AFRICAN SWINE FEVER RESPONSE PLAN
THE RED BOOK

FAD PReP
Foreign Animal Disease Preparedness & Response Plan

USDA

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The continued spread of African swine fever (ASF) in Asia and Europe—and the detection in 2021 on the Caribbean Island of Hispaniola (Dominican Republic and Haiti)—has placed the Western Hemisphere on high alert. APHIS has since taken several key steps to fortify the United States in the event of an ASF outbreak. These actions include the establishment of the ASF Protection Zone, increasing existing surveillance and mitigations in Puerto Rico and the U.S. Virgin Islands, and initiating several new proactive mitigation and prevention efforts in those territories. Simultaneously, APHIS accelerated ASF preparedness efforts in virtually all critical areas: expanding ASF active surveillance in both domestic pigs and feral swine, validating additional diagnostic sample types, increasing laboratory capacity, procuring equipment for the National Veterinary Stockpile for swine depopulation and disposal, and further developing numerous ancillary activities.

The updated version of the *USDA APHIS ASF Response Plan: The Red Book (July 2023)* reflects knowledge gained from policy discussions and response guidance development, and lessons learned from Federal/State/Industry exercises. This plan incorporates and supersedes previous versions of the *ASF Response Plan: The Red Book*. Additionally, this version incorporates changes made in related Foreign Animal Disease Preparedness and Response Plan (FAD PReP) materials.

The following list highlights important revisions made to this version of the *ASF Response Plan*.

- Introduces the concept and benefit of the Protection Zone for Puerto Rico and U.S. Virgin Islands.
- Acknowledges potential pathways of the ASF virus into the United States, given the Hispaniola threat.
- Includes a brief evaluation of the risk from *Ornithodoros spp*. tick as a vector in the United States.
- Clarifies information included in the description of the persistence of the ASF virus.
- Defines the incubation period for exposed individual pigs. Describes the time for lateral spread and detection within an exposed herd or group.
- Reflects an updated case definition.
- Emphasizes the role of contact tracing in an epidemiologic investigation.
- Addresses and integrates policy from APHIS' response to the 2022 United States Animal Health Association (USAHA) ASF resolutions for:
  - Authorization for indemnity and depopulation response time;
  - ASF detection in domestic pig as a trigger for a 72-Hour National Movement Standstill;
  - Resumption of domestic movement options at 'Hour 73';
  - Adopting standardized guidelines for harvesting establishments;
  - Establish national standardized permitting guidance for Control Areas; and
  - Restocking requirements in a Control Area.
- Introduces the Meat Harvest, Off-site Rendering, and Spray Dried Blood / Plasma Facility Plans.
- Introduces and describes the Domestic Pig and Feral Swine Incident Playbooks.
- References the U.S. Swine Health Improvement Plan.
- Introduces the Certified Swine Sample Collector Program.
- Corrects comments made and any errors identified in the prior version. Updates references throughout, as necessary.

While this *ASF Response Plan* provides strategic guidance before an outbreak, there will be additional policy guidance provided during an outbreak on specific response operation activities, particularly for the unified Incident Command. Please note certain topics, like the availability of an ASF vaccine for swine or

specific response guidance in an active outbreak, have rapidly changing statuses. These types of issues may be referenced briefly in The *ASF Response Plan* but treated more fully in associated guidance documents. If ASF is detected, these additional policy guidance documents and information will be distributed and available at www.aphis.usda.gov/fadprep.

USDA APHIS acknowledges that preparing for and responding to an ASF outbreak is and will be a complex effort requiring collaboration and cooperation from all stakeholders. USDA APHIS fully anticipates updates as new capabilities and processes become available. As such, if you have comments or suggestions on this document, please send an email to FAD.PReP.Comments@usda.gov with the subject line: "Comments to Updated ASF Response Plan" for consideration and possible incorporation into future versions.

The FAD PReP mission is to raise awareness, define expectations, and improve capabilities for FAD preparedness and response. For more information, please go to www.aphis.usda.gov/fadprep or email *FAD.PReP.Comments@usda.gov*.

Change Log USDA APHIS ASF Response Plan: The Red Book (July 2023)

Revision (date)	Page / Section	Change	
Rev.1 (October 25, 2023)		1	Corrected miscellaneous typographical and grammatical errors throughout
"	4-30/4.11.3	2	Removed reference to Table 1-1, incorrect reference: ~~(Table 1-1 provides information on ASFV susceptibility according to WOAH).~~
"	4-17/Fig. 4-2	3	Removed comment, irrelevant: ~~Stamping out is not pictured in these figures.~~

Preface

The Foreign Animal Disease Preparedness and Response Plan (FAD PReP)—*African Swine Fever Response Plan: The Red Book (July 2023)* provides strategic guidance for responding to an animal health emergency caused by African swine fever (ASF) in the United States. Information in this plan may require further discussion and development with stakeholders.

This *ASF Response Plan* is under ongoing review. This document is a major revision of the previous version published in **April 2020**. The primary additions and revisions are listed in the above introductory message. Please send questions or comments to:

National Preparedness and Incident Coordination Center
Veterinary Services
Animal and Plant Health Inspection Service
U.S. Department of Agriculture
E-mail: FAD.PReP.Comments@aphis.usda.gov

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Chapter 1
Introduction and ASF Information

1.1 Introduction To Response Plan

Due to the potential threat of African swine fever (ASF) in the United States from ongoing transmission throughout East Asia, parts of Europe and the Caribbean Island of Hispaniola (Dominican Republic and Haiti), this *ASF Response Plan: The Red Book* is updated as of July 2023. This version supersedes the previous version of the *African Swine Fever Response Plan.* The objectives of this plan are to identify the (1) policies and strategies needed to respond to an ASF outbreak in swine and (2) capabilities and critical activities that are involved in responding to that outbreak and (3) the timeframes for these activities. In an outbreak situation, these critical activities are under the authority of a unified State and Federal Incident Command per the National Incident Management System (NIMS).

This *ASF Response Plan* provides current information on ASF and its relevance to the United States. It does not replace existing regional, State, Tribal, local, or industry preparedness and response plans relating to ASF. Regional, State, Tribal, local and industry plans should be aimed at more specific issues in an ASF response. In particular, States should develop response plans focused on the specific characteristics of the State and the State's swine industry. Industry should develop response plans focused on the specific characteristics of their commercial operations and business practices.

1.2 Scope of Response Plan

This *ASF Response Plan* provides strategic guidance for the U.S. Department of Agriculture (USDA) and the Animal and Plant Health Inspection Service (APHIS) and responders at all levels in the event of an ASF outbreak occurring in domestic or feral swine.

This document does not cover, in detail, incident coordination or general foreign animal disease (FAD) response. For more information on these aspects, please refer to the *APHIS Foreign Animal Disease Framework: Roles and Coordination (FAD PReP Manual 1-0*) and the *APHIS Foreign Animal Disease Framework: Response Strategies (FAD PReP Manual 2-0)*. These documents cover general roles and responsibilities as well as general FAD response strategies, respectively. These documents and other Foreign Animal Disease Preparedness and Response Plan (FAD PReP) materials are available here: https://www.aphis.usda.gov/fadprep.

Additionally, this document does not provide in detail every response policy or response procedure for an outbreak. (e.g., specific virus elimination guidance, stamping-out policies, indemnity processes, etc.), or address international movement (export) considerations/ requirements. Past experience demonstrates this type of information is more effectively communicated as distinct, short, concise documents or information published on the FAD PReP website that can be distributed and updated rapidly. There will be additional policy guidance provided during an outbreak on specific response operation activities. In the event of an ASF outbreak in the United States, these policy guidance documents and updates will be posted on the ASF FAD PReP website.

1.3 Historical Presence and Current ASF Situation

ASF—first described in Kenya in the 1920s—is a contagious hemorrhagic disease of wild/feral and domestic pigs. It is often characterized by high morbidity and mortality rates. There is no effective treatment for ASF-infected swine, and vaccine candidates are still being researched and evaluated. ASF is a notifiable disease to the World Organisation for Animal Health (WOAH), which began collecting data on ASF in 2005. The disease does not pose a risk to human health or food safety.

ASF is currently widespread and endemic in sub-Saharan Africa, parts of West Africa, and the island of Sardinia. Beginning in 2007, ASF was confirmed in several East European countries, then it started appearing in European Union countries in 2014. The year 2018 brought the emergence of the virus in China. Not only does ASF continue to spread in the Europe, Asia, and the Pacific regions—both in domestic pigs and wild boars—the virus is also difficult to eradicate. Some successes have been reported. The Czech Republic eradicated ASF after a 2018 outbreak, only to see its return a few years later. Belgium eradicated ASF in 2020; Spain and Portugal in the mid-1990s; Hispaniola following outbreaks from 1977–1980.

In 2021, ASF was again detected in the Western Hemisphere on the Caribbean Island of Hispaniola (Dominican Republic and Haiti). As a consequence of this detection, the USDA established a Protection Zone (PZ) for the United States Territory of Puerto Rico (PR) and U.S. Virgin Islands (USVI). The PZ is consistent with the WOAH *Terrestrial Code Chapter 4.4, Zoning and Compartmentalization*.

ASF has never been reported in the United States, Canada, Australia, or New Zealand.

1.3.1 Threat of ASF in the United States

ASF is a critical threat to the United States due to the recent global spread, millions of susceptible swine in the United States, including feral swine, and the potential for severe economic impacts – estimated at several billion dollars. Although significant and promising advances were recently made in developing an ASF vaccine, there is still no commercially available, effective vaccine approved for emergency use in the United States. This makes prevention of disease entry critically important, and thorough preparation for an emergency response is vital.

In March 2019, USDA APHIS conducted the following ASF threat assessments: all of which are available online under Animal Disease Information for Swine:

- A qualitative assessment of the likelihood of ASF virus entry to the United States.[1]
- A non-animal origin feed ingredient risk evaluation framework.[2]
- A literature review of non-animal origin feed ingredients and the transmission of viral pathogens of swine.[3]

Among the findings of these evaluations is international travel and trade pose a substantial risk for viral incursion into the country. Illegal entry of swine products and byproducts presents the largest potential pathway for entry of ASF virus (ASFV) into the United States.

1.3.2 Preparedness Planning

With the continued expansion of ASF throughout Asia, Europe, and most recently Hispaniola in the Western Hemisphere APHIS preparedness efforts remain a priority. USDA continues to work closely with other Federal and State agencies, the swine industry, producers, and international partners to prepare for and prevent an occurrence in North America. Since 2018, USDA has participated in a series of tri-lateral (Canada, Mexico, and the United States) ASF Forums and initiated an ASF-specific exercise program to coordinate efforts. Preparedness and response exercises help ensure our Nation's readiness and provides an ideal, no-fault learning environment to discuss, practice, and implement plans, procedures,

[1] APHIS CEAH. (2019, March). Qualitative assessment of the likelihood of African Swine Fever Virus entry to the United States: entry assessment. *Risk Assessment Team.* Retrieved from https://www.aphis.usda.gov/animal_health/downloads/animal_diseases/swine/asf-entry.pdf.

[2] APHIS CEAH. (2019, March). Non-animal origin feed ingredient risk evaluation framework: scoping. *Risk Assessment Team.* Retrieved from https://www.aphis.usda.gov/animal_health/downloads/animal_diseases/swine/nofi-scope.pdf.

[3] APHIS CEAH. (2019, March). Literature Review: Non-animal Origin Feed Ingredients and the Transmission of Viral Pathogens of Swine. *Risk Assessment Team.* Retrieved from https://www.aphis.usda.gov/animal_health/downloads/animal_diseases/swine/non-animal-origin-feed-ingredients-transmission-of-viral-pathogens.pdf.

and processes in advance of an actual event. The 2021 detection of the ASFV in the Western Hemisphere created yet another sense of urgency.

1.3.2.1 The Protection Zone

As a consequence of the September 2021 detection of ASF in Hispaniola, the USDA established a PZ for the U.S. territories of PR and USVI in the Caribbean. The PZ is designed to minimize risk and allow the continental United States (CONUS) to maintain its free status if an ASF outbreak were to occur in the PZ. International standards require, and the U.S. implemented, biosecurity and sanitary measures in the PZ. APHIS VS also intensified movement control, animal identification, and animal traceability to ensure that animals in the PZ are clearly distinguishable from other populations. Additionally, APHIS VS implemented increased surveillance in the PZ and the rest of the country, including surveillance of wildlife.

One aspect of the Federal Order (FO) establishing the PZ was the suspension of interstate movement of all live swine, swine germplasm, and the placement of restrictions and transit permit requirements on swine products, and swine byproducts from PR and USVI. To support this, APHIS Plant Protection and Quarantine (PPQ) leveraged the predeparture program to screen passengers and small parcel cargo moving from PR and USVI to CONUS for prohibited swine products. PPQ has also engaged express couriers and the United States Postal Service to establish a joint program to inspect mail for prohibited animal and plant products destined for CONUS.

The newly established PZ can be added to the longstanding, interlocking safeguards USDA has instituted through its regulatory authorities to prevent ASF from entering the country.

1.3.2.2 Swine Industry Background

Although the U.S. may glean lessons from Europe and Asia with regard to ASF preparedness, our domestic pig sector and feral swine populations are distinct from those regions and require unique planning and approaches.

According to USDA's National Agriculture Statistical Service, most (70%) of the swine operations in the U.S. are small hobby operations, with 25 or fewer swine on the premises. However, greater than 90% of the swine inventory were located on hog operations with more than 2,000 head of swine. The States of Iowa, North Carolina, Minnesota, Illinois, Indiana, Nebraska, Missouri, Ohio, Oklahoma, and Kansas accounted for nearly 87 percent of all pigs in the U.S. inventory.

An estimated one million swine are being transported in trucks daily to various locations, including slaughter and further production and approximately 500,000 hogs are slaughtered each day.

1.3.2.3 KEY AREAS OF FOCUS FOR PREPAREDNESS

APHIS continues to work in earnest with states and the swine industry to develop and refine plans in case of a U.S. ASF outbreak. Through this collaborative planning process, we are able to better understand the factors specific to the U.S. swine industry that may pose response challenges.

1.3.2.3.1 Site Biosecurity

Biosecurity is key to preventing disease introduction and spread. Biosecurity includes the use of certain management practices to prevent the introduction of new disease and the spread of existing disease on swine operations. Examples of these practices include limiting opportunities for feral swine and domestic pigs to mingle; cleaning and disinfecting all equipment and vehicles entering or leaving a production site; and controlling human and vehicle entry between and within operations. Producers are responsible for developing and adhering to site-specific biosecurity plans to protect their own investments. Zoos and wildlife parks with exotic swine species are responsible for developing and adhering to their biosecurity plans.

Guidance and best practices are available through industry-led efforts such as the Secure Pork Supply (SPS) Plan and U.S. Swine Health Improvement Plan (US SHIP).

1.3.2.3.2 Truck Sanitation

Various diseases, including porcine epidemic diarrhea virus, certain strains of Senecavirus A, and other endemic diseases have been able to spread among the U.S. swine herd within months of introduction. Among the factors scientific studies attribute rapid disease spread to is the practice of transporting hogs in vehicles that are not cleaned and disinfected between loads. Locations of concern include all swine points of concentration, including slaughter plants, feed mills, and other collection points that contaminated vehicles may frequent and track virus.

1.3.2.3.3 Swine Traceability

In the event of an ASF disease outbreak on the U.S. mainland, trading partners will need to accept U.S. measures for traceability of swine commodities (live pigs and pork products) before engagement in regionalization or zoning agreements and resuming exports.

Early in 2022, the U.S. swine industry identified traceability as a priority for ASF preparedness. USDA APHIS is collaborating with stakeholders to develop a new framework for swine traceability. The agency is also open to non-regulatory options for activities that may be implemented sooner than the Federal rulemaking process allows.

1.3.2.4 New Preparedness Initiatives

1.3.2.4.1 U.S. Swine Health Improvement Program

An APHIS-funded pilot project promoting certification of healthy swine herds called the US SHIP is underway. The US SHIP program is intended to target ASF and classical swine fever through the creation of standards focusing on biosecurity, traceability, and surveillance principles. Currently, technical advisory committees comprised of U.S. pork industry subject matter experts are further developing technical standards necessary for "safeguarding, certifying, and bettering the health of U.S. swine." Pork producers and packing facilities in participating States that meet specified program requirements can enroll in the pilot program on a voluntary basis. As of early 2023, 32 States are active in the US SHIP program, including the top-producing swine States; and more than 50% of the United States' swine inventory is enrolled in the program with over 9000 participants. Industry has maintained a strong interest in seeing the program established as an official USDA program through the rulemaking process. As the pilot progresses, APHIS continues to assess the potential for making that transition.

For additional details and status of the US SHIP program, see https://www.usswinehealthimprovementplan.com.

