

# 2020 Fall Tuolumne River Stakeholder Meeting (*Virtual*)

## UTREP summary of focal species observations 2008-2020



### UTREP Amphibian Surveys:

- Collaborative effort to identify diversity of amphibians and reptiles below OSH
- Focal species: *Rana boylei* (RABO, Foothill Yellow-Legged Frog or FYLF) , Sierra Newt, Bullfrog, Western Pond Turtle and Sierra Garter Snake
- Historic Visual Encounter Surveys along established transects and more recently focused on FYLF distribution including areas downstream of Early Intake.

# October 1, 2020



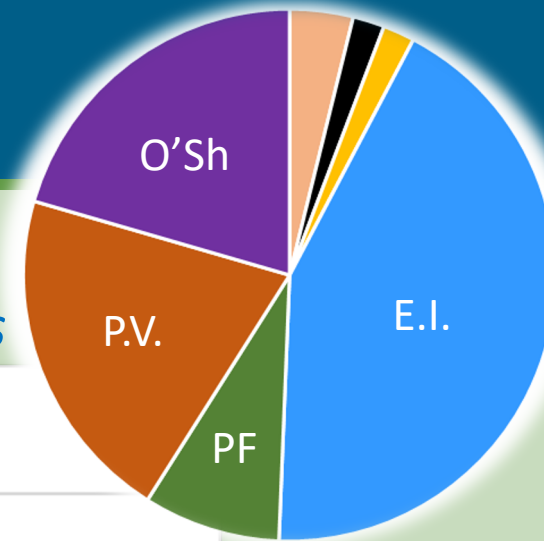
- Review UTREP survey locations and observations
- Summarize FYLF breeding above Early Intake
- Preliminary genetics results from 2018
- Expanding surveys downstream
- Review of focal species distribution
- Below CC/TR obs and Preview of FYLF future work

(Preemptive thank you to Don Ashton from McBain and Associates and Colleen Kamaroff of NPS for slide thievery)

