HABITAT MONITORING 2020 & 2021



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October 2021 Science Work Group

EMP & AEMR HABITAT UPDATE

SALMONID HABITAT MONITORING PROGRAMS

- EMP = Ecosystem Monitoring Program
 - 6 Trends site Reference Condition
 - Methods <u>here</u>
- AEMR = Action Effectiveness Monitoring and Research
 - Selected sites (Level 2) receive habitat surveys – Pre, 1, 3, 5 and 10 yrs. postrestoration
 - Methods <u>here</u>

HABITAT DATA COLLECTION INCLUDES

- Plant community/vegetation
- Soil conditions
- Sediment accretion
- Water surface elevation and temperature
- Subset of Sites Receive Biomass and Detritus Sampling



EMP & AEMR HABITAT UPDATE



- COVID impacts have been minimal for all Habitat Data Collection
 - RECORD field hours between 2020 and 2021, with no incidents
 - However, data processing backlogs have developed
- On track to catch-up before the 2022 summer field season
 - Integrating Tableau Data Management and Analysis into our workflow
 - Final draft edits being made to the updated monitoring protocols
 - EMP/AEMR report updates and manuscript

HABITAT HIGHLIGHTS/OUTLINE - 2022 REPORTS

- ✓ Continued update on vegetation shifts and their relationship to seasonal flooding and soil conditions
- ✓ Biomass data A deep dive into dynamics
- ✓ Focus on UAV imagery and vegetation/habitat mapping
- ✓ Under the hood transitioning data sets to Tableau



2020: EMP and AEMR Monitoring









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Cunningham Lake - EMP









Plant Community 2020 -Lower Reaches Conditions

• Stable

-Upper Reaches Conditions

- Higher summer water levels
- Generally, less vegetation in low marsh



Cunningham Lake - EMP Campbell Slough– EMP

Plant Community 2021 -Lower Reaches Conditions

• Stable

-Upper Reaches Conditions

- Lower summer water levels
- Increase in Wapato
 abundance



2021/22 Report: Digging Deeper into Detritus

- This research builds on *Hanson et al. 2016* and *Cordell et al. 2021*
- Closer look at decomposition dynamics and detrital quality of dominant plant communities:
 - Evaluation of Lignin, Nitrogen, and Carbon content of Living, Dead, and Macrodetrital plant materials
 - Soil conditions: C:N ratio, Bulk Density, ORP, pH, Salinity

2021/22 Report: Digging Deeper into Detritus

- About to add 500+ data points to these graphs (Thanks Ian & April!)
- Preliminary results were published in Rao et al. 2020

Summer Biomass

UAV IMAGE CLASSIFICATION – MANUSCRIPT UPDATE

UAV IMAGE CLASSIFICATION – MANUSCRIPT UPDATE

- New Showcase Project: Wallooskee Year-3 Post-Restoration (2020)
- Multispectral Drone with RGB and Near Infrared Sensor (see more)
- 200-acre site = 2 days of flight time, 25 ground control locations
- Pix4D processing and ArcGIS image classification

PRELIMINARY OUTCOMES INCLUDE

- >15 plant community and land cover classifications made across the 200 acres of wetland
- <0.25m² resolution
- High accuracy

NEXT STEPS

 Pull habitat classification and elevation data into Tableau to combine with hydrology and water quality data

UAV HABITAT MODEL - DATA ANALYSIS AND EVALUATION

- Export Map Classifications & Attributes to Tableau
- Easily display and query 40+ million data points
- Better understand drivers of plant classification

NEXT STEPS: MODELING HABITAT CONDITIONS

- Combining Habitat Classification, Elevation, Water Level and Water Quality Data
- Provides Information on Acres of Different Habitat Conditions for Salmon (and other species) across <u>Multiple Climate,</u> <u>Management, and</u> <u>Restoration Scenarios</u>

TABLEAU DASHBOARD FOR MULTNOMAH CHANNEL NATURAL AREA

MCNA INTERACTIVE EXAMPLE - CHECK IT OUT HERE

HABITAT WRAP-UP

- Keep an eye out for more SWG meetings about Monitoring Protocols, Tableau, and our UAV analysis progress, etc.
- Reference Sites and Restoration Sites are Tracking Positively– Biggest Challenges Continue to Be Grazing and Mowing
- Extremely grateful for the hard work and dedication of all our contractors and partners during these difficult times! ♡

Research Partners

THANK YOU

Applied Ecology