1.3.2.4.2 National Standardized Permitting Guidance for Control Areas

The swine industry identified the need for the development of consistent national criteria for intrastate and interstate swine movements from Control Areas in advance of an ASF outbreak. USDA APHIS collaborated with the USAHA Swine Committee to establish the biosecurity, surveillance and testing requirements for permitted movements. The resulting permitting guidance for various types of swine movements within, into, and out of a Control Area are available on the ASF FAD PReP website.

1.3.2.4.3 ASF Meat Harvest, Rendering, and Spray Dried Blood / Plasma Facility Response Plans

The ASF Meat Harvest Facility Response Plans were created to address response needs unique to harvest establishments and related industries during an ASF outbreak. These plans were developed in coordination with APHIS and the North American Meat Institute (NAMI)-led Slaughter Plant Working Group (SPWG) with participation from various Federal, State, and industry partners.

The culmination of the SPWG's efforts were the development of three ASF response plans to target specific scenarios for: 1) Meat Harvest Facilities in the Free Area with a Contact Premises status, 2) Meat Harvest Facilities located within a Control Area that do not have an Infected Premises status, and finally 3) Meat Harvest Facilities with an Infected/Positive premises status when ASF

presumptive or confirmed positive swine have been detected at the facility. Each of these templates are intended to serve as a response guide for harvest facilities during an ASF response.

Further, in collaboration with the North American Renderers' Association and North American Spray Dried Blood & Plasma Producers, the SPWG created two additional ASF Response plans specific to Off-Site Rendering and Spray Dried Blood / Plasma facilities.

These plans are a critical industry resource for implementing biosecurity practices aimed at preventing or recovering from an onsite ASF infection. They provide virus elimination standards following an ASF detection onsite and outline biosecurity practices to ensure continuity of business for these facility types. To find these templates, please go to the ASF FAD PReP website.

1.4 Nature of the Disease/Virus

This is a brief introduction to ASFV, which is a complex virus with variable clinical presentations. Further detail can be found in the *FAD PReP ASF SOP: Overview of Etiology and Ecology*.

1.4.1 Overview

ASFV belongs to the *Asfivirus* genus of the *Asfarviridae* family and is an enveloped virus with a double-stranded DNA genome. ASFV is unique, as it is the only known arthropod-borne DNA virus. Currently, there is no vaccine approved for emergency use in the United States.

There are 24 different genotypes and 8 serogroups of ASFV. Infection with ASFV presents in four different clinical forms (peracute, acute, subacute, and chronic), which are based on strain virulence, immune status, clinical signs, and gross lesions.

Susceptible species include all members of the pig family (Suidae): domesticated swine, feral swine, European wild boar, warthogs, bush pigs, and giant forest hogs. While susceptible, warthogs and bush pigs are resistant to signs of clinical disease. Some members of the Suidae family native to the Americas, such as peccaries (*Tayassu* spp.), are believed to be resistant to infection.[4]

[4] Based on historical information, see Dardiri, A.H., Yedloutschnig, R.J., & Taylor, W.D. (1969). Clinical and serologic response of American white-collared peccaries to African swine fever, foot-and-mouth disease, vesicular stomatitis, vesicular exanthema of swine, hog cholera, and rinderpest viruses. *Proc Annual Meeting U.S. Animal Health Assoc.* 73, 437–52.

1.4.2 Introduction & Transmission

There are three primary modes of transmission for ASFV: direct contact, indirect contact (fomites), and vector-borne. Direct pig-to-pig transmission occurs when infected pigs come into contact with susceptible pigs through contact with infectious blood, swine germplasm, excretions and secretions (e.g., saliva, respiratory secretions, urine and feces), or pig carcasses. There is lack of evidence that an infected pig can become a carrier and shed ASFV without showing clinical signs.[5,6] Indirect transmission can occur through contaminated pig products or fomites. ASFV can survive for months in pork meat, fat, and skin, and serve as a route of transmission, e.g., through the practice of "garbage-feeding" where swine become infected when fed contaminated food waste that has not been cooked appropriately to inactivate the virus. Potential transmission has experimentally been demonstrated through contaminated feed. It is also possible that ASFV can be transmitted mechanically. A 2018 study found that, while ingested ASFV-spiked stable flies could infect some pigs, it is unlikely that ingestion of blood-fed flies is a common route for transmission of ASFV between wild boars or between pigs within a stable.[7]

Soft ticks (*Ornithodoros* spp.) are competent vectors for ASFV transmission, passing the virus to swine hosts when taking their blood meal. In sub-Saharan Africa, ASF is maintained through the sylvatic cycle—recurring transfer between bushpigs, warthogs, and giant forest hogs of Africa and *Ornithodoros* species ticks that live in their wallows and burrows. These pigs are inapparently infected and act as reservoir hosts for ASFV.[8] Infected ticks are also able to transmit ASFV to other ticks (sexual), to their offspring (transovarial), and/or from one life cycle to another (transstadial). However, even where the sylvatic cycle exists in East and Central African countries, the majority of ASF outbreaks are not associated with ticks or wild suids.[9]

ASFV has been shown to persist in some *Ornithodoros* species for more than 5 years.[10] While some *Ornithodoros* species are present in the United States, it is

[5] Guinat, C., Gogin, A., Blome, S., Keil, G., Pollin, R., Pfeiffer, D.U., and Dixon, L. (2016). Transmission routes of African swine fever virus to domestic pigs: current knowledge and future research directions. *Veterinary Record.*178, 262-267. Doi: 10.1136/vr.103593.

[6] Karl Ståhl, K., Sternberg-Lewerin, S., Blome, S., Viltrop, A., Penrith, M., Chenais, W. (2019). Lack of evidence for long term carriers of African swine fever virus - a systematic review, *Virus Research*, Vol 272.

[7] Olesen, A.S., Lohse, L., Hansen, M.F., Boklund, A., Halasa, T., Belsham, G.J., … Bodker, R. (2018). Infection of pigs with African swine fever virus via ingestion of stable flies (*Stomoxys calcitrans*). *Transboundary and Emerging Diseases*. *65*, 1152–1157. Doi: 10.1111/tbed.12918.

[8] WOAH. (2021). African Swine Fever. Technical Disease Card. https://www.woah.org/app/uploads/2021/03/oie-african-swine-fever-technical-disease-card.pdf

[9] Sánchez-Vizcaíno JM, Mur L, Bastos AD, Penrith ML. New insights into the role of ticks in African swine fever epidemiology. Rev Sci Tech. 2015 Aug;34(2):503-11.

[10] Sanchez-Vizcaino, J.M., Mur, L., Martinez-Lopez, B. (2012). African Swine Fever: An Epidemiological Update. *Transboundary and Emerging Diseases*. 59(Suppl. 1), 27–35.

unlikely they would play a significant role in transmission given the absence of a primary wild suid reservoir host population to maintain a sylvatic cycle. Wild boar populations have been implicated in sustained transmission of ASFV, particularly in parts of the European Union.[11] There has only been one outbreak in Europe where the *O. erraticus* tick, an *Ornithodoros* species not found in the United States, played a role in viral transmission among outdoor swine farms on the Iberian Peninsula.[12] However, *Ornithodoros* species of ticks do not appear to be critical to the maintenance of ASFV in European wild boar populations. Importantly, ticks did not play a role in ASFV transmission despite the presence of *O. puertorincensis* in Haiti and the Dominican Republic during an ASF outbreak that lasted from 1978 to 1983.[13] *Ornithodoros* ticks are discussed in Section 4.12.2.

In other areas of the world, ASFV has been introduced and transmitted by illegal movement of infected swine and contaminated products (and their contact with naïve swine).

1.4.3 Incubation Period

The incubation period varies by exposure dose, route of transmission, and viral strain ranging from 3–21 days. The WOAH *Terrestrial Animal Health Code* states that the incubation period in *Sus scrofa* (domestic and wild swine) is 15 days.[14] A shorter incubation period (3-4 days) is typically observed with the acute form of disease.

When considering the incubation period for ASF, it is important to consider both the incubation period for ASF virus in an individual pig exposed (generally 2 – 7 days[15,16]), as well as the time to detect ASF in a group or herd of pigs with respect to clinical signs. Since ASF infection in pigs can resemble other common pig diseases and transmission is slow within a herd, early detection through clinical

[11] European Food Safety Authority. (2018). Epidemiological analyses of African swine fever in the European Union. *European Food Safety Authority Journal.* 16(11), 5494.

[12] Sanchez-Vizcaino, J.M., Mur, L., Martinez-Lopez, B. (2012). African Swine Fever: An Epidemiological Update. *Transboundary and Emerging Diseases*. 59(Suppl. 1), 27–35.

[13] Brown, V. and Bevins, S. (2018). A review of African swine fever and the potential for introduction into the United States and the possibility of subsequent establishment in feral swine and native ticks. Front. Vet. Sci., 06. Vol 5.

[14] WOAH. (2022). Article 15.1.1. *Terrestrial Animal Health Code*.
https://www.woah.org/en/what-we-do/standards/codes-and-manuals/terrestrial-code-online access/?id=169&L=1&htmfile=chapitre_asf.htm.

[15] Malladi S, Ssematimba A, Bonney PJ, St Charles KM, Boyer T, Goldsmith T, Walz E, Cardona CJ, Culhane MR. Predicting the time to detect moderately virulent African swine fever virus in finisher swine herds using a stochastic disease transmission model. BMC Vet Res. 2022 Mar 2;18(1):84. doi: 10.1186/s12917-022-03188-6.

[16] Guinat, C., Porphyre, T., Gogin, A., Dixon, L., Pfeiffer, D. U., & Gubbins, S. (2018). Inferring within-herd transmission parameters for African swine fever virus using mortality data from outbreaks in the Russian Federation. *Transboundary and emerging diseases*, *65*(2), e264–e271. https://doi.org/10.1111/tbed.12748.

signs or passive surveillance can take an extended period of time (>20 days[17]) for groups or herds of pigs.

1.4.4 Clinical Signs

Clinical signs vary by virus strain and disease form caused by the virus (peracute, acute, subacute, and chronic). In swine affected with the peracute form of ASF, death is often the first indication of disease. Swine affected with the acute form may develop fever (105–107.6°F/40.5–42°C), anorexia, listlessness, cyanosis, incoordination, increased pulse and respiratory rate, leukopenia, and thrombocytopenia (at 48–72 hours), vomiting, diarrhea, and abortion in pregnant sows.

Swine affected with subacute forms of ASF present with less intense, but similar clinical signs including slight fever, reduced appetite, and depression. Abortion in pregnant sows is also possible. Swine infected with the chronic form of the virus typically exhibit appetite loss, transient low fever, respiratory signs, necrosis of the skin, chronic skin ulcers, and swelling of the joints. They also can experience recurring episodes of disease, which could eventually lead to death.[18] Table 1-1 summarizes these signs.

Table 1-1. Clinical Signs Caused by the Different Forms of ASF

	Peracute	Acute	Subacute	Chronic
Virulence of strain	High	High	Moderate to low	Low
Immune status	Death before seroconversion	Many die before seroconversion	Seropositive	Seropositive
Clinical signs	Often found moribund or dead	Febrile (40.5°C–41.5°C), leukopenia, anorexia, blood in feces, reluctant to move, abortion in sows, erythemic skin progressing to cyanosis near death	Variable but typically similar to, though less severe than, acute ASF	Mild fever for 2–3 weeks; pregnant sows may abort; reddened then dark, raised, dry, and necrotic skin lesions, especially over pressure points
Gross lesions	Death occurs before distinct lesions form	Spleen enlarged (up to 3 times normal), dark and friable; multiple hemorrhages of internal organs, especially kidneys and heart; hemorrhagic lymph nodes; edema of gall bladder and lungs; congestion of meninges and choroid plexus	Lesions are similar but milder than acute ASF; spleen may be 1.5 times normal size; lymph nodes enlarge but only mildly hemorrhagic; few petechia on kidneys	Fibrinous pleuritis, pleural adhesions, caseous pneumonia, hyperplastic lymphoreticular tissues, nonseptic fibrinous pericarditis, necrotic skin lesions

Adapted from: Kleiboeker, S.B. (2002). Swine fever: Classical swine fever and African swine fever. Vet Clin Food Anim 18, 431–451.

[17] Ssematimba A, Malladi S, Bonney PJ, St Charles KM, Boyer TC, Goldsmith T, Cardona CJ, Corzo CA, Culhane MR. African swine fever detection and transmission estimates using homogeneous versus heterogeneous model formulation in stochastic simulations within pig premises. Open Vet J. 2022 Nov-Dec;12(6):787-796. doi: 10.5455/OVJ.2022.v12.i6.2.

[18] Petrov, A. et al. (2018). No evidence for long-term carrier status of pigs after African swine fever virus infection. *Transboundary and Emerging Diseases. 65*(5), 1318–1328.

1.4.5 Morbidity and Mortality

For all forms of the disease, morbidity rates are very high. Mortality rates vary by form. For the peracute form, mortality can reach 100 percent and occur in the absence of any clinical signs within 7–10 days after exposure to the virus. The acute form is also associated with mortality rates that approach 100 percent, often with death occurring within 6–13 days post inoculation. The mortality rate for the subacute form is dependent on the age of the affected populations; younger pigs have higher rates (70–80 percent), while older pigs experience significantly lower rates (less than 20 percent). For those affected by the chronic form of ASF, mortality is typically low.

1.4.6 Differential Diagnosis

Detection of ASF upon introduction is complex, due to its current clinical presentations throughout the world and resemblance to various production diseases present within the United States. When considering a potential diagnosis of ASF in the United States, the following diseases should also be included in the differential diagnosis:[19]

- Classical swine fever,
- Porcine reproductive and respiratory syndrome,
- Erysipelas,
- Salmonellosis,
- Aujeszky's disease (or pseudorabies) in younger swine,
- Pasteurellosis, and
- Other septicemic conditions.

1.4.7 Persistence of ASFV

ASFV is a very resilient virus that can withstand low temperatures, fluctuations in pH, and remain viable for long periods in tissues and bodily fluids. Table 1-2 provides a breakdown of ASFV resistance to physical and chemical action based on the WOAH ASF Disease Card. These factors must be considered when determining appropriate response strategies, including disinfection[20] techniques.

[19] WOAH. (2021). African Swine Fever. Technical Disease Card. https://www.woah.org/app/uploads/2021/03/oie-african-swine-fever-technical-disease-card.pdf.

[20] www.aphis.usda.gov/aphis/ourfocus/animalhealth/emergency-management/CT_disinfectants

Table 1-2. Resistance of ASFV to Physical and Chemical Action

Action	Resistance
Temperature	Highly resistant to low temperatures. Heat inactivated by 56°C or 132.8°F/70 minutes; 60°C or 140°F/20 minutes. This WOAH guidance must be adapted and validated for field conditions where use of these temperatures may not be feasible.
pH	Inactivated by pH < 3.9 or > 11.5 in serum-free medium. Serum increases the resistance of the virus, e.g., at pH 13.4—resistance lasts up to 21 hours without serum, and 7 days with serum.
Chemicals/disinfectants	Susceptible to ether and chloroform. Inactivated by 8/1000 sodium hydroxide (30 minutes), hypochlorites— between 0.03 percent and 0.5 percent chlorine (30 minutes), 3/1000 formalin (30 minutes), 3 percent ortho-phenylphenol (30 minutes) and iodine compounds. Note: disinfectant activity may vary depending on the pH, time of storage and organic content.
Survival	Remains viable for long periods in blood, feces, and tissues; especially infected uncooked or undercooked pork products. Can multiply in vectors (*Ornithodoros* sp.).

Source: WOAH Technical Disease Card for African Swine Fever, 2021.

Chapter 2
Framework for ASF Preparedness and Response

2.1 Foundation of Preparedness and Response

FAD PReP, including this ASF-specific plan, provides information and specific guidance on response requirements for an outbreak in the United States. FAD PReP documents are consistent with emergency preparedness and response principles found in the National Response Framework (NRF) and in the NIMS.

As mentioned early in Chapter 1, this document does not provide, in detail, general incident coordination and FAD response. For more information on aspects discussed in Chapter 2, please refer to the *APHIS Foreign Animal Disease Framework: Roles and Coordination (FAD PReP Manual 1-0*) and the *APHIS Foreign Animal Disease Framework: Response Strategies (FAD PReP Manual 2-0)*.

2.2 USDA Authorities

2.2.1 The Animal Health Protection Act, 7 U.S. Code 8301 et seq.

The Animal Health Protection Act (AHPA), 7 *U.S. Code* 8301 et seq., authorizes the Secretary of Agriculture to restrict the importation, entry, or further movement in the United States or order the destruction or removal of animals and related conveyances and facilities to prevent the introduction or dissemination of livestock pests or diseases. It authorizes related activities with respect to exportation, interstate movement, cooperative agreements, enforcement and penalties, seizure, quarantine, and disease and pest eradication. The Act also authorizes the Secretary to establish a veterinary accreditation program and enter into reimbursable fee agreements for pre-clearance abroad of animals or articles for movement into the United States.

