

**** Elk Browsing Intensity Impacts Aspen Recruitment on Multiple Use Landscape Over Three Decades**

Autumn Keller*, USDA Forest Service, Montana State University, Gardiner, MT
Daniel Tyers, USDA Forest Service
Daniel Atwater, Montana State University
Douglas Smith, National Park Service (retired)
Clayton Marlow, Montana State University

*Indicates Presenter

**Indicates Student Presentation

Quaking aspen (*Populus tremuloides*) stands are vital to ecosystem health, providing wildlife habitat, water and carbon sequestration, and natural fuel breaks. The Northern Yellowstone Winter Range, hereafter referred to as the northern range, is the wintering ground for the largest Rocky Mountain elk (*Cervus canadensis*) herd in Yellowstone National Park (YNP) and extends outside YNP onto the Custer Gallatin National Forest (CGNF). The northern range elk population, which has historically varied between 5,000 and 19,000 individuals, relies on aspen for winter forage. As of 2024, over 85% of these elk migrate to the CGNF in winter and can have strong impacts on aspen stage structure. Aspen stands are also affected by changes in precipitation and encroachment by conifers. The goal of this study was to relate long-term changes over 34 years in aspen stage structure to precipitation, conifer encroachment, and elk browsing of data collected from over 300 aspen stands on the CGNF. Previous studies concluded that aspen recruitment was increasing on a local scale in a few surveyed drainages, but was not increasing on a landscape scale. We found that aspen stem recruitment is now increasing on a landscape scale following recent elk density decline, with a 90% increase in stem counts since 2006. Stems that have outgrown the upper browse height of elk (2 m) increased the most in aspen stands with greater snow water equivalent, lower browsing pressure, and in stands farther from YNP. These data can be used to identify at-risk stands and prioritize management interventions.