

LOSS OF LIVESTOCK FORAGE AS CONIFERS REPLACE HISTORIC ASPEN STANDS

Investigators:

Barton Stam (Assist.Exten. Educator, Univ. Wyoming Coop. Exten. Serv., Termopolis)
John Malechek (Professor Forest, Range and Wildlife Dept., Utah State Univ., Logan)
Dale Bartos (USDA Forest Service and Forest, Range, and Wildlife Dept., USU, Logan)
James Bowns (Professor, Dept. Biology, Southern Utah Univ., Cedar City)
Bruce Godfrey (Professor, Dept. Economics, Utah State Univ., Logan)

Objective:

Determine the extent and estimated economic value of livestock forage that has been forgone due to aspen replacement by coniferous tree species on the Dixie and Fishlake National Forests and on private rangeland on Cedar Mountain

Methodology:

We measured the biomass of forage plants in the understories of aspen stands, stands of mixed aspen-conifer and stands that were historically aspen but are now dominated by conifers. This was done on both high-potential and low-potential sites on the Dixie and Fishlake National Forests and on private rangeland on Cedar Mountain during summers of 2002 and 2003. A statistical relationship was then established between forage production and conifer overstory. The economic value of forgone forage was estimated by translating animal unit months (AUMs) of forage into potential weight gain by feeder calves grazing on similar rangeland, and then applying 2003 market values to the amount of calf weight gain that would have been realized if ranges now dominated or partly-dominated by conifers had remained as historic aspen stands.

Results:

There was a close statistical negative relationship between understory forage production and conifer overstory. The relationship was curvilinear with the greatest decline occurring over the range of conifer cover between 0% and 15%. At conifer cover levels exceeding around 15%, understory biomass production is severely reduced. When these potential AUMs of forage were translated into livestock weight gains valued at 2003 market prices, forgone gross revenues ranged from \$10.1 to \$14.4 million for the combined Dixie and Fishlake National Forests. Additional forgone revenues to the U.S. Treasury might be associated with unrealized grazing fees.

Products:

- (1) M.S. thesis at USU (Barton Stam, 2004)
- (2) Presentation at 57th Annual Meeting of Society for Range Management, Jan. 2004, Salt Lake City
- (3) Manuscript ready to submit to the Journal of Rangeland Ecology and Management in Nov., 2004.

Additional Research Questions:

Other Funding Partners:

Utah Agricultural Experiment Station; US Forest Service (in-kind contribution of time by Mr. Steve Smith, Range Mgt. Specialist, Dixie Natl. Forest, and access to research sites on Dixie and Fishlake Forests)