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TEXAS A&M UNIVERSITY

Reducing Non-target Species Interference While Trapping Wild Pigs

TEXAS A&M AGRILIFE EXTENSION

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Feral hogs (*Sus scrofa*) are non-native, highly adaptable animals that cause significant ecological and economic damage in Texas.

Texas AgriLife Extension Service

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Introduction

Expanding populations of invasive wild pigs (Sus scrofa) in the U.S. adversely affect water quality, agricultural production, livestock, and native wildlife and their habitats (Seward et al. 2004). Domestic swine were introduced to North America in the early 1500s. Pigs that escaped or those unrecovered from free-range farming practices established feral populations. Additionally, Eurasian wild boar released in the early 1900s for hunting purposes further contributed to established populations in the U.S. The marked increase in wild pig abundance and distribution over the last 30 years is due in part to the adaptability and high reproductive success of these animals, but is also related to indiscriminate and sometimes illegal stocking. These actions led to the widespread populations observed today (Wood and Barrett 1979, Whitaker 1988). Perhaps seen as benign at one time, the introduction of this exotic species now causes concern. Wild pig populations currently number in the millions and can be found in 39 U.S. states, and agricultural and other associated damages are estimated to exceed $1.5 billion annually (Pimental 2007).

Legal control efforts include non-lethal means such as exclusion and electrified fencing (Reidy 2007), and lethal means such as trapping, snaring, shooting, aerial gunning, and the use of trained dogs (Sweeney et al. 2003). In the U.S., it is currently illegal to use toxicants to reduce wild pig numbers; however, there is ongoing research to understand its use and delivery. When test baits were hand-placed, investigators noted that raccoons consumed baits at more than twice the rate of wild pigs, 51% to 22%, respectively (Campbell et al. 2006). To minimize negative impacts on non-target species, wild pig specific devices are needed to deliver baits having toxicants.

Continued population growth of wild pigs suggests that available control techniques are not entirely successful (Dickson et al. 2001, Adams et al. 2006). For instance wild pigs eventually breach most types of fencing (Reidy 2007), and lethal techniques such as aerial gunning can be effective but are often cost prohibitive. Research conducted in Texas suggested that landowners used trapping the majority of time for wild pigs removal (Figure 1) compared to all other lethal methods (Timmons et al. 2012).

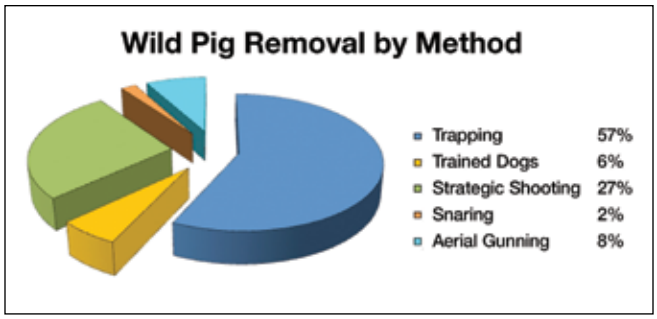

Figure 1. Survey results from 679 respondents indicted removal methods, including trapping, capture with trained dogs, strategic shooting, snaring, and aerial gunning in 2010 to remove 36,646 wild pigs (Timmons et al. 2012).

Non-target species can directly and indirectly impact efforts and increase the overall cost of trapping wild pigs (Hartin 2006). This group of animals can prematurely trigger traps, thereby eliminating the possibility of capturing wild pigs and wasting valuable time. Common attractants draw a variety of wildlife that could consume the bait meant for wild pigs. In areas with especially high numbers of non-target species, reduction of non-target animals may be necessary to increase the chances of capturing wild pigs. It is important to understand the laws pertaining to trapping non-target animals and to obtain the necessary permits and licensing.

There are a number of strategies for reducing negative impacts of non-target species when trapping or snaring wild pigs. In some cases, modifications to the trap design must be made while in other cases, attention to trap or snare placement can reduce interference from non-target animals. Keep in mind that greater success can be achieved when using the best combination of bait, trap and trigger type.

