Reducing bias in pHOS near Hatchery Hotspots

PACIFIC COAST STEELHEAD MANAGEMENT MEETING

Asilomar Conference Grounds– March 10, 2016

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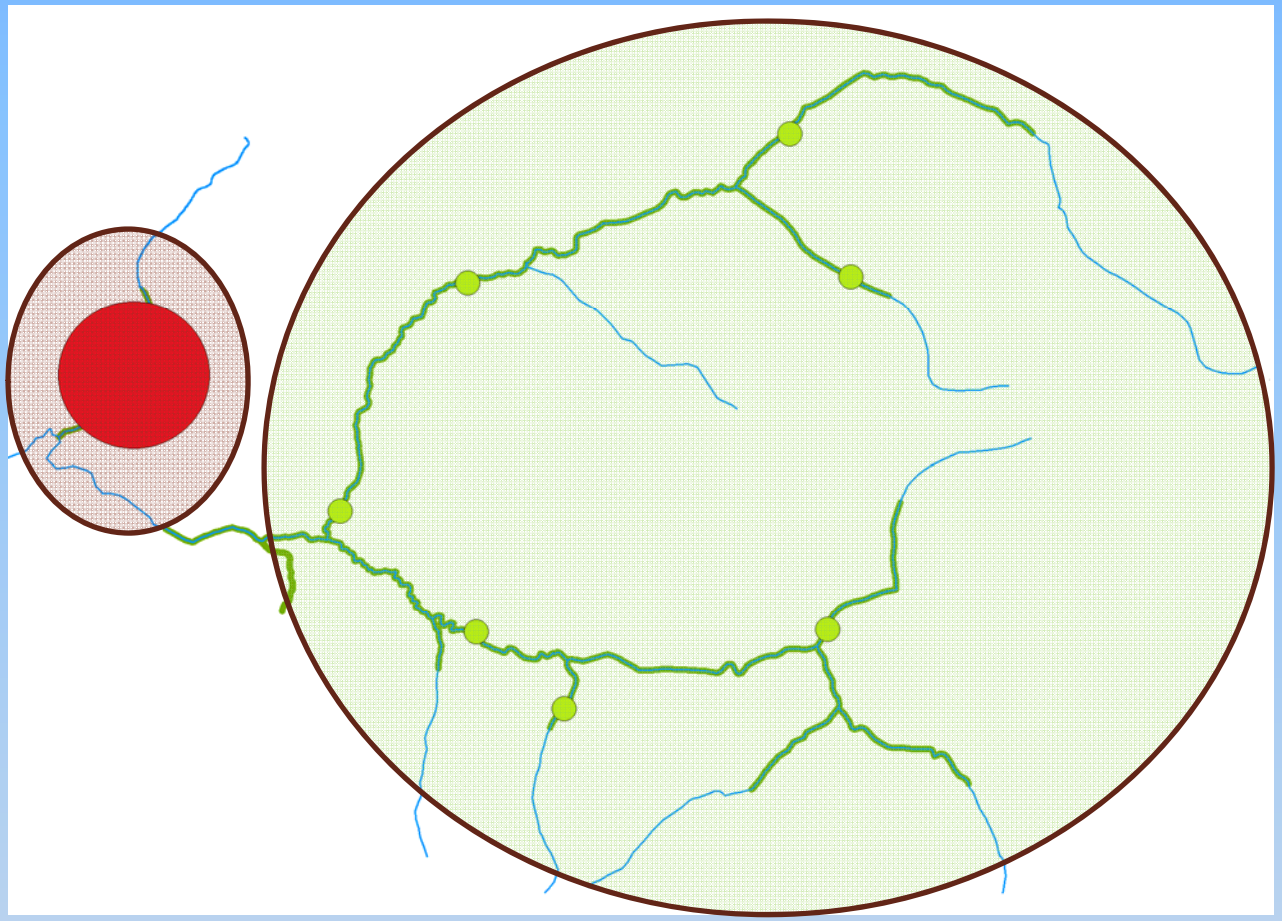
Oregon Adult Salmonid Inventory & Sampling Project