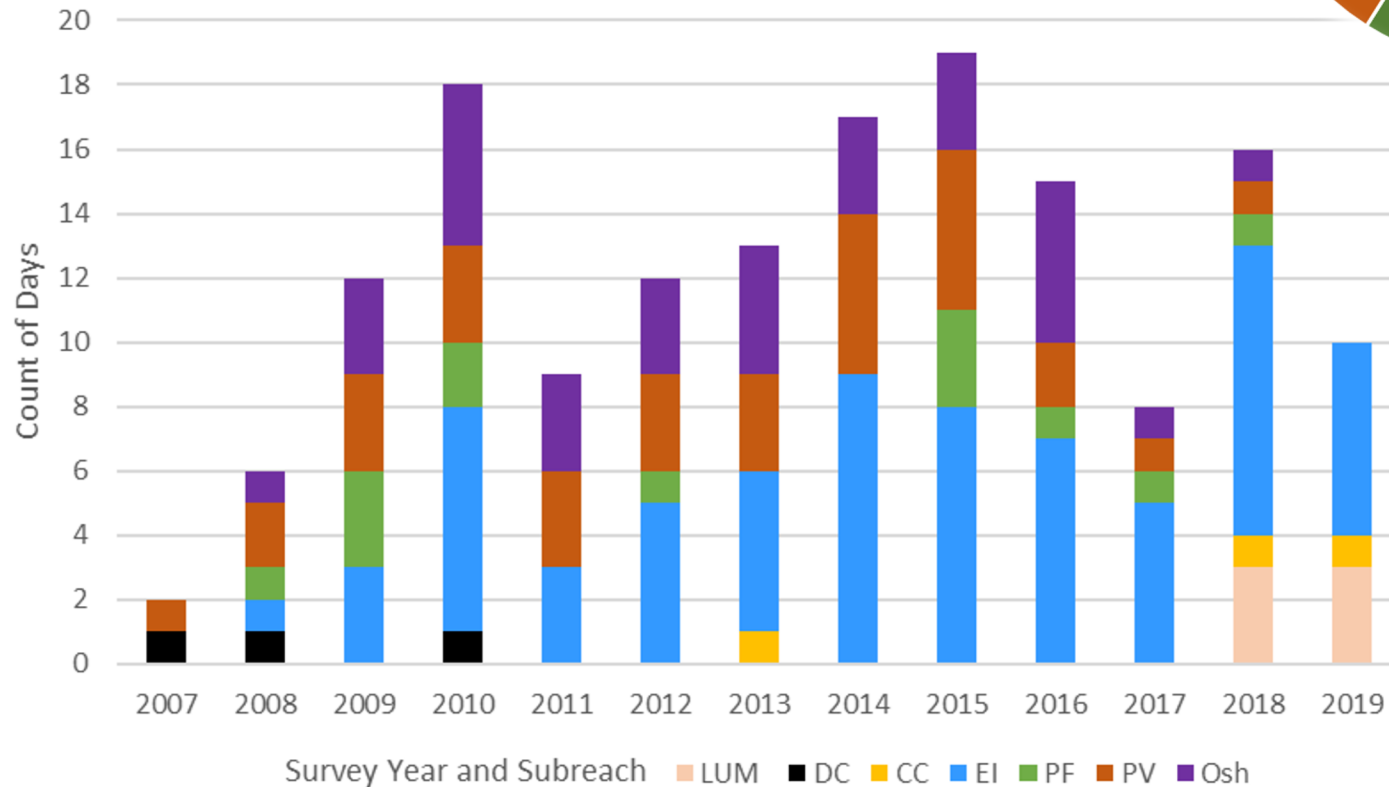
# Survey Effort — UTREP

## Number of Days per Subreach

- Early Intake, Poopenaut, OSH were early focuses.
- Early Intake and TR below Cherry Creek are the current focus



Count of Survey Days by Year and Subreach



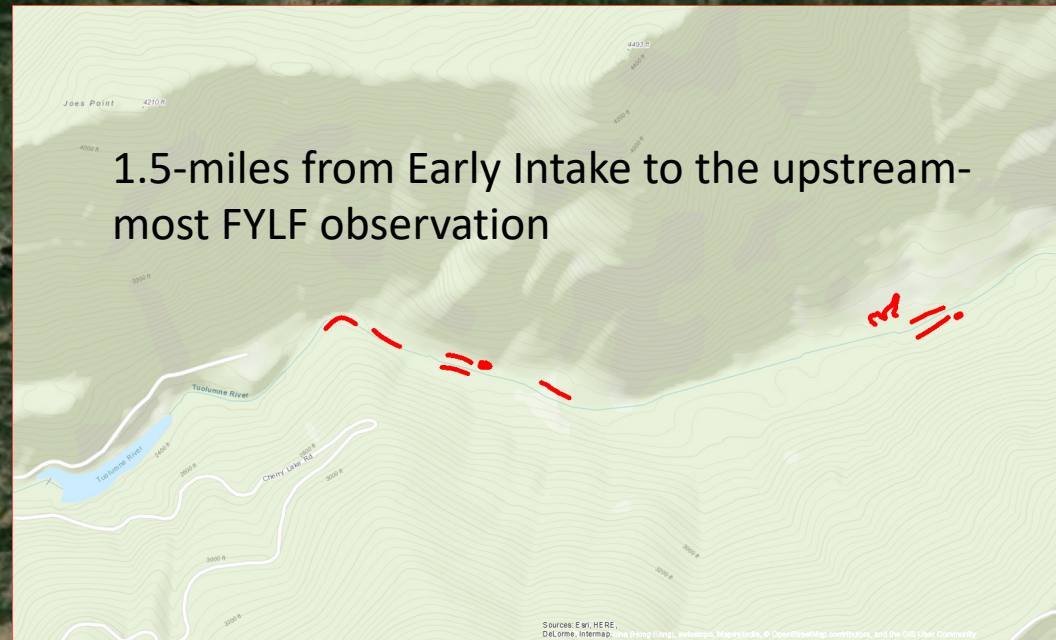
# Detection Counts: 2008-2010 & 2011-2019

