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Abstract: Feral hogs (*Sus scrofa*) have expanded their territory in Texas and are now found in all but the extreme western portions of the state. Perhaps the most dramatic expansion has occurred in the Rolling Plains of northwest Texas. Perspectives on feral hogs range from definitely for to adamantly against. Problems encountered with feral hogs include: (1) damage to crops and livestock, or facilities and equipment, (2) transmission of disease to humans and livestock, or (3) interaction with native wildlife including competition for available resources, depredation and destruction of habitat. The feral hog is also an animal with economic potential. Revenue can be generated by selling or hunting them. Is the feral hog an ecological unknown, an economic liability, or an under-utilized asset? The answer remains to be determined and may depend upon one's individual perspective.

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Key words: big game, depredation, exotic animals, feral hog, habitat, *Sus scrofa*, wildlife damage.

Feral hogs (*Sus scrofa*) were first introduced into Texas by LaSalle in 1685 (Taylor 1993). Further introductions occurred as colonists allowed their livestock to forage freely, gathering or harvesting them as needed. In modern times, both feral hogs and European wild boars (*Sus scrofa*) have been released for hunting purposes. There are now approximately 1 million feral swine in the state (Taylor 1993). Once found only in isolated pockets outside of South and East Texas, feral hogs now occur statewide with the exception of extreme West Texas, the western Panhandle, and the Dallas-Fort Worth area (Taylor 1993, Fig. 1). This recent population expansion has perhaps been most dramatic in the northwest region of Texas known as the Rolling Plains.

PERSPECTIVES

The feral hog has become something of a paradox in Texas, gaining both notoriety and popularity as well as new territory. Several possible reasons exist: (1) as the number of feral hogs increases, conflict with agricultural and wildlife interests increases accordingly, (2) as traditional big game hunting opportunities become less available, due primarily to higher costs, the feral hog has become an affordable alternative, (3) heightened public awareness of the possible adverse environmental impacts of feral/exotic animals has focused attention on feral hogs in some areas, and (4) very little scientific research has been conducted on the ecology of the feral hog in recently colonized areas. Most of what is known about feral hogs in the United States is from work done in California or the Southeast, in habitats very different from those which many feral hogs now occupy. Thus, many resource managers are being forced to deal with an ecological unknown.

Popular opinion on feral hogs in northwest Texas mirrors that in other parts of the country. Are most people for feral hogs, against them, or somewhere in between? The answer is "yes". To illustrate this point, consider the following titles or excerpts from recent scientific or popular literature:

"Wild Pigs: Environmental Pest or Economic Resource." (Tisdell 1982).

"Hog Wild, from suburban flower beds to golf courses,

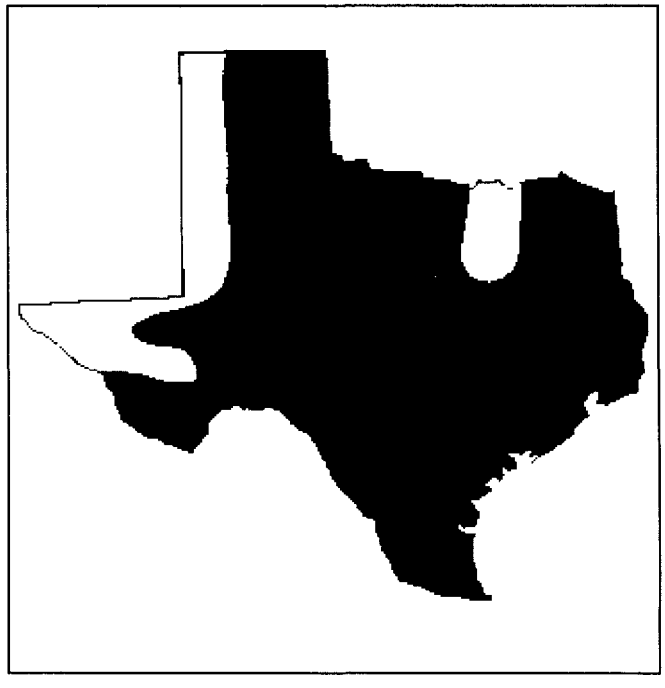

Fig. 1. Distribution of feral hogs in Texas (Taylor 1993).

ravenous pigs are eating their way through California." (Martin 1990).

