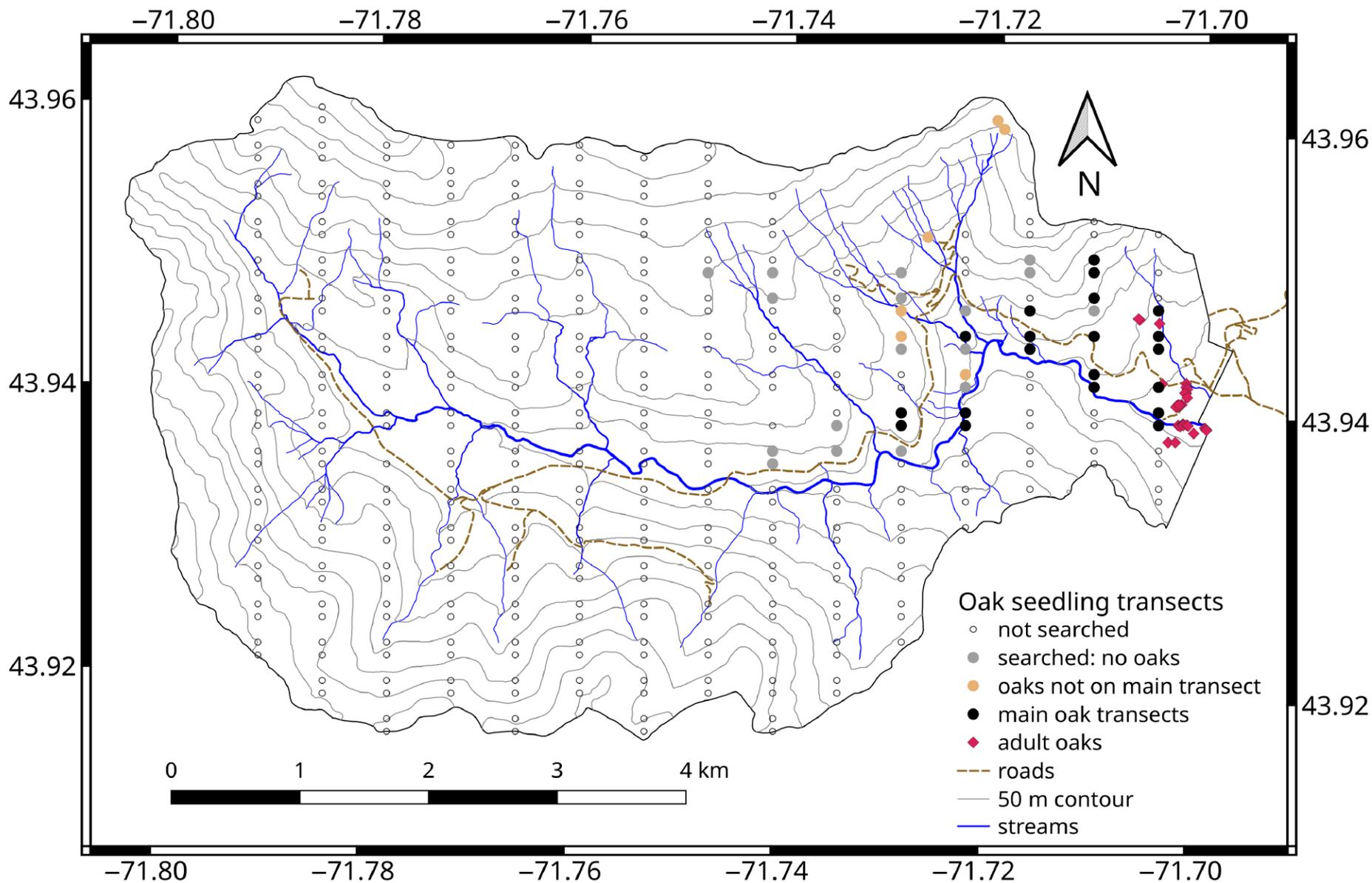
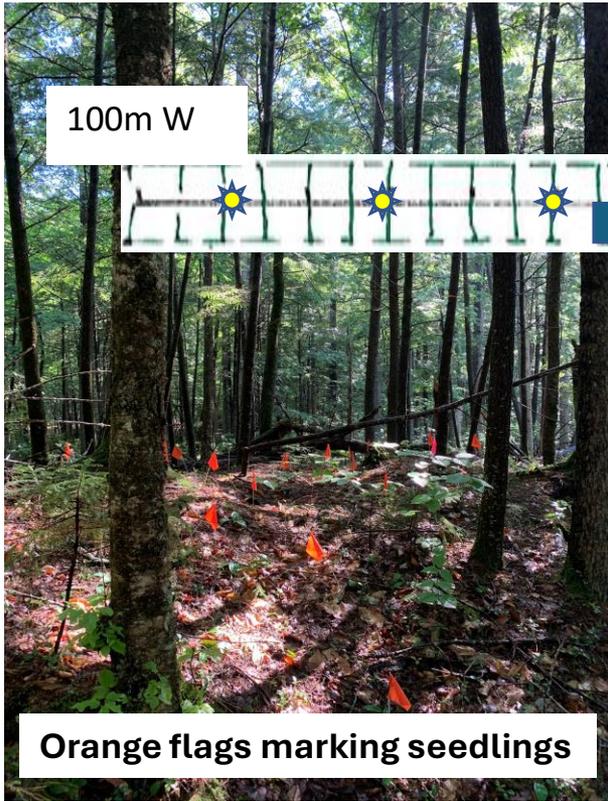


