

Maroon Ponds

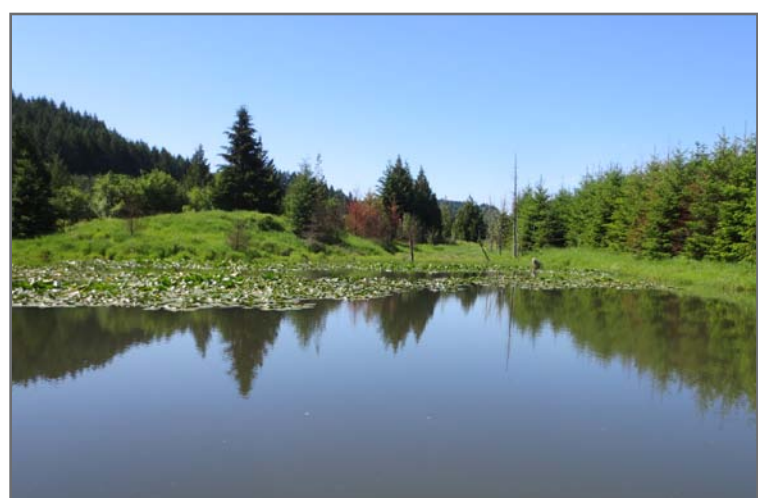
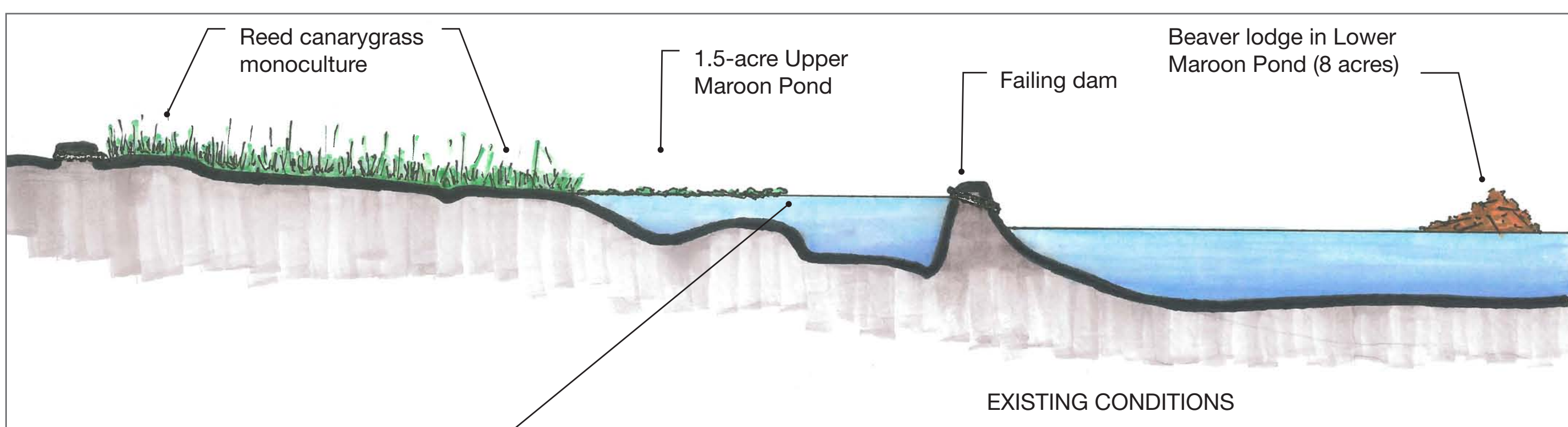
A case-study of wetland and stream habitat restoration from planning to post-construction

- ▶ Collaborative restoration with Clean Water Services of Washington County, Metro, and the American Beaver (*Castor canadensis*)
- ▶ Contributors: Sarah Hartung, Sr. Biologist (ESA Vigil-Agrimis); Robert Emanuel, PhD, Water Resource Project Manager (CWS); Nicole Czarnomski, PhD, Principal Scientist (formerly with ESA Vigil-Agrimis)
- ▶ Size & Location: Maroon Ponds is a 47.5-acre parcel along the Tualatin River located 30 miles west of Portland, OR – Upper Tualatin River Watershed

1 Planning/Pre-Construction

Restoration Goal: Achieve a diversity of high-value wetland and riparian habitats for a multitude of native species by creating a restoration design that incorporates resident beavers.

