

Wild Pig Field Signs - Identity and Confirmation

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Abstract: The study was carried out in wild pigs interfering with agriculture in the adjoining regions of forests and how they have migrated to human dwellings coming in close proximity to human interactions. Wild pigs are found to be the most prolific, very intelligent and secretive. These animals are adaptive ecological generalists and survive in wide range of habitats worldwide. The reproductive traits of wild pigs are extraordinary showing high prolificacy so it becomes impossible to control their population. These animals have adapted to become nocturnal and it becomes difficult in sighting them, nevertheless there are certain field signs that help to identify wild pig activity, the more common the field sign, the higher the number of animals found in a given area. Confirmation of the presence of wild pigs in an area is best based on a combination of several types of field sign to corroborate the existence of these animals and to identify the field signs. Wild pigs are an invasive species that pose significant threat to both the natural and manmade environments that cause an ecological imbalance. These animals cannot be eradicated in either existing or new areas where they are found, then the potential for damage and the cost of having to manage or control it must be made. The different types of damage are characterized and understood, the better that these impacts can be successfully handled from both an economic and environmental perspective. In order to know the existence of wild pigs in an area it is important to know the field signs attributed to this species in order to efficiently mitigate damage strategies, ultimately combating wild pig – human conflict.

Keywords: Wild pig-Field signs-Identity-Confirmation.

I. INTRODUCTION

Wild pigs cause intense damage to agricultural crops and have high reproductive traits, the damage they cause is totally intolerable by farmers and this leads to wild pig- human conflict. The control of populations of the populations of the wild pigs is most successful if such efforts can begin immediately following the establishment of these animals in an area as a call for implementing mitigation strategies. It is important, then, to be able to rapidly identify the presence of these animals in areas where wild pigs had heretofore been absent. Wild pigs can be secretive in their behavior, shifting activity patterns to avoid being readily observable by humans [1]. The presence of these animals in an area may therefore not be verifiable by the direct observations of either animals or their physical remains. However, the presence of wild pigs in an area can be readily identified from the field sign that these animals leave [2][3].

In fact, wild pigs can leave a diverse variety of visible evidence or impacts. The ability to accurately make such identifications is vital to being able to verify the new presence of wild pigs in areas where control of these animals is desired. Further, the absence of such field sign would corroborate the successful removal of these animals following an eradication program. The purpose of this paper is to review these various types of field sign made by wild pigs. The characterizations of the different type of wild pig field sign were observed. All observations were specifically recorded by the authors during the field study. Several topical areas are focused on and addressed, with the intention of providing a basis for understanding wild pig field signs within the context of better managing these animals and providing feasible

mitigation methods which a rising demand. Some behavioral variation does exist among the wild pigs of the three regions (Agricultural areas adjoining Mudumalai, Anaimalai, Sathyamangalam) of study; however these variations will be treated as one in the following sections unless otherwise noted for a specific example.

II. MATERIALS AND METHODS

The Study Area:

Behavioral study of wild pigs (*Sus scrofa*) interfering with agriculture was carried out in areas adjoining the Western Ghats (Mudumalai tiger reserve, Anaimalai tiger reserve) and Eastern Ghats (Sathyamangalam region) of Tamil Nadu state during November, 2013 to May, 2014. The wild pigs have moved from the forests to human inhabitations causing conflict. Each population was tracked by foot by various tracking teams without any disturbance to their normal life style. The field signs were recorded and the results were enumerated.

III. RESULTS AND DISCUSSION

The wild pig population in all the study areas consisted of adults comprising of Males, Females, Sub-adults and young ones. The different types of field sign made by wild pigs are Rooting, Tracks, Trails, Scats, Wallows, Rubs, Feeding sign, Scent marks, Nests and beds, Fence crossing (Plate1, 2, 3). The different types of field sign made by wild pigs are discussed in the following paragraphs:

1. Rooting –

The most common and evident field sign created by wild pigs is rooting. This was the first field sign noted. Wild pigs are provided with a Viscerotropic bone in their snouts “Os rostri” which anatomically aids in rooting with absolute ease. Rooting is very simply the result of wild pigs foraging for feed located in either the leaf litter or below the surface of the ground [1]. The feed can variously include hard and soft grass, newly emergent tips of shoots, roots, tubers, bulbs of grasses, fungi, both adult and larval invertebrates, and even some smaller vertebrate species. Rooting is typically conducted with the end of the animal’s snout being used to excavate soil in a forward pushing/scooping motion. The animal’s feet are infrequently used in a pawing motion to supplement the snout actions. Rooting is done by all wild pigs, regardless of sex or age. However, although wild piglets will root from their first day of life, adult wild pigs are responsible for most of the rooting [4]. Rooted areas can be extensive, sometimes covering large areas or entire fields. The size of the area rooted depends upon the number of wild pigs involved and the forage resource being sought. However, caution should be used in attempting to estimate the number of wild pigs based on the amount of rooting; a few pigs can root up extremely large areas [5].