"Sportsmen dedicated to the conservation, preservation and perpetuation of the Wild Boar." (Motto of the Wild Boar Conservation Society, Myers 1993).

A survey of 254 county agents (Rollins 1993) indicated that their constituencies were decidedly anti-feral hog (Fig. 2). While conceding a rural bias in the survey, his Texas results were similar to a survey of California landowners (Barrett and Pine 1980) where 48 and 39% of those respondents considered wild pigs as a pest or both pest and asset, respectively.

Feelings among agriculturalists toward feral hogs are divided along a roughly drawn line between farmers and ranchers. Row crop and forage producers may suffer severe losses to hog depredation while most stockmen (except sheep and goat producers) consider them at worst a nuisance. For those in the wildlife profession, that line could be drawn between hunters/outfitters and biologists/environmentalists; the former usually in favor of feral hogs and the latter against. This "mixed bag" of opinions is not unique to feral hogs. Perspectives on other feral or exotic species are similarly divided. One thing is certain: the solutions to problems caused by these animals will become increasingly complex.

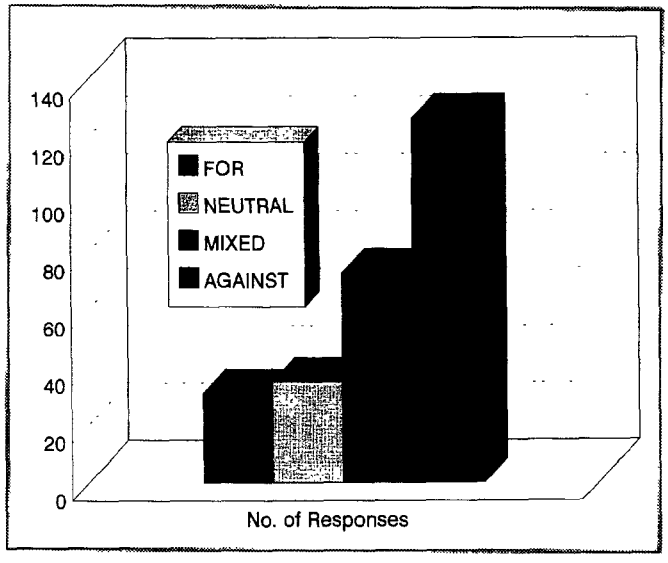

Fig. 2. Attitude survey on feral hogs in Texas (Rollins 1993).

PROBLEMS

Problems with feral hogs can be generally classified as (1) damage to crops and livestock, or facilities and equipment, (2) transmission of disease to humans and livestock, or (3) interaction with native wildlife including competition for available resources, depredation, and destruction of habitat.

Texas Animal Damage Control Service (TADCS) figures indicate that between $10,000 and $300,000 worth of crop damage by feral hogs was reported to TADCS annually between 1989 to 1994 (Beach, pers. comm.). In 1988, $116,200 of damage was reported by peanut producers alone (Beach 1993). A group of hogs can root up, trample, or consume several acres of a field or pasture in a single night. In addition to lost production, economic costs arise from rooted land resulting in increased equipment repair and down time, as well as decreased harvestibility of the remaining crop. In the Edwards Plateau, TADCS officials indicate that feral hogs are a major predator of lambs and kids (Beach 1993). Although cattle producers report relatively few instances of hog predation, damage to fences, feed supplies, and water sources does occur.

Feral hogs are known to carry or transmit brucellosis and pseudorabies (Davis 1993). Consequently, domestic swine should be double-fenced from feral swine and hunters should wear latex gloves while field dressing and processing. Transmission of diseases to free-ranging livestock is more difficult to prevent. Feral hogs often wallow in stock ponds and overflow areas, and frequently use feed grounds or hay lots, thus a certain degree of contact is inevitable. To what extent feral hogs actually transmit diseases to grazing livestock is unknown.

Given current public awareness of environmental issues, perhaps the most significant debate revolves around the interaction of feral animals with native flora and fauna. In California, feral hogs were eradicated over a 3-year period from Annadel State Park because of concern over the impact of this exotic species on the parks' ecosystem (Barrett et al. 1988). Hog rooting around springs, a lake, and a marsh had caused erosion, damage to emergent aquatic vegetation, and the possible disappearance of 1 rare plant species (*Navarretia plieantha*) from the park. Similarly, on Santa Cruz Island, both feral hogs and sheep have been eradicated due to their effects on the native vegetation (Sterner and Barrett 1991). Feral hogs have also been implicated in seedling depredation on longleaf pine (*Pinus palustris*) plantings (Lipscomb 1989) as well as disrupting forest (Ralph and Maxwell 1984, Singer et al. 1984) and grassland habitats (Spatz and Mueller-Dombois 1975).