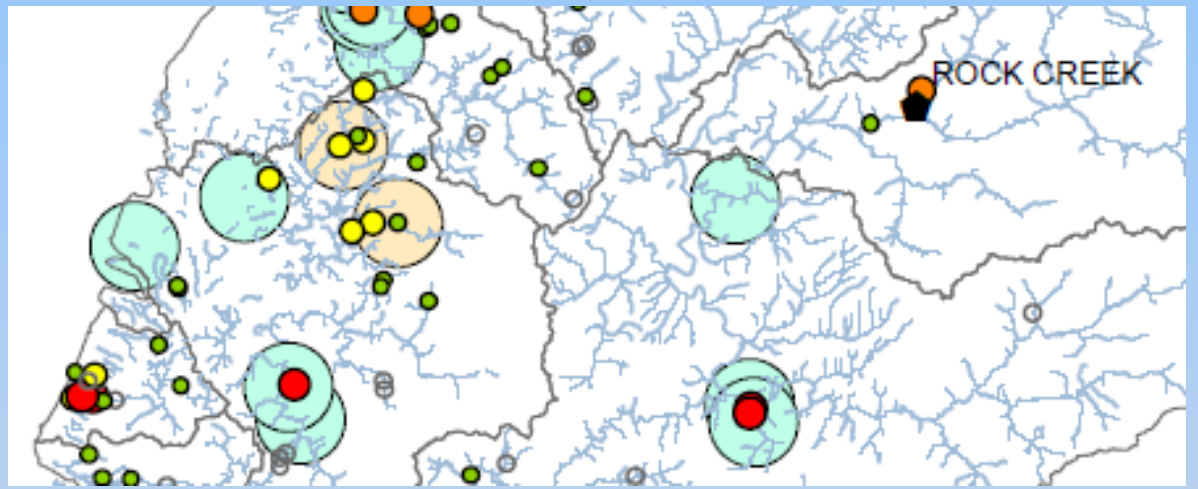
Oregon Hatchery Locations

The Result of Good Management: Hotspots



Good Medicine May Taste Bad

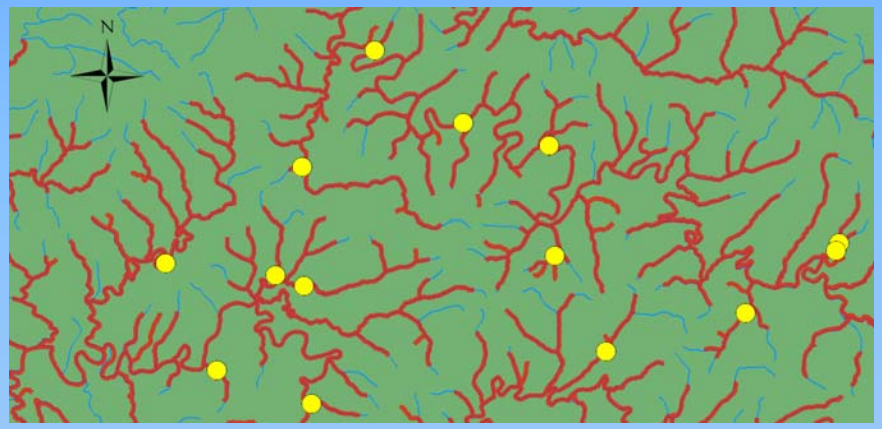
- Hotspots may be the goal, but they create some scenarios that are challenging for existing monitoring methods and metrics.



This Talk

- How hotspots in western Oregon were monitored in the past (StW)
  - A few of the issues with those methods
- An Improvement: The Coastal Multi-Species Conservation and Management Plan (CMP)
- Improved is not fixed: There is more work to do.

The (Recent)Past

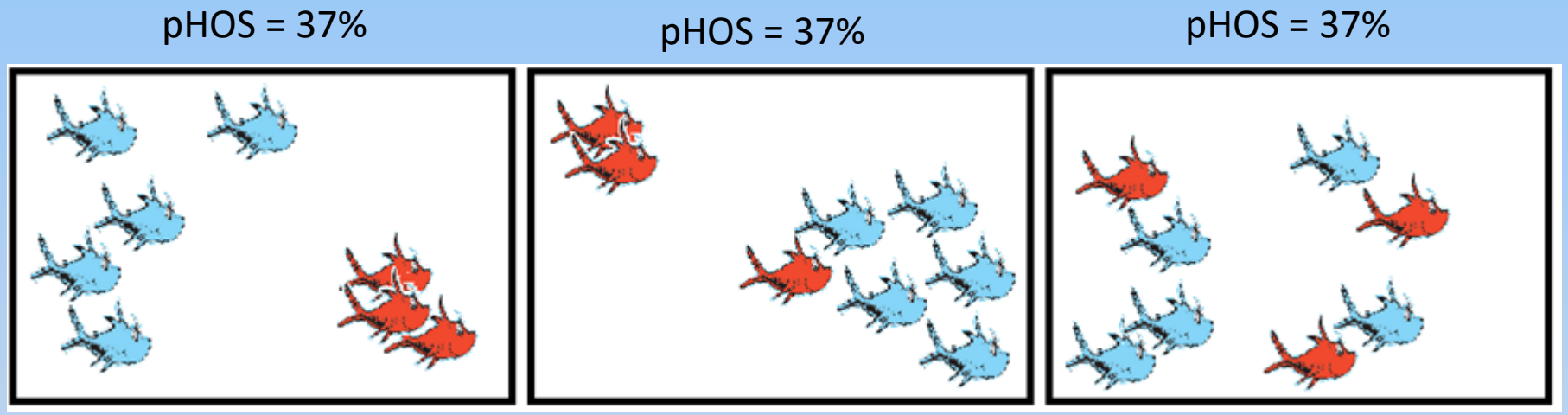


- GRTS based monitoring methods across whole of spawning habitat
- Redd-based survey methodology

- Live & Dead observations from surveys on spawning grounds
- These methods estimate pHOS across Strata/pops by simple proportions of fish observed on spawning grounds

