RESOURCE NOTES

NO. 33 DATE 08/01/00

Viability of Feral Horse Populations on Atlantic Coastal Barrier Islands: Implications for Management

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The eleventh in a series of 13, Session 4

Background

Feral and free-ranging horses have a long and illustrious legacy common to many Atlantic coastal barrier islands. I analyzed the population dynamics of the horses of Assateague Island National Seashore (ASIS), which encompasses the northern 28 km of the island. Here the horses live a wild existence and are managed as a living cultural resource. Using population reconstruction methods and computer simulation of feral horse life-history, I developed a demographic population viability analysis (PVA) for this population for the expressed purpose of assessing the impacts of fertility control, disease epidemics, and catastrophic storm events on population persistence. Partial pedigrees were constructed to examine lineage-specific effects on population demography and genetic zygosity.

Discussion

The reconstructed population varied from a low of 35 horses in 1975 to a high of 171 in 1988, and grew at an average annual rate of 15%, which by western experience is sub-par, but matches earlier estimates of >10%. Two-hundred forty-seven observations of survival histories (58 uncensored) of horses demonstrated that reconstructed March population size added significant prognostic value to the prediction of hazards for ASIS horses. There were no statistically detectable differences in survival between the sexes and no dramatic differences in the age at first foaling over time. Analysis of the interbirth interval revealed a strong population size influence, however. There was a pronounced change in the early-age hazards as population size increased, an observation unique among wild horse population studies. Adult survival changed very little and remained quite high over a wide range in population sizes. A meaningful population decline induced through fertility control could be approached at efficacies of $80% sustained over a period of 10 years. This translates into treating about 60 mares each year. Interestingly, just 3 of 17 progenitor mare matrilines were responsible for most of the foals born into the population over the 18 years examined in this study.

Conclusion

The levels of adult horse mortality due to storms, diseases and accidents, which are impossible to predict, had the most profound effect on population growth and viability. The simulation also suggested that management directed at specific matrilines exerts a disproportionate effect on rate of increase, population viability and genetic zygosity. As a precursor to management, PVA forces one to consolidate the existing knowledge base, explore management alternatives, and identify weaknesses in the data that might compromise biological inferences drawn from the exercise. While a prudent first step, PVA is not suited for every purpose. Managers should

consult with a population biologist who (1), has first-hand experience with the various approaches and, (2) can facilitate and incorporate knowledge from the field.

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