Diversity,
Diversity,
Diversity

Diversity, Diversity, Diversity

- Diversity of habitats
- Diversity of hydrology and inundation patterns
- Diversity of vegetation
- Diversity of salmon stocks
- Diversity of life history strategies
- Diversity needed in monitoring

Diversity Implications

- Estuarine restoration of diverse habitats has potential to help multiple stocks, especially lower river stocks
- What are consequences for loss of diversity? How does this affect resilience?
- How will resilience relate to effects of climate change, sea level rise, and geologic events?
- How do invasive species contribute to the loss of diversity?
- What are implications for habitat restoration?

Landscape

Landscape

- Landscape processes
- Landscape planning
- Landscape project development
- Landscape prioritization
- Landscape RME

Other Management Considerations

Multiple Management Considerations

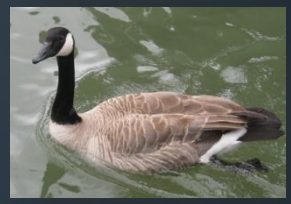
Are habitat restoration objectives compatible with other management objectives?

- **Hatchery management**
  - How do hatchery and wild fish interact in the estuary?
  - Do hatchery fish limit the effectiveness of estuary restoration?
  - Do hatchery fish change food webs, predation pressure, and capacity?
  - Hatchery practices confound geographic sources of genetic stocks
- **Harvest management**
  - Effects of hatchery and harvest intensity on escapement of fish into places like Youngs Bay
- **Agricultural management**
  - How to evaluate effectiveness of agricultural BMPs on water quality

Multiple Species Considerations

How to balance salmonid objectives with broader ecological and social community objectives?

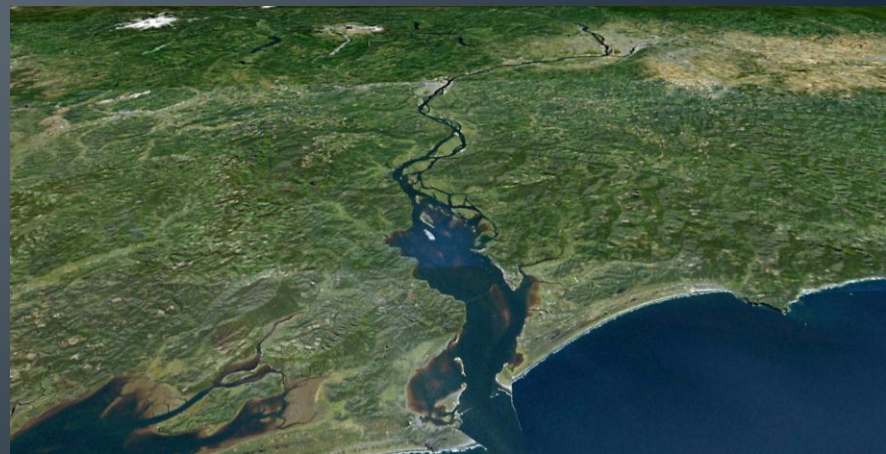
- Beaver
  - More pools, deeper and longer pools in tidal shrub habitat
  - Interaction with food webs (detritus), fish communities, and salmon habitat
- Mollusks
  - How to incorporate needs of other species into restoration projects to minimize risks
  - Add cobble habitat to restoration plan
  - Careful monitoring
- Columbian white-tailed deer
- Waterfowl
- Smelt
- Turtles
- Culturally-significant species
- Maintain biodiversity



Social Engagement

Social Engagement

- Science/research exchange with other areas
- Landowner exchange
- Invite early public participation, results in better support and advocacy
- Better public support for diversity, improve resilience of populations, build adaptive capacity, collaborate at a landscape scale
- Opportunities to influence planning processes through social engagement
- Awareness of water quality impacts
- Relationship to human health
- Tools for visualization



