

# Lagunitas Creek Stream Release Study

### Watershed Subcommittee

June 17, 2021



# Historical Total Reservoir Storage (June 1<sup>st</sup>)



### Lagunitas Creek Watershed

**Coho Salmon (CCC)** Endangered - State and Federal



#### **Steelhead (CCC)** Threatened - Federal



**California Freshwater Shrimp** Endangered – State and Federal





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### State Board Water Rights Order Governing Flows in Lagunitas Creek

### **Study Questions:**

What are the trade offs between releases, instream flow, and habitat suitability for target species?

Can flow releases be reduced without causing an "unreasonable effect" on fishery?

If so, what reductions are scientifically supportable for winter baseflow and migration pulses?



# **Potential flow reduction scenarios to evaluate**

- Delay winter baseflow for a period of time (e.g. 1 month) or until a natural migration-triggering event occurs
  - Test potential start dates and flow triggers
- Reduce winter baseflow by some volume (e.g. from 20 to 15 cfs)
  - Test sensitivity to a range of flow rates to see where effects become significant



# **Proposed approach**

- Select four sites that represent the most heavily used or typical habitat for coho spawning and rearing
- Complete detailed topographic survey of four sites
- Model sites in 2D hydraulic model
- Run range of flows  $20 \rightarrow 10 \text{ cfs}$ 
  - Extract habitat suitability metrics: wetted area, depth, velocity, temperature
- Adaptive management



# **2D Physical Habitat Simulation modeling**

Habitat Suitability	Water Depth (in)	Depth Score	Velocity (fps)	Velocity Score
Not Suitable	<1	0	<0.05 & >2	0
Low Suitability	1-6	1	1-2	1
Medium Suitability	6-12 & >36	2	0.5-1	2
High Suitability	12-36	3	0.05-0.5	3

Example for different species – not salmonids





#### Site 1 – 700 feet, 13% of spawning habitat in the Canyon Reach of Lagunitas Creek

Irving Bridge



Raw survey point data from Site 1 (95% complete)

# **Schedule**

Table 2: Schedule - Lagunitas Creek TUCP Support																																								
			April					May				lune								August				Sentember				October						<u> </u>						
		4-Apr	4-Apr 11-Apr 18-Apr 25-Apr 2-May			2-May	9-May 16-May 23-May 30-Ma			30-May	6-Jun	13-Jun	20-Jun	27-Jun	27-Jun 4-Jul 11-Jul			25-Jul	1-Au	ug 8-Aug	15-Aug	22-Aug	29-Aug	5-Sep	12-Sep	19-Sep	26-Sep	3-Oct	3-Oct 10-Oct 17-Oc		24-Oc	t 31-Oct	7-Nov	14-Nov	Nov 21-Nov 28-Nov					
Task #	Task Name/Description																																							
1.0	Project management			$\star$																																				
2.0	Ecological criteria development										1		1											Potential											Potential migration					
3.0	Winter migration flow analysis																							TUCP Application										flow release window						
4.0	Winter baseflow analysis: Habitat suitability model									1				2				3				4													opens					
5.0	Watershed hydrology model																																							
6.0	Agency/Stakeholder coordination								-		$\star$		$\star$		-				-																ļ '					
7.0	Optional TUCP support																																		L					
Legend																																								
$\star$	Kickoff meeting. Confirm goals, data needs, identify habitat suitability reaches.																																							
	Weekly team meeting																																							
$\star$	Lagunitas Creek TAC meeting June 11th																																							
$\star$	Watershed Committee Meeting June 17th																																							
1	1 Review and if needed update ecological flow criteria based on stakeholder input																																							
1	1 Complete first of four habitat suitability reaches for TAC meeting																																							
2 Complete habitat suitability modeling of reaches 2-4																																								
- Periodic coordination as needed																																								

#### Public Engagement:

- Monthly resource agencies meetings with RWQCB, CDFW, & NMFS
- Monthly meetings with Lagunitas Creek TAC Subcommittee

# **Next Steps**

- Complete Habitat Suitability Model for Sites 1 and 2
- Survey and model Sites 3 and 4
- Identify levels of habitat change associated with different flows
- Identify least impactful scenarios
- Provide results at upcoming committee meeting ahead of TUCP application deadline

# **Thank You**