

Foothill Yellow-legged Frog (*Rana boylei*) Monitoring on the South Fork Eel River



Sarah J. Kupferberg

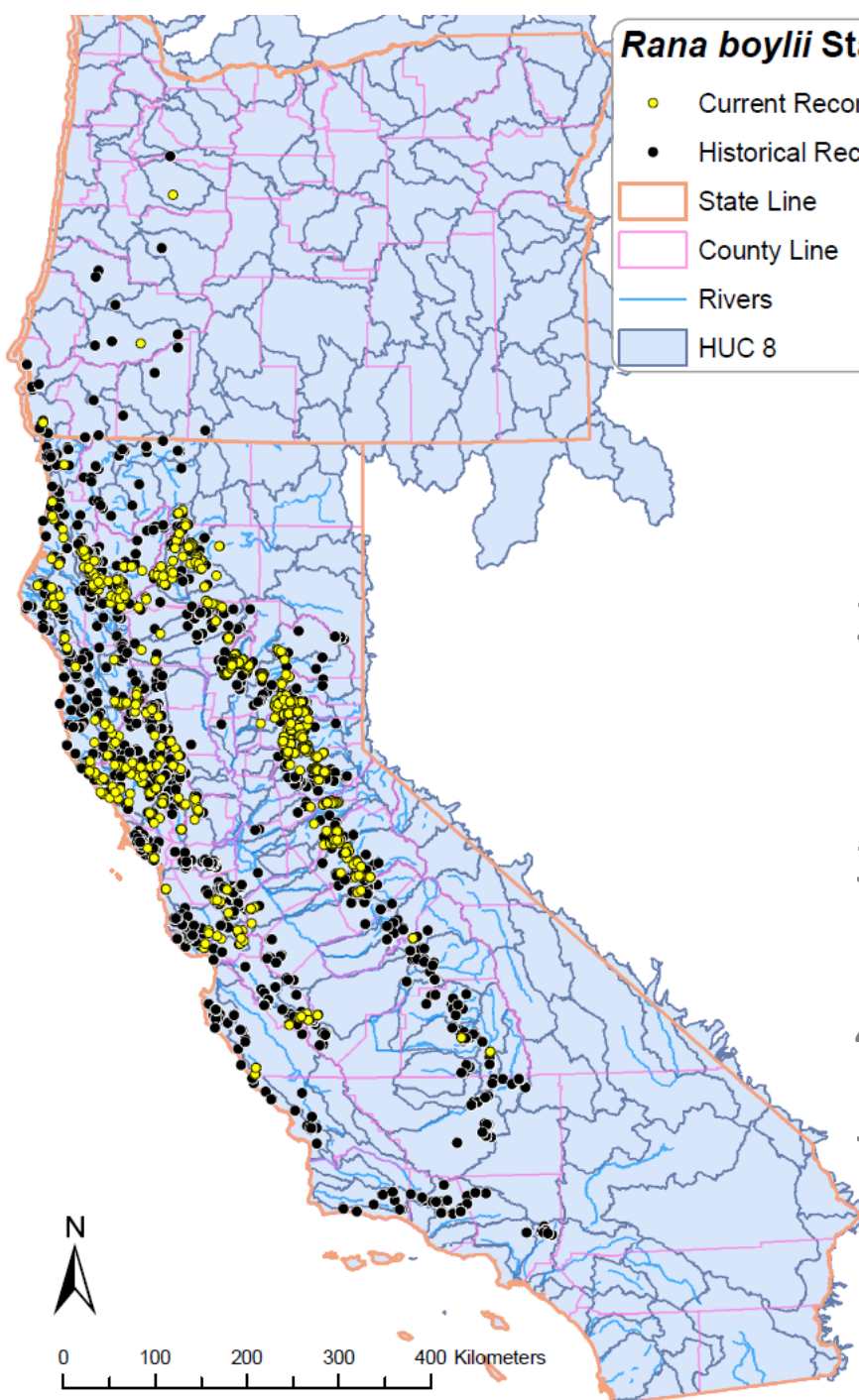
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Why monitor?

