

The History of an Uncharacteristic Lodgepole Pine/Aspen Stand  
in the Colorado Front Range  
or, Paradigm Lost

Final Report for the 3rd Annual Dendroecology Fieldweek  
Mountain Research Station, Nederland, Colorado

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Introduction

The subalpine forests of the central Colorado Front Range include large stands of trees dominated by lodgepole pine (Pinus contorta var. latifolia). Quaking aspen (Populus tremuloides) and limber pine (Pinus flexilis James) are less commonly distributed. Fire is an important process in the ecology of lodgepole, aspen, and limber pine ecosystems in east-central Colorado; all have characteristics of forest types that are promoted or maintained by fire. Fire is a stand-replacing event in lodgepole pine and aspen, and a stand-initiating event in limber pine; stands are generally even-aged cohorts. In the Rocky Mountains lodgepole pine trees regenerate following intense stand-replacing fires: bark is thin and most standing trees die; cones are serotinous; and seedling germination and survival are optimal on mineral soil (Lotan and Critchfield 1990). Aspen, however, regenerates best from root suckering after light or moderate fire. Like lodgepole pine, aspen is also thin-barked and stems usually die after fire, but suckers develop poorly if fire is too intense (Perala 1990). Limber pine is not widely distributed, occurring mostly at high elevations on windy, dry sites, but establishes after stand-replacing events, such as fire. Limber pine establishment is not directly promoted by fire like lodgepole pine or aspen, but depends on seed dissemination by birds and rodents. Rather, fire creates a favorable seedbed for this species (Steele 1990). Surface fires are not common in any of these species (Lotan and Critchfield 1990, Perala 1990, and Steele 1990).

A stand of lodgepole and aspen grows near the INSTAAR Mountain Research Station that shows ample evidence of an unusual event.

Figure 1. Study area location on Ward Quadrangle, Boulder County, Colorado (USGS 1978).

