Weaving Climate Smart Adaptation and Mitigation Practices throughout the lower Columbia River

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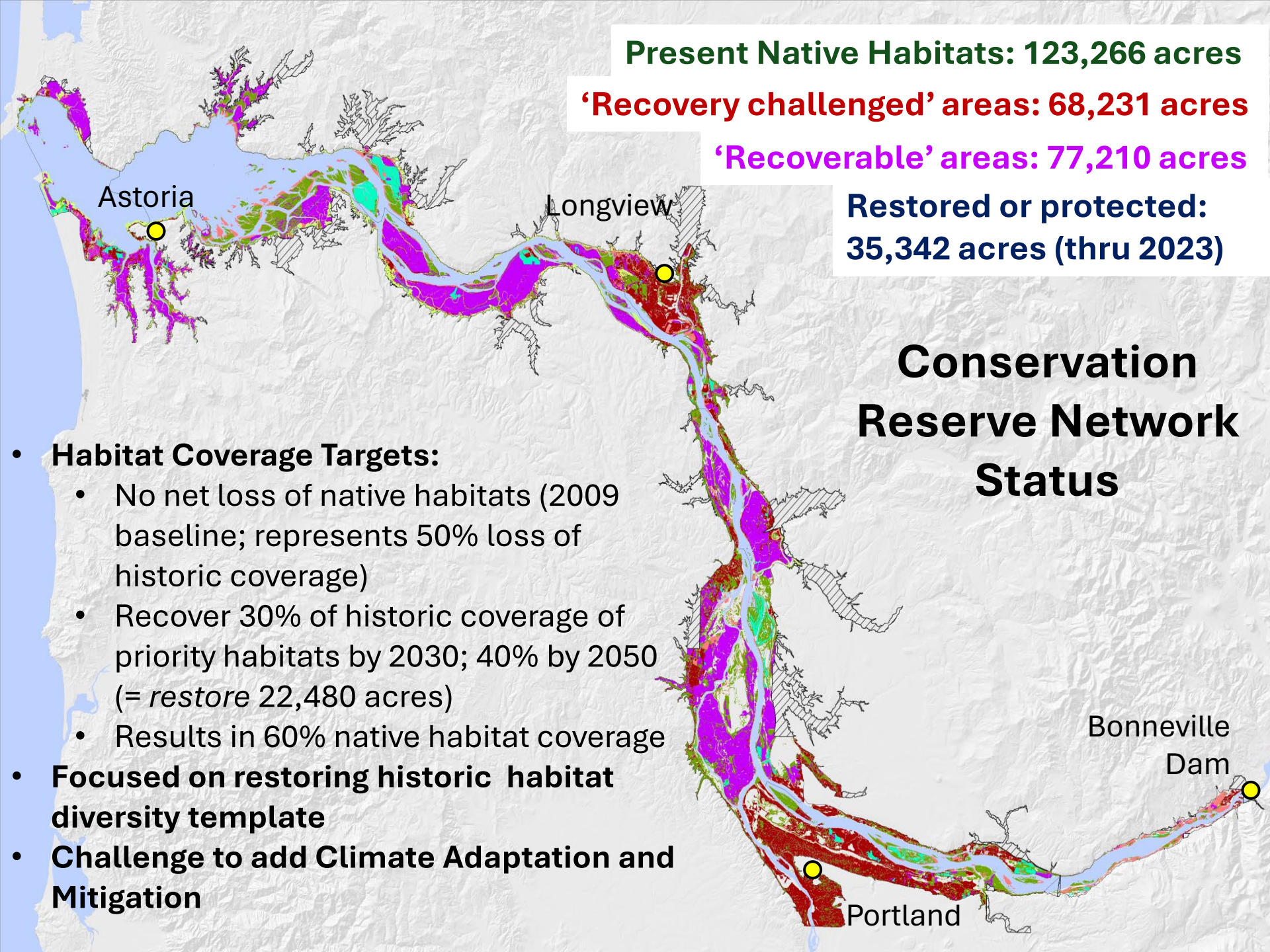
Lower Columbia Estuary Partnership



Conservation Reserve Network Status

- **Habitat Coverage Targets:**
  - No net loss of native habitats (2009 baseline; represents 50% loss of historic coverage)
  - Recover 30% of historic coverage of priority habitats by 2030; 40% by 2050 (= *restore* 22,480 acres)
  - Results in 60% native habitat coverage
- **Focused on restoring historic habitat diversity template**
- **Challenge to add Climate Adaptation and Mitigation**

Basin-Wide Climate *Adaptation* Measures for the Lower Columbia River

Reconsider goals and objectives in light of a changing climate (climate-smart; Stein et al. 2014):

1. Mapped **cold water refuge** locations and identified spatial gaps
   - Now testing and applying techniques to fill gaps and restore/enhance refuges
2. Assess vulnerability of lower Columbia River floodplain habitats to **sea level rise** and increased fluvial flooding
   - Develop engineering design criteria, best practices for activities that integrate SLR and fluvial flooding
3. Focus on process-based restoration techniques for floodplain connectivity, **hyporheic exchange**
4. Adding climate adaptation to individual restoration projects (e.g., living shoreline, alluvial fan for thermal cooling etc.)

