

Written Testimony
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Safeguarding American Agriculture from Wild, Invasive, and Non-Native Species

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Chairman Costa, Ranking Member Rouzer, Members of the Committee, thank you for this opportunity to submit a written statement on behalf of Noble Research Institute, LLC.

Lloyd Noble, an oilman and philanthropist, founded Noble Research Institute in 1945 to help revitalize agriculture following the Dust Bowl. Mr. Noble was a visionary in land stewardship and conservation, recognizing that "... the land must continue to provide for our food, clothing and shelter long after the oil is gone." Today, Noble Research Institute is the largest, nonprofit independent agricultural research organization in the United States. Among our efforts, we conduct agricultural consultation, education for youth and adult, and research focused on delivering solutions to great agricultural challenges. One of the greatest challenges facing farmers and ranchers ("Producers") today is the negative ecological and economic impact caused by wild, invasive and non-native species, including feral swine. Noble Research Institute has conducted extensive research on various methods for controlling feral swine populations. This research will be the focus of my testimony.

INTRODUCTION TO FERAL SWINE

Swine are a non-native species in the United States. The species was introduced to North America during the European colonial period in the 1600s. Swine eventually became a common form of livestock production in the United States. As domesticated livestock, they were bred for traits such as high fecundity (i.e., fertility) and accelerated meat production. These traits significantly increased the quality and quantity of pork available for human consumption.

Through accidental and, in some cases, intentional release of once-domesticated animals, combined with the introduction of swine as a game species for hunters, populations of feral swine began to develop. The same traits that were bred into domesticated swine for increased production have led to devastating ecological and economic impacts on ecosystems when this species is allowed to live in a feral state.

Feral swine are the most prolific large mammal in the United States. They have an early age of sexual maturity (6–8 months), short gestation period (115 days), and the ability for year round breeding and farrowing. Feral swine are a highly adaptable species that flourishes in a wide range of environments. They are opportunistic omnivores that consume an endless variety of plants and animals.

In addition to their genetic capacity for prolific reproduction, certain human interventions over time have also facilitated increased populations. Farm programs, such as the Conservation Reserve Program, reduced acreage in active agricultural production. This reduced the need for crop damage protection programs so feral swine populations in those areas were no longer trapped or hunted. At the same time, land ownership patterns began to shift with more people becoming absentee land owners of acreage not utilized as their primary means of income. These unmanaged acres are ideal habitat for feral swine populations. Practices intended to increase feral swine populations for recreational hunting since the 1930s have also facilitated the spread of feral swine in the United States. Intensive management for other game species such as deer, including production of food plots and provision of supplemental feeding, further favored establishment and growth of feral swine populations.

In the south central region of the United States, specifically Texas and Oklahoma, feral swine populations have experienced enormous growth in the last decade, increasing at an estimated average annual rate of 21% per year. While land use changes impacted population increases for feral swine, their geographical expansion has primarily been the result of feral swine transportation and stocking facilitated by humans for hunting. Feral swine populations now exist in at least 37 states, including the vast majority of states represented by this Committee. The total population in the United States is estimated to be more than 7 million animals.

IMPACTS ON AGRICULTURE AND NATURAL RESOURCES

Generally

Feral swine act like rototillers turning soil over in search of roots, tubers, insects, and anything else with caloric value. Damage caused by feral swine is widespread and extensive but rarely rigorously quantified. The most commonly cited estimate of feral swine damages to U.S. agriculture is \$1.5 billion annually. This estimate includes direct removal of crops, destruction through rooting of pastureland, damage to fences and harvest equipment, depredation on livestock, and livestock loss to disease from feral swine contact. However, this estimate did not include altered habitat for native wildlife, competition for food sources with livestock and wildlife, water contamination, soil degradation and loss, unaccounted disease impacts, vehicle collisions, and opportunity costs associated with non-production due to the likelihood of crop or livestock damage. Examples of significant impacts to agriculture appear regularly, including the 2006 *E. coli* outbreak in California spinach. Though contaminated spinach was only linked to one farm, the source was determined to be feral swine. Three people died, 60 contracted a unique type of kidney failure and several hundred were sickened. It was estimated that spinach farms in California lost as much as \$75 million due to public fears of consuming spinach. For all these reasons, it is likely that the \$1.5 billion damage estimate is grossly underestimated.

Crop Damage

Crops commonly impacted by feral swine include corn, cotton, milo, wheat, oats, rice, peanuts, soybeans, potatoes, melons, and pecans. Producers in areas with abundant feral swine populations are regularly forced to replant portions of their crop after feral swine consume seed or otherwise disrupt its establishment within days of planting. Mature crops are also commonly impacted. Yield

loss regularly occurs in various crop species due to direct consumption by feral swine or unsuitable harvest conditions caused by feral swine rooting. At Noble Research Institute, researchers found pecan harvest in areas rooted by feral pigs was 33.7% lower compared to unrooted areas.

