

Hunting at Howell Woods Standard Operating Procedures

These rules and regulations are designed to ensure a safe hunting experience, ensure an equal opportunity to participate in hunting sports for the general public and ensure proper game management by applying humane and scientific harvest techniques and regulations on the property of the Rudolph Howell and Sons Environmental Learning Center (Howell Woods), a division of Johnston Community College.

Section 1 Specific Safety Regulations

1. Treat every firearm with the same respect due a loaded firearm.
2. Always keep the firearm pointed in a safe direction. Do not load firearm until safely in the stand, keeping the safety on until ready to shoot. Keep your finger off the trigger until ready to shoot.
3. Identify your target and what is beyond it. Know the identifying features of the game you hunt.
4. Be sure the barrel and action are clear of obstructions and that you have only ammunition of the proper size for the firearm you are carrying.
5. Unload firearms when not in use. Leave the actions open. Firearms should be carried empty in cases to and from hunting area.
6. Never point a firearm at anything you do not want to shoot. Do not horseplay with a firearm.
7. Never climb a fence or tree, or jump a ditch or log with a loaded firearm. Never pull a firearm toward you by the muzzle.
8. Wear a safety orange hat and/or vest at all times while on the property when hunting deer, feral pig, squirrel and quail.
9. When using a personal tree stand for hunting deer or feral pigs hunters must hunt at least 10-feet above the ground but no more than 20 feet.
10. No type of tree stand may be erected on a dead tree (snag) or a tree with the upper 1/3 of the branches dead.
11. When hunting for deer or feral pigs, hunters must use a properly maintained stand that is certified by the Tree stand Manufactures Association (TMA).
12. Use a full-body safety harness at all times while in a climbing type tree stand.
13. Each hunter must possess a working flashlight and use while going to and from hunting area during the period of darkness.
14. Hunt in your designated hunting area only. Do not stray from your area for any reason.
15. No alcohol or other mind-altering drug may be ingested eight hours prior to or during the hunt.
16. No hunter may track animal alone or without a Howell Woods staff member or designated hunt volunteer.
17. Emergency phone numbers: Howell Woods Office: 919-938-0115, Howell Woods Radio System: 938-0412 or call 911
18. **All violators of any safety protocol will be immediately removed, without refund, from the property and prohibited from any future hunting opportunities at Howell Woods.**

Section 2 General Regulations

1. To qualify for any hunt at Howell Woods, hunters must possess a valid NC resident or non-resident hunting license and any other required stamp or tag and be 12 years or older. *Feral pig hunters only- possess a valid hunting license (any state) and are 12 years or older.*
2. Hunters between the ages of 12 and 15 must hunt with a adult relative (21 years or older) in the same stand/blind see [Section 6.4](#).
3. All hunters must sign in and out upon arrival or leaving the property at the designated location and have all harvested game inspected by a Howell Woods staff or designated Volunteer.
4. All harvested game must be inspected by a Howell Woods staff or designated Volunteer before processing. Field dressing or disposing of entrails or any other body parts of harvested game on the property is not allowed. All processing of game and disposal of waste must be conducted at the designated area.
5. All hunters and their equipment/vehicles and harvested game are subject to inspection by Howell Woods staff or designated Volunteer, State and/or Federal officials at anytime while on the property.
6. Four wheel drive vehicles and ATV's (All Terrain Vehicles) are allowed but must stay on marked roads or trails and proceed at a safe speed. Safety helmets must be wore at all times when operating an open ATV. All vehicle types are allowed on roads marked with green road signs. Only ATV's are allowed on road/trails marked with brown road signs. Other areas may be off limits to ATV traffic due to management or maintenance issues and will be posted or advised by a Howell Woods staff member or designated Volunteer prior to the hunt.
7. All hunters must pass the Howell Woods Orientation and Safety Open Book Test with a minimum score of 90% with all of the safety questions answered correctly (marked with an asterisks). Hunters who fail to correctly answer the required number of questions will be given the opportunity to take the test again, answering only the missed questions. Only after passing the test will hunters be allowed to hunt on the property. Each species, except deer and feral pigs, have separate tests. Each test has to be taken only once every calendar year.
8. Unless otherwise stated in the Species Specific Regulations, all firearms/bows used and their appropriate season for use must meet the requirements as set forth in the North Carolina Inland Fishing, Hunting and Trapping Regulations Digest for the current year.
9. Scheduled hunts will be held regardless of the weather with the exceptions for severe flooding or wind damage on the property or the main campus of Johnston Community College is closed for inclement weather conditions. Refunds or rescheduled hunts will not be considered for inclement or poor weather conditions for hunting, acts by other hunters (Howell Woods permitted hunters or trespassers) or other natural or human related conditions that are out of the control of the Howell Woods staff. If the Howell Woods staff cancels a hunt for any of the above reasons a complete refund will be given for the cost of the hunt fee only (not lottery fee or monies paid for other services related to hunting). Dates for Donor hunts may be rescheduled according to the availability of Howell Woods.

