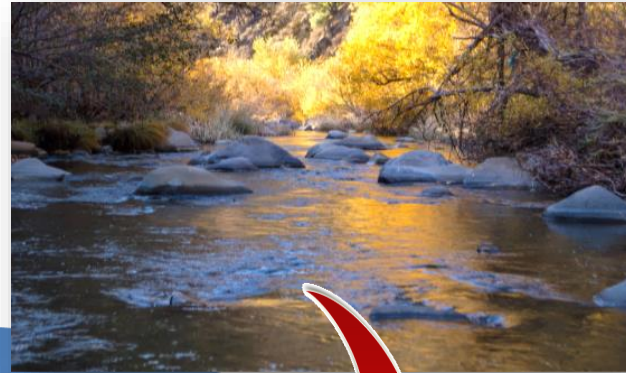
Fish, Floods, and Water Management Observations during the first Lower Alameda Creek fish passage season



Alameda Creek Watershed Forum, May 4, 2023

Presenter: Leonard Ash, Water Supply Supervisor

ACWD's Water Supply Portfolio

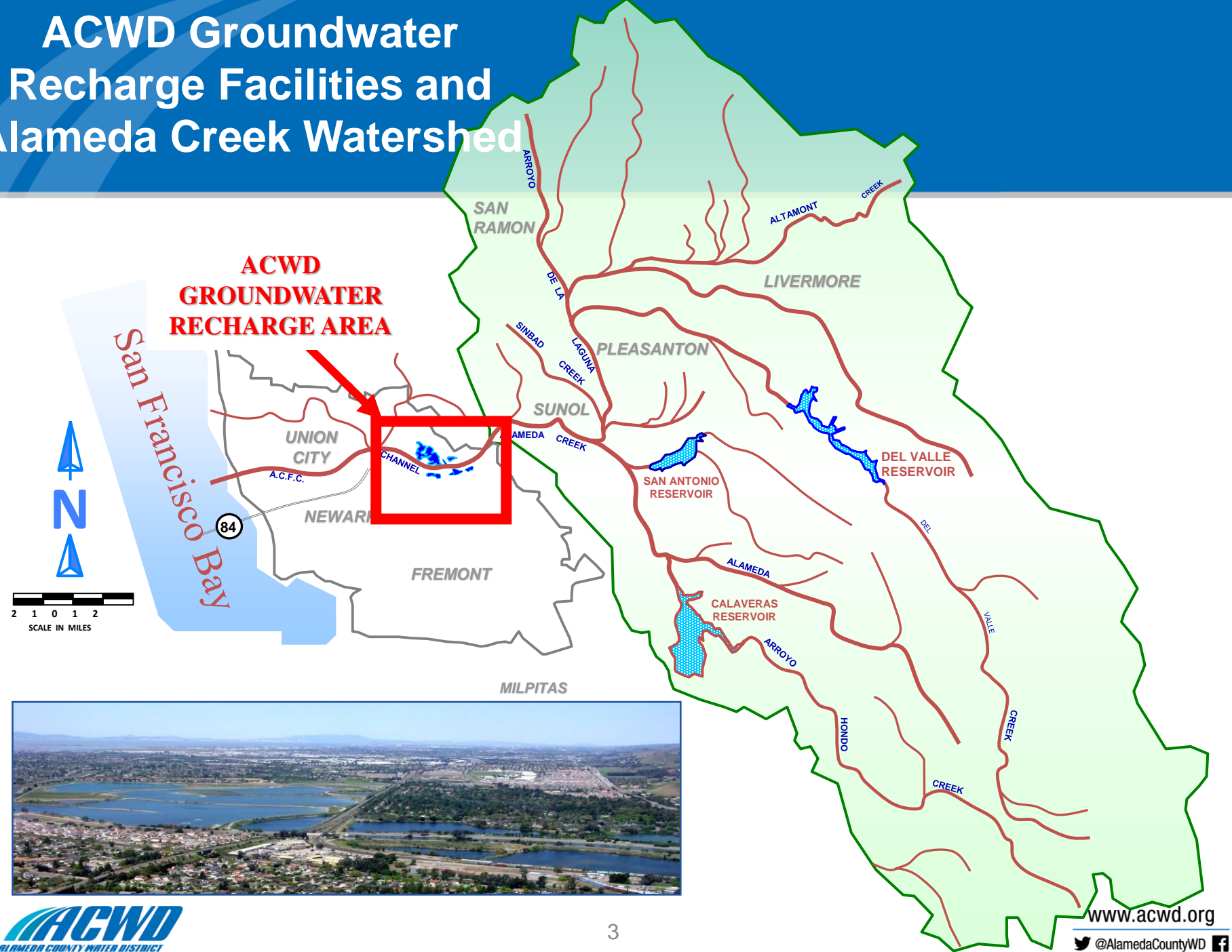


■ Alameda Creek Watershed (local)

■ State Water Project (imported)

■ San Francisco PUC (imported)

ACWD Groundwater Recharge Facilities and Alameda Creek Watershed



Alameda Creek – Many Interests

- 40% of ACWD's water supply
- Replenishes the Niles Cone Groundwater Basin
 - Water storage for dry year reserves
 - Protects aquifers from sea water intrusion
- Recreation
- Wildlife
- Flood Control
- Aesthetic & Environmental Value
- Fish Migration Corridor



Alameda Creek Steelhead

- Central Coast Steelhead Trout (*Oncorhynchus mykiss*)
- Anadromous:
 - Historic migrations from/to SF Bay
- Listed as “Threatened” under the Endangered Species Act in 1997
- Limited access to spawning and rearing habitat in upper watershed due to flood control and water supply structures



