



Installation of Pre-Planted Pallets via Helicopter to Restore Inaccessible Reed Canarygrass Dominated Wetlands

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EPA Reg. 9 Virtual WPDG Meeting
June 17, 2025





Tulalip Tribes (Tuh'-lay-lup)

Successors in interest to the Snohomish, Snoqualmie, Skykomish, and other tribes and bands signatory to the 1855 Treaty of Point Elliott.





Tulalip Wetland Program

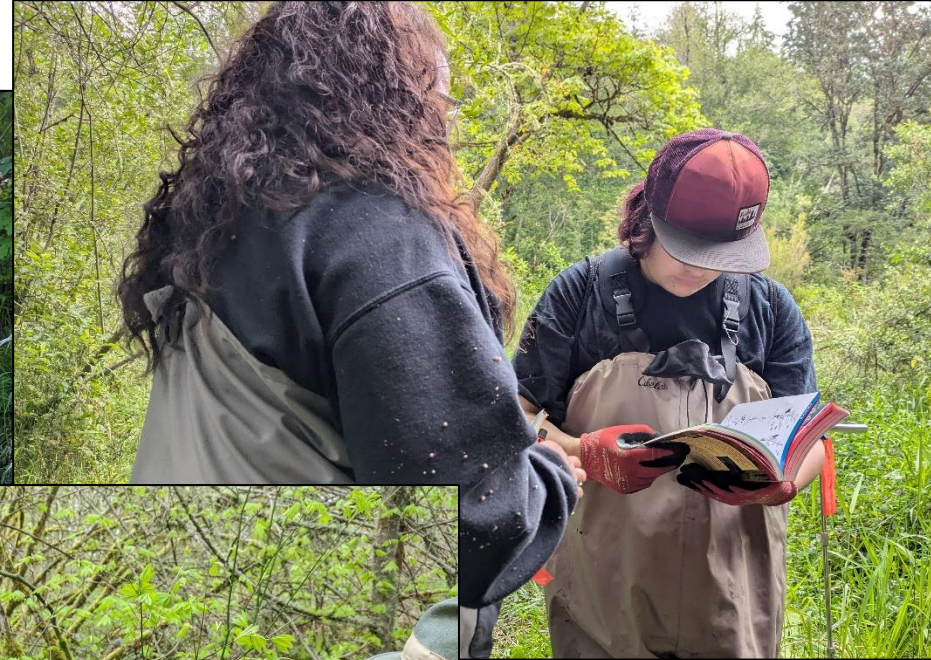
- Began in 1990s (Water Quality 104(b) grant)
- Have won 10 WPDGs since 2008
 - Capacity building
 - ~65% of 2025 Wetland Program staff wages
 - Hired two seasonal wetland technicians
 - PPG (no match, flexibility)





Tulalip Wetland Program

Current Projects: Wetland Monitoring & Assessment Strategy





Tulalip Wetland Program

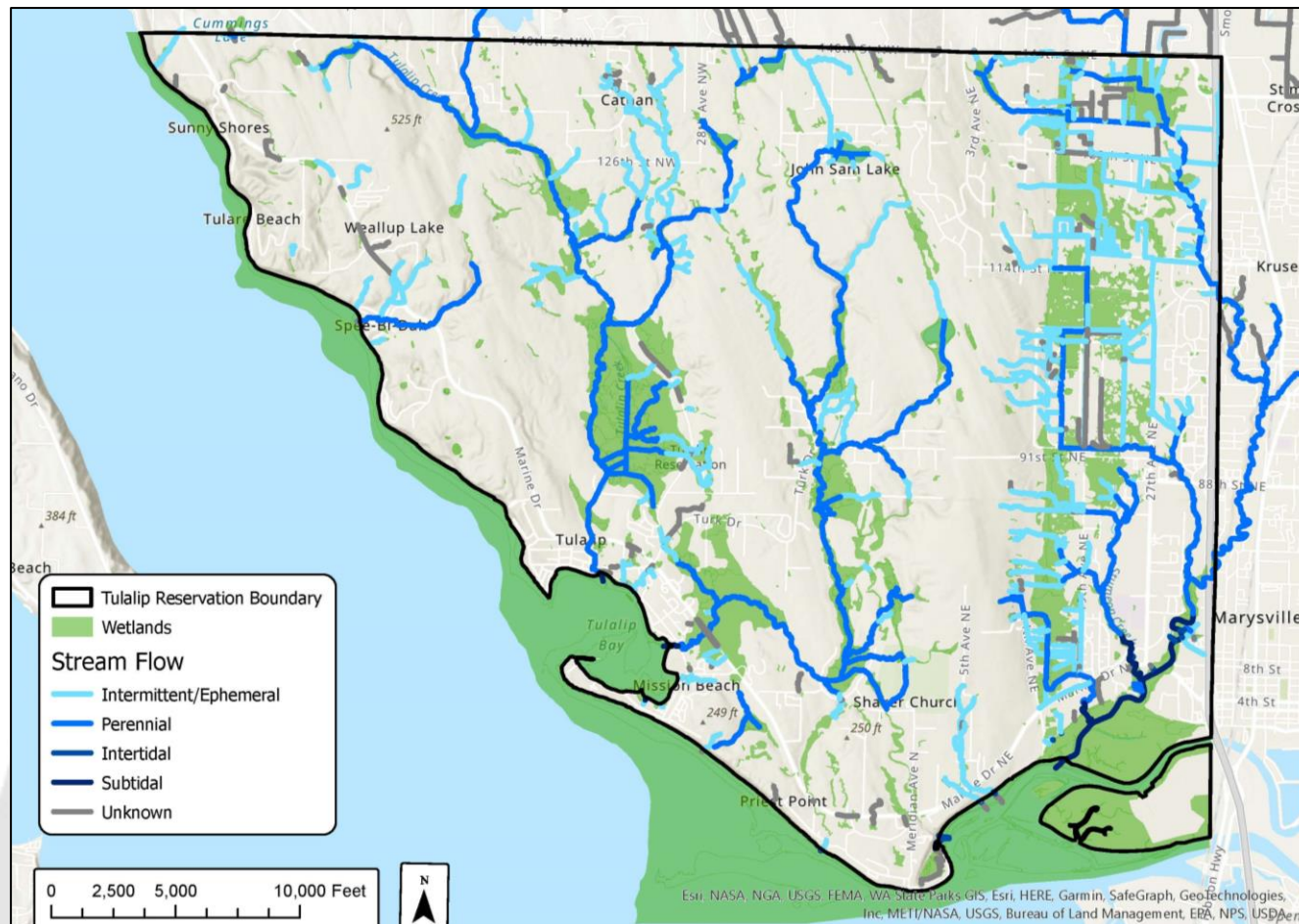
Current Projects: Wetland Action Prioritization Plan and Master Plant List