## Herp detections by species and year

- 18 native and 1 non-native herpetofauna species

Year	ACMA	ANBO	ASTI	COCO	COLA	CROR	DIPU	ELMU	ELsp	LACA	LICA	PICA	PLGI	PSSI	RABO	SCOC	SCsp	TASI	THCO	THEL	THSI	THsp	UNFR	UNLI	UNSN	GrandTotal	#NativeSpp/yr	Cumulative Total	
2007	1														15											16			
2008	24		3			1		2		1		6	2	83	39	17		63	61								302	12	12
2009	44	1	1	1	1	1		2		1			1	268			12	36	58		3	1				431	14	15	
2010	62		8				1	1	3		3	1	1	1756	28	42		99	102	1	7	1	1			2117	13	18 3-yr to total	
<b>2008-2010 total</b>	<b>130</b>	<b>1</b>	<b>12</b>	<b>1</b>	<b>1</b>	<b>3</b>	<b>1</b>	<b>7</b>	<b>0</b>	<b>2</b>	<b>3</b>	<b>7</b>	<b>4</b>	<b>2107</b>	<b>67</b>	<b>71</b>	<b>0</b>	<b>198</b>	<b>221</b>	<b>1</b>	<b>10</b>	<b>2</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>2850</b>	<b>18</b>	<i>Native Species</i>	
																												<b>13</b>	mean#spp/yr 2008-2010
2011	8		7								1			75		17		2	32	3						145	7	7	
2012	18		10		1	4		2			1			233	2	5		39	46	2	2				2	367	12	12	
2013	4	1	11	2						1			1	180	1	7		5	86	2	6	1	1	1	1	311	13	16	
2014	5		1	1	1	1		1				1		269			13	2	28	82		1	10		1	417	12	17	
2015	22		3		3	1	1		1		36	2		3031			13		25	127	2		1	1	3	3272	11	18 5-yr to total	
2016	5		1	2					7		1	3	1	1	1	12				30			3	3	1	71	9	18	
2017	2													6	1	2		1	3		1					16	7	18	
2018	20							1	1					2	26	5	1		10		1					67	7	18	
2019	26	2				1		2		1					17			2	6		1				1	59	8	18	
<b>2011-2019 total</b>	<b>110</b>	<b>3</b>	<b>33</b>	<b>5</b>	<b>5</b>	<b>7</b>	<b>1</b>	<b>6</b>	<b>9</b>	<b>2</b>	<b>39</b>	<b>6</b>	<b>2</b>	<b>3797</b>	<b>48</b>	<b>74</b>	<b>3</b>	<b>102</b>	<b>422</b>	<b>9</b>	<b>12</b>	<b>15</b>	<b>1</b>	<b>6</b>	<b>8</b>	<b>4725</b>	<b>18</b>	<i>Native Species</i>	
																												<b>9.6</b>	mean#spp/yr 2011-2019
<b>Grand Total</b>	<b>240</b>	<b>4</b>	<b>45</b>	<b>6</b>	<b>6</b>	<b>10</b>	<b>2</b>	<b>13</b>	<b>9</b>	<b>4</b>	<b>42</b>	<b>13</b>	<b>6</b>	<b>5904</b>	<b>115</b>	<b>145</b>	<b>3</b>	<b>300</b>	<b>643</b>	<b>10</b>	<b>22</b>	<b>17</b>	<b>2</b>	<b>6</b>	<b>8</b>	<b>7575</b>			

# Foothill Yellow-legged Frog (RABO) UTREP



Early Intake

FYLF Above Early Intake Observed or Presumed Breeding:

2007 (assumed based on observation of subadults in 2008)

2010 direct observation of larvae

2012 direct observation of larvae

2015 (assumed based on observation of subadults in 2016)