Disease

Livestock exposure to diseases and parasites carried by feral swine poses a significant risk for Producers. Feral swine regularly mingle with cattle, utilizing common water sources and feeding stations, and rooting and defecating in cattle enclosures. Similarly, the social behavior of swine results in contact and interaction among feral populations and domesticated swine in non-confinement pork production facilities.

Feral swine carry more than 60 infectious diseases that can infect humans and/or domestic livestock. Many of these diseases cause weight loss, abortions, or death in domestic animals despite having little to no impact on feral swine. Specifically, feral swine commonly harbor swine brucellosis and pseudorabies virus, both of which can be transmitted to domestic pigs. A recent study in Oklahoma and Texas found that feral swine tested positive for *Brucella* spp. antibodies in 12% of the samples tested. *Brucella* from feral swine has been identified in domestic cattle resulting in false positives in testing and additional testing at additional expense in order to maintain brucellosis-free status.

Pseudorabies commonly affects canids (i.e., domestic dogs, wolves, coyotes, foxes, etc.) in areas where feral swine prevalence is high. A separate study in Oklahoma found that feral swine tested positive for pseudorabies antibodies in 24% of the samples tested. Multiple deaths from pseudorabies in companion animals have been reported.

In addition to direct losses to domestic livestock and companion animals, disease transmission from feral swine poses significant trade risks with the potential to depress livestock markets in the event of a widespread outbreak. To maintain brucellosis-free status for cattle in the global marketplace, any time a cow tests positive for *Brucella*, an epidemiologic investigation at considerable governmental expense must be initiated.

Similarly, an occurrence of foreign animal diseases such as foot-and-mouth disease or African swine fever (“ASF”) in U.S. livestock would result in substantial losses to the industry from international markets. Although ASF would have a small impact on feral swine numbers, it could have a devastating impact on domestic pork production. U.S. pork exports in 2018 totaled approximately \$6.4 billion. If ASF is found in U.S. domestic pork, exports could suffer and result in catastrophic losses for U.S. pork Producers. Because feral swine are reliable reservoirs for many infectious diseases that could harm U.S. agriculture, they pose a serious risk to our biosecurity and economic sustainability.

Wildlife and Native Ecosystems

Feral swine negatively affect native wildlife populations by competing for food, habitat manipulation, and predation. Though predation on livestock species (primarily sheep, goats, and poultry) does occur, feral swine are more detrimental to a variety of wildlife species. This is due to the fact that wildlife species lack the protections that common animal husbandry practices

provide for livestock. Threatened and endangered species including whooping cranes (*Grus americana*), Kemp's Ridley sea turtles (*Lepidochelys kempii*), interior least terns (*Sterna antillarum athalassos*) and Attwatter's prairie chickens (*Tympanuchus cupido attwateri*) are all negatively impacted by the presence of feral swine. Ground nesting birds, amphibians, and reptiles are most susceptible to predation, but many small and large mammals are also affected in other ways. Feral swine disrupt, destroy and otherwise alter native plant communities. These changes to plant community structure and plant species composition displaces or destroys the wildlife species that evolved with and depend on them.

In native ecosystems, the disturbance created by feral swine rooting accelerates the establishment and spread of invasive plant species, while decreasing diversity and resilience of the native plant community. Feral swine degrade wetlands by wallowing and reducing vegetation along riparian corridors. They are especially attracted to wetlands as a means of thermoregulation and parasite control. Research in Texas demonstrated that feral swine remain within 25 meters of water 24% of the time and within 100 meters of water 48% of the time. These wetland ecosystems are among the most fragile and imperiled in the country, but extremely important biological filters for our nation's water supply.

The extent to which feral swine damage soils is not fully known, but, at a minimum, they have impacts comparable to dragging a plow through the soil without the subsequent benefit of planting a crop. This contributes to erosion, especially on seepage slopes, and leaves behind a number of pathogens that may persist in the environment for extended periods of time.

Urban Areas

Due to high densities of feral swine in some regions of the U.S., populations are increasingly encroaching on urban areas, negatively impacting these environments and increasing potential contact with humans. Environmental impacts include rooting damage to golf courses, public parks, green spaces, lawns and other landscaped areas. Vehicle collisions with feral swine are also becoming more frequent threats to human safety. From 2007 to 2017, at least two fatalities occurred in Texas due to vehicle collisions with feral swine in the roadway.

POPULATION CONTROL METHODS

Various public policy positions regarding feral swine population management have created a complex suite of challenges, strategies, and opportunities. Generally, Producers favor eradication of feral swine to reduce damages to their respective agricultural enterprises and maintain healthy and functioning ecosystems. However, some Producers have elected to benefit financially from recreational opportunities provided by feral swine on the landscape, e.g., guided and unguided hunts. These incentives, in whatever form, for having feral swine on the landscape perpetuate their existence and population spread. Due to the overwhelmingly high financial and environmental cost of damage caused by feral swine, population control strategies are vital to protection of landscapes, native ecosystems, domestic animal populations and other important agricultural production.

Trapping

Many techniques that were once effective for removing feral swine from the landscape are now obsolete. Research studies have shown that more than 70% of the feral swine population must be removed annually to actually reduce overall population numbers. The only available techniques capable of this level of control are trapping and Wildlife Services administered shooting from helicopter.

