

## **Introduction to HWC's Special Topic**

# Ecology and management of feral hogs

STEPHEN S. DITCHKOFF, School of Forestry and Wildlife Sciences, Auburn University, Auburn, AL 36849, USA [ditchss@auburn.edu](mailto:ditchss@auburn.edu)

BEN C. WEST, Jack H. Berryman Institute, Department of Wildlife and Fisheries, Mississippi State University, MS 39762, USA

**FERAL HOGS** (*SUS SCROFA*) have been present in North America since the arrival of the earliest settlers in the sixteenth century. Colonists originally released hogs because of the animals' ability to survive on their own and to serve as a ready food supply for settlers. Since that time, hogs have expanded their range and now are present in 40 of the 50 United States and parts of Canada. Their rapid expansion is similar to that of other introduced species, and, as a result, they are generally classified as an invasive exotics, along with hundreds of other plant and animal species. However, feral hogs may pose an ecological threat that far surpasses that posed by other invasive vertebrates.

Considerable information has been published describing the impacts that feral hogs have on native vegetation, native fauna, and ecosystems in regions where hogs have been introduced. Their unique method of obtaining food from below the soil surface by rooting is 1 reason their impacts on the ecosystem can be so far-reaching. When digging for plant or animal material to consume, feral hogs turn over the ground surface and displace large volumes of soil. This method of foraging can lead to impaired water quality, increased prevalence of exotic plants, and injury to native plant species (Cushman et al. 2004, Kaller and Kelso 2006, Kaller et al. 2007). Additionally, feral hogs pose considerable threats to populations of some animal species. They consume eggs of ground-nesting birds and reptiles (Tolleson et al. 1993, Gibbons et al. 2000) and directly prey upon adults of some species. It has been suggested that, due to their high rates of consumption of reptiles and amphibians, feral hogs pose a considerable threat to some federally-listed species (Jolley 2007). Feral hogs are of particular concern to the domestic hog industry because of their ability to transmit diseases to farm and domestic animals. For example, considerable resources have been spent in eradication

from domestic animals of diseases such as pseudorabies, which is prevalent in feral hogs (Corn et al. 2004).

Feral hogs are direct descendents of domestic stock and thus possess many of the characteristics of domestic hogs. For example, because of feral hogs' exceedingly high rate of reproduction, they pose considerable challenges in population control efforts. Members of the family Suidae have the highest rates of reproduction of any ungulates (Read and Harvey 1989); additionally, *Sus scrofa* has been genetically engineered for even greater reproduction during domestication. Mean litter size in feral hogs is normally between four and six (Taylor et al. 1998). This parameter, combined with a short gestation, early maturation (Dziecolowski et al. 1992), and the ability to produce 2 litters each year (Baber and Coblenz 1987), makes feral hog populations almost impossible to control or eradicate. Furthermore, research in Australia (Dziecolowski et al. 1992) suggests that feral hogs can respond to population reductions of 70% and return to pre-control levels in as little as 2.5 years.

These problems make feral hogs one of the greatest concerns to wildlife biologists and managers today. While some wildlife professionals recognize the ecological threat posed by feral hogs, many people are rather ignorant about these issues. The general public fails to recognize the seriousness of the threats posed by feral hogs, and, unfortunately, some groups continue to promote feral hogs as a valued and exciting game species. To address the biological, ecological, and social implications of feral hogs in our landscapes, several meetings have been organized in the past decades to discuss these issues. What is now generally considered to be the first national meeting on feral hogs took place in South Carolina in 1977. Following this initial meeting, there were subsequent symposia and conferences in Tennessee (1983),

Florida (1989 and 1997), Texas (1993 and 1999), and Georgia (2004). The 2004 meeting in Augusta, Georgia, prompted the organization of the 2006 National Conference on Wild Hogs, held in Mobile, Alabama, in an effort to provide a regular venue for biologists, managers, and researchers to get together and discuss issues related to feral hogs. The 2006 conference was sponsored by the Jack H. Berryman Institute, Center for Forest Sustainability at Auburn University, National Park Service, USDA/APHIS/Wildlife Services, School of Forestry and Wildlife Sciences at Auburn University, Alabama Wildlife Federation, Alabama Cooperative Extension System, Alabama Farmer's Federation, and Alabama Pork Producers. The papers presented at the conference covered a wide variety of topics including feral hog damage, diseases, habitat, reproduction, management, and control.