Site Selection and the Pre-baiting Process

Important factors to consider prior to any abatement effort include scouting, site selection, and the pre-baiting process. Begin by identifying wild pig sign including tracks, trails, scat and rooting damage (Figure 2). This will help in targeting locations such as travel routes among bedding, feeding, and watering areas for trap or snare placement. Placing a game camera at potential trap or snare locations will provide information on the exact time, number, and frequency of animals visiting a location. If trapping, the next step

Figure 2. Identifying wild pig sign including tracks (bottom right), trails (bottom middle), scat (left), and rooting damage (top right) will help target wild pigs and reduce the impacts of non-target species.

is to begin the pre-baiting process to verify both wild pig and non-target animal activity. Pre-baiting is a process that involves the use of bait to condition wild pigs to a trap site before and after the construction or placement of a trap. If snaring wild pigs, the pre-baiting process is unnecessary as this technique does not require the use of bait.

Many issues with non-target species can be minimized by recognizing wild pig sign and proper placement and baiting of wild pig traps. Texas A&M AgriLife Extension Service has resources to provide greater detail on these important aspects of wild pig abatement available at http//:agrilifebookstore.org.

- L-5523 Recognizing Feral Hog Sign
- L-5526 Placing and Baiting Feral Hog Traps

The Great Bait Debate

There is no shortage of options when it comes to selecting a type of bait attractive to wild pigs. In most cases, shelled corn or "deer corn" is a good bait option. However, corn may pose a challenge given that many other wildlife species consume it as well. The same can be said for other bait types, additives and flavorings. Of 11 baits assessed, no one additive or flavoring was 100% effective at preventing consumption by non-target species (Campbell and Long, 2008). Consequently, fermenting or "souring" corn or grain to make it less palatable is an easy first step to reduce non-target interference.

Figure 3. The use of fermented or "soured" corn or grain can help to reduce consumption of bait by non-target species.

Fermented Corn or Grain

The process of "souring" corn or grain is a relatively simple process, whereby a desired amount of bait is placed in a container and then water is added to cover the bait by an inch or two. The mixture will then ferment on its own given enough time. Covering the mixture, adding yeast, milk, or beer will accelerate the fermenting process especially when the container is placed in direct sunlight. This could take several days depending on the temperature, but the bait is properly fermented when the mixture is bubbling and giving off a strong, pungent and slightly sweet odor (Figure 3).

Assessment of Baits and Attractants

Wild pigs are opportunistic omnivores, and consume grasses, forbs, woody browse, roots, tubers, corn, grain, cactus (Optunia sp.), hard mast (nuts and seeds of woody plants), soft mast (berries and fruits), invertebrates (arthropods, mollusks, etc.), small vertebrates (frogs, birds, etc.), and detritus including carrion and animal feces (Taylor and Hellgren, 1997; Sweeney et al. 2003; Wilcox and Van Vuren, 2009). The diverse diet of these animals allows for a number of different baits, attractants, and flavorings to be used. Examples of other types of bait commonly used in wild pig trapping include: milos, rice, fruits, vegetables, dog food, catfish baits etc.

Of 46 different attractants tested for preference by wild pigs, only one was found to significantly reduce bait consumption by non-target species (Table 1). Among these attractants a particular strawberry flavored additive increased wild pig site visitation and consumption at bait stations, while reducing non-target visitation and consumption. A unique combination of furanones for this attractant was suggested as the cause (Campbell and Long, 2008). These researchers noted that alternative strawberry or berry flavors containing other chemical compounds may produce different responses from both wild pigs and non-target species.

Researchers	Attractants
G. Wathen, J. Thomas and J. Farmer (1988)	Acorn scent, Anise oil, Applesauce, Apricot nectar, Blood meal, Boar Mate ™, Boiled wheat, Chinese yams, Coal, Cod liver oil, Coffee beans, Corn mash, Creosote, Fish oil, Milk (spoiled), Molasses, Motor oil (new), Motor oil (used), Peppermint oil, Pine scent, Pine Sol ™, Snake feces, Snake scent, Soybean oil, Strawberry flavoring, Sweet potatoes, Tofu (spoiled), Truffles, Violet scent (imitation) and Walnut extract
P. G. Elsworth, J. L. Mitchell, and R. W. Parker (2004)	Creosote, Fish Stock, Meat meal, Molasses, and Vanilla
T. A. Campbell and D. B. Long (2008)	Anise, Apple, Banana, Berry, Boarmate™, Bubblegum, Butterscotch, Caramel, Cheese, Pig Frenzy™ and Strawberry

Table 1. Listing of attractants evaluated for wild pig preference.

