

Wild Pig Newsletter

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The Effects of Abatement Efforts on Wild Pig Behavior

By: Josh Helcel, Extension Associate - Texas A&M Natural Resources Institute

Wild pigs (*Sus scrofa*) are notorious for their ability to adapt and evade various control efforts. Groups of wild pigs that are not pressured often increase their diurnal activity and become more active during the day time (Gundlach 1967). However, as abatement pressures increase wild pigs can alter their behavior to become more active at night and other behaviors can modify as well (Stegeman 1938, Hanson and Karstad 1959, Choquenot et al. 1996, Waithman 2001, Pei 2006). This article will discuss various effects abatement techniques can have on wild pig behavior, and will recommend strategies that can help to minimize behaviors including trap aversion and escape when enacting control efforts for wild pigs.

(Continued on page 2)

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Hunting Can Accelerate Wild Pig Birth Rates

It is generally accepted that sport hunting wild pigs will not significantly reduce populations. Perhaps less apparent is that human activities such as hunting can induce evolutionary ramifications at both the population and species level (Darimont et al. 2009). A good example of this has been observed in deer species (*Odocoileus sp.*); whereas high rates of trophy harvest were shown to lead to smaller overall horn size and body mass over time (Coltman et al. 2003). In wild pig populations, though, high hunting pressure doesn't necessarily lead to reduced body sizes or smaller tusks. Extensive monitoring of wild pig populations over 22 years found that high hunting pressure can actually cause wild pigs to advance offspring birth rates by as much as 12 days per gestation cycle (Gamelon et al. 2011). This acceleration in birth rate is further compounded by increased conception rates of sows within their first year of life when populations experience increased adult mortality from hunting or other abatement efforts (Gamelon et al. 2011). Essentially, wild pigs may breed earlier and produce offspring more quickly when subjected to hunting pressure. Given this novel survival strategy, it becomes more understandable why a state like Missouri banned completely the sport hunting of wild pigs on conservation lands.



Research indicated that wild pig sows subjected to high hunting pressure had higher conception rates in their first year and produced offspring up to 12 days sooner than normal gestation.

Wild Pig Adaptations to Aerial Gunning

Aerial gunning is an effective population reduction strategy unless limited by topography or dense canopy cover (Campbell et al. 2010). However, previous research

has shown that wild pigs can intelligently adapt their behavior to avoid detection and flushing by helicopters (Saunders and Bryant 1988). It might be assumed that these animals would simply disperse from their home range in response to aerial gunning efforts. In fact, research indicated the opposite in that core area and home range sizes did not alter either before or after enacting aerial control (Campbell et al. 2010). Instead, wild pigs can adapt to aerial gunning by seeking dense cover and refusing to flush from it despite concerted efforts by the pilot and crew.



Instead of flushing, some wild pigs have adapted to evade helicopters by holding within dense cover.

What is significant about this behavior is that until relatively recently wild pig populations had not encountered significant predation from above their line of sight. Despite this, they have quickly adapted to be capable of intelligently evading a formidable 5000 pound “aerial predator” that otherwise would seem to have every advantage. The intelligence and adaptability of wild pigs are key factors that compound effective control (Sweeney et al. 2003), and this is again evidenced by their potential to learn to evade aerial gunning efforts.

Trap Aversion

Research has long documented trapping as an effective population reduction technique, with 70-80% reductions in populations having been reported using this technique alone (Saunders et al. 1990, Vernes et al. 1999). However,

wild pigs can adapt to avoid traps altogether for a variety of reasons. This can occur due to the size and type of trap used, but also can be attributed to inadvertently “educating” wild pigs through incomplete captures. With the exception of solitary adult males (boars), wild pigs travel in social groups called sounders. When trapping these animals, it is important to target and remove the entire sounder in a single trapping effort. This is generally accomplished through a process of pre-baiting and conditioning the group over time to routinely enter a trap large enough to contain the entire sounder. Corral style traps are often best suited for this, and research indicated this type of trap to be four times more effective than conventional box traps (Williams et al. 2010). Box traps, while valued for their portability, usually only capture 1-3 animals at a time. No matter what type of trap is used, incomplete captures can divide sounders and cause remaining pigs to avoid traps in the future.



In order to minimize learned trap aversion due to incomplete captures, the goal of any trapping effort should be to target and remove the entire sounder of wild pigs.