Existing Conditions: Farm pond with failing 10-foot high push-up dam; lower floodplain bench with stands of reed canarygrass and meadow foxtail; remnant Oregon oaks and Pacific madrone with Douglas fir encroachment; degraded fields and 2,880 feet of riparian forest along the Tualatin River.



Planning Highlights:

- Maroon Ponds was the first collaborative project between Metro and Clean Water Services in the 4,750-acre planning area of Upper Tualatin River Basin.
- Unique opportunity for water quality and habitat restoration with 75% of the planning area in public ownership (USFWS, CWS, Metro and Joint Water Commission). Private landowners also engaged in ecological enhancement.

Permitting Challenges:

- Ten month design and permitting schedule.
- Justify converting Upper Maroon Pond into a hillside wetland/stream complex by showing substantial (greater than 0.5 increase) gains in terrestrial wildlife habitat, aquatic habitat and fish habitat.

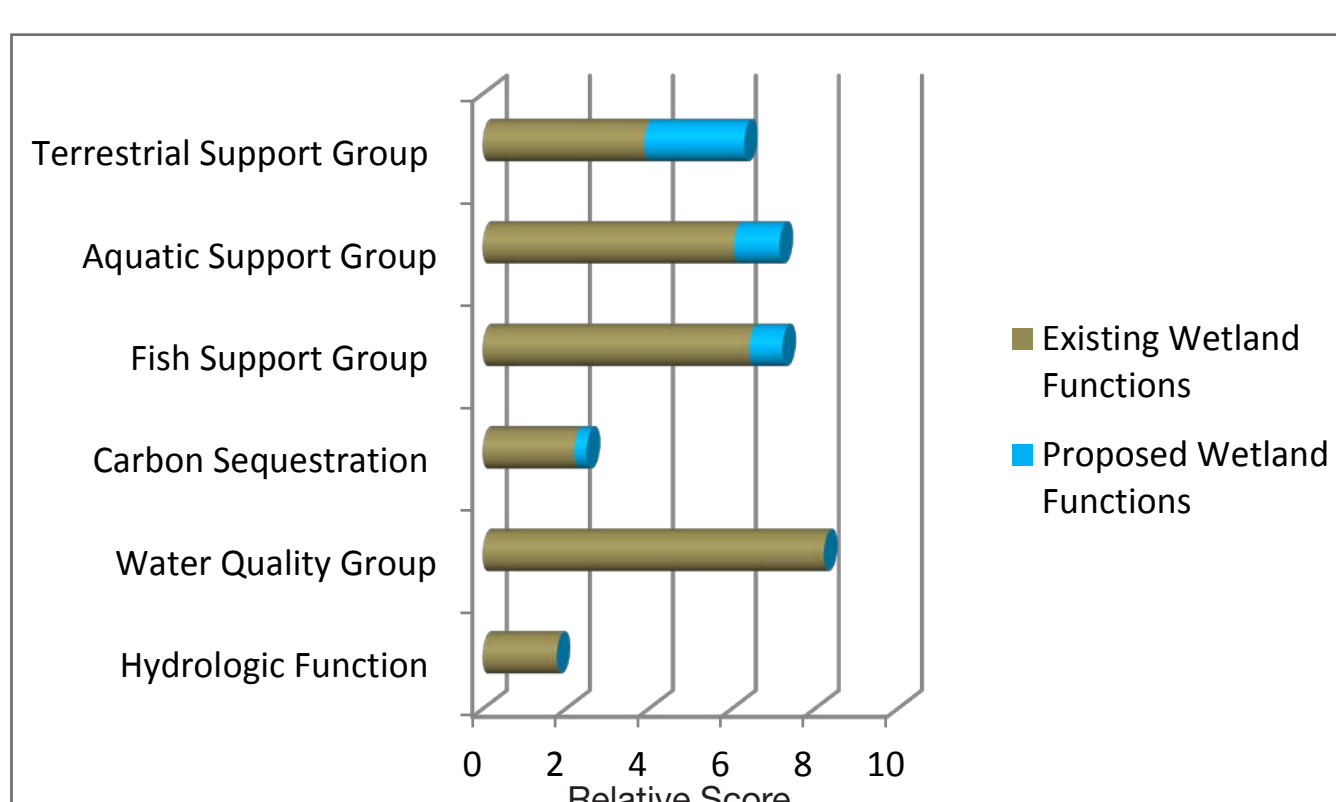


Figure 1: Comparison of Existing and Predicted Functions of Upper Maroon Pond using the Oregon Rapid Wetland Assessment Protocol (ORWAP).

