



# **NO** Feral Hogs in Virginia

## A Problem Based Learning Unit on Feral Hogs



Virginia Department of Game and Inland Fisheries,  
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This unit was developed as a joint effort between the Dept. of Game and Inland Fisheries and the following educators:

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## Feral Hog – Problem Based Learning Unit

What are the environmental issues surrounding a population of Feral Hogs in Virginia?

### The problem:

Feral hogs are considered the number one invasive species in the U.S. Populations of feral hogs are currently becoming established in Virginia. They are detrimental to natural habitats and endangered native plant and animal species. Once established, feral hogs are nearly impossible to eradicate. Adult feral hogs have no natural predators aside from humans and exhibit a very high reproductive potential, a population can triple in size in 14—16 months. Feral hogs are not only a risk to Virginia’s native wildlife resources, but also to the health of the Commonwealth’s commercial pork industry. They can harbor many diseases and parasites including swine brucellosis, pseudorabies, Trichinella, and toxoplasmosis, some of which are transmissible to livestock, pets, wildlife, or humans. Feral hogs can cause extensive crop damage and pose threats to health of livestock and farm equipment from rooting damage to fields, fences, and pastures. The wallows produced by the hogs can impair local waterways.

**Before there is a local population of feral hogs causing problems, your team must develop a strategy to keep them out of the county.**

**Introductory activities:** The activities below were developed to support this unit. Teachers may use only those that address their curriculum or they can choose to use all if desired. The activities are not in any particular order, that is left to the teacher to determine.

- *Environmental Dilemma – Nuisance or Resource*
- *Disease Outbreak – Pseudorabies*
- *Fence in – Fence out*
- *Wanted for Questioning*

**Research the issue:** You can find additional information on the Dept. of Game and Inland Fisheries’ [Feral Hogs in Virginia](#) webpage.

- Brainstorm issues and possible solutions
- Student research and discussion may include:
  - What are feral hogs?
  - Where did they come from?
  - How do they move to new locations?
  - What are the issues they create in the ecosystem?

### **Project Presentations:**

Students create and present a presentation that they prepare for their classroom town council. The presentation should use their initial research to explain:

- What are feral hogs?
- How does a feral hog population end up in a community?
- How can a community prevent the introduction of a feral hogs (awareness through education, notification at the first sittings, issues with free range livestock, etc.)?
- Different current solutions to feral hogs
- Specific solutions for their community

Presenters should be prepared to take questions and be prepared to defend their specific proposed community solution.

Local professionals may be invited to listen to the presentations including representatives from the Soil and Water Conservation District, Extension Service, Agricultural Community and VA Natural Resource Agencies.

### **We would like your help:**

This unit is new and the Department still has a few activities under development. The invasive nature of Feral Swine is a major ecological threat to Virginia's forest, fields and waterways. If you use any part of this unit or have comments on the activities or ways they can be improved we would love to hear from you.

Send comments to [Suzie.Gilley@dgif.virginia.gov](mailto:Suzie.Gilley@dgif.virginia.gov) thank you

## **Environmental Dilemma – Nuisance or Resource?**

Students debate the pros and cons of the presence of feral swine in the community.

### **Background:**

Virginia is on the front lines of the northward spread of feral hogs in the eastern United States. Feral swine are detrimental to natural habitats and endangered native plant and animal species. Once established, they are nearly impossible to eradicate. Adult feral swine have no natural predators aside from humans and exhibit very high reproductive potential. A population can triple in size in 14—16 months. Seventy percent of a population must be removed each year to stabilize growth.

Feral swine are not only a risk to Virginia's native wildlife resources, but also to the health of our commercial pork industry and other domestic species. They can harbor many diseases and parasites including swine brucellosis, pseudorabies, *Trichinella*, and toxoplasmosis, some of which are transmissible to livestock, pets, wildlife, or humans. Feral swine can cause extensive crop damage and pose threats to health of livestock and farm equipment from rooting damage to fields, fences, and pastures.

The domestic pig can survive on its own and become feral in a very short time. Within three generations the pig will take on wild characteristics, growing a bristly coat, and tusks for rooting (these teeth are normally pulled in domestic populations). In Virginia they are classified as a nuisance and invasive species. Once wild, feral hogs become wary of man and can be dangerous to people and domestic animals.

Citizens have a variety of opinions about feral swine; some would like the population to grow for recreational hunting or to harvest for the meat market, others contend that the damage caused by the feral hogs outweighs any benefits.

Additional information on feral hogs can be found on the Department of Game and Inland Fisheries website at <http://www.dgif.virginia.gov/wildlife/feral-hogs/> .

### **Procedure:**

- 1) Provide some initial background on feral swine, providing students with the website mentioned above or printed copies of the resources provided on the state website.
- 2) Divide the class into teams of four and provide them with the scenarios below representing four different perspectives on wild hogs in a community.
- 3) As a team they should research and discuss each of the questions provided coming to a team conclusion as to the best option for the community.
- 4) After all discussion questions are answered, the teacher will facilitate a class debate or Socratic seminar on whether they believe the invasive feral swine is a nuisance or a resource.

### **Discussion and/or Research Questions**

- What is an exotic (or non-native) species?
- When does an exotic species become an invasive species?
- What is pseudorabies?
- What is a ruffed grouse? What does it mean to be a “game species”?
- What do you think it means to be an “opportunistic omnivore”?
- What is a threatened species? What is an endangered species?
- Does Mr. Smith have the right to sue Mr. Cretin because the hogs have moved onto Mr. Smith’s land? Why or why not?
- Does Mr. Smith have the right to shoot any feral hogs that are on his land? Why or why not?
- How do Virginia’s fence laws (i.e. “fence in” vs. “fence out” counties) influence the outcome?
- Does Miss Montgomery have the right to sue Mr. Cretin because the hogs are threatening her business? Why or why not?
- Since the Cretins own their own land, shouldn’t they be allowed to do what they want on it? Why or why not?
- Do the rights of the public trump one’s personal rights, and thus, rights of one’s own land?
- At what point does the overall ecological health of the land trump one’s personal rights, and thus, rights of one’s own land?
- Should laws be passed to protect the health of the river?
- What is biodiversity and why is it important?
- How do invasive species such as the feral hog threaten biodiversity?