Rana boylei Status

- Current Record (≤ 10 yrs)
- Historical Record (> 10 yrs)
- State Line
- County Line
- Rivers
- HUC 8



1. **CA species of special concern**

2. Indicator of many habitats & processes because complex life cycle

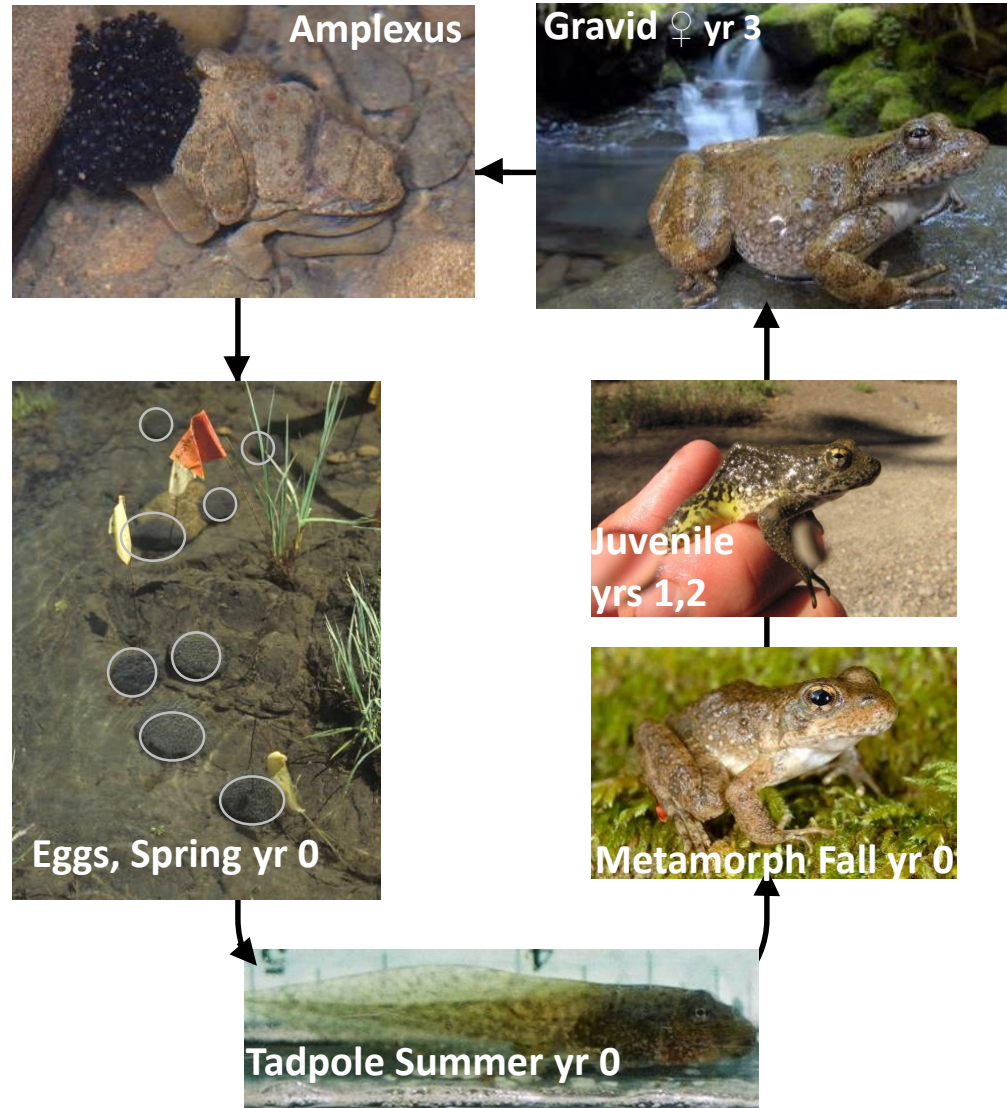
3. Important link in algal based food chains