Unfortunately, most conventional trapping mechanisms, such as a simple box trap or a larger corral trap, can only remove 50% of the feral swine population, but typically far less. Moreover, research suggests that the conventional do-it-yourself traps that were suggested by resource professionals in the past may actually be responsible for what Producers and professional trappers today call “trap-shy” pigs.

Feral swine are highly intelligent. They travel in social groups referred to as “sounders.” When a portion of a sounder is captured in a conventional box trap or corral trap, it is commonly the most naïve feral swine that are captured. The more wary animals remain on the landscape. These “survivor” animals then breed and contribute to future generations of feral swine that have the advantage of maternal guidance and are genetically wary. This natural selection for more wary populations has resulted in the need for development of more effective control systems and novel techniques to increase effectiveness and longevity of control.

Noble Research Institute spent years investigating strategies to catch trap-shy feral swine. The current result of this research is a fully suspended trap that functions much differently than conventional box traps and corral traps. This fully suspended trap design has been commercialized and made available to Producers and other customers under BoarBuster® product name. Multiple years of research has shown that the fully suspended BoarBuster trap is capable of capturing 88% of feral swine in a population. BoarBuster trap-related research also revealed a higher capture rate than any other trap available on the market. Real-time trap monitoring and activation from a smart phone also saves Producers time and enhances the success rate for capturing entire sounders. This negates the problem of creating more trap-shy feral swine in the breeding population.

While the BoarBuster trap system has proven to be a very effective control mechanism, Producers have a wide variety of control techniques to deploy at varying costs. There is no silver bullet to the feral swine problem. Agricultural resource professionals have previously urged Producers to employ an integrated approach to feral swine control, using multiple techniques in unison to achieve a cumulative effect. Unfortunately, Producers are not likely to have extensive experience with feral swine control when they first encounter damage on their farms and ranches. As a result, Producers often gravitate to the cheapest and easiest option first and not necessarily the most effective option. Education on area-specific best management practices that utilize the most effective technologies first is vital to successfully controlling the feral swine population. Producers must have access to the newest, proven technologies for feral swine control, and they must be strategic and adaptive in their practices, not simply apply an integrated approach.

Education

Feral swine experts from research organizations, universities, state and federal wildlife departments and other governmental agencies across the nation often collaborate to educate the public about feral swine biology, management, and control. This is accomplished primarily through county-wide or regional presentations, workshops, demonstrations, consultation, publications distributed to landowners, and more recently through videos, social media, and websites. State and federal grants have extended the reach of Producer education on feral swine, but more coordinated educational programs and delivery are needed. As feral swine populations expand, it will be increasingly important to ensure Producers are fully educated on the proper management and control of this invasive species. Further, as Producers shrink in numbers across the United States, non-traditional educational methodologies will be necessary to reach land owners that are not necessarily connected to agricultural production.

The continued collaboration and connection among feral swine experts is critically important to encourage new ideas and the dissemination of information across the U.S. Feral swine experts convene annually at the International Wild Pig Conference (even years) and the Wildlife Damage Management Conference (odd years) to educate one another on the emerging issues in feral swine control. The experts share information on the effectiveness of management strategies in each state. Some states have successfully halted or slowed feral swine population growth because of strategies they adopted or avoided based on experiences shared by colleagues in other areas of the country.

Continued Research

Funding for continued research is also vital to future success in feral swine control. As the recipient of a USDA grant in 2015 that funded a collaboration between Noble Research Institute and the National Wildlife Research Center ("NWRC"), I can personally attest to the benefit of federal funding for feral swine research. Through our work, we ultimately developed feral swine abundance estimates for measuring performance of management activities using catch per unit of effort data. Results of this study are now being used to evaluate the performance of feral swine control efforts around the U.S. and to monitor population levels in several states. Following the completion of this USDA-funded research, the collaborative relationship between Noble Research Institute and NWRC continued, allowing our organizations to collectively build educational and management tools for Producers.

Federal funding is also contributing to research on introduction of a safe and effective toxicant for feral swine. Toxicants, which are already being utilized in other countries to combat feral swine, will be yet another tool for feral swine management. But again, they will not be a silver bullet to the feral swine problem.

We anticipate that new funding available through the USDA's Feral Swine Control Pilot will result in truly innovative programs designed to educate Producers and increase efforts to control feral swine. Ideas that achieve marked success will be amplified across other areas of the country to further combat the exponential growth of feral swine populations. The Feral Swine Control Pilot further stands to benefit feral swine control professionals and the general public.

Conclusion

Despite improved knowledge and innovative solutions being brought to the market, feral swine populations continue to grow at the expense of agricultural production, wildlife populations and native ecosystems. If left unchecked, feral swine could have devastating impacts on our nation's food supply, agricultural industry, and environment. Continued support for developing advanced feral swine control tools and strategies, conducting additional feral swine control research, and educating Producers on the most effective strategic and adaptive control practices is essential if the United States hopes to prevail over this invasive and prolific species.