**Perspective #1: Bob Crietin**

The Crietin family owns over 30 acres of property in the southwestern region of Virginia. An avid deer and turkey hunter, Mr. Crietin read an article in the local paper of the invasive feral hogs in the neighboring county, and he and his three sons decided to try their luck hunting these wild hogs in a controlled hunt set up by the Department of Game and Inland Fisheries, DGIF, last year. During last year's hunt, Mr. Crietin shot a hog and was able to bring it home to feed his family. The Crietin family enjoyed the pork and Mr. Crietin signed up to participate in the next one. Mr. Crietin's oldest son Bob, however, did not want to wait until the next organized hunt. After all, he thought, we can hunt deer and turkey on our own property, therefore, how cool would it be to hunt wild hogs on our own property as well? Under the cover of darkness, Bob and his friends transported three feral hogs onto his family's property and released them.

Since the release of the three hogs six months ago, Bob has noticed a lot of damage to his family's property. Much of the ground has been overturned as if by a plow, he has observed girdling on the trees, and wallows have been dug everywhere, making it difficult to get along the paths they had cleared for their four-wheelers. This makes it harder to hunt on their property and that is the primary reason why they bought it. Most disturbing of all is the apparent drop in the deer population and the complete disappearance of the wild turkeys that they once enjoyed hunting on their property. Bob's father did, however, shoot one of the hogs on his property and the family was able to prepare several meals from that one hog.

**Perspective #2: Jim Smith**

The Smith family owns a 200 acre working farm that borders the Crietin's property. Jim Smith grows strawberries, corn, soybeans and various other vegetables. Mr. Smith also runs a small dairy farm that provides local fresh milk and ice cream to the town's grocery market. The Smith family farm has been in their family for four generations and is their family's sole income. Furthermore, the Smith's milk is the only local organic milk sold in the town's grocery market.

Unfortunately, Mr. Smith's farm is greatly suffering in recent months because feral hogs have moved onto their land. Jim has lost thousands of dollars to destroyed and eaten crops. Furthermore, the fences that surrounded and protected his dairy cows have been pushed through and destroyed.

Worst of all, one of his cows became severely ill and died recently. The veterinarian diagnosed the cow with pseudorabies.

**Perspective #3: Ann Sharp**

Ann Sharp is a graduate student at a university two miles from the Smith family farm. Her thesis is on the effect of both the selective and clear cutting of trees on the ruffed grouse populations of the region. Surprisingly, Ann has noticed a steep decline in a population of ruffed grouse that inhabits an ecosystem untouched by tree harvesting. It appears that a voracious consumer has ravaged the acorn and beechnuts in the area, as well as the young herbs, leaves, and flowers that inhabit the ecosystem. Ann is greatly concerned that her beloved grouse will not be able to compete with the gluttonous appetite of this unwelcome newcomer. Furthermore, Ann has found evidence that its destructive rooting has disturbed the nesting habitats of the ruffed grouse, and was devastated to find it had even eaten grouse eggs and hatchlings. Though not a threatened or endangered species, the ruffed grouse is a favored game species among the residents of the region.

**Perspective #4: Allison Montgomery**

Allison Montgomery is the owner of a canoe and kayak touring company. Her small business brings tourists on paddling trips along a beautiful river that is downstream from the Smiths and Cretins properties. In recent months, Allison has noticed a drop in the once abundant wildlife populations that attracted her customers. Worse still, the river has taken on a mysterious smell and contains an excessive amount of silt and particle suspension. Alarmed, Allison placed a call to the Department of Environmental Quality to come out and investigate. It was determined that there was bacterial contamination in the once pristine waters of the river, and the biologists suspect that invasive hogs are to blame.

## **Pseudorabies Outbreak**

Students will follow the path of transmission of one of the pathogens carried by Feral Swine to domestic animals through a simulated lab experience.

### **Background:**

A pseudorabies outbreak has been confirmed near Glatha, Tolley County, Virginia. The outbreak claimed the lives of 4 hunting dogs after they encountered a feral swine carcass in the nearby woods. The dogs had scavenged and eaten the meat from the infected feral swine, and soon after the dog's showed signs of "mad-itch," a common side effect of the viral infection.

Feral swine are descendants of the domesticated pig. Once feral they are an invasive species, a public nuisance and a threat to Virginia's ecosystems. They compete for wild animal food resources, destroy habitat by rooting and wallowing and will eat ground-nesting birds, eggs, fawns and young domestic livestock.

Feral swine can be carriers of the pseudorabies virus which is transmitted through nasal and oral secretions. Pseudorabies is fatal to cats, dogs, cattle, sheep and goats. The Department of Health stresses that pseudorabies is not transmissible to humans, but feral swine can be carriers of multiple viruses, parasites and bacteria that can lead to severe illness. Caution should be used when encountering and processing feral swine due to the potential health risks to both humans and pets.

Blood samples were taken from several feral hogs that were turned in by hunters from the local area. Samples were also collected from the hunting dogs that had been exposed to these hogs. One of the dogs was reported as showing signs of possible pseudorabies infection. All samples are being analyzed as part of ongoing research on the spread of feral swine disease.

### **Preparation:**

***Perform the following disease transmission lab to determine the path of transmission.***

### **Lab: Pseudorabies Transmission**

#### **SAFETY:**

1. Do not touch any of the liquids in the laboratory. Inform instructor of any spills.
2. Wear goggles at all times!
3. Hold cup away from your body and do not smell it!
4. Immediately rinse any liquid that contacts skin with water. Notify teacher of any accidents that occur in lab.

**Materials:**

- Laboratory procedure sheet and pencil
- One clear or opaque plastic cup with clear liquid supplied by your teacher.

*Note to teacher: All but one cup is filled  $\frac{1}{4}$  of the way with water; one cup is filled  $\frac{1}{4}$  the way with a solution of 0.1M NaOH. Sodium hydroxide is very hazardous in case of skin contact, eye contact, ingestion and inhalation; refer to your SDS regarding all safety precautions. To make a 0.1 M solution of sodium hydroxide, dissolve one gram of NaOH pellets in 250mL of distilled water. It is recommended that teachers obtain prepared Phenolphthalein from a chemistry teacher in the building.*

**Simulation:** This exercise is designed to simulate the passing of the highly contagious disease, pseudorabies, from one invasive feral hog to another, and/or from an invasive feral hog across species to a domesticated animal. Students will understand how quickly diseases can pass from one organism to another.

