NORTHWEST NATURAL RESOURCE GROUP

Keeping a Weather Eye Open:

Measuring Snowfall in the Nisqually Watershed

Maintaining a steady and reliable source of water in a changing climate is critical for the health of both people and ecosystems. Northwest Natural Resource Group (NNRG) has been testing methods of ecological forestry that will increase the resilience of future watershed forests.

At the Nisqually Community Forest near Mount Rainier, we have implemented several forestry techniques that you may recall from our previous article:

1. Thinning the forest to spread available soil moisture among fewer trees,
2. Installing snow gaps so that more snow accumulates and extends snowmelt season, and
3. Planting seedlings from warmer zones to provide a local source for adapted genetic traits.

The techniques were used on formerly industrial forests, and are part of our overall plan to restore the forest while also making it more resilient to the predicted future climate in the area.

In the gaps we thinned last year, we have been measuring snow accumulation to gauge whether the forestry techniques we have used have been effective. Staff use trail cams set to take a picture a day, aimed at 3-meter stadia rods to show the depth of the snowpack. They also walk transects, using avalanche probes to measure the depth of the snow. They have been walking those transects every two weeks while the snow is accumulating, and will walk them every week while it is melting (the “ablation season”).

Data collection is still ongoing, but so far the results match our prediction that snow accumulates in thinned areas and gaps more quickly. These efforts should gradually reduce the risk of tree mortality, improve the forest habitat, and supply snowmelt to headwater streams later into the spring.

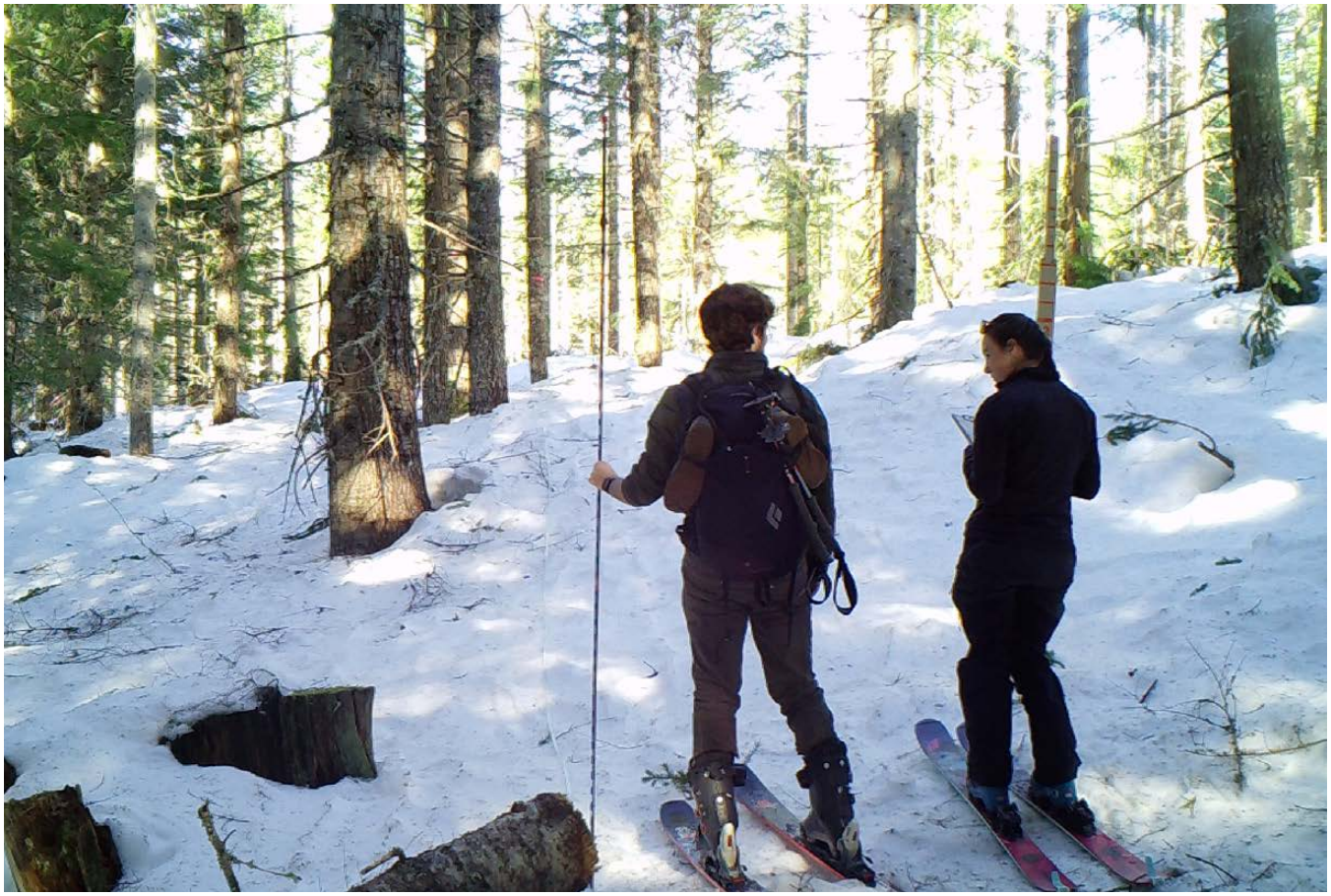
This spring, we will be planting these snow gaps and thinned areas with seedlings sourced from warmer areas. As we were considering where we should source these seedlings, we used the **seedlot selection tool**, looking ahead to the trees’ maturation years of years 2041-2070 under a RCP 4.5 climate trajectory. The latter number refers to a scenario of moderate future greenhouse gas emissions that would lead to 2-3°C of warming (as opposed to the ‘worst case scenario’ of RCP 8.5).

Given the abundant in-seeding we expect of volunteer silver fir, noble fir, and western hemlock from uncut areas adjacent to the forest gaps, we intend to plant at about 350 trees per acre and will focus on Douglas-fir and Western redcedar. Our canopy gaps cover about 16 acres in total, so we will plant 5,550 seedlings. To explore the survival and vigor of local and ‘imported’ seedlings, we will split plantings evenly between local and externally sourced seed stock. We also plan to plant 600 western white pine and seedlings and a few hundred western hemlock from lower elevations, to gauge how well they do compared with local seed stock.

*If you’re interested in seeing this project in action, take a look at our recent video, **‘A Little Thinning Goes a Long Way’**.*

As we have **discussed previously** in the Treeline Network, the assisted migration of species is an evolving and sometimes controversial topic. There are risks to more intensive forms of assisted migration; however, there is also a sense that the risks of inaction are greater. The **Forest Adaptation Network** (FAN) has been discussing how to develop professional best practices for assisted migration in our area and will share ideas through the network as they arise.

(Right) NNRG Forest Technician Nora Halbert installs a camera and a stadia rod to measure the accumulation and ablation of snow. Photo Credit: Jaal Mann/NNRG



NNRG Forest Technicians measure the accumulation and ablation of snow. Photo Credit: NNRG