Red oak seedling demography

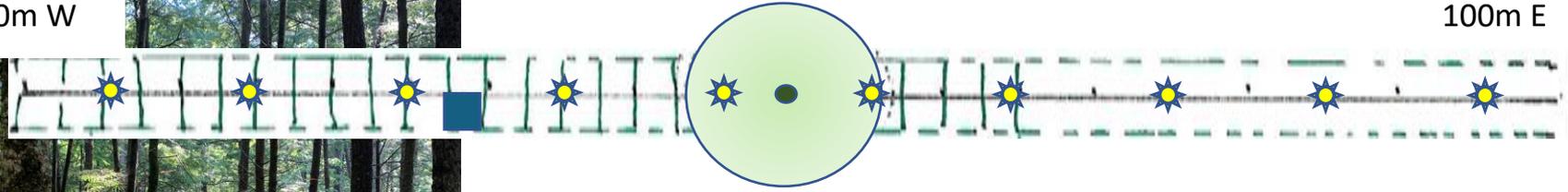




Valleywide plot
and center (0m)

Study area design

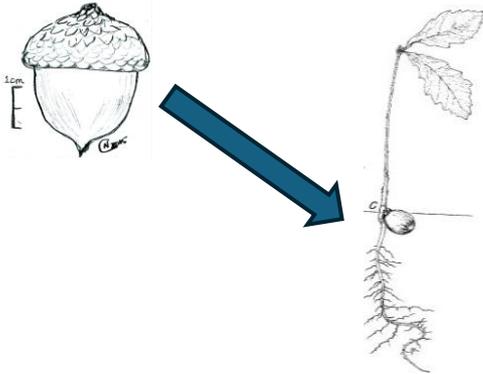
100m E



Since 2011, northern red oak seedling individuals are followed annually at transects centered at valleywide plots. The study areas run 100m west and east of plot center in a 10m belt transect. We put effort into tracking these seedlings to understand how and when this species will start to establish into the northern hardwood forest. As is obvious from the map, the seedlings are only at the eastern end of the valley currently. Interested folks can find our first paper from these transects (Cleavitt et al. 2024).

The center of the transect lines are marked every 10m with yellow flags, so the line can be laid in the same way every year, while the individual seedlings are marked with orange flags.

Please, leave flags alone (even if an animal has taken them out of the ground, as we need to know this has happened) and avoid walking near the marked seedlings. Additionally, any work requiring soil or vegetation disturbance should be done outside the study transect areas. We carefully quantify light, shrub and tree cover. Because seedlings invest a lot of energy in their roots please refrain from any soil sampling in the area. Even if you don't see a seedling near the flag, there may be one there buried, browsed or for some other reason obscured from you.



Oak seedling population currently maintained by constant, sporadic influx of acorns