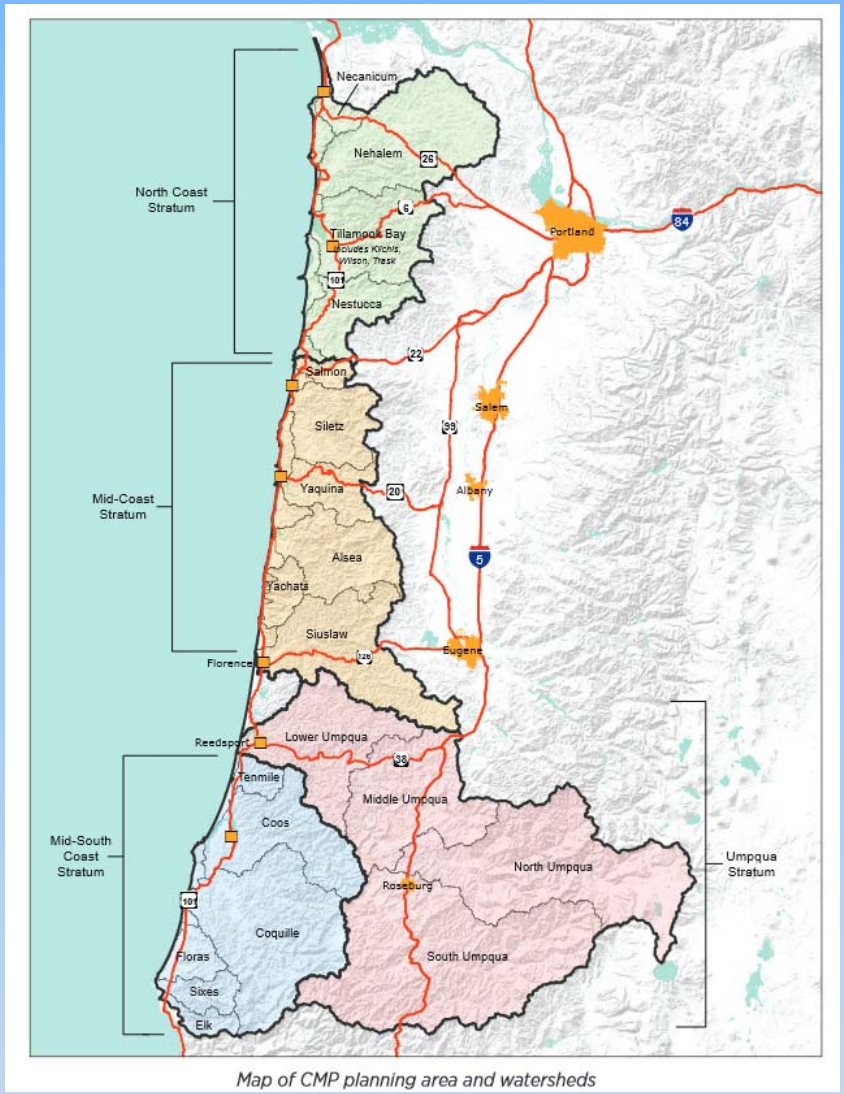
Issues Include

- Credibility: Stratification methods vary with situation
- Small sample sizes of fin-mark observation
- Observation biases in fin-marks
- Methods assume that fish spawn where observed
- Hot spot sites are unique and represent only themselves
- pHOS is not geographically explicit: Not a true measure of Introgression



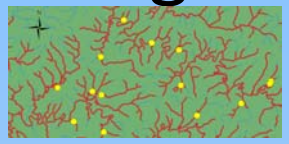
Coastal Multi-Species Conservation and Management Plan (CMP)

- Coast wide & Unique in that it addresses six distinct groups of fish species, none of which are listed under the ESA
- Maintain, protect & restore naturally produced native fish to provide ecological, economic & cultural benefits.



