

The Feral Hog Problem: Can Cost-Sharing Help?

Trapping systems can be an effective method for managing feral hogs, but they are expensive. Would financial assistance through a cost-share program increase their adoption?

Background

Feral hogs are an invasive species in the United States that annually inflicts an estimated \$1.5 billion in damages and control costs. Hogs damage crops, spread pathogens to livestock and humans, and destroy pastures, lawns, and fences. The damage also includes collisions with vehicles, as well as attacks on farmers and people recreating outside. As an invasive species, feral hogs also disrupt the dynamics of indigenous wildlife, decrease plant diversity, soil health, and water quality.

Feral hog control is a spatial challenge. Hogs are intelligent, adaptable, and mobile. Feral hogs that have been hunted learn to hide or lie still in the presence of humans, can become exclusively nocturnal, and often change or expand their home ranges to avoid harm. Groups of hogs, known as sounders, often move across large areas and can be difficult to catch. Lacking natural predators, feral hogs have spread from 18 U.S. states in the early 1980's to 35 today, with an estimated population of 6 million as of 2018.

Feral hog control is a temporal challenge. Hogs reproduce quickly. A sounder's size can double in four months, as a sow can reproduce as early as six months of age and has four to twelve piglets per year.

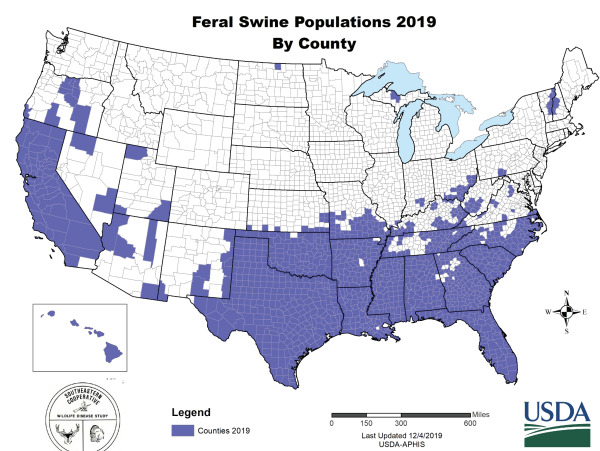
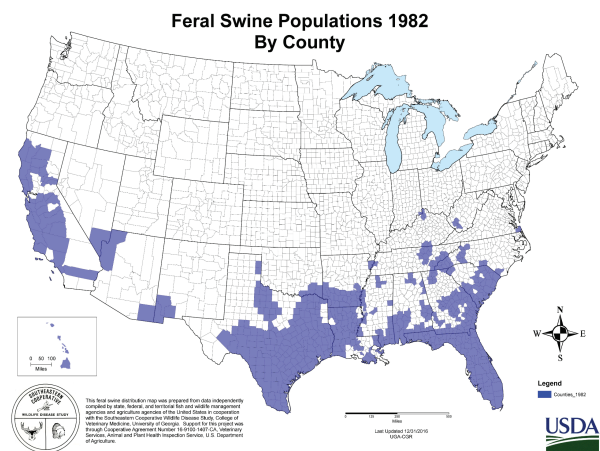
Success Stories

The costs of feral hog control typically fall on private individuals and, to a lesser extent, public land managers. Control methods vary widely in efficacy, cost, and feasibility. Ground hunting is inexpensive, but it only eradicates a few hogs at a time. When the sounder is large, ground hunting often just disperses the hogs and associated damage across a larger area. Fencing properties to exclude hogs can be prohibitively costly and hogs can breach fences by either climbing through gaps, burrowing under, or damaging them.

Aerial hunting can effectively reduce sounders that occupy open areas with low lying vegetation. However, aerial hunting is not effective in heavily covered areas and is generally illegal in densely populated areas. Toxicants and contraceptives are potential solutions,

but more research is needed about the potential harm from toxicants on the environment and native, non-target species and about the long-term effectiveness of contraceptives.