Section 4 Specific Species Regulations

Section 4.1 Whitetail deer and Feral pig

1. All hunters must be in there designated stand no later than 1 hour prior to official sunrise for morning hunts and 3 hours before official sunset for afternoon hunts. All hunters must remain in your designated hunting area until 2 hours after official sunrise for morning hunts and 30 minutes after official sunset for afternoon hunts. Hunters who harvest game between 10am and 1 hour before the afternoon stand deadline may leave their area to proceed to check-out location or for assistance in game recovery. Exceptions will be for emergency reasons only!
2. Bow and arrows are only allowed during the designated September bow season. Bows and pistols may be used as a secondary weapons only!
3. Hunters who choose to provide their own stand must use a properly maintained stand that is certified by the Tree stand Manufactures Association (TMA) and hunt at least 10 feet off the ground (at waist level when sitting) but no higher than 20 feet above ground within the designated hunting area.
4. Hunters must use a full-body safety harness at all times while in a climbing type tree stand.
5. No type of tree stand may be erected on a dead tree (snag) or a tree with the upper 1/3 of the branches dead.
6. Hunters must wear a safety orange hat and/or vest at all times while on the property.
7. All food type baits must be approved by the Howell Woods staff before use on the property.
8. Howell Woods will provide ladder or box type stands and automatic feeders with corn at all designated stand locations.
9. Hunters wishing to add additional bait to pre-baited sites or to scout their assigned hunting area must make prior reservations with a Howell Woods staff member. Additional baiting or scouting will only be conducted on Monday, Wednesday or Friday the week before the scheduled hunt.
10. September-December Stewardship/lottery hunts will be held Tuesday - Saturday the second or third week of the months of September, October, and November (or the first week after the opening of the whitetail deer season) morning and afternoon. Primary hunt days are Friday and Saturday, additional days may be purchased - **days available are Thursday, and Wednesday of the hunt week to be taken in that order.**
11. January-March feral pig Stewardship/Lottery hunts will be held Thursday - Saturday, beginning after 12:00pm only.
12. All hunters will be expected to provide their own transportation to and from their designated hunting area. Assistance will be provided in retrieval of harvested game only.
13. All hunters will be expected to clean and dress their harvested animal. Howell Woods will provide a covered area with lights, several gambrels, running water, ice, skinning tools (except knives) and waste disposal services. Volunteers may be available to assist with cleaning and skinning services.
14. There are no bag or size limits for the harvest of feral pigs.
15. Whitetail deer bag limits are as stated in the North Carolina Inland Fishing, Hunting and Trapping Regulations Digest for the current year for the Eastern region. Howell

Woods is a participant in the North Carolina Deer Management Assistance Program which allows additional harvesting of antlerless deer without the use of the hunters personal big game tags.

16. Only whitetail bucks that meet all three of the following requirements may be harvested (considered “trophy bucks”);
 - a. The spread of the rack is wider than the ears (greater than or equal to 14 inches).
 - b. The base of the horn is bigger than the eye (approximately 4 inches).
 - c. The main beam is longer than the deer’s face (greater than or equal to 13 inches).
17. There shall be a monetary penalty assessed for harvesting bucks that do not meet the minimum requirements. See [Section 6.1 or 6.4](#) for more details.

Feral Pig Hunting is conducted on the Howell Woods property for several reasons:

- **Reduces a non-native population which helps wild turkey and other native wildlife.**
- **Gives hunters a longer hunting season and something a little different.**
- **Provides a source of income to Howell Woods.**
- **Helps to reduce crop and road damage.**
- **Greater public awareness of the damaging environmental impacts of feral pigs and the existence of Johnston County’s finest environmental learning center.**