Section 421 of the Homeland Security Act, 6 *U.S. Code* 231 transfers to the Secretary of Homeland Security certain agricultural import and entry inspection functions under the AHPA, including the authority to enforce the prohibitions or restrictions imposed by USDA.

Additionally, the Code of Federal Regulations (CFR) gives the APHIS Administrator authority to determine the existence of disease and the authority to

prevent the spread of disease through the destruction and/or disinfection of animals, eggs, and materials as appropriate. As such, it also authorizes APHIS to appraise and indemnify animals and materials destroyed, provided certain conditions are met; these conditions include complying with quarantines, adhering to proper biosecurity protocols, and accurately designating payments between contract growers and owners of animals (9 CFR 53).

2.2.1.1 Extraordinary Emergency

The AHPA also authorizes the Secretary of Agriculture—after notice to review and consultation with certain State or Tribal officials—to declare that an extraordinary emergency exists because of the presence of a pest or disease of livestock and because this presence threatens the livestock of the United States (7 *U.S. Code* 8306). This provides the Secretary with additional authority to hold, seize, treat, apply other remedial actions to destroy (including preventively slaughter) or otherwise dispose of any animal, article, facility, or means of conveyance; and prohibit or restrict the movement or use within a State, or any portion of a State, of any animal or article, means of conveyance, or facility. Per this same section (7 *U.S. Code* 8306(d)(1)), the Secretary is required to compensate the owner of any animal, article, facility, or means of conveyance the Secretary requires to be destroyed unless certain conditions are met (these exceptions are listed in 7 *U.S. Code* 8306(d)(3). If the owner fails to comply with such an order, the Secretary may take similar action and recover from the owner the costs of such action (7 *U.S. Code* 8306(c)).

The written declaration of Extraordinary Emergency lists specific activities USDA plans to bring to the State(s). It is not used as a high-handed usurpation of State authority; rather, it can support the State where its authorities are unclear. In an ASF outbreak, USDA will consider declaring an Extraordinary Emergency to allow States to enforce a 72-hour National Movement Standstill of live swine. Another use may be to readily access and conduct response activities on lands where feral swine are known or suspected to be infected with ASF; especially in States which have a patchwork of laws administered through multiple agencies or departments—Agriculture, Fish & Wildlife, Natural Resources, Game, etc. Additionally, the federal authority to access private properties with feral swine may be needed, and the declaration could be written to include that.

2.2.2 The Swine Health Protection Act, 7 U.S. Code 3801 et seq.

The Swine Health Protection Act (SHPA), 7 *U.S. Code* 3801 et seq., authorizes the Secretary of Agriculture in cooperation with States and other jurisdictions to regulate the treatment and feeding of garbage to swine. Untreated garbage serves as media where numerous infectious diseases, such as ASF, could be transmitted via improperly treated garbage. The SHPA and regulations found in 9 CFR 166 contain provisions that prohibit persons from feeding waste unless properly

treated to kill disease organisms. Those who feed waste are required to hold a valid license except under certain circumstances outlined in 9 CFR 166. In addition, § 166.2(c) states that these regulations shall not be construed to repeal or supersede State law that prohibit the feeding of garbage to swine.

2.3 USDA APHIS VS GUIDANCE

2.3.1 Procedures and Policy for an ASF Investigation, VS Guidance 12001.4[21]

VS Guidance Document 12001.4: Procedures and Policy for Investigation of Potential FAD/EDI provides guidance for the investigation of potential FAD/emerging disease incidents. There is also a FAD PReP Ready Reference Guide on *VS Guidance 12001.4* to assist responders during the initial disease investigation.

2.3.2 Animal Health Policy in Relation to Feral Swine

When APHIS policy supports eradication of an infectious agent/disease/vector, APHIS VS will seek measures, through 1) movement and testing requirements; 2) herd plans; and 3) emergency response plans to keep feral swine and domestic pigs apart and to eradicate ASF from potential reservoirs when eradication is deemed technically feasible. If eradication is not technically feasible at the time, measures must be taken to keep these potential reservoirs (feral swine) separate from domestic pigs. APHIS Wildlife Services (WS) will monitor feral swine for ASF by testing serum and whole blood samples collected in conjunction with routine activities to reduce crop damage. As sick and dead feral swine are located due to non-traumatic events (e.g., disease starvation, old age) APHIS VS will test for ASF by viral antigen through FAD investigations. APHIS WS will collaborate with the Area Veterinarian in Charge (AVIC) and State Animal Health Official (SAHO) to initiate related FAD investigations. Consistent surveillance and monitoring activities through APHIS VS' Swine Hemorrhagic Fevers Integrated Surveillance Plan will increase the likelihood of early detection for ASF by rapidly locating and testing sick and dead feral swine.

APHIS recognizes that depending on the State(s), the authority and responsibility for managing feral swine may vary. Primary authority may either be under fish and wildlife management agencies, agriculture agencies, or there is no clear authority designated. However, VS has statutory authority under the AHPA to implement disease control and/or eradication actions for wildlife and feral swine under certain conditions.

Should wildlife or feral swine be affected by the control and eradication measures proposed by the Secretary of Agriculture, the Secretary will consult with the State agency having authority for protection and management of such wildlife.

[21] 12001.4 refers to the latest sequential version as of the published date of this response plan.

2.4 USDA Roles and Responsibilities Overview

Understanding the roles and responsibilities of Federal departments or agencies involved in responding to a FAD incident helps with the effectiveness of a coordinated emergency response. USDA APHIS responds to animal and agricultural health issues under USDA statutory authority and is the primary agency responsible for coordinating response efforts to assist State and local governments, farmer's associations and similar organizations during an FAD incident affecting domestic livestock or poultry in accordance with 7 CFR 371.4(b)(5). Incidents will be handled in cooperation with States, Tribes, and local governments.

Federal response to the detection of an FAD such as ASF is based on the response structure of NIMS as outlined in the NRF, which defines Federal departmental responsibilities for sector-specific responses. During an ASF outbreak, the USDA may request Federal-to-Federal (FFS)[22] support from other Federal departments and agencies.

If the President declares an emergency or major disaster, or if the Secretary of Agriculture requests the Department of Homeland Security (DHS) lead coordination, the Secretary of Homeland Security and DHS assume the lead for coordinating Federal resources. USDA maintains the lead of overall incident management. If an ASF outbreak occurs in the United States, the planning assumption is that the Secretary of Agriculture will declare an extraordinary emergency.

2.5 USDA APHIS Incident Management

In an ASF incident or outbreak, USDA APHIS provides National Incident Management Teams (NIMT), coordinates the incident response, manages public messages, and takes measures to control and eradicate ASF. It is critical that effective and efficient whole community situation management and clear communication pathways are employed for a successful response effort.

Synchronized management and organizational structure support control and eradication actions taken during an ASF outbreak. Accordingly, APHIS employs NIMS and the Incident Command System (ICS) organizational structures to manage an ASF response. ICS is designed to enable efficient and effective domestic incident management by integrating facilities, equipment, personnel, procedures, and communications operating within a common organizational structure.

[22] FFS refers to the circumstance in which a Federal department or agency requests Federal resource support under the NRF that is not addressed by the Stafford Act or another mechanism.

Details for implementing ASF response activities for domestic pig and feral swine in the field will be available on the ASF FAD PReP website.

2.5.1 Incident Management Structure

The APHIS Administrator is the Federal executive responsible for implementing APHIS policy during an ASF outbreak; the Administrator is supported by the APHIS Management Team (AMT) and the Emergency Preparedness Committee (EPC).

During any significant APHIS-led emergency response, the lead Program Area Deputy Administrator or Associate Deputy Administrator(s), and/or Director of the Emergency, Management, Safety, and Security Division (EMSSD) (who is also the Chair of the APHIS EPC) are authorized to approach the APHIS Office of the Administrator (OA) to recommend that an APHIS Multiagency Coordination (MAC) group be stood up to support ongoing response. Many of the MAC functions may be delegated to the VS Deputy Administrator (VSDA), who is the Chief Veterinary Officer (CVO) of the United States. The VSDA is supported by the VS Executive Team (VSET) to coordinate policy.

An APHIS National Incident Coordination Group (ICG), led by an Incident Coordinator and a Deputy Incident Coordinator, is immediately established to oversee the functions and response activities associated with the incident. This ICG is flexible and scalable to the size and scope of the incident and works closely with unified Incident Command (IC) field personnel, in a unified Incident Management Team (IMT). The ICG also coordinates with any MAC Group that is established at the APHIS or USDA level, based on the specific incident. For example, in the 2022-2023 Highly Pathogenic Avian Influenza outbreak in the United States, the APHIS MAC Group was formed due to the size, scope, and impact of the incident.

In addition to policy and incident coordination, the APHIS Administrator, AMT, the VSDA, and VSET communicate, collaborate, and coordinate with relevant industry associations, the National Assembly of State Animal Health Officials and National Association of State Departments of Agriculture, public health agencies (Federal and State), and other partners in a whole community approach.

2.5.2 Field Organization

At the beginning of an incident, the SAHO or designee, and the VS AVIC, or designee, initially serve as Co-Incident Commanders in a unified IC Structure. The AVIC will be relieved when a State and/or APHIS IMT is stood up, and an Incident Command Post (ICP) is established. In a large ASF incident, there may be multiple ICPs and full VS NIMTs may not be dispatched to each location; to-date, VS has five standing NIMTs. In any situation, ICPs will remain a unified State-Federal IC organizational structure.

If the outbreak involves more than one incident, more than one IC is likely to be established. An Area Command (AC) may also be established. In this case, individual Incident Commanders responsible for potentially multiple unified IMTs would report to the AC. AC organizational structures may not be established or appropriate in all incidents; in many cases, the ICG will perform the same functions as an AC. For more information on a single incident and multiple incident coordination along with a full NIMT configurations, see *APHIS Foreign Animal Disease Framework: Roles and Coordination (FAD PReP Manual 1-0)*.

Chapter 3
ASF Outbreak Response Goals and Strategy

3.1 Response Goals

The APHIS goals of an ASF response are to (1) detect, control, and contain ASF in swine as quickly as possible; (2) eradicate ASF using strategies that seek to stabilize animal agriculture, the food supply, the economy, and to protect public health and the environment; and (3) provide science- and risk-based approaches and systems to facilitate continuity of business (COB) for non-infected animals and non-contaminated animal products.

Achieving these three goals will allow individual livestock facilities, States, Tribes, regions, and industries to resume normal production as quickly as possible. They will also allow the United States to regain ASF-free status without the response effort causing more disruption and damage than the outbreak itself.

3.2 Epidemiological Principles

The control and eradication of ASF in swine is based on four epidemiological principles:

1. *Prevent contact between ASFV and swine*. This is accomplished through:

    a. quarantine of infected swine and movement controls in the Control Area (Infected Zone [IZ] + Buffer Zone [BZ]),

    b. aggressive contact tracing of the Infected Premises, including premises epidemiologically-linked through a network relationship, where appropriate, and

    c. enhanced biosecurity procedures that include preventing contact between feral swine and domestic pigs.

2. *Stop the production of ASFV by infected or exposed swine.* This is accomplished by mass depopulation (and disposal) of infected and potentially infected swine; prioritization may increase effectiveness.

3. *Prevent the transmission of ASFV by vectors.*

4. *Prevent ASFV from becoming established in feral swine populations.*

3.3 Control and Eradication Strategies

The United States' control and eradication strategy for ASF in swine is based on international standards and USDA APHIS FAD PReP response standards.

1. Quarantine Infected Premises.
2. Establish Control Areas (movement controls) around Infected Premises.
3. Conduct aggressive contact tracing of Infected Premises, including premises epi-linked through a network relationship, where appropriate.
4. Conduct stamping-out to eradicate ASF virus.
5. Conduct surveillance in Control Areas and Free Areas.
6. Implement enhanced biosecurity.
7. Consider vaccination; however, there is currently no vaccine approved for emergency use in the United States for ASFV in swine.

APHIS acknowledges there may be significant challenges in controlling and eradicating ASF, depending on the outbreak (e.g., if feral swine are infected). In any instance, movement control measures are critical since ASF is easily spread by infected swine and contaminated fomites. It is essential movement controls are science- and risk-based to minimize disruption to normal business and to facilitate the appropriate allocation of incident resources. To assist in doing so, contact tracing will be emphasized in addition to the standard Control Area movement controls. Contact Premises outside of the Control Area will be aggressively investigated in order to rapidly detect new cases.

3.3.1 Defining Stamping-Out as a Response Strategy

For ASF, stamping-out is the depopulation of clinically affected swine and, as appropriate, swine exposed to the virus. Depopulation and disposal of Infected Premises or Pigs must be conducted in a biosecure manner to prevent further disease spread. Box 3-1 lists the key elements of stamping-out. Further detail on Depopulation, Disposal, and Decontamination (3D) activities are discussed in Section 4.11.

Box 3-1. ASF Stamping-Out Strategy

Stamping-Out Critical Goals

- After the identification of an Infected Premises or Pig, all infected swine will be depopulated in the safest and most humane way possible.
- As a general goal, APHIS recommends that depopulation and disposal activities be completed as soon as possible after approval for indemnity payment. That said, identifying a specific depopulation response time goal is not an absolute requirement.
- Assessing possible depopulation and disposal of swine on any farm location will require proper planning and resources to ensure health and safety of the owner, grower and responders, and proper planning and resources will be needed to ensure animal welfare. In some cases, other swine, such as those on Contact Premises, may also be depopulated.
- To be most effective in stopping disease transmission, it may be necessary to prioritize depopulation (of premises or even within a single premises) based on clinical signs and epidemiological information.
- Public concerns about stamping-out require a well-planned and proactive public relations liaison campaign.
- Care should be taken to consider the mental health implications for owners and responders.

3.3.1.1 WOAH Definition of Stamping-Out

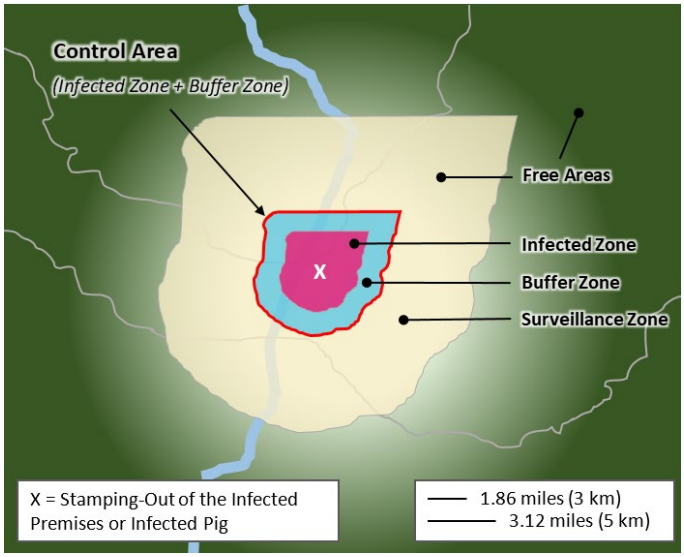
"Stamping-out" is defined in the WOAH *Terrestrial Animal Health Code (2022) Glossary*, as:

> a policy designed to eliminate an outbreak by carrying out under the authority of the Veterinary Authority the following: (a) the killing of the animals which are affected and those suspected of being affected in the herd or flock and, where appropriate, those in other herds or flocks which have been exposed to infection by direct animal to animal contact, or by indirect contact with the causal pathogenic agent; animals should be killed in accordance with Chapter 7.6; (b) the disposal of carcasses and, where relevant, animal products by rendering, burning or burial, or by any other method described in Chapter 4.13; (c) the cleansing and disinfection of establishments through procedures defined in Chapter 4.14.

3.3.2 Zones and Areas in Relation to Stamping-Out

Figure 3-1 illustrates an example of a stamping-out strategy where an Infected Premises or an infected feral swine are depopulated. See Section 4.5.1 for further information on zones and areas for an ASF outbreak response.