**Procedures:**

1. Abide by all laboratory safety rules paying particular attention to the ones listed above.
2. Students will line up in two different rows. All students will turn to their right and slowly walk in an elongate oval. When the teacher says "STOP", the students opposite of each other will turn to face one another.
3. Facing students will mix the liquids in their cups by having one of the students pour his/her cup contents into the cup of the student they are facing. The other student will then pour half of the contents of his/her cup into the other's empty cup. CAUTION: DO NOT SPILL any liquids!
4. Write down the name of the individual that you exchanged fluids below.\*
5. The lines will start moving again when the teacher says "START".
6. We will repeat this procedure (#2-4) two more times for a total of three exchanges.
7. After the three exchanges, carefully return to your seat with your cup.  
CAUTION: DO NOT SPILL any liquids! Do not remove your goggles!
8. The teacher will then move through the classroom dropping one drop of phenolphthalein into each cup.
9. If you are "infected" with the disease, your liquid will turn pink. (Phenolphthalein is a base indicator.)
10. Each class member will try to track the passing of the disease and identify patient zero, the first infected hog that started the outbreak.

11. Once lab is complete students should wash their hands with soap and water.

**List the individuals IN SEQUENCE that you exchanged cup contents.\***

1. \_\_\_\_\_

2. \_\_\_\_\_

3. \_\_\_\_\_

**DIRECTIONS:** List ALL the individuals in the class that were infected and try to determine the SEQUENCE of infection. Cross out individuals if the first or second person contacted is NOT infected. After discussing the path of infection with your classmates, you should be able to narrow it down to two students. Only your teacher can confirm this and tell you who had the initial infected cup. Circle "Patient Zero"- the individual who had the initial infected cup.

<i>Infected Individual</i>	<i>First Contacted</i>	<i>Second Contacted</i>	<i>Third Contacted</i>

**Discussion Questions:** Answer the following questions based on the lab and the article preceding the lab.

1. This activity was designed to show you how quickly a disease can pass from one organism to another. In the case of pseudorabies, how did the four hunting dogs become infected? Explain.

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\_\_\_\_\_

\_\_\_\_\_

2. Are all infectious diseases caused by viruses? Explain.

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**3.** Infectious diseases are spread in many ways. List several different ways that infectious diseases are spread:

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**4.** Based on your answer to #3, what are different ways that you can **prevent** the spread of infectious diseases?

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**5.** The article introducing this disease outbreak referred to the feral hog as an “invasive species”. What does it mean to be an invasive species?

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**6.** Why is the feral hog a threat to Virginia’s ecosystems? Explain.

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**7.** Pseudorabies is a disease that has the ability to cross over from one species to another, making it particularly dangerous. What other diseases have the ability to do this? Explain.

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**8.** Would an antibiotic be helpful in the case of pseudorabies? Why or why not?

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## Fence Them In or Fence Them Out

### **Objective:**

Students will: 1) identify a local issue resulting from a local land use law; and 2) evaluate alternative solutions to a land – use issue.

### **Activity Summary:**

Current preferences for free range and locally grown foods have created a lot of challenges for both farmers and consumers. Laws and regulations surrounding the production of foods have not kept up with current practices. One of the challenges are the Fence Laws in Virginia that date back to the 1630's and English Common Law. This law is currently set by the local government and adjoining counties may have different laws regarding fencing of livestock and fields.

Students will role play a community meeting of a governing board in a fictional community about the local fence laws.

### **Materials needed:**

Local fence law information - available on local government website or from local planning district office  
Copies of the background scenario and citizen cards

Reference article found at: [https://augusta.ext.vt.edu/content/dam/augusta\\_ext\\_vt\\_edu/files/va-fence-law-handout.pdf](https://augusta.ext.vt.edu/content/dam/augusta_ext_vt_edu/files/va-fence-law-handout.pdf) , teachers may also do a web search for "Virginia Fence Laws" to obtain additional information and examples.

### **Procedure:**

Provide students with copies of the background scenario, information about fencing laws and the list of concerned community residents.

Select seven students to be the Board of Supervisors who will hear the complaint and make a ruling. The rest of the class will play the role of local farmers, landowners, businessmen, reporters, outside experts and others in the community.

If possible, invite someone from the local Board of Supervisors or Planning Commission to come to class to discuss local ordinances around fencing.

Students should be given time to review their part and develop their presentation. This can be done in class or as a homework assignment. Students should prepare an initial statement lasting 3-4 minutes and can present further information as time allows. Those serving as members of the board should research the local law and/or review the reference article.

On the day of the meeting invite the students serving as the Board of Supervisors to sit behind a table set up in front of the room. The Chair will be responsible for keeping order and calling citizens to speak, another student may serve as the time keeper.

After everyone has had the opportunity to speak and ask questions, discuss as a class what would be best for the community and for the landscape. Guiding questions include:

- What are some things we have learned about land-use decision making?
- What factors influence land – use decision making and planning?
- What responsibilities do we have as citizens in helping to shape local regulations?

#### Background scenario:

Patrick-Ville is located about 60 miles south of the Washington DC in central Virginia. It is a small rural farm community struggling to get products to market. Several years ago the farmers decided to go natural to meet the new trend for locally produced foods as well as free range livestock. Northern Virginia and DC markets will provide a viable market for their meat and produce. Within the farming community there are several livestock farmers and different vegetable producers.

Since the community has made the decision to go organic, local business has been booming and other support industries have sprung up in town that have provided jobs for those that were not directly connected to agriculture in the past. A local market sells local honey and wool yarns to tourists, farmer markets sell seasonal produce and a small feed and seed store caters to those wanting to grow a few vegetables in their backyards.

Lately there has been discussion around some problems that have occurred in the community. Fields have been torn up and crops eaten or trampled. Some of the bee hives have been destroyed and fences knocked down. The community is located in a fence - out county where landowners are responsible for fencing livestock out of their agricultural fields. The nearby adjoining county has laws requiring that livestock be fenced in.

Putting fences around crop acreage is expensive and the farmers would like the county to change the fence law that makes it the responsibility of the livestock farmers to keep their animals on their land and pay for any damages to the crops.

The livestock farmers state that they can't control an animal if it decides to roam, eat corn and other crops. They will be happy to come and retrieve any individual that gets lose but shouldn't have to pay for the damages since it would be difficult to prove it was a particular animal. They also contend that wild animals such as deer, bear and feral hogs also damage crops.

At the request of the town mayor, the local Board of Supervisors is holding a special meeting to discuss the fence laws.

Who lives in Patrick-Ville?