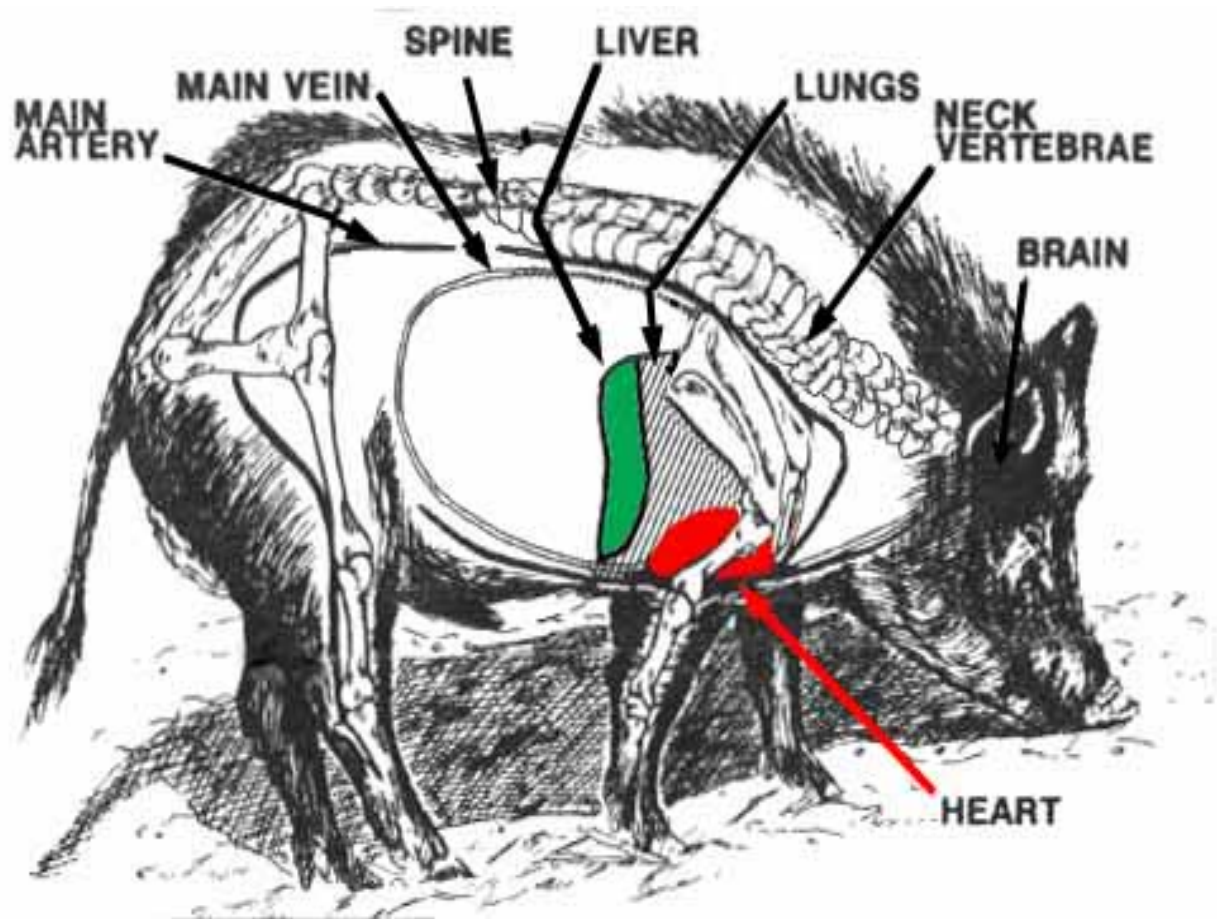
Hunting feral pigs is not the same as hunting whitetail deer. Feral pigs tend to be much more wary and have an excellent sense of smell and hearing, probably more sensitive than deer. You must be patient when hunting feral pigs. They often move in the late afternoon just before sunset and near bait piles, the sow will often be off a little ways in thicker vegetation as the younger piglets are feeding. Large boars mostly travel alone or use the cover of darkness to move about and to feed on bait piles.

Shot placement for a quick, humane kill of a feral pig is also different than that on a whitetail deer. Using the diagram below, notice the placement of the heart and lungs and how the spinal cord dips down at the shoulders. The effective “kill zone” is also much smaller and lower on a feral pig than that of a deer. Located around the shoulder area is a shield of thick hide and fat that gives the feral pig excellent protection from a variety of missiles, projectiles or tusks of other feral pigs. *Head shots are highly recommended!*

Remember- No hunter tracks wounded animals without a Howell Woods staff member or designated volunteer!!

Tracking of any wounded animal will only be conducted for a maximum of 30 minutes-MAKE YOUR SHOT COUNT!!

Internal Anatomy of a Feral Pig In Regards to Effective “Kill Zone”



A NATIONAL PERSPECTIVE ON FERAL SWINE

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Status and Perspective

A general perspective on feral swine across the United States is somewhat akin to one's perception of beauty and often described as being in the eye of the beholder. Feral swine, although rarely described as beautiful, may be good, bad, ugly or of no significance. According to Walker's Mammals of the World (Nowak 1991), the first swine (*Sus scrofa* L.) in the United States were those brought by the Polynesians to Hawaii around A.D. 1000, and those introduced by the Spanish to the southeast in the early 16th century. Some of these earliest introductions provided genetic pools for several valuable domestic breeds as well as for the many feral populations introduced in other parts of the world.

