

**Comparing Past, Current, and Future
Stream Mapping with
Flows, State Jurisdictions, and
Changing Alameda County Jurisdiction
Under the
Watercourse Protection Ordinance**

**Bruce King, Friends of San Lorenzo Creek
Alameda Creek Watershed Conference**

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What Prompted This Presentation?

Alameda County's jurisdiction to protect streams in all unincorporated areas was drastically reduced when USGS:

- Employed new stream delineation and mapping methods, and then...
- Published the 2018 US Topo maps that showed drastically less intermittent streams



Alameda County Watercourse Protection Ordinance (WPO)

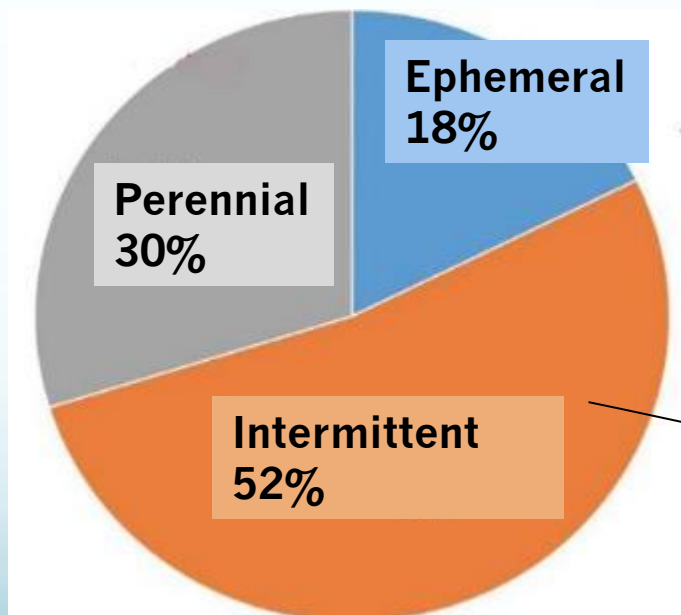
- Alameda County Public Works Agency (ACPWA)
- Unincorporated areas
- Adopted in 1982
- “Watercourses” are blue-line (perennial & intermittent) streams on most recent US Topo maps
- Topo map stream reaches remained stable for 36 years until USGS 2018 US Topo maps



USGS & DWR Categories and Definitions

DWR = California Department of Water Resources

- **Perennial streams.....** flow at all times
- **Intermittent streams..** flow in winter to early spring and are dry in late spring to fall
- **Ephemeral streams...** flow in direct response to rainfall



US Army Corp
& EPA based on
USGS NHD, 2017

What's Next?

- **Compare Stream Types**
- **State vs. County Jurisdictions**
- **USGS Hydrography Programs**
- **Stream Delineation on Maps**
- **Ground-Truthing Study Results**

**With a focus on Intermittent Streams
and Impacts on the
County's WPO Jurisdiction**



State vs Alameda County Jurisdictions

- California Water Boards and Dept of Fish & Wildlife (CDFW) jurisdiction:
 - Over nearly all streams
 - Use narrative standards to define streams
 - “A channel that conveys water in response to rainfall and has sufficient flow to create a defined bed and bank”*
 - Do not use stream categories or US Topo maps
- Alameda County Public Works (ACPWA):
 - Jurisdiction: Streams on most recent US Topo maps as defined in the WPO
 - Problem: County coordination with state agencies