4. Breeding censuses are tractable

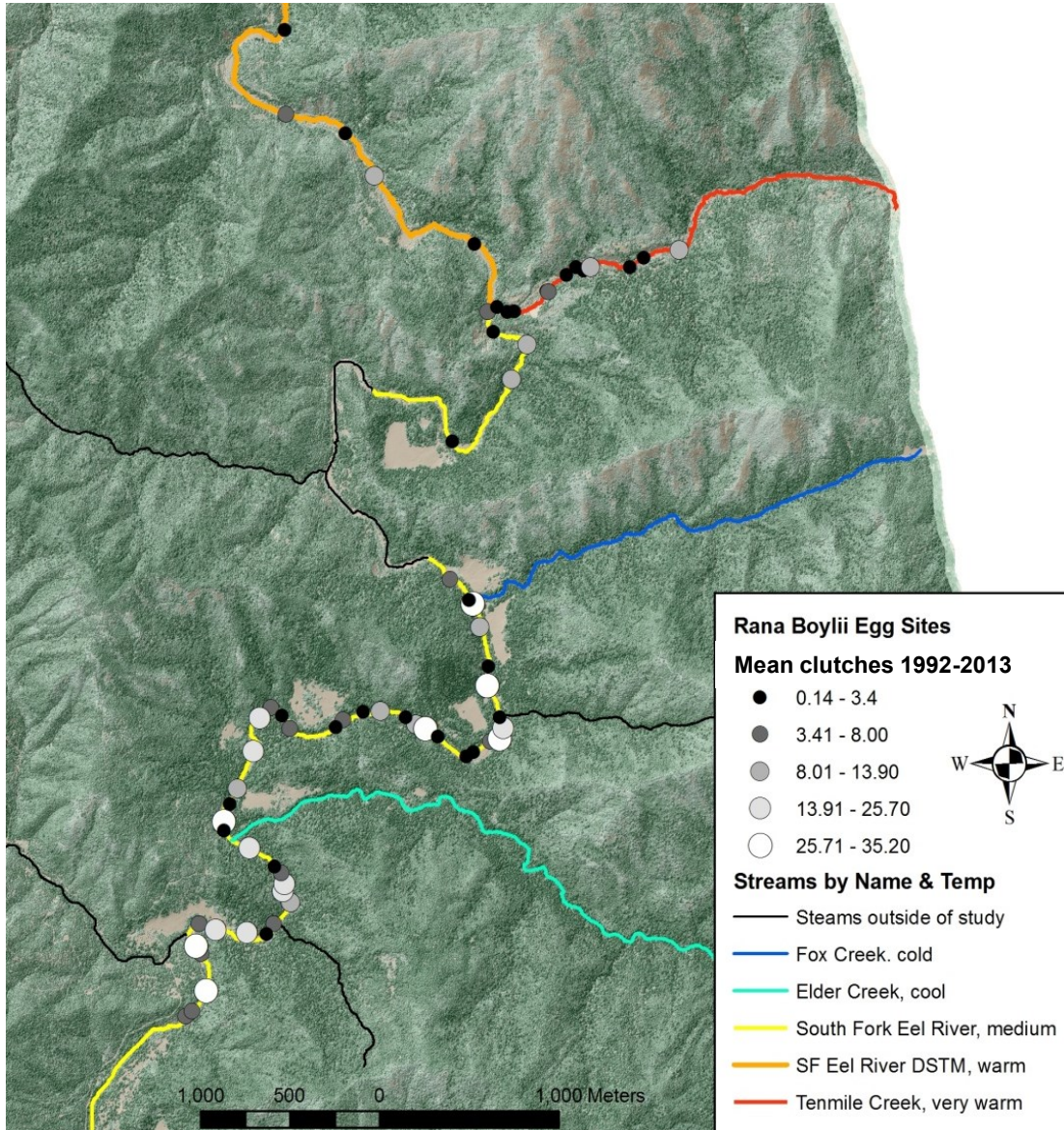
5. Good baseline data exist



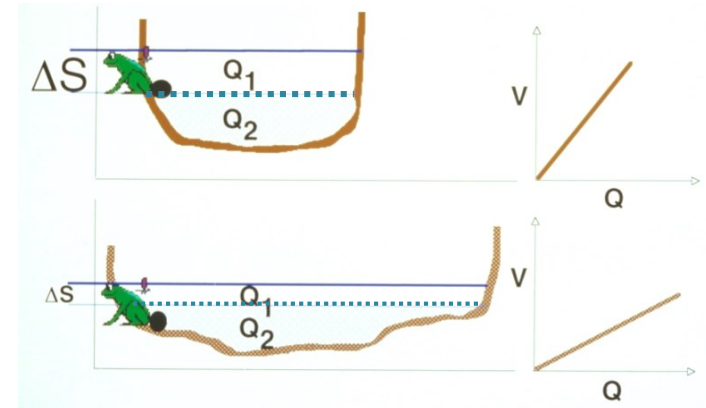
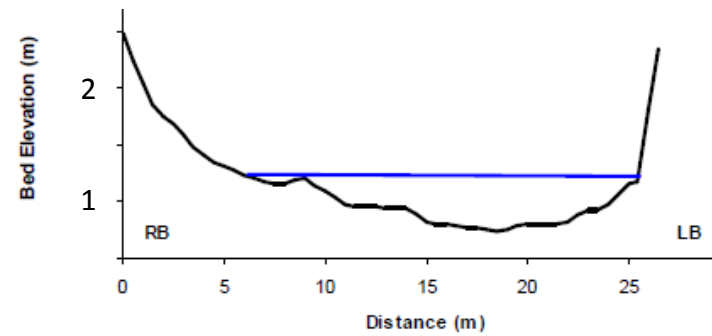
2. Indicator of many habitats & processes



