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 here*
- **AEMR** = Action Effectiveness Monitoring and Research
  - Selected sites (Level 2) receive habitat surveys – Pre, 1, 3, 5 and 10 yrs. post-restoration
    - *Methods here*

**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
✓ 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
Lower River Habitat Conditions Stable Over Time
2020: EMP and AEMR Monitoring

Ilwaco – EMP

Ilwaco Slough

Welch - EMP

Welch Island

Steamboat Slough

Whites Island

Whites – EMP

Welch - EMP

Welch Island

Steamboat Slough

Whites Island

Whites – EMP

Cunningham Lake - EMP

Cunningham Lake

Campbell Slough – EMP

Campbell Slough

La Center Wetlands

Franz Lake – EMP

Franz Lake

Campbell Slough

Flight’s End

Plant Community 2020

- Lower Reaches Conditions
  • Stable
- Upper Reaches Conditions
  • Higher summer water levels
  • Generally, less vegetation in low marsh

Lower River Habitat Conditions
Stable Over Time

Upper River Habitat Conditions
More Variable – Tied to Columbia’s Fluvial Influence
Franz 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

Plant Community 2021
- Lower Reaches Conditions
  - Stable
- Upper Reaches Conditions
  - Lower summer water levels
  - Increase in Wapato abundance
2020: EMP and AEMR Monitoring

- Ilwaco – EMP
- Steigerwald – Pre
- Steamboat Slough – Year 6
- Whites – EMP
- La Center Phase 1 – Year 5
- Wallooskee – Year 3
- Cunningham Lake – EMP
- Flights End – Year 3
- Campbell Slough – EMP
- Franz Lake – EMP

* Long-term Mound Study
* Part of EMP Long-term Biomass Study

Levels of Monitoring:
1. Project Type
   - AEMR
   - AEMR/EMP
   - EMP

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Looking Ahead – 2022
- Dibblee Slough Yr. 10
- Palensky Yr. 1
- Flights End Yr. 5
- Wallooskee Yr. 5

* Pit-tag Array Planned 2022/23
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*
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 Multiple Climate, Management, and Restoration Scenarios

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! ♡