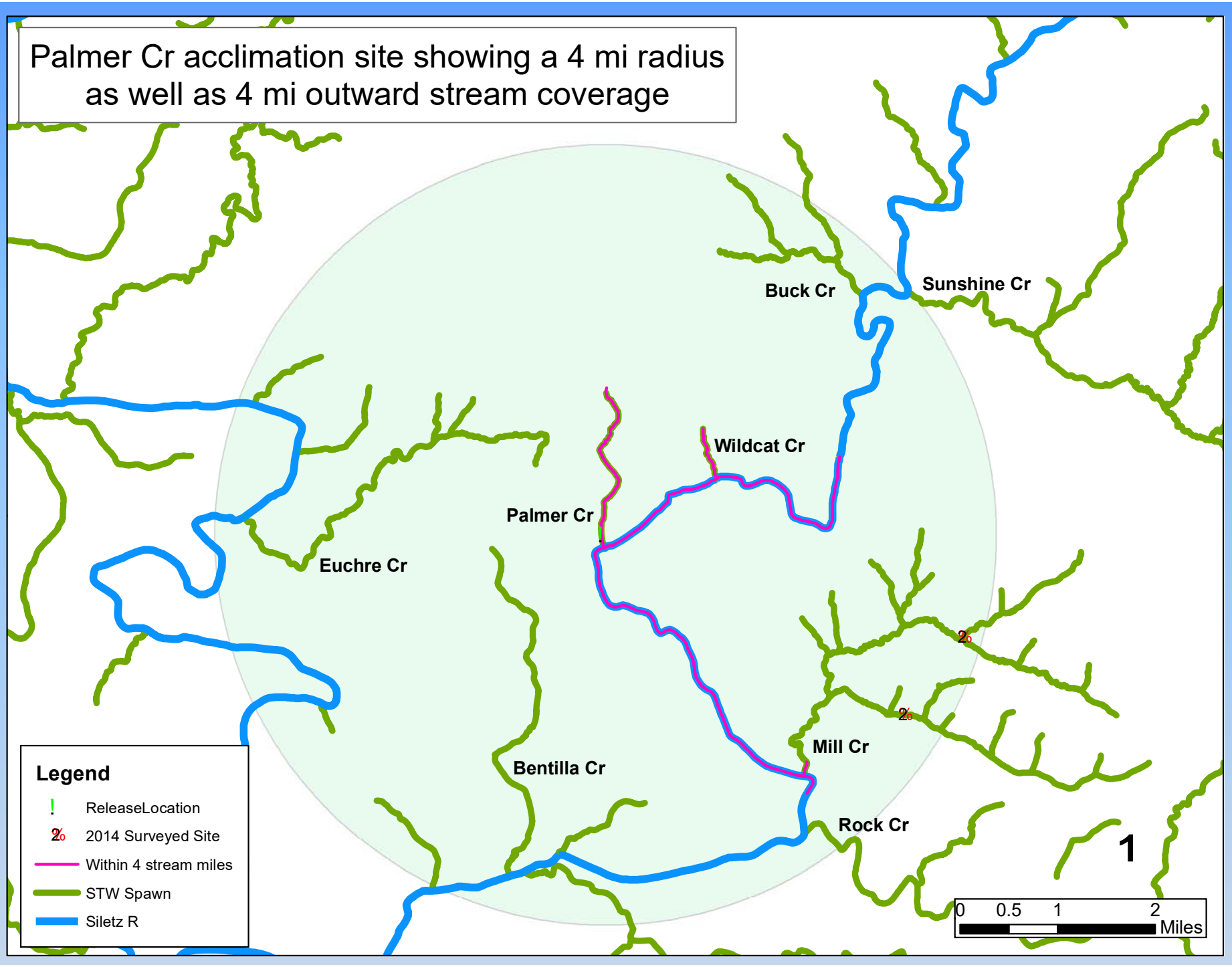
Map of CMP planning area and watersheds

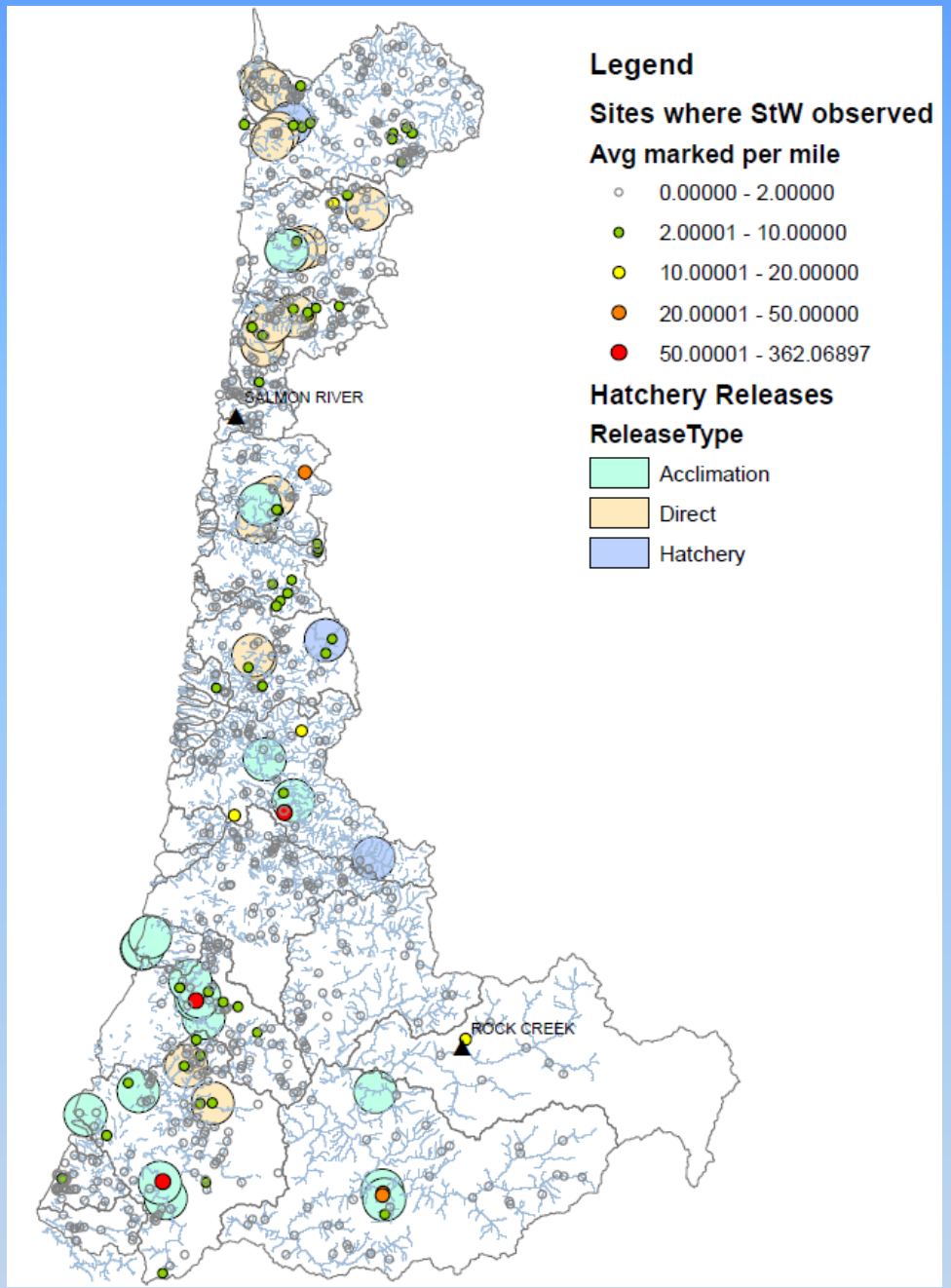
CMP monitoring prescription

- Use existing monitoring and survey methodology 
- Prescribe a rule for when and how to stratify monitoring efforts 

CMP Approach

"an alternative calculation to assess pHOS can be made by excluding the immediate area of