Fish Passage Improvements Program

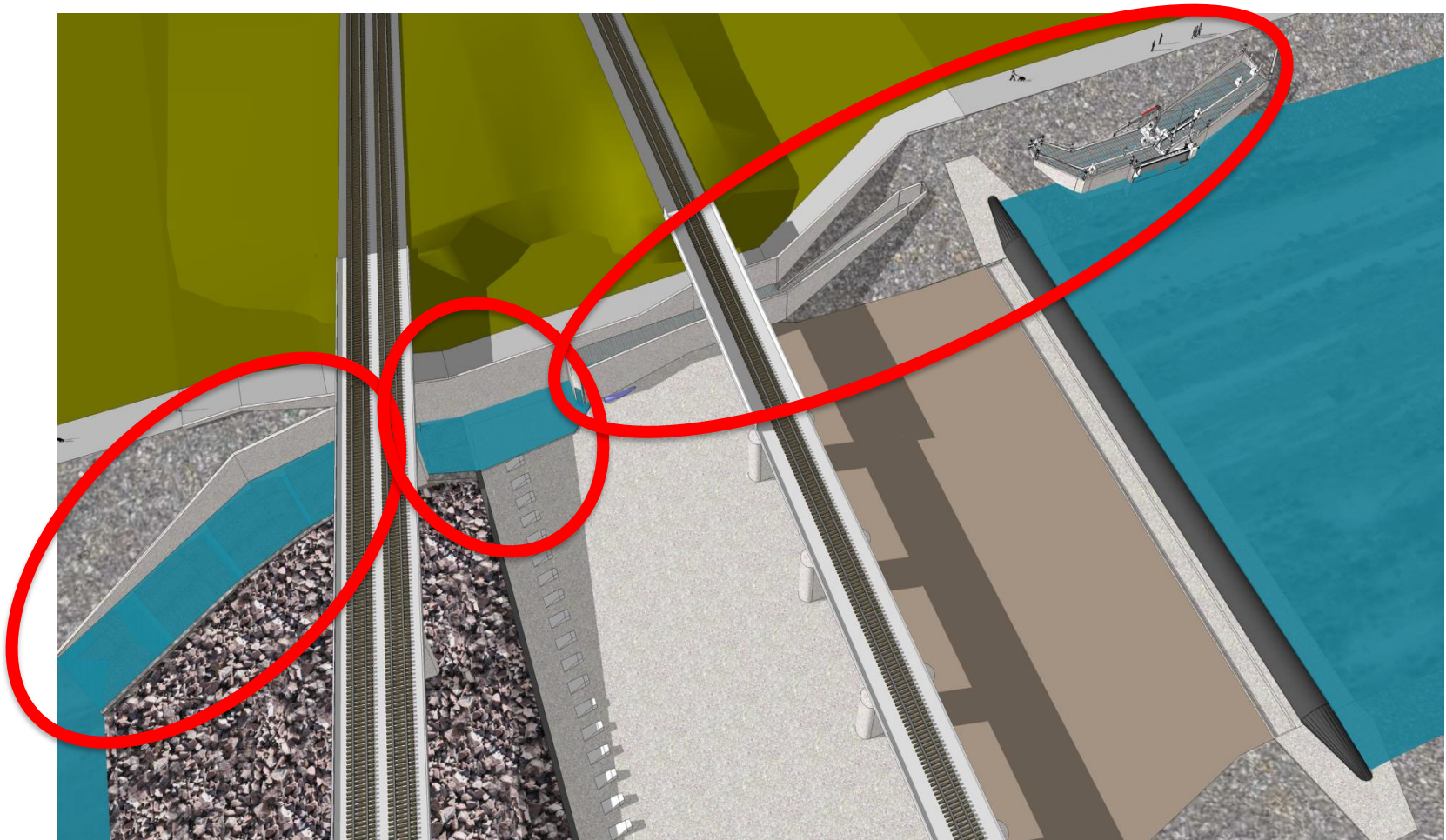
- “...a good steward of the environment.”
- Founding member Alameda Creek Fisheries Restoration Workgroup
- ACWD objective: support fishery restoration while **ensuring reliability of critical water supplies**
- ACWD Infrastructure Plan:
 - Remove Rubber Dam No. 2
 - Ladder Remaining Dams
 - Remove Select Diversions
 - Screen and Improve Remaining Diversions
- Operational Enhancements



Rubber Dam No. 1 / Drop Structure “Before”



Rubber Dam No. 1 / Drop Structure Fish Ladder Design



Rubber Dam No. 1 / Drop Structure Lower Fish Ladder



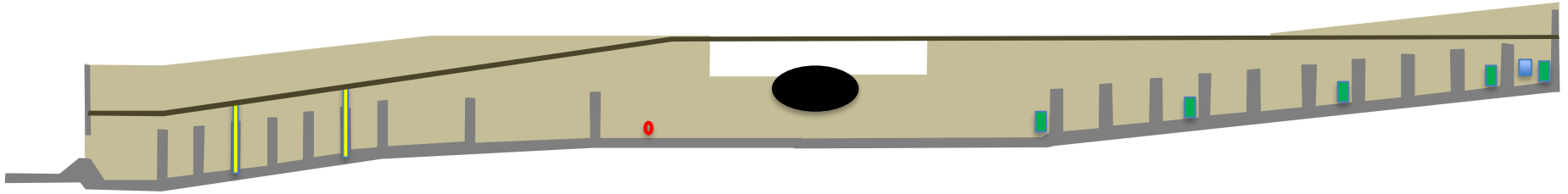
Rubber Dam No. 1 / Drop Structure Lower Fish Ladder



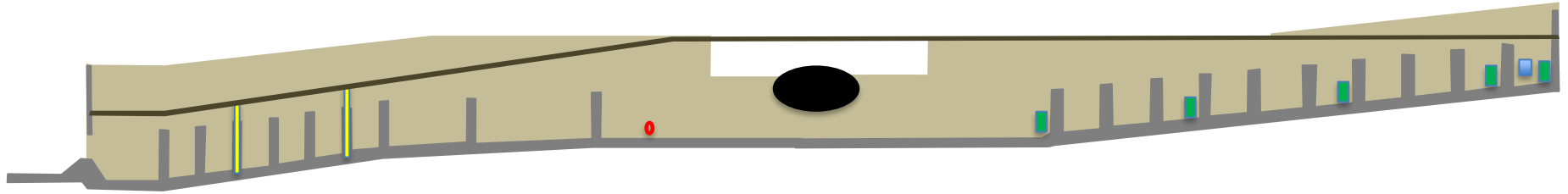
Rubber Dam No. 1 / Drop Structure Fish Ladder Transition Pool



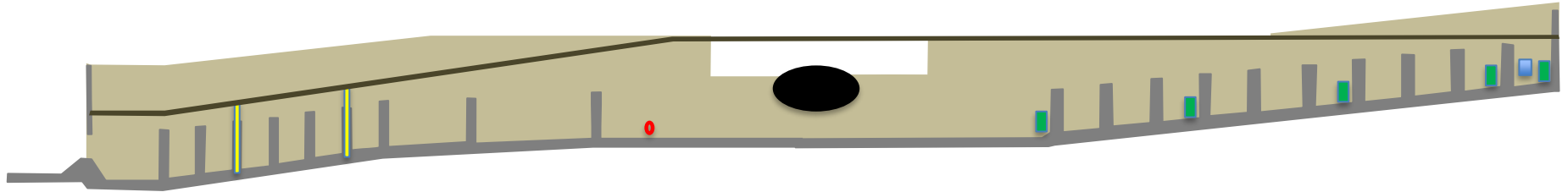
Rubber Dam No. 1 / Drop Structure Upper Fish Ladder



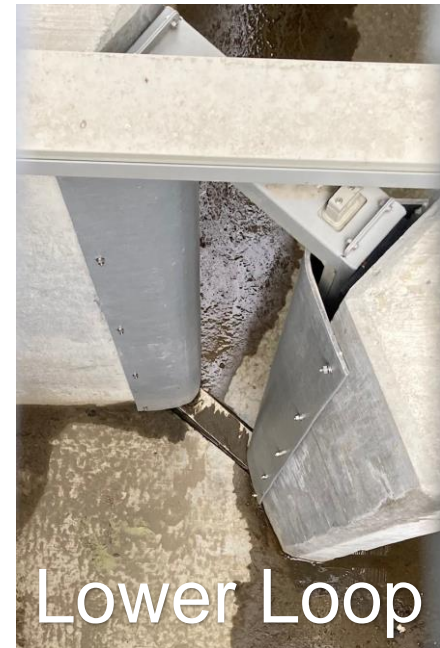
Rubber Dam No. 1 / Drop Structure Upper Fish Ladder Vertical Slots