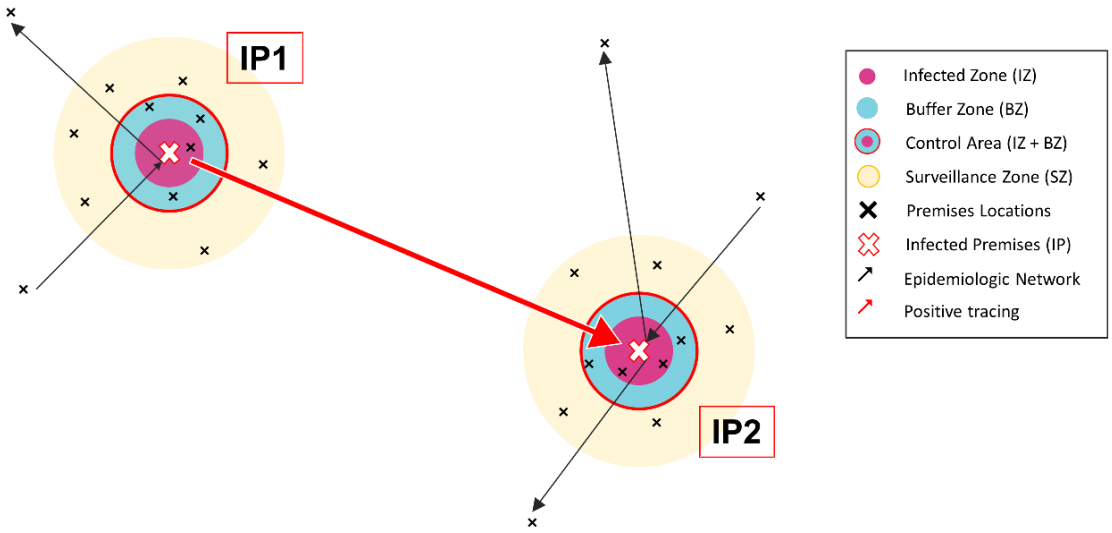
Figure 3-1. Example of Zones and Areas in Relation to Stamping-Out



3.3.3 Zones and Areas in Relation to Contact Tracing

Figure 3-2 illustrates an example of an epidemiologic network where contact tracing from the first Infected Premises (IP1) identified an epidemiologically-linked Contact Premises outside of the initial Control Area. This additional Infected Premises (IP2) triggered a new Control Area that led to additional Contact Premises. All high-risk direct Contact Premises that are traced from/to an Infected Premises are subject to immediate investigation and State quarantines.

Figure 3-2. Example of Contact Tracing in an ASF Outbreak



3.3.4 Control and Eradication of ASF in Domestic Pigs

In the event ASF is detected in domestic pigs,[23] the control and eradication strategy is (as noted in Section 3.1):

1) Quarantine Infected Premises.

2) Establish Control Areas (movement controls) around Infected Premises.

3) Conduct aggressive contact tracing of Infected Premises, including premises epi-linked through a network relationship, where appropriate.

4) Conduct stamping-out to eradicate ASF virus.

5) Conduct surveillance in Control Areas and Free Areas.

6) Implement enhanced biosecurity.

This section will focus on control strategies in domestic pigs, for further information on stamping-out refer to Section 3.3.2 and Section 4.11.1.

The primary control strategy in domestic pigs focuses on preventing ASFV from coming in contact with susceptible swine. This is accomplished through the establishment of Control Areas, supported by quarantine and movement controls, along with enhanced biosecurity efforts. The size and number of Control Areas will vary based upon the population(s) infected (commercial, backyard, or feral), the epidemiological information available, and the risk of ASFV transmission through swine, fomites, or vectors. In any situation, a positive ASF detection would require a minimum Control Area with a 5-kilometer radius, consisting of a 3-kilometer IZ and a 2-kilometer BZ. In addition, there is a 5-kilometer Surveillance Zone (SZ) in the Free Area surrounding the Control Area.

Ongoing literature on the sizes of these zones is being developed by APHIS VS Center for Epidemiology and Animal Health (CEAH) and will be posted on the ASF FAD PReP website, once available.

A full epidemiological assessment must be completed in order to determine the extent of the outbreak, which includes the identification and prioritization of epidemiologically-linked Contact Premises and surveillance for contact, sick and dead feral swine. Feral swine found near ASF infected domestic pigs may be depopulated. All domestic pig premises, infected or not, should take additional biosecurity precautions to prevent contact between feral swine and domestic pigs.

[23] See Appendix A for a complete list of definitions.

3.3.5 Control and Eradication of ASF in Feral Swine

In the event ASF is detected in feral swine, the control and eradication strategy is:

1. Establish Control Areas around infected feral swine (location on the landscape). Domestic pig premises in the feral swine Control Area will be subject to movement controls.

2. Conduct aggressive epidemiological investigation.

3. Increase separation between feral swine and domestic pigs in the Control Area.

The primary eradication strategy is the stamping-out of infected feral swine followed by population reduction. This is essentially the same strategy as in domestic pigs; however, implementation varies due to the differences between production-based systems and feral swine. This section will focus on control strategies in feral swine, for further information on stamping-out refer to Section 3.3.2 and Section 4.12.1.

Control of ASF in feral swine focuses on limiting viral spread and transmission through the establishment of Control Areas that encompass the home range of the infected feral swine. At a minimum, the Control Area surrounding the infected feral swine will have a 5-kilometer radius, consisting of a 3-kilometer IZ and a 2-kilometer BZ. In addition, there is a 5-kilometer SZ in the Free Area surrounding the Control Area. A larger Control Area may be needed depending upon the estimated home range of the feral swine.

Like ASF control in domestic pigs, Control Areas for feral swine are dependent upon the epidemiological requirements of the outbreak. Feral swine will have additional epidemiological considerations. They are free-ranging animals that cannot be "quarantined" and primarily move within defined or estimated home ranges. The home range of feral swine populations can vary widely and are influenced by the availability of food and water resources, as well as by their sex.

ASF is thought to move slowly through wild boar populations in Europe, with estimates suggesting rates of spread at 0.7 to 1.5 kilometers per month.[24,25] The relatively slow rate of spread should allow the initial response to focus on intense on-the-ground surveillance to determine the extent of infection within populations

[24] Podgórski, T., and Śmietanka, K. (2018). Do wild boar movements drive the spread of African swine fever? *Transboundary and Emerging Diseases*, *65*(6), 1588–1596. Doi: 10.1111/tbed.12910.

[25] European Food Safety Authority (EFSA), Boklund, A., Cay, B., Depner, K., Földi, Z., Guberti, V., ... & Šatrán, P. (2018). Epidemiological analyses of African swine fever in the European Union (November 2017 until November *16*(11), e05494. doi: 10.2903/j.efsa.2018.5494. 2018). *EFSA Journal*,

so that adequately-sized Control Areas can be established and adjusted as necessary.

The establishment of Control Areas and zones will delineate where management actions occur. Feral swine within Control Areas will be removed and tested in accordance with incident depopulation efforts. Additional essential activities include strategic population reduction, public outreach, targeted surveillance, and surveillance for dead pigs. Any carcasses found within a Control Area will be tested and disposed of properly in accordance with applicable State and Federal environmental laws unless access to their location would require considerable resources. Immediate carcass removal and proper disposal is key in preventing the spread of ASFV through feral swine populations. Recent work suggests that more than 50 percent of ASF transmission in wild boar can be carcass-based.[26]

Analytical tools that estimate local feral swine population abundance in the United States and optimal culling radius will be used to help refine control and eradication strategies.[27,28,29]

Chapter 4 provides further information on designations of feral swine zones, and areas (Section 4.5.1), in addition to management activities (Section 4.13) that occur within those designations to control and eradicate ASF.

3.4 Initial Response Actions

3.4.1 Authorization for Response and Associated Activities

When the criteria for a presumptive positive ASF case have been met (see Chapter 4 for case definitions), the APHIS Administrator or the VSDA (CVO of the United States) can authorize APHIS personnel—in conjunction with State, Tribal and unified IC personnel—to initiate certain response activities of the index case (Infected Premises or Infected Pig), including an epidemiological investigation of Contact Premises.

[26] Pepin, K.M., et al. Unpublished.

[27] Pepin, K. M., Brown, V. R., Yang, A., Beasley, J. C., Boughton, R., VerCauteren, K. C., Miller, R. S., & Bevins, S. N. (2022). Optimising response to an introduction of African swine fever in wild pigs. Transboundary and Emerging Diseases, 69, e3111– e3127.

[28] Tabak, M. A., Piaggio, A. J., Miller, R. S., Sweitzer, R. A., & Ernest, H. B. (2017). Anthropogenic factors predict movement of an invasive species. *Ecosphere*, *8*(6), e01844. Doi: 10.1002/ecs2.1844.

[29] Lewis, J. S., Corn, J. L., Mayer, J. J., Jordan, T. R., Farnsworth, M. L., Burdett, C. L., ... & Miller, R. S. (2019). Historical, current, and potential population size estimates of invasive wild pigs (Sus scrofa) in the United States. *Biological Invasions*, *21*(7), 2373-2384. Doi: 10.1007/s10530-019-01983-1.

Upon ASFV confirmation in domestic pigs by the National Veterinary Services Laboratories (NVSL) Foreign Animal Disease Diagnostic Laboratory (FADDL), the Secretary of Agriculture will

- Take immediate steps to declare an Extraordinary Emergency (refer to Section 2.2.1.1) (if the ASFV confirmation involves domestic pigs);
- Issue a 72-hour National Movement Standstill (if the ASFV confirmation involves domestic pigs);
- Authorize indemnity for depopulation of Infected Premises in conjunction with APHIS, State, and Tribal animal health officials according to the depopulation methods allowed by the American Veterinary Medical Association (AVMA); and
- Authorize payment for virus elimination at a uniform, flat rate, based on the size of the affected premises.

In the event of an NVSL-confirmed detection of ASF virus not involving domestic pigs but in feral swine only, USDA **will not** automatically execute a 72-hour National Movement Standstill. Instead, USDA and affected State(s) will establish initial Control Area(s) and Surveillance Zone(s) appropriate for the conditions of the detection. However, if there is an epidemiological circumstance that associates domestic pigs with the feral swine detection, USDA will implement a National Movement Standstill. An example of such a circumstance will be a detection in feral swine located or situated in a domestic pig epidemiological risk situation (such as feral swine commingled on a domestic pig premises or feral swine commingled at a buying station).

A confirmed positive ASF detection in domestic pig or feral swine will immediately impact international movements (exports); APHIS and Food Safety and Inspection Service (FSIS) should be consulted to determine trade/ export impacts of any ASF detection. For more information, see the APHIS Exports website.

ASFV is transmitted to swine only through close contact (not aerosol transmission) and is not zoonotic. Therefore, APHIS and State Animal Health Officials will focus on initial quarantine, site biosecurity, and aggressive contact tracing as critical priorities measures to contain the outbreak. The authorization for indemnity and subsequent swine depopulation activities will occur after those initial steps.

The primary driver of indemnity policy will be the availability of sufficient funds through the duration of an ASF outbreak. Additional considerations include the regulatory requirement for confirmation, degree of confidence in any National Animal Health Laboratory Network (NAHLN) non-negative ASF diagnostic test result, and application of the APHIS Case Definition for ASF (see Section 4.2.1.2) , which provides guidance for evaluating diagnostic test results and swine clinical signs to assign a regulatory status of suspect case, presumptive positive case, or confirmed positive case. Finally, indemnity authorization depends upon the

submission of an indemnity request – including all required recordkeeping documents (e.g., mortality sheets, herd inventory logs, etc.) for appraisal.

The following sections provide further detail on the initial response actions taken for ASF outbreak.

3.4.2 Coordinated Public Awareness Campaign

If ASF is detected in the United States, a Joint Information Center (JIC) will be established to organize, integrate, and coordinate information to ensure consistent messaging across multiple jurisdictions and disciplines. APHIS Legislative and Public Affairs (LPA)—the primary liaison for an ASF outbreak—and the USDA Office of Communications will invite State, local, and industry communicators to participate.

A public awareness campaign must be effectively coordinated with the creation and distribution of audience-appropriate information. Effective communication and messaging are among the most important critical activities to the overall ASF effort.

ASF communication objectives must

- furnish accurate, timely, and consistent information;
- maintain credibility and instill public confidence in the government's ability to respond to an outbreak;
- minimize public panic and fear; and
- address rumors, inaccuracies, and misperceptions as quickly as possible.

Box 3-2 provides key messages that should be emphasized and reinforced by communications personnel during an ASF outbreak.

Box 3-2. Key Communication Messages in an ASF Outbreak

Key Communication Messages

- We are responding quickly and decisively to eradicate the virus.
- ASF does not affect human health and cannot be transmitted from pigs to humans.
- ASF is not a food safety concern—properly prepared meat is safe to eat.
- We are safeguarding animal agriculture and the food supply.

Additional key messages for producers

- Protect your herd with good biosecurity practices and be vigilant in reporting signs of illness to your veterinarian, or State or Federal animal health official.
- Update your biosecurity plan and implement an ongoing African swine fever training program for personnel.
- Restrict access to production sites.
- Enhance employee biosecurity practices.
- Ensure strict movement-of-animal protocols.
- Prevent feed contamination and control wildlife, rodents, and flies.
- Put in place proper carcass disposal and manure management practices.

For more information on fighting African swine fever, visit Protect Our Pigs

Trade restrictions will be communicated via APHIS and FSIS. For more information, see the APHIS Exports website.

All personnel involved in an incident—from executive leadership to field responders—must be cognizant of the impact of social media. While it can be a useful tool in disseminating information or even gathering intelligence, it can also put a spotlight on a single aspect or episode of an event that misrepresents the whole of the effort. This threatens the intended public message, as well as the safety of responders and the progress, if not the success, of the response operation.
Any Agency-initiated social media for the incident must be done thoughtfully and coordinated through the on-site Public Information Officer and LPA. Responders should never use personal social media accounts to discuss the incident.

3.4.3 Regulatory Movement Controls

Upon strong suspicion of ASF on a domestic pig premises during an FAD investigation, a temporary hold order or quarantine will be immediately issued by State authority, or Tribal authority. Confirmation of ASF by NVSL is *not* necessary for States, or Tribes, to implement quarantines and/or movement controls on individual premises during an investigation.

With NVSL confirmatory results, the SAHO will issue an official quarantine. A Federal quarantine (under the AHPA and CFR authorities) may also be issued, if requested by the SAHO or directed by the Secretary of Agriculture. The Incident Commander will work with the Operations Section and the Planning Section to

determine and establish zone, area, and premises designations during an ASF outbreak. These designations are captured in the Emergency Management Response System 2.0 (EMRS2)—the official system of record for permits and permitted movements made into, within, and out of ASF Control Areas.

Each State has different quarantine authorities; therefore, each State's animal health emergency response plan should describe the implementation of quarantines and movement controls. Due to the highly integrated nature of the swine industry, it will also be necessary to consider swine interstate movements.

3.4.3.1 National Movement Standstill

See ASF Response Policy *USDA Declaration of Extraordinary Emergency & 72-hour National Movement Standstill*, dated July 10, 2023.

A National Movement Standstill is a complete stop in live swine movement or dead pigs to rendering across the entire United States mainland. This does not include pork meat or pork products, swine germplasm, or feed. It is primarily intended to allow States, Tribes, and industry to gather initial critical information for a unified approach to an ASF response, while inhibiting further virus transmission before effective disease control measures can be successfully implemented. Upon confirmation of ASF in domestic pigs, USDA will issue a National Movement Standstill for 72 hours in the contiguous United States via Federal Order. USDA APHIS will further provide notification to State animal health officials, industry associations and through a press release, the APHIS website (www.aphis.usda.gov/fadprep), and the agency's social media accounts.

In the event of an NVSL confirmed detection of ASFV in feral swine only (a detection not involving domestic pigs), USDA will not automatically execute a 72-hour National Movement Standstill. USDA and affected State(s) will establish Control Area(s) and Surveillance Zone(s). However, international movement will be impacted. Trade restrictions will be communicated via APHIS and FSIS. For more information, see the APHIS Exports website.

USDA **will** execute a 72-hour National Movement Standstill upon a detection of ASFV in feral swine if there is an epidemiological circumstance requiring such action. An example of such a circumstance will be a detection in feral pigs located or situated in domestic pig epidemiological risk situation (such as feral pigs commingled on a domestic pig premises or feral pigs commingled at a buying station).

In the event of a National Movement Standstill, USDA will provide clear, concise requirements for its implementation, and make the notice easily accessible to all stakeholders. Specifications of issuance will at least be defined for:

- a specific geographical area or boundary (e.g., National or other);

- a specific requirement that all live swine in transit at issuance must reach a destination;
- specific start and stop times indicating the duration of a standstill;
- a specific list of what items are restricted from movement (e.g., live swine; deadstock removal); and
- a specific list of what items are exempt from movement restrictions (e.g., negligible risk FSIS-inspected products).

The National Movement Standstill prohibits movement of live swine nationwide. for both domestic movement and international movement (exports) (see National Movement Standstill on the ASF FAD PReP website). Additionally, it prohibits swine deadstock removal services, as this is considered a high-risk activity for potential disease spread. In the interest of animal welfare, USDA does not require or recommend that feed deliveries be prohibited in a movement standstill.