Baiting Strategies

Most baits are scattered on the ground, leaving them accessible for any species to find. However, if other strategies are used, bait loss can be reduced. For instance, a "pig pipe" consists of a 6 inch by 4 foot schedule 40 PVC pipe fitted with a threaded coupling and removable cap on one end to which a rotating eye bolt is attached (Figure 4). Holes slightly larger than a kernel of corn are drilled at various points in the pipe allowing corn to fall out. The amount of corn dispensed by the pig pipe can be adjusted by covering or adding holes. Wild pigs will quickly learn to roll the anchored pipe to receive a food reward. This technique can be used in the trapping process to extend the amount of time pigs remain at a trap site, but can also be implemented in the scouting and pre-baiting process to reduce the amount of bait used in selecting trapping locations.

Figure 4. A pig pipe can reduce consumption of bait by non-target species, as the pipe must be rolled to dispense the bait.

Many non-targets may initially use their sense of sight to detect bait meant for wild pigs. Placing a three-quarters inch sheet of plywood (cover board) over a bait pile impairs visual detection and restricts physical access to the bait. Wild pigs can use their sense of smell to detect the bait and adults generally have no problem moving the cover board to access it. Species including white-tailed deer, most small mammals, and especially birds can be deterred using this technique. However, non-targets such as raccoons are surprisingly strong for their size and can access bait just under the edge of the cover board (Figure 5).

Figure 5. Raccoons are among the most difficult non-target animals to deter when trapping wild pigs with bait. However, species such as white-tailed deer, birds and most small mammals can be foiled using the cover board technique.

Deterrents and Repellants Used in Baits

Texas A&M AgriLife Extension Service does not recommend the use of diesel fuel on corn, or any other bait when trapping wild pigs (Figure 6). Diesel fuel can damage water quality, habitat, and wildlife. Reducing wild pig populations is important, but it is equally important to do so in a responsible way.

Figure 6. Do not use diesel or diesel coated baits when trapping wild pigs, as the potential for harm outweighs the gains.

Studies conducted on commercially available repellents designed for use on bait had conflicting results regarding their effectiveness. Researchers in south Texas found that the addition of allyl isothiocyanate (horseradish) and capsaicinoid (pepper) based repellents to wild pig bait did not reduce removal rates by raccoons (Campbell and Long 2007). Conversely, a study conducted in southeast Texas utilized the same repellent and found that bait consumption by raccoons was significantly reduced (Sumrall 2011). No impact was observed on bait consumption by wild pigs in either study.

Non-target Species and Trap Selection

Selecting the right trap type can be just as important as knowing how to select a wild pig trapping site, especially when trying to minimize the impacts of non-target species. Conventional box and corral traps are triggered manually by some type of animal-activated mechanism, but with these traps, there can be no guarantee that the animal activating the trap will be a wild pig.

Box Traps

Box traps rely on an animal activated trigger for activation. While this kind of trap offers mobility as its key advantage, they generally capture only one or two adult wild pigs at a time. Research conducted in Georgia found that one conventional box trap was less effective overall when compared to one larger and more permanent corral trap (Williams et al. 2011). Most box traps completely enclose the trapped animal, and this can lead to non-target animals being injured when inadvertently trapped. More experienced trappers construct or modify box traps in various ways to allow for the safe and easy release of non-target animals. Provided the box trap is at least 4 feet tall, removing portions of the top paneling can allow non-target animals such as deer to escape on their own. Incorporating a rear door can be a benefit when releasing non-target animals (Figure 7). Another strategy is removing the floor paneling from the trap so that it can be flipped over to release non-target animals.

Placing a T-post, 2X4 board, or wire across the entry of trap gates can deter entry by larger livestock including cattle. This partial barrier technique can also be effective in deterring trap entry by deer (Figure 8), however limited resource availability can influence their determination. Some experimenting and modification of barriers may be necessary depending on the time of year, trap type, location, and non-target species causing issues. Nevertheless, modifications to both corral and box traps can deter entry, reduce bait loss and trigger activation, and aid in the safer release of non-target species.

Figure 7. This box trap has been modified to have a rear door to allow for the safer and easier release of inadvertently trapped non-target species and has had a portion of the top removed to allow non-target species to jump or climb out.

Figure 8. Larger livestock including cattle can be deterred from entering box and corral traps by using partial barriers like a T-post, 2X4 board, or wire, but the success of this method in deterring deer can be influenced by resource availability.

