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Appreciating feral hogs: extension education for diverse stakeholders in Texas

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Abstract:

Texas harbors the largest population of feral hogs (*Sus scrofa*) in the United States, with populations estimated at >2 million. Depending on one's perspective, feral hogs are either a pariah (from the farmer's standpoint) or a popular sporting animal (from a hunter's standpoint). As feral hogs increase in range and density, conflicts among stakeholders are sure to increase. Texas Cooperative Extension (TCE) initiated educational programs in 1991 to address concerns regarding the presence and management of feral hogs. Since that time, we have developed various workshops, symposia, and educational materials (e.g., print, videotape, and website) as means of addressing "the good, the bad, and the ugly" aspects of feral hogs in Texas. Texas Cooperative Extension involves various stakeholder groups, including agriculturalists, biologists, hunters, and wildlife damage management professionals in its efforts to provide a thorough, balanced approach to management of feral hogs. Our goal is to increase critical thinking skills among stakeholders while seeking consensus on local damage issues caused by feral hogs.

Key words: conflict resolution, extension education, feral hogs, human–wildlife conflicts, immunocontraception, integrated pest management, invasive species, *Sus scrofa*, Texas

POPULATIONS of feral hogs (*Sus scrofa*) occur in at least 39 states (Gipson et al. 1998, J. Mayer, Westinghouse Savannah River Company, personal communication), with Texas harboring the greatest population, estimated at >2 million. Feral hogs currently occupy about 240 of Texas' 254 counties—basically all of the state with the exception of the western portion of the High Plains and Trans-Pecos ecoregions (Adkins and Harveson 2007, Mersinger and Silvy 2007; Figure 1). As one might expect, the increasing population of feral hogs brings with it both assets and liabilities, depending on stakeholders' perspective.

The high fecundity of feral hogs (Taylor et al. 1998) and the activities of hunters, who at times transported them to different locations, have resulted in rapid feral hog population increases over the past 20 years. Burgeoning populations of feral hogs cause various problems for private landowners and public agencies. Stakeholders impacted by feral hogs include agriculturalists, conservationists, hunters, and the general public (Figure 1). Commercial pork producers

and cattle ranchers are concerned about the spread of swine brucellosis and pseudorabies (Hartin et al. 2007). Feral hogs are second only to coyotes (*Canis latrans*) as predators of sheep and goats in some areas of Texas (Mapston 2004). A 2004 survey of Texas landowners found that since feral hogs first appeared on private property, damage estimates averaged \$7,515 per landowner statewide, with an estimated



FIGURE 1. Feral hogs are common in many parts of the United States.

\$2,631 per landowner spent on control efforts and damage correction (Adams et al. 2005). Feral hogs accounted for 10 to 25% of losses of simulated quail and turkey (*Meleagris gallopavo*) nests in the rolling plains of Texas (Tolleson et al. 1995). Besides having agricultural impacts, feral hogs are a serious exotic threat to sensitive ecosystems (Engeman 2007a, 2007b; Cearley 2005). While hog hunters and outfitters often tout feral hogs as a popular, affordable species of big game (Chambers 1999), agriculturalists and conservationists are united in their dislike of the marauding exotics. Feral hogs can have detrimental impacts on local water quality and aquatic biota (Kaller et al. 2007). Expansion of feral hogs westward in Texas threatens nesting success of rare birds (e.g., lesser prairie chicken [*Tympanuchus pallidicinctus*]).

When any free-ranging ungulate exceeds its carrying capacity, educational strategies should be developed to address management alternatives for that species (Rollins and Higginbotham 1997). In this paper we describe extension education programs used by Texas Cooperative Extension (TCE) since 1990 to increase public awareness of assets and liabilities associated with the increasing population of feral hogs.

TCE's approach to provide information about feral hogs

As the outreach arm of Texas A&M University, TCE is charged with providing factual, research-based information to clientele (Higginbotham 1999). When dealing with controversial species (e.g., feral hogs), our strategy is not to teach stakeholders *what* to think, but instead *how* to think. Our goal is to present unbiased, research-based information to stakeholders so that they may make informed decisions to best serve their individual needs while being aware of the consequences of their management practices.

TCE often markets educational programs on feral hogs as Feral Hog Appreciation Days (FHAD), a play on words that serves to both arouse and intrigue potential participants. The dictionary defines the word *appreciate* in basically 3 contexts—all of which are relevant to a discussion of feral hogs among a diverse group of stakeholders:

- “to value or admire highly;”
- “to judge with heightened awareness;” and

- “to be cautiously or sensitively aware of” (Webster’s 1975).

TCE agents incorporate the various contexts of appreciation in our educational strategies to ensure that the multifaceted nature of feral hog issues is addressed.

How TCE helps the public develop empathy for the perspectives of others

Stakeholder audiences in Texas relative to feral hogs include landowners, hunters, meat processors, natural resource agencies, nongovernmental conservation organizations, and, increasingly, urbanites. We recognize that stakeholder perspectives on feral hogs include the “good”, the “bad”, and “the ugly.” Accordingly, we design educational programs that include all 3 aspects. And as our audiences are usually cross-sections of the local community, certain participants may not agree with their neighbors’ opinions.

