



Developing Techniques to Restore Mt. Rainier Subalpine Meadows

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Mt. Rainier's meadows are
plant and animal habitat



Repeated off-trail trampling kills sensitive meadow vegetation

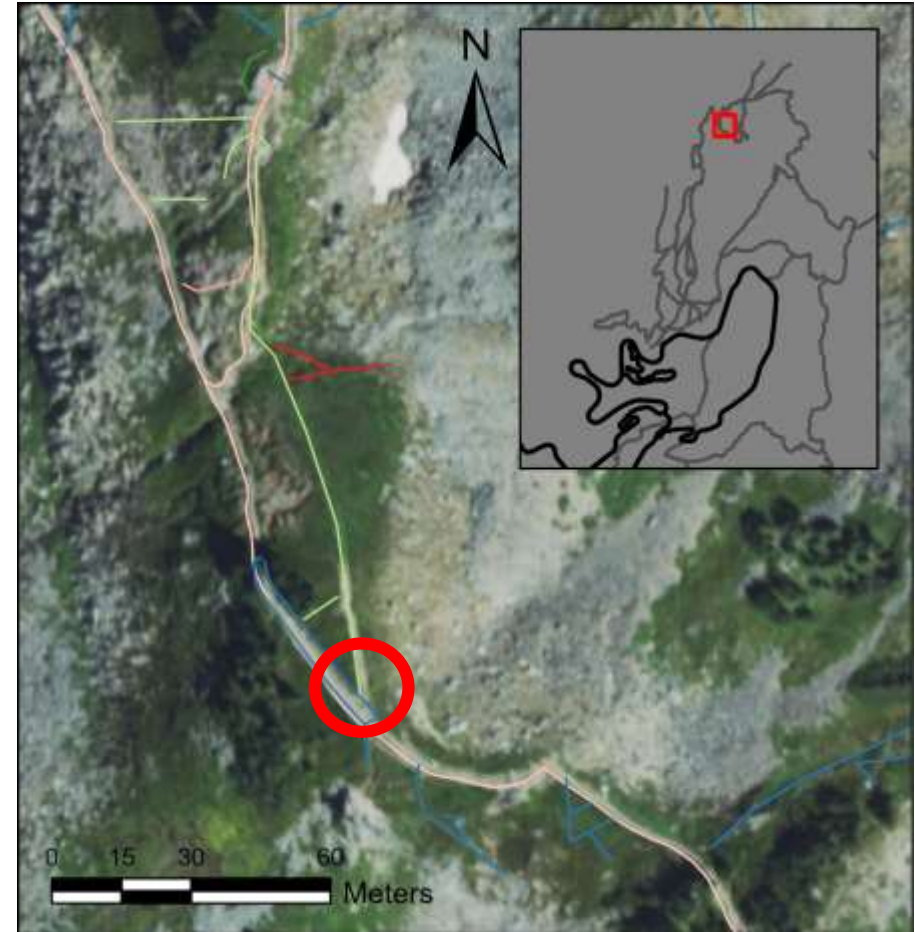


Mt. Rainier National Park plants plugs to speed meadow recovery



Photo from NPS.gov

Restoration on the Skyline Trail Loop, Paradise, Mt. Rainier



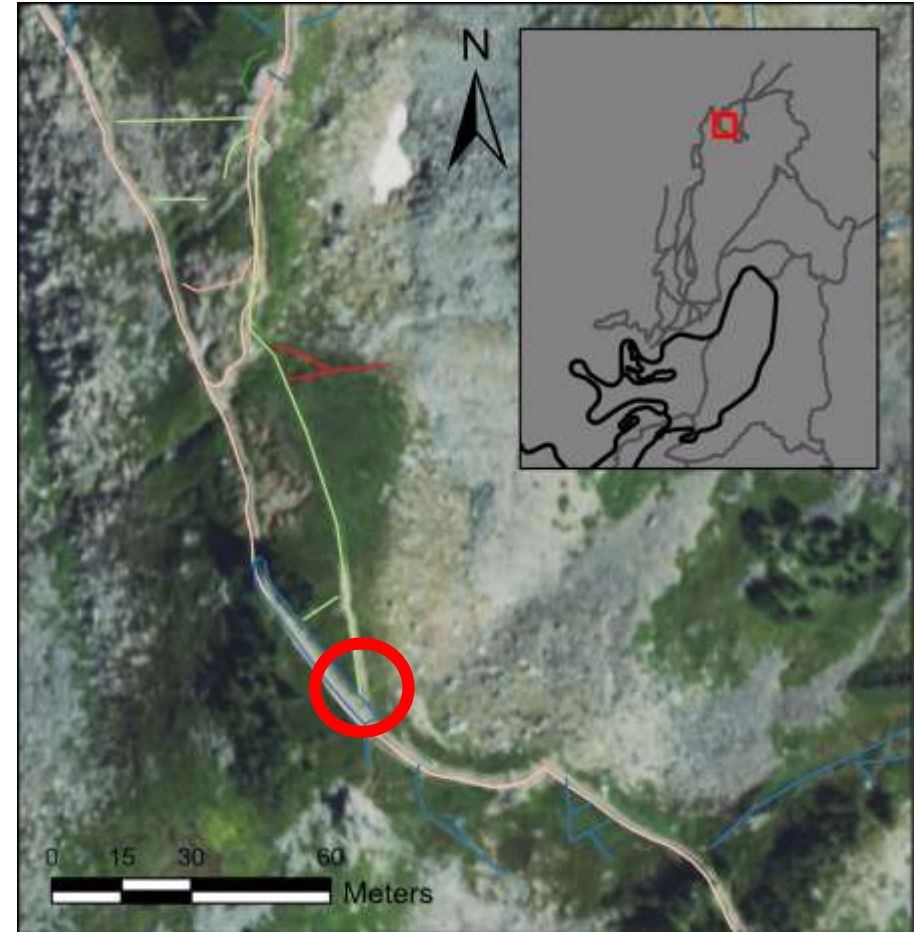
Satellite Imagery < 3 years ago, NPS
unpublished restoration mapping

Restoration on the Skyline Trail Loop, Paradise, Mt. Rainier

Appx. 15 years after restoration (2013)



Google Street View 2013; Restored 1992-1998



Satellite Imagery < 3 years ago, NPS unpublished restoration mapping

Restoration on the Skyline Trail Loop, Paradise, Mt. Rainier

Appx. 15 years after restoration (2013)



Google Street View 2013; Restored 1992-1998

Appx. 26 years after restoration (2024)





Most of the year, Mt. Rainier looks like this—
the growing season is short!

Question 1: Can changing the planting **density** or **mulching** plantings speed meadow recovery?