the hatchery or acclimation/release site from the calculation."

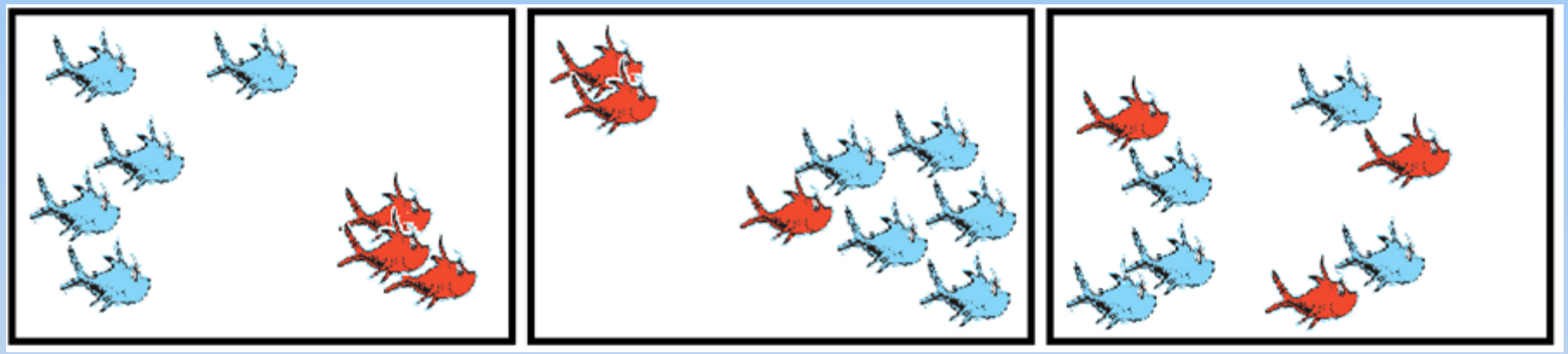

Palmer Cr acclimation site showing a 4 mi radius as well as 4 mi outward stream coverage
Buck Cr
Sunshine Cr
Wildcat Cr
Palmer Cr
Euchre Cr
Bentilla Cr
Mill Cr
Rock Cr
Legend
ReleaseLocation
2014 Surveyed Site
Within 4 stream miles
STW Spawn
Siletz R
0 0.5 1 2
Miles
1