Tulalip Wetland Program

Starting Project: Update and Refinement of Wetland Inventory and Hydro Data Layer





Pre-Planted Pallet Project Video
<https://vimeo.com/885825119>

The Oxbow Wetland Pallet Project

Reed Canarygrass

- Invasive perennial rhizomatous grass
- Often creates large single-species stands in wetlands, floodplains, and riparian areas
- Established stands reduce habitat quality and value
 - Decrease water quality
 - Increase local flooding
 - Decrease fish passage



Dead fish

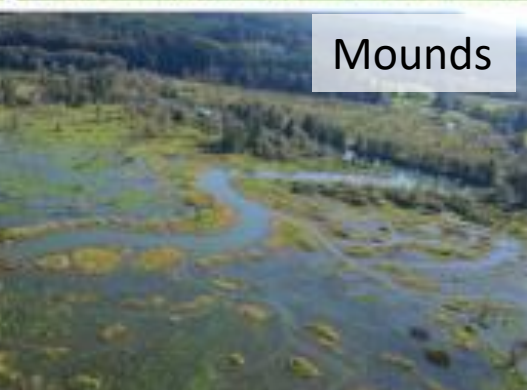
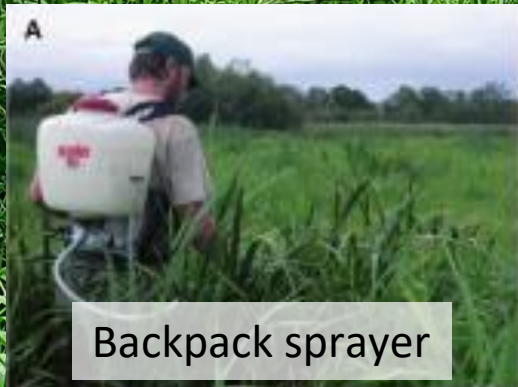
Found stranded and dead Coho during site visits



H. Richardson

Reed Canarygrass

- Difficult to eradicate existing stands
 - Shading generally considered the best long-term control strategy



Reed Canarygrass

➡ Some sites are not accessible





Project Overview

- Demonstration project funded by EPA WPDG
- Determine if pre-planted pallets can be installed in a RCG-dominated wetland
- Install 120 pre-planted pallets and equivalent-sized willow live stake and control plots
- Could be used in a variety of settings



