IRRUPTION, CRASH, AND RECOVERY OF AN INTRODUCED MOUNTAIN GOAT POPULATION IN THE CRAZY MOUNTAINS, MONTANA 1941–2011

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Abstract: Common debates in mountain goat (*Oreamnos americanus*) management include sustainable harvest rates, whether goat populations exhibit compensatory reproduction to changes in population size, differences in population dynamics of native and nonnative populations, and influence of harvest pressure on demographics and trophy quality. We analyzed the 70-year history of an introduced mountain goat population in the Crazy Mountains to shed light on these issues. The reintroduction of 21 mountain goats in the Crazy Mountains in 1941-1943 established the first nonnative population in North America. This population experienced a rapid "irruptive" phase from 1941–1957, increasing to 342 observed goats followed by a rapid "crash" in numbers, declining to 165 observable goats in 1961. From 1961–1976 the observable population declined to 35 goats, and remained stable between 1976–1989 ranging from 23-47 observed goats. In 1989 the population began a "recovery" phase and increased from 47 to 371 observed goats in 2011. Goat hunting harvests varied from conservative seasons (1953–54) to liberal seasons (1955–1967) to no hunting (1976–1989) to an Adaptive Harvest Management (AHM) approach (1993-2011), designed to respond to population indices and dampen population fluctuations. Annual mean harvest of 8.7% (range 5.3–13.5%) of observed goats since inception of AHM in 1993 has resulted in a gradually increasing population ($r = 0.07$), compared with rapid population growth between 1943–1957 ($r = 0.41$). Recruitment trends since 1993 have been stable, averaging 22 kids per 100 adults (range 18–37). Analysis of age at harvest and horn lengths of harvested goats did not indicate change in demographics or trophy quality over time. Based on the Crazy Mountain model, it may be possible for wildlife managers to increase harvest levels on introduced goat populations to reduce the negative effects of "boom and bust" population cycles.

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