<p>The vegetable farmers have begun to rotate their crops and plant a variety of crops instead of a single crop in each field. Hedgerows have been allowed to grow up between the fields so that songbirds would be plentiful to feed on insects. Bat boxes have been erected on each field to help control agricultural pests. In addition, farmers depend on the sale of organic honey from the hives that been placed in the center of the fields to pollinate the crops.</p>	<p>Mary Glass has started a horseback riding business. She rents the use of local lands to take tourist on quiet rides in the country. Recently, several of the more popular wooded trails have appeared plowed and there are large mud puddles alongside the trails. This creates a danger to her horses as they may accidently step into holes in the uneven ground.</p>
<p>The poultry farmer, Ms. Jones, owns 30 acres and has replaced her chicken houses with large fenced areas so the birds can roam in a semi-free state but still be protected from both avian and mammalian predators. The three fenced areas are each equipped with nesting boxes for roosting and laying. Each area is connected to the next with a narrow run. The birds can feed on wild insects and seeds and then are moved to another run allowing each run to recover naturally. Ms. Jones has trained her small herding dog to herd the birds through the gates from one area to another.</p>	<p>Sally Trout lives on the outskirts of town and has a small 3 acre lot. She has a backyard garden surrounded by a picket fence. She grows tomatoes, beans and other vegetables along with a small wildflower garden. She has 2 laying hens that nest in an old dog house. Last week, she discovered her fence had been knocked down and something had destroyed her garden and got into the hen house destroying the nests. She found her hens frightened and hiding behind a chair on the porch.</p>
<p>The hog farmer, Mr. Smith, has opened the pen gate and allowed his hogs to roam free on his land. All of his hogs have been vaccinated and certified disease free. The hogs come when called by Mr. Smith for food although lately some have been staying a little further away and he hasn't been able to capture all the young piglets, which tend to be wilder than their parents, for their shots and examinations. Mr. Smith has an electric – wire fence around the property the hogs roam and has a cattle guard across his driveway.</p>	<p>Mr. Clarke raises goats for their milk which he turns into cheese. He also raises sheep and lamas for their wool. He provides the wool to a local industry which creates yarn that is sold nationally. Mr. Clarke's pastures are fenced. The sheep, goats and lamas stay in the pastures and are watched over by a very protective herding dog.</p>
<p>Jon Deer lives in town in a small apartment. He enjoys long walks in the country side to watch birds. His favorite birds are the eastern meadowlark and bob-white quail. For several years it appeared that the populations were growing because of the new farming practices adopted by the community. Lately the populations don't appear to be as healthy and he is wondering if predators are destroying nests since both species build their nests on the ground.</p>	<p>Samantha Kool owns a small souvenir shop in town where she sales honey, yarns and other items manufactured in the community. She often enjoys walking with Jon Deer. She isn't a birder but loves the native wildflowers and pollinators that can be seen along the roadways. She takes pictures and then frames them for sale in her shop.</p>

<p>Joe Pine owns a local fencing company. He is an expert on the various types of agricultural fencing and what types of fencing will be most effective at keeping animals away from crops and in their pens. He also sells cattle guards and other equipment used in agriculture.</p>	<p>Bob Hunter, writes for the local paper “The Sunny Side Press” He recently wrote about the damage to a local farm and to a local forest and wants to do a follow-up story.</p>
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**Additional resources that may be useful:**

Information and resources on Virginia’s fence laws:

[https://augusta.ext.vt.edu/content/dam/augusta\\_ext\\_vt\\_edu/files/va-fence-law-handout.pdf](https://augusta.ext.vt.edu/content/dam/augusta_ext_vt_edu/files/va-fence-law-handout.pdf)

Bob-white Quail: <http://www.dgif.virginia.gov/quail/> or

<http://www.dgif.virginia.gov/wildlife/quail/action-plan/quail-action-plan.pdf>

Feral Pigs: <http://www.dgif.virginia.gov/wildlife/feral-hogs/>

Black Bears: <http://www.dgif.virginia.gov/wildlife/bear/>

Project WILD activity “To Zone or Not to Zone” for information contact [Suzie.Gilley@dgif.virginia.gov](mailto:Suzie.Gilley@dgif.virginia.gov) or

[www.projectwild.org](http://www.projectwild.org)

## Wanted for Questioning

**Objective:** Students will solve a mystery using questioning skills.

Students will role play parts in an investigation of who may have damaged the farmer's field as mentioned in the newspaper article, *The Sunny Side Press*.

**Procedure:** Divide your class into groups.

Choose one group to represent the Chief of Police, his/her assistant and detectives;

- The **Chief and assistant's** role is to make sure that all suspects are read their rights and makes the final decision if there is enough information to prosecute the suspect or let them return to the wild.
- **Detectives** will conduct the investigations on each suspect and then question each suspect for additional information.

The other students are divided into smaller groups made up of wildlife suspects and their attorneys. Provide each group with one of the wanted posters of suspects. The wanted posters contain some information and have blank sections for the students to do additional research on the species. Depending on the amount of class time available; teachers may include all or part of the information on each poster. Blank cards are available if the teacher would like the students to conduct all the research.

Within each group are the following roles:

- **Wildlife Suspect** who may have done the damage to the field. If needed teachers may assign two students to this role in the group.
- **Attorneys** for each of the suspects. Attorneys will help defend their client during questioning by detectives.

Allow time for the students to complete their research and develop their defense.

After the research is completed set the stage for a "friendly" interrogation of each suspect to include:

Questioning skills for detectives

- types of questions to ask
  - Where were you on the night of \_\_\_?
  - What is your favorite food
  - How do you get that food
  - Did you damage the farmers field
  - Need to examine foot print (have comparisons ready)

- How to ask a question without harassing the suspect.

Chief of Police or Assistant can step in if things get out of hand; remind students that all suspects must be treated fairly and are innocent until proven guilty.

A suspect may also be read a modified version of their Miranda rights *“that he/she has the right to remain silent and that anything the person says will be used against that person in court; the person must be clearly informed that he/she has the right to consult with an attorney and to have that attorney present during questioning, and that, if he/she is can’t afford an attorney, one will be provided at no cost to represent him/her.”*

## Suspect Wanted for Questioning

### *Ursus americanus*

AKA : Black Bear; American Black Bear; Bear

<http://www.dgif.virginia.gov/wildlife/bear/black-bear-facts/>

**Physical Description:** Approximately four to seven feet from nose to tail and two to three feet high at the shoulder. Males are larger than females. Suspect has small eyes, rounded ears , a long snout, large non-retractable claws, a large body, short tail and shaggy hair.