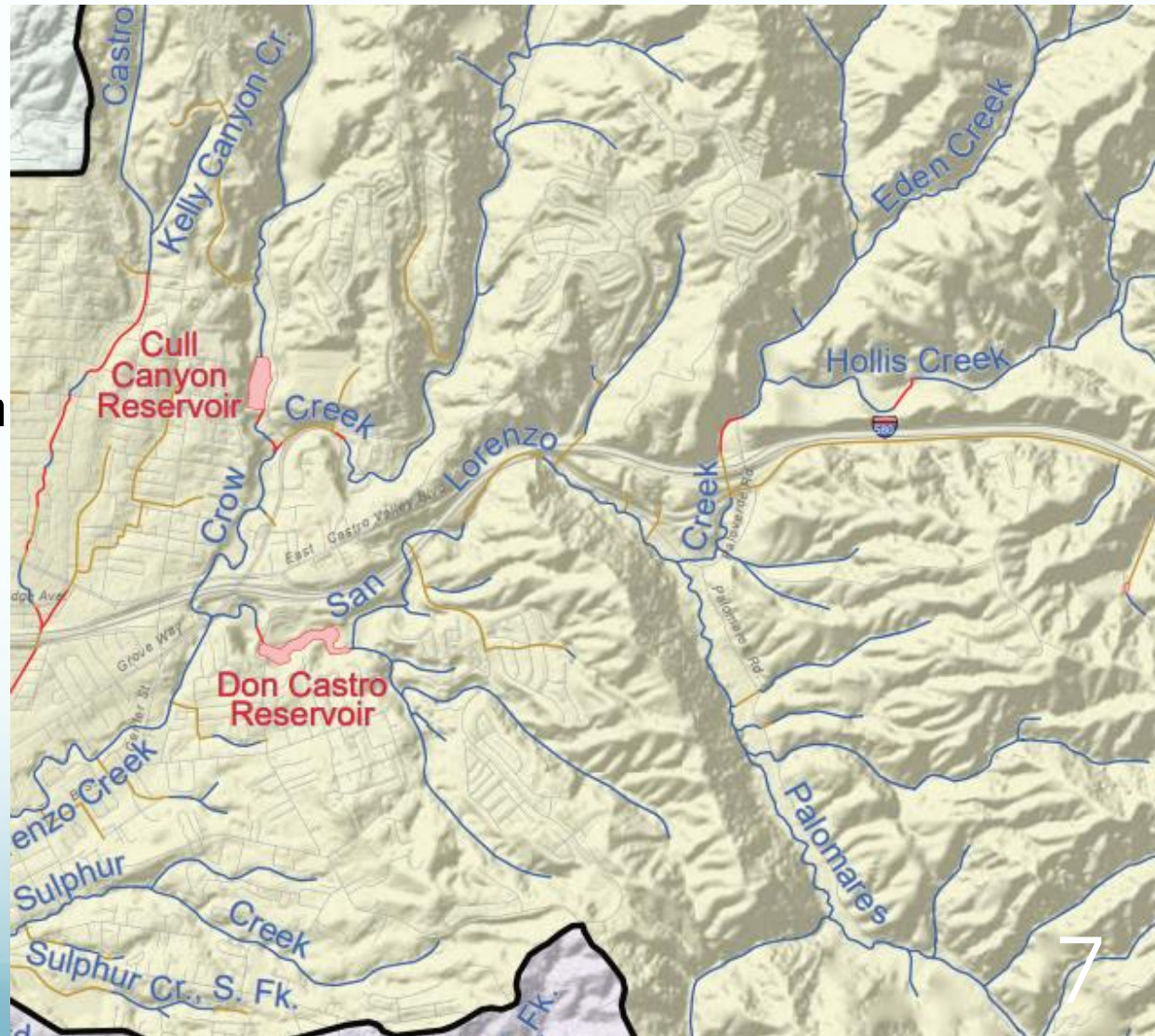
Oakland Museum & County Flood Control Watershed Maps

Shows all
streams with
sub-watersheds
 ≥ 50 acres

No stream
categories shown

Ground-truth
survey rating:

*Best
intermittent
stream ID*



Changes in USGS Hydrography and Maps

Past: Topo maps made by hand from primary sources including direct field observations

Now: National Hydrography Dataset (NHD)

- US Topo maps are produced from NHD
- US Topo maps do not display all NHD streams
- NHD is updated by USGS and their NHD Steward... California Dept of Water Resources (DWR)
- DWR stream delineation rules assess aerial photographs every 2-3 years, no ground-truthing