Leks concentrated near confluences



-same sites used year after year
-distinctive channel morphology



Indicator of functioning sediment transport



e.g. rock #150 transported and deposited through 4 different breeding sites

Thermal indicator – Frogs migrate to find warm water for tadpoles





3. Important link in algal based food chains

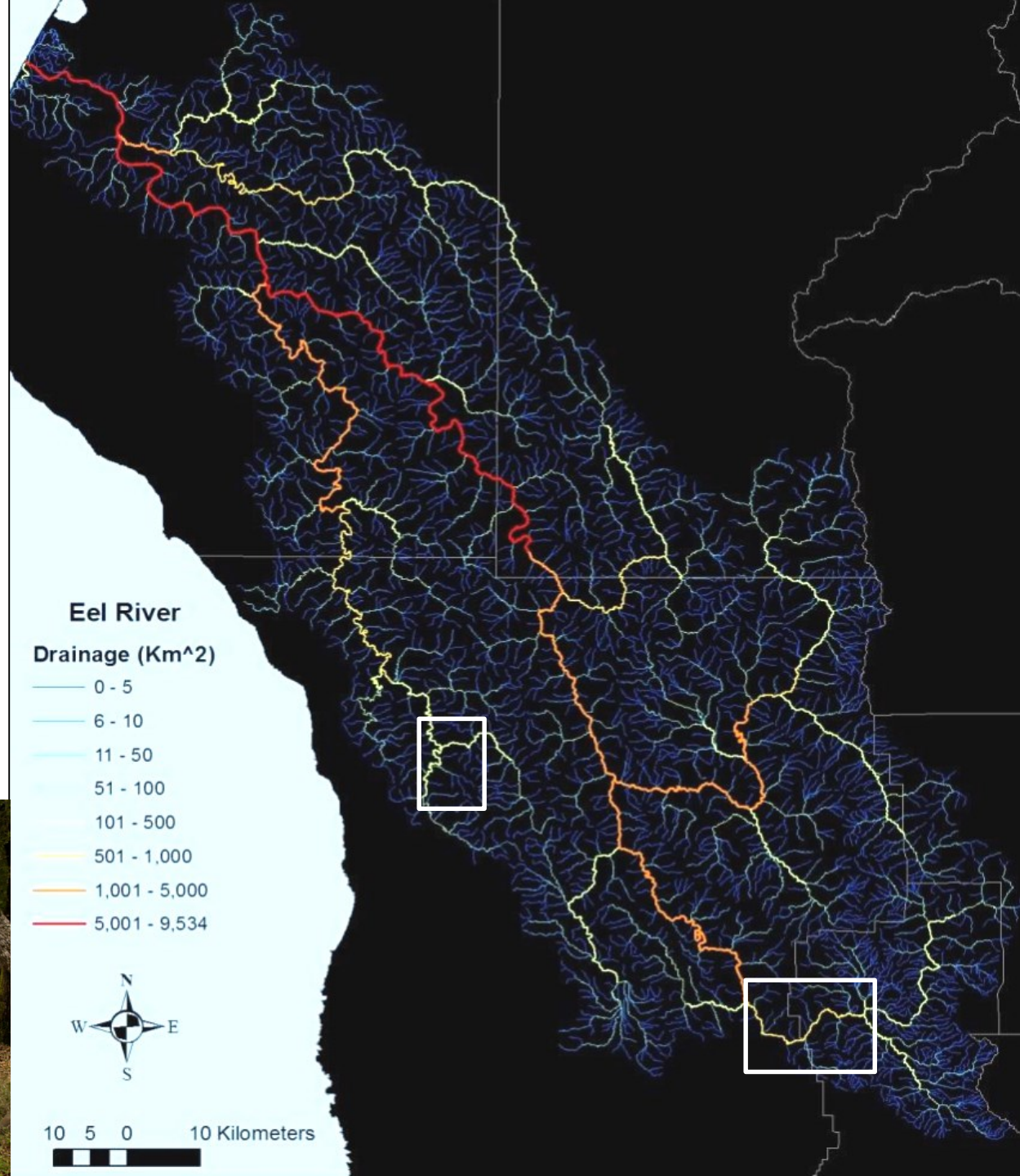




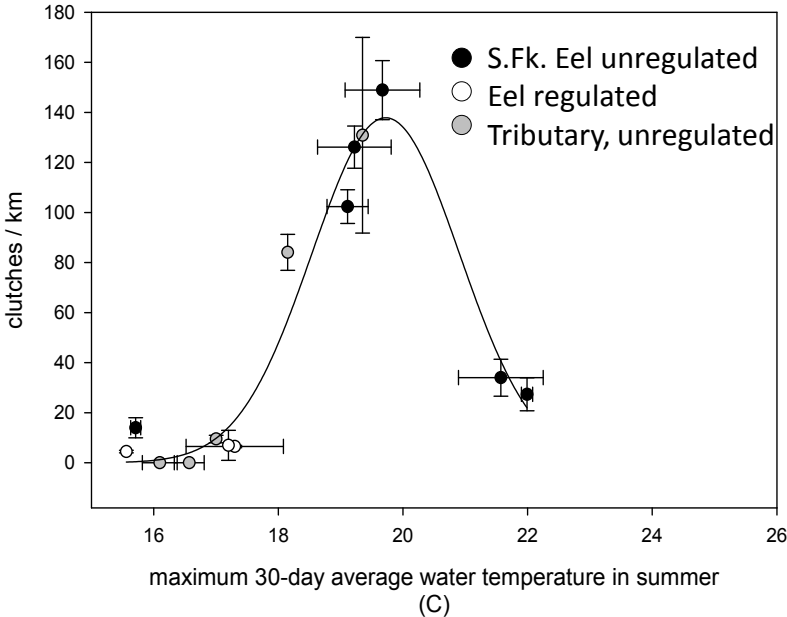
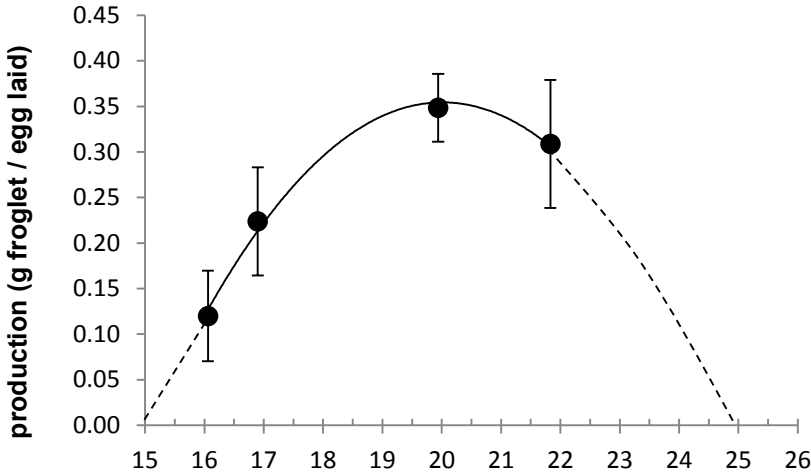
4. Easy to census

- eggs easier to see and count than frogs**
- 500m up and downstream of a trib confluence is a representative sample**