2018 direct observation of egg clutch → larvae → froglet

2020 direct observation of larvae

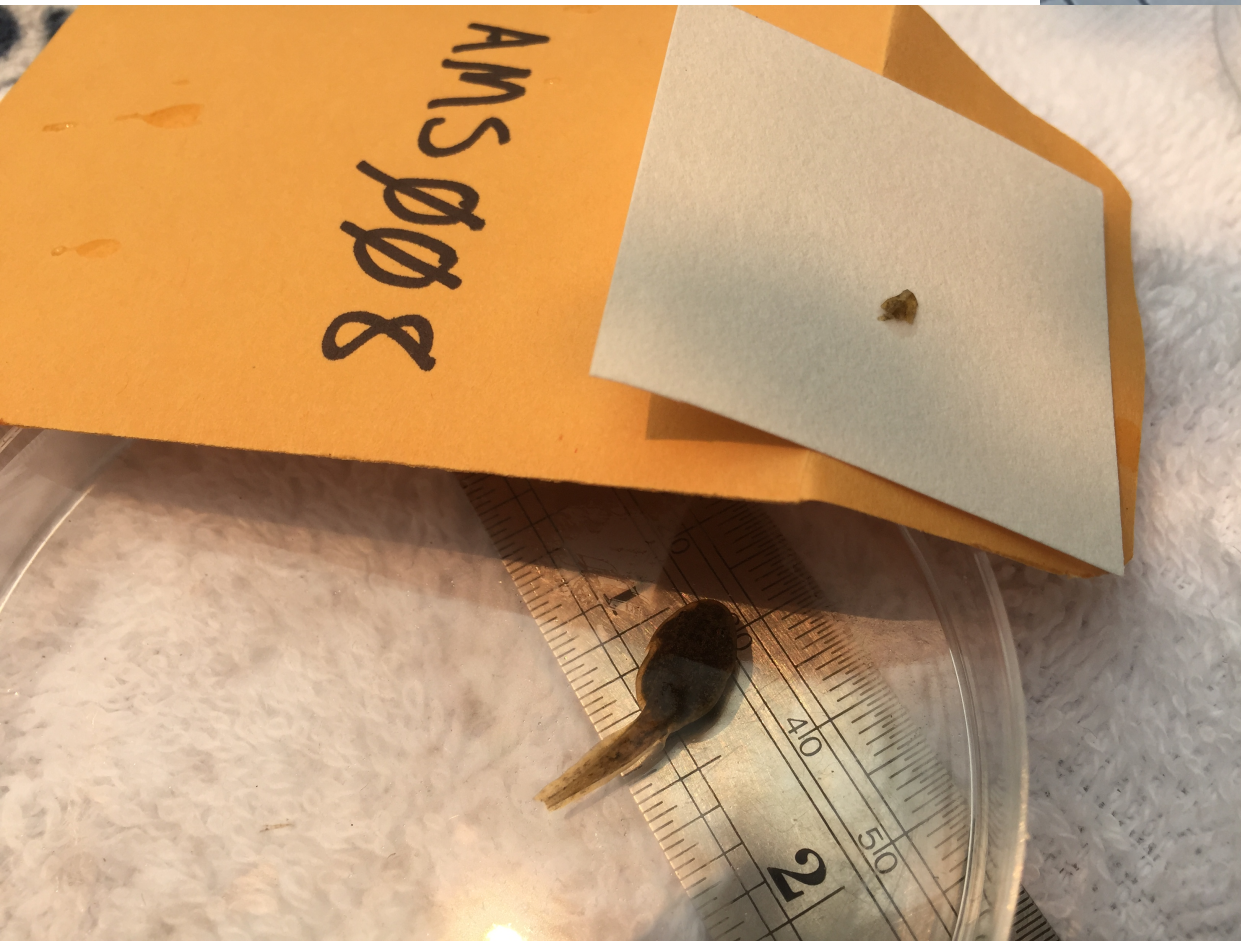


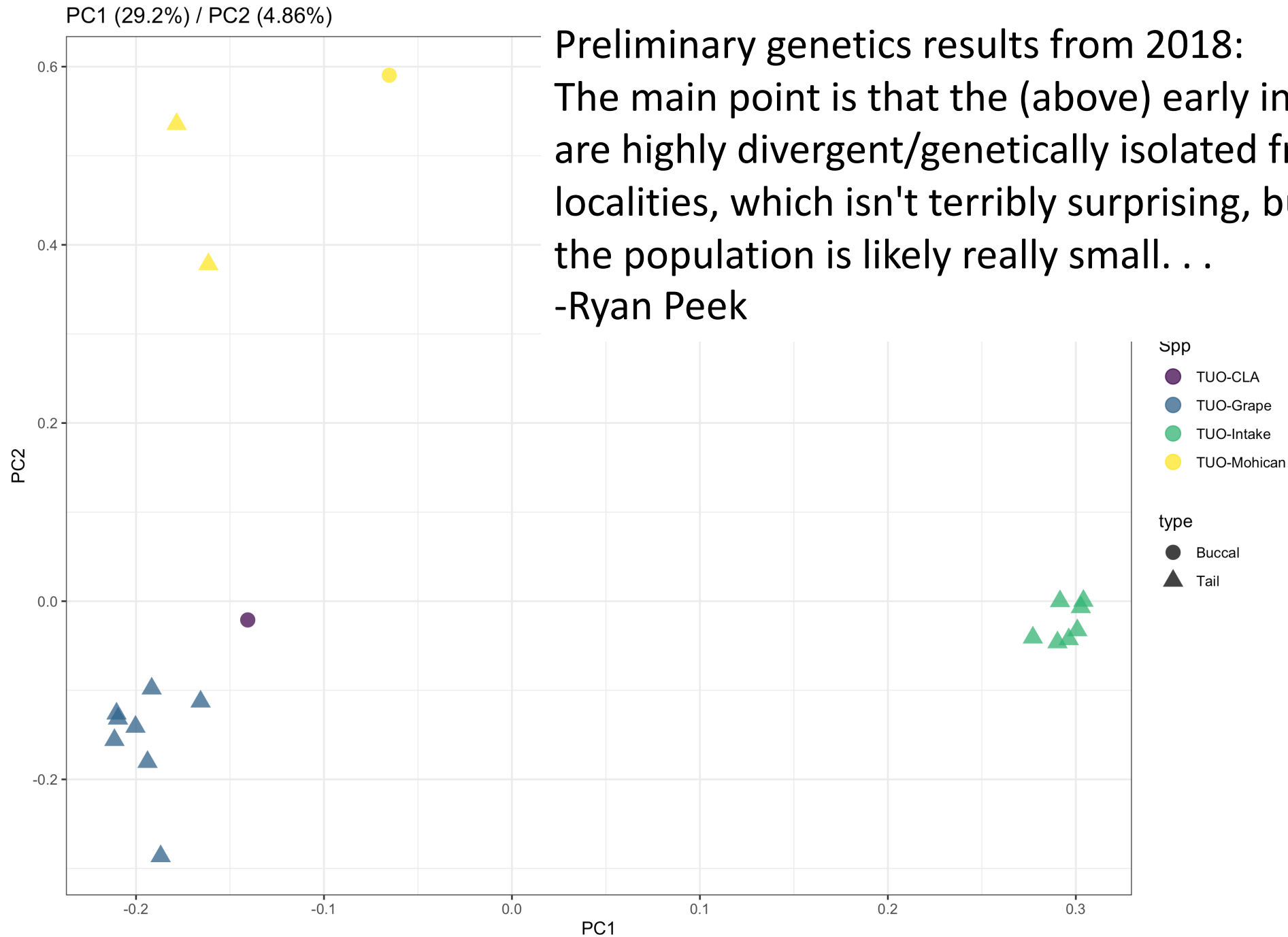


6/25/2018  
First FYLF egg mass found  
upstream of Early Intake.



July 2018  
DNA sampling  
(tail clips)





## Preliminary genetics results from 2018:

The main point is that the (above) early intake samples are highly divergent/genetically isolated from the other localities, which isn't terribly surprising, but it does mean the population is likely really small. . .

-Ryan Peek

# July 2020 DNA sampling



- Beginning in 2018, the SFPUC has been expanding surveys downstream.
- Additional monitoring has been performed by NPS, USFS, USFW/USGS and their collaborators, among others.