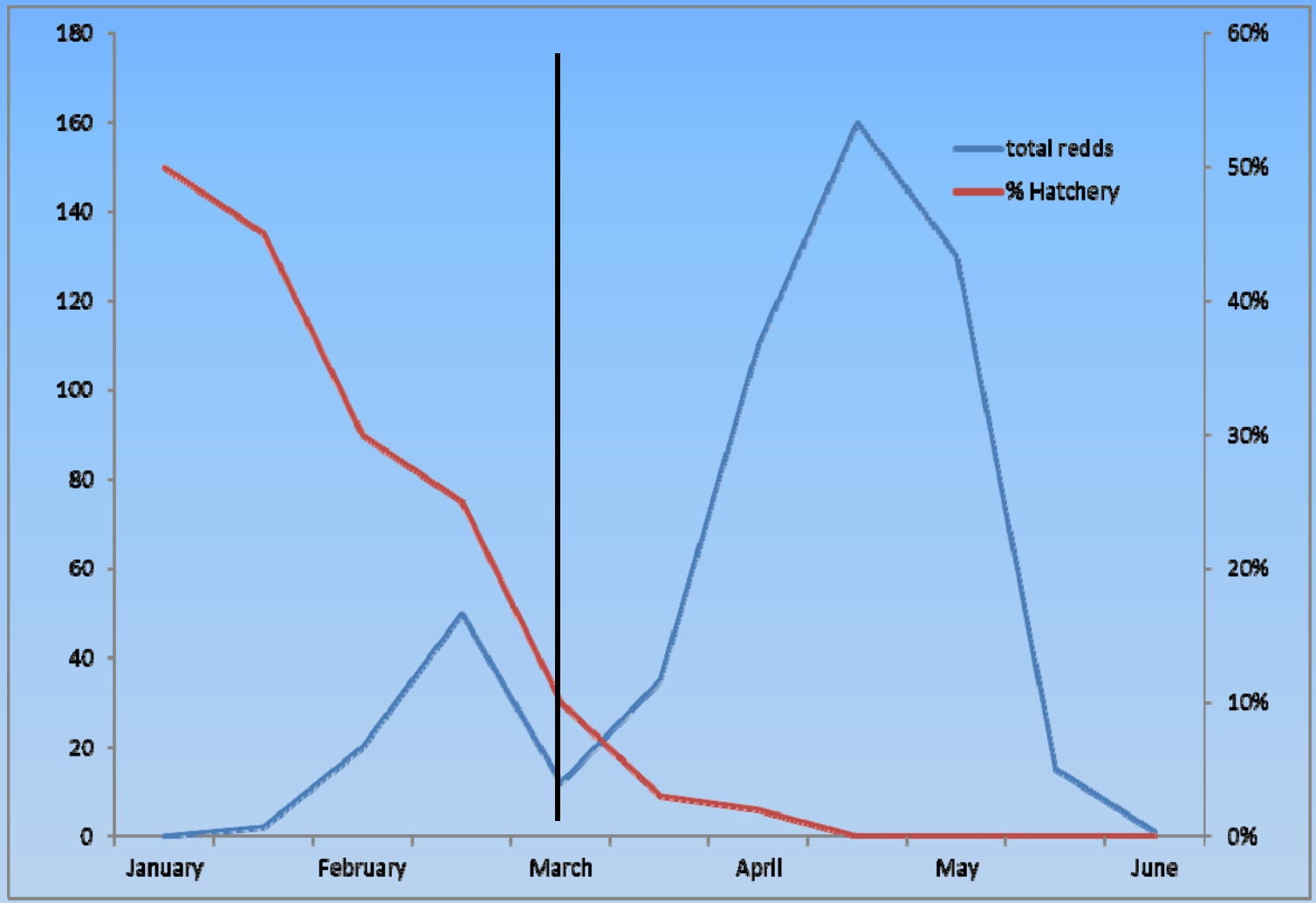
- Each release radius becomes its own sampling entity, and 30% of habitat will be sampled according to normal protocols
- Estimates of hatchery and wild will be added to the main body of strata estimates
- Also establishes differing target levels for hotspots and wild areas.

Are we there yet?

- Hot spots represent only themselves?
- Spatially Explicit?
- Credibility Improved?
- Temporally explicit?
- Problems with observation & sample size?
- Do fish spawn where we observe them?