Rooting by this omnivorous species was pronounced and varied like

- (1) Pit type rooting,
- (2) Trench type rooting,
- (3) Area rooting.

Pit rooting involves the directed foraging for a specific localized food item. Such rooting can consist of a shallow hole down to a deep burrow, up to 120 cm in depth. Trench rooting consists of an elongated ditch typically one or more meters in length. The last category, area rooting, involves large areas of continuous rooting. This can be from a few square meters to hectares in size.

Several factors are involved in this variability, including the target resource, and the age and social unit being occupied by an individual at the time of actively foraging. Adults of both sexes tend to root systematically in deep regular patterns. Sub adults and yearlings root more shallow and irregular patches. Piglets and juveniles dig up shallow spots in an erratic and haphazard manner [6]. The three types of rooting observed also vary in depth and this was in agreement with the classifications made by [4] who classified rooting into three types based on depth: superficial litter rooting, organic topsoil

rooting, and mineral soil rooting. Of these, the superficial type was by far the predominant form of rooting. The manner of rooting was dependent not only upon the food being sought, but also on the moisture content of the soil.

The type of habitats where wild pigs will root was extremely variable and can be determined by several factors. The location of rooting in different vegetation types in the study area appeared to be related to elevational movement in response to changes in ambient temperatures, food availability, and farrowing activity coinciding with the observations of [7]. Rooting can be found in soils that range from relatively dry to completely inundated conditions. The damage on agricultural crops at the 50 % flowering stage and standing grain crops were high than grasses relating to the findings of Wilson [8]. Rooting occurred throughout the year. However, depending upon the location, the frequency and intensity of rooting by wild pigs can be seasonal. The rooting was intense during the summer season and the winter season.

2. Tracks –

The tracks of a wild pig are typical of most large cloven-hoofed mammals. However, wild pig tracks are distinctive in that the lateral toes or dewclaws (i.e., digits 2 and 5) are evident in many of the prints left. This is a result of the lateral toes being located very low on each leg. The exception to this is on very hard ground; however, a very careful examination will usually result in at least a minor imprint of the lateral toes being found. Wild pig tracks tend to be more rounded or circular in general overall shape, being as long as they are wide. Typically, the tracks of Wild Pigs adult wild pigs range from 5 to 6 cm in length and 4 to 7 cm in width. The central toes are large, with only a small space between them at the back. The inner and outer margins of the prints taper to form a somewhat pointed tip at the front of the track print. The lateral toe prints, or the dew claws, generally triangular or crescent shaped, are located to the outside and behind the central toes. The hooves or toes on the front feet are slightly larger, being physically longer and proportionately wider than those of the rear feet. In addition, the lateral toes on the front feet are closer and slightly positioned more to the outside in comparison to those of the rear feet. The track of younger animals are simply smaller replicas of the adult tracks usually varying from approximately 2 to 6 cm in both length and width, however, except in soft substrates (e.g., deep mud or snow) the dewclaws are seldom present in the prints of piglets and shoats.

Wild pigs exhibit a single rounded central triangular print flanked by the lateral or dewclaw prints. When walking, wild pigs typically place their feet in a heel-to-toe pattern such that the hind prints often almost perfectly overlap the front prints. The front two toes tend to point outward from the medial line of the track pattern. The prints also straddle the medial line of the path being traveled that varies with trotting movements. The spacing for these groups of tracks along this line typically ranges from 25 to 40 cm, and would be dependent upon the size of the animal and the speed at which it was walking or trotting. When running, the tracks are often placed in groups of four with a further distinct pairing of the front and rear pairs. The hoof prints of a running pig are widely placed and the lateral toes can be very distinct. Tracks can also be used to determine a number of things about the animal that made them. The tracks can be used to tell which direction the animal was heading, about what size the animal was, whether or not the animal was in a hurry, and, in combination with other factors (e.g., the presence of feeding sign or tracks of other animals), what the animal in question was generally doing. Based on the freshness of the tracks left, one can further estimate how recently the animal passed through the area being study. Both soil type and meteorological conditions should be taken into account when trying to “age” wild pig tracks. These findings were in recorded agreement with the values reported by [9]