This issue of *Human–Wildlife Conflicts* contains papers representing a subset of the 32 presentations delivered in Mobile, along with other papers submitted to the journal. All represent a substantial contribution to the body of knowledge concerning feral hogs.

Two papers in this special issue describe the impacts that feral hogs have on native ecosystems. Engeman et al. (2007a) provide a description of rooting damage of feral swine in a power-line corridor in southeastern Florida. Additionally, they report on vegetative changes on the area following initiation of a hog removal program. Kaller et al. (2007) report on water quality and aquatic biota in Louisiana watersheds inhabited by feral hogs. Their data suggest that feral hogs have adverse effects on aquatic faunal communities in these watersheds and are quite possibly a major source of coliform bacteria.

Hartin et al. (2007) provide the first published description of the range of feral hogs in Missouri. Additionally, the authors summarize prevalence estimates for pseudorabies virus, swine brucellosis, tularemia, and classical swine fever in feral hogs in Missouri.

Two papers in this issue report on the biology of feral swine and current research efforts that are aimed at providing a better understanding of the species. Adkins and Harveson (2007) describe density, survival rates, home range size, and habitat use of feral hogs in the Davis Mountains, Texas. Their study examined whether densities of feral hogs in Texas are associated

positively with precipitation. Mersinger and Silvy (2007) report on the temporal and spatial use of reclaimed surface lignite mines by feral hogs in eastern Texas. Their study examined the effect that hogs are having on vegetation used in the reclamation process. They provide habitat management recommendations that may reduce impacts by hogs in these areas.

Engeman et al. (2007b) detail an adaptive management approach used with feral hogs in Florida, where hog activity is monitored and control efforts can be targeted to improve efficiency of management programs. Additionally, they discuss methods that can be used to evaluate the economic impacts of feral hogs.

Rollins et al. (2007) describe the efforts of Texas Cooperative Extension in dealing with damage issues of feral hogs. The authors describe the different perspectives of landowners regarding feral hogs and the success of their extension program at providing a thorough and balanced approach to management of feral hogs in the state.

These papers provide a general summary of the issues discussed at the 2006 national conference. At the conference, the importance of a regular venue for wildlife professionals to discuss issues relating to feral swine became apparent. It was therefore decided at the conference that another such meeting will be held in 2008 with a special focus on issues relating to wild and feral hogs. The meeting will be held in St. Louis, Missouri, and is tentatively scheduled for April 13–16, 2008. Please be on the lookout for information about this upcoming conference. Judging from the success of previous conferences about feral hogs, the 2008 conference should be a resounding success.

### Literature cited

- Adkins, R. N., and L. A. Harveson. 2007. Demographic and spatial characteristics of feral hogs in the Chihuahuan Desert, Texas. *Human–Wildlife Conflicts* 1:152–160.
- Baber, D. W., and B. E. Coblenz. 1987. Diet, nutrition, and conception in feral hogs on Santa Catalina Island. *Journal of Wildlife Management* 51:306–317.
- Corn, J. L., D. E. Stallknecht, N. M. Mechlin, M. P. Luttrell, and J. R. Fischer. 2004. Persistence of pseudorabies virus in feral swine populations. *Journal of Wildlife Diseases* 40:307–310.

