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## Feral Hog Fidelity to Home Range After Exposure to Supplemental Feed

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### ABSTRACT

Thirteen feral hogs were captured on the King Ranch in South Texas and fitted with radio transmitters in order to test if their movements were based on food availability. Supplemental feed was introduced into the range of some animals after they were tracked for a period of time with no feed. Six sows and a boar yielded enough radio locations to calculate home range size. The average home range size calculated by the minimum convex polygon method for unsupplemented sows was 143% of that for supplemented sows. Two sows exhibited a decrease of 67% in their average core areas after exposure to feed. Supplemented animals spent a great deal of time in the vicinity of feeding sites but did not totally abandon their previous home range.

### INTRODUCTION

Feral hogs (*Sus scrofa*) are descendents of domestic swine gone wild and in some cases are crossed with the taxonomically identical European wild boar. European wild hogs were introduced in Texas as a game animal in the 1930's and since then many landowners have released them in new areas as

well as areas which already had feral hog populations (Ramsey, 1968). Jackson (1964) estimated the Texas population of feral hogs at between 0.5 and 1 million animals.

In some areas, feral hogs are important game animals. In other locals, they are economically significant pests because of their depredation on agricultural crops (Pine and Gerdes, 1973; Barrett, 1977; Springer, 1977). Feral hogs also compete with native wildlife for food (Barrett, 1971; Wood and Roark, 1980) and can serve as a disease reservoir, particularly for swine brucellosis (*Brucella suis*) (Wood et al., 1976; Becker et al., 1978).

Knowledge of the movements of feral hogs is important to understanding the potential scope of their depredations, and for developing game management plans. Several investigators have hypothesized that the movements of feral hogs are based solely on food availability (Pullar, 1950; Wodzicki, 1950; Kurz and Marchinton, 1972). The purpose of this study was to test the food availability-movement hypothesis in South Texas by introducing supplemental feed into the home range of feral hogs and observing their subsequent movement response.

### STUDY AREA

The study was conducted on the Encino Division of King Ranch, Inc., in Brooks County, approximately 12 mi southeast of Falfurrias, Texas. Research was conducted in the 6,000 ac Mota Bonita pasture and 640 ac of the southwestern corner of Hormigas pasture.

The climate is subtropical but quite variable. The average annual temperature is 22° C. As a rule, winters are mild although cold fronts may cause short periods of freezing temperatures. Rainfall for Falfurrias has averaged 23.8 in. annually since 1907. However, there are great fluctuations from year to year.

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Soils are of the Falfurrias-Sarita-Nueces association, and are described as moderately well, well, and somewhat excessively drained fine sands that have moderately slowly, moderately rapidly, and rapidly permeable lower layers (Soil Conservation Service, General Soil Map, Brooks County, Texas).

Vegetation varies from solid stands of live oak (*Quercus virginiana*) and mesquite (*Prosopis glandulosa*) to open grassland with intermittent live oak and mesquite mottes. The most common grasses are threeawn (*Aristida* spp.), seacoast bluestem (*Schizachyrium scoparius*), and thin paspalum (*Paspalum setaceum*). The dominant forbs are croton (*Croton capitalus*) and sunflower (*Helianthus debilis*).

**METHODS**

Hogs were trapped beginning in July 1985 in order to instrument them with radio transmitters which allowed remote location of animals. Trap sites with abundant hog sign were selected and prebaited with corn. A square trap made of metal pipes and heavy mesh welded-wire fencing was used. The trap was prebaited with the door fixed open so that hogs could move in and out. When it appeared that animals were regularly visiting the bait, the door was positioned to allow hogs to get in, but not out of the trap. Captured hogs were handled without drugs.

An 150-151 MHz radio transmitter inserted in a leather collar was placed on each hog selected for study. Signal range was approximately 1 mi and battery life was about 2.5 yrs. A receiver connected to a pair of directional yagi antennas attached on a boom that was disposed transversely across the top of a 10 ft. mast was used to take bearings on collared animals. The antenna apparatus was mounted on a truck. Both antennas and the receiver were connected to a triple connector, which increased signal strength, gave greater accuracy, and subtracted the signals from the antennas (giving a null) when they were directly in line with a transmitter. A pointer attached to the mast indicated the null pattern on a compass through which the mast rotated. The precise bearing to the transmitter was the center (in degrees) of the null pattern.

