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**Preference:** Poster Session

**Theme:** Native Plant Conservation

**Status:** Professional

**Sagebrush decline on the Colorado Plateau: A look at sagebrush and soils**

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**Abstract:** Sagebrush (*Artemisia tridentata*) ecosystems are important habitat for mule deer, greater sage grouse, and many other charismatic fauna. They are also important rangeland for the western livestock industry, and considered by many to be vital recreation areas. However, these ecosystems are also in decline. Growing concern for this problem has led to a great many studies on the dynamics of sagebrush ecosystems, particularly in the Great Basin, but very little is known about how sagebrush responds on the Colorado Plateau which has drier and monsoonal climatic conditions as well as different soils and vegetation. This is problematic because there is little to suggest that restoration successes in well studied areas will be successful on the Colorado Plateau. In Beef Basin, an area of southern Utah known for recreation, cattle grazing, and deer hunting, sagebrush habitat has degraded to such an extent that it is more accurately described as grassland. Sampling sites were randomly selected across two neighboring basins based on the three dominant soil types and four vegetation classes. These classes were assigned based on September NDVI values. Line-point-intercept, shrub density, and soils data are used to determine which soil characteristics influence the presence of sagebrush on the landscape. Non-ephemeral sagebrush leaves provide nitrogen content and hydration measures which are used to explain the variation of sagebrush health. Our findings allow land managers to direct conservation efforts by predicting which areas can be successfully restored as well as those which may face further loss of sagebrush and sagebrush ecosystems.