Study System





Study System





Study System



5/30/2022

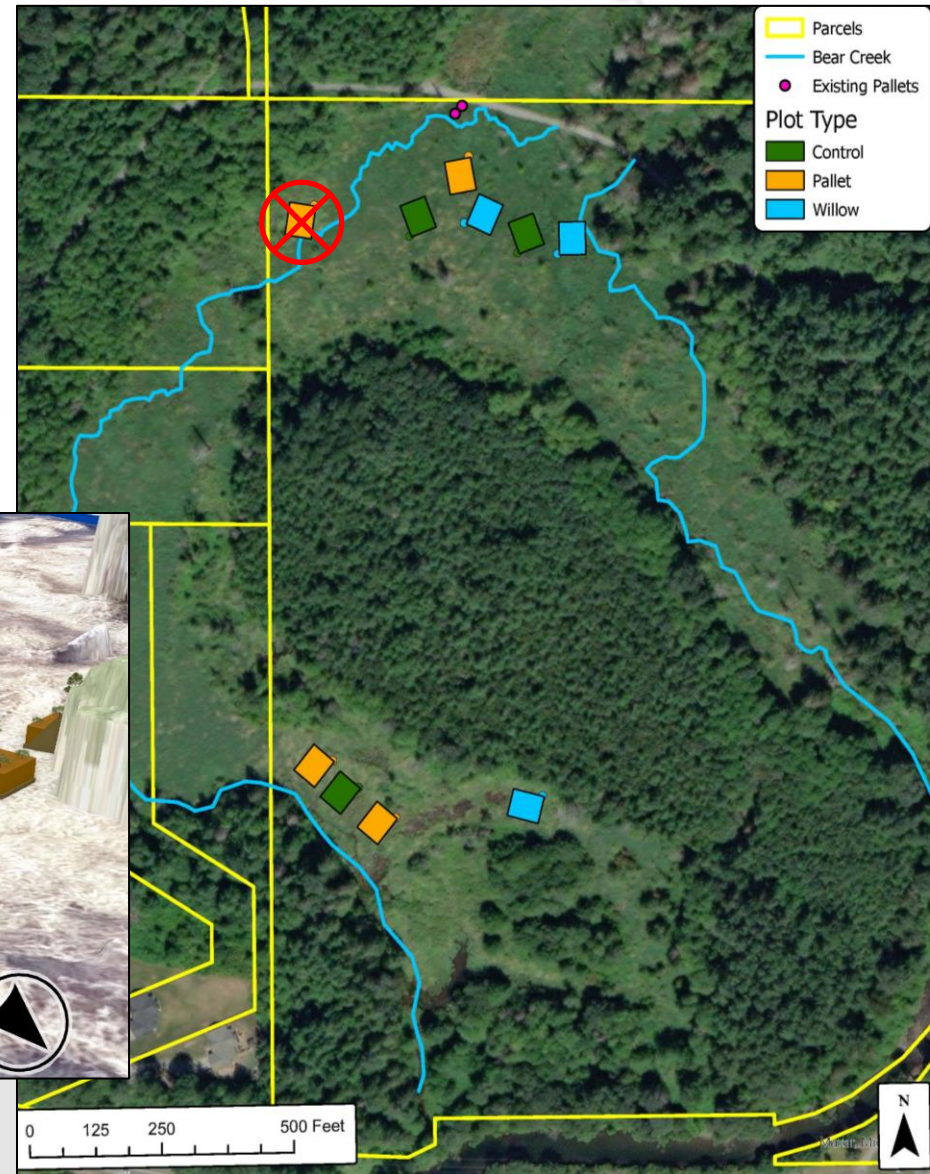


1/20/2023



Study Design

- 9 50'x60' plots
 - 3 Pallet Plots
 - 3 Willow Plots
 - 3 Control Plots





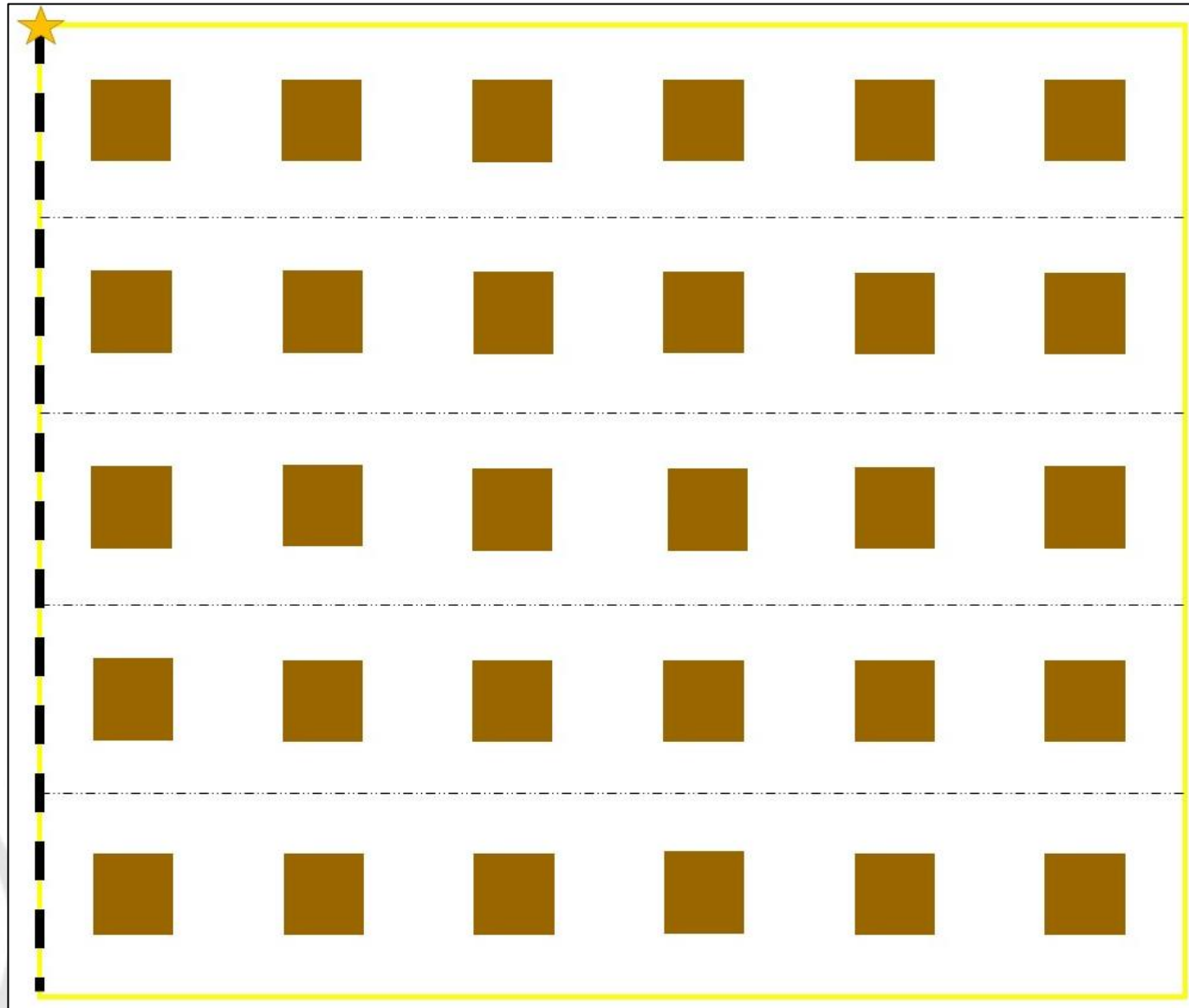