We often use a simple geometric image of rectangles (Figure 2) to force the audience to think critically, and to underscore the complexity of various ecological issues associated with the management of feral hogs. Figure 2 is projected before audiences who are asked to count the number of squares they see. After 20 seconds, the image is removed, and answers are solicited from the audience. Answers typically vary from 16 to 27 squares. Once audiences see that not everyone

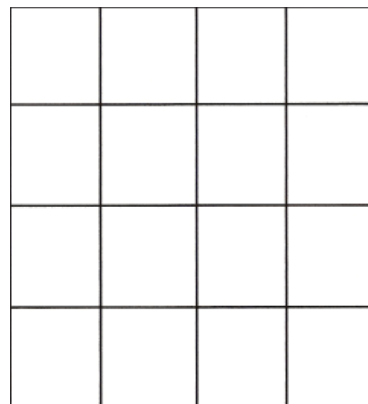


FIGURE 2. “How many squares can you find in this diagram?” (See text for answer.) Diagram used during extension education programs in Texas to illustrate the individual differences in perception of the multifaceted nature of feral hog issues.

arrived at the same answer, they are shown the image and are given another 20 seconds to recount the squares. Their answers still vary, but most audience members now see more squares than they did previously. The correct number is 30 squares (i.e., 16 squares involving 1 cube, 9 involving 4 cubes, 4 involving 9 cubes, and 1 involving 16 cubes).

This simple exercise gets the audience involved and underscores 2 important teaching points. First, although everyone looks at the same figure, they do not have the same solution to the problem. Second, we discuss the fact that the more one studies an issue (especially issues dealing with ecology), the more complex the situation becomes. In other words, there likely is not a simple solution to ecological problems, and no one solution is likely to satisfy everyone.

“The Good”

Hunters and landowners who cater to hog hunters view feral hogs as a challenging, tasty species of big game that may be hunted year-round in Texas. The mean value of a feral hog hunt to landowners in 1994 was \$164 (Rollins 1994), and some landowners derive income by developing hunting enterprises around feral hogs (Chambers 1999). Hunting feral hogs is especially popular among bow hunters. The demand for so-called wild boar meat, especially in European markets, has increased the price for live feral hogs; and prices offered usually exceed those for domestic pork (Weems 1999; Figure 3). Accordingly, trapping feral hogs in various cage-traps has become increasingly popular in recent



FIGURE 3. Commercial demand for “wild boar” meat in upscale restaurants in the northeastern United States and abroad has spawned a demand for feral hogs.

years.

While the rooting behavior of feral hogs is generally regarded as an ecological liability (Engeman 2007a, 2007b), feral hogs can also have a positive effect on the environment. For instance, the soil disturbance associated with rooting promotes early successional species (e.g., *Croton* spp., *Helianthus* sp.), which are important seed-producing plants for upland game birds (Rollins 1999).

“The Bad”

Economic liabilities associated with the presence of feral hogs include agricultural damage, such as crop depredation, damage to netwire fences, and predation on lambs and kid goats (Mapston 2004, Conover and Vail 2007, Hartin et al. 2007). These also include disease transmission to livestock and humans (Lawhorn 1999), hog–vehicle collisions, and degradation of parks and golf courses (Engeman 2007a, 2007b).

“The Ugly”

Feral hogs are a serious competitor for mast with white-tailed deer (Yarrow 1987), and high hog densities can adversely impact amphibian populations. While feral hogs are considered to be serious predators of ground-nesting birds (Tolleson et al. 1995), their impact on abundance of northern bobwhites (*Colinus virginianus*) and wild turkeys is unclear (Rollins 1999).

TCE’s education and information programs

Extension education programming comes about through the interaction of county extension agents, local input by extension clientele, and subject matter specialists. The array of responses includes one-on-one communication, local county meetings, symposia, public demonstrations of research findings, printed publications, and electronic outlets (e.g., video programs, web-based information; Table 1).

Requests for information about feral hog management were common by the late 1980s. Such requests were handled initially through individual communication until 1990, when we conducted the first educational program dealing with feral hogs in Cayuga, Texas (Higginbotham 1999). Since then, the basic program presented in Cayuga has been replayed several times across

TABLE 1. Examples of educational programs and products developed to educate stakeholders about feral hog management in Texas.

Effort	Medium	Stakeholders
Individual requests	Letter, e-mail, telephone call	Various
County meetings	Slide presentations	Diverse, but usually agriculturalists; meetings last <2 hours
Feral Hog Appreciation Days	Slide presentations; demonstrations; videos	Landowners, hunters, holders of private applicators licenses
Symposia	Slide presentations	Diverse; including landowners, hunters, agency biologists
Publications	Printed and electronic Printed: Mapston (2004) Web-based: (www.feralhog.tamu.edu) Video/DVD: Rollins (1994); Cearley (2005)	Various

Texas. Interest in the management of feral hogs increased to the point that a national symposium on feral hogs was convened in 1993 in Kerrville, Texas (Hanselka and Cadenhead 1993). The symposium consisted of presentations by authorities from across the nation on both the positive and negative aspects of feral hogs.