There are other references (Towne and Wentworth 1950) who credit Christopher Columbus with introducing eight head of swine to the West Indies in 1493 on his second voyage across the Atlantic. These authors also credit Hernando DeSoto with 13 head of swine brought to Florida from Cuba in 1539 and thought to have been descendants of those introduced by Columbus.

Regardless of the source of introduction and relocations over the past 500 years, or whose account is most accurate, current estimates of feral swine in the United States are over two million animals in 23 states. The Minnesota Board of Animal Health (Mackey 1992) conducted a 50 state survey of chief wildlife and livestock disease control officials who reported established feral swine populations in 23 states. Of these 23 states, only 12 reported population estimates, which when totaled, amounted to 1,916,350 animals. The remaining 11 did not estimate populations, however, several of these states (Alabama, Arkansas, Louisiana, Georgia and West Virginia) suspect populations of several thousands of animals. It is reasonable, therefore, to estimate that the present feral swine population in the U.S. exceeds two million animals.

Unlike more traditionally considered large game species such as deer, for which state natural resource agencies maintain annual season hunting dates, bag limits and harvest figures, feral swine harvest and population estimates, in most cases, are not closely monitored. In fact, in the 14 states where they are classified as an animal which can be hunted by license holders, several of these states have a year-round open season with no bag limit on harvest and no special fee or permit requirement. In the Minnesota survey (Mackey 1992), 14 state officials who responded noted that they currently have a ban on the importation/introduction of feral swine into their states. If one were to poll sportsmen, private landowners, wildlife and livestock officials in states both with and without current feral swine populations, the opinions, concerns and philosophies would be mixed. Although there has been considerable research conducted on feral swine across the U.S. and in other countries, there is a diverse perspective about the status and management of feral hogs. There is a continuous critical need to inform people with factual information about feral swine and the known potential positive and negative effects.

Management Concerns

Prevention of the introduction and establishment of feral swine in states with no known feral swine populations is one of the management concerns of state natural resource agencies. As previously noted, 14 states currently have some type of ban or prohibition on such importation and introduction. However, not everyone acknowledges existing bans or regulations. Some people who might introduce feral swine may be well-meaning, but ignorant of the ban, if one exists, in their state. Others ignore laws or regulations because they like the idea of another species to hunt regardless of their potential impact on the ecosystem, other wildlife, domestic livestock, or damage to crops or forest lands.

Two major concerns about feral swine shared by professional wildlife managers and livestock officials as well as livestock producers are: (1) that feral swine are known to be very adaptable, have a high reproductive capability and, because of their feeding habits and behavior, can significantly impact wild ecosystems; and (2) that feral swine are known disease carriers. For example, Wood and Barrett (1979) identified five diseases known to have been found in feral swine in the U.S. that were contractible to either humans or domestic livestock.

Ecosystem Impact

Numerous studies (Wahlenberg 1946, Lucas 1977, Springer 1977, Wood and Brenneman 1977, Wood and Lynn 1977, and Lipscomb 1991) address the impact of feral swine on wild ecosystems. Other studies document direct impacts on native species via predation or consumption by feral swine (see Hanson and Karstad 1959, Springer 1977, Wood and Roark 1978). Wood, Woodward, Mathews and Sweeny (1992) noted that in personal communication with Joe Kurz of the Georgia Department of Natural Resources, a departmental study indicated that feral swine depredations resulted in the loss of 80% of sea turtle nests on Ossabaw Island. In a study by Wood and Barrett (1979), they concluded that the introduction or enhancement of feral swine populations in wild ecosystems was unsound. There are other studies that have been conducted in the U.S., as well as in other countries with feral swine, which document the depredation of feral swine on native wildlife and domestic livestock, and the impact on forestry, agriculture and the integrity of wild ecosystems.