During the 72-hour period, APHIS and SAHOs will consider and allow critical low risk movements. APHIS VS will collaborate with States and the private sector to identify Control Areas, which will subsequently require permits for any movements and on plans for resumption of movement in the Free Area. Prior to the end of the 72-hour period, at approximately 48 hours, APHIS VS will confirm the anticipated end of the standstill order, or announce any intention to extend it, through the notification avenues referenced above (See Section 3.6 for additional information on resumption of movement). Allowance for resumption of international movements (exports) will be communicated via the APHIS Exports website.

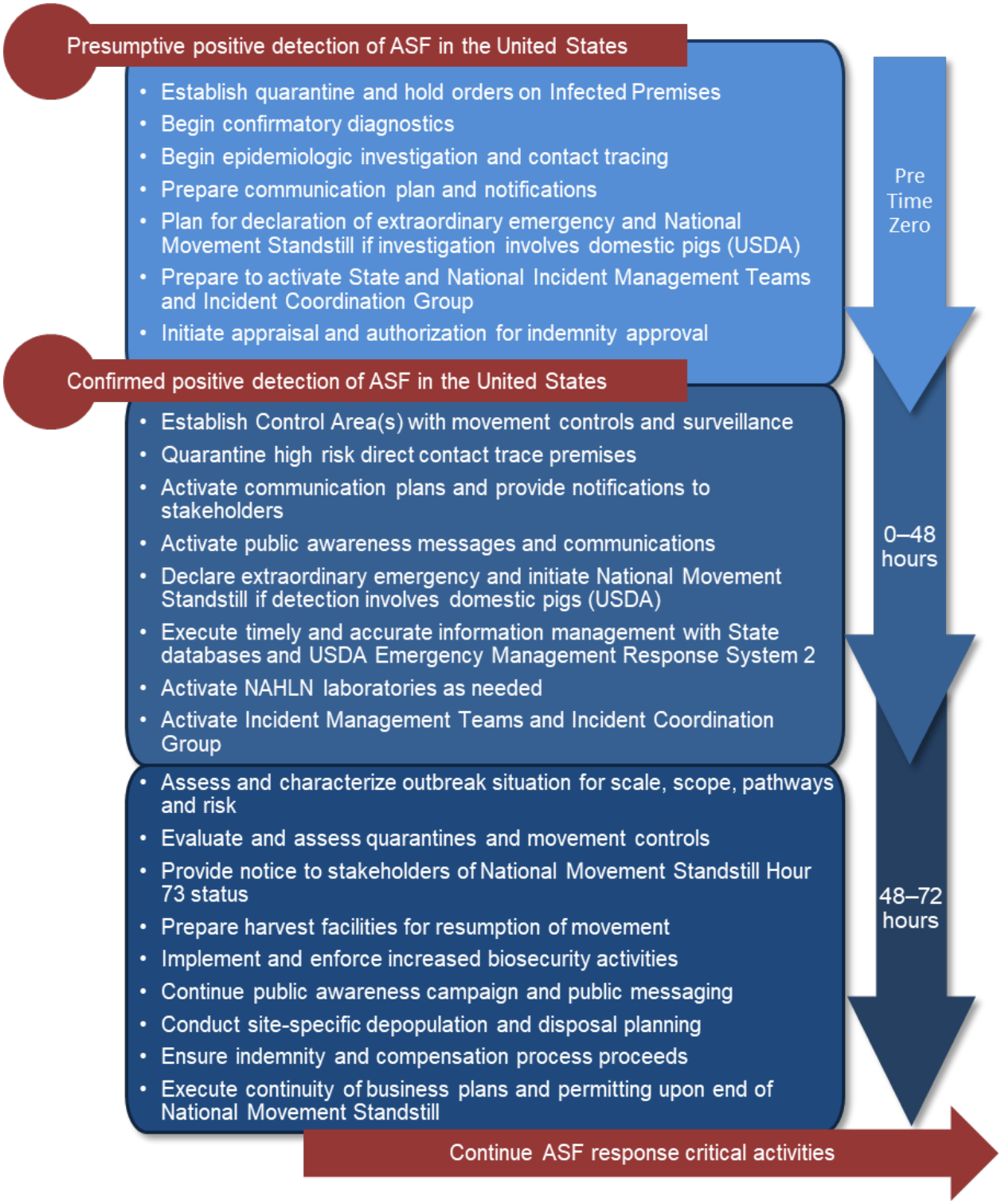
Quarantine and movement controls are critical to stopping disease transmission, particularly for ASF. State, Tribal, and APHIS officials must carefully weigh the risk of disease transmission against the need for critical movements (e.g., feed) and business continuity. A National Movement Standstill only works if all parties involved understand the reasons and goals for a movement standstill—and have planned for it.

Note: Policy issued during an incident or outbreak will be posted on the ASF FAD PreP website and will supersede these general specifications.

3.4.4 Initial Critical Activities of an ASF Response

After the detection of ASF in the United States, specific actions must occur as seen in Figure 3-3. These critical tasks are fundamental to the rapid control and containment of ASF. Figure 3-3 delineates many of the most important tasks and activities but is not all-inclusive. Each response effort is different and may create unique challenges.

Figure 3-3. Initial Critical Activities of an ASF Response



3.5 Movement Control Post Standstill

The release of a National Movement Standstill *does not* mean that all USDA and State movement restrictions have been lifted, signifying the resumption of normal movement. States will have issued initial quarantines and established Control Areas, as necessary, to contain and control disease spread. Live swine, dead swine, and potential ASF fomite movements into, within, and out of a Control Area will require a permit. The Incident Management Team and States will evaluate and approve permits for live swine, dead swine, and potential ASF fomite movements. Any permits for interstate commerce must be approved by the origin and destination SAHOs.

While quarantine and movement controls are highly effective at limiting the spread of disease, they also impede normal business operations. Varying restrictions and requirements for live swine or product movement can be expected by non-infected States; therefore, impacting non-infected operations. The implementation of continuity of business (COB) plans is essential to assist with the managed movement of non-infected premises and non-contaminated animal products. All States, infected or not, should anticipate the influx of permit requests once a standstill is lifted.

Information about allowance for international movements (exports) will be communicated via APHIS and FSIS. For more information, see the APHIS Exports website.

3.6 Hour 73: Response Options Following a 72-Hour National Movement Standstill

See ASF Response Policy, *Hour 73: Response Options for Resumption of Swine Movements following 72-hour National Movement Standstill,* dated May 15, 2023.

Upon conclusion of the 72-hour National Movement Standstill, at Hour 73, slaughter establishments in the Free Area should be removed from any extended national standstill order and allowed to resume operations. A stop movement of swine to slaughter establishments in Free Areas beyond the initial 72-hour National Movement Standstill would result in significant issues and harm for non-infected production premises in Free Areas, including animal welfare concerns. Thus, APHIS VS will execute one or more of the following Hour 73 options for production premises dependent upon premises specific circumstances:

1. Continue National Movement Standstill for an additional period beyond Hour 73 exempting swine movement to slaughter establishments in Free Areas.

2. End the 72-hour National Movement Standstill at Hour 73.

- Premises in Free Areas resume intrastate and interstate commerce at Hour 73 without permits unless movement is into an established control area.

- Premises in established Control Areas need permits for intrastate and interstate commerce.

3. Establish a smaller geographical or jurisdictional movement standstill area (such as part of a state, or an entire state, or a region) for intrastate and /or interstate commerce at Hour 73.

    - Premises in Free Areas resume intrastate and interstate commerce at Hour 73 without permits unless movement is into an established control area.

    - Premises in established control areas need permits for intrastate and interstate commerce.

Chapter 4 provides further information on quarantine and movement control, COB, and permitting requirements during an ASF outbreak.

Chapter 4
Specific ASF Response Critical Activities and Tools

FAD PReP documents identify critical activities and tools to be employed in the event of an ASF outbreak. These critical activities and response tools assist in controlling, containing, and eradicating ASF while facilitating COB in an outbreak. This chapter describes key parts of these critical activities and tools.

Documents referenced in this chapter can be found at www.aphis.usda.gov/fadprep.

To achieve the goals of an ASF response, critical activities and tools must be implemented to successfully execute response strategies. Box 4-1 lists some necessary critical activities and tools to effectively contain, control, and eradicate ASF. A science- and risk-based approach that protects the public, animal health, the environment, and stabilizes animal agriculture, the food supply, and the economy is utilized.

Box 4-1. Overview of Critical Activities and Tools for an ASF Response

Critical Activities and Tools for Containment, Control, and Eradication

- Public communication and messaging campaign *(3.4.2)*
- Swift imposition of effective quarantine and movement controls *(4.6)*
- Stringent and effective biosecurity measures *(4.10)*
- Rapid diagnosis and reporting *(4.3)*
- Epidemiological investigation and contact tracing *(4.5)*
- Increased surveillance in domestic and feral swine populations *(4.4)*
- Continuity of business measures for non-infected premises and non-contaminated animal products *(4.7, also Secure Pork Supply Plan)*
- Mass depopulation and euthanasia *(4.11)*
- Effective and appropriate disposal measures *(4.11)*
- Virus elimination measures *(4.11)*
- Feral swine population reduction *(4.12)*

4.1 Etiology and Ecology

Information on the etiology and ecology of ASF helps promote a common understanding of the disease agent among responders and other stakeholders (see Chapter 1 for ASF information). The *ASF Overview of Etiology and Ecology SOP* contains additional information.

4.2 Laboratory Definitions and Case Reporting

Laboratory and case definitions provide a common point of reference for all responders. Case definitions and laboratory criteria are developed according to the *Case Definition Development Process SOP* which describes the general process for developing and approving animal disease case definitions for use in animal health surveillance and reporting. The *ASF Case Definition* is discussed below.

4.2.1 Laboratory Definitions

The following case definitions were published in March 2023. In any ASF outbreak, case definitions may be edited after the first presumptive or confirmed positive case (index case). The case definition will be reviewed throughout the outbreak and modified based on additional information or the changing needs of the eradication effort.

4.2.1.1 Laboratory Criteria

1. *Agent isolation and identification:* Collect whole blood ([Ethylenediaminetetraacetic acid (EDTA) and heparin), whole blood swabs, spleen, lymph nodes, and tonsils. Keep samples as cold as possible without freezing, unless using inactivating media. Tests include real-time polymerase chain reaction (PCR), immunohistochemistry (IHC), and virus isolation (VI).

2. *Agent Characterization*: Genome sequencing is critical to differentiate viral strains.

3. *Serology:* Antibody (Ab) detection in serum can be evaluated by enzyme-linked immunosorbent assay (Ab ELISA), indirect fluorescent antibody test (IFAT), and indirect immunoperoxidase test (IPT). Antibodies typically develop 7-10 days postinfection and can persist for life. Pigs infected with highly virulent ASFV strains can die before antibody production occurs.

4.2.1.2 Case Definition and Reporting Criteria

1. *Suspect case:* A suid with

    a. clinical signs consistent with ASF; OR

    b. an epidemiologic link to ASFV; OR

    c. a non-negative result by a serological antibody screening assay conducted as part of a national surveillance activity.

2. *Presumptive positive case:* A suspect case with a non-negative test result for ASFV PCR from a National Animal Health Laboratory Network (NAHLN) or other APHIS approved screening laboratory.

3. Confirmed positive case:

    a. ASF virus has been isolated and sequenced at NVSL; OR

    b. A suid with clinical signs consistent with ASF or an epidemiologic link to ASFV or cause for suspicion of previous association or contact with ASFV; AND

        i. an ASF PCR[30] positive result with genomic sequencing at NVSL; OR

        ii. antibodies specific to ASFV are identified by Ab ELISA and confirmed by IPT at NVSL.

Under the APHIS National List of Reportable Animal Diseases (NLRAD), ASF is a U.S. FAD and a WOAH-notifiable disease. Suspect cases should be reported to a State Animal Health Official (SAHO) or Area Veterinarian in Charge (AVIC) who will decide if the report is credible and assign a Foreign Animal Disease Diagnostician (FADD) to further investigate the possibility of ASF infection. For more information on FAD investigation procedures please refer to *VS Guidance Document 12001.4: Policy for the Investigation of Potential Foreign Animal Disease/Emerging Disease Incidents* and the *FAD Investigation Manual (FAD PReP Manual 4-0)*.

4.3 DIAGNOSTICS

Effective and appropriate sample collection, diagnostic testing, surge capacity, and reporting are critical in an effective ASF response. These activities may require additional resources in the event of an ASF outbreak. In particular, meeting the demand for sampling pigs for investigations, surveillance, and movement will require additional personnel. Surge capacity will likely be needed for diagnostic laboratory testing. Surveillance plan requirements must be fully integrated with current diagnostic sample collection, sample testing, surge capacity, and reporting capabilities.

During a suspected or actual ASF outbreak, the key goals for diagnostics are to

[30] Once first identification has occurred at NVSL, ASF PCR positive result at a NAHLN approved laboratory or NVSL.

- provide clear direction to responders on sample collection and processing procedures, if modification from routine standards is required,
- meet the surge requirements for diagnostic testing at specific intervals, starting at time zero and at 24-hour intervals as the response escalates,
- utilize (Emergency Management Response System 2.0 [EMRS2]) to prepare and create submission documents when available, and
- report all diagnostic test results to appropriate personnel *and* information management systems (EMRS2) as soon as possible and within 4 hours of diagnostic test completion.

The *FAD Investigation Manual (FAD PreP Manual 4-0)* offers detailed information on diagnostic sample collection, diagnostic testing, and reporting. This document provides guidance on who is responsible for diagnostic testing, sample packaging and shipping, and roles in FAD investigations.

See *VS Guidance Document 12001.4* and the associated ready reference guide for the policy and guidance on FAD investigations. The procedures outlined in this document should be followed in all FAD investigations, including those in which ASF is a differential diagnosis.

4.3.1 Sample Collection and Diagnostic Testing

Trained personnel and field collection kits are required to effectively collect samples from swine. During an FAD outbreak, the quantity and frequency of samples collected need to increase; the Certified Swine Sample Collector (CSSC) training program ensures that the sample collection capacity is met to help ease the workload on existing FADDs and swine veterinarians. Development of the Federal-State-Industry CSSC training program was funded by USDA APHIS' National Animal Disease Preparedness and Response Program for the initial first two years, and Pork Checkoff for the third year. Program Standards are available here.

Table 4-1 details what specimens should be collected for diagnostic testing at NVSL-FADDL. Additional specific information on how to package and label laboratory submissions is also available here.

Confirmatory diagnostic testing for ASF will be performed at NVSL FADDL, with NVSL's Diagnostic Virology Laboratory providing support during an outbreak. Tests performed to determine the presence of ASFV include agent detection through PCR, and VI; agent confirmation and characterization through genome sequencing; and antibody detection through Ab ELISA, IFAT, and IPT tests.

Table 4-2 shows diagnostic tests performed by NVSL-FADDL, the required specimen and the minimum time needed to obtain results. Figure 4-1 shows the diagnostic test flow at NVSL-FADDL for ASF samples received. This information is current as of this document's publication, updates may be subject to change. Consult NVSL-FADDL guidance on the APHIS website for conducting sample collection.