Trap Escape

Wild pigs can also adapt to escape traps, and individuals that learn to do so often exhibit this behavior repeatedly. Trap escapes can be accomplished through climbing, rooting, exploiting trap design flaws and even jumping considerable heights in excess of 4 feet. It is important to construct and implement sound trap designs, and it is equally important to check traps as soon as possible following each trap night. Many experienced trappers check their traps at first light and bring a firearm in order to harvest any residual pigs that may be near the trap site due to incomplete capture or escape. The Texas A&M

Natural Resources Institute recommends that corral traps be constructed with four to six 16' cattle panels that have 5' panel height and 4" mesh in order to minimize trap escapes. It is generally not necessary to bury or trench paneling underground, but it is important not to leave any gaps at ground level or near the head gate. Game cameras can be integral in monitoring wild pig activity at traps sites, and can also help to identify any modifications necessary in order to minimize the potential for trap escape.



Wild pigs will attempt to escape traps if given the opportunity. Ensure that traps are constructed properly and check traps at first light to help minimize trap escape attempts. (Image Credit: Andy James)

Conclusion

Wild pigs exhibit a variety of behavioral responses to abatement pressure. Their intelligence and adaptability can complicate effective control, factors that are only compounded by their extreme fecundity. It is important to select appropriate strategies as well as to adapt control techniques as necessary in order to minimize any potential issues which can reduce the success of abatement efforts. This can undoubtedly be easier said than done, as is evidenced by the numerous and often remarkable ways in which wild pigs can evade control efforts despite the best technologies available to man. However, best management practices including trapping, aerial gunning, strategic shooting, snaring, and the use of trained dogs remain proven tools that, when implemented in a combined approach, can successfully abate the damages associated with wild pigs.

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Wild Pigs Negatively Impact Water Quality

By: Forrest Cobb, Research Assistant
Texas A&M Natural Resources Institute

Three years ago some of my colleagues and I spent every week checking and rechecking an electric fence we hoped would keep wild pigs out. We were conducting a horticultural study with 1,600 fresh and tender ornamental plants grown over the course of a year. Unfortunately for us, our small plot was not far from a creek that supported a seemingly endless population of wild pigs. Every week we would see damaged brush, dead plants, and clumps of bare loose soil just outside the fence line. Thankfully they never got inside, but while we had the luxury of fencing off and maintaining that relatively small enclosure, that same level of exclusion would not have been feasible for a larger tract of land and certainly is not for stream and river courses and their associated wetlands. Impacts on agriculture, plant diversity, and wildlife habitat can be easily observed in areas disturbed by the rooting behavior of wild pigs. One of their less obvious impacts, and the focus of our newest publication, is the impact of wild pigs on water quality in Texas.

Biology, Distribution and Harvest of Wild Pigs in Texas

Wild pigs now occur in at least 36 states and the economic toll of these animals in the US was estimated to exceed \$1.5 billion in 2007, a number likely to be much larger today¹⁴. Population modeling indicates that as many as 3-5 million wild pigs now inhabit Texas and they are present in almost every county in the state (Figure 1)¹⁵. The number and range of these animals is not surprising considering their incredible adaptability and fecundity. With an average lifespan of 4-5 years, adult sows commonly produce litters of 4-6 offspring and can have 1-3 litters per year¹⁷. Their population growth is relatively unchecked by predators. Coyotes, bobcats, and feral dogs have been known to prey upon juveniles but humans remain the only significant predators of adult wild pigs. Population modeling has indicated that as much as 66% of the wild pig population would need to be harvested every year for 5 years or more to halt population growth¹⁹. With humans only harvesting an estimated 29% of the population per year, we will see continued growth and

spread of wild pigs¹⁹. Omnivorous and intelligent, wild pigs are well adapted to conditions across the state and their foraging, opportunistic predation, rooting, and wallowing behaviors are incredibly disruptive, having serious repercussions for the ecological and economic health of our state.

**Feral Swine Populations 2016
By County**

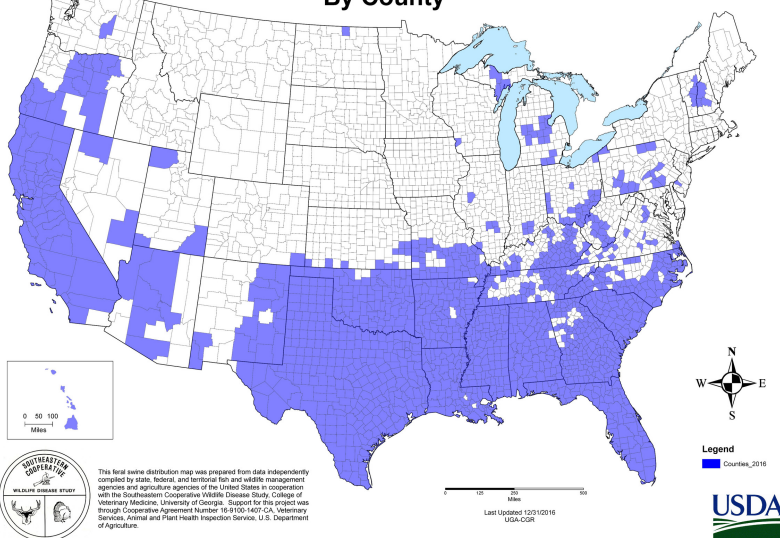


Figure 1. NFSMS data showing 2016 feral swine populations by county. (Image Credit – USDA-APHIS in Corn and Jordan 2017)