Not mulched

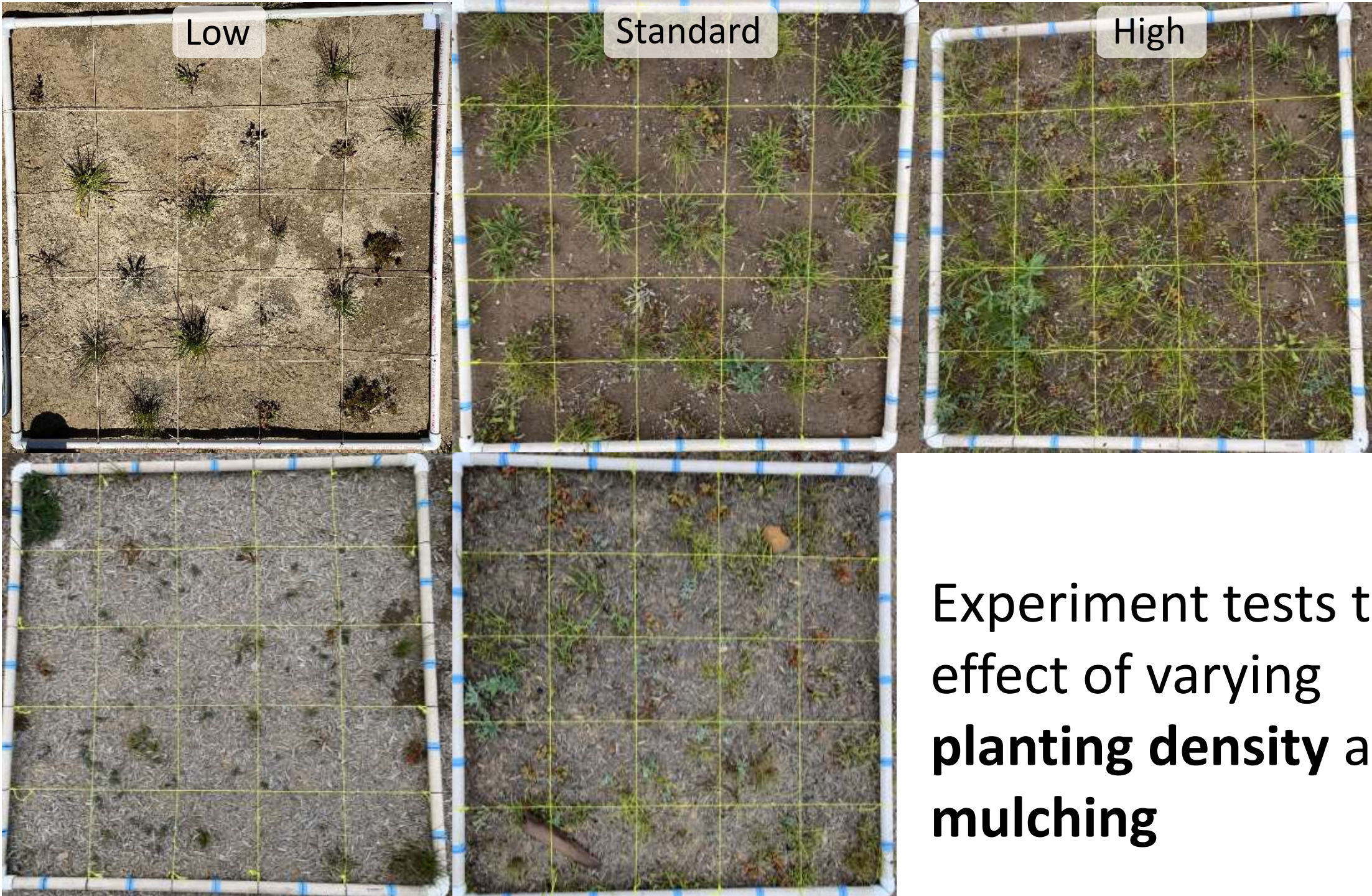
Low

Standard

High

Mulched

Experiment tests the effect of varying **planting density** and **mulching**



Data Collection


- Annually from 2021-2024
- % foliar cover
- Rooted plant locations



A scenic mountain landscape with a dirt path leading through green vegetation towards a forested mountain peak under a clear blue sky. A faint rainbow is visible in the distance.