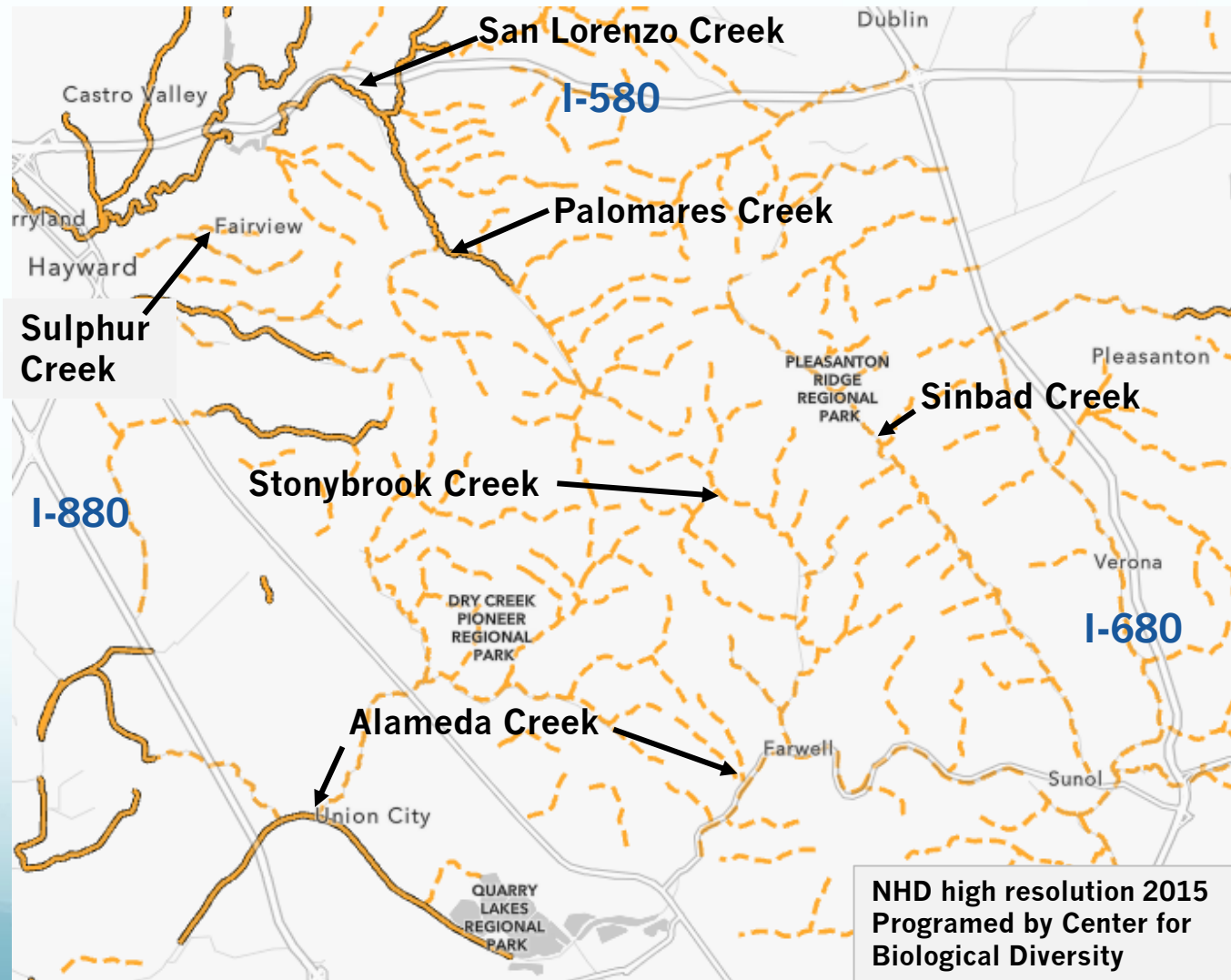
Near Future: 3D Hydrography Program using Lidar