Project-Specific Climate *Adaptation* Measures

- **Steigerwald Floodplain Reconnection Project**
  - Roughly 1,000-acre restoration project on mainstem focusing on recovery of salmon, steelhead and lamprey habitat
  - Uses a 500-year flood event as the engineering design standard (instead of 100-year traditionally required)
  - Removes 2 miles of levee and builds setback levees with a living shoreline (instead of traditional riprap)
  - Restores a historical alluvial fan to provide habitat complexity and thermal cooling

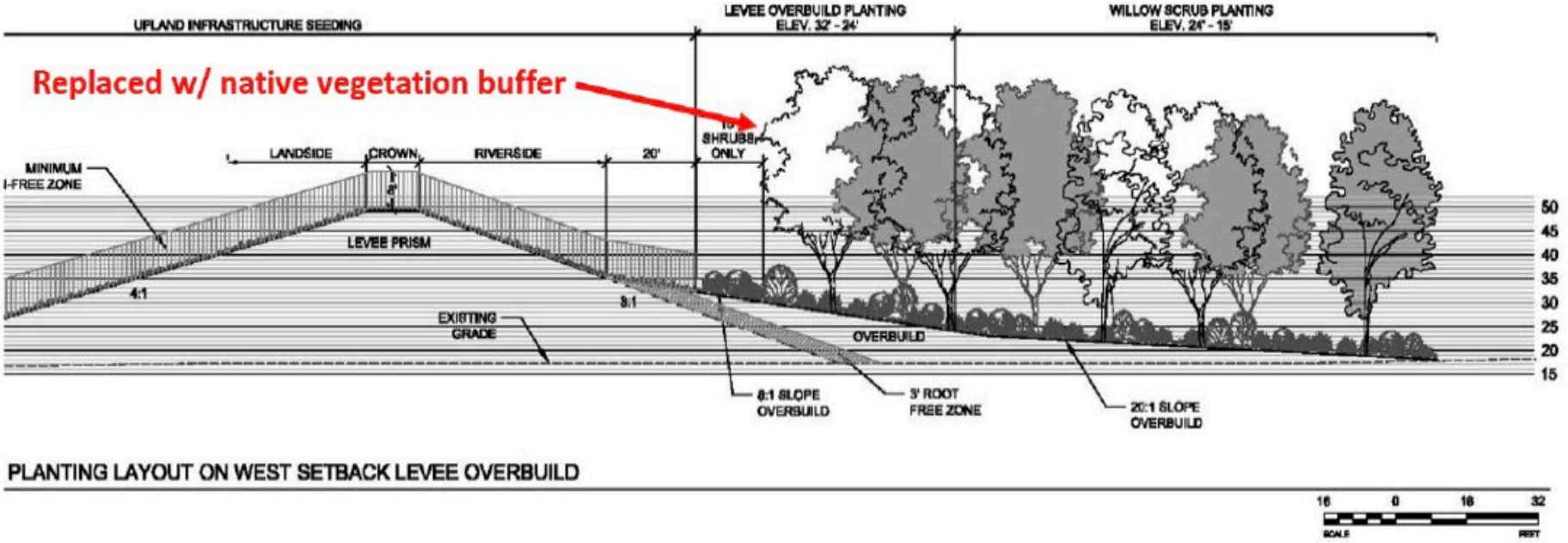


Figure 6. The living shoreline restoration design concept being implemented at the Steigerwald Flood Risk Reduction and Floodplain Restoration Project site.

Project-Specific Climate *Mitigation* Measures

Steigerwald Floodplain Reconnection Project

Activities included:

- **1.7 million cubic yards of soil** moved with large diesel-burning construction equipment to build the setback levees and create wetlands
- Burning **429,491 gallons of diesel** fuel
  - One gallon burns **22.6 lbs** of CO_2
  - Equates to **9,706,496** lbs of CO_2
- **1,080 cubic yards of concrete** poured for a flood wall, two bridge abutments, and other infrastructure
- **244,084 pounds of steel** installed as reinforcing bar in concrete and for pedestrian bridges spanning two floodplain channels

➢ ***Resulted in the release of @ 14,358,216 pounds of CO_2***

Project-Specific Climate *Mitigation* Measures

- **Planted over 640,000 native trees and shrubs as part of the project**
- Preliminary analysis - project will **achieve carbon neutrality in 8-12 years***
- *Reducing footprint of new projects during **design** phase*