Baseline Conditions

➤ Collected data in July 2023










Sampling Design



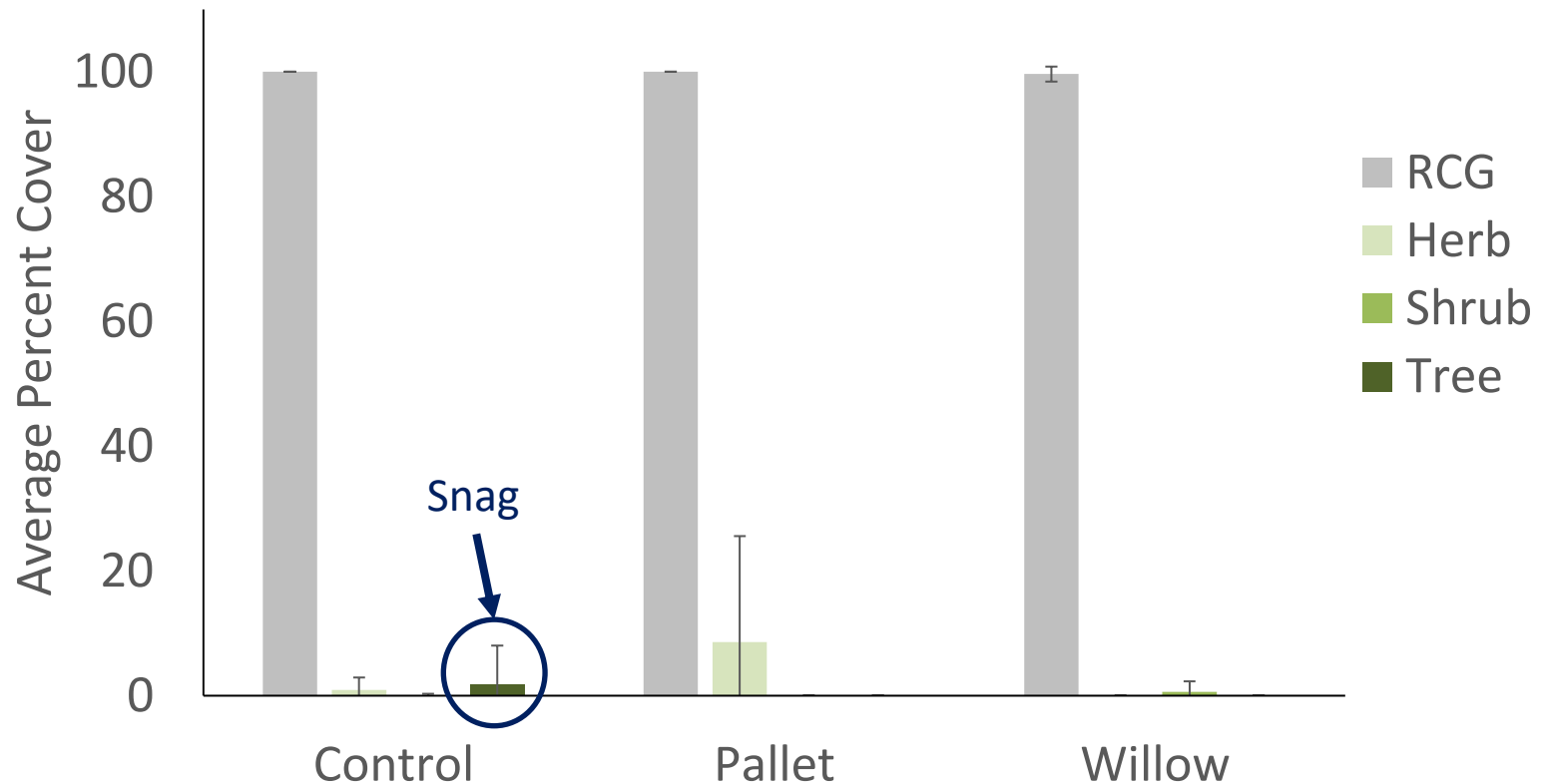
LEGEND

-  Experimental plot boundary
-  Pre-planted pallet
-  Baseline
-  Transect Line
-  Marked plot corner



