



PRV detection in a feral swine sounder, NY State, Spring 2021

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*Cayuga, Cortland, Onondaga, Seneca and
Ontario counties*

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Summary

- Multiple agencies
- Disease definition
- Multiple counties and premises affected
- Background
- Surveillance and testing
- Quarantines
- Resolution and challenges

NYS Department of Agriculture and Markets, Division of Animal Industry

- The DAI promotes sustainable animal production agriculture and the safety of the animal origin food supply.
- DAI veterinarians administer animal disease programs and, in conjunction with the US Department of Agriculture, establish health standards necessary for the marketing of animals and animal products in the state.
- Perform surveillance for animal diseases of significance to agriculture
- Control and eradication of infectious and contagious diseases in New York State livestock and poultry



USDA: Veterinary and Wildlife Services



- **APHIS VS** is organized into the VS Deputy Administrator's Office (VSDA) and strategically focused business units: Field Operations, Strategy and Policy, and Diagnostics and Biologics.
- APHIS works to protect and improve the health, quality, and marketability of our nation's animals (incl wildlife), animal products, and veterinary biologics. This subject area describes many of the diseases facing animals today, as well the steps APHIS is taking to prevent, control, and eliminate those conditions.
- The mission of **USDA APHIS WS** is to provide Federal leadership and expertise to resolve wildlife conflicts to allow people and wildlife to coexist. WS conducts program delivery, research, and other activities through its Regional and State Offices, the National Wildlife Research Center (NWRC) and its Field Stations, as well as through its National Programs.

Department of Environmental Conservation

- The DEC enforces environmental laws through a number of means, including traditional police-type law enforcement, as well as administrative and civil actions. To be effective, state enforcement personnel and policies must work in concert with their local and federal counterparts, and citizens must be kept informed and involved.