Feral hogs also cause problems for wildlife managers. White-tailed deer (*Odocoileus virginianus*) will avoid feeders, food plots, or natural foraging areas that are utilized by feral hogs (pers. observation). A survey of foresters, wildlife biologists, and land managers in 11 southern states (Wood and Lynn 1977) indicated that approximately 47% of the respondents believed feral hogs were important competitors with deer, turkeys (*Meleagris gallopavo*), and squirrels (*Sciurus* spp.) for food. Yarrow and Kroll (1989) reported that competition for mast and forage occurs seasonally between deer and hogs especially during drought when alternate foods are unavailable. In the Sierra Foothills, competition between hogs and black-tailed deer (*Odocoileus hemionus columbianus*) was found to exist only in buckbrush (*Physocarpus monogynus*), north slope habitats (Barrett 1982). Additional conflict with native wildlife occurs in the form of nest depredation. Feral hogs have been reported to prey on the nests of bobwhite quail (*Colinus virginianus*, Synatzske 1979, Tolleson et al. 1993), turkeys (Synatzske 1979), and sea turtles (*Chedonia mydas*, *Carretta caretta*, Barron 1980).

Feral hogs are opportunistic omnivores that have readily adapted to the mixed-grass brushland of the Texas Rolling Plains, an area with much less rainfall and less diverse

plant communities than south or east Texas. Several studies have investigated the diet of feral hogs in Texas (Ellisor 1973, Everitt and Alaniz 1980, Hellgren and Holzem 1992, Kroll 1986, Springer 1977, Taylor 1991, and Yarrow and Kroll 1989). Hellgren (1993) stated that seasonal changes in hog diets were similar across these regions. Grasses, forbs, roots, and tubers were the primary food source in the spring. Hard and soft mast comprised most of the summer diet. In the fall, invertebrates and mast (where available) dominated. Winter diets were more variable among regions with animal matter and grains added to the previous foods. The amount of animal matter was usually small but varied between seasons and regions. Vertebrates consumed included hog, armadillo (*Dasypus novemcinctus*), deer, various birds, reptiles, and amphibians. In the Rolling Plains, animal matter (both vertebrate and invertebrate) may be a more important food item than in the areas where diet research has been conducted (Fig. 3) because of lower plant diversity.

Because of differences in habitat (i.e., food availability) between the Rolling Plains and previous research areas, the importance of bobwhite quail in this region, and the implication of feral hogs as nest depredators, several studies have been conducted to determine the type and amount of depredation on simulated quail nests in the area. Over a 2-year period, feral hogs accounted for 33.5 % of depredation on simulated nests in mesquite (*Prosopis glandulosa*) and juniper (*Juniperus pinchotii*) habitats on the Y Experimental Ranch (YER) in Foard county (Tolleson et al. 1994). A companion study in Shackelford County indicated that feral hogs were only responsible for 11.5% of simulated nest loss there (Tolleson et al. 1994). In the nesting season following a prescribed winter fire at the YER in 1994, feral hogs destroyed only 10.0 and 14.0% of simulated nests in burned and control areas respectively (Tolleson et al. unpubl. data). Similarly, feral hogs depredated 9.0% of simulated nests across treatments when comparing winter versus summer prescribed fires and same year versus 1- and 2-year-old burns.