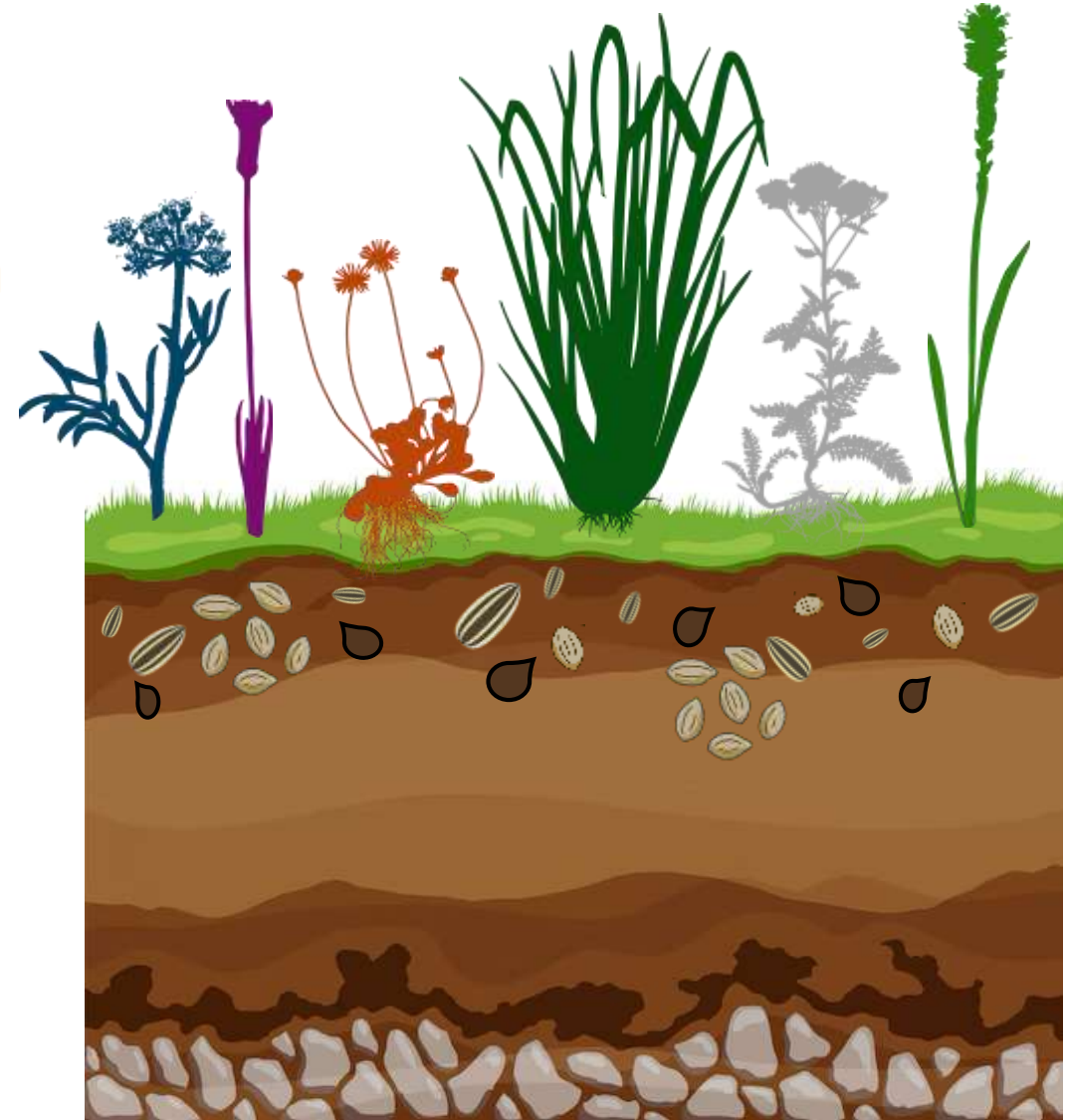
This study will answer:

- Should the park add mulch?
- Do some species survive or grow better than others?
- Should the park plant more/less densely?