Corral Traps

Corral traps are generally much larger than box traps, and offer the opportunity to capture the entire sounder of wild pigs, consequently, they are a better choice over box traps. Further, the open top design allows animals such as deer to simply jump out if

Figure 9. Non-target species like deer can simply jump out of corral traps with 5-foot panel height.

Figure 10. Remotely triggered trap gates use motion sensing cameras to capture real time activity and images at trap sites. The trapper can close the door at their discretion using a mobile phone or computer.

they trigger the trap (Figure 9). Coupled with a more selective trigger and switching to fermented corn, corral traps generally offer an affordable and effective way to trap wild pigs, while reducing the impacts of non-target species.

Trigger Selection for Wild Pig Traps

Costs, complexity, and effectiveness vary among trap and trigger types and each type has strengths and weaknesses. When choosing these components, consider how wild pigs will interact with them and how non-target animals could cause problems with bait consumption and/or prematurely setting off the trap. Good judgement here could prevent interference saving time and money during trapping efforts.

Remotely Triggered Gates

Remotely triggered gates for corral traps rely on technology which gives the trapper a choice to close the gate or not. Animal activity at the trap site can be observed remotely, and the trap should be closed when most, if not all of the entire sounder is in the trap. This technique eliminates trap closure by non-target species (Figure 10), but does not eliminate bait consumption by non-target species. Consider moving the trap or using a bait type such as fermented corn or grain if non-target bait consumption becomes an issue.

Animal-Activated Triggers

Selectivity of an animal-activated trigger is important to prevent the premature closure of traps, wasted effort and added expense checking empty traps. Adult wild pigs generally exhibit more caution than juveniles, and research suggests that juveniles are more likely to enter a trap enclosure than adult males (Williams et al. 2011). This can become an issue when using an animal-activated trigger such as a trip wire, which can often be set off by either juvenile wild pigs or a variety of non-target species. If a trap closes too soon, it may result in capturing only a part of the sounder. Those nearby could then be conditioned to avoid traps altogether. However, there are a number of animal-activated trigger systems which can reduce premature activation by using rooting behavior, body size and strength of wild pigs to the trapper's advantage.

Push Through Entrance for Continuous Catch

Some corral and box traps do not have a trigger, but instead require wild pigs to push through a space to enter the trap and gain access to bait. An advantage of this system is lower cost over other corral trap styles that require the purchase of a gate. A disadvantage is that adult wild pigs and trap shy individuals may show aversion to visual barriers and be reluctant to gain entry. Research conducted on continuous catch box traps (Figure 11) showed that this type of system resulted in the most juvenile captures compared to box traps with side swing gates (Long and Campbell 2012). This same study recommended that continuous catch doors should not be used in management efforts targeting adult wild pigs (Long and Campbell 2012).

Figure 11. Box traps with continuous catch or "rooter gates" may result in more juvenile captures compared to other gate types.

Figure 12. While continuous catch corral traps can be useful in excluding livestock, other designs may be more efficient in capturing an entire sounder of wild pigs.

If using a continuous catch corral trap (Figure 12), it is wise to wire the entrance open during the pre-baiting process and then incrementally close the gap to train animals to enter the trap. When an entire sounder is routinely entering the enclosure, the trap can then be set to catch. However, this process can often be time intensive. Because of this, many experienced trappers and land managers often employ other trap doors when targeting adults or an entire sounder of wild pigs.

Figure 13. A bucket trigger can help to reduce bait consumption and trap activation by juvenile wild pigs and non-target species.

Bucket Trigger

A bucket trigger is an animal-activated system that reduces non-target activation by taking advantage of their strength and the way wild pigs aggressively feed. The trap is triggered when adult wild pigs push the bait filled bucket off of a platform. Cinder blocks, boards or logs make good platforms. Adding weight to the bucket (bricks, scrap iron, etc.) before adding the bait will make the trigger harder to activate by juvenile pigs or non-target species. Given their strength, adult pigs will not have a problem tipping the bucket over to access the bait and close the trap. An advantage of this type of trigger is that a white-tailed deer and/or raccoon may eat from the bucket, but generally will not knock it over and close the trap (Figure 13).

When using a bucket trigger, it is recommended to drill holes near the bottom edge of the bucket large enough for bait to dribble out. If using a bait type such as fermented corn or grain, the lid can be partially closed to retain moisture and reduce non-target consumption. The pre-baiting process should be carried out with the bucket system in place to condition the pigs of its presence, but the trap should not be set to catch until a desired number of wild pigs are routinely entering and feeding within the trap.