PRV non negative

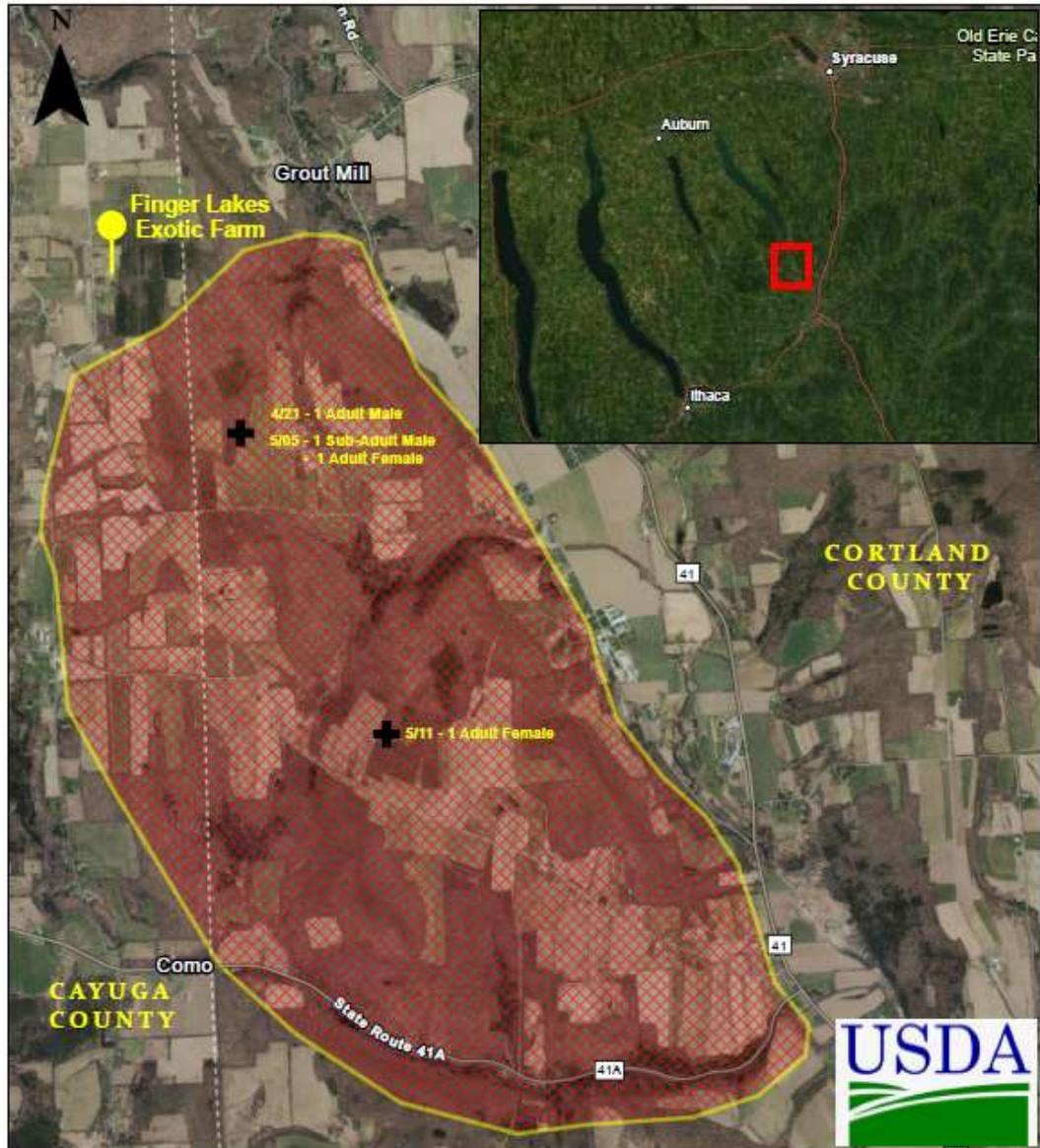
- 4/21/2021: USDA WS dispatched an adult feral swine boar in Cortland County. Blood samples were submitted to the Federal Brucellosis Laboratory in KY (KY-FBL) and, on 5/10/2021, the National Feral Swine Program reported that the samples were **non-negative for pseudorabies (PRV)** on gB-ELISA. These samples were later confirmed non-negative by NVSL (gB-ELISA and g1-ELISA).
- 5/5/2021: two additional feral swine (1 adult female, 1 sub-adult male) were dispatched by USDA-WS and samples were tested through the routine feral swine surveillance framework. Both pigs were reported gB-ELISA non-negative by the KY-FBL.
- 5/11/2021: Wildlife Services notified Veterinary Services that a feral pig sounder was present in Cortland County, NY and one pig was non-negative for pseudorabies at the KY-BFL.

Known Distribution of Feral Swine in New York

2020 - 2021

0 0.25 0.5 1 Miles

✚ Feral Swine Removed
✘ Feral Swine Distribution



Feral swine distribution

- Black X: locations where feral swine were removed
- Yellow line: perimeter of zone of epi investigation
- Area includes both Cayuga and Cortland counties, Moravia, Homer, and Groton

Background

- By law, New York does not allow the import of Eurasian Wild pigs for hunting preserves. However, swine hunting in preserves is permitted. The two preserves in the feral pig population report purchasing swine “locally” for release and hunting.
- NYS is free of feral swine (but domestic pigs can still get loose...)



PRV

- Pseudorabies (Aujeszky's disease) is a disease of swine that can also affect cattle, dogs, cats, sheep, and goats. Pseudorabies virus (PRV) is a contagious herpesvirus that causes reproductive problems, (abortion, stillbirths), respiratory problems and occasional deaths in breeding and finishing hogs. Infected newborn pigs may exhibit central nervous system clinical signs.
- PRV is primarily spread through direct animal-to-animal (nose-to-nose) contact between an infected, shedding pig and a noninfected pig. It may also be spread by sexual contact. If present on inanimate objects, such as boots, clothing, feed, trucks, and equipment, the virus can also spread from herd to herd and farm to farm.

Signs of PRV

- Clinical signs in pigs depend on the age of the affected animal. In **piglets**, central nervous systems signs, incoordination, sneezing, coughing, and high mortality. In adult pigs coughing, fever, pneumonia, central nervous systems signs, and reproductive signs such as failure to breed, abortions, mummified piglets, stillbirths, and small litters. **Adult pigs** often have low mortality and the virus can remain hidden in the pig in a carrier state for long periods of time.

