

# Feral Swine Monitoring and Eradication

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## Problem

Feral swine upset the ecosystem balance by destroying vegetation and spreading infectious diseases to livestock herds and native species. Herds move often, successfully and actively disseminating destruction and chaos, leaving the soil depleted of its nutrients and, ultimately, its usefulness for agricultural purposes.

## Hypothesis

If a high power thermal imaging camera is attached to a drone, then it will have the ability to accurately identify and track large herds of invasive feral swine as they roam the wilderness in Texas.

## Project Overview

This study is designed to approach the incorporation of drone technology in the elimination of the source of a vast agricultural and ecological devastation in the United States: Feral Swine.

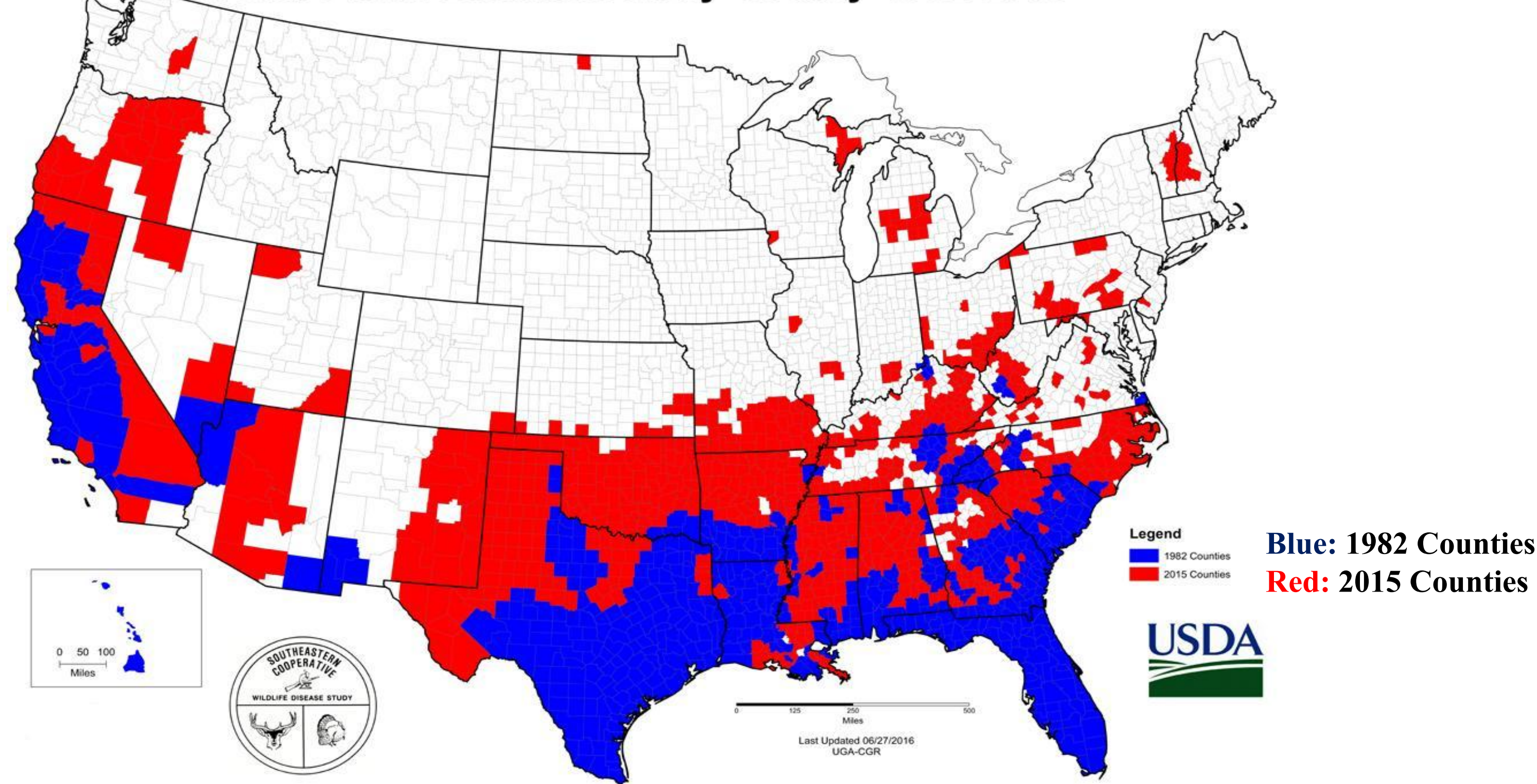
### Objectives:

