



NOAA
FISHERIES

Restoration and Monitoring from a Listed Species Recovery Perspective

Leah Mahan

NOAA Restoration Center

Restore America's Estuaries Summit

December 13, 2016

NOAA Responsibilities

- Threatened and Endangered Species
 - Prevent extinction of NOAA trust resources
 - Recover listed species
- Magunson-Stevens Act
 - Rebuild overfished stocks
 - Ensure a safe and sustainable supply of seafood
- Essential Fish Habitat
 - Maintain habitat for NOAA Trust Resources
 - Restore Essential Fish Habitat



NOAA
FISHERIES



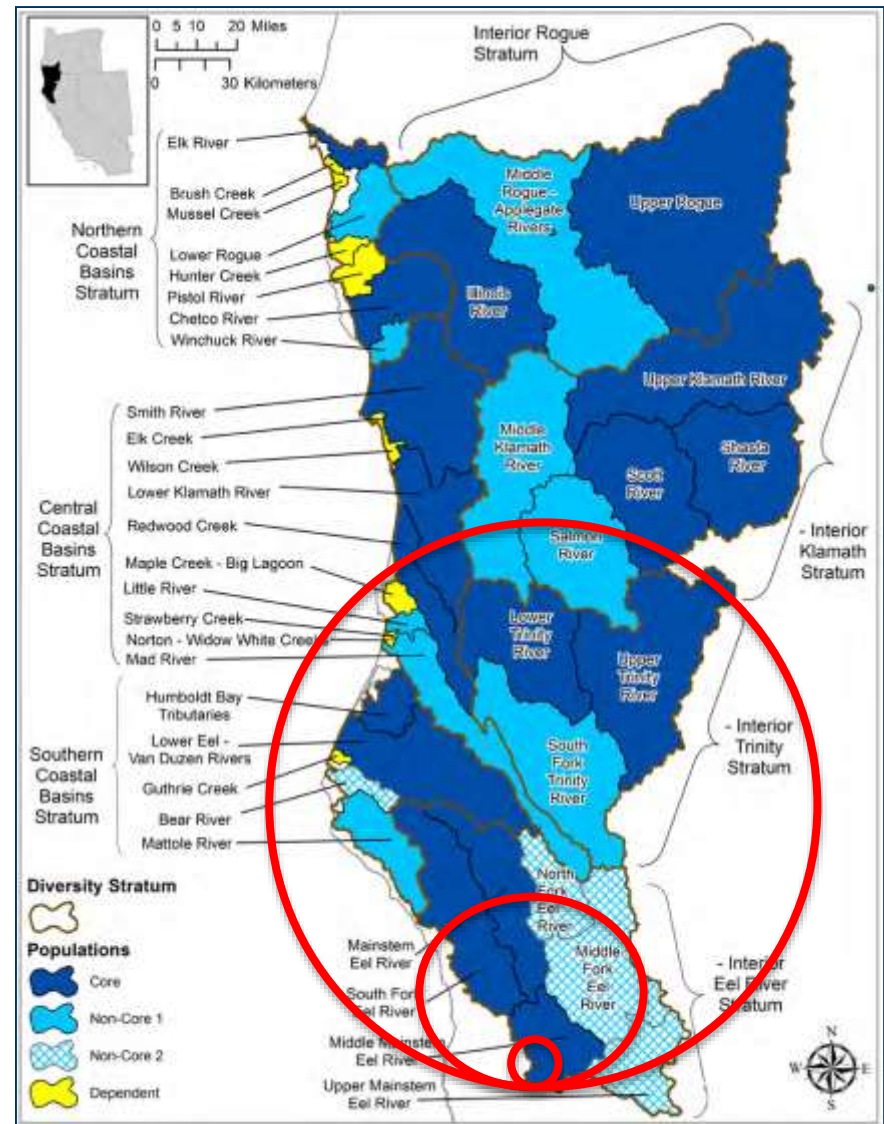
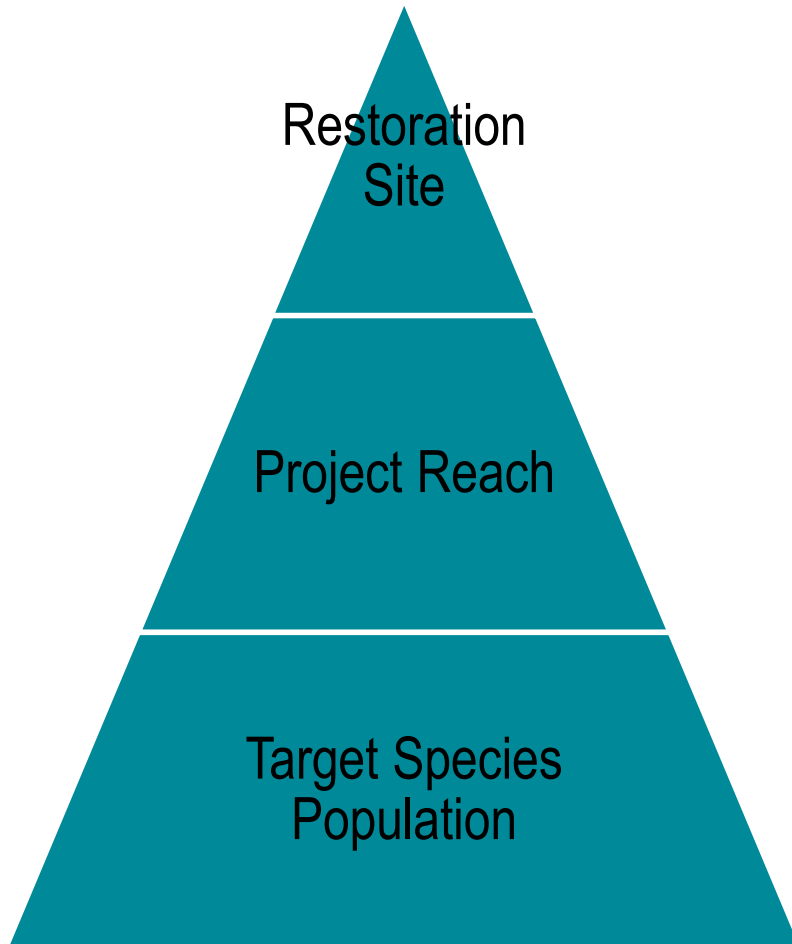
Salmon and Steelhead Recovery Plans