3. Trails –

The trails used by wild pigs are normally the same ones used by other ungulates like deer gaur occupying the adjoining area around forests. Visibly well worn or cleared paths are the key to look for. These are most obvious when they intersect roads or other open habitats. The use of these trails by wild pigs is specifically confirmed by the presence of tracks. Barrett [10] noted that wild pigs will continue to use defined trails or paths, even when they travel across wide, open areas. This was in agreement with the findings made in this study it was further noted that most wild pig trails follow the shortest possible route from one point of interest (e.g., bedding area, water source) to another, regardless of the topography or vegetation. Wild pigs will create shorter or lower-topped like tunnels natural boarder trails through thick coverings. In some cases, trails may be exclusively used by wild pigs. A peculiar finding was that wild pigs used trails that go straight up a steep hill. This was in agreement with the observations recorded by Kramer [11], Waithman [12].

Wild pigs will also variously use manmade hiking trails, foot paths, and unpaved secondary roads located within areas which they inhabit. The use of the latter was often more frequent.

On the other hand, it is easy to understand that moving along an open roadway, even one that's unpaved is less demanding than moving through thick brush along a trail through a thicket. In short, when wild pigs can take the easy route, they often will. Normally, these animals entered one of these manmade roads on a game trail, traveling down the road for a short distance even up to approximately 50 to 100 m, then exiting the road on another trail simply criss crossing human inhabitations. However, some individual wild pigs will also travel these secondary roads and jeep trails for considerable distances. Especially the adjoining agricultural areas and tea plantations serve as a great source of cover for these animals.

4. Scats –

The scats or droppings of a wild pig can vary widely depending on the material having been eaten and the size of the animal that produced it. In general, most are irregularly shaped lumps approximately 3-7 cm thick and 7-22 cm in length [5]. The color may vary from light brown to black, and may have a purplish hue when fresh. Frequently, wild pig scats resemble a segmented sausage composed of compacted fecal material. The consistency of the scats will also vary with the foods being consumed. And there is a system of community defecation that is observed in these animals. Most wild pig droppings are short-lived (Stevens 1996), turning gray over time and breaking into separate droppings depending upon the season, [3].

5. Wallows –

Wild pigs lack Sweat glands and have a physiological need dissipate heat, in order to thermoregulate wild pigs make use of wallows. Wallowing occurs year-round, however, it is especially pronounced in the summer months. Wallows can be present in almost any type of low-lying or wet areas. Most of the wallows were found in muddy depressions in well-traveled foot trails, while some were found in and around small streams with slow-moving water [13]. Location of wallows was also recorded near nesting regions and along the edges of reservoirs, wallows were found in patches of rain-created mud puddles [11]. This was in agreement with Conley et al. [14] who also reported that wild pig wallows have been found in mud puddles in old roads as well as in the lateral drainage ditches along these roads. Depending on the substance involved, the sides of the wallow are often smooth where the animal has rolled. The shape is, of course, dependent upon the size of the animal or animals using any one specific wallow. The largest wallows appear to have been used by several animals at one time and usually multiple wallows can also be found in close proximity to one another. These findings coincide with the findings made by [3].

6. Rubs –

Wild pig rubs, although most often associated with wallows, can also be found alone. Rubs are, very simply, where wild pigs rub up against trees, fence posts, rocks, telephone poles, or other immovable objects. Tree rubs are often found near trails that wild pigs use regularly especially those near wallows. Rubbing by wild pigs functions to scratch and remove mud, hair, and ectoparasites. Wild pigs often suffer from infestations of lice (*Haematopinus suis*) and ticks. Wallowing in mud may serve to immobilize these parasites, and rubbing then mechanically removes them. Wild pigs also rub on medium- to large-sized pine trees which are a common finding in the study area, owing to rough nature of the bark and on long erected poles and fence posts. Muddy, smoothly-rubbed bands on trees, poles, or posts are located between 10 and 94 cm above the ground [15], and often completely encircle the structure being rubbed. In some cases, certain trees were used so often that the bark is completely rubbed off [11]. The height of a muddy rub can give an indication of the relative height of the wild pig that created it. However, when pigs rub against an object, the animals tend to arch their backs giving a greater appearance to their height than the rub would indicate. Aggressive rubbing by very muddy pigs can also result in mud being tossed or thrown higher than the animal's back.