NHD Layer Showing Blue-Line Streams on 2015 (and earlier) US Topo Maps

Streams
displayed:
Perennial
Intermittent

WPO scope
1982-2018

Ground-truth
survey rating:
Better
Intermittent
stream ID

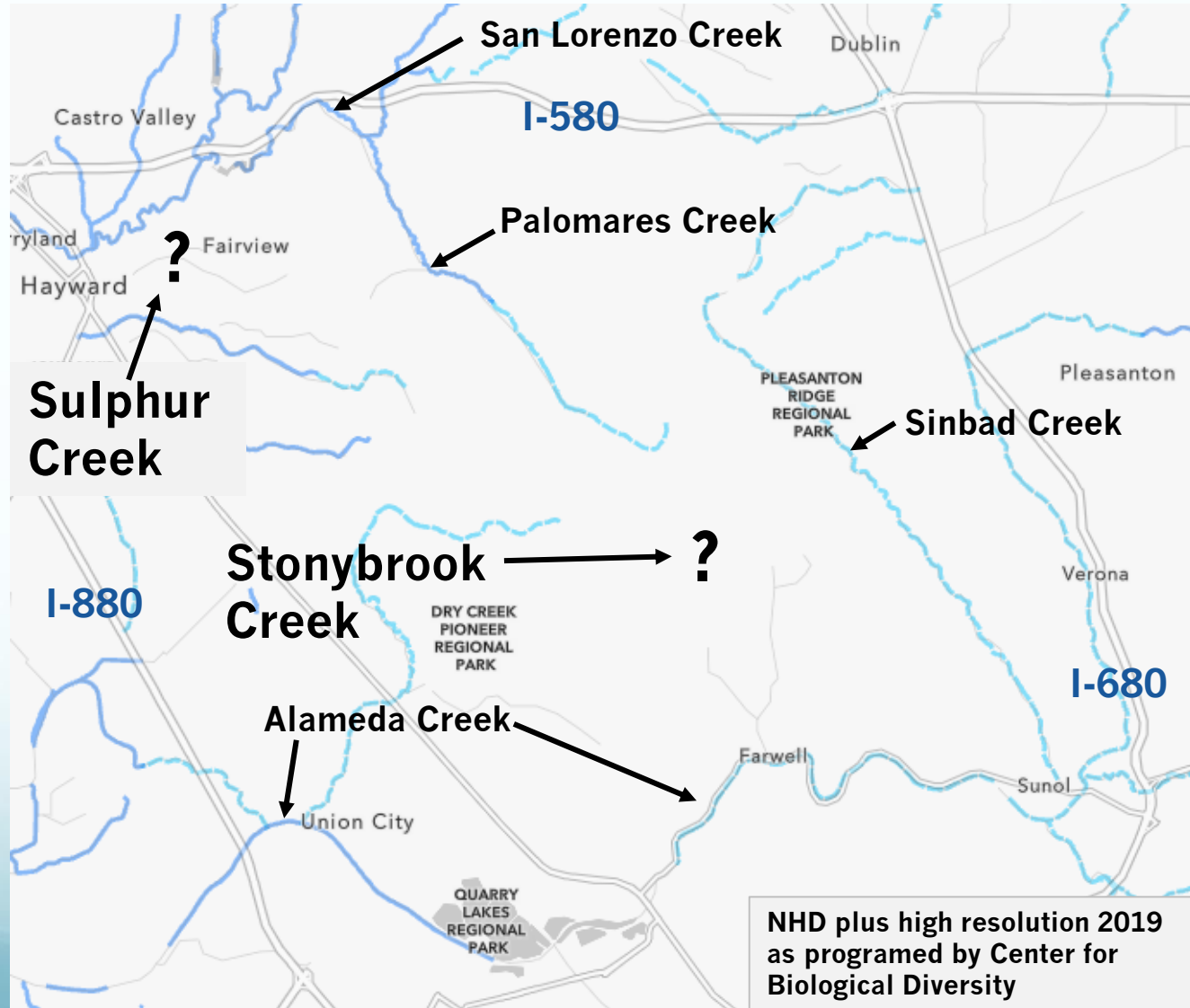


NHD Layer Showing Blue-Line Streams on 2018 & 2021 US Topo Maps

Streams
displayed:
Perennial
Intermittent

WPO scope
2018-Today

Ground-truth
survey rating:
Worst
Intermittent
stream ID



Blue-Line Streams

2015 vs 2018-2021 US Topo Maps

2015
US Topo Map:
Green & Red
streams

2018-2021
US Topo Map:
Green streams

Blue-circled
areas are
subwatersheds
of ≥ 50 acres

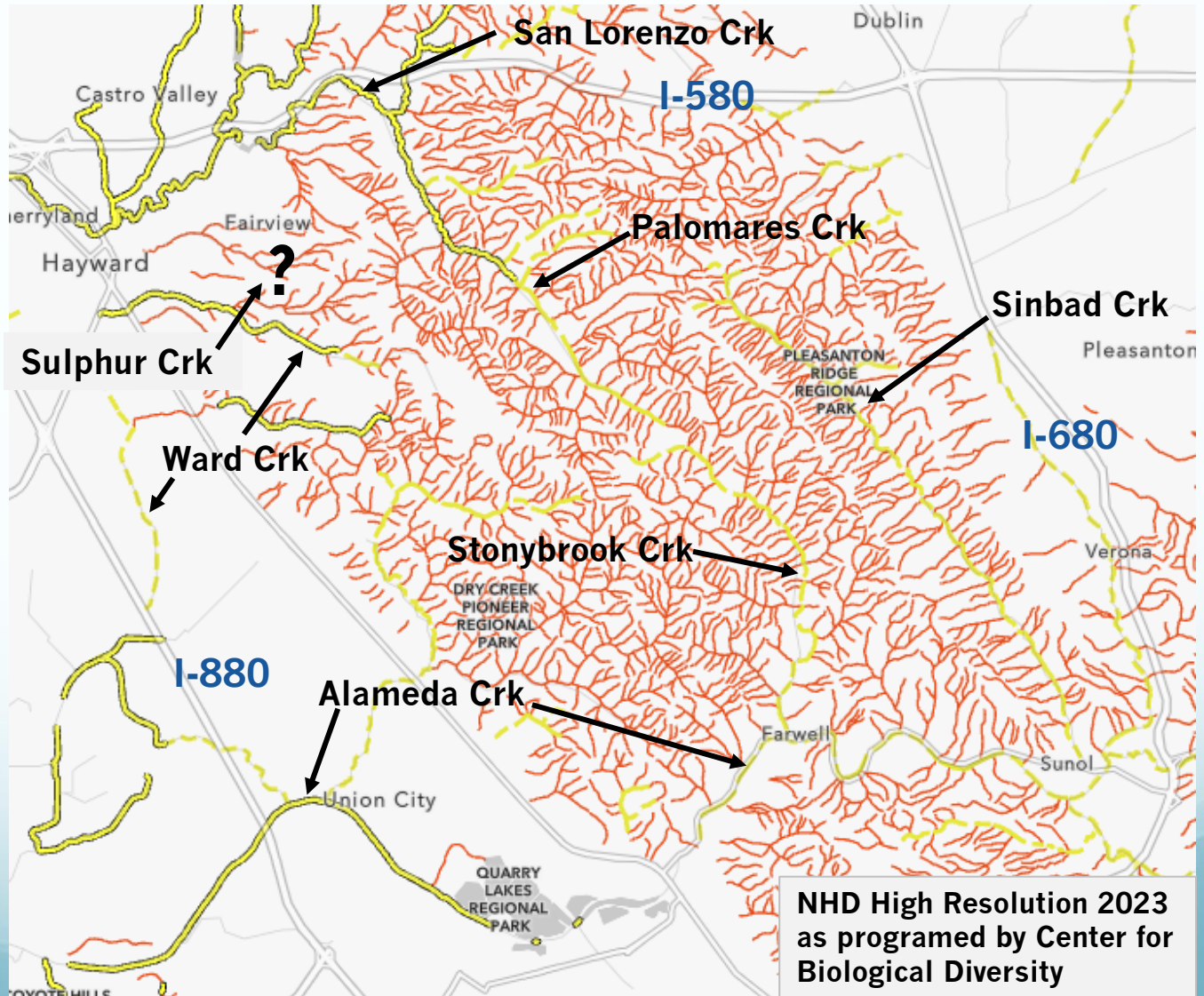
**ACPWA lost
WPO
jurisdiction
over the Red
streams**