Disease Reservoirs

It is well known among wildlife and livestock professionals that feral swine serve as highly mobile disease reservoirs for several contractible diseases. The two most serious diseases commonly found in feral swine are swine brucellosis and pseudorabies. Swine brucellosis, according to a revised United States Department of Agriculture Bulletin, "Wild Pigs - Hidden Danger to Farmers and Hunters" (Anon. 1992), is currently confirmed in 10 states in the U.S.; pseudorabies is in 12 states. Both humans and other domestic livestock (principally swine) can become infected via contact with brucellosis-diseased feral swine. Pseudorabies, despite its name, is not related to rabies and does not infect humans, however, it causes serious production loss to domestic swine producers. Once infected with pseudorabies, an animal is a life-time carrier and there is no effective treatment. It also can be transmitted,

and often is fatal to other wild and domestic animals, including: raccoons, skunks, opossums, foxes, and rodents, as well as cattle, sheep, goats, dogs and cats.

Both federal and state laws govern the control of swine brucellosis and pseudorabies. The relocation of feral swine demands negative blood tests for these diseases. Anyone considering relocation of feral swine should first contact their state veterinarian. A recent survey of pork producers in Georgia conducted by the Southeastern Cooperative Wildlife Disease Study (Doster ed. 1992) indicated that 71% were aware that feral swine are often infected with swine brucellosis and pseudorabies. Five percent of the respondents reported feral swine on their land, 13% had feral swine within one mile of their land, and 27% had feral swine within five miles of their farm. They also reported that 9% had observed feral swine in contact with their animals and 1.5% had purchased wild swine in the past. Of these farmers, 6.5% of them, or their employees, hunted feral swine and 69% of the farms that had feral swine in the vicinity kept their domestic swine in outside pens.

The investigators concluded: the data reveals the need for a stronger public education program about feral swine for the pork industry as well as for sport hunters; and, although these findings came only from Georgia pork producers, they probably reflect the situation in a number of other southeastern states.

In a feral hog control study (Wood, et.al. 1992), of 589 feral hogs removed from a coastal plain habitat in South Carolina, swine brucellosis and pseudorabies were found in 13.9% and 9.7% respectively of those animals. Numerous other studies have indicated the incidence of these diseases in feral swine populations that can be transmitted to domestic swine. Quite often, feral swine show up in rural sale barns where the potential is high for infecting domestic herds. For this and other reasons, most swine farmers and livestock officials would like to see feral swine populations either eradicated or carefully monitored and controlled to avoid infection of domestic swine and resultant economic losses. It is important to note, however, that it is unlikely that either or both of these diseases would disappear even if it were possible to eradicate all feral hogs. For example, in the final report of the Feral Swine Meeting for Epidemiologists conducted in September 1992 in Arlington, Texas, a report (Anon. 1991) indicated that of 3,000 pseudorabies infected herds in the U.S., only 17 of those reported the most probable source of infection as contact with feral swine. And, of the 67 swine herds known to be infected with swine brucellosis in 1991, only six herds were infected as a result of contact with feral swine. However, in this same report, samples taken of feral swine on some private lands in Florida indicated high levels of pseudorabies-positive animals and fairly low levels of swine brucellosis-positive animals.

Damage Prevention and Control

Damage caused by feral swine can occur in many forms. Some common examples are: rooting and feeding on forest regeneration sites, row crop and pasture lands and food plots or plantings for wildlife; damage to ponds, tanks, springs and water holes; damage to wild ecosystems and threats to biodiversity; competition with other preferred wildlife species game and non-game; predation on other wildlife and domestic animals; and, disease threats to domestic livestock and humans. In addition, like deer and other large game species which cross highways, feral swine often cause not only damage to automobiles, but to their passengers when contact is made at high speed. Unfortunately, prevention of damage by

feral swine in some situations on croplands is practically impossible without significantly reducing the swine population. For example, if agricultural crops or food plots are interspersed within habitats containing viable populations of feral swine, fencing costs may be prohibitive.

The best way to avoid potential damage problems with feral swine is avoid letting anyone introduce the animals into new areas. If they exist on property owned or managed by adjacent landowners, either fence effectively and monitor carefully, or use every legal means allowed to eliminate animals that move on to your lands. Fencing is expensive and not always effective unless carefully maintained. In fact, the only effective fencing I have seen included either six foot anchor chain fencing buried a foot underground or woven wire fencing surrounded by electric fencing. Therefore, except for protecting small areas, fencing is likely to be cost-prohibitive. Because of feral swine predation on lambs in Australia (Pavlov and Hone 1982) and the difficulty of control, some extensive efforts using electric fencing in lambing areas has been found to be effective as noted by Plant (1980).

Once established, control of feral swine populations, is usually difficult, quite expensive and rarely can be accomplished in a short period of time. In fact, over large areas of habitat, it may be virtually impossible to bring feral swine populations under control, or to eradicate populations. The animals' high reproductive capability, their adaptability, their tenaciousness and the limited control methods add to the difficulty. In some areas, feral swine may be protected by open range livestock regulations.