**Known Associates:** Solitary most of the year. Females will travel with young.

**Last Known Location:** Seen roaming throughout Virginia.

**Behavior:** Suspect has been known to tear apart entire logs in search of insects using its long claws.

**Dining Preferences:** Omnivore including berries, insects, grass, small mammals. Also has a sweet tooth.

**Evidence:**

## Suspect Wanted for Questioning

### *Meleagris gallopavo*

AKA : Turkey, Tom Turkey, Wild Turkey, Gobbler

<http://www.dgif.virginia.gov/wildlife/turkey/factsheet.asp>

**Physical Description:**

Turkey is a large bird 36-44 inches in length with iridescent bronze feathers and black and white barring on wings. Large fan like tail used by males to attract females. Head and neck are void of feathers and can be red to a bluish- gray. Males have a black beard and spurs on their legs.



**Known Associates:** May travel with 20 – 30 others in a flock.

**Last Known Location:** Seen in rural and some suburban communities throughout Virginia

**Behavior:**

Individuals and flocks will scratch up large sections of ground looking for preferred food.

**Dining Preferences:** Suspect feeds on insects and other invertebrates. A variety of seeds including acorns are also a favorite.

**Evidence:**

# Suspect Wanted for Questioning

## *Sciurus carolinensis*

AKA : Squirrel, Gray Squirrel, Old Bushy Tail

<http://www.dgif.virginia.gov/wildlife/information/?s=050057>

**Physical Description:** Suspect has a bushy tail, moderate ears without tufts and a grayish to yellowish brown coat on the upper parts (though no hair is all gray, some tipped with white), white under and on the chin, abdomen, and ventral legs. Weight: 16-18 ounces Length: 12-21 inches



Hole dug by squirrel

**Known Associates:** Other squirrels in area, often seen chasing others through trees.

**Last Known Location:** Parks, forests, backyards where there are oak and other mast producing trees. Two subspecies are found in Virginia, a northern and a southern. Both are similar in appearance.

**Behavior:** Known to bury up to 1,000 nuts each year and later will dig them up creating small holes. Will dig through leaf litter in search for food.

**Dining Preferences:** Herbivore mainly feeding on nuts and seeds but is known to occasionally feed on insects, eggs and young birds.

**Evidence:**

# Suspect Wanted for Questioning

## *Scalopus aquaticus aquaticus*

AKA : Mole; Eastern Mole

<http://www.dgif.virginia.gov/wildlife/information/?s=050017>

**Physical Description:** This suspect is distinguished by its large, wide, almost hairless forepaws. The tail is short, round, scantily haired. The nose is elongated into a distinct snout. The eyes are small with no external opening, and external ears are not present. The fur is dense, silky, colored from black to silver.



**Known Associates:** Tends to be solitary

**Last Known Location:** eastern half of state and at lower altitudes in the western portion. They are most common in grassy fields, meadows, pastures, lawns and forest floors. They require well drained sandy soils which have a low rock and clay content

**Behavior:** Digs long tunnels that are either surface runways approximately 2-3 cm deep, used primarily for food collection, or deep permanent passages (10-40 cm deep) used for living quarters. They are active day and night in burrows.

**Dining Preferences:** Feeds on a wide variety of invertebrates including worms and grubs.

**Evidence:**

# Suspect Wanted for Questioning

## *Marmota monax monax*

**AKA:** Groundhog; Woodchuck; Whistle Pig

<http://www.dgif.virginia.gov/wildlife/information/?s=050054>

**Physical Description:** Large heavy-bodied rodent with a total length from 20 to 27 inches and a weight from 5 to 10 pounds. It has a short head, and legs, and short, well-haired ears. They have grizzled or grayish brown fur above, the belly is paler, and the feet and legs are dark brown to black.



**Known Associates:** Loner, males awake from hibernation to search for females in mid-February. Local legend states they will wake on February 2<sup>nd</sup>.

**Last Known Location:** Present everywhere in Virginia except the eastern shore and the extreme southeastern corner of the state. This species prefers open woods, brushy areas, and fields, individuals are occasionally found in dense timber stands. They use forest edges, meadow grasslands, blowdowns or other opening in a forest

**Behavior:** Builds extensive underground burrows usually with several openings. Leaves a large pile of dirt at entrance.

**Dining Preferences:** Herbivore, feeds on a variety of vegetation.

**Evidence:**

# Suspect Wanted for Questioning

## *Ondatra zibethicus*

AKA : Muskrat; Common Muskrat;  
Large –toothed Muskrat

<http://www.dgif.virginia.gov/wildlife/information/?s=050092>

**Physical Description:** Large rodent with a large, blunt head, small eyes, short small ears almost hidden in fur and partially webbed hind feet (broad) to accommodate its semiaquatic existence. They are aptly named for the strong musky odor they can produce. The fore feet are smaller and the tail is long, laterally flattened, scaly, and sparsely haired ventrally. The fur is rich brown above, with coarse guard hairs, paler below. Total length is 456-553 mm, and weight is 0.6-1.8 kg.



**Known Associates:** Dens in family unit.

**Last Known Location:** Two sub-species are found in Virginia, the Common Muskrat is found in the mountain regions while the Large-toothed Muskrat can is located in the eastern portion of the state.

**Behavior:** Builds small structures out of cattails and other aquatic plants. Will make bank burrows to store food.

**Dining Preferences:** Herbivore, feeds mainly on aquatic plants

**Evidence:**

# Suspect Wanted for Questioning

## *Sus scrofa*

**AKA :** Feral Pig, Feral Hog, Wild Boar, Wild Pig

<http://www.dgif.virginia.gov/wildlife>

**Physical Description:** Wild pigs are large even toed ungulate that may weigh over 500 pounds. The bristled coat may be solid color or spotted. Tusks are long and used for rooting in fields. Same species as the domestic pig raised on farms.



**Known Associates:** Will travel in family units called a “sounder”.

**Last Known Location:** Several small populations currently exist in the southeastern corner, central and southwestern portions of Virginia.

**Behavior:** The rooting behavior causes deep furrows in fields and in the forest. They will tear up native vegetation in their search for food. Wallows are created and will decrease the water quality in nearby streams.

**Dining Preferences:** This suspect will eat anything and everything from plants to invertebrates and even small vertebrate species. They have been known to destroy habitats and crops in their search for food.