We generally attempted to locate hogs 2 or 3 times per week. Some locations were obtained in the late summer of 1985 but little or no tracking was done during fall 1985 so as not to interfere with hunters on the area. Radio tracking effort increased in January 1986 and continued until tracking ceased in late May. Most radio-tracking was done between 0700 and 2100. However, 24-hr tracking sessions were also undertaken. During these sessions the position of each hog was determined every 2 to 3 hrs. Locations were determined by triangulation from bearings taken from the truck. Bearings were taken from 1 point, then the vehicle was driven quickly to another point for the second bearing.

Bearings were plotted on aerial photographs with an 1:15,840 scale, and their intersection (the location) was marked on an acetate overlay. Autocad-Engineering drafting package (Racker and Rice, 1985) was then used to obtain coordinates for the locations and for the boundry of the study area.

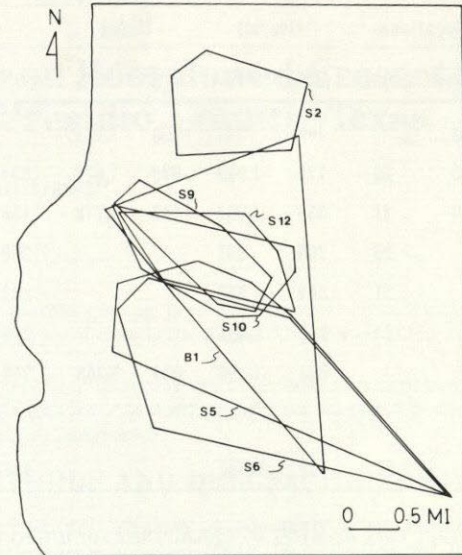
Home ranges were calculated using the McPaal program (Stuwe, 1985). Home range sizes were determined by the minimum convex polygon method (Mohr, 1947) and by the harmonic mean technique (Dixon and Chapman, 1980). For the latter, an overall home range corresponding to 95% of the radio locations and a core area (Kaufman, 1962; Springer, 1982) corresponding to 60% of the locations, were calculated.

To assess the effect of supplemental feeding on movement of feral hogs, approximately half of the collared animals were supplemented with a pelleted hog ration and corn. Hogs were fed from February to May 1986. Three wooden troughs with lift-lids were used as self-feeders.

**RESULTS**

Twelve sows and 1 boar were collared during the study. Several hogs lost collars resulting in few locations on these animals. Problems were also encountered when hogs chewed off the transmitting antenna on the collar. Home ranges were only calculated on those animals on which 15 or more locations were available. Six sows and the boar had sufficient locations (range 15-51) under this criterion. The period of monitoring of these hogs ranged from 42-298 days.

Five of the sows had overlapping ranges as determined by the minimum convex polygon method (Fig. 1).



**Figure 1. Home range polygons for 6 sows and 1 boar tracked on Encino Division, King Ranch, South Texas, July 1985-May 1986.**

Although belonging to different family groups, S5 and S6 had similar home ranges. Animals S9, S10, and S11 also overlapped for a considerable extent although we did not determine if they ranged in the same group. The boar overlapped with all sows. The home ranges tended to be elongated and appeared to be bounded by open areas.

Overall home range size as determined by the minimum convex polygon method varied from 378-1,339 acres (Table 1).