As noted by Tipton (1977), population models and data from a Polish control program over several years demonstrates the difficulty of population control. What this and similar data and population modeling efforts illustrate is that not only does a significant portion of the population have to be removed to effect the following year's population, but the effectiveness of control can vary greatly with food availability, weather conditions and natal mortality. For areas with considerable acreage and good distribution of feral swine, intensive population control for several consecutive years may be necessary to effect significant population reduction.

Effectiveness of control methods depends on the status of the regulations on the species in your state. For example, if feral swine are not considered a game species and can be taken year round, a combination of control methods, if legal, could be used. Hunting with dogs and shooting where legal and feasible, followed by a variety of trapping methods and snares, can be effective if diligently pursued in reducing populations. For additional information on feral swine control, see the "Great Plains Handbook on Prevention and Control of Wildlife Damage" chapter on feral hogs by Birmingham (1983). This handbook is in the process of being revised and is expected to be available later this year.

The economics of feral swine control vary due to methods allowable for use, intensity of control effort, and the geography of the area to control. A recent paper (Wood et.al. 1992) indicated that during a 19 month intensive study, 1987-1988, 589 feral hogs were removed at a cost of about \$54 per animal. However, for a longer six year study effort, costs per animal removed were about \$70. Clearly, the costs of control must be weighed against damage assessment estimates or other costs or values, such as recreational hunting if hunting is a management objective.

Recreational Uses

Hunting for feral swine is a very popular sport in some states. Based on my personal experience, the meat can be very good and can be prepared in a variety of ways. Proper precautions should be taken in processing and in cooking feral swine to avoid risks of disease.

In some states, the hunting of feral swine, particularly on private lands, whether for so-called Russian/European boar, razorbacks, or common feral swine, is a popular sport. However, in some areas, feral swine are taken incidental to hunting for other species. For some private landowners who charge either a daily or seasonal fee or lease annual hunting rights to others, they may feel that the return exceeds the known costs of damage or management costs. In some states where they are considered a big game animal, both state agencies and private managers practice various levels of management including harvest restrictions, season and bag limits, or require the purchase of special permits. Others, which may not classify them at all, may allow taking year round by any means as legal and only require a current hunting license.

The perspective of many agencies and managers is that natural mortality, disease, predation, hunting and trapping generally keep feral swine populations at stable levels. However, others, such as public and private land managers, work diligently either to keep populations low or to eradicate them. In some areas, where few, if any restrictions on hunting and trapping apply, it is possible to keep populations in check. Hopefully, additional research and monitoring capabilities will reveal better management technologies to assist land managers in decisions about feral swine.

Summary

Feral swine are well established in almost one half of the states in the United States. Considering their adaptability, reproductive capability, appeal to many hunters, and the difficulty and costs of control measures, it is likely that they will be with us for a long time. A review of the extensive research literature reveals that there have been many useful studies to help us learn more about these animals, yet we recognize the need to continue the search for better management tools and technologies. Land managers (private and public) continue to wrestle with the dilemma of management of feral swine.

Some of the improved management capabilities are needed for other species as well. For example, we need to find better means of population estimation and monitoring; we need better tools for prevention and control of wildlife damage and disease transmission; and, we need improved capabilities in managing habitats for all species in an ecologically balanced manner. We also need better capabilities to quantify the impacts of certain species on the ecosystem, not just of feral swine, but other populations such as white-tailed deer, beaver and coyotes.

Sharing existing knowledge and experience, the generation of continuing research and management knowledge, and other meetings to address management implications related to feral swine will benefit all of us. However, to be more effective in managing feral swine,

responsible agencies and/or law makers may have to become more aggressive in establishing and enforcing needed regulations on feral swine relocation and control. Until this happens, wildlife managers across the nation with established populations of feral hogs will have to continue to try to achieve some ecological balance between population management, habitat capabilities and recreational use.

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Scientific Name: *Sus scrofa*

Integrated Taxonomic Information System (ITIS): [180722](#)

Other scientific names appearing in the literature of this species:

Common Name:

Distinguishing Features:

Wild hogs are variable in color, size, coat, and form. The body is rounded and legs are short. The tail may be coiled (Whitaker, 1988). Skulls of wild hogs are recognizable by the steeply elevated cranium, the absence of a bony ring around the eye socket, the presence of well developed incisor teeth in the upper jaw, and the presence of upper canines that project outward and sometimes upward. The dental formula is $I3/3, C1/1, P4/4, M3/3 \times 2 = 44$ (Lowery, 1974).