Rubber Dam No. 1 / Drop Structure Upper Fish Ladder PIT Tag Antennas



Upper Loop



Lower Loop

PIT = Passive Integrated Transponder

SFPUC Electrofishing Surveys



Rubber Dam No. 1 / Drop Structure Fish Ladder - Start-up Testing

- Purpose: gain operational familiarity with system controls, operations, safety protocols, and confirming calibration of monitoring equipment
- Began testing at the end of November 2022 and through December



Start-up Testing – Fish Passage

- Head drop measurements
 - Simulate high and low flows through the fish ladder
- Velocity measurements
 - Test fish passage flow rates and form a baseline for average velocities using a velocity meter

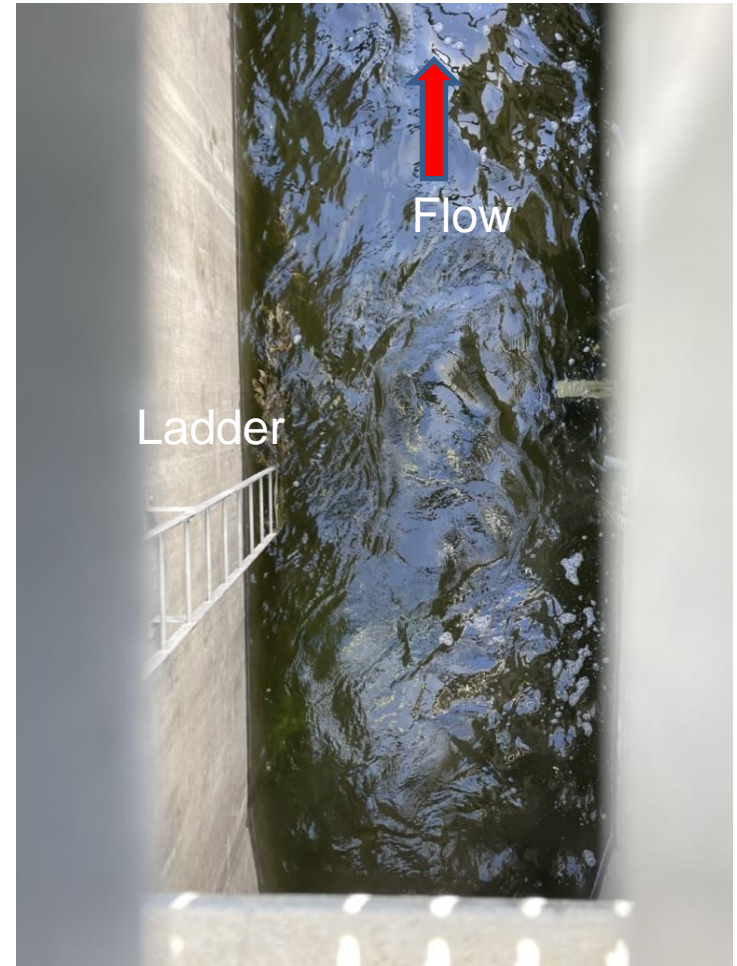


Start-up Testing – Monitoring Equipment

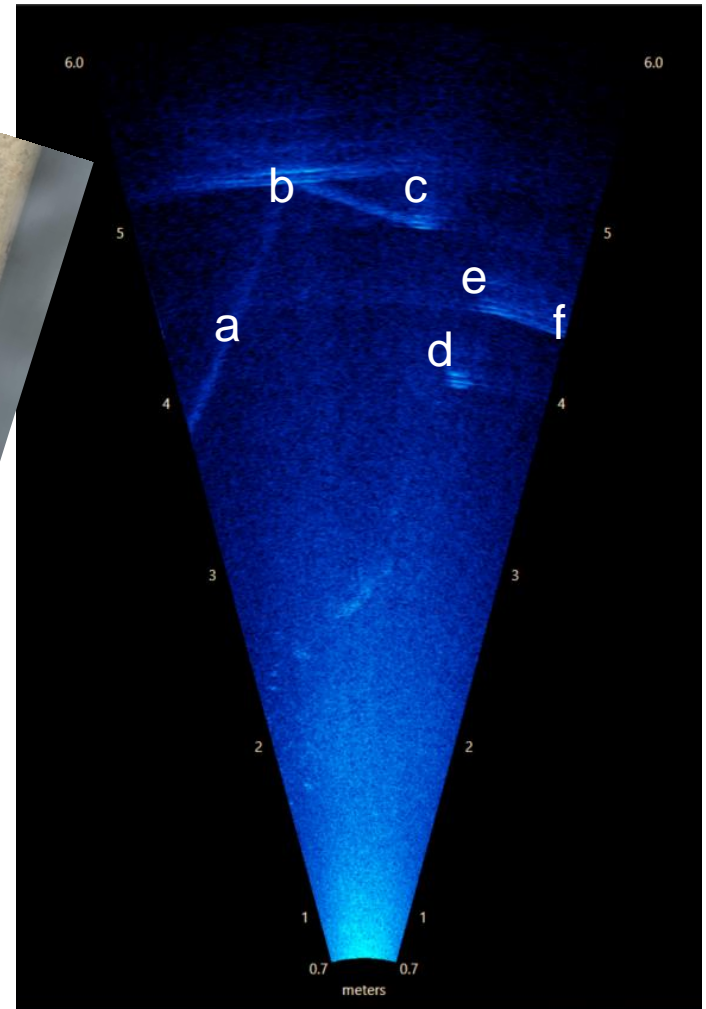
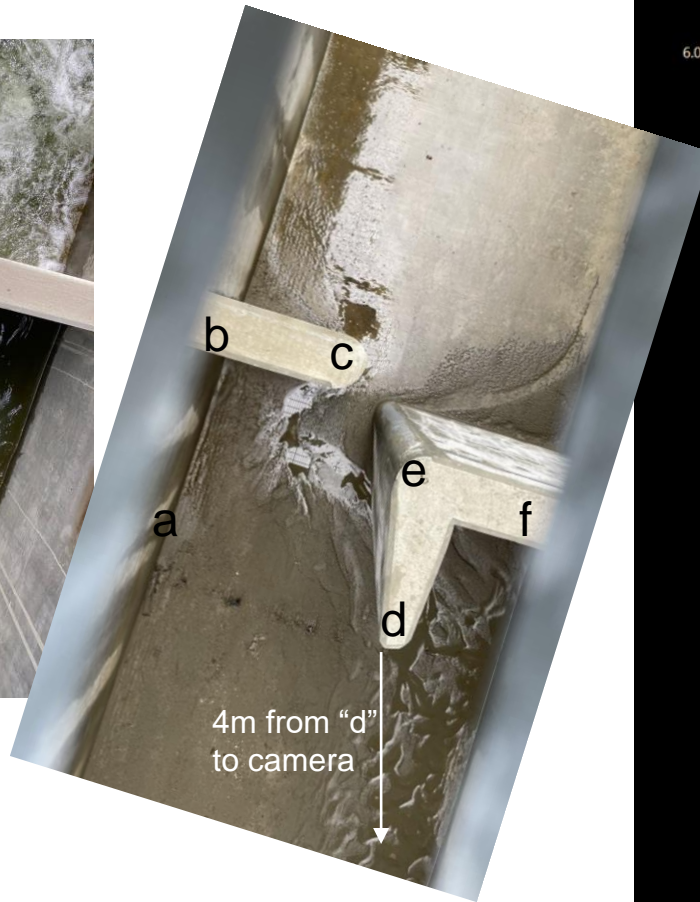