**Evidence:**

# Suspect Wanted for Questioning

## *Scalopus aquaticus aquaticus*

AKA : Mole; Eastern Mole

<http://www.dgif.virginia.gov/wildlife/information/?s=050017>

**Physical Description:**

**Known Associates:**

**Last Known Location:**

**Behavior:**

**Dining Preferences:**

**Evidence:**



# Suspect Wanted for Questioning

## *Ursus americanus*

AKA : Black Bear; American Black Bear; Bear

<http://www.dgif.virginia.gov/wildlife/bear/black-bear-facts/>

**Physical Description:**

**Known Associates:**

**Last Known Location:**



Virginia Department of Game and Inland Fishes

**Behavior:**

**Dining Preferences:**

**Evidence:**

## Suspect Wanted for Questioning *Sciurus carolinensis*

AKA : Squirrel, Gray Squirrel, Old Bushy Tail

<http://www.dgif.virginia.gov/wildlife/information/?s=050057>

**Physical Description:**

**Known Associates:**

**Last Known Location:**

**Behavior:**

**Dining Preferences:**

**Evidence:**



## Suspect Wanted for Questioning *Meleagris gallopavo*

AKA : Turkey, Tom Turkey, Wild Turkey, Gobbler

<http://www.dgif.virginia.gov/wildlife/turkey/factsheet.asp>

**Physical Description:**

**Known Associates:**



**Last Known Location:**

**Behavior:**

**Dining Preferences:**

**Evidence:**

## Suspect Wanted for Questioning

### *Ondatra zibethicus*

AKA : Muskrat; Common Muskrat;  
Large –toothed Muskrat

<http://www.dgif.virginia.gov/wildlife/information/?s=050092>

**Physical Description:**

**Known Associates:**

**Last Known Location:**

**Behavior:**

**Dining Preferences:**

**Evidence:**



## Suspect Wanted for Questioning

### *Sus scrofa*

AKA : Feral Pig, Feral Hog, Wild Boar, Wild Pig

<http://www.dgif.virginia.gov/wildlife/feral-hogs/>

**Physical Description:**

**Known Associates:**

**Last Known Location:**

**Behavior:**



Dining Preferences:



# The Sunny Side Press

Evidence:

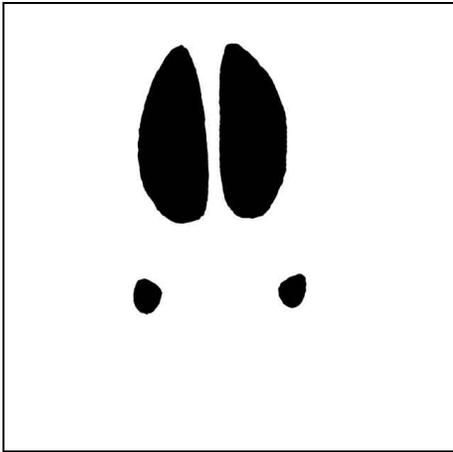
Serving Your Virginia Communities

January 20, 2018

# Local Property Damage Raises Many Questions/Concerns

by: Terri Harris

Yesterday morning, a local farmer awoke to a very disturbing scene on his property. While taking his routine morning walk, Daniel Thomas stumbled upon a large area of overturned and trampled soil in one of his pastures. There were no tire tracks observed leaving the scene of the crime, only mysterious markings that the local police department has yet to identify.



The drawing above was provided by the local police department's sketch artist. It depicts the markings that were left at the scene of the crime.

To the right, you can see a detailed example of Mr. Thomas' property damage.



The picture above shows a large portion of Mr. Thomas' damaged pasture..



This particular pasture was often used for hay production. It is feared that the culprit may be visiting similar locations for future destruction. As you pass by agricultural fields, oak forests, golf courses, and similar landscapes, keep your eyes peeled for this type of damage.

More pictures and related story page 2.



Property damage of this magnitude can be charged as a Class 1 misdemeanor in the Commonwealth of Virginia. Mr. Thomas has offered a **\$500 reward** for anyone with information leading to an arrest in this case.



Pictures from page 1, Local Property Damage:



In a related story:

### **Damage to local state forest is mystery.**

Local forester, Jamie Smith, has noticed damage in the State Forest. Large areas of the forest floor have been disturbed. Once crystal clear vernal pools are nothing but mud puddles, all the salamanders and tree frogs seen during the spring survey have disappeared.

Last fall's acorn or mast crop was pretty good remarked Smith, by mid-winter squirrels were having a hard time finding food. There is also a noticeable lack of new growth on the forest floor and the local garden club was disappointed not to see as many wildflowers on their annual spring hike.



# Feral Hogs in Virginia: Biology, Ecology & Effects on Native Wildlife and Habitats

Thanks to Katie Martin, District Wildlife Biologist  
for use of her presentation



# What is a Feral Hog?

- Feral: something domesticated returning to an untamed state
- DGIF Hunting/Trapping Regulation Booklet 2013
  - “Any free-ranging pig that is surviving on it’s own in the wild without human ownership”
- *Sus scrofa*: domestic swine, feral pig and Eurasian wild boar → All same species



# What is a Feral Hog cont.

- Domestication occurred over 9,000 years ago
  - Imported by Spanish explorers
- Coat color is not a determining factor
- Very intelligent, secretive and adaptable
- Occupy a wide range of habitats
  - Preference for riparian/wetland areas
- Lifespan: 4-8 year average
- Females often in groups known as sounders



Photo of sounder group in Culpeper County, VA (2013)