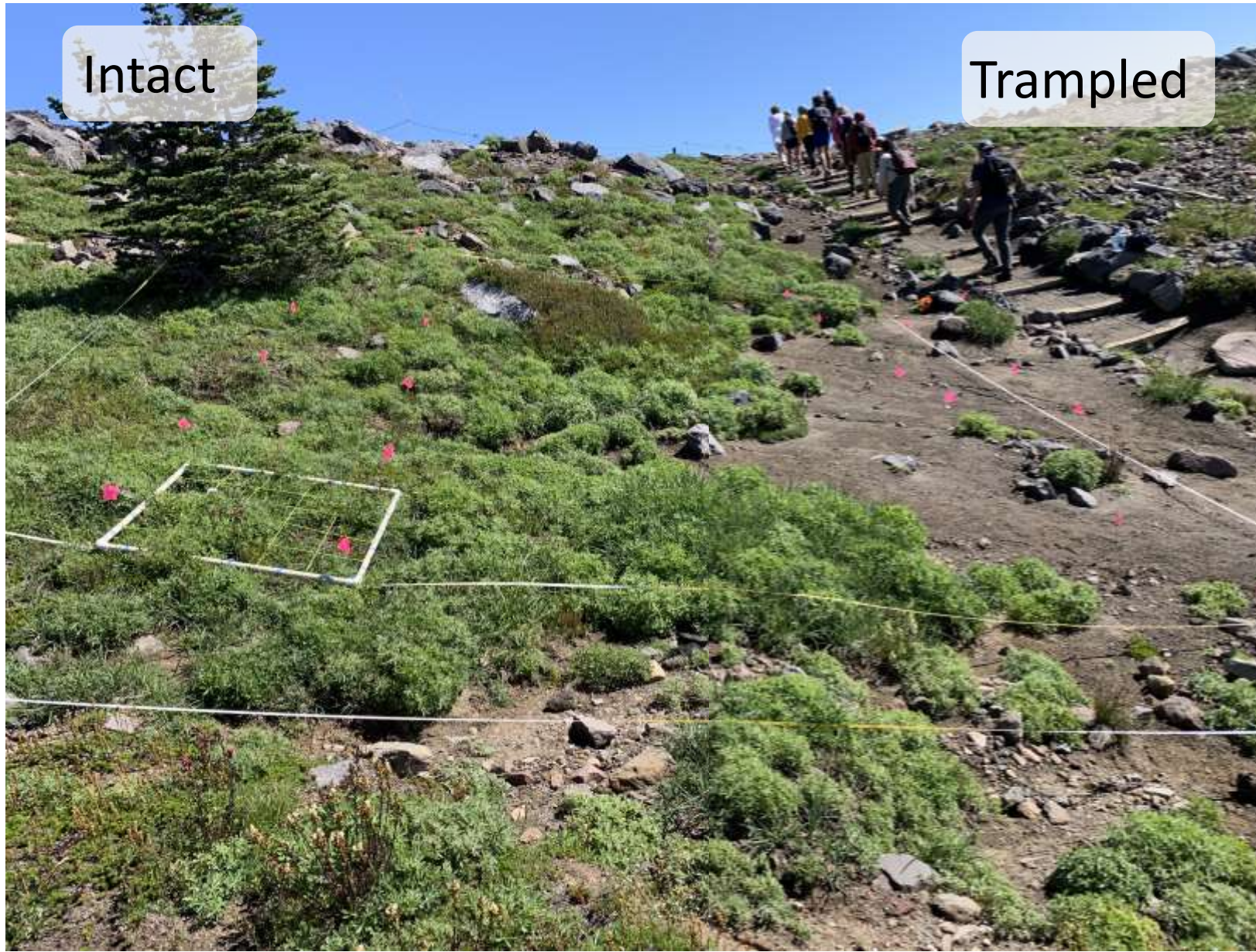
A photograph of a mountain landscape. In the foreground, a research plot is marked with white PVC pipes and yellow string. Pink flags are placed along the plot's boundaries. A yellow cross-shaped marker is visible on the right. The background features a steep, green mountain slope with a line of evergreen trees and a large, snow-capped mountain peak under a cloudy sky.

Question 2: Does the soil hold seeds for restoration?