- Devising a way to eliminate feral swine populations from North America, starting in Texas.
- Utilizing drone technology to closely monitor invasive swine herds.
  - Thermal Imaging cameras allow for 24 hour detection of herds.
- Feral swine have high reproductive rates and travel through an area quickly and destructively.
  - Spread zoonotic diseases
  - Destroy habitats, vegetation, and agricultural land



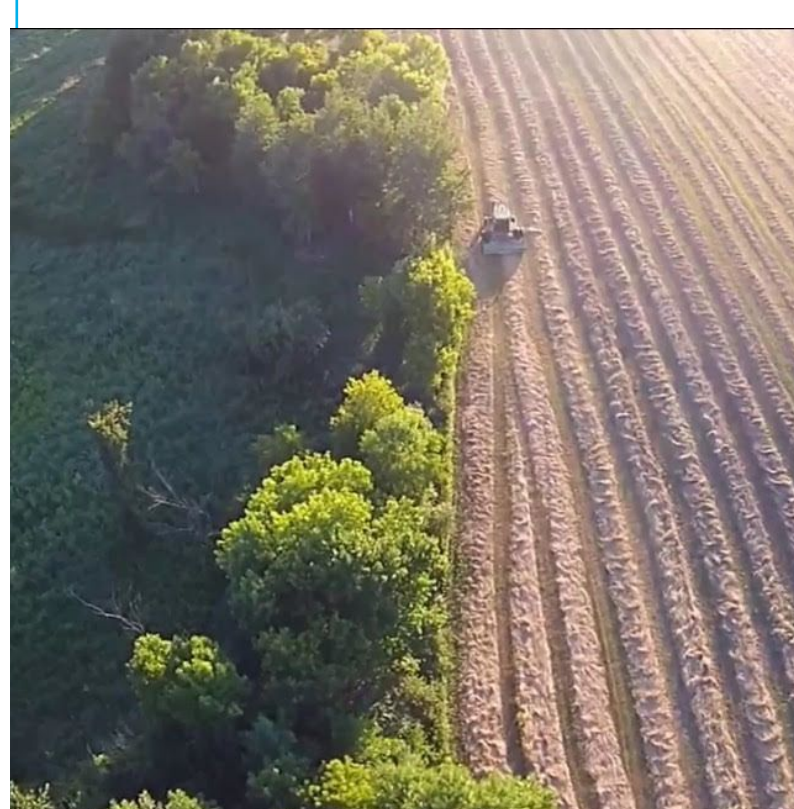

## Materials & Methods

Materials	Use
Drone World's Nanuk 950 Drone	Tracking invasive herds
Thermal Imaging Camera	Filming and capturing images of swine herds
Cadaver Piglets (2)	Used for Proof of Theory Experiment

Feral Swine Distribution by County 1982-2015



## Procedure

Step 1	Step 2	Step 3	Step 4
			
Proof of Theory trial conducted at the University of Minnesota's Veterinary Diagnostic Laboratory. Tracking and filming cadaver pigs with a drone and thermal camera.	Utilization of the drone and camera to track pets and livestock on a farm during the daytime and nighttime.	Identification of live feral pig herds in the wilds of Texas using the drone with attached thermal imaging camera.	Successful operation of the drone and thermal imaging camera to track swine herds, so that they may be captured and killed.

## Data / Observations

- ✓ The Flir thermal camera was able to very accurately differentiate between warm and cold temperatures.
  - ✓ Cold being white and black being hot.
  - ✓ Shades of grayscale are vibrant and exact (see Step 1 image).
- ✓ Drone World's Nanuk drone was more difficult to fly indoors at the VDL.
- ✓ Drone World's Nanuk drone was flown successfully, with ease, outside.

## Results (Ongoing)

- Proof of Theory experiment was a success:
  - Viable thermal readings, film, and images were acquired.
  - Successful flying of the drone over the cadavers and participants in an enclosed space and outdoors.

### Study is ongoing



## Conclusion/Impacts

- The incorporation of drones in the tracking and monitoring of feral swine populations will aide in reducing their destructive tendencies and help to eliminate their ever-increasing numbers.
  - Proof of Theory Experiment demonstrated that thermal technology and the drone may easily identify swine.
- Overall, the drone and thermal camera will allow for easier, faster, and less expensive monitoring, capture, and killing of these invasive pigs.

## Works Cited

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