Wild hogs in the United States are a mixture of pure-bred wild boars, pure feral domestic strains, and hybrids of the two. Modern domestic hogs are a product of selective breeding and originated from wild boars. Domestication is believed to have begun in China around 4900 B.C., and may have begun as early as 10,000 B.C. in Thailand (Nowack, 1991). At present, domestic hogs are morphologically very different from their parent form. However, when they occur together feral domestic hogs and wild boars readily interbreed forming morphologically intermediate hybrids (Whitaker, 1988). In the United States, introduced pure-bred wild boars chiefly occur in North Carolina, Tennessee and California, and have been reported from preserves in New Hampshire, Vermont, and Pennsylvania. Pure-bred wild boars have a coat of long bristly hairs thickening into a mane on the neck and shoulders. They are usually black and sometimes brown or grey in color. The tail is moderately long and hangs straight, never coiled. The upper tusks are typically between 3 and 5 inches long, but may grow to 9 inches in length, and curl out and up along sides of mouth. The lower tusks are smaller, they turn out slightly rising outside mouth and pointing back towards the eyes (Whitaker, 1988). Wild hogs, which are either feral domestic hogs or hybrids of domestic hog and wild boar, have been reported from all five Gulf states, as well Arizona, Arkansas, Georgia, Missouri, Oklahoma, Oregon, and South Carolina (Whitaker, 1988). They have been reported to range from 108,000 to 375,000 square km of the Coastal Plains region of the southeastern United States (Johnson et al., 1982).

Similar Species:

The peccary, *Dicotyles tajacu*, which is much smaller, more uniformly and thickly coated, usually with light collar over shoulders, and upper tusks pointed down. Peccaries are found in southeastern Arizona, extreme southeast and southwest New Mexico, and south and central Texas (Whitaker, 1988).

Biology:

Wild hogs usually roam in groups of several females and their young. Males are solitary except when associated with breeding groups (Gingerich, 1994). Home ranges vary between

males and females, and with climate, population density, and food availability (Baber and Coblentz, 1986). Baber and Coblentz (1986) reported home ranges for wild hogs established on Santa Catalina Island, California to vary between 0.90 and 2.44 square kilometers, with males having larger home ranges than females. Wild hogs occur in a variety of habitats, but tend to prefer wooded areas close to water (Gingerich, 1994). They occur in flat coastal areas, in swamps and marshes, as well as on hills or mountain sides (Golley, 1962). Their sense of sight is rather poor but their senses of hearing and smell are extremely acute (Ingles, 1965). Wild hogs are typically not aggressive and will retreat if approached. However, when cornered, wounded, or defending young, they may charge and are capable of inflicting serious wounds with their razor sharp tusks (Ingles, 1965; Nowack, 1991; Gingerich, 1994).

Temperature Tolerance: Wild hogs do not have sweat glands. They regulate their body temperature by lying in water or mud, and cannot survive in hot climates without a plentiful supply of water (Gingerich, 1994). Their foraging behavior, and the areas in which they forage most intensely, varies seasonally in accordance with fluctuating temperatures (Belden and Pelton, 1975; Van Vuren, 1984).

Reproduction and Fecundity: In areas of tropical climate, wild hogs breed year round. Breeding peaks are typically associated with the rainy season. In areas of temperate climate breeding occurs in the spring (Nowak, 1991). Males fight for control of female groups, and usually win control of 1-3 females, rarely up to 8 (Nowak, 1991). Males return to their solitary lives after breeding (Nowak, 1991; Gingerich, 1994). Females have an estrous cycle of 21 days and are generally receptive for 2-3 days. The gestation period is 100 to 140 days (Ingles, 1965; Nowack, 1991). Near-term females leave the group to give birth, but rejoin it shortly after. Unlike other ungulates the young are born in a nest in which they remain for some time after birth (Nowak, 1991). Nests are generally shallow depressions lined with grass or Spanish moss (Golley, 1962). Females have one or two litters per year, with five to twelve piglets in a litter (Ingles, 1965; Gingerich, 1994). Litter size has been reported to increase with age and peaks when females are between 2-3 years of age (Baber and Coblentz, 1986). Johnson et al. (1982) reported a mean litter size of 3.3 for wild hogs of the Great Smokey Mountains National Park. Baber and Coblentz (1986) reported litter size as 5 for wild hogs established on San Catalina Island, California. The piglets are weaned in three to four months, and may leave the mother prior to the birth of the next litter (Nowack, 1991). Sexual maturity is obtained as early as 5-8 months in females and 7.5-12 months in males (Johnson et al., 1982). Although cases of under yearling females conceiving in the wild have been reported (Conley et al., 1972), females typically do not breed until they are at least 18 months of age (Nowack, 1991). Males do not breed until they reach full size at about 5 years of age (Nowack, 1991).