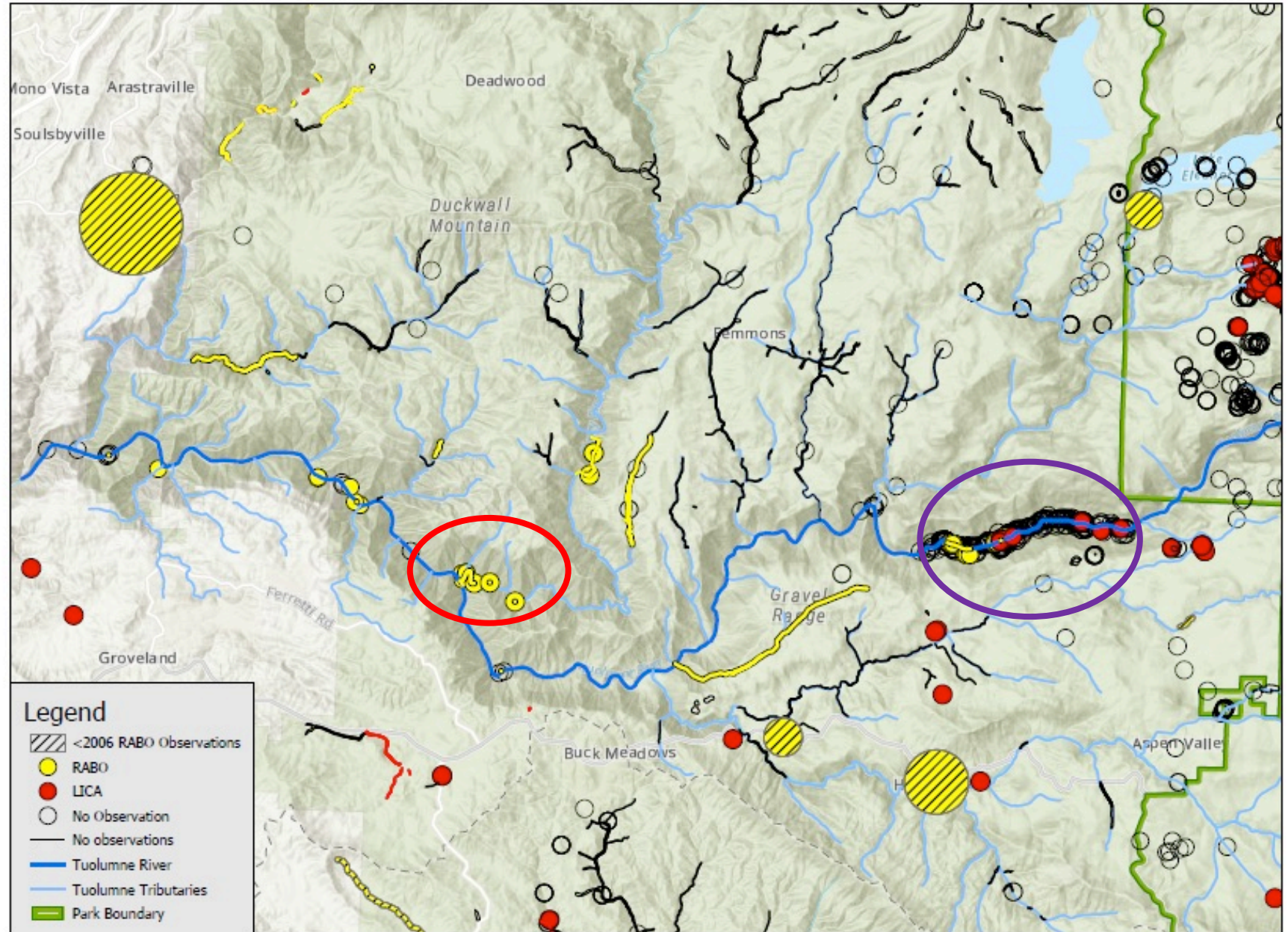


Historical surveys and FYLF observations (CNDDDB data compilation by Colleen Kamaroff):

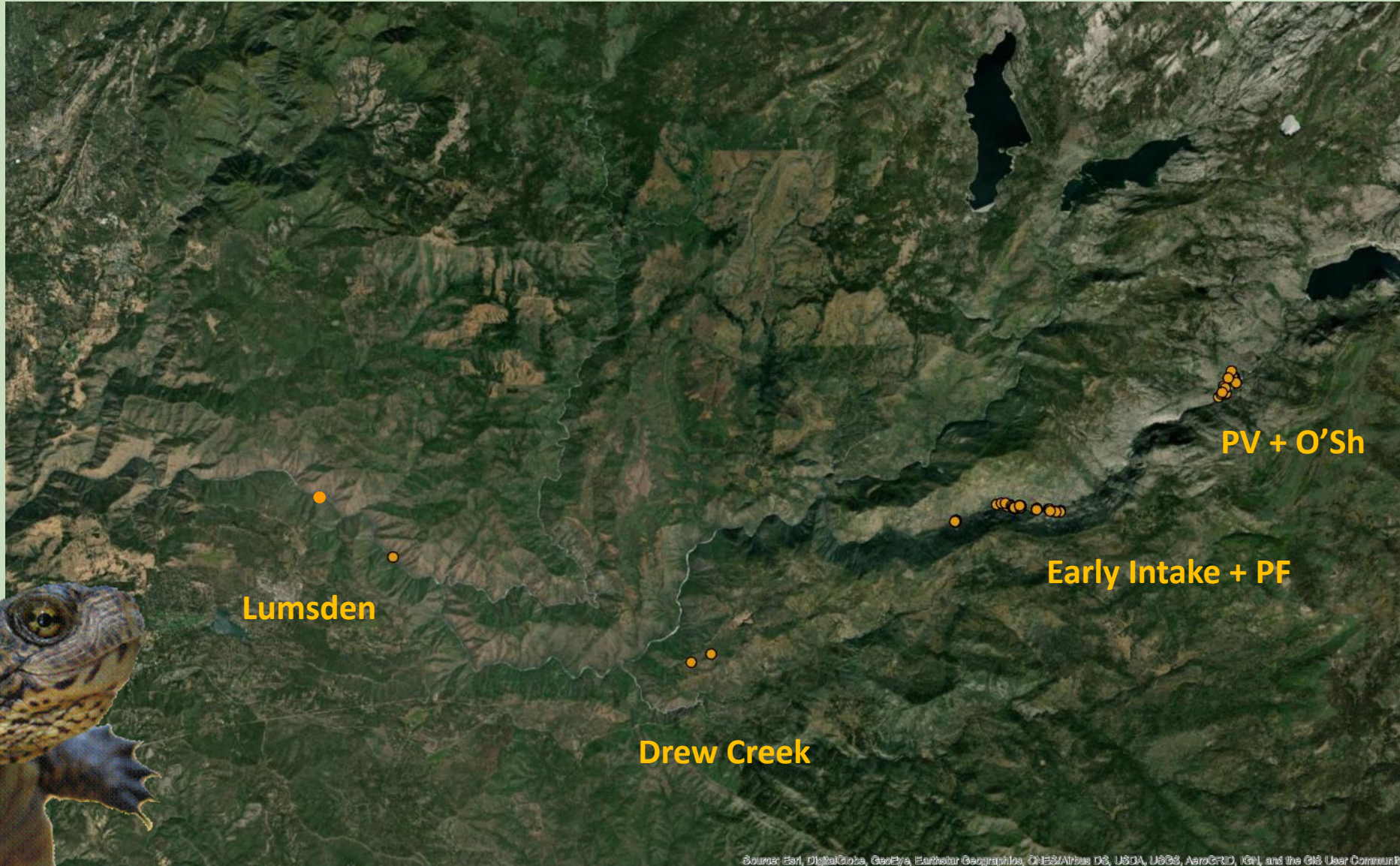
-Black lines and circles represent surveys without FYLF observations

