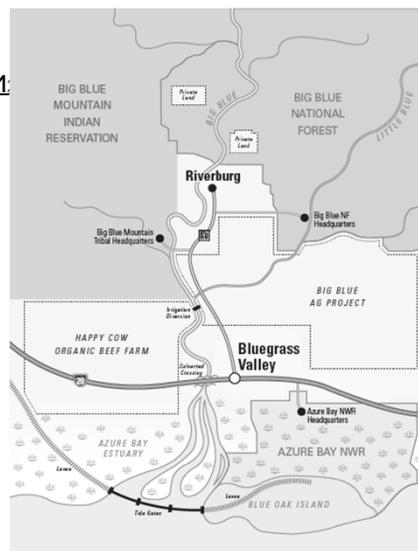
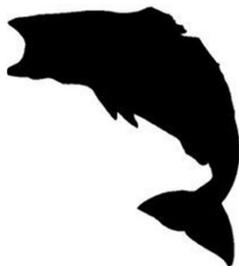


# Big Blue River Ecosystem Restoration

## BIG GREEN RESTORATION TEAM:

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## Phased Approach Timeline

- Phase 1: 2017  
Improve Azure Bay Estuary and surrounding habitat.
- Phase 2: 2020  
Improve Freshwater Riverine and Riparian Landscapes ecosystem.
- Phase 3: 2023  
Improve Upland Oak Prairies habitat.



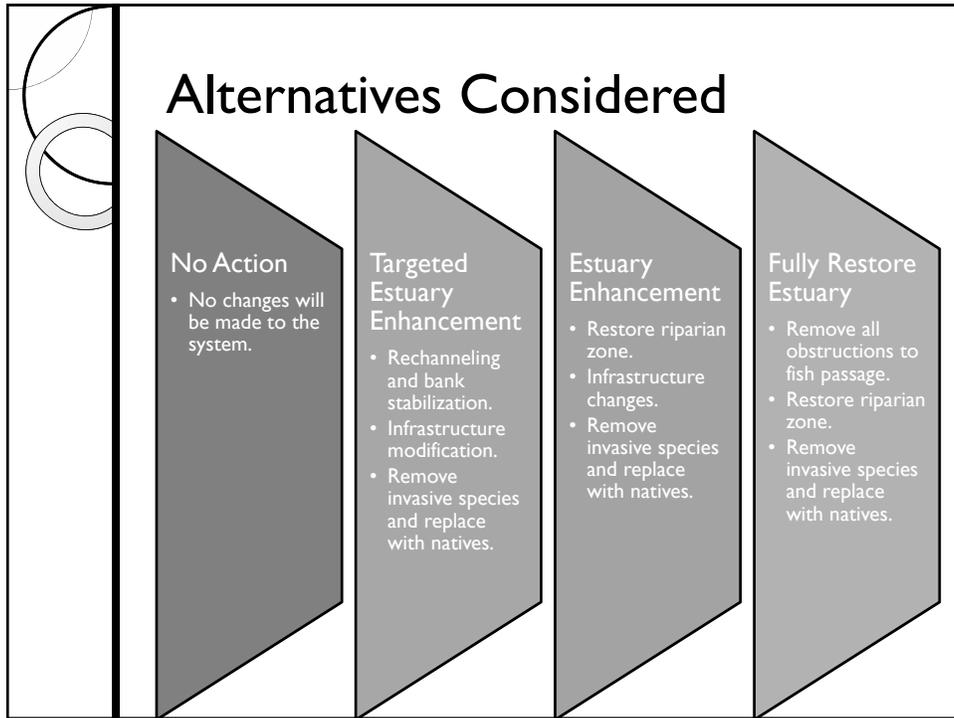
## Estuary's Conditions and Threats

- Decreased estuary functions
  - Flood protection
  - Habitat
- Alteration of habitat
  - Decreased connectivity and complexity
- Loss of native species
  - Increase in invasive species
- Limited fish passage
  - Core spawning and rearing sites
- Other anthropogenic impacts
  - Pollution
  - Sedimentation



## Restoration Goals and Objectives

- Overall Goal:  
Restore estuary to a healthy and resilient habitat for the enhancement and survival of wildlife.
  - Objective 1:  
Improve and restore fish passage.
  - Objective 2:  
Improve water quality.
  - Objective 3:  
Reverse degradation of habitat by oil spill.