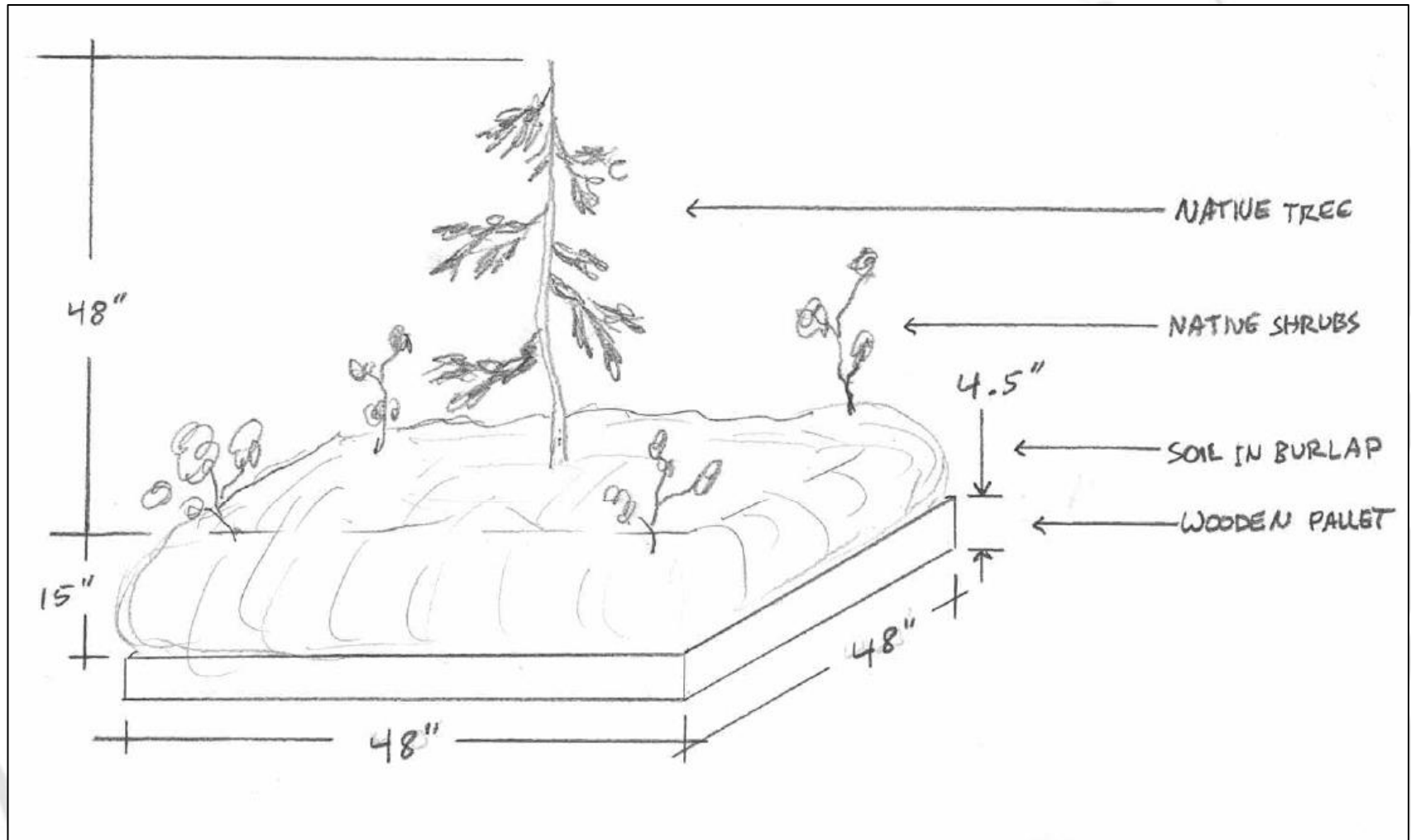
Baseline Conditions

- 95-100% RCG for every transect
- Some sparse bittersweet nightshade, red twig dogwood, Sitka willow, and snag cover along transects





Pre-Planted Pallet Design





Pallet Creation





Pallet Installation

- We flew pallets one by one (~0.75 miles away)
- We did not need to fly over any roads or buildings/structures.





Willow Plots

- 350 willow live stakes per plot
 - Hooker willows
 - Pacific willows
 - Sitka willows