Figure 14. A rooter stick trigger is more likely to be activated by adult wild pigs instead of juveniles.

Figure 15. Animal activated triggers such as this tire trigger depend on wild pig rooting behavior and the strength of adults to activate the trap gate.

Rooter Stick

A rooter stick is a relatively selective animal-activated trigger which relies on the feeding behavior of wild pigs (Figure 14). The trigger is constructed by driving pieces of steel rebar at an angle on either side of a bait filled hole. A stick which is connected to a lead wire to the gate is then placed behind the rebar to hold the gate in the open position. The gate closes when the stick is lifted up over the rebar, typically by adult wild pigs, while gaining access to the bait.

Tire Trigger

A tire trigger is one of the more reliable animal activated systems in reducing trap activation by non-target species. This system relies on wild pig rooting behavior and the strength of adults, with the trigger's sensitivity being adjusted by using different size tires (Figure 15). Tire sizes in the 13-16 inch range are recommended, and this system can be used with both single and dual door trap types. The pre-baiting process should be carried out with the tire in the trap and the trap door wired open. Be sure to provide bait in and under the tire, as the trap is only activated when the pigs flip or push the tire far enough to activate the trap gate. This system generally works best with single or dual guillotine style gates. Tension of the trip wire can be adjusted by the amount of "slack" left in the line. Baiting the trap with the tire towards the back and a U-shape string of bait around the tire can help to ensure that the greatest number of animals enter the trap before activation by an adult wild pig.

Non-target Species and Snaring Wild pigs

Snaring is an effective and relatively inexpensive technique for capturing wild pigs. Though snares are designed to catch only one wild pig per set, multiple snares can be used at a time to increase overall success. Snaring is a method that does not require the use of any type of bait, and this technique can be used to capture wild pigs as they travel near wallows, tree rubs, along fence crossings and other travel routes. However, non-target animals can still be an issue when snaring because of the risk of injury or death to any animal caught in a snare. In order to minimize the risk of capturing a non-target animal when snaring, it is recommended to place a game camera at any potential snaring location prior to setting a snare. This can help verify wild pig activity, while avoiding non-target animals that may be using the location.

Recognizing wild pig sign is another important aspect of selecting a snare location. The goal is to select locations that are being used by wild pigs only, and to avoid areas and trails used by non-target species. It is recommended to use snares designed for wild pigs that are 1/8" to 3/32" in diameter, and also snares that employ a "deer stop" – a single ferrule or small nut attached to the snare that prevents it from completely closing around a non-target animal (Figure 16). Wild pig snares can be bought with a preinstalled stop, but a stop can also be installed to prevent the snare from closing beyond 2-3 inches in diameter.

Figure 16. The use of game cameras and snares that employ a "deer stop" can help to reduce the impacts of non-target species. A stop is used to prevent the loop from completely closing.

Conclusion

By taking steps to minimize the negative impacts of non-target animals, time and money can be saved, while giving a better chance to reduce wild pig numbers. Keep in mind that trapping is a process and not an event, and it may take some time to develop effective methods that captures wild pigs and minimizes the actions of non-target species. With a little creativity, patience, and effort, landowners and managers can trap more efficiently and successfully contribute to wild pig abatement in Texas.

Texas A&M AgriLife Extension Service is dedicated to public education, outreach, and direct technical assistance and has made available numerous resources including publications, webinars, and videos in order to aid landowners in wild pig abatement. These resources can be found on our website: http://feralhogs.tamu.edu.

See other wild pig resources at http://agrilifebookstore.org.

- L-5523 Recognizing Feral Hog Sign
- L-5524 Corral Traps for Capturing Feral Hogs
- L-5525 Box Traps for Capturing Feral Hogs
- L-5526 Placing and Baiting Feral Hog Traps
- L-5527 Door Modifications for Feral Hog Traps
- L-5528 Snaring Feral Hogs
- L-5529 Making a Feral Hog Snare
- ESP-419 Feral Hogs Impact Ground-nesting Birds
- ESP-420 Feral Hog Laws and Regulations
- ESP-421 Feral Hogs and Disease Concerns
- ESP-422 Feral Hogs and Water Quality in Plum Creek
- ESP-423 Feral Hog Transportation Regulations
- L-5533 Using Fences to Exclude Feral Hogs from Wildlife Feeding Stations
- SP-467 Feral Hogs Negatively Affect Native Plant Communities

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NOTES:

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