## Alternative A: No Action

Positives	Negatives
Cost-effective	Lose land to flooding
Not disruptive	Continued degradation of estuary
Irrigation as usual	Species decline
Tidal flows unchanged	Warming water
	Loss of habitat diversity
	Lack of estuary connectivity
	Continued subsidence and flooding
	Loss of recreational opportunities

## Alternative D: Fully Restore Estuary

Positives	Negatives
Increase estuary functions	High implementation cost
Conservation of listed species	Disruptive
Decreased risk of flooding	Changes in tidal flow (effects on Happy Cow)
Water is cooled	Changes in irrigation
Natural fire regime	Effects on local products
Recreational opportunities	Economic challenges
Return to native vegetation	Need for road repairs (after culvert removal)
Tribe's cultural resources restored	
Decreased fish mortality	

## Challenges

- Funding!
- Buy-in from all stakeholders.
- Phase 3 participants may be frustrated with the proposed restoration timeline.

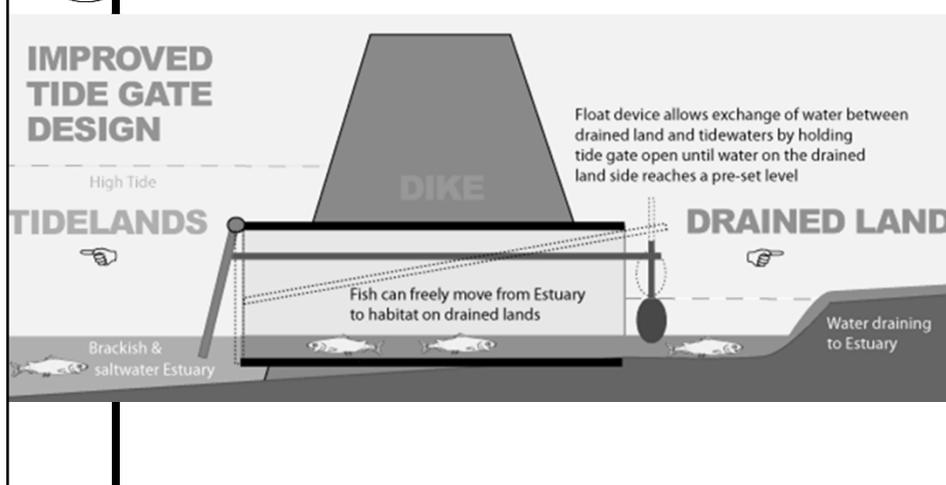
## What to do ... what to do?

- Our chosen alternative is:

### **Alternative B**

- Economical.
- Achievable.
- Timing.
- Feasible monitoring.
- Considerate of multiple stakeholders.
- Will still improve habitat for listed species which are most vulnerable.

## For Example:



## Monitoring and Management

- Adaptive management strategy (3 yrs.)
  - Pre/Post-monitoring included.
  - Compartmentalized culvert.
  - Tide gate floats.
- Salmon monitoring plan.
- Develop targets for cordgrass removal and replacement.
- Water quality
  - DO
  - Temperature
  - Flow

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The partner logos include: U.S. Fish & Wildlife Service, Big Blue Agricultural Project, Happy Cow, Big Blue Department of Fish and Game, National Wildlife Refuge System, Trout Unlimited, Blue Mountain Tribe, Blue Moon County, NOAA, Environmental Protection Agency, and Blue Grass Valley.

## Coordination Strategy

- Trustee Council Scoping Meetings
- Researchers Workshop (solicit expertise)
- Stakeholders Workshop
- Outreach Town Hall



## Compliance

- 404 for stream and culvert
- Section 7 consultations for culvert work
- 10(a)(1)(A) recovery permit
- NPDES permit (CWA)
- Section 106 (NHPA)
- State permitting
- City building permitting
- Other as determined by solicitors

## Funding Sources

- NRDA Settlement (pre-spill baseline)
- Federal Highways - culverts
- Coastal Program
- Private Lands – NRCS and partners program(s)
- NGOs (Blue Trout Unlimited, Riverburg-Blue River Stewards, etc.)
- Wildlife Tribal Grant(s)
- Proceeds from outreach

## Public Outreach

- Blue Orange Festival
- Blue Trout Festival
- Trout Stout
- Blue-lipped 5k
- Salmon Superhighway
- Signage
- FB Live
- Blog
- Listserv