Control Plots

➡ No treatment





Costs

Pre-Planted Pallets

- ~\$332/pallet or ~\$9,519/plot
- 352 people hours

Willow Live Stakes

- ~\$2.40/live stake or ~\$841.70/plot
- 30 people hours

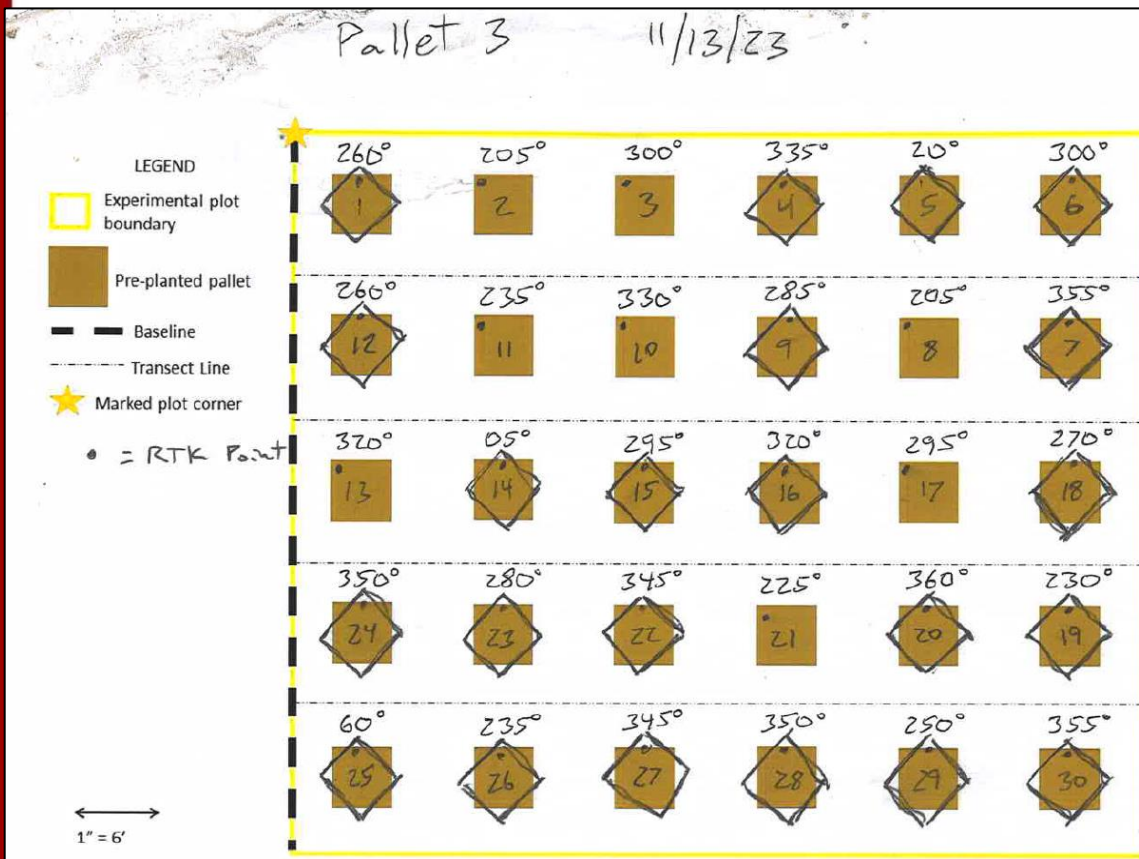
Control Plots

- \$0



As-Built