- ARIS Sonar Camera
 - Become familiar with camera operation
- Passive Integrated Transponder (PIT) Tag Antennas
 - Test various flows for the upper and lower antennas

ARIS Sonar Camera



ARIS Sonar Camera

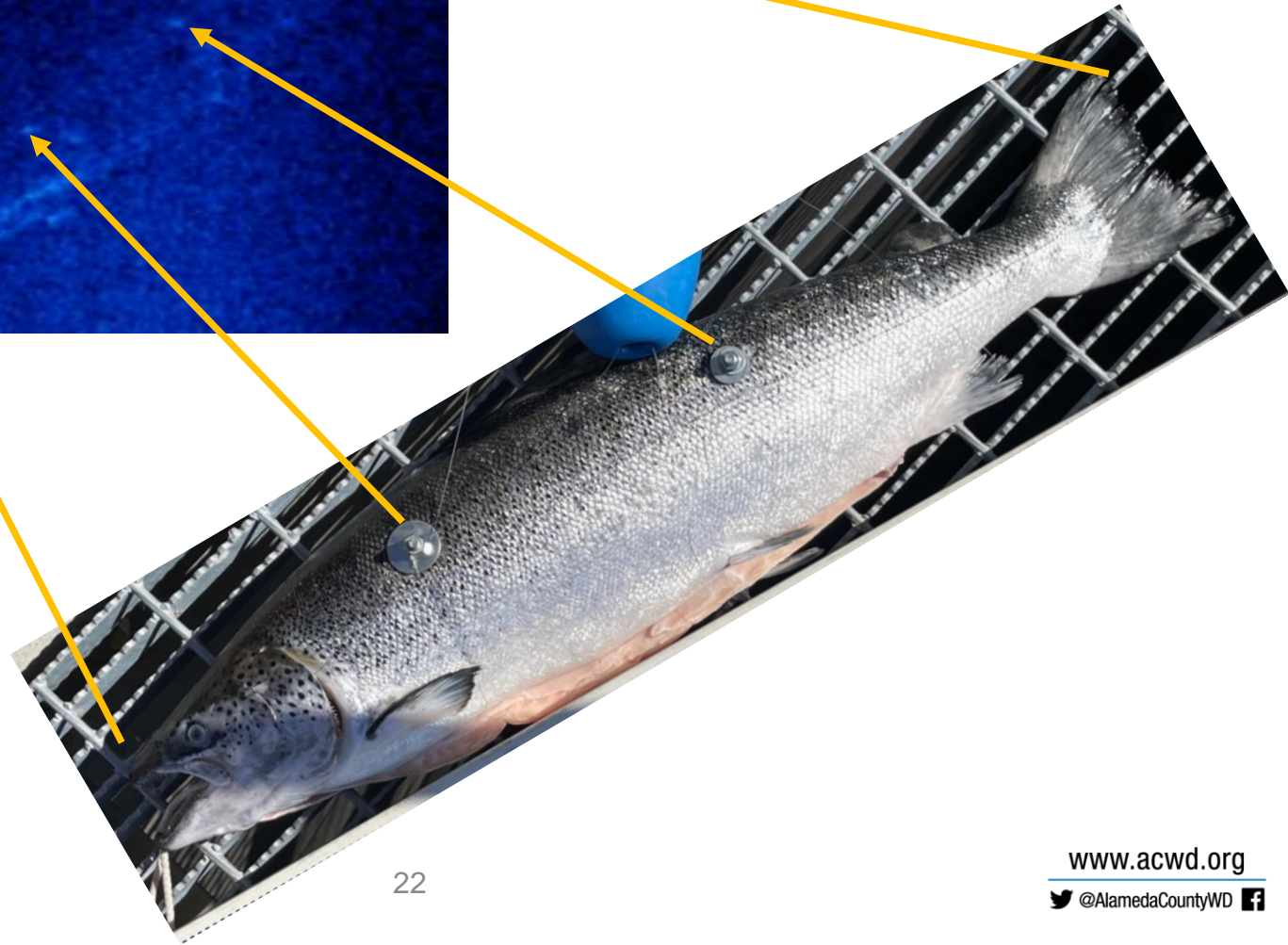
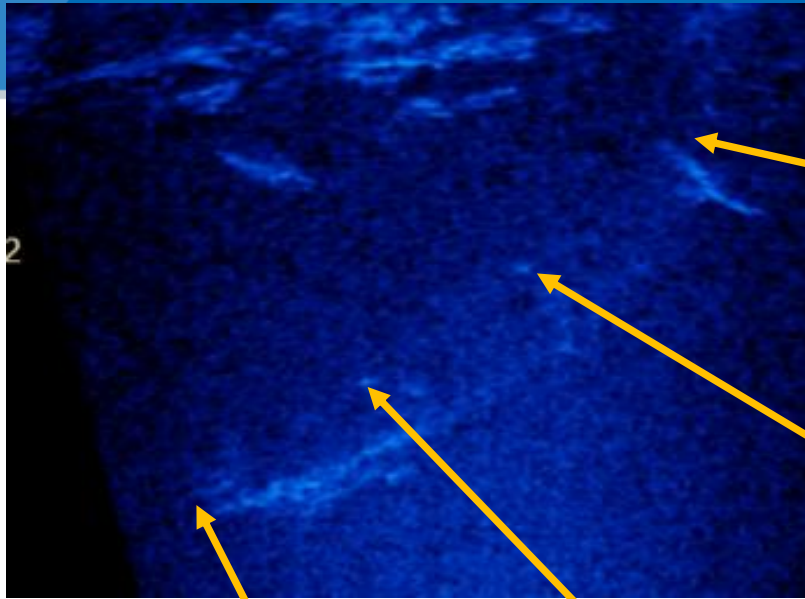


ARIS Sonar Camera

Market fish were used for testing of the ARIS sonar camera.