2023 USGS National Hydrography Dataset Layer

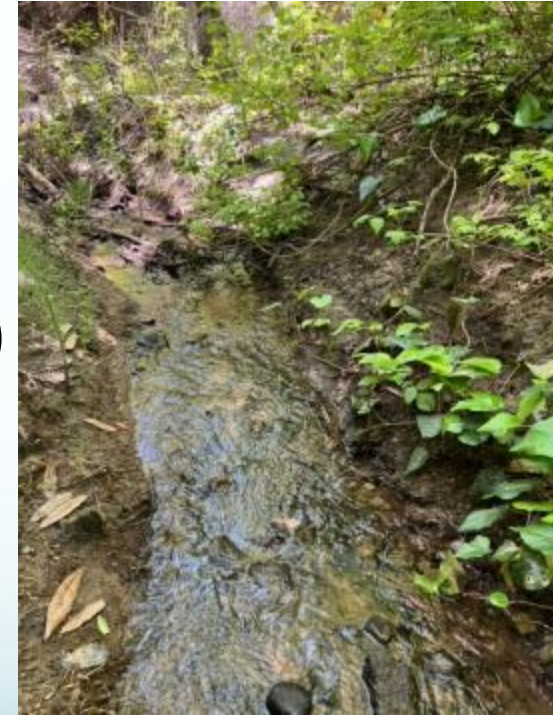
All streams displayed:
Perennial
Intermittent
Ephemeral

