Wildlife Services

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National Wildlife Research Center

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Feral Swine Damage Control Strategies

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Major Cooperators
- Animal Control Technologies Australia
- Archbold Biological Station
- Invasive Animals Cooperative Research Centre
- MacArther Agro-ecology Research Center
- Sul Ross State University
- Texas A&M University-Kingsville
- Texas Department of Agriculture
- Texas Parks and Wildlife Department
- University of Florida
- USDA/APHIS/Veterinary Services
- Wildlife Services Operations

Groups Affected By These Problems
- Consumers
- Livestock producers and farmers
- Meat processors
- Sporting organizations
- U.S. citizens and landowners
- Wildlife and natural resource managers

National Wildlife Research Center Scientists Provide Basic Ecological Information to Develop Feral Swine Damage Control Strategies.

Wildlife Services' (WS) National Wildlife Research Center (NWRC) is the only Federal research organization devoted exclusively to resolving conflicts between people and wildlife through the development of effective, selective, and socially responsible methods, tools, and techniques

As increased urbanization leads to a loss of traditional wildlife habitat, the potential for conflicts between people and wildlife increases. Such conflicts can take many forms, including property and natural resource damage, human health and safety concerns, and disease transmission among wildlife, livestock, and humans.

The high reproductive rate and adaptability of feral swine has resulted in populations that have dramatically increased in size and distribution. This invasive animal now occurs across much of the United States where it causes a range of agricultural and environmental damage through depredation, rooting, and wallowing activities. Furthermore, feral swine compete with native wildlife and livestock for habitats, are carriers of exotic and endemic diseases, and transmit parasites to livestock and humans. It is estimated that feral swine in the United States cause more than $1 billion in damages and control costs each year.

Applying Science and Expertise to Wildlife Challenges

Effects of Baiting on Feral Swine Culling Success—How feral swine respond to control operations is an important consideration in developing optimal management plans. To better understand feral swine behavior, NWRC scientists studied the effects of supplemental feeding/baiting on feral swine movements and the likelihood of baiting to reduce dispersal of swine under culling pressure on the Rob and Bessie Welder Wildlife Foundation (WWF) in San Patricio County, Texas. By placing global positioning system (GPS) collars on feral swine, scientists were able to track movement throughout control operations. Population-wide culling activities included trapping and shooting around a centralized bait station. Feral swine home ranges did not differ between the bait station site and other non-baited sites. However, the daily movement rates of feral swine at bait station sites were 39 percent greater than movement rates of animals in non-baited areas. Opposite to what was expected, baiting stations did not reduce movement in the treatment areas. WS does not recommend the use of baiting as an alternative to fencing for containing feral swine during culling activities.

Tuberculosis and Feral Swine—There is little information regarding the diseases and parasites found in feral swine populations in the Texas border region. This information is needed to understand risks from trans-boundary diseases and to devise and evaluate control strategies. Information from the Texas border region is of particular importance because of the natural movements of wildlife, legal movements of livestock, and illegal movements of animals and animal products from and to Mexico, where many diseases, including bovine tuberculosis, may be present in domestic livestock. Bovine tuberculosis is caused by the bacterium *Mycobacterium bovis*. In a recent NWRC study, approximately 400 feral swine were opportunistically sampled for *M. bovis* in southern Texas. Though no evidence of *M. bovis* infection was found in the swine, researchers recommend continued periodic and strategic sampling of feral swine for *M. bovis* in high-risk areas since feral swine are capable of becoming reservoirs of the disease.

Improving Traps for Feral Swine—Without an effective registered toxicant in place, trapping continues to be one of the primary methods for controlling feral swine populations. As such, numerous trap designs are currently used to capture feral swine; however, drop nets had never been evaluated. In a study conducted in Oklahoma, NWRC scientists compared the effectiveness and efficiency of a drop-net and a traditional corral trap for trapping feral swine. A mark and recapture analysis showed more swine were removed with drop-nets than with corral traps. Efficiency estimates for the average time per capture were 1.9 and 2.3 hours for drop-nets and corral traps, respectively. Feral swine did not appear to exhibit trap shyness around drop-nets, which often allowed the researchers to capture entire sounders (family units) in a single drop. Use of drop-nets also eliminated capture of non-target species. Results of this study indicate that drop-nets are an effective tool for capturing feral swine.

Monitoring Feral Swine Populations with Mark-Recaptur— Land managers often use a variety of lethal control methods to combat growing feral swine problems. NWRC researchers evaluated the use of the biomarker tetracycline hydrochloride (TH) and mark-recapture techniques for monitoring the effectiveness of feral swine control methods. Researchers established and observed feral swine bait stations containing TH-treated sour corn. TH is a palatable and ingestible antibiotic that establishes a permanent fluorescent mark on growing bone and teeth. Using data on the number of feral swine observed consuming TH-treated bait and the number of animals subsequently removed from the population with TH-marked teeth, researchers calculated population estimates. TH proved to be a suitable marker for mark-recapture estimates of feral swine. The technique also included several advantages over traditional population monitoring techniques, such as reduced animal capture and handling costs; the ability to euthanize captured animals instead of releasing them for future recapture; and the ability to employ a variety of recapture methods.