- GPSed pallets
- Recorded plants on each pallet





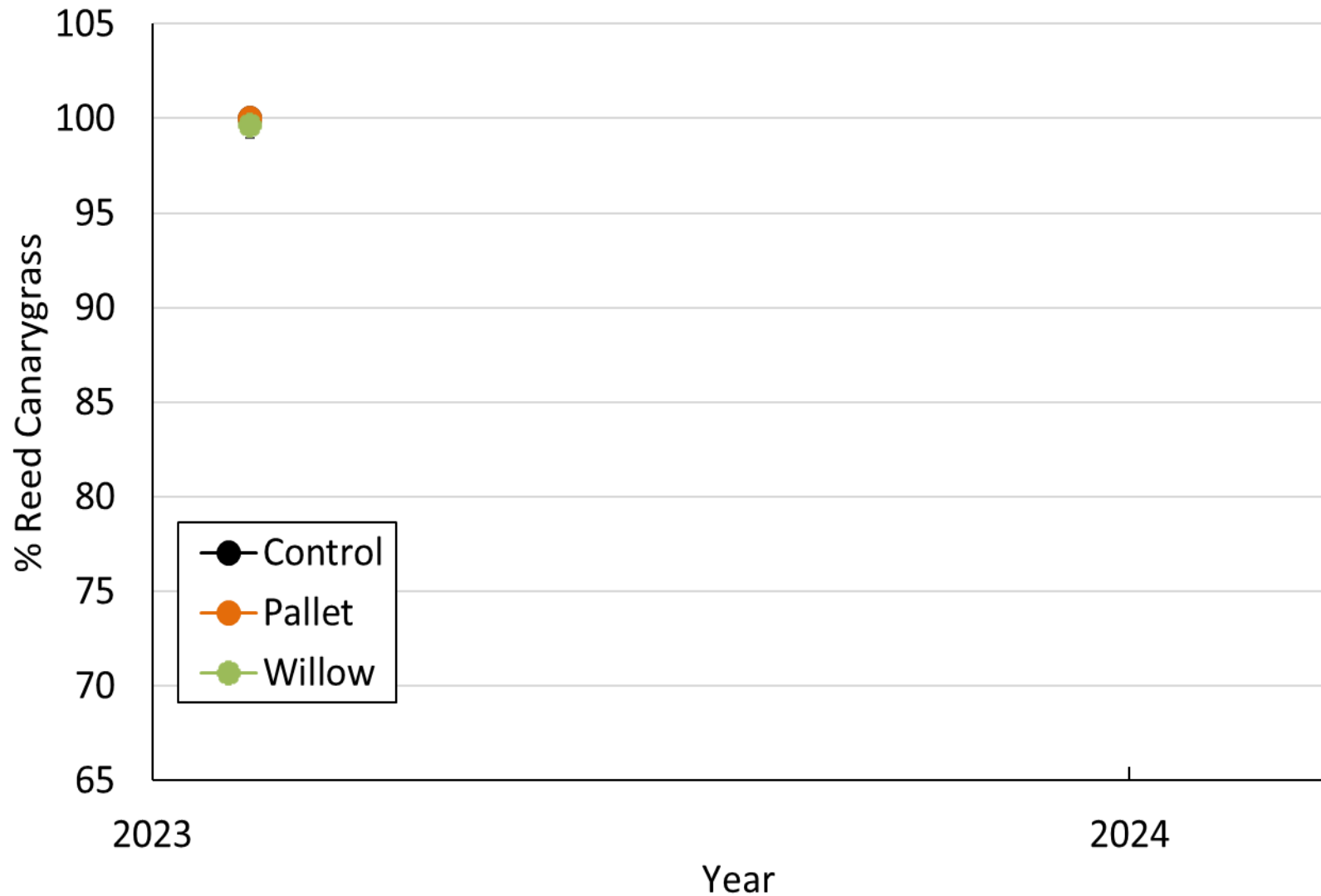
Year 0 Monitoring

► May 2 and June 26, 2024



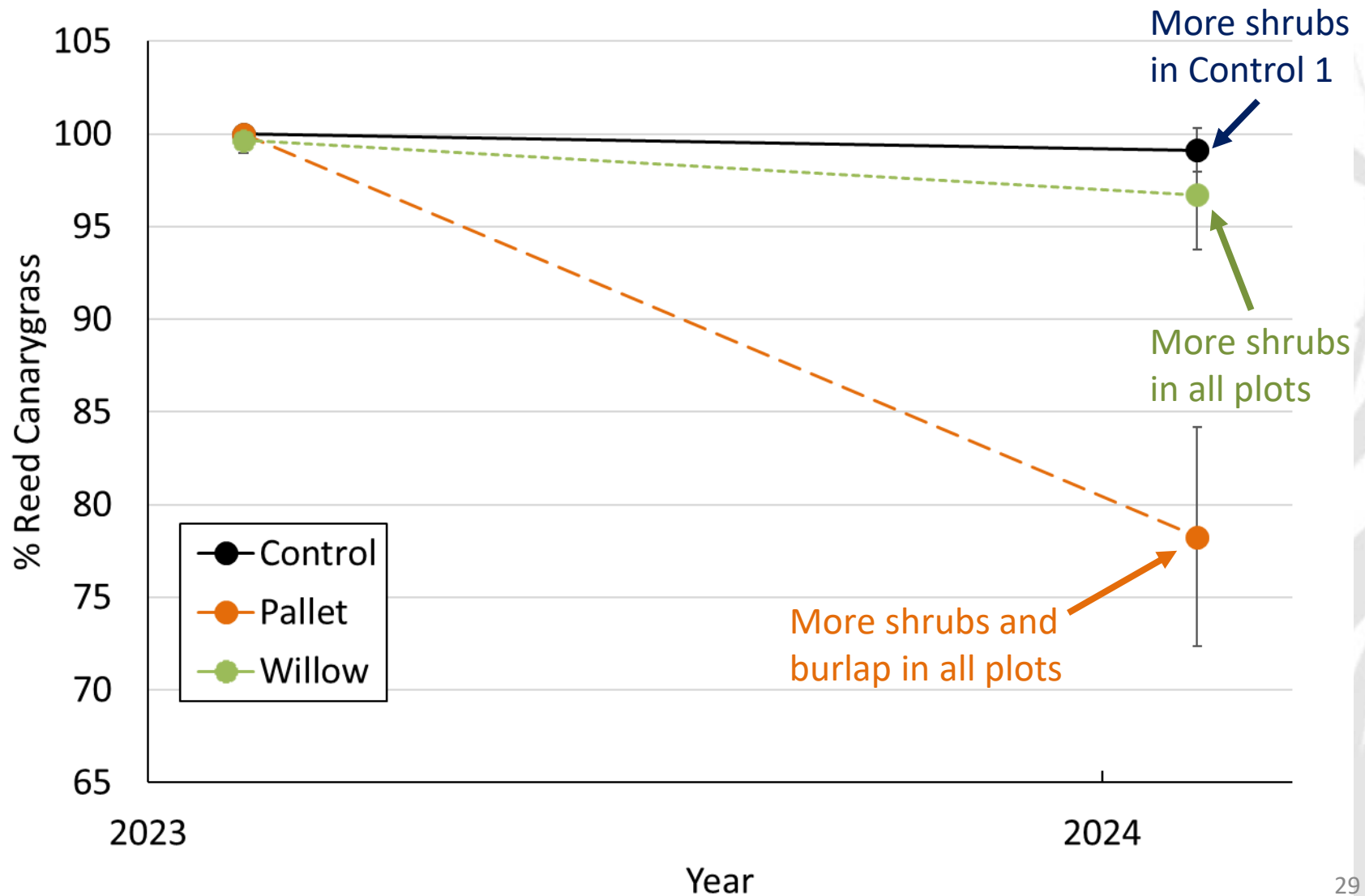


Monitoring





Monitoring





Year 0 Monitoring

➤ Beavers, Deer, and Bears! Oh my!





