ABSTRACT

TITLE:	The Effects of Various Sudden Aspen Decline Intensities on Understory Microclimate and Plant Biomass in Southwest Colorado.
AUTHOR(S):	Keaveny, Ellen ; Korb, Julie
PRESENTED AT:	7th Annual Natural & Behavioral Sciences Undergraduate Research Symposium Program, Fort Lewis College, 2012

ABSTRACT: Rapid mortality of aspen (Populus tremuloides) featuring high crown loss, concurrent branch dieback, and poor suckering was first observed extensively in southwestern-Colorado in 2004. This unusual abrupt fatal phenomenon, often referred to as Sudden Aspen Decline (SAD), is the result of predisposing factors, inciting factors, and contributing factors. Microclimate, one potential inciting factor, encompasses a significant importance in maintaining a stable aspen forest and substantial understory vegetation. Forest openings, present in SAD stands due to high crown loss and synchronous branch dieback at amplified levels, may be strongly influential in the regeneration of forests. Powell and Bork (2007) illustrated in a study that quantified forest openings and understory microenvironment, that forest gaps within closed canopy forests have a direct effect on temperature extremes and photosynthetically active radiation (PAR). With an increase of PAR being accessed by understory vegetation from the lack of high canopy interception, an increase of vegetation at the soil surface develops. The Dolores District of Southwest Colorado possessed the highest percentage of SAD in Colorado as of 2008, making the Mancos-Dolores Ranger District and ideal location for our study area. The effect of forest variability, both in treated stands to promote aspen regeneration and non-treated stands, on microclimate conditions is important in understanding plant biomass and aspen regeneration responses. The main objectives are to quantify the effects of various SAD intensities on: 1) soil surface and subsurface temperatures and soil moisture; and 2) understory vegetative standing biomass from different plant functional groups.