5. Good baseline data re density and change through time exist for comparisons



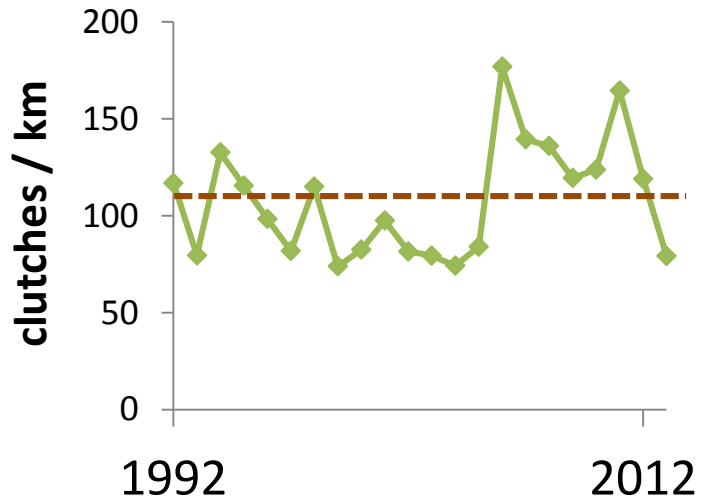
Clutches per stream kilometer vary in relation to temperature



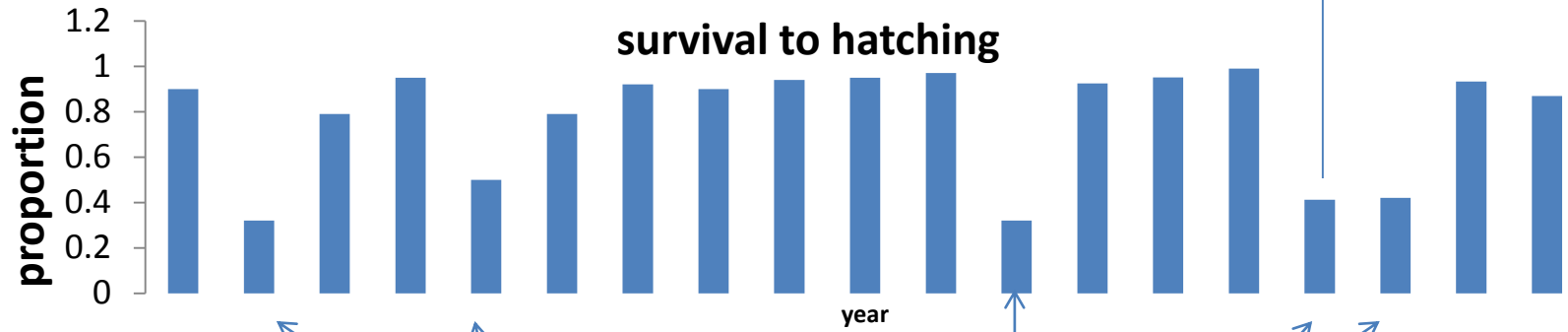
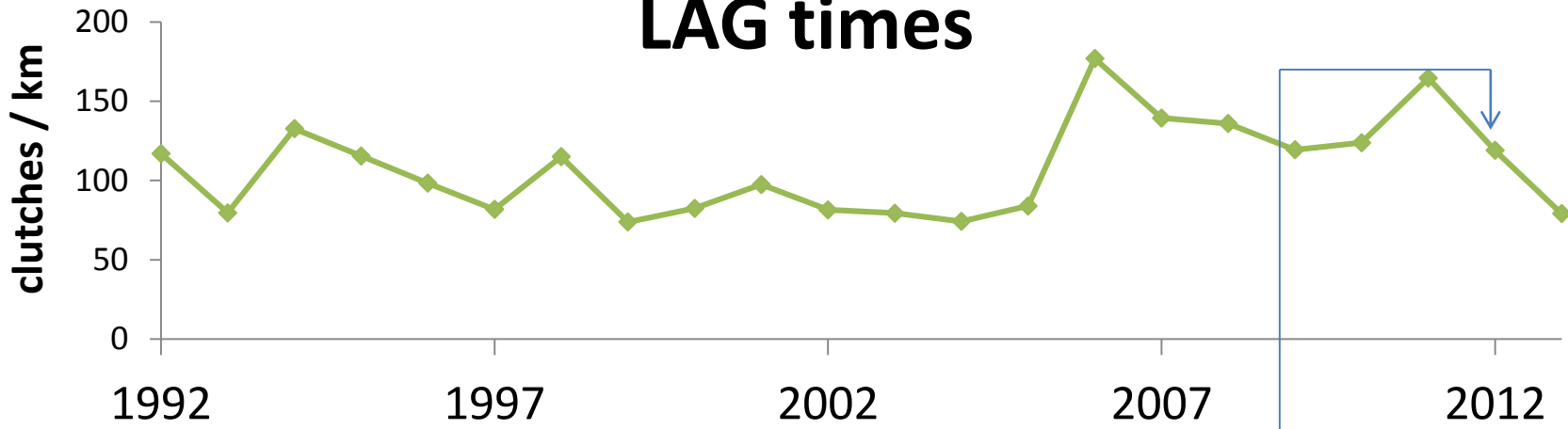
What can you learn from long term monitoring?