ARIS Sonar Camera



Start-up Testing – Monitoring Equipment

- Biomark PIT Tag Antennas
 - Test various flows for the upper and lower antennas



Start-up Testing Successes

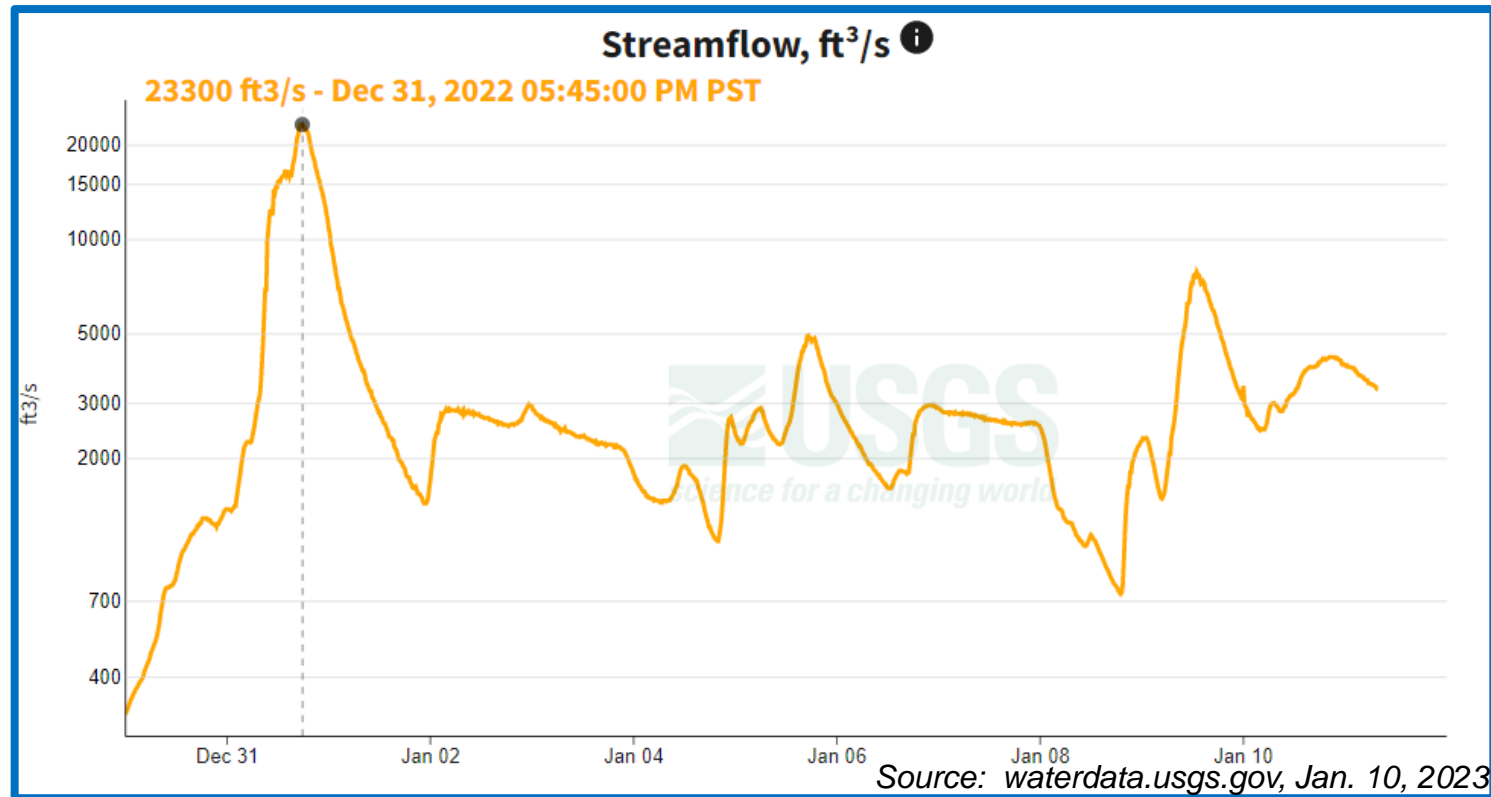
- Validated design met physical parameters for fish passage
- Confirmed monitoring equipment functionality



Lower Rubber Dam No. 1 Fish Ladder
Transition Pool
November 30, 2022
Photo Credit: D. Sarka

Historic Winter Flows

Provisional streamflow data from U.S. Geological Survey (USGS) streamflow gage at Niles Canyon