Trapping methods, using remote triggers, that can capture the entire sounder can be efficacious and cost effective over time. When feral hogs observe other hogs from their sounder caught in a trap, they learn to identify and avoid future traps. Remote observation and activation from a smartphone or computer avoid this adaptive behavior by preventing traps from closing too quickly and only capturing part of the sounder. However, the significant upfront costs of these large traps with remote triggers can discourage people from adopting them.

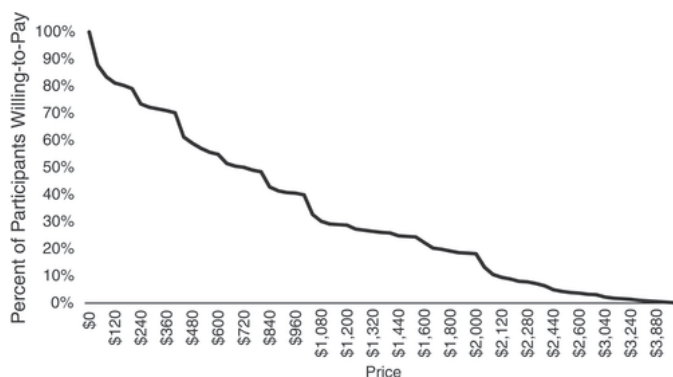


Design

Recognizing the significant upfront costs to feral hog traps, CBEAR developed a cost-share program called the Agricultural Value, Innovation and Stewardship Enhancement program. In the program, agricultural landowners could bid in a competitive auction for one of several large, \$4,000 Jager Pro Manually Initiated Nuisance Eliminator (M.I.N.E.) trapping system. When an animal enters the trap, the owner gets an alert via an app. The owner can then remotely view the trap and, after confirming that the entire sounder has entered the trap, close the trap via cellular service.

To encourage people to learn about the trap and the auction, we paid participants \$50 to watch a video and read text that explained the program. Participants had to be 18 years or older, from the southeastern United States, and had to make at least a \$1,000 a year from agricultural production. The total number of people who sat through the program explanation was 1,016. After learning about the trapping system and the auction rules, participants decided if they wished to submit a bid at the program's website. Willing bidders were presented with a slider, ranging from 0% to 100%, which allowed them to indicate how much of the \$4,000 cost they wanted to pay.

Farmers' Willingness to Pay for a Feral Hog Trap in a Cost-Share Auction



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Results

Approximately 44% of the farmers who learned about the program (450) chose to bid on the feral hog trapping system. As shown in the bid curve, the mean bid was \$908 (23% of the full cost) and the median bid was \$720 (18% of the full cost). Nearly 20% of the bids were under \$100.

These values should be viewed as lower-bound estimates of bidders' WTP for a feral hog trap. The program's first-price, sealed-bid auction gave bidders incentive to bid enough so that they would win, but not necessarily as high as their true WTP because bidding exactly their true WTP would leave them with zero gain. While these results cannot be extrapolated to the full population of landowners whose properties are affected by feral hogs, it is likely that the landowners who bid in our auction have an above average willingness to pay for hog control.

These results suggest that some landowners may even need financial incentives to adopt the trap for free: 80% of the participants who did not bid had feral hogs on at least one acre of their land in the past year and 75% reported that feral hog damage directly impacted crops on their farm.

Landowners are interested in controlling feral hogs, but our study suggests that they are not willing to pay a lot to control them. The low willingness-to-pay observed in our study could arise from several sources: (1) landowners did not perceive high costs from feral hogs on their property; (2) landowners did not believe the M.I.N.E trap was effective; or (3) landowners recognized that if they invested to control hogs, but their neighbors do not, their return on investment in the trap may be low.

We believe that the third reason may be the most likely one. Regardless of the reason, however, the results imply that if trapping in the US is going to play a major role in controlling the growing feral hog population, farmers and other landowners will need financial assistance to help defray the upfront costs. Furthermore, efforts should be made to coordinate the trapping to account for the spatial and temporal aspects of this problem.

More Information

This paper can be read in full in the Applied Economics Perspectives and Policy(AEPP) Journal in the article titled "The Problem of Feral Hogs and the Challenges of Providing a Weak-link Public Good"