TEXAS A&M | Institute of Renewable Natural Resources

TEXAS A&M UNIVERSITY | AgriLIFE RESEARCH & EXTENSION Texas A&M System

FERAL HOG STATEWIDE POPULATION GROWTH AND DENSITY

THE ISSUE

Feral hog (*Sus scrofa*) management in Texas and throughout the southeastern United States is increasing due to the prolific breeding potential and environmental impacts caused by the species. This free ranging, non-native, invasive species exhibits one of the highest reported reproduction rates of any ungulate. When hogs were introduced into the United States in the 1500's, they were beneficial to early settlers because of their importance as a meat source and adaptability to the environment. Release or escape of then domestic hogs has led to their current expansion. In Texas, feral hogs are reported to cause nearly $52 million in annual agriculture damage with higher reported damage in farming areas. This is equivalent to approximately $7,500/landowner in damage since feral hogs occupy largely private lands. As the population of feral hogs continue to grow, so will the conflict with agriculture and wildlife requiring more attention from natural resource managers.

SCOPE OF WORK

Population dynamics (i.e., survival, reproduction, density, etc.) of feral hogs is poorly understood throughout their range to include Texas. The estimated number of feral hogs, for example, in Texas ranges from a reported 1 million to as high as 4 million, and not really based on scientific studies or data. Conversely, the rate of growth for feral hogs also has been cited as doubling each year and again not based on empirical data further complicating efforts to estimate hog densities. The objective of this project was to (1) evaluate population growth rates, and (2) obtain crude density estimates for feral hogs state-wide. For Objective 1 (estimate population growth rate), we constructed a state-wide feral hog model using a sex- and age-structured population model (see Figure 1). From a comprehensive literature review of 21 scientific studies conducted throughout the southeastern United States, we estimated demographic parameters (i.e., survival, litters/year, average litter size, etc.), which included mean, low, and high estimates for each demographic parameter. Variance estimates for model parameters allowed demographic stochasticity to be incorporated with each simulation. Multiple model simulations (>100) were conducted and population trajectories averaged for further comparisons.

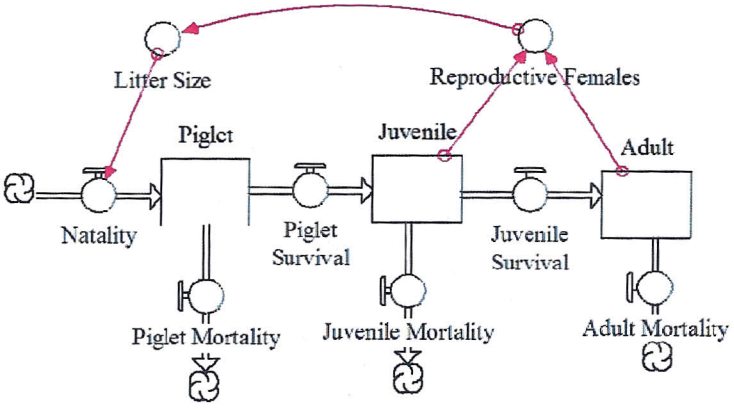
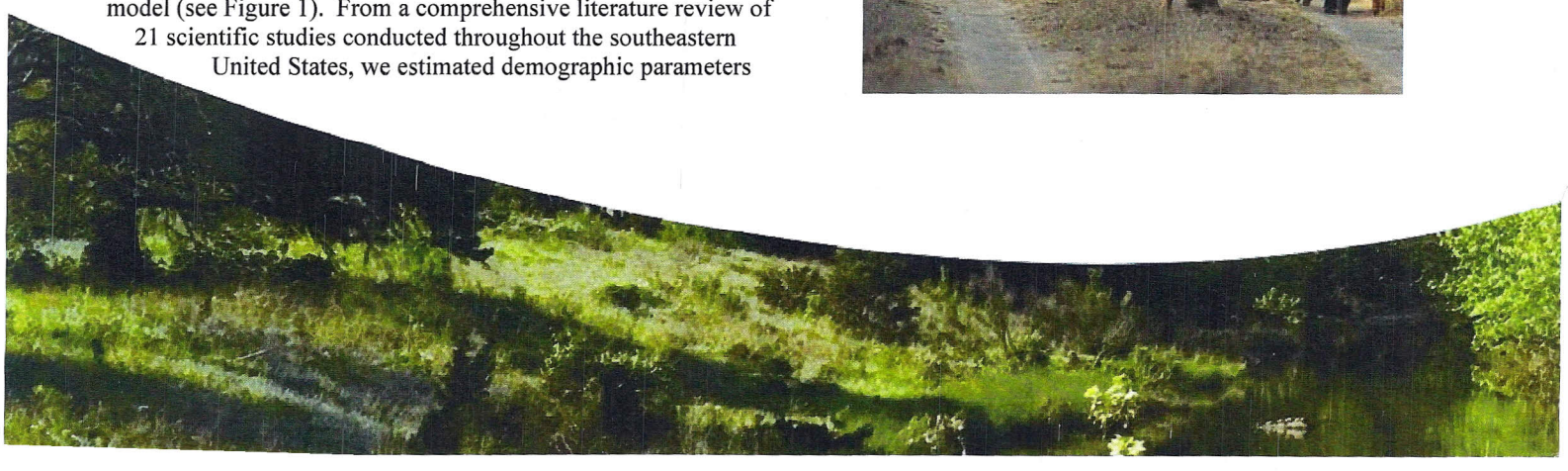


Figure 1. Conceptual feral hog model.