Table 4-1. Sample Collection for Diagnostic Testing

SPECIMEN	MEDIUM	SHIPPING PRESERVATIVE
LIVE ANIMALS		
Individual animals		
Serum	Serum separator tube (8-10ml)	Ice pack
Whole blood EDTA	Purple top tube (8-10ml)	Ice pack
Whole blood swab	In 3 ml molecular transport media (MTM) obtained from NVSL	None
Tonsil scraping	In 3 ml tris-buffered tryptose broth (TBTB) transport media obtained from NVSL	Ice pack
Pooled animals		
Blood swabs	Up to 5 animals, Use spun swabs in MTM obtained from NVSL. Do not store swabs in MTM.	None
DECEASED ANIMALS		
Individual animals		
Fresh tissue: spleen, tonsil, mandibular, gastrohepatic, renal, or iliac lymph node	Separate Whirlpak per tissue type	Ice pack
Whole blood swab Spleen pulp swab	In 3 ml molecular transport media (MTM) obtained from NVSL	None
Set of tissues	Formalin (10:1)	Ice pack
Pooled animals		
Blood swabs Spleen pulp swabs	Up to 5 animals, Use spun swabs in MTM obtained from NVSL. Do not store swabs in MTM.	None
Spleen or tonsil	Must be collected individually and pooled under laboratory conditions	Ice pack

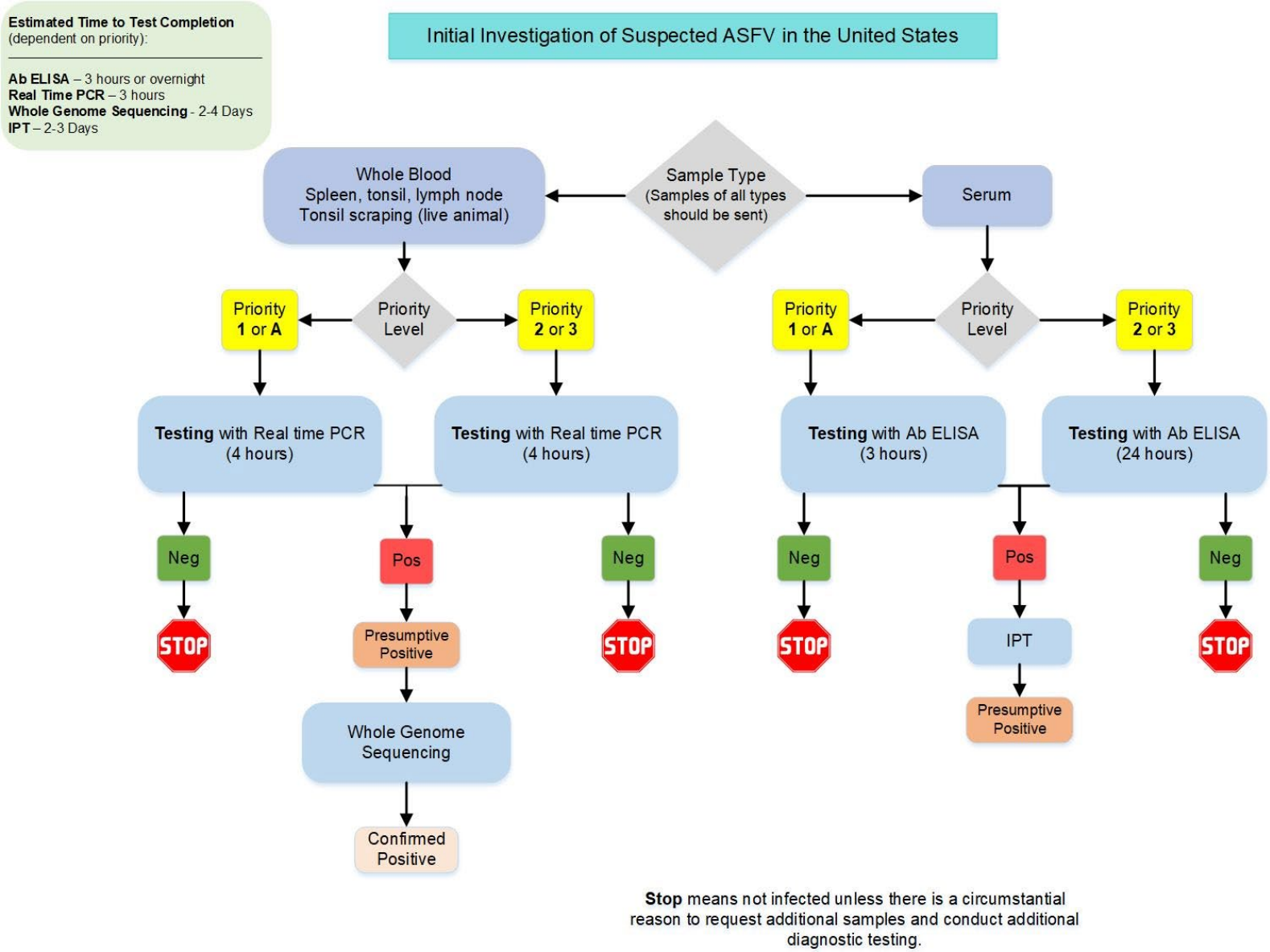
Source: NVSL-FADDL Disease-Specific Guide to Sample Collection

Table 4-2. Diagnostic Tests Performed for ASFV at NVSL-FADDL

Procedure	Specimen	Minimum test time
Ab ELISA	Serum	2-3 day
IPT	Serum	2-3 day
Real time PCR	Blood, tissue (tonsil, lymph node, spleen), swab (whole blood, spleen pulp)	3 hours
Whole genome sequencing	Blood, tissue (tonsil, lymph node, spleen), swab (whole blood, spleen pulp)	2-4 days
VI	Blood, tissue (tonsil, lymph node, spleen)	14-21 days (three 7-day cycles)

Note: Test time may vary depending on the number of samples or need to repeat the test. These are typical times that can be expected. Further information for an initial investigation is provided in Figure 4-1.

Figure 4-1. Diagnostic Test Flow for Initial Investigation of ASF in the United States



4.3.2 Surge Capacity

NAHLN laboratories provide rapid standardized surveillance and response testing for FADs. Currently, there are 49 laboratories approved for ASF testing. NAHLN maintains and updates this list on their website,[31] along with a map to geographically visualize laboratory capacity by State. APHIS realizes that, in an ASF outbreak, collecting and testing diagnostic samples will require significant resources. It is a priority to maintain this capacity and ensure that additional NAHLN laboratories have this diagnostic capacity in the immediate future.

4.4 Surveillance Design

The purpose of surveillance is to define the distribution of the disease, detect new outbreaks, and establish disease-free zones. Surveillance activities can aid in establishing priorities in terms of control and mitigation strategies and help evaluate the efficacy of response efforts. They are also critical to maintaining COB and providing evidence of disease freedom following an outbreak.

Surveillance personnel are involved in the case definition development, design of surveillance sampling schemes, and the assessment and reporting of surveillance findings. It is critical to coordinate between the personnel conducting surveillance activities and those responsible for epidemiological investigations, quarantine and movement control, and biosecurity.

This section provides a broad overview of ASF surveillance. Additional surveillance guidance documents with further detail on surveillance procedures and sampling schemes for domestic pigs during an outbreak will be posted on the ASF FAD PReP website. APHIS VS CEAH subject matter experts will support the unified IC to help define appropriate surveillance strategies during an outbreak.

4.4.1 Surveillance Goals and Objectives

Surveillance is a critical activity during an outbreak of ASF. The following are the goals of surveillance in response to an ASF outbreak in either domestic or feral swine:

- Implement a surveillance plan that will (1) define the present distribution of ASF in domestic pig and feral swine and (2) detect unknown Infected Premises[32] quickly.

[31] For further information on NAHLN Laboratories, see https://www.aphis.usda.gov/aphis/ourfocus/animalhealth/lab-info-services/nahln?urile=wcm:path:/APHIS_Content_Library/SA_Our_Focus/SA_Animal_Health/SA_Lab_Information_Services/SA_NAHLN/response-guidance.

[32] Refer to Section 4.5.1 for zone, area, and premises designations.

- Define the epidemiologic network for each Infected Premises.
- Determine feral swine presence near domestic premises, and if present, incorporate susceptible feral swine populations within the surveillance plan; coordinate with APHIS WS, U.S. Department of Interior (DOI), State wildlife agencies, and State agriculture departments.
- Provide surveillance data summaries and analyses at intervals specified by the unified IC.

Box 4-1. Surveillance Plan Objectives in an ASF Outbreak

Surveillance Plan Objectives

- Detect ASF Infected Premises and infected feral swine quickly.
- Determine the size and distribution of the ASF outbreak.
- Determine zone and premises designations.
- Supply information to evaluate outbreak response activities.
- Provide surveillance and testing requirements for movement of live swine into, out of, and within Control Area(s) that will include epidemiologic networks.
- Provide surveillance and testing information for pre-movement requirements.
- Provide evidence that Control Area(s) are free of disease.
- Provide evidence to demonstrate disease-freedom following eradication.

4.4.2 Surveillance Activities Overview

There are three key periods of surveillance activities in an outbreak. The initial 72 hours post-ASF outbreak declaration, the control and eradication period (the time until last case is detected and depopulated), and the completion of virus elimination to declaration of disease freedom.

Surveillance activities begin with the development of a surveillance plan. Surveillance plans may differ to address the objectives of the incident, time period of the response, and the specifications of the zone, area, and premises designations (see Section 4.5.1). Plans may also vary by outbreak type, field capacity, and epidemiologic characteristics that can differ by region, host, and virus. Surveillance activities and associated testing are based on the best scientific information available at the time and may need to be modified as an outbreak progresses.

Data collection for surveillance purposes can be either passive or active. Passive surveillance is ongoing and begins with the producer, veterinarian, or laboratory personnel suspecting a case of ASF and informing State or Federal animal health officials. Active surveillance is initiated by regulatory officials requesting the collection of animal health data using a defined protocol to perform actions that are scheduled in advance. Decisions about whether information is collected, what

information should be collected, and from which animals is made by the investigator.[33]

4.4.3 Passive Surveillance

Passive surveillance is continuously conducted within the United States. Passive surveillance relies on producers, veterinarians, and laboratory personnel to voluntarily report suspect cases based on clinical signs and lesions compatible with ASFV to State or Federal animal health officials. Passive surveillance for ASFV applies to all swine. Feral swine that are found dead or visibly sick (ruling out evidence of trauma, e.g., car strikes, etc.) will be tested and/or euthanized. Any suspect cases, in either domestic or feral swine having clinical signs compatible with ASF (e.g., abnormal health events and/or significantly decreased production parameters), will trigger a FAD Investigation (per *VS Guidance Document 12001.4)*. In the event of an ASF detection, passive surveillance is intensified through rapid and clear communication to all producers and veterinarians.

APHIS WS works collaboratively with States that have established populations of feral swine to reduce the number of feral swine and associated damages they inflict to agriculture, property, natural and cultural resources, and human health. As WS routinely monitors feral swine populations, they alert VS of any ASF suspect cases.

4.4.4 Active Surveillance for Domestic Pigs

Due to the increased spread of ASF in Asia and Europe, USDA implemented a targeted active surveillance program in 2019. The objectives of the program include strengthening detection capabilities, enhancing outbreak preparedness, and supporting claims of disease freedom for ASF and CSF. This plan, Swine Hemorrhagic Fevers: African and Classical Swine Fever Integrated Surveillance Plan, can be found on the USDA APHIS ASF website under technical documents. Additionally, a public dashboard is available summarizing the sampling performed since the plan was implemented.

During the initial stages of an ASF outbreak, surveillance is designed to provide evidence so that informed decisions can be made in regards to zone sizing, premises designation, and epidemiologic networks. In particular, all Suspect Premises in the Control Area must be tested to determine whether they are Infected Premises or At-Risk Premises. In addition, Contact Premises epidemiologically-linked to Infected Premises, will be identified and prioritized

[33] Active Surveillance is defined here by the International Conference on Animal Health Surveillance (ICAHS) in the Animal Health Surveillance Terminology Final Report from Pre-ICAHS Workshop, July 2013 (version 1.2).

so that appropriate surveillance activities and movement controls can be implemented quickly.

As the response progresses, surveillance is used to assess the disease status within Control Areas, SZ, and epidemiologically-linked networks. Surveillance assessments will determine if the initial parameters need to be re-evaluated or the criteria has been met for Control Area release. Surveillance can also provide evidence to demonstrate post-outbreak disease freedom.

Active surveillance also includes pre-movement testing. USDA APHIS is actively collaborating with stakeholders to further develop and define parameters for pre-movement testing.

4.4.4.1 Outbreak Selection Criteria and Sampling Methods

Individual pig sampling is the only validated method to detect ASFV. Currently, approved sample types include whole blood and fresh tissue (spleen, lymph node, and tonsil) (see Table 4-1). NVSL is diligently working to evaluate aggregate methods, such as rope sampling. Dead pigs and those presenting with case compatible clinical signs should be prioritized for sampling.

Updated guidance, as available, will be posted on the ASF FAD PReP website.

4.4.5 Active Surveillance for Feral Swine

In the event ASF is detected in feral swine populations, the initial surveillance goal will be to determine the distribution of infection. Once determined, control and eradication strategies can be implemented through established Control Areas (refer to Section 4.5.1 for zone, area, and premises designations).

Feral swine within Control Areas will be removed and tested in accordance with incident depopulation efforts. In the event a Control Area covers a large geographical area, surveillance testing will be refined to achieve the most efficient and effective approach. Surveillance activities outside of the Control Area and in the SZ will focus on heightened surveillance through wildlife management activities (see Section 4.12) where periodic sampling will occur. A sampling scheme will be developed during an outbreak and will be adapted as needed throughout the outbreak to account for availability of resources and to support the designation of zones and areas. The ultimate goal is to eliminate ASF in feral swine in order to prevent virus maintenance or spillover into domestic pigs.

4.5 Epidemiology

Epidemiological activities work to quickly and accurately identify cases of ASF, locate other Contact Premises that may be infected, and investigate the source of the outbreak. An epidemiologic investigation can classify premises so that appropriate zones, areas, and premises designations can be applied. Additional

activities involve the tracing of all contacts with affected animals and premises, including movement of non-susceptible animals, humans, fomites, animal products or byproducts, and equipment that may have come into contact with ASFV.

4.5.1 Zones, Areas, and Premises Designations

A critical component of an ASF response is the designation of zones, areas, and premises, which are used in quarantine and domestic movement control efforts. The Incident Commander works with the Operations Section and Planning Section to

1. determine appropriate zones, areas, and premises designations in the event of an ASF outbreak, and

2. re-evaluate these designations as needed throughout the outbreak based on the epidemiological situation.

Table 4-3 summarizes the premises designations that are employed in an ASF outbreak response for domestic pig production premises. Table 4-4 summarizes the zone and area designations that would be used in an ASF outbreak response.

Table 4-3. Summary of ASF Premises Designations for Domestic Pig Production Premises

Premises	Definition	Zone
Infected Premises/ Infected Pig(s) (IP)	Premises or pig location where a presumptive positive case or confirmed positive case exists based on laboratory results, compatible clinical signs, ASF case definition, and international standards.	Infected Zone
Contact Premises (CP)	Premises with swine that have been epidemiologically-linked to an IP through exposure to animals, animal products, fomites, or people. CPs would be subject to contact tracing.	Infected Zone, Buffer Zone, Free Area
Suspect Premises (SP)	Premises under investigation due to the presence of swine reported to have clinical signs compatible with ASF. This is intended to be a short-term premises designation.	Infected Zone, Buffer Zone, Surveillance Zone
At-Risk Premises (ARP)	Premises with swine, but none of those swine have clinical signs compatible with ASF. ARPs are not IPs, CPs, or SPs. ARPs may seek to move susceptible animals or products within the Control Area by permit. Only ARPs are eligible to become MPs.	Infected Zone, Buffer Zone
Monitored Premises (MP)	Premises objectively demonstrates that it is not an IP, CP, or SP. Only ARPs are eligible to become MPs. MPs meet a set of defined criteria in seeking to move susceptible animals or products out of the Control Area by permit. MPs provide biosecurity, surveillance and herd health status information to the IMT.	Infected Zone, Buffer Zone
Free Premises (FP)	Premises outside of a Control Area and not a CP or SP.	Surveillance Zone, Free Area

Table 4-4. Summary of ASF Zone and Area Designations

Zone/Area	Definition
Infected Zone (IZ)	Zone that immediately surrounds an Infected Premises or Infected Pig(s).
Buffer Zone (BZ)	Zone that immediately surrounds an Infected Zone or a Contact Premises.
Control Area (CA)	Consists of an Infected Zone and a Buffer Zone.
Surveillance Zone (SZ)	Zone outside and along the border of a Control Area. The Surveillance Zone is part of the Free Area.
Free Area (FA)	Area not included in any Control Area. Includes the Surveillance Zone.

4.5.1.1 Considerations for Zones and Areas

In an incident, the unified IC establishes an Infected Zone (IZ) and a Buffer Zone (BZ) for each ASF Infected Premises. This Control Area (the IZ and the BZ) may change as the outbreak progresses. In an ASF incident, additional considerations are needed to incorporate the specific characteristics of the swine industry, as well as considerations for feral swine since they, too, are susceptible to ASF. Zone, area, and premises designations may include epidemiologically-linked Contact Premises that are not all in the same, or contiguous geographical area, and areas that reflect home ranges of feral swine populations.

The perimeter of the Control Area should be at least 5 km (~3.12 miles) beyond the perimeter of the closest Infected Premises or Infected Pig. The size of the Control Area depends on the circumstances of the outbreak, including transmission pathways and estimates of transmission risk, swine movement patterns and concentration points, distribution of feral swine in proximity, natural terrain, jurisdictional boundaries, and other factors. The boundaries of the Control Area can be modified or redefined when tracing and other epidemiological information becomes available.

Table 4-5 provides a description of the minimum sizes of areas and zones for domestic pig production premises and feral swine found on the landscape; and Table 4-6 describes the epidemiologic factors used to determine the size of zones and Control Areas.

Table 4-5. Minimum Size of Zones and Areas

Zone or Area	Minimum Size and Details
Infected Zone (IZ)	Perimeter should be at least 3 km (~1.86 miles) beyond perimeters of presumptive or confirmed Infected Premises or Infected Pigs based on epidemiological circumstances. This zone may be redefined as the outbreak continues.
Buffer Zone (BZ)	Perimeter should be at least 2 km (~1.24 miles) beyond the perimeter of the IZ. Width is generally not less than the minimum radius of the associated IZ, but may be much larger. This zone may be redefined as the outbreak continues.