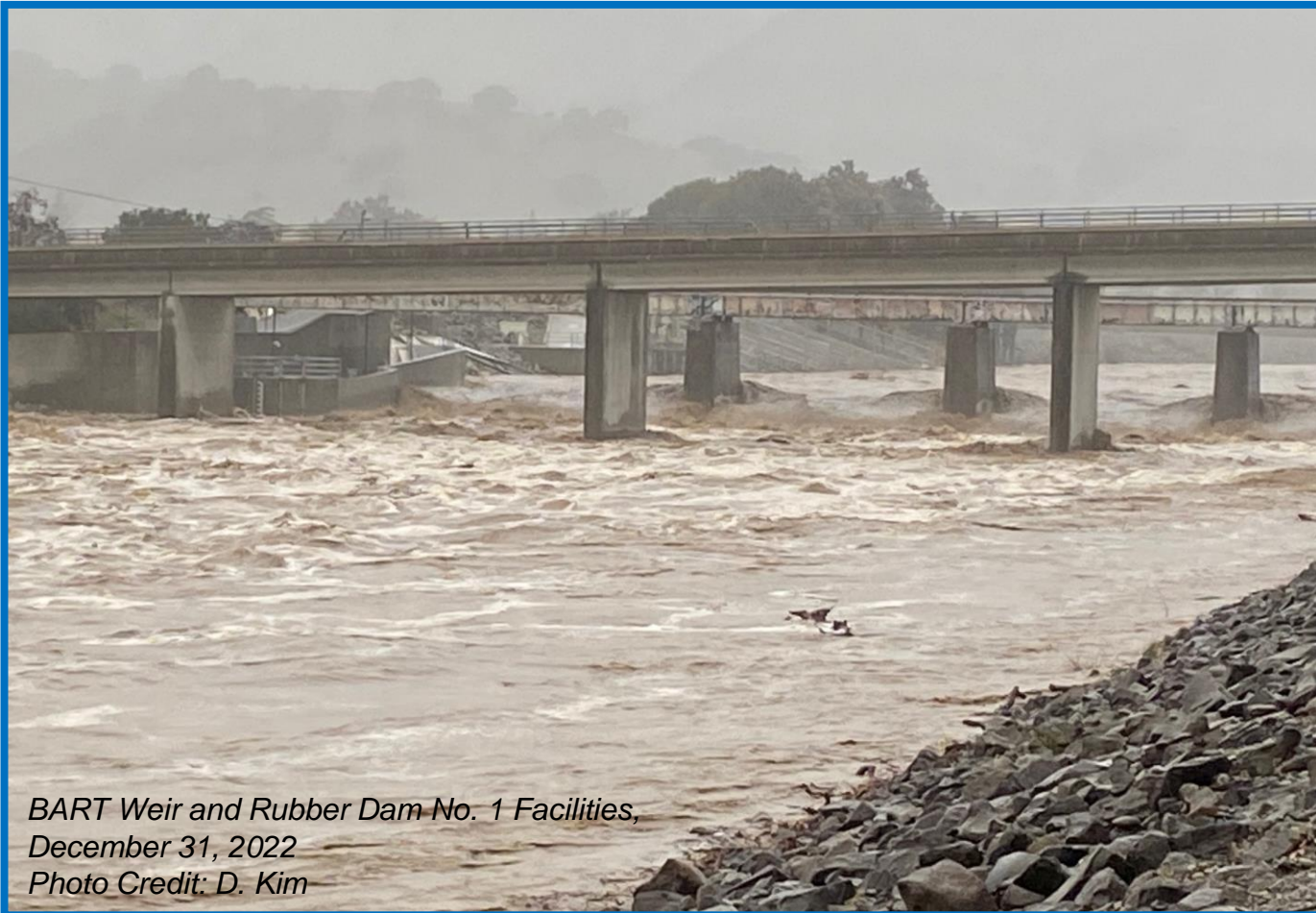


Alameda Creek – Niles Staging Area



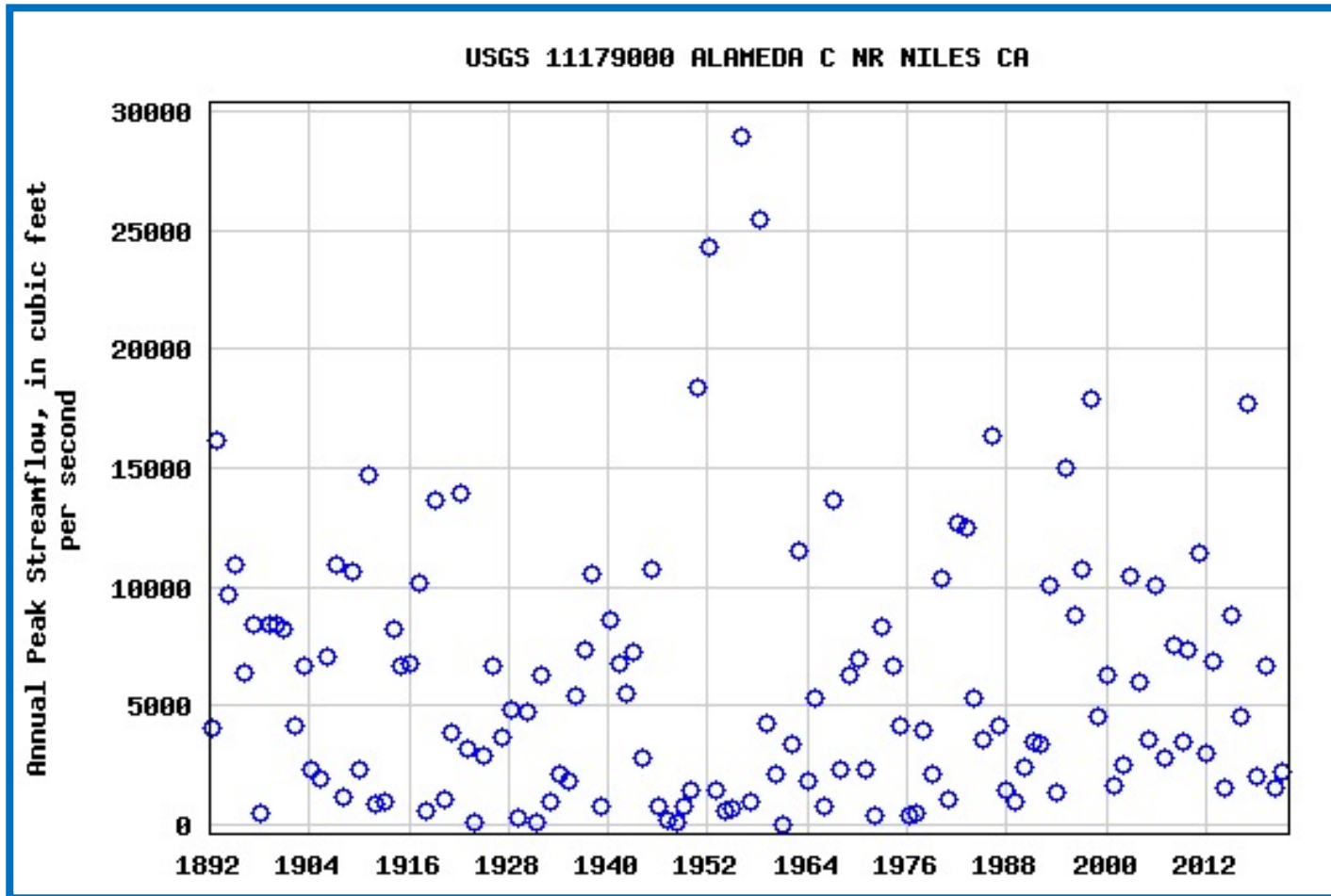
*Niles Staging Area,
December 31, 2022
Photo Credit: J. Warren*

Alameda Creek – BART Weir



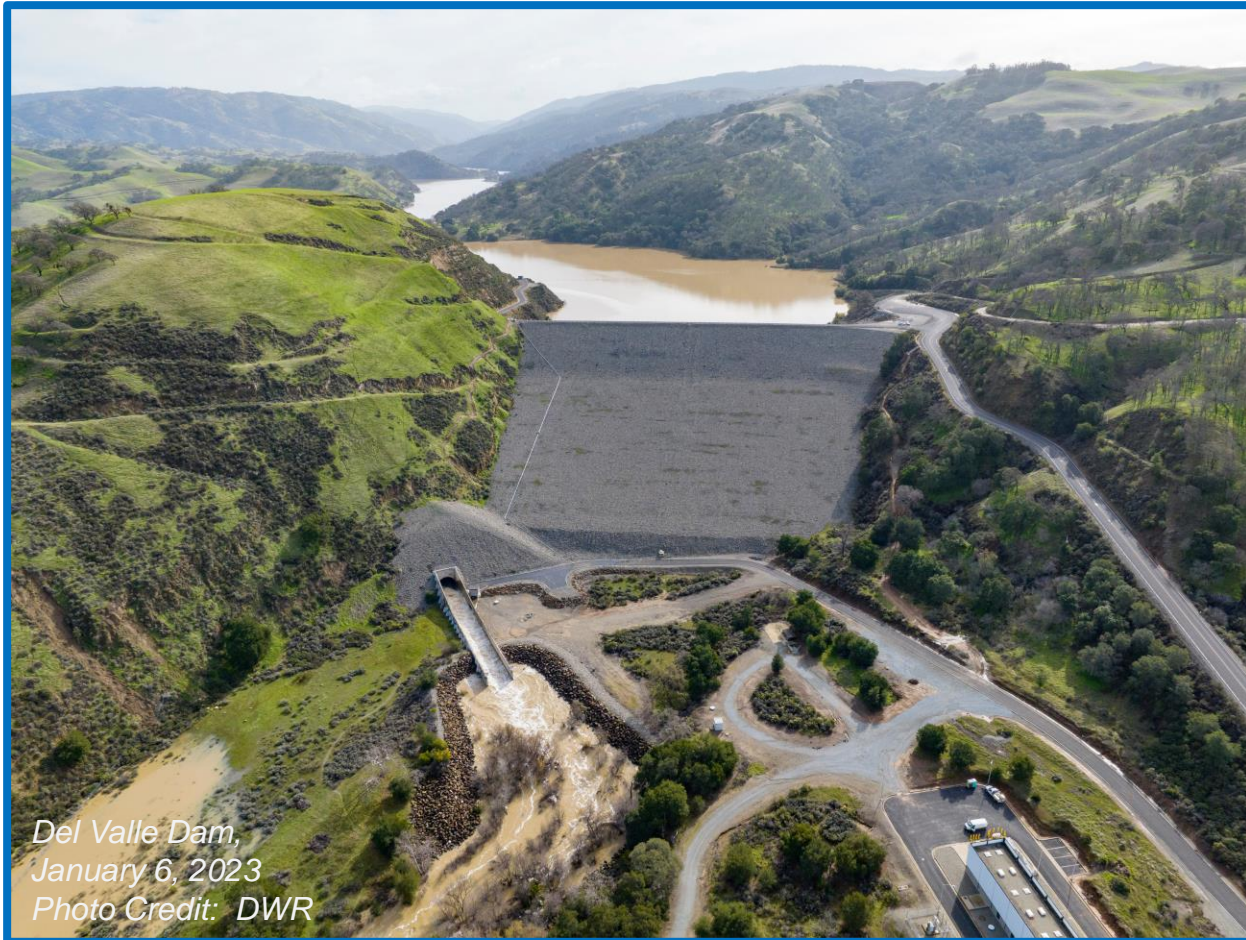
*BART Weir and Rubber Dam No. 1 Facilities,
December 31, 2022
Photo Credit: D. Kim*

