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Ecology and Management of Feral Hogs on Fort Benning, Georgia.

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SUMMARY

Invasive species, such as feral pigs (*Sus scrofa*) are often ecologically harmful and have expanding distributions. Effectively reducing feral pig populations, which is becoming an increasingly common objective of wildlife managers, requires determining how reduction efforts affect vital rates and which vital rate potentially has the largest effect on the population growth rate (λ). We implemented a manipulative experiment of

feral pig populations at Fort Benning, Georgia to assess the demographic effects of a lethal reduction. We compared demography of a non-manipulated control population with a treatment population, where feral pigs were experimentally removed. Using mark-recapture data from trapping, re-sight with cameras, telemetry of radio-collared pigs, and hunter-returned tags, we estimated survival, recruitment, and population growth rates of treatment and control populations for 2004-2005. Matrix model analytical and simulation sensitivity analyses were used to determine which seasonal vital rate could potentially contribute most to changes in the population growth rate.

The top ranked model for survival included a treatment effect; survival was lower for the treatment population compared to that for the control. Recruitment estimates did not differ between treatment and control populations, but the population growth rate was lower for the treatment population compared to that for the control. Both analytical and simulation sensitivity analyses indicated that the population growth rate was potentially most sensitive to changes in juvenile survival, especially during fall/winter and summer. Simulation sensitivity analysis revealed that the sensitivity of λ to juvenile survival increased as survival decreased in the treatment population. Based on our lethal removal efforts, reducing survival can be used in management to lower population growth rates of feral pigs. However, management actions lowering juvenile survival or juvenile recruitment will most effectively lower the growth rate of feral pig populations and ultimately reduce the adverse effects of feral pigs on native species.

If effective control and removal techniques are to be developed, it is critical to understand if feral pig populations respond to reductions in density that are associated with removal efforts by increasing reproductive output. We compared reproductive

parameters and condition of adult sows that were collected between a control area and a treatment area where lethal removal occurred. From October 2004 to April 2006, we implemented a concentrated removal effort within the treatment area. Although the population density was 50% greater in the control area than the treatment area, we did not detect differences between areas for condition, litter size, ovarian mass, corpora lutea mass, nor corpora lutea number. It is possible that several years of heavy mast production during the study may have negated any affect on condition and subsequent reproduction between the two study areas. These data suggest that reproductive parameters of feral pigs do not exhibit density-dependence during periods when pig populations are in good condition. However populations experiencing nutritional stress may be more reproductively responsive to reductions in density.

With herpetofauna populations decreasing worldwide and the range of feral pigs expanding, the negative effect that feral pigs can have on threatened reptile and amphibian populations due to depredation could be substantial. From April 2005 to March 2006, we collected feral pigs (n = 68) with the use of firearms and examined stomach content for reptiles and amphibians. By estimating foraging time based on food passage rate and activity patterns, we were able to characterize daily and annual consumption rates of herpetofauna. We found 64 individual reptiles and amphibians, composed of 6 different species, which were consumed by feral pigs during an estimated 254 hours of foraging. Herpetofauna consumption showed distinct summer and winter peaks. Species (*Anolis carolinensis*) that are primarily arboreal became more vulnerable to depredation when temperatures were low due to their need to seek thermal shelter. Other species (*Scaphiopus holbrooki*) that exhibit explosive breeding behavior coinciding

with mass terrestrial migrations also faced increased vulnerability to pig depredation. Results suggest that feral pigs are opportunistic consumers that can exploit and potentially have a negative impact on species that exhibit similar life-history characteristics as those species reported in this study.

The data summarized in this report are taken from the theses of L. B. Hanson and D. B. Jolley. These documents are included as attachments, and their official citations are included below. A third thesis is currently being prepared by W. D. Sparklin and is anticipated to be completed during fall 2007.

Hanson, L. B. 2006. Demography of feral pig populations at Fort Benning, Georgia. M.S. Thesis, Auburn University, Auburn, Alabama, USA. 90pp.

Jolley, D. B. 2007. Reproduction and herpetofauna depredation of feral pigs at Fort Benning, Georgia. M.S. Thesis, Auburn University, Auburn, Alabama, USA. 44pp.