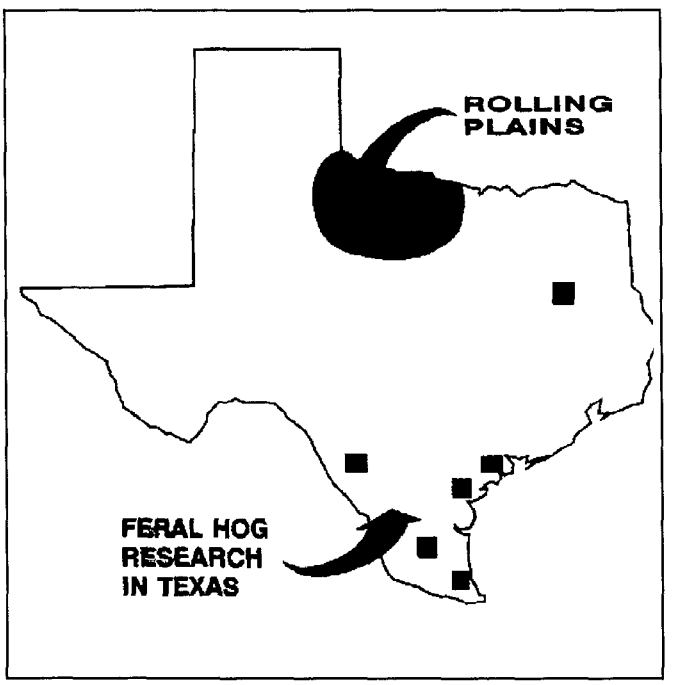

Fig. 3. Geographic distribution of feral hog research in Texas.

During the past 2 years at the YER, we have also conducted several experiments utilizing radio telemetry with bobwhite quail. Complications arose when trying to trap quail in the presence of feral hogs, hence we developed a protective cage made from 4.9 x 0.9 m (16 x 3 ft) welded wire panels bent into a circle and held in place by steel "T" posts (Fig. 4). A feeder or trap can be placed inside and the horizontal wire in several of the smaller openings at the bottom of the panel cut and bent outward to allow entry by the birds and deny access to the hogs. Since implementation of this method, feral hog impacts on quail trapping and feeding have been eliminated.

Another question concerning feral hogs is which, if any, animals prey on them? Absence of predation may be a major factor in their recent expansion. Coyote (*Canis latrans*) and bobcat (*Lynx rufus*) appear to prey on juvenile or weakened adult hogs. An occasional cougar (*Felis concolor*) is the only endemic carnivore capable of killing an adult hog in Texas, consequently man is the only significant predator of feral swine. It is easy to understand how a species which will eat anything and has no major natural enemy other than disease would prosper.

POTENTIAL

The feral hog has become the "poor man's" big game animal in some areas. As the cost of hunting white-tailed deer escalates, so has the popularity of hunting feral hogs. Hunting fees for feral hogs average $75-150 per day in Texas, while the same deer hunt may cost from several hundred upward to thousands of dollars. In Texas, many hogs are taken as a bonus while hunting other species such as deer or exotics, although an increasing number of hunters are specifically pursuing feral hogs. Texas does not classify feral hogs as game animals thus they can be hunted year round. In California where the feral hog is a game animal, "wild pig" hunting has surpassed deer hunting in popularity (Barrett 1993). Florida also considers the feral hog a game animal on state controlled lands. If the white-tailed deer is ever unseated as the most popular big game animal in Texas, the feral hog will be responsible.

We have allowed feral hog hunting on the YER since beginning work there in 1992. Harvest data indicate that in 1993, 30 animals averaging 56.7 kg were taken and that hunter success was 35.0%. We granted 85 hunter days of access at $60 per day and a limit of 1 either sex hog per day. Our hog hunting was a limited input operation with no guiding provided, but it still generated approximately $5,000 of revenue. Aerial surveys have determined that an average of approximately 200 feral hogs occupy the 15,378 ha ranch at a given time compared to approximately 75 deer. Most of the hog-only hunting on the ranch takes place during January and February, after the close of deer season. We feel that hog hunting has been beneficial to our ranch operation. The problems we have encountered (hay bales damaged, supplement consumed,

rooting around water supplies) have been more than offset by the economic benefit at least in the short-term. Only time will tell if these animals cause long-term ecological degradation. In contrast to our situation, one South Texas outfitter at the March 1993 Feral Hog Symposium in Kerrville, Texas, that offered guided hunts with dogs, produced for the participants, invoices for over $20,000 of hog hunts in a 30-day period. There is also a meat packer in South Texas which deals exclusively in feral hogs and ships the meat to gourmet restaurants. Feral hogs can be big business.

Feral hog hunting is a relatively untapped resource in the Rolling Plains. Few of the ranchers contacted in this area offered hog hunts. As the demand for affordable year-round hunting opportunities increases, land managers in this region are well positioned to meet that demand with feral hog hunting. However at this time, unlike South Texas or the Edwards Plateau, many ranchers here are unwilling to allow access to their property. Economics will undoubtedly play a major role in determining whether or not this trend can survive.