**Table 1. Home range size determined by the minimum convex polygon method for 6 sows and 1 boar monitored on the Encino Division, King Ranch, South Texas, July 1985 - May 1986.**

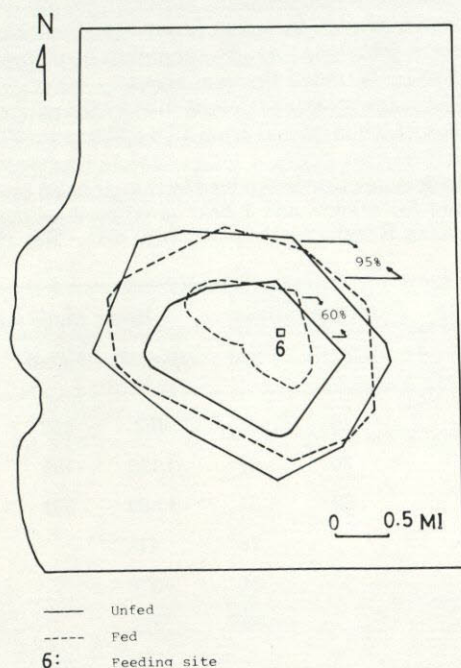
Sows	No. locations		Home range (acres)		
	Unfed	Fed	Overall	Unfed	Fed
S2	15		452	452	
S5	20	23	1,173	795	847
S6	30	21	1,309	931	482
S9		28	415		415
S10		21	378		378
S11		23	420		420
Avg.			692	726	509
Boar					
B1		51	1,339		1,339

The overall home range size of the boar was 194% of the mean overall home range size for the 6 sows. Mean home range size for unsupplemented females (726 acres, SD = 247) was 143% of that obtained for supplemented sows (509 acres, SD = 200). Home range sizes using the harmonic mean method at 95% contour varied from 603-2,984 acres (Table 2).

**Table 2. Home range and core area sizes calculated by the harmonic mean method for 6 sows and 1 boar monitored on the Encino Division, King Ranch, South Texas, July 1985 - May 1986.**

Sows	No.		Home range (Acres)					
	locations		Overall		Unfed		Fed	
	Unfed	Fed	60%	95%	60%	95%	60%	95%
S2	15		163	711	163	711		
S5	20	23	771	1,909	879	1,677	304	1,729
S6	30	21	358	1,764	442	1,778	138	1,055
S9		28	269	951			269	951
S10		21	262	553			262	553
S11		23	240	1,035			240	1,035
Avg.			343	1,154	494	1,388	242	1,065
<b>Boar</b>								
B1		51	427	2,984			427	2,984

The average core area (60% contour) size for unfed females (494 acres, SD = 361) was 204% of that obtained for supplemented sows (242 acres, SD = 62). Comparison of core areas before and after exposure to supplemental feed for S5 and S6 revealed a decrease of 67% in their average core area size. Figure 2 illustrates the shrinkage in core area after feed became available for S5.



**Figure 2. Ranging areas before and after supplemental feeding for sow S5 calculated by the harmonic mean method using 60 and 95% of location.**

## DISCUSSION

The overall mean home range size for sows was smaller than those reported elsewhere. This could have been related to habitat, sample size, length of study, and different time intervals over which individual animals were tracked. Hogs seemed to prefer dense stands of oak which were scarce on the study area. This may have contributed to hog concentration in relatively small areas. Where the vegetation was more open and oaks occurred only in scattered clumps, hogs (S5 and S6) exhibited larger home ranges and day-to-day movements.

In general, the mean home range size for unsupplemental sows was larger than that of supplemented females. However, the home range of S5 was slightly larger while she was being fed compared to when no feed was available. The feed may have caused her to enlarge her range to encompass the feeding site if it was outside her regular area of concentration. Although this hog was frequently located in wooded areas adjacent to the feeding site, she kept making occasional travels back to her previous area of concentration. It was difficult to keep out enough feed to meet the energy demands of the study animals because of the large concentration of hogs at feeding sites. However, the response to feed observed (generally smaller home ranges and core areas) is an indication of how supplemental feeding can be used to manipulate movement patterns and concentrations of hogs.

## CONCLUSIONS

Feral hogs spend a great deal of time in the vicinity of supplemental feeding sites. However, it appeared, at least in the short term, that hogs did not totally abandon previous areas of concentration. Thus, hog movements were heavily, but not totally, based on food availability.