PRV

- There is no treatment but antibiotic medications can control secondary bacterial infections. (PRV vaccines are available, require USDA approval for use, and can be used to assist in outbreak response efforts.)
- ***Currently, all 50 States are considered free of PRV in commercial production swine herds.*** PRV was eliminated from commercial herds in 2004 in the US.
- Exposure may occur via contact through open barriers or through outright co-mingling of domestic pigs with feral pigs. Free-roaming feral swine are currently found in at least 34 States

Feral swine background

- Feral pigs are **widely considered to be the most destructive invasive species in the United States**. They can do remarkable damage to the ecosystem, wrecking crops and hunting animals like birds and amphibians to near extinction. They have wrecked military planes on runways.



Feral swine sounder

- Game cam photo
- Sow and piglets



Feral swine sounder

- Game cam photo



Feral sounder

- April 2021: These animals belonged to a small sounder of originally about 8 adults that USDA-WS had been monitoring and working to remove. By the end of May 2021, they had removed 4 of the original 8, leaving 4-5 adults + six 2-3-week-old piglets (from trail camera monitoring)
- A *sounder* is a herd of feral hogs primarily **comprised of one or more adult sows and one or multiple generations of offspring**. A sounder is the primary social unit among feral hogs.



Local swine premises

- As of May 21, all premises with domestic swine within a 10-mile radius of the 4/21/2021 boar's harvest were contacted and/or quarantined.
- Epidemiological questionnaires and visit to each premise
- Kune Kune!

Local swine premises

- **Four non-commercial premises with domestic swine**
 - Backyard 2 adult Kune kune pigs and 6 piglets kept outdoors
 - Backyard 2 Kune kune adults in town kept outdoors in a backyard
 - Backyard 11 meat breed pigs kept inside a barn
 - Backyard 9 meat breed pigs kept inside a barn
- **Two hunting preserves**
 - One preserve within 0.5 miles of the known feral pig range, number of pigs is at least 16.
 - Another preserve within 5 miles of 4/21 boar harvest site has at least 20 pigs.

Quarantine criteria

- Premises with swine at high risk of exposure to *PRV* from a known source of infected feral swine in the area.
- All swine on the premises shall be confined and able to be restrained, identified, and blood tested for *PRV* and *SB* (or as many necessary to provide a 95% level of confidence for detection of 10% prevalence). If all pigs tested are negative for *PRV* and *SB*, the swine on the premises will be released without further restrictions.
- OR swine may be tested as they are harvested during hunts
- 3 premises quarantined: small hobby farm with 2 adults and 6 piglets, Cayuga Co. hunt preserve, Cortland Co hunt preserve

Testing

- The two hunting preserves were visited May 27 and offered several options for testing:
 1. Round up and confine all pigs and have them tested for PRV and SBr
 2. Collect serum samples from hunter-harvested pigs until all or a sufficient number have been sampled to ensure 95% confidence of detecting a 10% prevalence rate (95/10) within the preserve
 3. A combination of live pig testing and sampling of hunter harvested animals until at least a 95/10 level of sampling is completed.

Testing cont

- The remaining free roaming pigs in both hunt preserves were sampled by hunter harvest until the goal of 95/10 was met for each.
- The Cayuga hunt preserve as of 6/28/2021 all 20 pigs were sampled.
- The Cortland preserve tested 15/20 pigs; the owner reports he killed the remaining 5 for his consumption and did not collect samples.

How did we do this?