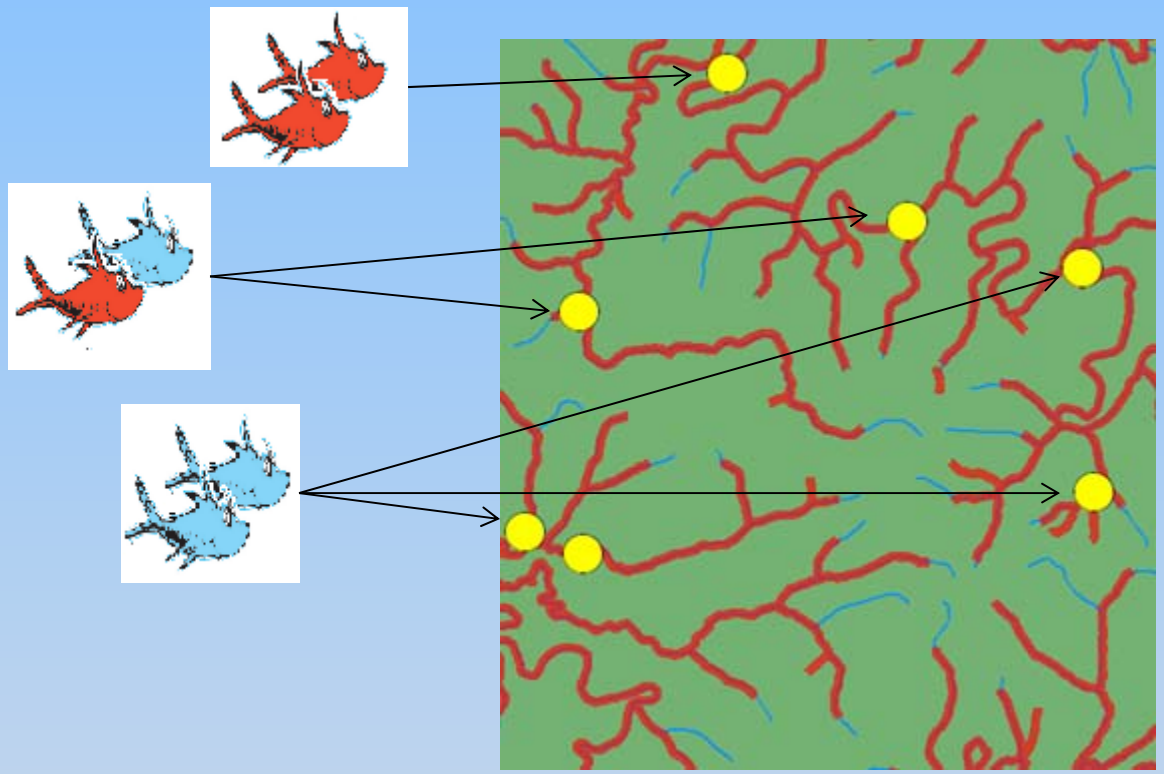
Examples of improvements

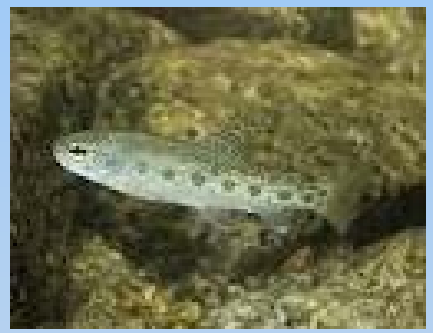


Temporal Stratification

Examples of improvements

- Parentage-based tagging (PBT): sampling from juveniles to establish reduced bias estimate for pHOS





Examples of improvements

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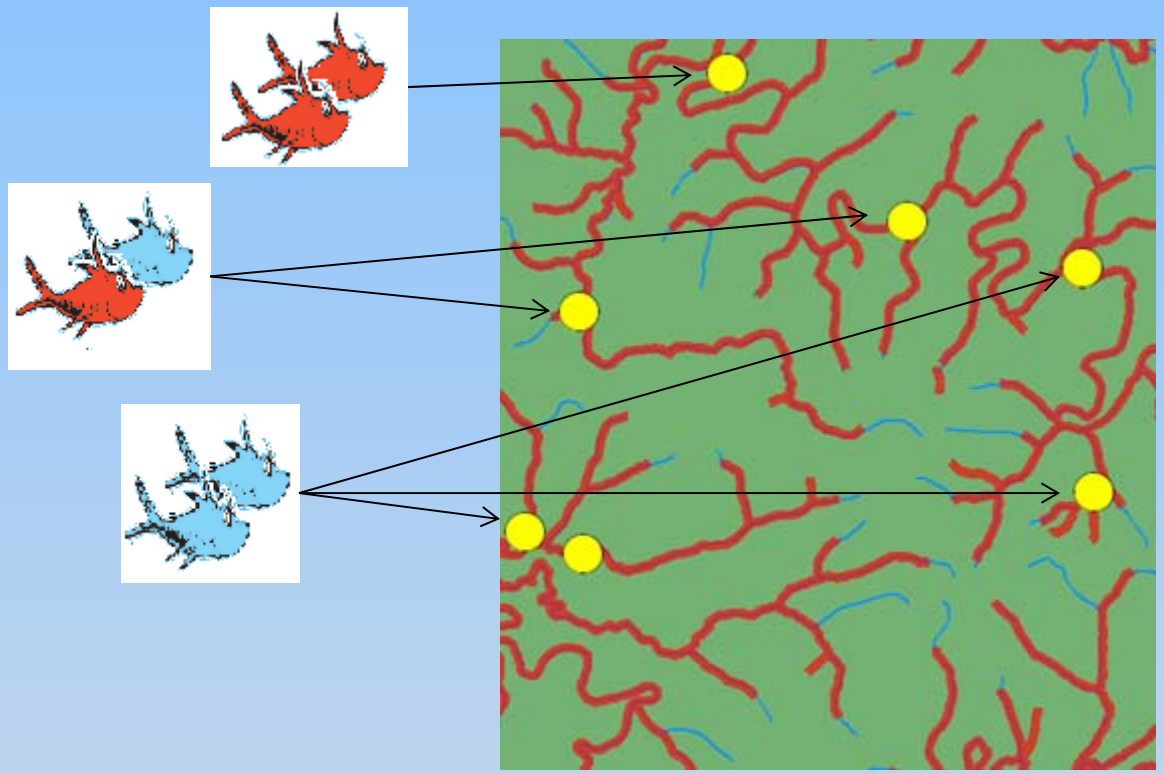