Scorned, praised, or left alone, the feral hog will no doubt continue to flourish in northwest Texas. As resource managers and wildlife professionals, we should seek to learn all we can about these animals so that we can more efficiently live with, manage, or control them; whatever the case may be.

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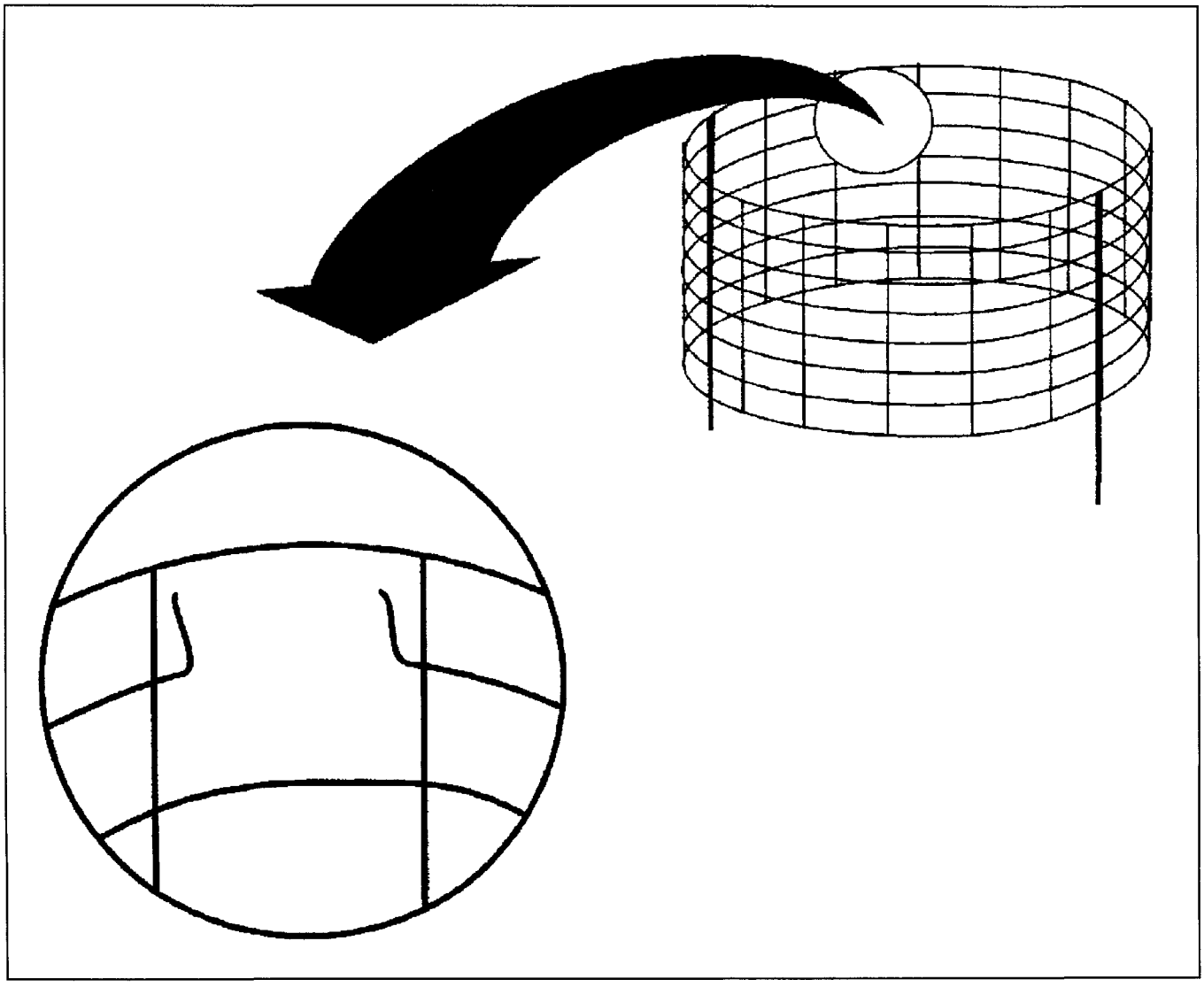

Fig. 4. Hog panel protective cage.

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