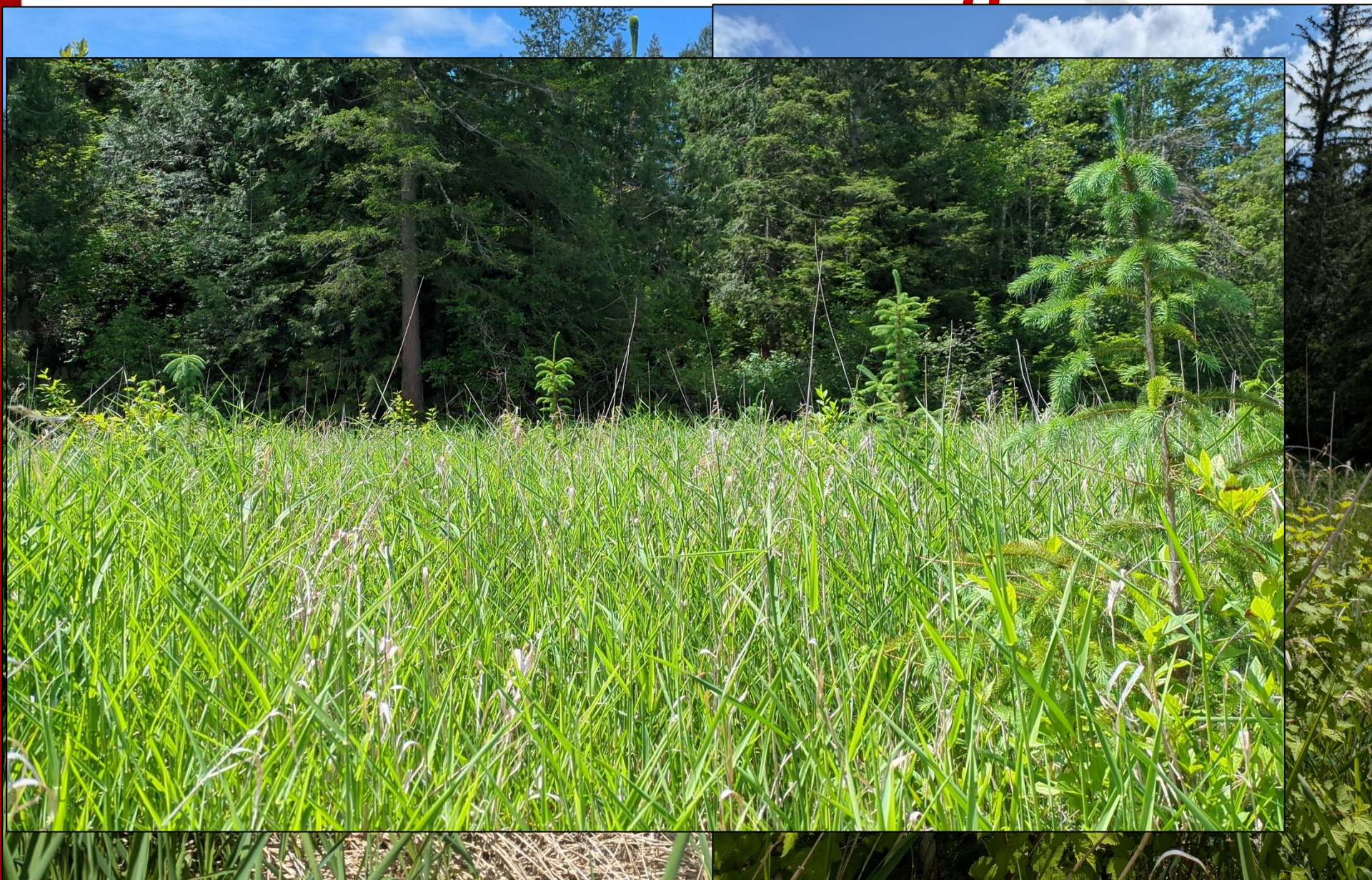
Year 1 Monitoring

➤ In progress!





Year 1 Monitoring





tig^wicid! (Thank you!)

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Project Timeline

- **January 2022:** Applied for WPDG
- **April 2022:** Received award letter
- **September 2022:** Received WPDG funds (put in PPG)
- **January 2023:** Began talking with permitting agencies to determine what we needed to submit
- **January/February 2023:** Wetland delineation and rating conducted for permitting
- **February 2023:** Submitted draft QAPP to EPA for review
 - **March/April 2023:** Review and slight revisions
 - **April 2023:** QAPP approved/finaled by EPA
- **February/March 2023:** Submitted applications to permitting agencies



Project Permitting

- **US Army Corps of Engineers:** Nationwide Permit #18 (Minor Discharges)
 - Fish Passage & Restoration Programmatic (FPRP) consultation for §7
- **WA Dept. of Fish & Wildlife:** HPA through the Habitat Recovery Pilot Program (HRPP) process
- **WA Dept. of Ecology:** met ECY's NWP #18 programmatic decision
- **Snohomish County:** Flood Hazard Permit





Project Timeline

- **February/March 2023:** Submitted applications to permitting agencies
 - **April 2023:** Obtained Hydraulic Project Approval from WDFW, Ecology determined the project met the programmatic decision for NWP #18
 - **July 2023:** Obtained Nationwide Permit 18 from USACE and Flood Hazard Permit from WDFW
- **June 2023:** Began ordering trees/shrubs
- **August 2023:** Ordered willow live stakes, pallets, biodegradable stakes, burlap, rope, soil, skid steer rental
- **September 2023:** Had to re-sort our helicopter contractor
- **October 2-4, 2023:** Pallet construction
- **October 9-11, 2023:** Planting pallets
- **October 12, 2023:** Fly day!