7. Feeding Sign –

Being omnivorous in their food habits, wild pigs can leave a variety of other feeding sign. They are usually driven to be nocturnal due to the anthropogenic pressures and involve in crop raiding in agricultural outlets. This would be variable depending upon the type of vegetation or agricultural plantation. The most obvious would be rooting. Direct foraging on agricultural crops like carrots, cabbages, beetroots and tapiacos chiefly tubers, these crops are general cultivations in these

study areas and there is a lot of crop raiding done by wild pigs leading to intense form of wild pig human conflicts leading to tragic outcomes like poisoning. Plants rooting out of the ground and the root stock consumed, and bulbs of grasses, lateral roots of pine trees, the eggs of ground-nesting birds and carrion can all be used to identify the presence of wild pigs. Wild pig tracks associated with the above mentioned feeding sign can be used to verify the identification of these animals. Foraging wild pigs will also displace and dig/chew into decomposing logs to locate insects, earthworms and small vertebrates [16].

8. Scent Marks –

Although wild pigs actively scent mark [17], the specific identification of these field sign was difficult. The common scent marking that was done by wild pigs, the only ones that leave readily-identifiable evidence are from using either the metacarpal or the tusk glands. Unfortunately, such markings were not distinguished in the study. Trees that have been marked with tusk glands can be similarly difficult to identify. Trees tusked by male wild pigs result in the bark being removed and the bare wood exposed. Goulding [3] described frequent tusking as producing a distinct “paisley” pattern in the bark. Tusking may also secondarily function to increase the resin flow of pines being rubbed.

9. Fence Crossings –

Given strong neck muscles and the ability the lift heavy things with their snouts, wild pigs tend to create a lot of openings either under or through wire fences. Goulding [3] described the 210 opening as an arch, characteristic of having been made by wild pigs. As these animals create and then use these crossings, bristles become caught in the twisted barbs of strand fencing or the joints on woven wire fences. Such hairs left at these crossings are clear evidence that wild pigs are present in the local area. However, given the durability of wild pig bristles, these hairs can last in these situations easily for several months. That being the case, it is recommended that all hairs present at crossings being monitored be removed when the fenced is checked. One should be careful when doing this to try to not touch the wire around the opening in the fence, inadvertently leaving human scent at the crossing. Periodic removal of the bristles present, in combination with the presence of other sign (e.g., tracks), will enable one to determine the how recently these fence crossing are being used. In addition to the bristles, mud can also be rubbed off on the wire bordering the openings of these fence crossings.

10. Nests and Beds –

Wild pigs build nests and it is common to encounter both unoccupied nests and beds [18]. Farrowing nests are constructed by pregnant sows within 24 h prior to giving birth to their offspring [19]. The primary function of this type of structure has been theorized as providing the neonates with protection from inclement weather conditions [20]. It can also serve as protective camouflage for hiding the newborn piglets from potential predators [21]. The nests are typically round to oval in shape, and consist of a rooted-out area that is either unlined or lined with nesting material. Sows most often select nest sites with protective overhead cover. Sows also often select secluded, undisturbed place with dense protective cover to build their farrowing nests. However, some nests are built in areas of open understory, which offer no visual protective cover or screening from potential predators. Wild pig resting or loafing beds are less complex than farrowing nests. These structures are used by either adult and/or immature animals for resting. As many as fifteen pigs have been observed occupying one bed. The general shape of solitary beds is similar to that of the farrowing nests. [19].

IV. CONCLUSIONS

The different types of field signs made by wild pigs have been documented and reasons enumerated for clear understanding of their existence. Wild pigs are forgotten genera in the environment that proves to be a link in causing most of the conflict with regard to agriculture. They have also modified into nocturnal species owing to the human activity during daytime. It is essential that concrete field signs are clarified to find out the existence of these animals in these areas, so that control and mitigation strategies may be properly designed.

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APPENDIX - A

List of Figures:


PLATE-1 Wild Pigs	
	
a. Wild pig-Sow	b. Wild pig -Boar- Prominent Tushes
	
c. Piglets of Wild pig	d. Sub adults
	
e. Rooting by wild pigs	f. Foot tracks of a wild pig

PLATE-2 Wild Pigs	
	
a. Fence crossings	b. Nests and beds
	
c. Trails of wild p[igs]	d. Scat of wild pigs
	
e. Bulbs in grasses	f. Wallowing area

PLATE-3
Wild Pigs



a. Nocturnal activity



b. Black cloth -deterent



c. Damage to agricultural crops



d. Wallow and rooted areas



e. Electrical fencing



f. Close wire fencing