- Cortland County hunt preserve: we supplied them with kits to collect blood samples immediately after pigs were harvested. 15/20 were harvested in 2 hunts, samples collected by USDA/AGM staff
- Cayuga County hunt preserve: majority of swine were in a pasture and were corralled into a large stock trailer. USDA and AGM staff collected blood samples. The remaining animals were sampled after hunter harvest
- Local hobby farm: blood samples collected by AGM staff

Samples: feral swine

Table 1: NVSL Results feral swine:

IV No.	Premises ID	County	Date sampled	NVSL Acc No.	NVSL results	Date NVSL results	Lat/Long	Animal description
IV:2936:2 1	974,110	Cortland	4/21/2021	21-013967	g1 & gB ELISA <u>PRV non-neg</u>	5/14/2021	42.70672, - 76.26603	Adult boar
"	"	"	5/11/2021	21-014070	g1 & gB ELISA <u>PRV non-neg</u> VI no isolation	6/23/21	Not given	Lactating sow

Table 2: KY-FBL results feral pigs (excluding those confirmed at the NVSL):

IV No.	NPIN	County	Date sampled	Referral No.	Results	Date results	Lat/Lon	Animal description
IV:2936:21	974,110	Cortland	5/5/21	NYMJ050521	gB-ELISA <u>non-negative</u>	5/20/21	42.70672 -76.26603	Adult female
"	"	"	"	"	gB-ELISA <u>non-negative</u>	"	"	Sub-adult male
"	"	"	6/14/21	NYMJ061421	Negative PRV	7/8/21	Not provided	2 boars, 1 sow, 1 male piglet, 1 fe piglet
"	"	"	6/16/21	NYMJ061621	gB-ELISA <u>PRV non-negative (all 3)</u>	7/8/21	Not provided	2 Female piglet, 1 male piglet
"	"	"	6/29/21	NYMJ062921	Negative PRV	7/8/21	Not provided	Adult sow

Samples: domestic swine

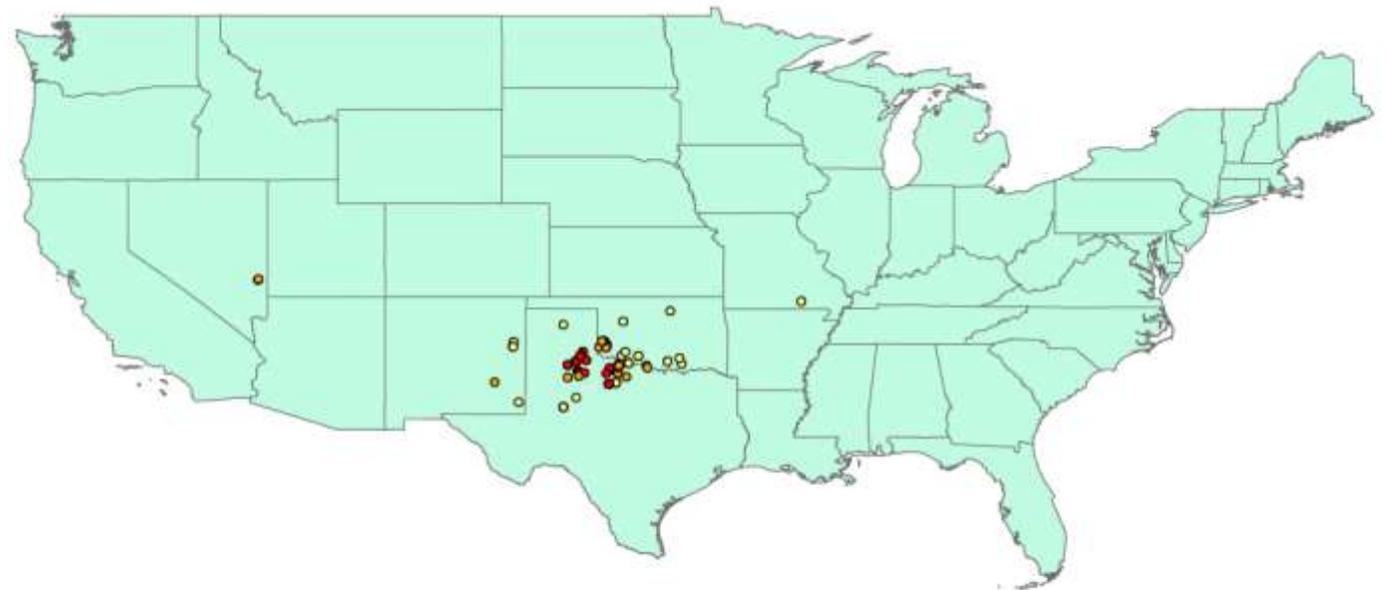
Accession	NPIN	County	Date sampled	Number sampled	Date resulted	Results	Type premises
21-016069	005OQY5	Cortland	5/29-31/21	9 adults of ~ 20	6/4/21	PRV g1 & gB ELISA negative; Brucellosis BAPA neg	Hunting preserve 1 st group tested
21-016814 21-016811	005OQY5	Cortland	6/5-6/21	6 adults (brings total to 15/20 sampled)	6/8/21	PRV g1 & gB ELISA negative; Brucellosis BAPA neg	Hunting preserve 2 nd group hunter harvest
21-016340	00QSPMV	Cayuga	6/2/21	1 of 2 adults	6/8/21	PRV g1 & gB ELISA negative; Brucellosis BAPA neg	Hobby farm
21-016339	00QSP11	Cayuga	6/2/21	11 of ~16 adults	6/8/21	PRV g1 & gB ELISA negative; Brucellosis BAPA neg	Hunting preserve
21-017634 21-017633	00QSP11	Cayuga	6/13/21	2 adults	6/17/21	PRV g1 & gB ELISA negative; Brucellosis BAPA neg	Hunting preserve
21-018830	00QSP11	Cayuga	6/27/21	3 adults	7/1/21	PRV g1 & gB ELISA negative; Brucellosis negative	Hunting Preserve