Extension publications on feral hogs (Stevens 1997, Coats 1999, Mapston 2004) often reference information from proceedings of the 1993 symposium (Hanselka and Cadenhead 1993) and a symposium conducted in 1999 by the Texas Animal Health Commission. Several of these documents are also available for sale or free online in Portable Document Format (PDF) from the Texas Cooperative Extension's online bookstore (www.tcebookstore.org).

TCE complements its educational programs with columns in various periodicals (e.g., *Farmer-Stockman* magazine, *Texas Wildlife* magazine) to raise public awareness about feral hog management. In 2004, we developed a website (<http://feralhog.tamu.edu>) to provide an Internet source for information about feral hog management alternatives.

Texas stakeholders include farmers and ranchers who need pesticide recertification training to meet regulatory requirements. Anyone who administers restricted-use pesticides during farming and ranching operations in Texas must possess a pesticide applicator license from the Texas Department of Agriculture (TDA). Private applicators must become recertified every 5

years by completing 15 hours of continuing education. Prior to 2004, information on feral hog management did not qualify for recertification training, as there are no pesticides registered for use in controlling feral hogs. In 2004, however, TDA permitted programming on feral hogs to be eligible for continuing education units.

Developing TCE's Feral Hog Appreciation Days

We conducted the first daylong program of FHAD in Jacksboro, Texas, in 1997 and nine more since then. These programs are typically 6 hours long and qualify for 5 educational units for participants holding certified pesticide applicators licenses. Local county extension agents typically partner with their local representatives of Texas Wildlife Services (affiliated with the U.S. Department of Agriculture's Animal and Plant Health Inspection Service-Wildlife Services and administratively housed under TCE), a local Texas Parks and Wildlife game warden, a representative of the Texas Animal Health Commission, and other local experts, as appropriate.

A standard agenda for a FHAD program includes:

- A pre-test consisting of an interactive slide presentation called "What's Your Feral Hog I.Q.?" that is used to assess participants' knowledge of feral hogs;
- A discussion of the idea of appreciation

applied to the multifaceted aspects of feral hogs;

- Biology of feral hogs, including diet, reproduction, diseases and parasites, movements, and interactions with wildlife and domestic livestock;
- Management alternatives for minimizing damage by feral hogs;
- Discussion of how to capitalize on hunting and commercial demands for feral hog meat;
- Discussion of human health issues (e.g., swine brucellosis) that may arise from handling feral hogs (Figure 4);
- Regulatory concerns regarding hunting, trapping, transporting, or selling feral hogs;
- Demonstration of control alternatives by Texas Wildlife Services personnel; and
- A post-test to gauge learning.

The presentation, titled “What’s Your Feral Hog I.Q.?”, consists of 20 true-or-false and multiple choice questions that evoke audience participation. We complement slide presentations with 1 of 2 video programs, as time permits: “Feral Hogs in Texas: the Good, the Bad, and the Ugly” (Rollins 1994) and “Coping with Feral Hogs” (Cearley 2005). Each video program provides a synopsis of various perspectives on feral hogs and their management in Texas.

Evaluating the effectiveness of FHAD

In 2006, we used TCE’s customer satisfaction survey to evaluate the effectiveness of FHAD. Using this protocol, participants ($n = 88$ responses) at a FHAD in Mason County, Texas, in September 2006 provided the following results:

- 95% were “mostly” or “completely” satisfied with the activity;
- 89% were “mostly” or “completely” satisfied with the information being helpful for making decisions relative to their own situation;
- 91% considered the information “extremely” or “quite” valuable;
- 57% indicated they planned to take action based on information from this program;
- 61% anticipated benefiting economically; and
- 98% would recommend this particular activity to others.

Also in 2006, we conducted statewide awareness programs at 24 locations in 23 counties and reached a total of 1,725 clientele.



FIGURE 4. Feral hogs are often butchered on site as a convenient source of pork, but they can provide an opportunity for disease transmission.

Participants returning surveys indicated that damage attributable to feral hogs totaled 1.5 million dollars (\$3,086/respondent) for the previous year (2005). Because of the knowledge they acquired, each of these same respondents believed that they would be able to reduce their annual damage caused by feral hogs by 42% or \$1,281. Participants were asked to rate the likelihood of their recommending TCE as an information source on feral hogs. The mean rating was 8.7 (on a Likert scale of 0 = not likely and 10 = likely). This resulted in a Net Promoter Score (Reichheld 2006) of 54% (ratings of 50% to 80% are considered to be a measure of high efficiency).

Conclusions

As the range and density of feral hogs continue to increase, conflicts caused by them will continue to increase. We suggest the establishment of formal state working groups like those initiated in Missouri as a means of organizing and implementing action plans at the state level. While the first response of some states is a management plan to contain or eradicate feral hogs, we submit that educational efforts should be included in the plan. We offer our extension education model as a vehicle to increase awareness among diverse stakeholders.

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