Solves previous issues

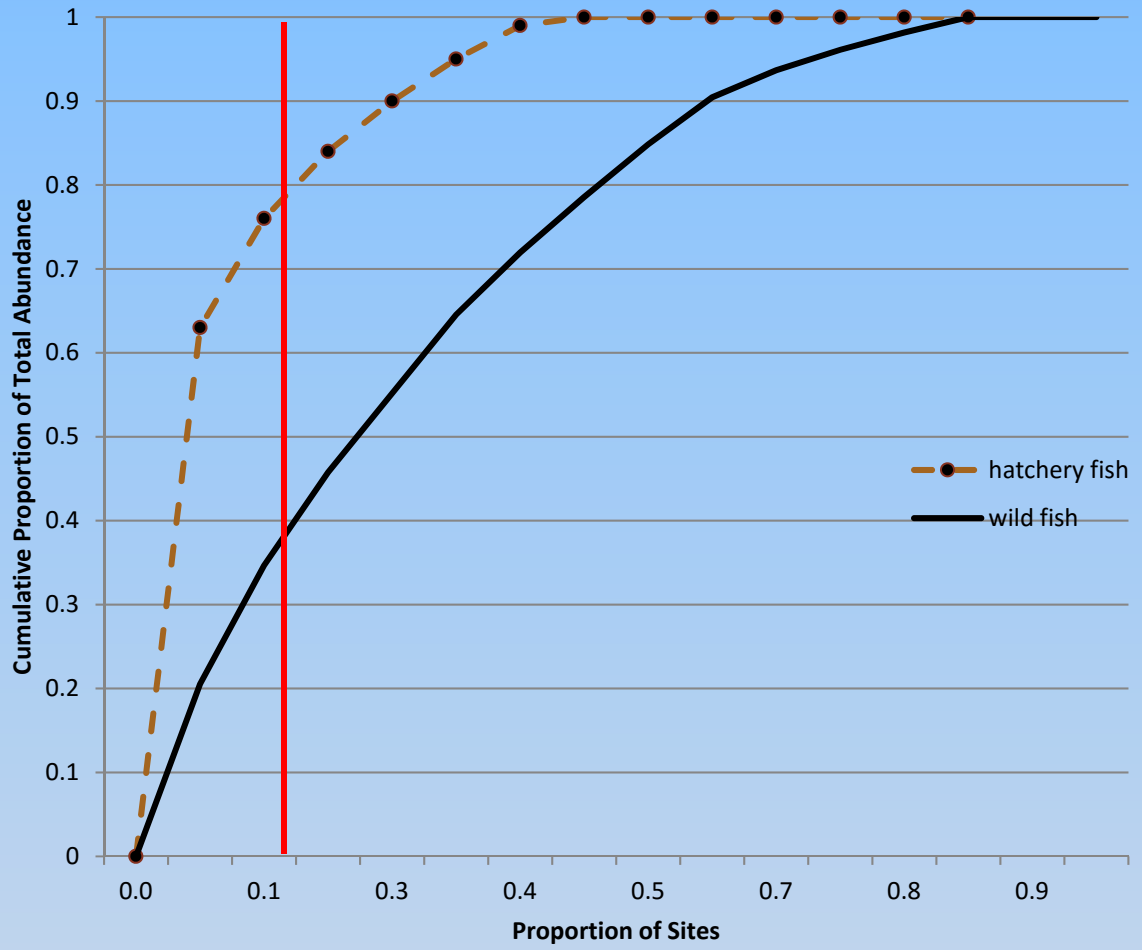
But takes effort, may not be suited to large scales, & is potentially Expensive

PEHC: Proportion of effective hatchery contribution

- Solves previous issues & gets at introgression
- Requires only a sample of adult parentage to get started
- But requires some work to calibrate to local scenarios, and like PBT still requires additional sampling for the jv component.

Improvements cont…

- Frequency distributions



The mean is made of exceptions

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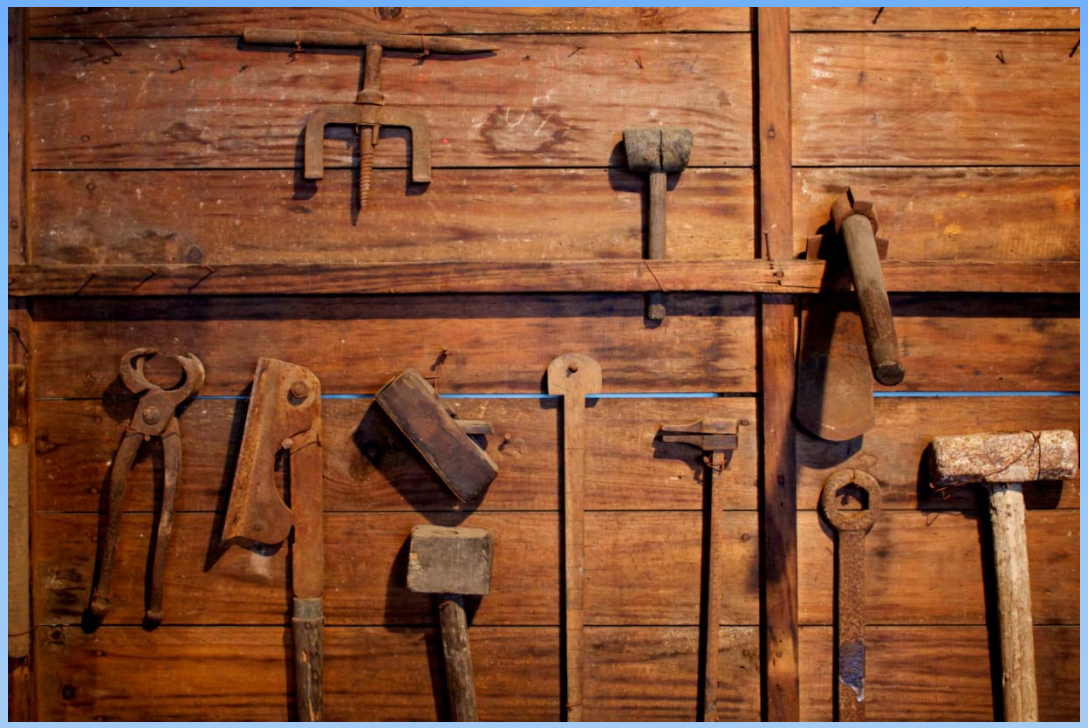
Basins are unique. Years are unique. All scenarios are strange.

The Push and the Pull



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- **Still Working on better monitoring methods and metrics**
- **But also need to promote use of secondary metrics and analysis to understand the context of situations that are currently a bit too tricky for existing measures.**