Emerging Tools and Potential Uses

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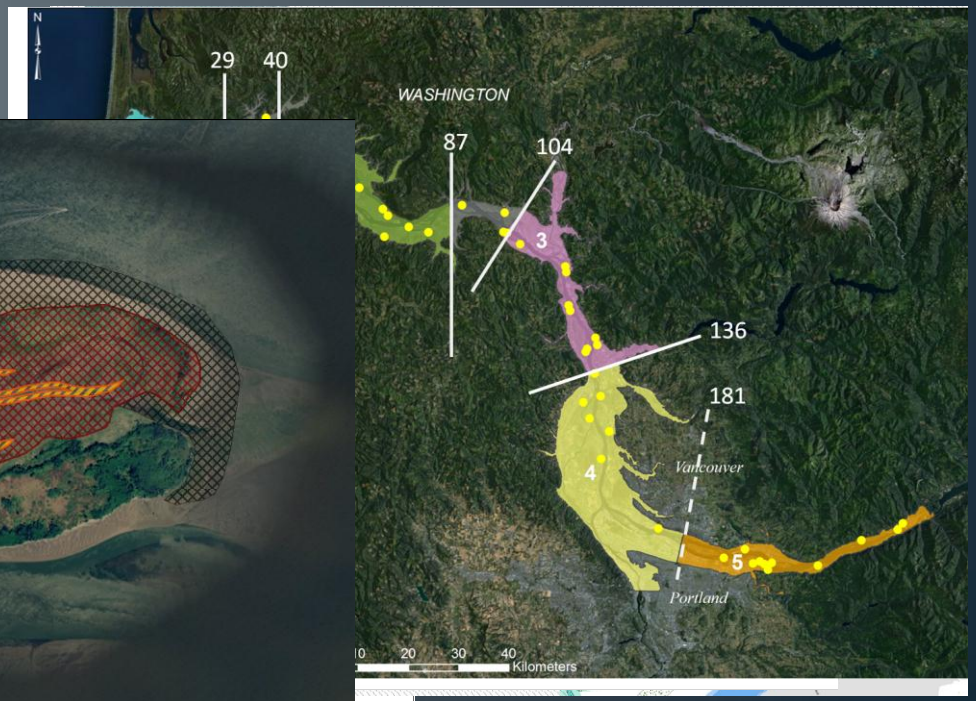
- Guidelines for beneficial use of dredge material
- Habitat Restoration Prioritization Strategy
- Landscape Planning Framework using the Ecosystem Classification
- Identified vegetation zones
- SATURN and Data Explorer

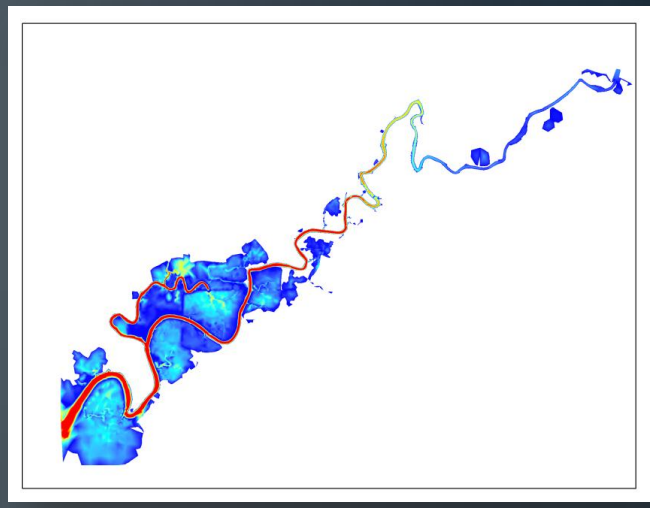


Use of preliminary data in adaptive management

Making decisions in an imperfect world

Modeling dike breach to wetted area relationship

- Synergistic effects up to certain point, then diminishing returns
- Could inform restoration designs, cost-benefit analyses, estimate of restoration benefits



Questions?

- Can results be transferred to other basins?
- Does modeling reflect actual on-the-ground response?
- Is wetted area the correct metric?
- Potential value of upstream habitat with less frequent inundation?
- Would results differ if breaches were selected strategically?

Pile dikes protecting shallow water habitat

- Need to maintain/repair existing pile dikes to maintain their dual function of protecting habitat and maintaining navigation channel

Questions?

- How does this impact RPA recommendations?
- How to improve or modify pile dikes to decrease predation, improve salmonid access, and improve complexity of shallow water habitats?
- Combine with dredge material placement to create and maintain habitat?
- Potential temperature and toxic contaminant issues would need to be considered

Knowledge Gaps and Needs

Importance of Monitoring

- Chum reintroduction efforts/strategies in Oregon
- ERTG uncertainties list and SBU estimates
- Longer-term effectiveness of restoration projects
- Program effectiveness

Knowledge Gaps and Needs

- Role of invasive species
- Toxicity and synergistic effects of contaminants
- Impact of hatchery interactions with wild juvenile salmonids
- Broader monitoring base
- Role of diversity in maintaining resiliency
- Understanding of food web dynamics

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