Three independent, state-wide data sources were used to estimate population growth rates for feral hogs, and compared to average model population trajectories: (1) reported harvest numbers from Texas Parks and Wildlife Department (TPWD) aerial permit holders, (2) feral hogs sold to processing plants for consumption (i.e., slaughter house data), and (3) USDA APHIS-Wildlife Service agency harvest estimates.



For Objective 2 (i.e., state-wide density estimate), we conducted a comprehensive literature review that resulted in the identification of 8 feral hog studies reporting hog densities from various Texas ecoregions. From this review, we determined an overall state-wide density estimate with a 95% confidence interval. We then determined potential feral hog habitat through the use of a Geographical Information System (GIS) based on National Land Cover (i.e., vegetation types) and average rainfall. With the vegetation cover layer, we omitted areas unlikely to support high densities of feral hogs (e.g., water, barren ground, low-high development). We also omitted areas receiving <20 inches of annual rainfall as suitable feral hog habitat with the exclusion of riparian areas (these were classified as suitable based on water availability needed by hogs). From this analysis, we estimated approximately 134 million acres of suitable feral hog habitat (Figure 2) or 79% of the entire state.

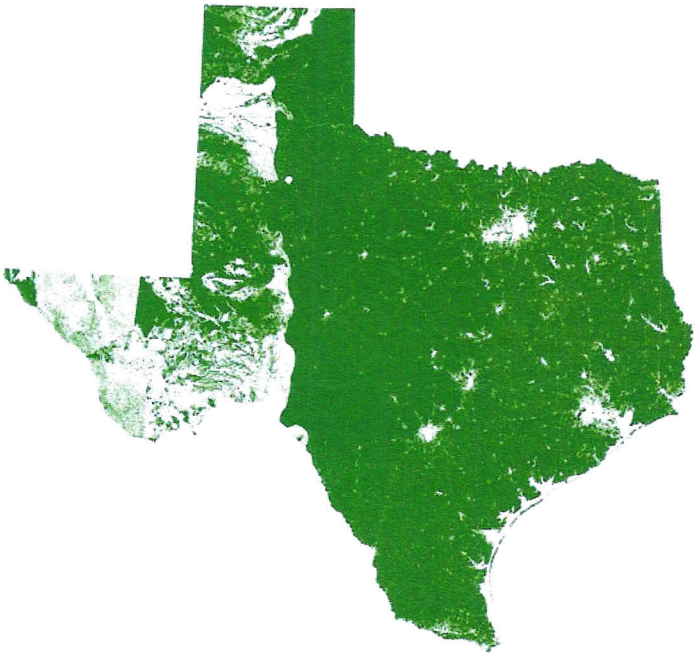


Figure 2. Feral hog suitable habitat (green).

RESEARCH HIGHLIGHTS

Population Growth Rate (Objective 1) – We estimated approximately 18-21% annual population growth based on demographic estimates used in our state-wide feral hog model. Annual intrinsic growth from all data sources varied between 19 -25%, with an average of 21% (Figure 3).

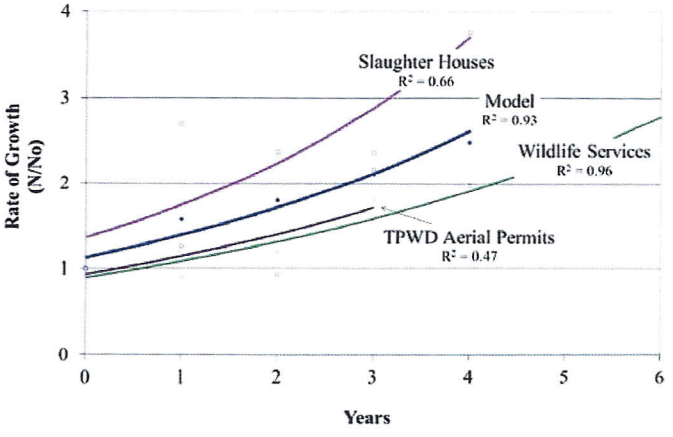


Figure 3. Model population trajectory compared to hog trend datasets.

Observed increases in state-wide hog trend data were very similar to model population trajectories, suggesting model results are reasonable and support parameter estimates used in model construction.

Feral Hog Density (Objective 2) – We found the average hog density in Texas from reported studies ranged from 1.33 hogs/ square mile to 2.45 hogs/square mile. This range (1.33-2.45 hogs/sq. mile) represented a 95% confidence interval. By multiplying the density estimate to the total potential suitable feral hog habitat, we estimate the number of feral hogs state-wide to be between 1.8 and 3.4 million hogs (mean 2.6 million hogs).

Photos taken by Joshua Anderson.
http://www.joshuaandersonphotography.com