30.40 inHg ↑

62°F



05/19/09 08:01 PM

Courtesy of Jon Simmons, VDGIF



30.8 inHg ↓

63°F



05/16/09 07:09 AM

Courtesy of Jon Simmons, VDGIF

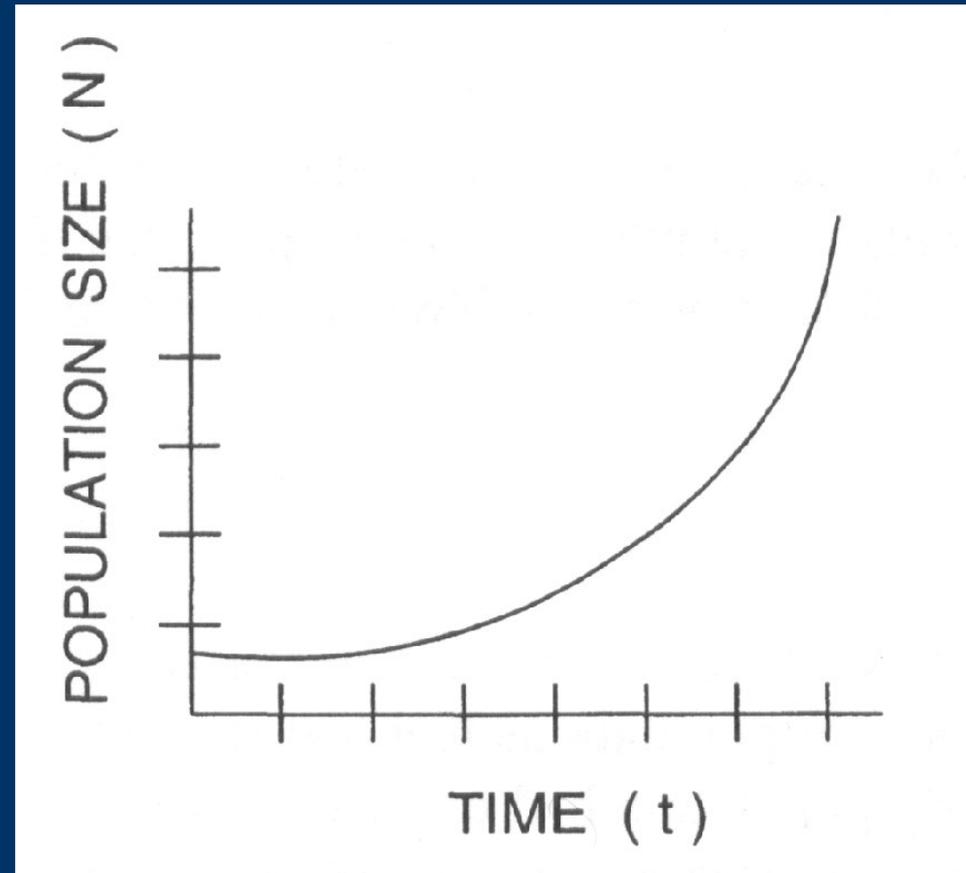


# Reproduction

- Can be sexually mature as early as 6 months of age
- Sows (females) can produce 3 litters in 14 months
- 4-8 piglets per litter
  - Depending on resources can have up to 10+ piglets/litter
- No defined breeding season like in our native wildlife
- Back Bay NWR / False Cape SP study
  - Frequently encountered pregnant sows with a litter of piglets
- What does a species do if reproduction is high and mortality is low?

# Population Dynamics

- High reproductive output
- Low natural mortality
- Population can triple in a little over 1 year
- **To stabilize you must remove 70% each year!**
- **Nearly impossible once established!**



# Behaviors: Rooting

- “Dig” up food
- Crop fields, base of trees (acorns, mast), wetlands
- Very destructive
- Increases erosion and sedimentation





# Behaviors: Wallowing

- Used to lower body temperature/protect from insects
- Contaminates water sources, increases erosion, destroys aquatic habitats



# Behaviors: Feeding

- Opportunistic omnivores
- Diet changes based on availability/season
  - Highly adaptable
- Majority of diet is plant based
  - All parts of plant: seeds, roots, leaves, stems, shoots, bulbs, bark, tubers and fruit
  - Mostly native plants
- Highly prefer mast producing species
- Consume all types of agricultural crops

# Feral Hog Ecological Impacts

- Threats to wildlife
- Habitat destruction
- Ecological damage
- Crop damage



# Threats to Wildlife Resources

- Direct competition for food
- Poor mast years → Increased competition
- Will aggressively exclude deer from feeding sites
- Depredate quail and turkey nests
  - Texas study: 20% of quail nests on 2 study sites
  - Can prey on young turkey, quail and grouse chicks/poults



# Threats to Wildlife Resources

- Predation of small animals
  - Salamanders, frogs, snakes, and even white-tailed deer fawns



# Threats: Wildlife Resources

## ■ Stream Sedimentation

- Aquatic invertebrates' lifecycle disruption
- Decrease spawning habitat for certain species
- Significant impacts on mussel production
- Huge negative impact in Chesapeake Bay watershed

## ■ Wallowing Areas:

- High bacteria loads
- Algae blooms
- Eutrophication
- ↓ Dissolved oxygen = Fish Kills

# Ecological Damage

- Rooting increases soil erosion
- Damage to sensitive plant communities
  - Especially problematic in riparian communities
- Water contamination
- Disturbance may increase spread of invasive plants
- Interrupts natural nutrient cycling

# Forest Ecosystem Damage

- Heavy mast consumers
- Rooting and mast consumption can hinder forest regeneration
  - Especially for oaks/hickories (large seeded trees)
- Tree roots damaged by rooting behavior
- Rub and feed on tree bark-lead to tree mortality



# Crop Damage

- Pigs cause millions of dollars in lost revenue to farmers annually
- Estimated at \$1.5 billion annually nationwide  
(Pimentel et al. 2002, Pimentel 2007)
- Vegetables, corn, soybeans, fruit trees, small grain, planted pine seedlings
- Damage to infrastructure
  - Pond levees, fences, irrigation equipment, etc
- Rooted fields can cause injury to livestock and damage to farm equipment
- Is happening right now in Virginia



05/10/2012 19:22

Gene Sullivan



05/26/2012 19:42

Gene Sullivan



# Conclusions

- Feral hogs are an ecological disaster
- Destroy habitat for native wildlife, native plants, streams and other sensitive ecological areas
- Agricultural damage happens quickly and can cause large financial impacts
- High reproductive capacity and low mortality = A fast moving problem
- And this is only the beginning of the story.....

# What can you do to help?

- Report feral swine when you see them.
- Do not import feral swine or release captive pigs.
- Don't glamorize feral swine!
- Share with others the issues surrounding feral swine.
- Feral swine are just one invasive species in Virginia, learn about others and what actions you can take to prevent the spread of invasive species.

# Thank you to the Feral Swine Curriculum Writing Team

## ■ Teachers

- Ruthanne Cole, M.S. - Bland County Schools
- Robert Cox - Orange County Schools
- Maurice Cullen - VA Beach City Schools
- Tanya Taylor - Chesapeake City Schools
- Adrienne Sawyer - Chesapeake City Schools
- Barbara Young – VDOE/retired

## ■ VDGIF Staff

- Peter Ackers, Biologist
- Glen Askins, Biologist
- Suzie Gilley, Educator
- Aaron Proctor, Biologist

# Feral Hogs: Trouble on the Horizon

by Aaron Proctor

You can call them wild hogs, wild boars, razorbacks, or even Russian boars. Most wildlife biologists refer to them collectively as feral hogs or feral pigs. Whatever you call them, they pose disastrous threats to wildlife habitat wherever they exist and are nothing but bad news. But what exactly is a feral hog? Merriam-Webster defines the word *feral* as “not domesticated or cultivated” and “having escaped from domestication and become wild.” Simply put, it’s a hog that is surviving on its own in the wild without ownership. Feral hogs do not have to possess thick and coarse black hair or have long tusks. They are known to have different shades and combinations of black, brown, red, and blonde hair. A feral hog can simply be a hog that has escaped a farm operation or has been released to the wild; free from the influence of any humans, buildings, or fences.