Trophic Interactions: Wild hogs are omnivorous eating roots, leaves, acorns, nuts, bulbs, and tubers, as well as snails, slugs, earthworms, insect larvae, frogs, reptiles including venomous snakes, bird eggs, rats, mice, small weakened or vulnerable mammals, and carrion (Lowery, 1974; Bratton et al., 1982; Laycock, 1984; Baber and Coblentz, 1987; Gingerich, 1994). Laycock (1984) reported a wild hog attacking, killing and eating a white tailed deer fawn. They are occasionally even cannibalistic (Gingerich, 1994). Subadults consume a greater quantity of animal matter than adults and under yearlings tend to have a more diverse diet than subadults or adults (Dardaillon, 1989). Diet tends to vary seasonally with availability of mast (fallen acorns and nuts) which is a preferred food item, and with climate (Golley, 1962;

Belden and Pelton, 1975; Bratton et al., 1982; Van Buren, 1984; Baber and Coblenz, 1987). For animals established in Georgia, roots and tubers constitute the main food items taken in winter, whereas leeches, earthworms, insects and fiddler crabs make up a greater portion of the diet in spring and summer. In uplands acorns, roots, seeds, and pines are preferred items (Golley, 1962). Foraging occurs both during the day and night, but is most intense at night, especially during the summer (Van Buren, 1984; Gingerich, 1994). The tusks which may be used as dangerous weapons, function primarily in finding and harvesting food (Laycock, 1984). Although a hoofed mammal, wild hogs have only one stomach, and do not chew cud (Ingles, 1965).

Young wild hogs are taken by a number of different predators, including, hawks, owls, eagles, foxes, and bobcats (Laycock, 1984; Gingerich, 1994). Adults are rarely taken because of their large size, but panthers occasionally kill and consume wild hogs in southern Florida (Gingerich, 1994).

Maximum Size:

Some domestic hogs may weigh as much as 450 kg (Nowak, 1991).

Distribution:

Wild boars, from which domestic hogs originated, originally occurred from southern Scandinavia and Portugal to southeastern Siberia and the Malay Peninsula, from western Sahara to Egypt, and on Britain, Ireland, Corsica, Sardinia, Sri Lanka, Japan, the Ryukyu Islands, Taiwan, Hainan, Sumatra, Java, and many small islands of the East Indies as far east as Komodo (Nowak, 1991).

Wild hogs occur in all five Gulf states (Whitaker, 1988), including several barrier islands (Baron, 1982).

Potential Impacts:

Where abundant wild hogs can have devastating effects on the ecosystem. They consume large amounts of food and may reduce the food supply available for animals such as deer, bear, rabbit, squirrel and turkey (Lacock, 1984; Gingerich, 1994). The most serious damage comes from rooting which is their natural feeding behavior (Laycock, 1984; Gingerich, 1994). Wild hogs overturn large areas of turf leaving a considerable area without vegetation. Rooting is most intense in areas and seasons in which mast is scarce (Bratton et al., 1982). Understory vegetation in forests is greatly affected as are ground nesting birds such as grouse and wild turkey, terrestrial salamanders, etc. (Belden and Pelton, 1975; Laylock, 1984). Rooting is also fairly intense in wet areas under forest cover, and concern over species in these areas has been expressed (Bratton et al., 1982). Reports of species imperilled by rooting behavior from other parts of the United States include the southern red-backed vole, *Clethrionomys gapperi*, the northern short-tailed shrew, *Blarina brevicauda*, and the red-cheeked salamander (Laylock, 1984; Singer et al., 1984), as well as regionally endangered herbs such as *Stachys clingmanii* and *Woodwardia virginiana* (Bratton et al., 1982). Singer et al. (1984) reported wild boars in monitored areas of the Great Smokey Mountains National Park to have reduced plant cover by as much as 80%,

increase bare ground by 88%, reduced the depth of the forest litter by 65%, reduced the weight of leaf litter by 59%, exposed 1,400 - 2,800 tree roots/ha, decreased bulk density of soil, accelerated decomposition and loss of nutrients from the forest floor, and altered the nitrogen transformation process in watersheds, with nitrate-nitrogen in stream water double their usual levels (Singer et al., 1984). Wild hogs probably have similar effects on ecosystems of the Gulf states.

In addition, wild hogs are a reservoir for several serious diseases. They carry pseudorabies, which is fatal in panthers, swine brucellosis which can be fatal in people, and trichinosis (Gingerich, 1994), among others.

Recommendations:

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