Zone or Area	Minimum Size and Details
Control Area (CA)	Perimeter should be at least 5 km (~3.12 miles) beyond the perimeter of the closest Infected Premises or Infected Pig. Please see Table 4-6 for factors that influence the size of the Control Area. This area may be redefined as the outbreak continues.
Surveillance Zone (SZ)	Width should be at least 5–10 km (~3.12 miles to ~6.21 miles) beyond the Control Area.

Table 4-6. Factors to Consider in Determining Control Area Size for ASF

Factors	Additional Details
Jurisdictional areas	◆ Effectiveness and efficiency of administration ◆ Multi-jurisdictional considerations: local, State, Tribal, and multistate
Physical boundaries	◆ Areas defined by geographic features ◆ Areas defined by manmade structures ◆ Areas defined by distance between premises
ASF epidemiology	◆ Reproductive rate ◆ Incubation period ◆ Ease of transmission ◆ Infectious dose ◆ Modes of transmission (contact with secretions, excretions, fomites, vectors) ◆ Survivability in the environment ◆ Ease of diagnosis (for example, no pathognomonic signs; requires diagnostic laboratory testing)
Infected Premises characteristics	◆ Number of contacts ◆ Transmission pathways and transmission risk ▪ Extent of animal movement ▪ Number of animals ▪ Species of animals ▪ Production stage ▪ Movement of traffic and personnel to and from premises (fomite spread) ▪ Biosecurity measures in place at time of outbreak
Contact Premises characteristics	◆ Number and types of premises ◆ Susceptible animal populations and population density ◆ Animal movements ◆ Critical movements (e.g., feed) ◆ Movement of traffic (fomites) and personnel to and from premises (fomite spread) ◆ Biosecurity measures in place prior to outbreak
Environment	◆ Types of premises in area or region ◆ Land use in area or region ◆ Estimated feral swine home range
General area, region, or agricultural sector biosecurity	◆ Biosecurity practices in place prior to outbreak ◆ Biosecurity practices implemented once outbreak detected
Number of backyard premises	◆ Types of premises, animal movements, and network of animal and fomite movements

Factors	Additional Details
Feral Swine	◆ Presence/absence of populations ◆ Population density ◆ Estimates of home range size ◆ Number of ASF positive carcasses ◆ Presence of feral swine markets or slaughter facilities

4.5.1.1.1 Additional Considerations for Feral Swine

Additional factors for zones and areas must be considered in the event feral swine are infected with ASFV. Feral swine are free ranging animals that primarily move within defined home ranges. The size of these home ranges vary based on resources, climate, habitat, and other factors.

Since an ASF outbreak in feral swine would almost certainly involve more than one pig, the IZ would likely be larger than the 3 kilometer minimum recommendation around a single index case. The initial IZ would encompass all ASF-positive feral swine cases and expand beyond the home range size for the affected population(s) of feral swine. Since feral swine home ranges vary widely, the exact size of the Control Area(s) will be determined by State/Federal wildlife experts after initial assessment. The average is approximately 1.5 to 3 square kilometers.[34]

Research on feral swine contact networks indicate that contact, and by extension, disease transmission, is uncommon between feral swine that are more than 2 kilometers apart on the landscape. The resulting IZ would therefore extend at least 3 kilometers out in all directions from the feral swine index case[35] with adaptations for natural and manmade landscape features. Some regions have additional feral swine data available[36] that could be used in the event of an outbreak to refine both home range estimates and the size of the IZ.

The BZ will expand proportionally with increases in the IZ so that it always provides a buffer equivalent to at least 2 kilometers surrounding the IZ. The BZ will indicate an area of increased ASF risk where no positive feral swine have been detected. Additionally, there will be a SZ of at least 5 kilometers surrounding the BZ. These zones will be adapted as the incident progresses, in addition to changes in epidemiology.

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[34] Kay, S. L., Fischer, J. W., Monaghan, A. J., Beasley, J. C., Boughton, R., Campbell, T. A., ... & Wisely, S. M. (2017). Quantifying drivers of wild pig movement across multiple spatial and temporal scales. *Movement ecology*, *5*(1), 14. Doi: 10.1186/s40462-017-0105-1.

[35] Pepin, K. M., Davis, A. J., Beasley, J., Boughton, R., Campbell, T., Cooper, S. M., ... & Wyckoff, C. (2016). Contact heterogeneities in feral swine: implications for disease management and future research. *Ecosphere*, *7*(3), e01230. Doi: 10.1002/ecs2.1230.

[36] Kay, S. L., Fischer, J. W., Monaghan, A. J., Beasley, J. C., Boughton, R., Campbell, T. A., ... & Wisely, S. M. (2017). Quantifying drivers of wild pig movement across multiple spatial and temporal scales. *Movement ecology*, *5*(1), 14. Doi: 10.1186/s40462-017-0105-1.

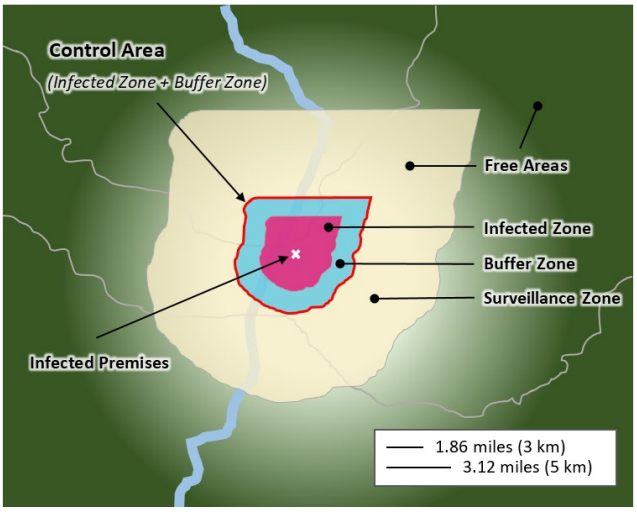
4.5.2 Visualizing Zones and Areas for Domestic Pigs & Feral Swine

Figure 4-2 illustrates examples of zones, areas, and premises designations for both domestic pigs and feral swine. Adjustments will be needed during an outbreak based on the evolving epidemiological and incident situation.

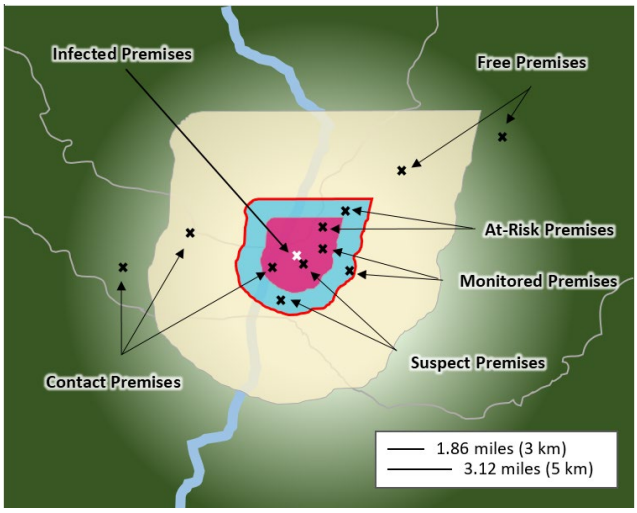
Figure 4-2. Examples of Zones, Areas, and Premises for Domestic Pigs and Feral Swine in an ASF Outbreak Response

Domestic Pigs

Zones and Areas



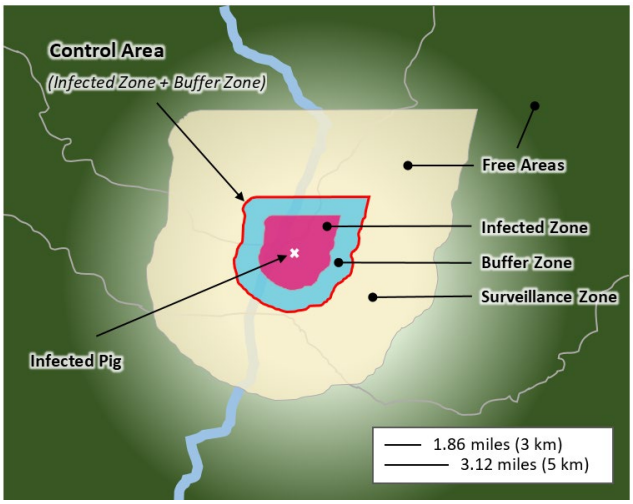
Premises



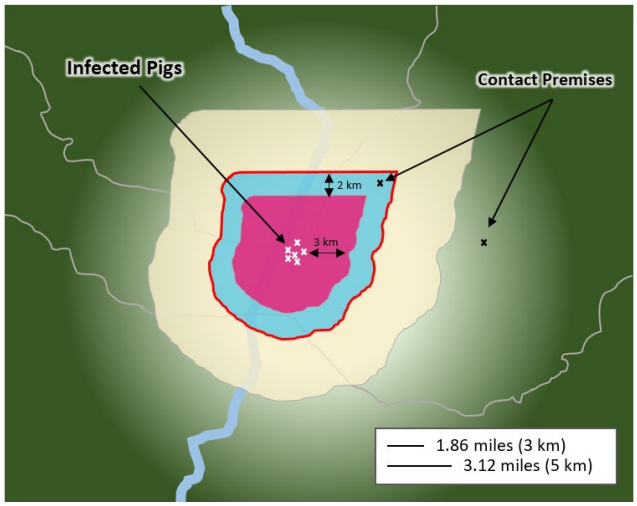
Note: The Surveillance Zone is part of the Free Area.

Feral Swine

Zones and Areas



*Pigs**



* The minimum Infected Zone is 3 kilometers; however, when multiple pigs are found nearby on the landscape the Infected Zone will be adjusted to incorporate all pigs, which potentially can result in a larger Infected Zone.

Note: The Surveillance Zone is part of the Free Area.

4.5.3 Epidemiological Investigation and Contact Tracing

An epidemiologic investigation can identify the index case, determine risk factors for transmission, and support the development of mitigation strategies. During an ASF outbreak, an epidemiological questionnaire will be utilized by the unified IC to assist in determining the scale and scope of the outbreak. The investigation and associated questionnaire will incorporate wildlife contact, particularly for feral swine, as well as an assessment to determine whether *Ornithodoros* spp. ticks are implicated in, or present a risk for, ongoing transmission. Evidence from recent outbreaks in previously ASF-free countries suggest that ticks may not play an epidemiologically significant role (if any role) in sustained transmission; other modes of direct and indirect transmission pathways should be the focus of control and containment activities.

Intensive contact tracing activities will also be required during an ASF outbreak to identify all Contact Premises. Contact tracing should identify all domestic pig movement onto and off an Infected Premises that occurred within the last 30 days of onset of clinical signs (i.e., two WOAH incubation periods for ASFV). In addition, all premises or locations having a shared indirect contact during the last 15 days with the Infected Premises will also be traced and subject to surveillance requirements.

Contact tracing is used in combination with traditional Control Areas to assist in limiting the spread of ASFV. Unlike traditional Control Areas that focus on local spread surrounding an Infected Premises, Contact tracing directly addresses movement and its role in disease transmission. As a result, additional cases can be identified quickly, and incident resources can be utilized more efficiently.

Regulatory officials and producers are expected to work together during an outbreak to identify Contact Premises—premises that have potentially been exposed to ASFV due to an epidemiologic link to an Infected Premises. Epidemiologic links that are most important to the spread of ASFV include the movement of people, animals, and equipment between sites. These premises, along with those in the Control Area, are most likely to be infected with ASF.

Section 3.3.3 provides an example of zones and areas in relation to contact tracing.

Box 4-2 explains the fundamental importance of movement tracing in an ASF response effort.

Box 4-2. Importance of Contact Tracing in an ASF Outbreak

Contact Tracing

One of the single most important and urgent veterinary activities during an ASF outbreak is to rapidly and diligently trace-back and trace-forward movements from an Infected Premises. This contact tracing aids in the control of the spread of ASFV and limits the impact of the outbreak. Contact tracing should capture all movements to and from the premises including, but not limited to, susceptible swine, non-susceptible species, animal products, vehicles, crops/grains, and personnel. Contact tracing also includes consideration of all potential modes of transmission and possible contact with feral swine.

Administering epidemiological questionnaires and tracing activities are typically conducted by a unified IC. Additional virtual support may be necessary from other personnel that have epidemiology expertise. No two incidents are the same: questionnaires, procedures, and priorities will be determined based on the specific circumstances of the incident.

The *Epidemiological Investigation and Tracing SOP* as well as the *National Animal Health Emergency Management System (NAHEMS) Guidelines: Surveillance, Epidemiology, and Tracing* both provide more information. The ASF Epidemiology Questionnaire can be found here.

4.6 Domestic Response: Quarantine and Movement Control

Quarantine and movement control measures are fundamental to any ASF response effort, as movement of infected animals and contaminated fomites spread ASFV. By restricting the movement of infected animals, animal products, and contaminated fomites, quarantine and movement control can be a powerful tool in controlling and eradicating an ASF outbreak.

Movement control is typically accomplished through a permit system for Control Areas. Permitting allows entities to make necessary movements into, within, and out of a Control Area without creating an unacceptable risk of disease spread. Criteria required for movement will depend on the risk of that movement, and may include biosecurity, cleaning and disinfection (C&D), and/or diagnostic testing depending on the specific permit. EMRS2 is APHIS' system of record for permits and permitted movements made into, within, and out of ASF Control Areas.

It is important that quarantine and movement controls, while critical to stopping disease transmission, also consider competing priorities; in implementing domestic measures, States, Tribes, and APHIS officials must weigh the risk of disease transmission against the need for critical movements (e.g., feed) and business continuity. Considerations should also be taken for the highly integrated

nature of the swine industry, where movements are often incorporated in networks and cross State lines. Movement control procedures are based on the best scientific information available at the time, and all personnel—premises owners, managers, and responders—should adhere to these measures.

The *NAHEMS Guidelines: Quarantine and Movement Control* and the *FAD PReP Permitted Movement* manual provides further information on measures considered necessary to prevent the spread of ASF.

For international exports, no animal or animal (by-)products can be exported from control zones. Exports of live animals and their by-products originating outside of control zones may proceed only when allowed by the importing country. Current country-specific requirements for the export of live animals and animal (by-) products can be accessed from the APHIS Exports website. Country-specific requirements for the export of pork meat/meat products can be accessed from the FSIS Export Library Import & Export Library.

4.6.1 Control Area Movement

Domestic movement related to swine business into, within, and out of a Control Area will either require a permit or tracking by the unified IC or producers. Any movement of swine and conveyance brings some level of risk of ASFV transmission from a known or unknown Infected Premises to non-infected premises. The risk of moving swine and conveyances depends on the nature of the item being moved and its ability to transmit or be contaminated with ASF.

For domestic movement of susceptible swine or potential fomites out of the Control Area to a Free Area, the permit process occurs as described in the document entitled *Permitted Movement (FAD PReP Manual 6-0)*. This includes approval from the origin State, and if interstate, the destination State. Requirements for a permit may vary depending on the permit, which takes into consideration the incident, National standards, State regulations, applicable WOAH standards, and conditions and criteria for the permitted movement(s), including requirements for biosecurity, surveillance and diagnostics. For international movements (exports), no animal or animal (by-)products can be exported from a control zone.

It is the State's responsibility for ensuring producers in their State know what type of movements require a permit, what requires no permit but reporting to the State and/or the unified IC, and what requires enhanced record keeping by the producer. It is important that criteria for movement during an ASF outbreak is communicated in an accurate and timely manner.

See APHIS guidance on Movement Control and Permitted Movement for more information.

4.6.1.1 Permit Requests And Types

Permit requests are made to the State and/or Incident Management Teams established for the response. The State may have their own permitting system. APHIS uses the EMRS2 Customer Permit Gateway, also referred to as "the Gateway", for permits and permitted movements regarding a Control Area. EMRS2 does not guarantee, certify, or otherwise assume that all requirements for a permit have been met. EMRS2 only facilitates the issuance of permits; it remains critical that all responsible parties ensure and remain vigilant that any requirements are met, as necessary, for the issuance of permits.

A critical component of the APHIS VS ASF response strategy will rely on the establishment of control areas around infected domestic premises or infected feral swine locations to 1) prevent the virus from coming into contact with susceptible swine, 2) support response efforts by quarantine and movement controls with enhanced biosecurity, and 3) emphasize contact tracing. Movement controls provide entities the ability to make necessary movements without creating an unacceptable risk of disease spread.