Currently, feral hogs are known to exist in at least 40 states across the country. There are an estimated 4 to 6 million nationwide, with an estimated 2.5 million in Texas alone. We can thank early explorer Hernando DeSoto for first introducing swine in the southeastern

U.S. in the 1500s in present-day Florida. Like many other domesticated livestock animals, hogs seemed an easy choice to bring to a new world as a food source. But there are some crucial differences between swine and other livestock animals. Hogs have the ability to thrive in a wild state, can exist in a variety of climates, and possess a very high reproductive potential. They also disturb the ground as they forage and turn up the earth (called “rooting”). They have been described as “four-legged ecological disasters.” That’s about as bad as it gets among the wildlife community.

A pair of mature swine can produce 3 litters of up to 4–8 piglets about every 14 months. Once piglets reach the juvenile size-class, approximately 40 pounds at about 6 months of age, there really aren’t any natural predators on our landscape that can control their numbers. Feral hogs are the biological equivalent of a military battle tank. Their coarse hair, thick skin, and cartilaginous plates on their shoulder blades evolved for protection from fighting with each other. Thousands of years of domestication are not enough to suppress these hidden genes. A group of pink and portly barnyard hogs left out in the wild can revert

back to this wild-looking state in only a few generations. They are also a filthy species. Feral hogs are known to carry at least 45 different diseases and parasites that can be infectious or harmful to livestock, pets, native wildlife, and humans.

In Virginia, the only long-term or historical population of feral hogs exists in the extreme southeastern Virginia Beach area, in Back Bay National Wildlife Refuge, and in False Cape State Park. Estimated to fluctuate between 200 and 500 individuals, this population is the result of subsistence farmers abandoning their homesteads in the 1920s–1930s and leaving their livestock behind. The fact that a breeding population of hogs has existed in this rather harsh and sandy environment for nearly 100 years is a testament to their heartiness and ability to survive in a multitude of habitats. Throughout the years, this population has been hunted through controlled programs and other collection efforts and is greatly undesired on both the federal and state lands they occupy. Yet they still exist, proving that hunting alone does not control population numbers.

A look at range maps from 1988 and 2009 (pg. 21) paints a grim picture. Feral hogs are spreading like wildfire across the country, and they don’t pop up in new areas without help. Pigs are not migratory animals. More and more suspect populations of feral hogs are appearing across the commonwealth, where wildlife biologists for both the Department (DGIF) and the U.S. Department of Agriculture, Wildlife Services speculate that intentional releases are occurring by those who wish to get feral hogs established for hunting purposes.

Decades of wild hog hunting in many states, often without bag limits under a “nuisance species” declaration, has done nothing to stop their spread. In fact, it is most likely making it worse. The popularization of hog hunting is growing, so it follows that the desire by some to transport and stock feral swine



## LEGEND

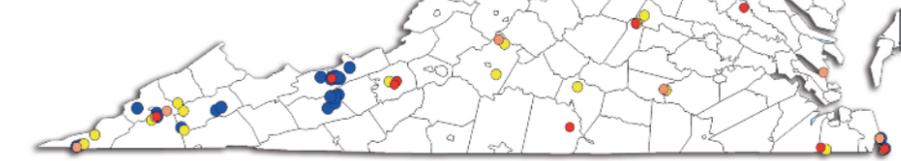
### Feral Hog Locations in the US

-  1988
-  2009

Map data courtesy of:  
Southeastern Cooperative  
Wildlife Disease Study –  
University of Georgia

### June 2012 Feral Hog (*Ses scrofa*) Locations in Virginia

-  CY 2012
-  CY 2010
-  CY 2011
-  1993-2009

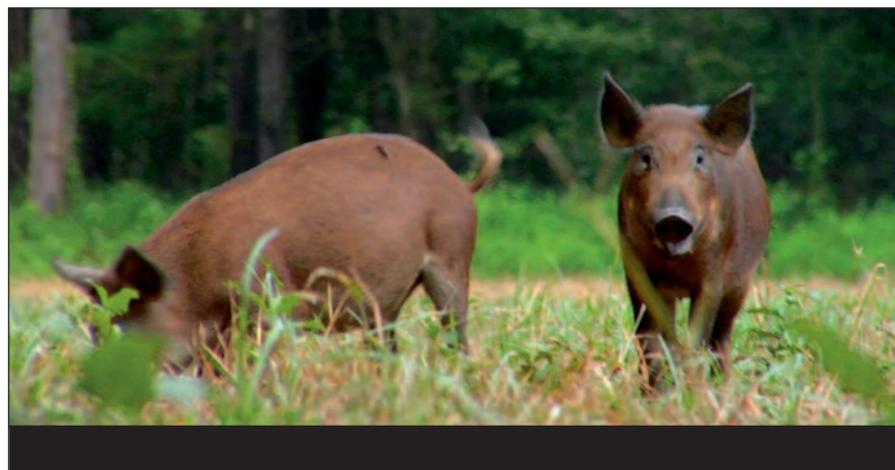


USDA APHIS WS VA & DGIF

*Feral hogs are known to carry at least 45 different diseases and parasites that can be infectious or harmful to livestock, pets, native wildlife, and humans.*

in new places is growing as well. But feral hogs are not “fun and games.” What may seem like an innocent sport where one can harvest hogs as a nuisance species actually poses a tremendous threat to our native wildlife and habitat across the commonwealth.

Last year the Department formed a feral hog committee along with partner agencies and is beginning to focus on the feral hog problem in Virginia. We hope that landowners, hunters, and wildlife enthusiasts alike will all band together to understand and support the idea that there’s no place for these hogs in the wild. If you see or suspect that feral hogs are on your property, please notify your nearest DGIF office. For more information on feral swine and control methods, please visit the following web pages: [www.extension.org/feral\\_hogs](http://www.extension.org/feral_hogs) and <http://wildpiginfo.msstate.edu/index.html>.



Mississippi State University Extension

The spread of feral hogs across the U.S. is nothing but bad news.



Jon Simmons

30.40 inHg ↑ 62°F 05/19/09 08:01 PM VCP543

Among other concerns, feral hogs cause tremendous damage to the landscape.

Aaron Proctor serves as the Department’s district biologist in the southeastern region of the state.