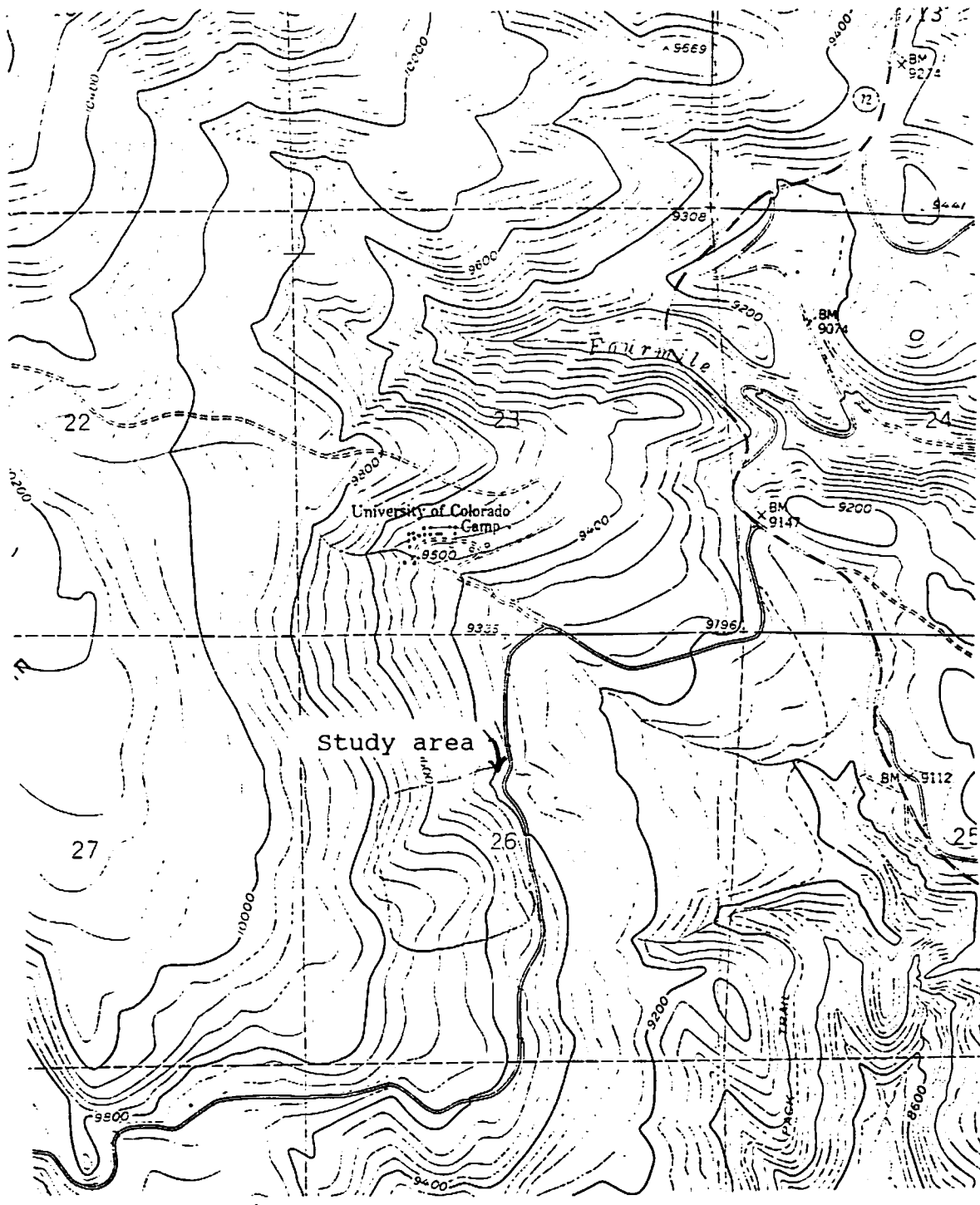


Figure 2. Species composition of  
Trees > 4 cm, Transect 1

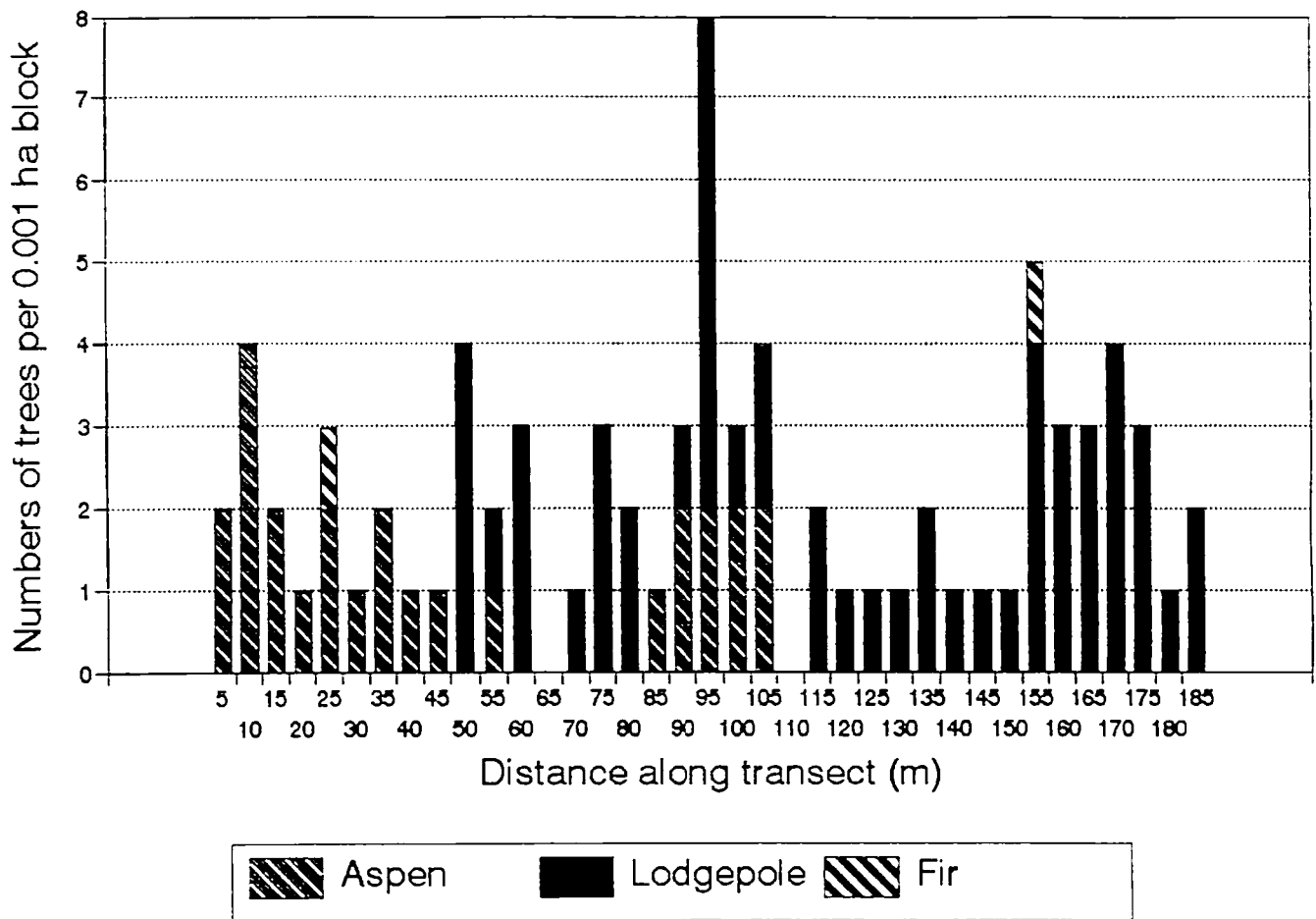


Figure 4. Size distribution of trees on Transect 1.