Genetics

- *“Specifically, the vast majority of feral swine represent a mix of Western heritage breeds and European wild boar with little contribution from major commercial breeds. Among these individuals, we see modest associations to Western heritage breeds and European wild boar balanced with associations to Chester Whites, Durocs, and some Yorkshire. Using the genetic tools currently available, it appears plausible that these individuals represent the progeny of a mixed breed domestic pig × feral swine (of wild-caught origin) pairing.”*
- Dr. Timothy Smyser PhD, National Wildlife Research Center

Genetics

- Genetic results show the pig was not an escaped pig of some heritage breed (such as the American Guinea Hogs which escaped in the area in 2019)
- WS reported the preliminary findings appear to provide evidence that **ID0036357 originated in northern Texas/southern Oklahoma area.**



Pairwise Genomic Relatedness

- 0.094299 - 0.109325
- 0.109326 - 0.129869
- 0.129870 - 0.161679

Eurasian boar (*Sus scrofa*)

- What are the regulations on Eurasian boar in New York State?
- To prevent Eurasian boar from entering or becoming permanently established throughout the state, the following regulations have been put into place:
 - As of October 2013, it is illegal to import, breed, or release Eurasian boars in NYS.
 - As of April 2014, it is illegal to hunt or trap free-ranging Eurasian boar in NYS.
 - As of September 2015, it is illegal to possess, sell, distribute, trade, or transport Eurasian boar within NYS.

Eurasian boar

- Boar hunts were very popular prior to 2013 when NYS banned the import of these animals into the state
- The local hunt preserves purchase heritage breed domestic swine in place of the boar they previously offered





Heritage breed pigs

- Gaining popularity with hobby farmers
- Also used on hunt preserves
- “medium sized” hogs who generally do well on pasture/outdoor housing

Challenges

- Working with pigs!
- Removing the feral swine from the landscape
 - Thank you WS and DEC!
- Locating small producers
 - 4H, CCE, asking neighbors, driving around the area
- Figuring out how to confine outdoor pigs for sampling
- Coordinating with multiple agencies
- Distrust in government agencies (producers)
 - Both hunt preserves had some “history” here
- Pig blood is fragile (hemolyzes easily)

Outcome

- All (known) feral swine were removed from the landscape as of March 2022
- None of the domestic swine sampled were positive for PRV or SB
- Excellent compliance from all producers who were contacted
- We learned a lot
- Built stronger relationships between agencies
- Gained added SB surveillance (swine farms, hunt preserves and 2 local slaughter plants)