On 5km reach of Angelo Reserve – No statistical trend over twenty years 1 yr autocorrelation



LAG times



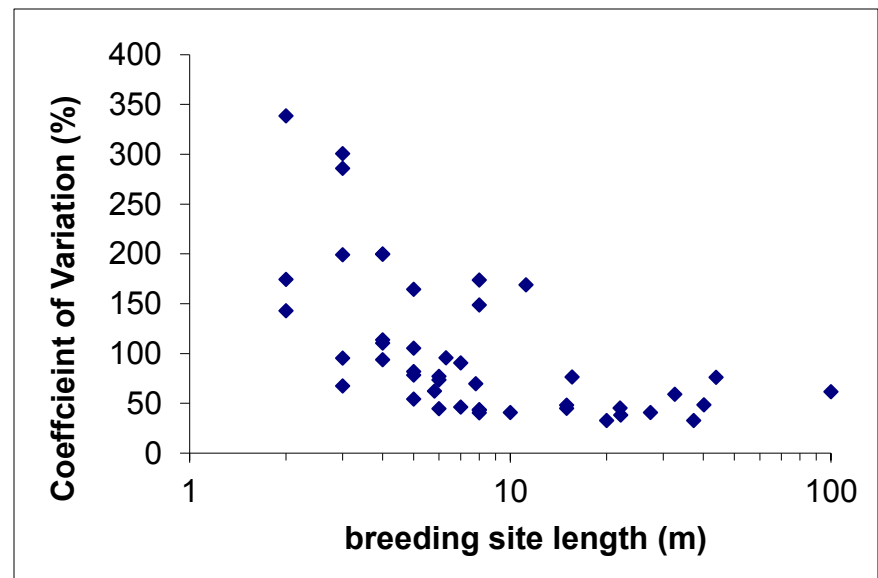
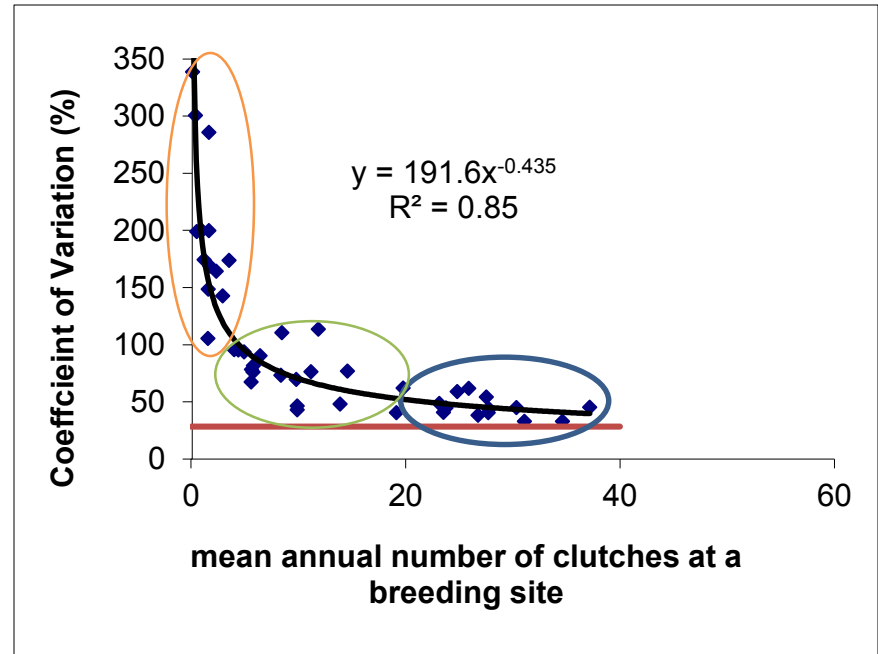
Is the stability due to a portfolio effect?