Seeds can wait in the soil for the right growing conditions



Surveys of aboveground plant community





Soil collected from intact and disturbed areas was sieved and cold-stratified

Step 1: Add warmth, water, and
sunlight and wait

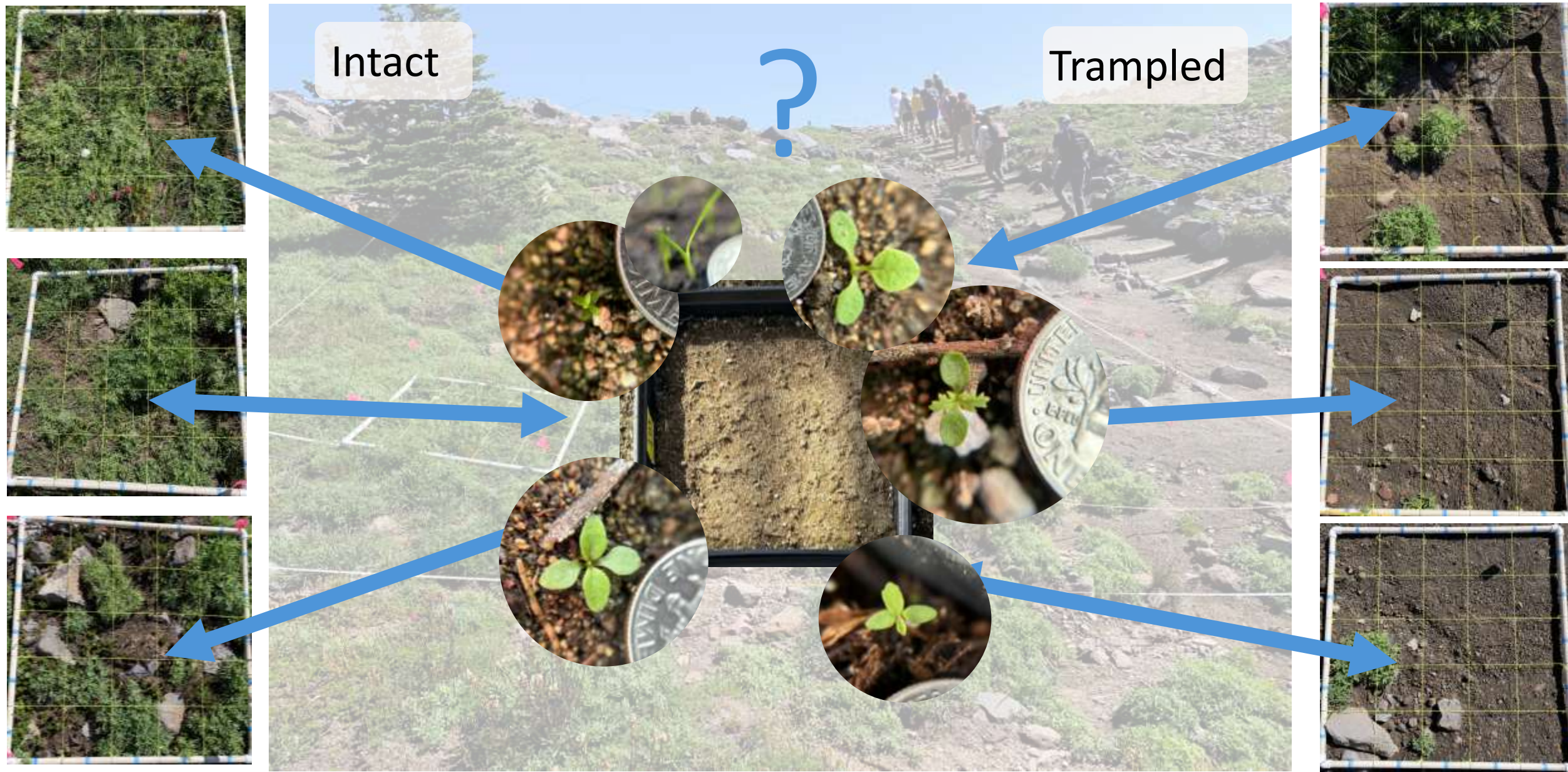




Step 2: Grow seedlings to
identifiable life stage

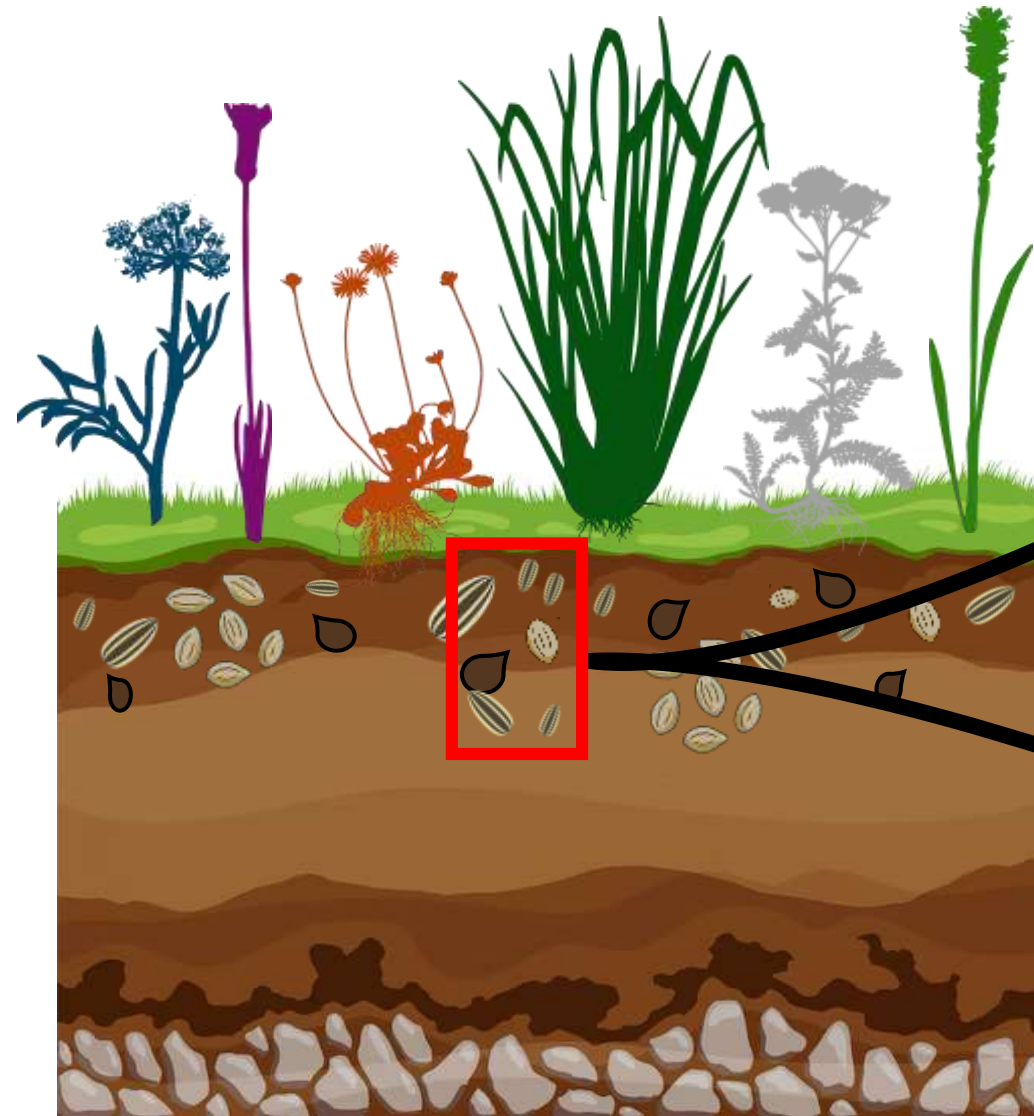
The image shows a large number of black plastic seedling trays arranged in rows. Each tray is divided into multiple small compartments, each containing a seedling. The seedlings are at various stages of growth, with some having large, broad leaves and others being small and delicate. Some trays have small white labels with handwritten text, such as 'Olivette' and 'Bapt'. The seedlings are growing in a dark, rich soil medium.

Step 3: Compare seedling community to aboveground community



Plant community in
trampled or intact areas:

Plant community in soil seed bank:





If the soil already has sedges, could restoration plantings focus on other species?

A scenic mountain landscape. In the background, a large, rugged mountain peak is covered in snow and partially obscured by a clear blue sky. The foreground and middle ground consist of steep, grassy slopes with patches of green and brown vegetation. A dark, rocky ridge runs diagonally across the upper left. In the lower right, a paved road or path is visible, bordered by a simple metal railing. The overall scene is bright and clear, suggesting a sunny day.

To be continued! Up next:

- Data entry and analysis
- Thesis writing and completion!

Thank you!



NORTHWEST
Climate Adaptation
Science Center



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HORTICULTURAL
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