-Yellow represent FYLF observations pre-2019

-Red circles represent Bullfrog observations



# Northwestern Pond Turtle (ACMA) UTREP



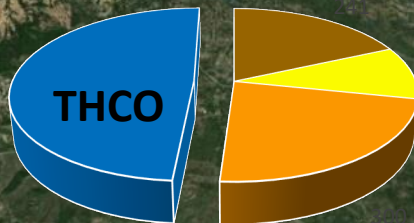
Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community



# Sierra Garter Snake (THCO)



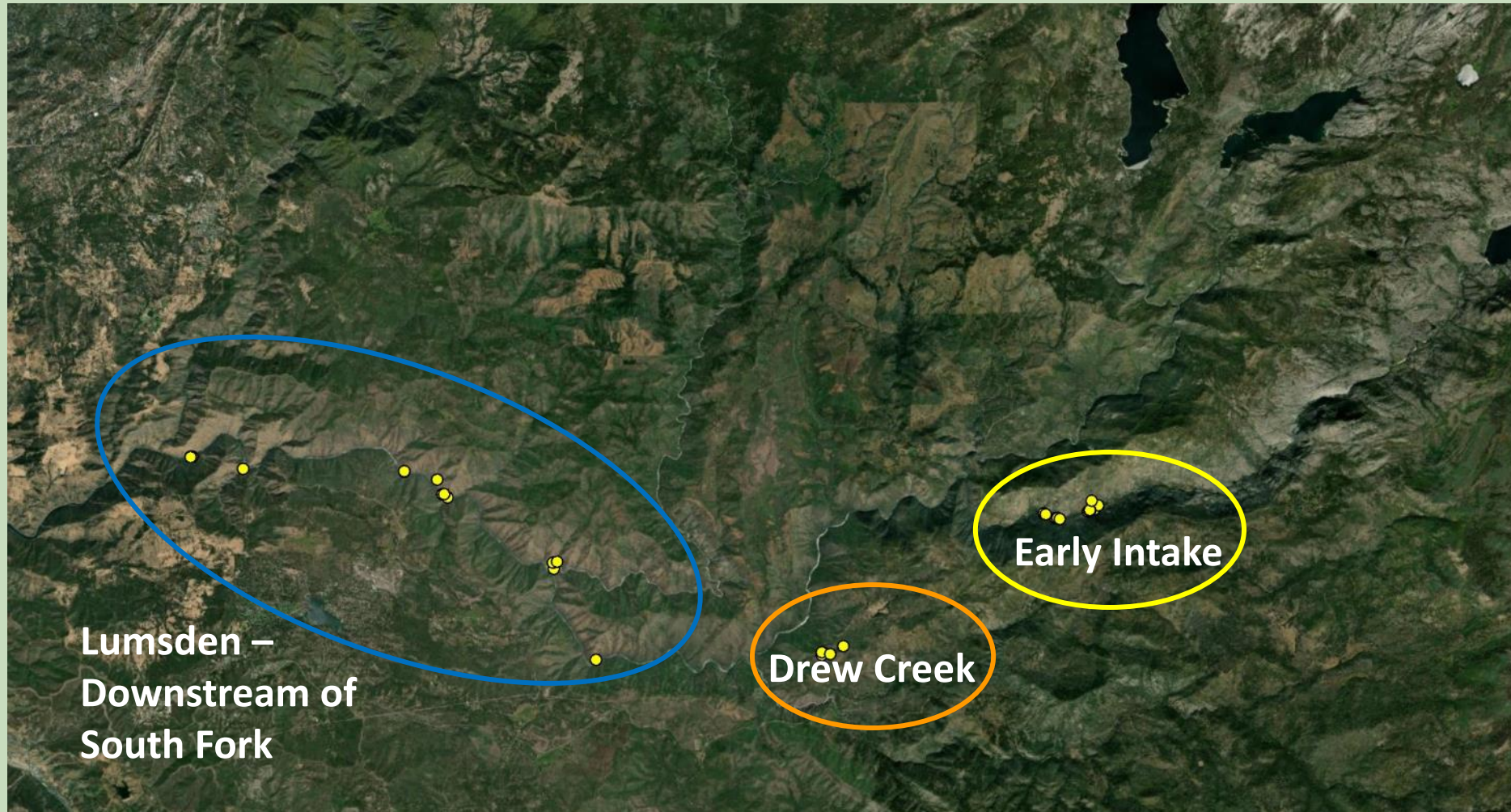
River-dependent Species



Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

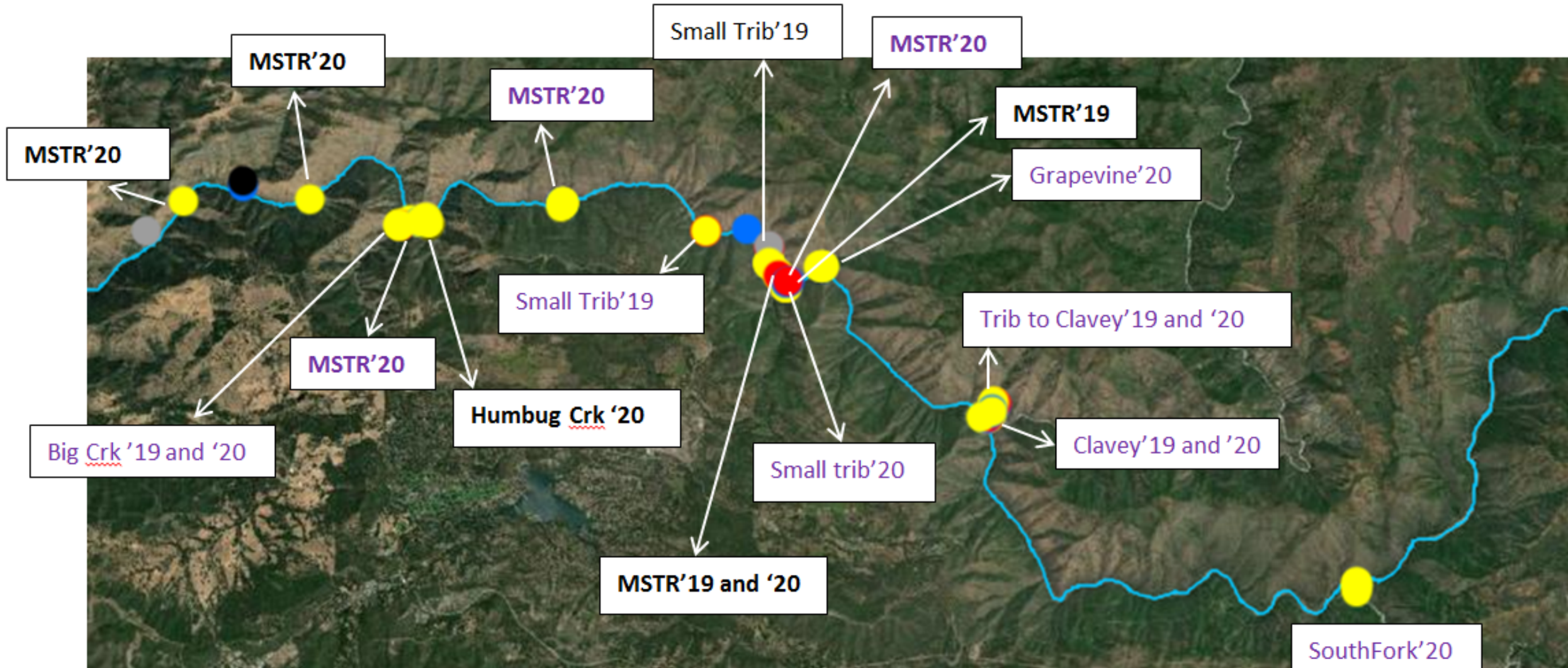
# Foothill Yellow-legged Frog (*RABO*) UTREP

Don Pedro



# FYLF 2019-20 observations downstream of the South Fork of the Tuolumne during float trips.

- Observation year noted as '19 and/or '20
- Purple denotes presumed breeding
- Genetic samples collected at most locations



Mainstem Tuolumne River  
8/21/2020



Grapevine Creek  
8/20/2020



Small trib to Clavey R.  
8/20/2020





# Next Steps

- Analyze genetic samples to suggest population sizes and genetic diversity/isolation, as well as to inform future surveys
- Collect environmental DNA (eDNA) in areas between Early Intake and the South Fork to “discover” new FYLF areas
- Continue monitoring the Early Intake areas
- Take questions



# Appreciating the following:

- William Sears, Travis Espinoza and lots of other SFPUC biologist and Hetch Hetchy operations staff.
- Rob Grasso, Colleen Kamaroff and the other NPS rockstars who helped with fieldwork and data.
- Don Aston, Tim Caldwell and other fine humans at McBain & Assoc.
- Steve Holdeman and others at USFS.
- You, and your internet provider