Alameda Creek Peak Streamflow



Source: https://nwis.waterdata.usgs.gov/nwis/peak/?site_no=11179000

Lake Del Valle Flood Releases



Del Valle Dam,
January 6, 2023
Photo Credit: DWR

Sustained High Flows

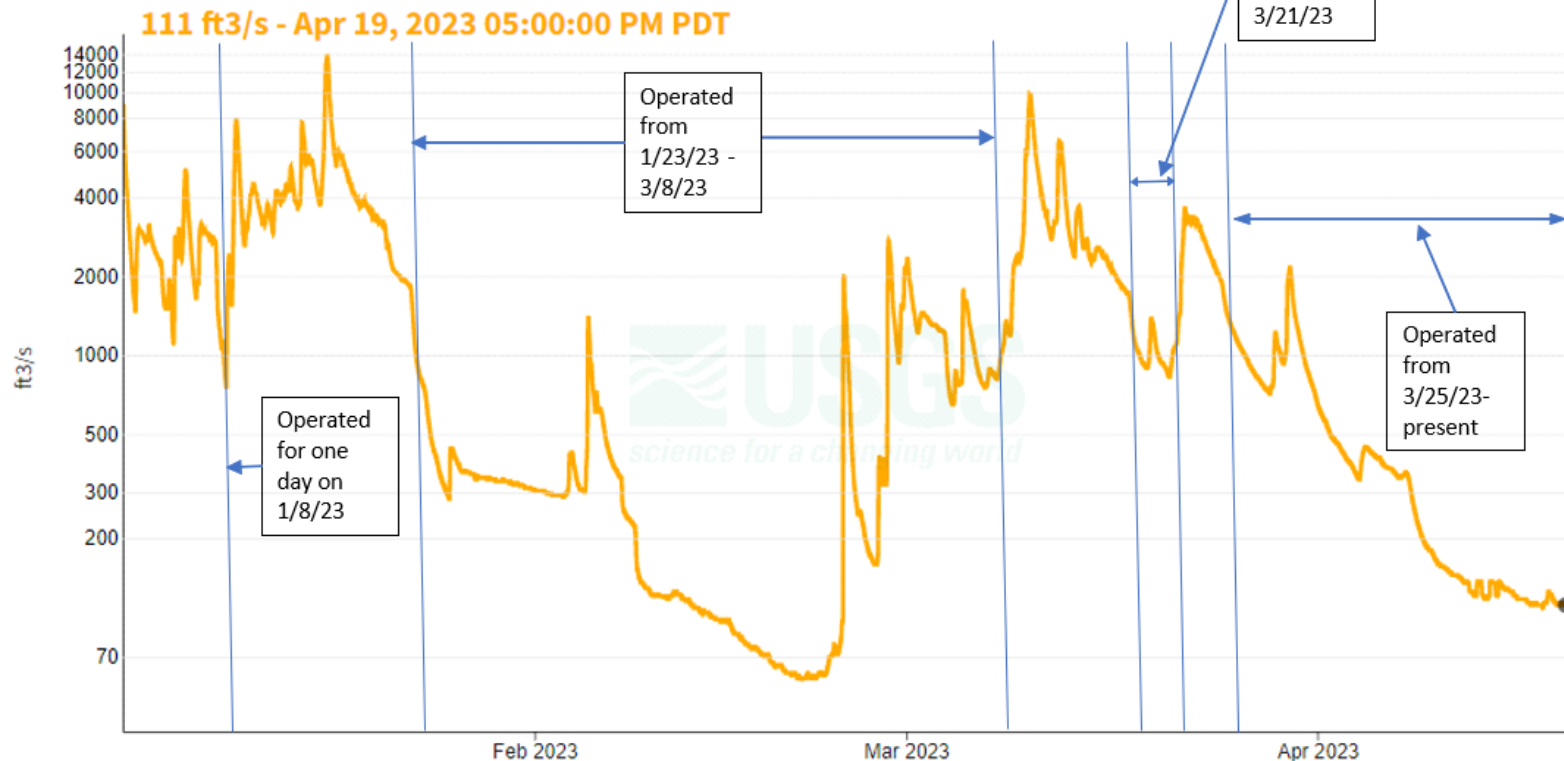


Winter Operations Through Present

Alameda C NR Niles CA - 11179000

January 1, 2023 - April 19, 2023

Streamflow, ft³/s ⓘ



<https://waterdata.usgs.gov/monitoring-location/11179000/#parameterCode=00060&startDT=2023-01-01&endDT=2023-04-19>. Accessed April 19, 2023.