Feral Swine Activity Near Domestic Swine Facilities—A major concern with feral swine is their potential to maintain and transmit diseases to domestic swine. The domestic swine industry is dominated by operations that maintain some level of biosecurity. However, a portion of the industry is considered “backyard” or transitional production. It is these smaller operations that provide opportunities for disease transmission between feral and domestic swine through fence lines and contaminated surfaces. To help aid in disease management, NWRC researchers collected data on feral swine movements, habitat preference, and the influence of boundaries and corridors near 28 small-scale domestic swine facilities in Texas. Data from collared feral swine showed they preferred habitat characteristics commonly found surrounding domestic swine facilities. Feral swine also demonstrated a disproportionate use of specific vegetation types as compared to their availability during both wet and dry periods. Additionally, the presence of paved, 2-lane roads influenced movements of feral swine. This information aids in the development of targeted management and eradication strategies near domestic swine facilities, particularly in emergency situations such as disease outbreaks.

Selected Publications:

CAMPBELL, T. A., D. B. LONG, M. J. LAVELLE, B. R. LELAND, T. L. BLANKENSHIP, and K. C. VERCAUTEREN. 2012. Impact of baiting on feral swine behavior in the presence of culling activities. Preventive Veterinary Medicine 104:249–257.

CAMPBELL, T. A., D. B. LONG, L. R. BAZAN, B. V. THOMSEN, S. ROBBE-AUSTERMAN, R. B. DAVEY, L. A. SOLIZ, S. R. SWAFFORD, and K. C. VERCAUTEREN. 2011. Absence of Mycobacterium bovis in feral swine (Sus scrofa) from the southern Texas border region. Journal of Wildlife Diseases 47:974–978.

CAMPBELL, T. A., D. B. LONG, and G. MASEI. 2011. Efficacy of the Boar-Operated-System to deliver baits to feral swine. Preventive Veterinary Medicine 98:243–249.

CARDENAS-CANALES, E., T. A. CAMPBELL, Z. GARCIA-VAZQUEZ, A. CANTU-COVARRUBIAS, J. FIGUEROA-MILLAN, R. W. DEYOUNG, D. G. HEWITT, F. C. BRYANT, and J. ORTEGA-SANTOS. 2011. Nilgai antelope in northern Mexico as a possible carrier for cattle fever ticks and Babesia bovis and Babesia bigemina. Journal of Wildlife Diseases 47:777–779.

LAPIDGE, S., J. WISHART, L. STAPLES, K. FAGERSTONE, T. CAMPBELL, J. EISEMANN. 2012. Development of a feral swine toxic bait (HOG-GONE®) and bait hopper (HOGHOPPER™) in Australia and the USA. Proceedings of the Wildlife Damage Management Conference 14:19–24.

LAVELLE, M. J., K. C. VERCAUTEREN, J. W. FISCHER, G. E. PHILLIPS, T. HEFLEY, S. E. HYGNSTROM, S. R. SWAFFORD, D. B. LONG, and T. A. CAMPBELL. 2011. Evaluation of fences for containing feral swine under simulated depopulation conditions. Journal of Wildlife Management 75:1200–1208.

LONG, D. B., and T. A. CAMPBELL. 2012. Box traps for feral swine capture: a comparison of gate styles in Texas. Wildlife Society Bulletin 36(4):741-746.

MOCZYGEMBA, J. D., D. G. HEWITT, T. A. CAMPBELL, J. A. ORTEGA-S., J. FEILD, and M. W. HELLICKSON. 2012. Home ranges of nilgai antelope (Boselaphus tragocamelus) in Texas. Southwestern Naturalist 57:26–30.

RAMIREZ, E. R., M. C. DOMINGUEZ-BRAZIL, C. W. LAWSON, S. M. BURNS, R. GUARNEROS-ALTOMIRANO, S. J. DEMASO, W. P. KUVLESKY, Jr., D. G. HEWITT, J. A. ORTEGA-S., and T. A. CAMPBELL. 2012. Home ranges of female Rio Grande wild turkeys in southern Texas. Southwestern Naturalist 57:198–201.

REIDY, M. M., T. A. CAMPBELL, and D. G. HEWITT. 2011. A mark-recapture technique for monitoring feral swine populations. Rangeland Ecology and Management 64:316–318.

SANDERS, D. L., F. XIE, R. E. MAULDIN, L. A. MILLER, M. R. GARCIA, R. W. DEYOUNG, D. B. LONG, and T. A. CAMPBELL. 2011. Efficacy of ERL-4221 as an ovotoxin for feral swine. Wildlife Research 38:168–172.

WYCKOFF, A. C., S. E. HENKE, T. A. CAMPBELL, D. G. HEWITT, and K. C. VERCAUTEREN. 2012. Movement and habitat use of feral swine near domestic swine facilities. Wildlife Society Bulletin 36:130–138.

Major Research Accomplishments:

- WS evaluated the use of bait stations to contain feral swine during simulated culling activities and found bait stations to be ineffective at containing animals, but facilitated removals.
- WS determined that drop-net traps were more successful in capturing feral swine than traditional corral traps. Researchers also found box traps with rooter gates captured more juvenile feral swine, resulting in more total captures than box traps with side-swing gates.
- WS studied feral swine movement and habitat use near domestic swine facilities and found animals preferred habitat characteristics commonly found surrounding domestic swine facilities.
- WS found no evidence of *Mycobacterium bovis* in feral swine populations within the southern Texas border region.
- WS developed a mark-recapture population monitoring technique that complements feral swine damage management activities.
- WS evaluated ERL-4221 as an ovotoxin for feral swine and found the chemical to be ineffective at reducing total ovary mass, number of follicles, and number of corporal lutea.