- Cushman, J. H., T. A. Tierney, and J. M. Hinds. 2004. Variable effects of feral hog disturbances on native and exotic plants in a California grassland. *Ecological Applications* 14:1746–1756.
- Dziecolowski, R. M., C. M. H. Clarke, and C. M. Frampton. 1992. Reproductive characteristics of feral hogs in New Zealand. *Acta Theriologica* 37:259–270.
- Engeman, R. M., J. Woolard, H. T. Smith, J. Bourassa, B. U. Constantin, and D. Griffin. 2007a. An extraordinary patch of feral hog damage in Florida before and after initiating hog removal. *Human–Wildlife Conflicts* 1:271–275.
- Engeman, R. M., B. U. Constantin, S. A. Shwiff, H. T. Smith, J. Woolard, J. Allen, and J. Dunlap. 2007b. Adaptive and economic management methods for feral hog control in Florida. *Human–Wildlife Conflicts* 1:178–185.
- Gibbons, J. W., D. E. Scott, T. J. Ryan, K. A. Buhlmann, T. D. Tuberville, B. S. Metts, J. L. Greene, T. L. Mills, Y. S. Poppy, and C. T. Winne. 2000. The global decline of reptiles, déjà vu amphibians. *Bioscience* 50:653–666.
- Hartin, R. E., M. R. Ryan, and T. A. Campbell. 2007. Distribution and disease prevalence of feral hogs in Missouri. *Human–Wildlife Conflicts* 1:186–191.
- Jolley, D. B. 2007. Reproduction and herpetofauna depredation of feral hogs at Fort Benning, Georgia. M.S. Thesis, Auburn University, Auburn, Alabama, USA.
- Kaller, M. D., J. D. Hudson III, E. C. Achberger, and W. E. Kelso. 2007. Feral hog research in western Louisiana: expanding populations and unforeseen consequences. *Human–Wildlife Conflicts* 1:168–177.
- Kaller, M. D., and W. E. Kelso. 2006. Swine activity alters invertebrate and microbial communities in a coastal plain watershed. *American Midland Naturalist* 156:163–177.
- Mersinger, R. C., and N. J. Silvy. 2007. Range size, habitat use, and diel activity of feral hogs on reclaimed surface-mined lands in east Texas. *Human–Wildlife Conflicts* 1:161–167.
- Read, A. F., and P. H. Harvey. 1989. Life history differences among the eutherian radiations. *Journal of Zoology (London)* 219:329–353.
- Rollins, D., B. J. Higginbotham, K. A. Cearley, and R. N. Wilkins. 2007. Appreciating feral hogs: extension education for diverse stakeholders in Texas. *Human–Wildlife Conflicts* 1:192–198.
- Taylor, R. B., E. C. Hellgren, T. M. Gabor, and L. M. Ilse. 1998. Reproduction of feral hogs in southern Texas. *Journal of Mammalogy* 79:1325–1331.
- Tolleson, D., W. Rollins, W. Pinchak, M. Ivy, and A. Hierman. 1993. Impact of feral hogs on ground-nesting gamebirds. Pages 76–83 in C. W. Hanselka and J. F. Cadenhead, editors. *Feral swine: a compendium for resource managers*. Texas Agricultural Experiment Station. College Station, Texas, USA.



STEPHEN S. (STEVE) DITCHKOFF is an associate professor in the School of Forestry and Wildlife Sciences at Auburn University. He received his Ph.D. degree in wildlife ecology from Oklahoma State University, M.S. degree in wildlife ecology from University of Maine, and B.S. degree in fisheries and wildlife from Michigan State University. His primary research interests focus on white-tailed deer, feral hogs, and the evolutionary ecology of large mammals.



BEN C. WEST currently serves as the national outreach coordinator for the Jack H. Berryman Institute at Mississippi State and Utah State universities. He holds faculty appointments of associate professor at MSU and adjunct assistant professor at Utah State University. His educational background includes a B.S. in natural resources management from the University of Tennessee-Martin, an M.S. in wildlife science from Virginia Tech, and a Ph.D. in wildlife science at USU. His professional interests include wildlife damage management, communication, and conflict resolution in the natural resources arena. He currently serves as president for the Mississippi chapter of The Wildlife Society.