YELLOWSTONE BISON POPULATION DYNAMICS: AN INTERGRATED ANALYSIS

Julie A. Fuller and Robert A. Garrott, Montana State University, 310 Lewis Hall, Bozeman, MT 59715, rgarrott@montana.edu

Keith E. Aune, Montana Department of Fish, Wildlife & Parks, Research and Technical Services, 1420 E. 6th Ave., Helena, MT 59620, kaune@mt.gov

Patrick J. White, National Park Service, Yellowstone National Park, Mammoth, WY, 821 90, PJ_White@nps.gov

Thomas J. Roffe, USDI Fish and Wildlife Service, 1400 S. 19th Ave., Bozeman, MT 59718

Jack C. Rhyan, USDA Animal and Plant Health Inspection Service, Veterinary Services, National Wildlife Research Center, 4101 Laporte Avenue, Fort Collins, CO 80521

Rigorous vital rate estimation is essential to parameterize population models to gain ecological and management insights. Bison in Yellowstone ational Park (Y P) have increased from just 46 in 1902 to nearly 5000 today, but this conservation success is overshadowed by controversy. Y P bison are infected with brucellosis, and the State of Montana is concerned about potential economic consequences if domestic livestock outside YNP contracted the disease. To understand drivers of bison population dynamics and potential effects of vaccination programs, we evaluated a Leslie matrix model parameterized with survival and reproduction estimates from 7 years of telemetry studies (1995-2001). We also analyzed 28 years of early-season calf:adult ratios (1970-1997) and 9 years of late-season calf: adult ratios (1997-2005). Covariates considered included snowpack, drought, elk, and bison density. Adult female survival was high (0.96) and static. Birth rates varied by brucellosis exposure and age structure, with lower birth rates in primiparou individuals. Early- and late-season calf:adult ratios were negatively correlated with snowpack (r^2 = 0.26-0.60, $P < 0.05$). Integrating these vital rates into a matrix model resulted in a growth rate estimate of λ=1.10,

closely corroborating an estimate of λ=1.09 from count data. λ was highly elastic to adult survival (0.52), moderately elastic to juvenile survival (0.36), and slightly elastic to fecundity (0.12). Simulating the effects of brucellosis eradication through vaccination programs resulted in λ =1.13, roughly a 3% increase. We concluded brucellosis eradication could further increase bison population growth rates and potentially exacerbate conflicts outside YNP.

Brett Gullett, Confederated Salish & Kootenai Tribes, P.O. Box 278 Pablo, MT 59855

Don Catanzaro, 16144 Sigmond Lane Lowell, AR 72701

The Columbian sharp-tailed grouse *(Tympanuchus phasianellus columbianus*) is an important species to the Salish, Pend O'reille and Kootenai people that has suffered tremendous declines over the past century with 1978 being the last documented recording on tribal lands. An understanding of the quantity and quality of Columbian sharp-tailed grouse (CSTGR) habitat on tribal lands is critical in order to increase the probability of successful reintroduction of this species. Presently, we have completed a habitat assessment of Ferry