Ground-truth survey rating:
Bad
Intermittent
stream ID

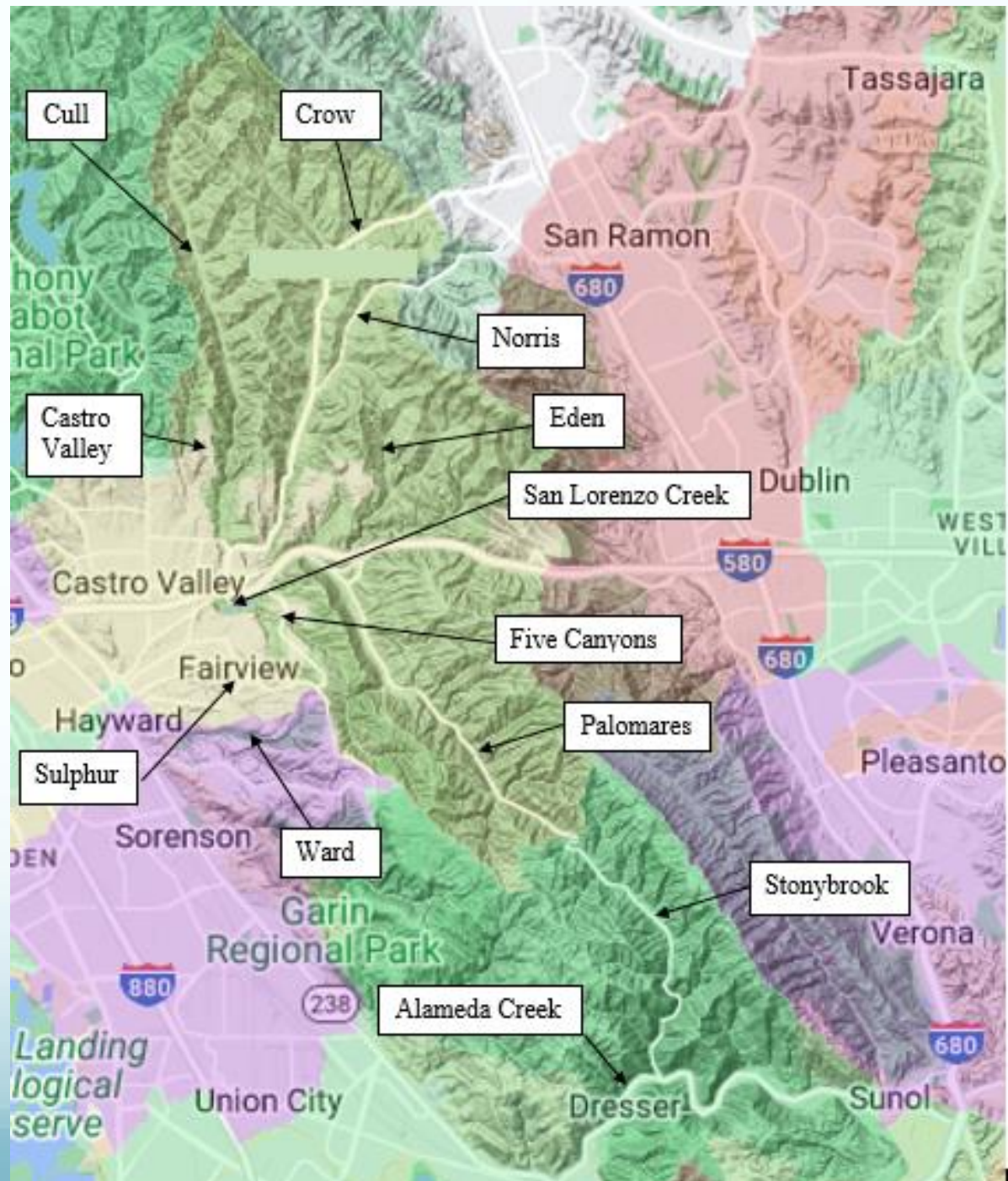
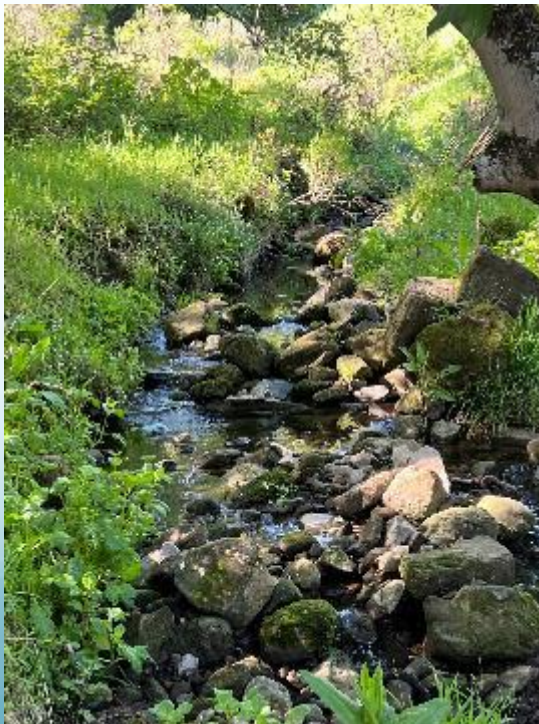