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## Initial Establishment of 14 Forage Species on Rootplowed Creosotebush (*Larrea tridentata*) Rangeland in Presidio County, Texas

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### ABSTRACT

In June and July of 1985, 14 species were broadcast seeded on a sandy and gravelly range site in Presidio County, Texas. Both sites supported heavy creosotebush (*Larrea tridentata*) communities and were rootplowed and disced to remove the shrubs and prepare a seedbed. Overall average seedling density in the fall of 1985 was 84.68 per 50 square feet on the sandy site and 76.38 on the gravelly site. Five species (and a mixture) showed better than average establishment on both sites. These were: A-68 Lehmanns lovegrass (*Eragrostis lehmanniana*), Cochise lovegrass (*E. lehmanniana* × *tricophora*), Niner sideoats grama (*Bouteloua curtipendula*), green sprangletop (*Lepochloa dubia*) and Llano buffelgrass (*Cenchrus ciliaris*).

### INTRODUCTION

The Trans-Pecos region of Texas consists of approximately 18,000,000 acres, most of which is rangeland important for livestock production. Grazing capacity of the Trans-Pecos has been compromised by an abundance of brush species such as mesquite (*Prosopis glandulosa*), creosotebush (*Larrea tridentata*), tarbush (*Flourensia cernua*), and catclaw (*Acacia greggii* and *Mimosa biuncifera*). Traditional means of controlling unwanted brush include mechanical methods (such as plowing, shredding and rollerchopping), prescribed burning and the application of chemicals. Mechanical methods of control followed by reseeding have been widely practiced on many types of rangeland. Reseeding on arid rangelands however is risky from the standpoint of seedling establishment and cost effectiveness. Many ranchers, who own their own crawler tractors and have either a rootplow or heavy disc, prefer mechanical control of brush over chemical methods, since they feel they spend less cash out of pocket. A common practice is to broadcast seed immediately behind the rootplow or disc.

Species used for reseeding should be well adapted to the climate and soils of the area, be nutritious and palatable enough to be of value to a producer but yet be able to with-

stand moderate grazing pressure. Another consideration, from a rancher's point of view, is the availability of seed at low or moderate cost.

The objective of this study was to evaluate several potentially adapted forage species in a seeding trial on rootplowed and/or disced creosotebush rangeland.

### METHODS AND DESCRIPTION OF AREA

Two creosotebush-dominated study sites, located on the Johnny Surratt ranch near Plata, Presidio County, Texas, were initiated in the spring of 1985. The region lies within the desert grassland vegetation zone as defined by the Soil Conservation Service, but is currently dominated by desert shrubs such as creosotebush and tarbush. Average annual rainfall is 11 inches, usually concentrated in late summer. The average frost-free period is generally from March 21 to November 10. High winds in spring, temperatures of over 100° F. in summer, and potential summer evapotranspiration rates of approximately 100 inches are common in this desert ecosystem.

One of the sites was located on a gravelly soil of an upland topographic position; the other was located on a sandy soil in a basin or low topographic position. The basin soil was classified as a sandy loam, mixed, thermic ustollic camborthid. The upland soil was classified as a loamy skeletal, mixed, thermic, ustollic calciorthid. Two 150 foot by 150 foot macroplots were established on each site — one plot in each location had been rootplowed in 1984 and disced in 1985; the other plot in each location was rootplowed and disced in 1985 prior to seeding.

Each macroplot was divided into three blocks, each of which was further subdivided into 15 subplots 10 feet wide and 50 feet long. A different species was assigned to each of 14 subplots in each block in a randomized complete block design. One subplot received a mixture of all species. The northeast corner of each subplot was marked with a stake and an identifying number.

Seed of the 14 forage species was hand broadcast at approximately 20 pure live seed per square foot with a cyclone seeder on June 20 (basin site) and on July 3, 1985 (upland site). All seed except that of *Eragrostis* spp. was covered by dragging with a section of chain link fence. *Eragrostis* seed was not covered because of its very small size (Cox and Martin, 1984). The species used (table 1) were selected on the basis of known or expected adaptability to arid regions and their value as forage for livestock and wildlife.

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