Sugar maple seedling demography

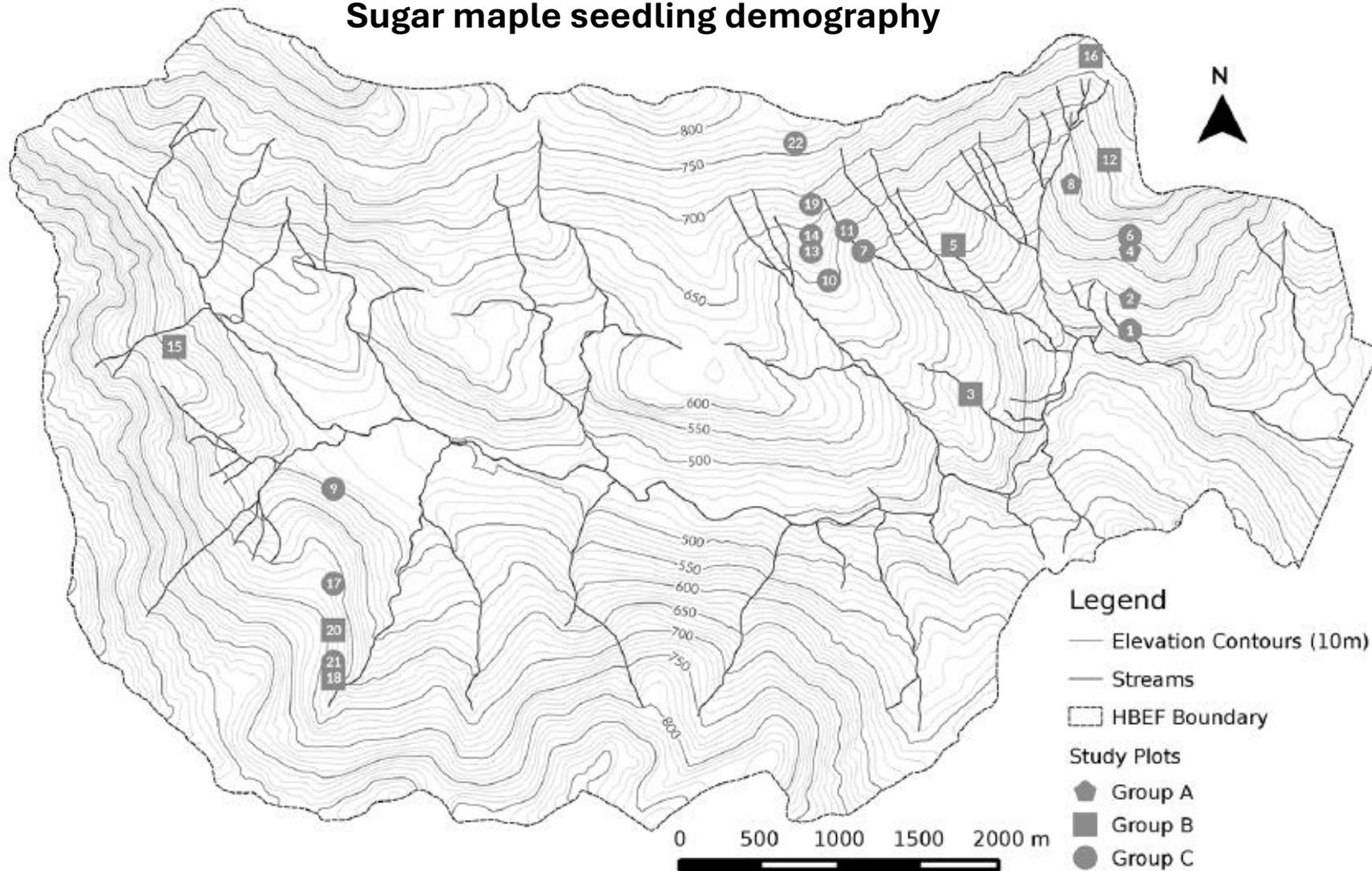
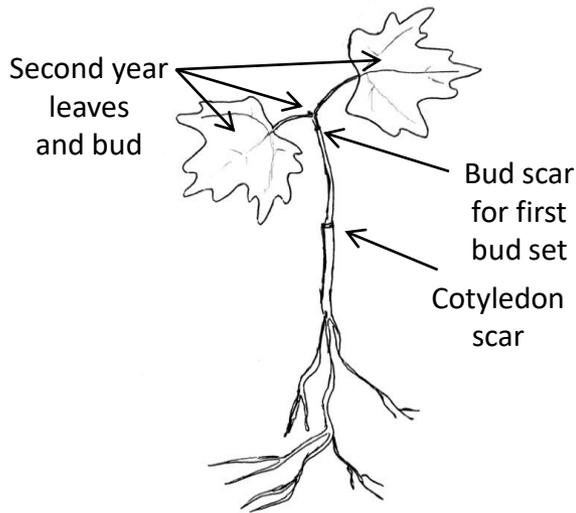


Fig. 1. Location of 22 study areas within the Hubbard Brook Valley, Woodstock and Ellsworth, New Hampshire. Sites are numbered 1–22 by increasing elevation corresponding to the order in Supplementary Tables S2 and S4. Sites are further coded by symbol to indicate group membership based on survival curves.



Since 2007, sugar maple seedling individuals are followed annually at transects centered at valleywide plots and in some areas of the south-facing watersheds. The study areas vary in size as 100 seedlings are initially marked for every study cohort. Most study areas are fairly contained 1m by 10m or less. We put effort into tracking these seedlings to understand limits to sugar maple regeneration in the northern forest. Calcium was shown to be important based on comparative work with seedlings in and outside of W1 (Juice et al. 2006; Cleavitt et al. 2011). Subsequent work throughout the valley and the state have found that biological agents, especially foliar fungus and insect herbivores are more important than previously thought (Cleavitt et al. 2014, 2025).

Double-marked seedling with flag behind and twist tie at base.



Sugar maple seedlings can be aged by the bud scars. Although, breakage can obscure true age.

There are currently three cohorts of sugar maple seedlings being tracked: 2007 seedlings have blue flags, 2010 seedlings have orange flags and 2018 seedlings have yellow flags. A seedling's life is tough but there are still some 2007 sugar maple babies making a go at it in the understory. All of the seedlings are double marked with a flag and a less obvious ground level marker.

Please, leave flags alone (even if an animal has taken them out of the ground, as we need to know this has happened) and avoid walking near the marked seedlings. Additionally, any work requiring soil or vegetation disturbance should be done outside the study transect areas. We carefully quantify light, shrub and tree cover. Because seedlings invest a lot of energy in their roots please refrain from any soil sampling in the area. Even if you don't see a seedling near the flag, there may be one there buried, browsed or for some other reason obscured from you.