2024 Ground-Truthing Study

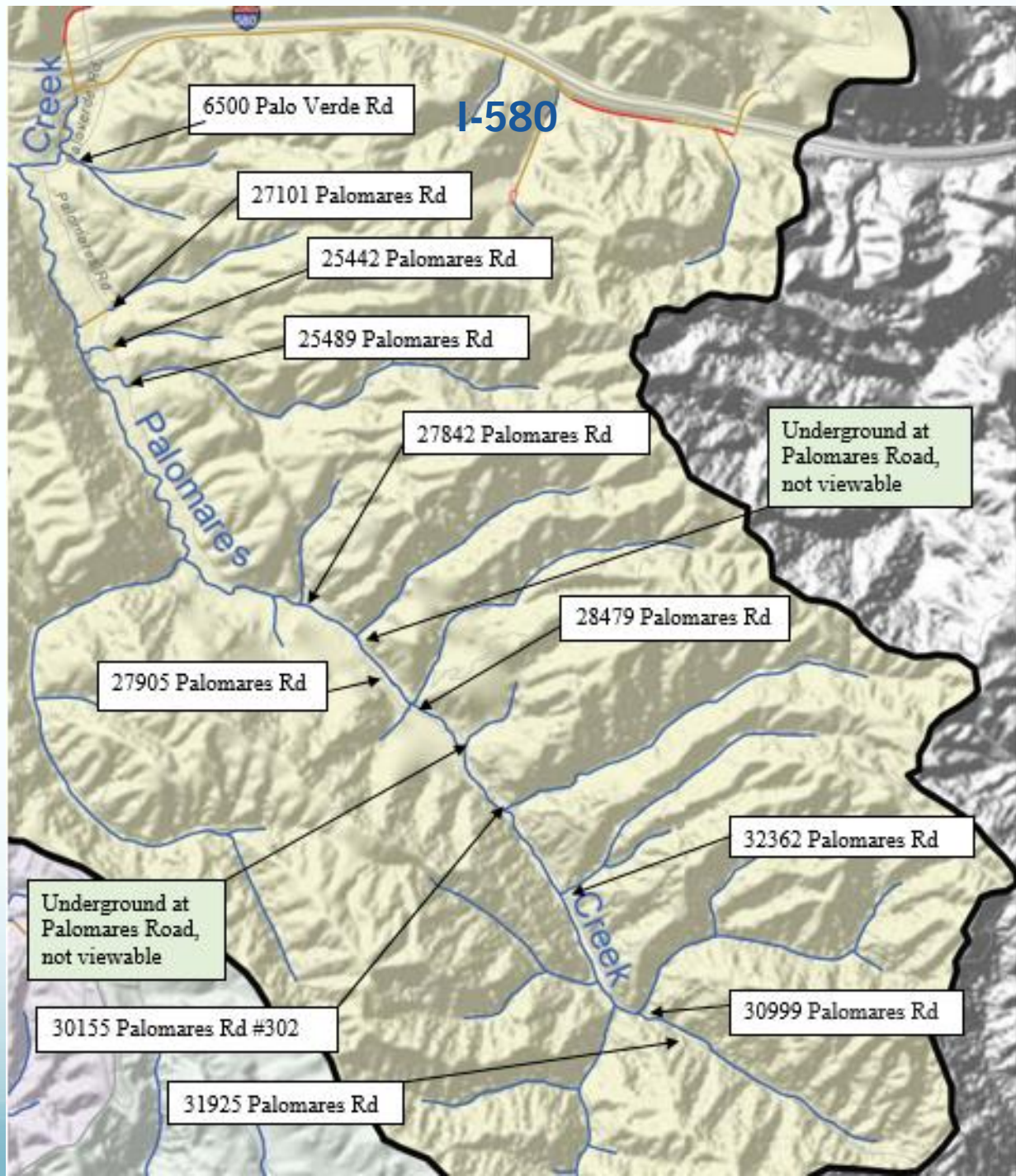
- Friends of San Lorenzo Creek
- Streams deleted from Topo maps & WPO, and...
other small, flowing streams
- Field visits and photo assessments
- 58 streams in ten local watersheds
- End of wet season (mid March - April)
- After 1 to 2 weeks of no precipitation
- During normal wet season