Analogies to stock market:

- Frogs “invest” when lay eggs at a site
- Sites vary in risk and return on investment
 - Too cool and shady = poor food, slow growth for tads
 - Too warm = bullfrogs, parasites
 - Too steep bank = scour / stranding
 - Too open = colonization by alders

Diversified portfolio decreases variability

- Individual sites \gg CV than meta-population
- large cobble bars have the least variable populations



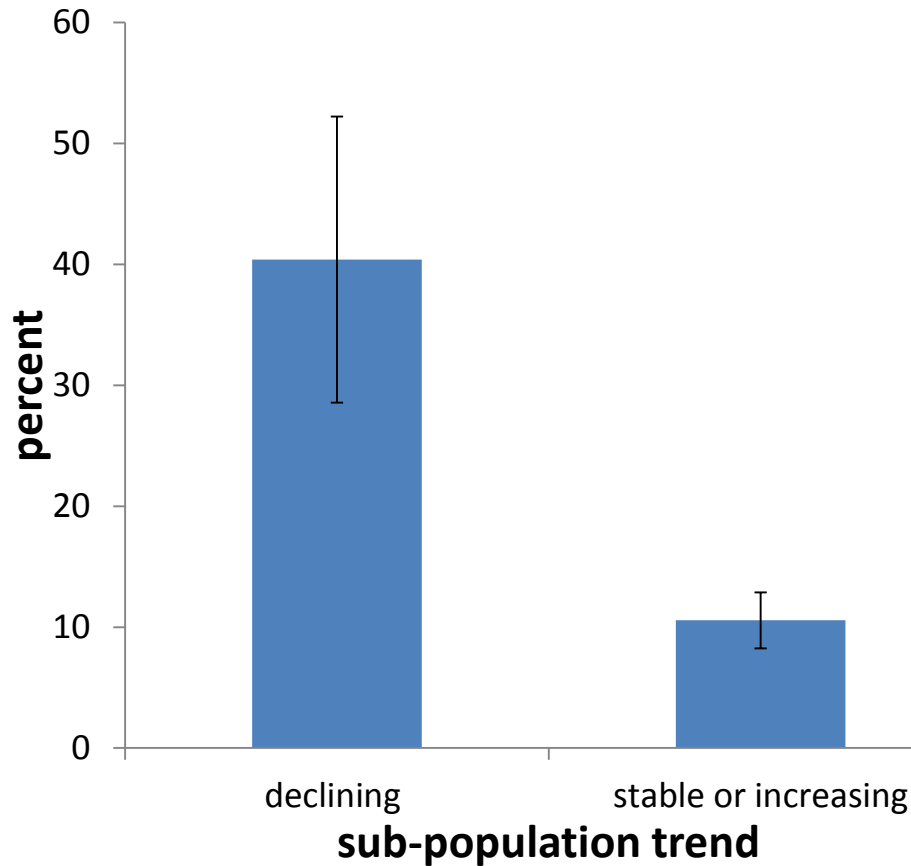
At the SF Eel breeding sites have a wide range of canopy covers







1994 to 2012 change in canopy cover





Opportunity for Monitoring response to dam removal





No lake since 2007

Frogs colonizing gravel bars to breed

- Dam slated for removal once funds raised
- Opportunity for BACI study
- Started egg mass monitoring in 2012



Thanks to my frog friends

Many egg-hunters:

Mary Power, Peter Steel, Kristi Grief, Syd Temple, Carmen Bailey, Mary Poteet, Jacques Finlay, Joe Drennan, Tania Blacic, Vance Vredenburg, Kurt Fausch, Jesse Walker, Safia Houssein, Rebecca Doubledee, Phoebe Bass, Janny Choy, Sapna Khandwala, Sarah Madden, Ann-Marie Osterback, Amy Lind, Wendy Palen, Sarah Yarnell, Ryan Peek

Alessandro Cattenazi –esp. photos!

Kevin Wiseman and Karla Marlow for Feather River data and photos

Rob Leidy -- this photo

A group of four brown frogs are perched on a mossy rock. The frogs are dark brown with lighter brown spots and are looking in various directions. The rock is covered in green moss and some small plants. The background is dark and out of focus.

Interested in joining me?
Want to start your own
census?
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