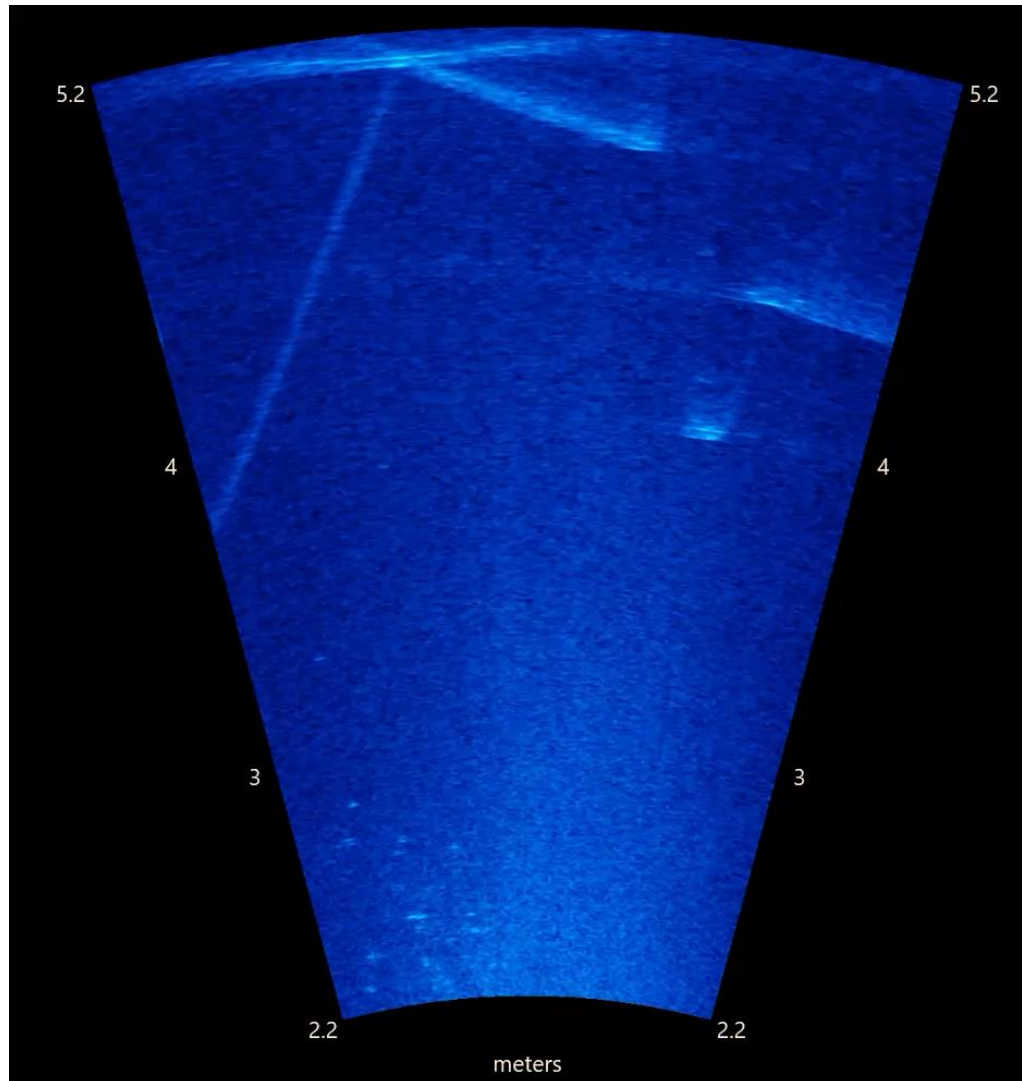
Observations – Chinook Salmon



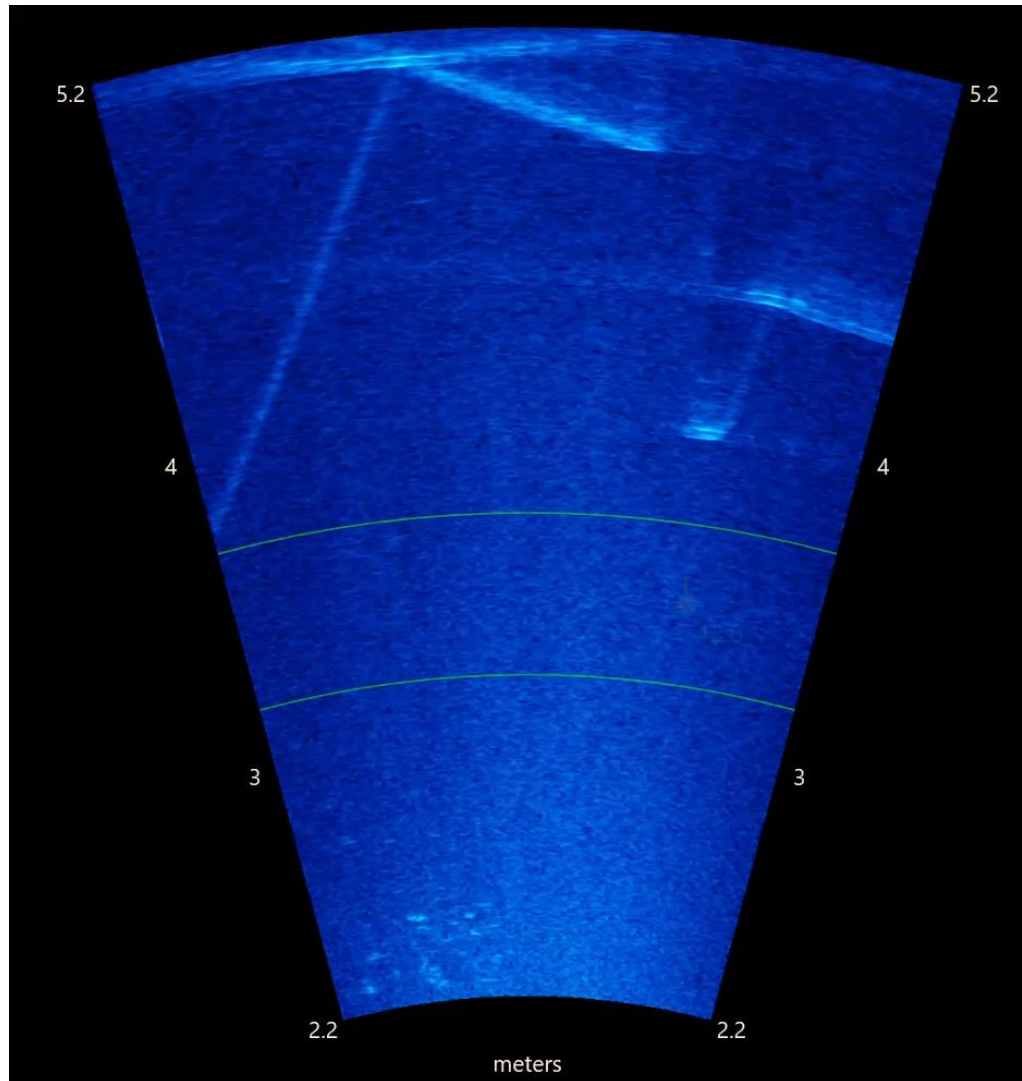
Observations – Pacific Lamprey



ARIS Sonar Camera



ARIS Sonar Camera



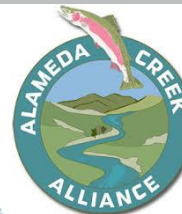
Fish Ladder Successes

- Since the start of operation and monitoring, monitoring results show that possibly three of the four species/life stages of interest have successfully used the fish ladder:
 - ✓ Chinook during the in-migration season
 - ✓ Pacific lamprey during in-migration season
 - ✓ Juvenile *O. mykiss* during the out-migration season
 - Adult steelhead during the in-migration season

ACWD Fish Passage Program

Partners and Stakeholders

- Collaboration Partners
 - Alameda Creek Alliance
 - Alameda Creek Fisheries Restoration Work Group
 - East Bay Regional Park District
 - San Francisco Public Utilities Commission



- Agency Partner for RD1/BART Weir Fish Ladder
 - ACFC&WCD



- Regulatory/Permitting Agencies

USACE Readiness	SFRWQCB
USACE Regulatory	UPRR
ACFC&WCD	BART
USFW	EBRPD
NOAA/NMFS	DSOD
CDFW	PG&E



- Other Organizations/Funding Entities
 - U.S. Bureau of Reclamation
 - National Fish & Wildlife Federation
 - California Natural Resources Agency
 - CA Wildlife Conservation Board
 - Coastal Conservancy



Questions?

Leonard Ash
leonard.ash@acwd.com
(510) 668-6539



Rubber Dam No. 1 Fish Ladder
January 1, 2023