San Lorenzo and Alameda Creek Watersheds Surveyed



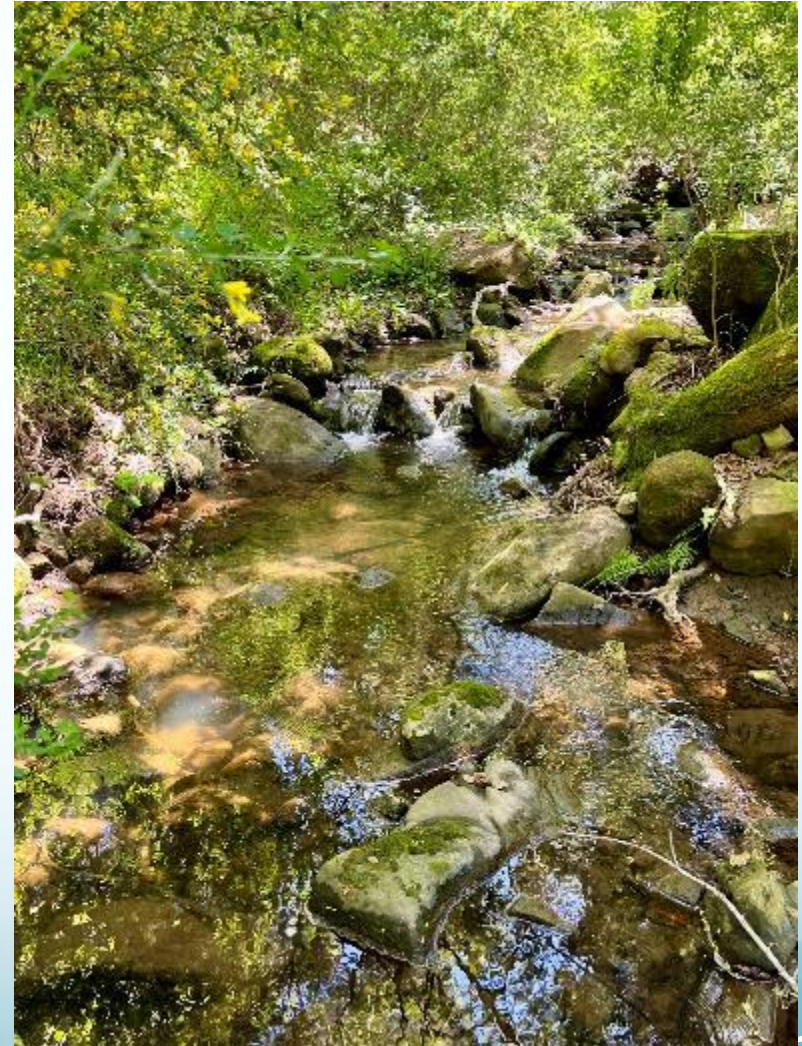
Survey Locations on Palomares Creek



Ground-Truthing Study Findings

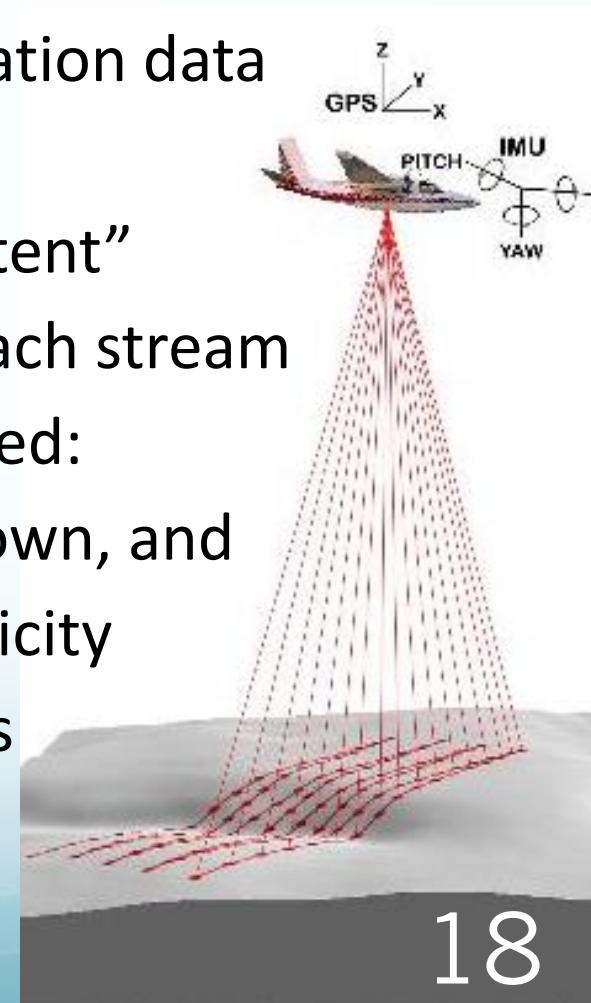
- All 58 streams were flowing and meet USGS and DWR definitions of an “intermittent stream”
- Intermittent stream survey results:
 - ✓ Best: Flood/Oak Museum maps show most
 - ✓ Better: 2015 US Topo maps showed 78%
 - ✓ Worst: 2018-21 Topo maps only showed two
- Notable:
 - ✓ Alameda Creek categorized as intermittent
 - ✓ Sulphur & Stonybrook watersheds vanished

Unnamed Tributaries Deleted from Current Topo Maps



USGS Transition to 3DHP

- NHD >> new 3D Hydrography Program (3DHP)
- Lidar detection & high-resolution elevation data
- Large increase in streams
- No longer use “perennial” & “intermittent”
- Periodicity measure associated with each stream
- On US Topo maps, USGS has not decided:
 - How many streamlines will be shown, and
 - How to represent stream’s periodicity
- Ongoing data updates & US Topo maps



WPO Issue Summary

- Since 1982, WPO covers perennial and intermittent streams on most recent US Topo maps
- 2018-21 US Topo maps removed >50% total stream reaches from ACPWA jurisdiction
- Ground-truthing indicates removed streams meet USGS & DWR definitions of “intermittent” streams
- County needs to act to regain its jurisdiction to protect intermittent streams

ACPWA & BOS Public Actions

Timeline	Actions
2022-23	Municipal Advisory Councils (3)
2022-23	Advocated to regain jurisdiction and developed WPO stream map based 2015 US Topo map
2023	Ag Committee & Planning Commission
2023 Aug	Switched, advocated for current US Topo maps
2023 Sep	Sup Miley & Haubert voted to take to full BOS
2023 Dec	ACPWA said want to move to 3DHP lidar maps
2024	???

What We Requested

Friends of San Lorenzo Creek	Alameda Creek Alliance
Sierra Club SF Bay Chapter	Ohlone Audubon Society
Citizens Com Complete Refuge	Water Board staff
Many citizens	

- ACPWA act to regain intermittent stream jurisdiction
- Develop WPO stream map using either:
 - AC Flood Control online watershed maps
 - 2015 US Topo perennial & intermittent streams

Evaluate 3DHP lidar stream data and maps when USGS transitions over the next several years

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