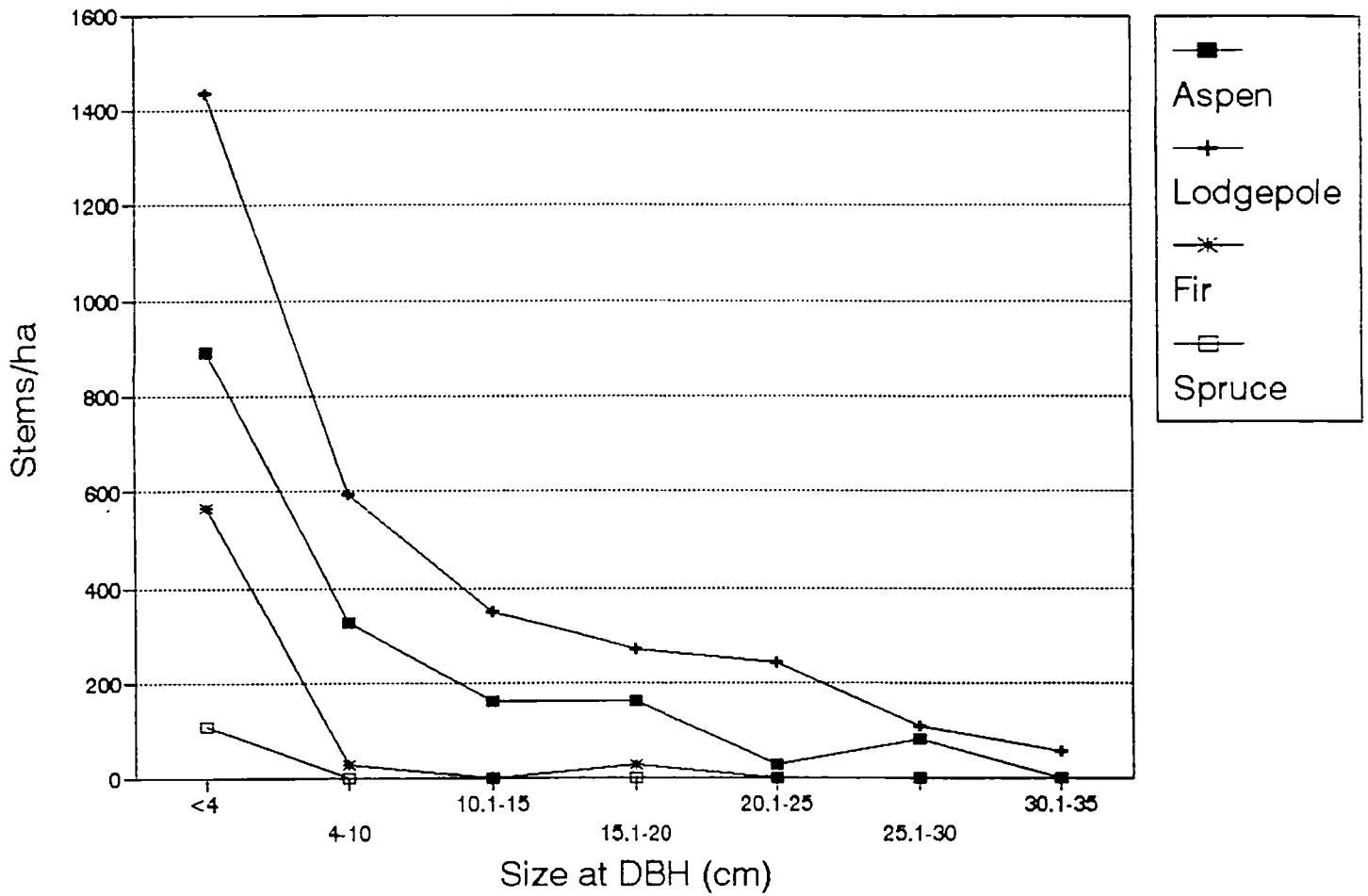
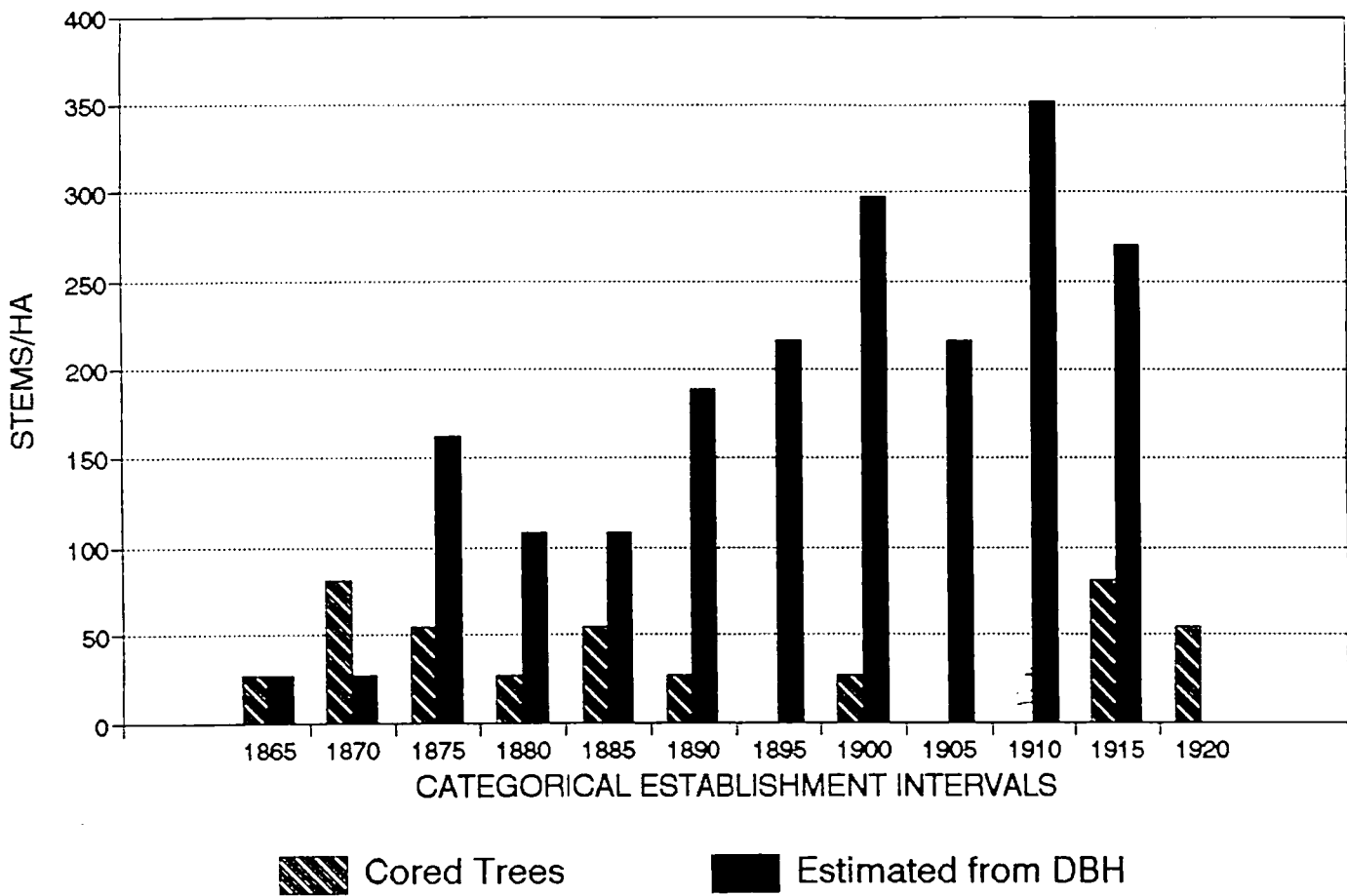


Figure 6. Establishment dates of Lodgepole Pine (actual and estimated)



limiting climate variable for lodgepole pine growth. Temperature presumably limits growth by determining water availability through the growing season.

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