- Three species of listed salmonids
 - Coho salmon
 - Chinook Salmon
 - Steelhead



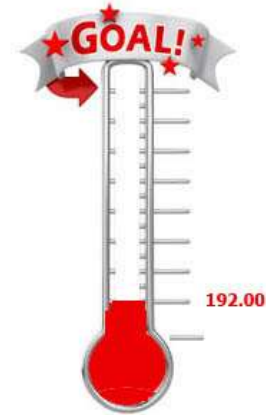
Recovery Plans

Community-based Restoration Program Monitoring Evolution



Monitoring for Recovery

How are we doing?



- At what scale do we make a difference in the population?
- Where are we making a difference?
- How much more restoration is needed to meet recovery targets?



How can we do better?

Monitoring for Recovery: Methods

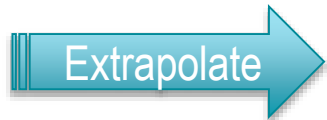
- Winter Adult Spawner surveys
- Summer Juvenile Surveys
- Habitat Surveys
 - Spawning Habitat
 - Substrate characterization
 - Spawning sites
 - Rearing habitat
 - In-stream Flow
 - In-stream cover (Large wood, etc.)



Coho salmon redd during winter spawner survey

Monitoring for Recovery: Logic

- Delisting target (fully recovered) = NOAA's goal
- Total miles of high Intrinsic Potential (IP) habitat in population area
- Number of fish per mile in restored reach
 - Estimate based on monitoring results
 - Assumption: all high IP habitat equal value



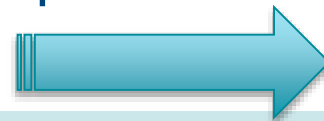
Project contribution to population recovery

Ryan Creek Barrier Removal: Targets

- Middle Mainstem Eel River Population
- 144 miles of high IP habitat in population



- Recovery target: 6300 spawners



= 43 spawners per mile

Ryan Creek Barrier Removal: Results

- 41 coho salmon redds (82 spawners) in 1.5 miles of opened habitat
- Estimate: 54 spawners/mile in project reach
- Recovery Target: 43 spawners/mile



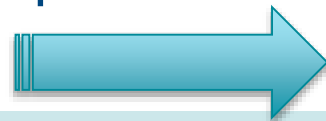
⇒ 123% of reach target
⇒ 1.3% of population recovery target

Glenbrook Gulch Dam Removal: Targets

- Albion River Population
- 59.2 miles of high IP habitat in population



- Recovery target: 2300 spawners



= 38 spawners per mile

Glenbrook Gulch Dam Removal: Results

- 6 coho salmon redds in 1 mile of restored habitat
- Estimate: 12 spawners/mile in project reach
- Recovery Target: 38 spawners/mile



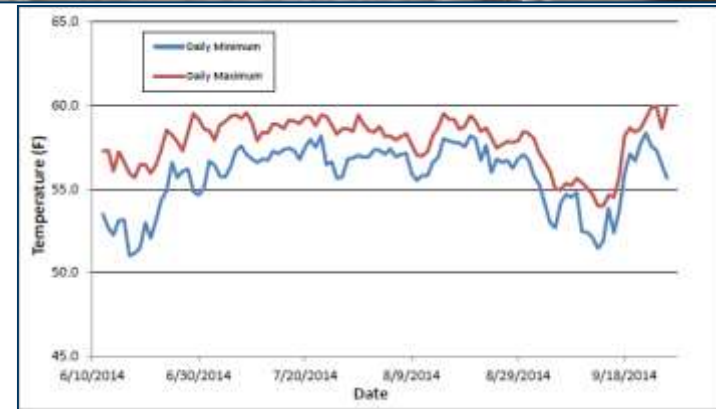
⇒ 32% of reach target
⇒ 0.5% of population
recovery target

Essex Gulch Barrier Removal: Priority

- Barrier “complex”
 - County Road
 - State Highway
 - Private Road
- Estimated cost \$2-4m

⇒ Low priority (#23)

- Fish immediately downstream
- 4.5 miles of habitat blocked
- Looked at:
 - Spawning habitat (lots)
 - Rearing habitat (lots)
 - Temperature and in-stream flow (excellent year round)



Essex Gulch Barrier Removal: Targets

- Lower Mad River Population
- 85 miles of high IP habitat in population



- Recovery target: 540 spawners

 = 6 spawners per mile

Essex Gulch Barrier Removal: Results

- Potential for 170 spawners in 4.5 miles of blocked habitat (based on habitat surveys)
- Estimate: 38 spawners/mile in project reach
- Recovery Target: 6 spawners/mile



⇒ 633% of reach target
⇒ 31% of population
recovery target
⇒ Barrier moved to #3
priority in Northern CA

Monitoring in Species Recovery Context

Lessons Learned:

- High value of viewing monitoring data in context of recovery
 - Informs us about population benefits of past restoration
 - Informs us how future projects could fit into recovery
 - Helps us get perspective on how far we have to go



Improved Prioritization

- Ross Taylor and Associates
- Trout Unlimited
- Mendocino County
- Humboldt County
- Caltrans
- California State Parks
- California Conservation Corps

Thank You Partners!