Wild Pig Impacts on Wetlands and Riparian Areas

A worrisome aspect of wild pigs in Texas is the impact on water quality they have by damaging riparian areas and wetlands. Since wild pigs lack sweat glands, they often stay close to water bodies in order to cool themselves by wallowing in wet, shaded areas. This concentrates wild pig populations in sensitive riparian areas, which are both crucial transitional zones between upland areas and water bodies, and a vital component of maintaining overall water quality¹¹. Healthy riparian and wetland communities perform numerous critical functions which maintain water quality including, stabilizing soils, decreasing water velocities during flooding, providing fish and wildlife habitat, mitigating contamination from surrounding storm water runoff, and lowering water temperatures through shading¹¹. Because of their disruptive rooting and wallowing behavior, as well as heavy foraging of native mast (fruits and nuts), wild pigs can significantly decrease native vegetation cover in riparian corridors^{2,9,15}. By reducing native ground cover, native tree abundance, and native seedling

establishment, they increase the presence and abundance of invasive plant species, and destabilize stream and river banks leading to increased sedimentation, nutrient loads, turbidity, and altered pH levels^{1,2,3,5,9,15}.

Wild Pigs and Bacterial Impairment

While they indirectly impact water quality through the destruction of riparian and wetland communities, wild pigs also directly impact water quality through defecation⁸. One study of fecal coliforms in the Buck Creek watershed of Texas found that as much as 50% of E.coli bacteria samples collected were from wildlife sources including wild pigs, while only 20% originated from domestic animals or livestock⁷. With a high defecation rate (1,121 grams per day) when compared to other wildlife species like white-tailed deer (500-772 grams per day), their contribution to bacterial loading and water quality is becoming a growing concern for land managers and regulatory authorities statewide^{10,12,13}. Especially since, as of 2012, the majority of Texas water bodies were listed as bacterially impaired^{10,12,18}. Bacterial impairment increases the potential for disease transmission in both wildlife and human populations. Recreational activities such as swimming, wading, and fishing are necessarily restricted as a result of these unsanitary conditions.

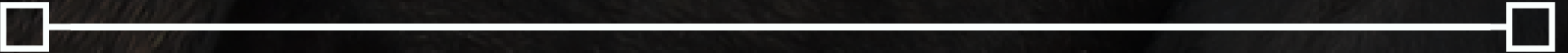


Wild pig activity in and near water sources can spread invasive plant species, destabilize soil, reduce native species abundance, alter nutrient and pH levels, increase turbidity, and contribute to increased E. coli bacteria levels in surface water systems.

Agriculture is also impacted when access to high quality water becomes limited. One study found that livestock with a quality water supply can produce as much as 20% more animal gain as compared to livestock with access to impaired water²⁰. Furthermore, the low dissolved oxygen and high nutrient levels associated with impairment can reduce aquatic species abundance and diversity, and lead to massive algal blooms and fish kills.

Conclusion

Wild pig populations contribute to impaired water quality in Texas, both directly through fecal deposition, and indirectly by altering wetland and riparian communities. While more research is needed to quantify their impact and contribution to water impairment, wild pig abatement has been shown to benefit riparian ecosystems and overall water quality by reducing bacterial impairment, reducing the spread of invasive species, increasing vegetation cover, facilitating proper nutrient cycling, decreasing erosion, and decreasing surface water turbidity^{4,6,9,16}. Given the wide spread and growing challenge posed by wild pigs in Texas, the potential benefits of management and control should be considered in any plan for improving or safeguarding water quality. Application of consistent and widespread abatement efforts remains the only way of stabilizing and thus reducing the impacts of wild pig populations on landscapes and water quality in Texas.



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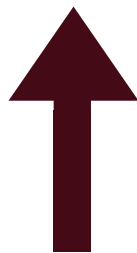
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**Wild pigs negatively impact water quality:
Implications for land and watershed management**



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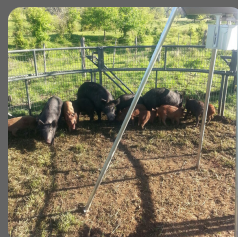
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Are Wild Pigs Considered Wildlife?

*How Texas classifies wild pigs
may surprise you
(click to view)*



Sounder Level Trapping

*Learn to minimize trap aversion
while trapping wild pigs
(click to view)*



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*Early consumption of solid food by juveniles
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(click to view)*

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