On Bruce Mountain in the Bighorn Mountains of Wyoming, the upper treeline ecotone has advanced upslope since 1970 and to the highest extent in at least the past 210 years. However, the mechanisms facilitating tree establishment and treeline advance during this time were distinctly different between north and south-facing slope aspects. Tree regeneration on the south-facing slope was predominantly confined to microsites in the sheltered lee of boulders where more shade, moisture retention, and protection from the wind exist. Trees on the north-facing slope colonized open alpine tundra and facilitated continued regeneration clustered in close proximity to these trees. Thus, while patterns of tree establishment and treeline advance are well understood, it remains unknown whether differences in tree growth exist between these two sites. This is relevant as other studies suggest that favorable climatic conditions for tree establishment do not correspond with periods of high annual growth rates for trees at upper treeline. The goal of this research was to determine whether distinct patterns of tree establishment influence annual growth rates of these trees. To address this, I calculated basal area increment (BAI) for all trees positioned above the upper forest border. Surprisingly, annual growth rates and corresponding BAI values were almost identical between sites since 1970. These results suggest that tree establishment may be more of a critical limiting factor to upper treeline advance than tree growth because consistent growth patterns were found irrespective of spatial pattern on opposite slope aspects. From spatial pattern analysis, tree establishment on the northern slope adheres to the known biological preferences for each of the treeline species; while the pattern of establishment on the southern slope is overridden by the availability of favorable sites (i.e. in the lee of boulders) providing needed shade and moisture retention. As the treeline is a temperature and moisture-limited ecotone, there are observed differences along the elevational gradient within the site and between species that grow open and have a higher drought tolerance compared to those that rely on shade and neighboring trees.