2 Construction

Restoration Objectives:

- Remove failing push-up dam to restore hillside wetland/stream complex.
- Rely on resident beaver to restore hillside step-pools in Upper Maroon Pond area.
- Replace reed canarygrass and meadow foxtail with diverse native plant communities.
- Add large wood to increase habitat complexity and the supply of basking logs for western pond turtle.
- Maintain sparsely vegetated areas for turtle nesting habitat.



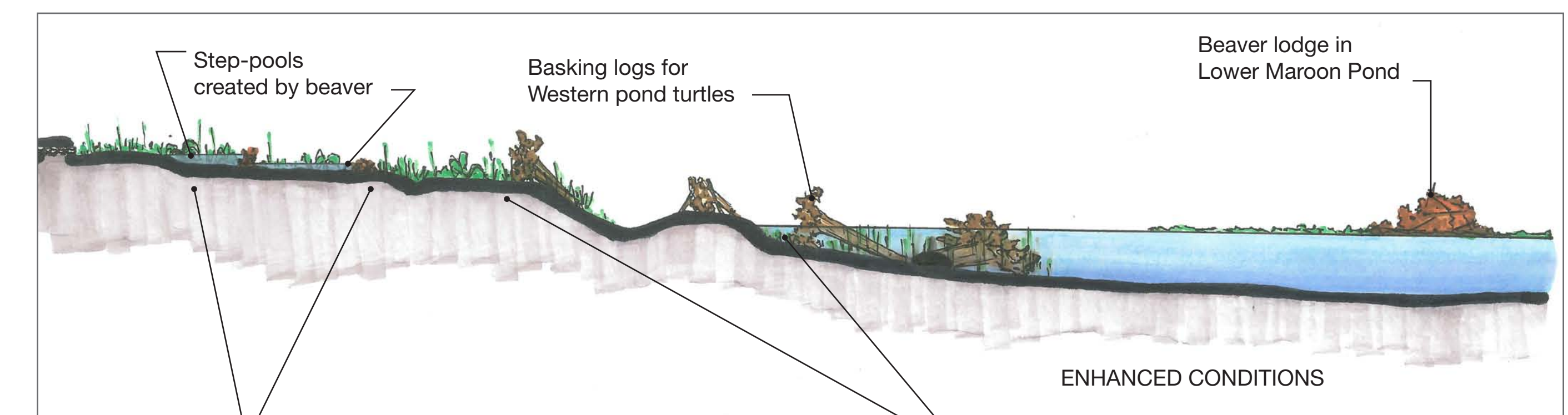
The Details:

- Draw-down pond over two weeks in July.
- Excavate the dam and lower bench September 2014.
- Strategically place live stakes/brush structures (starter dams) to promote beaver activity and the creation of step-pools (Pollock et. al. 2012).
- Plant 7,000 bare-root shrubs and trees along the edge of former Upper Maroon Pond.
- Install 4,300 live cuttings on the pond bottom for beaver.
- Install 20 large wood structures including basking logs and anchored pieces.
- Thin Douglas firs to release oak and madrone growth.

3 Post-Construction

Results:

- Beavers added to starter dams and created two step-pools on the hillside within a few months of completing earthwork and live-stake planting.
- Numbers of amphibian egg masses dramatically increased (winter 2014).
- Western pond turtles were seen basking on restoration logs (spring 2014).



Next Steps:

- Plant 45,000 trees and shrubs (1,600 stems per acre) in riparian zone (Fall 2015).
- Maintain all plantings for 20 years (until 2035).
- Treat weeds and interplant twice annually.
- Monitor every two years.
- Continue thinning Douglas fir to create open oak woodland (60% cover).
- Receive shade credits in 2018 through CWS Temperature Management Program.

Funding Source: CWS capital funds and Metro levy dollars.