Table 4-7. Movement Controls: Permit Types during an FAD Incident

Specific Permits	Continuity of Business Permits
Provide control and containment of the FAD outbreak for infected premises.	Facilitate continuity of business for non-infected premises which are inside the Control Area.
Provide biocontainment (keeping the disease on infected premises) and bio exclusion (keeping the disease out of non-infected premises).	For movements from at-risk premises or monitored premises.
Allow critical or essential movements: 1) to ensure animal welfare (e.g., feed trucks) 2) related to response activities like depopulation and disposal	Two types of COB permits: 1) Operational – for the non-infected premises to continue operations during an outbreak (e.g., equipment, service crews, and carcasses). 2) Production – used for movements of animals and animal products into the supply chain for feeding, growing, processing, or to market.

Specific requirements for ASF COB permits are described in Section 4.7.

Permits and permitted movement outside the scope of the Control Area (in other words, not going into, within, or out of a Control Area) during an ASF outbreak are not captured in EMRS2 and should continue under regular authorities (Federal, State, and/or Tribal), using existing processes, procedures, and guidance. For a large scale ASF outbreak, States, APHIS, and industry continue to develop improved permit procedures and processes for Control Areas, pre-movement testing, and surveillance in the Free Area.

For general information and guidance on permitting, please refer to the document *Permitted Movement FAD PReP (Manual 6-0)*. For more information on the permitted movement process, please refer to the ready reference guide here.

Current country-specific requirements for the export of live animals and animal (by-)products can be accessed from the APHIS website.

4.7 Continuity of Business

COB manages movement for non-infected premises and non-contaminated animal products in a regulatory Control Area and facilitates movement, into, within, and out of a Control Area. COB provides science- and risk-based approaches and systems as a critical activity in an ASF response. This helps to facilitate agriculture and food industries in maintaining typical business, or returning to business during a disease response, while the risk of disease spread is effectively managed. COB planning can help to minimize unintended consequences on producers and consumers impacted by ASF while still achieving the goals of disease response.

During an ASF outbreak, COB plans will be implemented to facilitate the managed movement of commodities and animals from At-Risk Premises and Monitored Premises existing within regulatory Control Areas, helping the swine industry to continue business operations. To ensure effective implementation of COB plans, they must be developed and exercised in advance of any outbreak.

The *NAHEMS Guidelines: Continuity of Business* covers topics such as

- preparedness and response goals,
- key roles and responsibilities in COB planning,
- details of COB as part of an FAD response, and
- potential components required for a COB plan.

For more information on COB for an ASF outbreak, please refer to the *Secure Pork Supply Plan* located at www.securepork.org.

4.7.1 COB Permits for Live Animal and Semen Movements

Producers and federal and state officials recognize it is to all stakeholders' benefit to create consistency and transparency through the development of national standardized permitting requirements for domestic movements. As of this publication, national guidance for domestic pigs/semen transfer movements and domestic pigs to slaughter is being finalized and will be placed on the FAD PReP website. Following is a description of the core principles of the permitting and testing requirements.

The permit requirements listed below mitigate uncertainty in the likelihood of infection and disease spread associated with swine movement, with consideration including the following: frequency of movement of the specified swine type, the number of different destination premises swine from the same originating premises are moved to, the potential extent of continued disease spread, and variation in industry practices.

In addition, the permit requirements introduce a pre-movement isolation period as a mitigation measure for each movement type to reduce the risk of disease exposure on a premises in the days leading up to the swine movement. Based on a within-herd ASF transmission model[37], a pre-movement isolation period (PMIP) combined with pre-movement diagnostic testing decreases the risk of moving infected but undetected pigs from a premises, compared to implementing testing alone. The PMIP time period and testing frequency for each movement type was determined based on a protocol that balances increasing the probability of detecting ASF if present on the premises with logistical and operational needs for different swine production types to support continuity of business.

4.7.1.1 ASF COB PERMIT AND PMIP REQUIREMENTS FOR CONTROL AREAS

For specific movements, please see the posted document referenced above.

Permit Requirements

1. The premises must meet the criteria for a Monitored Premises designation and have a premises identification number. A Monitored Premises objectively demonstrates that it is not an Infected Premises, Contact Premises, or Suspect Premises

2. The pre-movement isolation period is 5 days (for transfer movements; 3 days for movements to slaughter), during which biosecurity is heightened.

3. Strict biosecurity requirements are listed for people or items crossing the line of separation and cleaning & disinfection of vehicles or items entering the site.

4. Movements on/off premises with appropriate biosecurity are described as *Allowed*—e.g., feed, essential personnel, emergency needs—or *Prohibited*—e.g., live animals, mortality/ manure/ garbage removal, visitors, movement of non-critical equipment.

[37] Ssematimba et al. 2002 "African swine fever detection and transmission estimates using homogenous versus heterogenous model formulation in stochastic simulations within pig premises." Open Vet J, Vol 12(6): 787-796

Testing priority (*example for gilt transfer movement*)

1. Dead pigs
2. Sick pigs
3. Pigs in hospital/sick pens
4. General population

Testing at 3 days pre-movement and at 1 day pre-movement

Test all dead swine in each barn up to 31 samples. If testing of dead swine does not produce 31 samples for the barn, sample animals in accordance with the priority list above to meet the balance.

Traceability of testing

All samples must either be collected by an accredited veterinarian, or a Certified Swine Sample Collector approved by the appropriate state animal health official. The request for permit must include identification of who collected the sample.

Movement requirements

a. All trucks hauling live swine must be cleaned and disinfected after delivery of swine. Cleaning and disinfection includes, but may not be limited to, anything that has been in direct or indirect contact with the swine (does include driver).

b. All movements under a permit must be completed within 48 hours and reported to the state animal health official that approved the permit.

5-day PMIP and test schedule—Most transfer movements

3-day PMIP and test schedule—Movements to slaughter

4.8 Information, Reporting and Task Management

Information, reporting, and task management during an ASF incident or outbreak ensures that responders, stakeholders, and decision-makers have access to accurate and timely critical emergency response information. Ideally, Federal, State, Tribal, and local information management systems are compatible for information and data sharing.

EMRS2 is the official USDA APHIS system of record in an ASF outbreak. It contains critical information, such as Infected Premises data, and provides automation for essential response processes (e.g., resources, and permitting). It is essential that EMRS2 contain accurate premises data prior to an incident to facilitate response efforts and devote resources to critical response tasks. States are strongly encouraged to import data before an ASF outbreak occurs.[38]

During an animal health emergency or disease response, APHIS VS will perform a cadre of information, reporting, and task management activities consisting of incident coordination, response planning for high-priority FADs, reporting, and inter-agency coordination. The APHIS VS National Preparedness and Incident Coordination Center will develop, update, and coordinate concepts of operations, response plans, procedures, and guidance for an ASF response making information and task management duties essential for Federal, State, and local response activities.

4.8.1 Emergency Management Response System 2.0 (EMRS)

In an ASF outbreak, the goal is to have EMRS2 task management processes performed in 12-hour or shorter intervals. Timely submission of information will ensure an effective response. Information must be entered in both an accurate and consistent manner across widespread field operations; this is especially important when there is more than one ICP. If possible, it may be necessary and/or beneficial to centralize certain data-entry capabilities, particularly when field resources are stretched. Using EMRS2, USDA and State/Tribal officials will be able to manage an infected premises and its Control Area from the investigation period through quarantine release and Control Area release, with full transparency about where a premises stands in the response and recovery process. Appendix B provides an example workflow illustrating a broad overview of EMRS2 task management activities undertaken when response activities occur.

Field personnel should be provided with access to mobile technology devices necessary for collecting, monitoring, and sharing information. EMRS2Go is a mobile application which enables rapid and straightforward data entry into

[38] States can refer to the EMRS2 webpage for more information, and more specifically, the guidance, *Premises Data Transfer to EMRS2 from External/State Based Systems,* which is located here: https://www.aphis.usda.gov/animal-emergencies/emrs

EMRS2 from the field. Rapidly functional, robust, and scalable information technology infrastructure is needed during an ASF outbreak.

4.8.2 Reporting

Reporting plays an important role, not only in directing disease mitigation activities in the field for the unified IC, but also in resource allocation, budgeting, and internal and external communication regarding the incident. Reporting does not replace or supplant "communications." Instead, reporting offers information and data on the incident that can be used for situational awareness and communications materials, such as websites and press releases.

Information entered in EMRS2 is used for internal and external situation reports produced daily, weekly, and as requested. It is also used to produce specific reports on key aspects of the response, such as permitting or deployments. Both the NIMT and ICG rely on EMRS2 for producing accurate reports during an outbreak. It is imperative in an ASF outbreak that information management and data integrity is a priority.

Incident reports as required daily, weekly, or as requested by the VSDA for internal and external reporting purposes will consist of situation reports, summary list of infected premises, epidemiological, permitting and movements, conveyances, and deployment. Geographic Information System (GIS) maps, including ICG maps and public summary map books, are essential tools to ensure a rapid and coordinated National, regional, or local response effort.

4.8.3 Information Management Systems and Tools

In an ASF outbreak, there are key systems which help to facilitate response. These include the following:

- EMRS2, the USDA APHIS official system of record for FAD investigations and response;
- APHIS Response Information System (ARIS), managed by APHIS Dispatch personnel, used for requesting and deploying qualified personnel to the incident;
- Laboratory Messaging System, which communicates (messages) laboratory results from NVSL and some NAHLN laboratories, including directly to EMRS2;[39]

[39] Not all NAHLN laboratories currently have messaging capabilities. This is a high priority for USDA APHIS and the NAHLN laboratories.

- Third party systems, such as State or industry information technology systems; and
- Third party analysis tools, such as ArcGIS and Tableau, are utilized to tailor incident information for enhanced communication, illustration, and analyses.

For more information on these aspects, please refer to the *APHIS Foreign Animal Disease Framework: Incident Information Management and Reporting (FAD PReP Manual 3-0*).

4.9 Health & Safety and Personal Protective Equipment

Though ASF is not a threat to public health, responders may be exposed to other health hazards; prevention of adverse human health events related to emergency response efforts is very important. For general information, please see the *NAHEMS Guidelines: Health and Safety* and *NAHEMS Guidelines: Personal Protective Equipment.* In an incident, refer any health and safety questions or concerns to the Safety Officer or other designated response official.

APHIS EMSSD provides services that support agency and interagency emergency management activities, and protect the health, safety, and security of APHIS and other USDA personnel.

4.9.1 Mental Health Concerns

The health and safety of all personnel is affected by the mental state of those involved in the ASF response effort. An ASF outbreak and associated response activities could have a significant psychological effect on both responders and owners of affected swine. Conducting or viewing depopulation and disposal operations can certainly cause mental distress. Tensions may run high, especially among small producers whose losses approach complete financial devastation and ruin. Incident Commanders should encourage responders to access mental health support; Safety Officers assigned to the ICPs are key resources for personnel.

The Department of Health and Human Services (HHS) has developed resources specifically for emergency and disaster responders, State and local planners, health professionals, and the general public at https://emergency.cdc.gov/coping/index.asp; additional general mental health information is here: www.cdc.gov/mentalhealth; a mobile disaster app for first responders available here: https://store.samhsa.gov/product/samhsa-disaster. APHIS employees can also find support through the Employee Assistance Program found here: http://www.foh4you.com/.

4.10 BIOSECURITY

Strict biosecurity measures are crucial to prevent or slow the spread of ASF.[40] Owners, producers, veterinarians, and responders should observe strict biosecurity measures during an incident or suspected incident. Proper biosecurity during an ASF outbreak has two key functions: containing the virus on Infected Premises (biocontainment) and preventing the introduction of ASFV from the movement of personnel and fomites to naïve premises (bioexclusion).

Preventing exposure of swine to ASFV in blood, fluids, carcasses, fomites and the environment is critical in preventing ASF transmission; this includes employing and enhancing vector control methods. Biocontainment and bioexclusion measures can also be implemented *within* a premises to slow or limit the spread between pens and buildings when ASF has been diagnosed; this can help facilitate control and containment activities.

APHIS acknowledges that identifying and depopulating infected or exposed feral swine may be difficult. As such, it is critical for producers to implement and maintain biosecurity measures that prevent contact between feral swine and domestic pigs. Producers should seriously reevaluate any outdoor production of pigs on premises that are in proximity to an Infected Premises or feral swine.

An additional area of consideration is garbage feeding, which is regulated by APHIS; States determine whether or not to allow regulated garbage feeding within their State. During an ASF outbreak, APHIS and/or State officials may implement additional requirements or inspections related to garbage feeding.

4.11 3D ACTIVITIES

3D activities include depopulation, disposal, and decontamination during an outbreak. Due to the nature of ASFV, 3D options may be limited; therefore, the supplemental 3D Guidance—Option Matrices and Considerations assists responders in determining the 3D alternatives during an outbreak. Note, that data are based on scientific research, and not necessarily based on field experience. This guidance, the Carcass Management Dashboard, and other tools are available on the APHIS Carcass Management website.

4.11.1 Mass Depopulation and Euthanasia

Mass depopulation and euthanasia are not synonymous, and APHIS recognizes a clear distinction. Euthanasia involves transitioning an animal to death as painlessly and stress-free as possible. Mass depopulation is a method that gives as much consideration to the welfare of animals as practicable, given extenuating circumstances. Mass depopulation will likely be employed in an ASF outbreak as

[40] Existing biosecurity producer plans are available online, such as SHIP and SPS.

a response measure to prevent or mitigate the spread of ASF through the elimination of infected or potentially infected swine in order to protect agriculture and the National economy. The United States recognizes this as a control and eradication strategy, as defined by international standards and the WOAH as "stamping-out" (refer to Section 3.3.1).

In an ASF outbreak, euthanasia or mass depopulation will be conducted in accordance with the AVMA's guidance[41] so that all affected swine are depopulated safely, quickly, efficiently, and humanely as possible. In addition, the emotional and psychological impact on animal owners, caretakers, their families, and other personnel should be minimized.

The method of depopulation will depend on animal considerations, facility characteristics, method characteristics (practicality, reliability, irreversibility, and compatibility), personnel considerations, carcass considerations, equipment considerations, and the environment where the animals are maintained. With ASF, significant environmental contamination can result from blood and fluids from infected swine—this should also be considered when selecting depopulation (and disposal) methods. In all cases, euthanasia or depopulation activities must incorporate excellent biosecurity practices to control the ASFV and prevent further transmission.

As a general goal, APHIS recommends that depopulation and disposal activities be completed as soon as possible after approval for indemnity payment. That said, identifying a specific depopulation response time goal is not an absolute requirement. Assessing possible depopulation and disposal of swine on any farm location will require proper planning and resources to ensure health and safety of the owner, grower and responders, and proper planning and resources will be needed to ensure animal welfare.

4.11.2 Disposal

Proper disposal of animal carcasses and materials (e.g., bedding, feed) prevents or mitigates spread of ASFV. The goal is to conduct operations in a timely, safe, biosecure, acceptable, and environmentally responsible manner. Wastes requiring disposal may include carcasses, animal products, contaminated manure, litter, bedding, contaminated feed, contaminated personal protective equipment (PPE), and contaminated materials and equipment that cannot be cleaned and disinfected.

Due to the persistent nature of ASFV, options for disposal are limited. For example, composting may not be feasible when there are large amounts of biomass; resources for rendering are currently limited. Burial poses significant challenges with environmental contamination and the ability of the ASFV to

[41] The *AVMA Guidelines for the Depopulation of Animals* support advance planning for possible emergency situations and provide guidance for making decisions during an emergency: https://www.avma.org/resources-tools/avma-policies/avma-guidelines-depopulation-animals.

persist in the environment. Each option has its own environmental, logistical, and managerial challenges. APHIS and State officials and subject matter experts will collaborate to determine best approaches.

Disposal may involve other State and Federal agencies: USDA may coordinate with HHS, DHS, and/or the Environmental Protection Agency to provide technical assistance and guidance, in alignment with Federal, State, and local regulations.

Refer to the *FAD PReP Disposal SOP* and the *NAHEMS Guidelines: Disposal* for more details.

4.11.3 Cleaning and Disinfection/Virus Elimination

C&D is a general term describing a part of regular biosecurity operations (e.g., to disinfect vehicles). Cleaning is the removal of gross contamination, organic material, and debris via dry cleaning (sweeping) and/or wet cleaning (water and soap or detergent); disinfection destroys or eliminates the pathogen through heat or chemical means. A combination of methods may be required.

In a disease response context, virus elimination refers to the C&D activities that are undertaken stepwise after depopulation and disposal in order to move towards restocking. Virus elimination is C&D with the primary purpose to destroy or eliminate ASFV on the premises as cost effectively as possible to prevent further spread. A virus elimination plan includes the area/materials undergoing C&D, methods, personnel, materials, supplies, equipment, and other relevant considerations. When performing virus elimination procedures, it is important to do so in the safest manner possible. The plan may also include the scientific rationale for virus elimination parameters, the process by which the premises will be evaluated and recorded as successfully cleaned and disinfected, specific protocols, and procedures for handling damaged private property due to C&D activities. Contingencies such as fallowing may be considered for premises that cannot undergo the C&D process. Specific C&D guidance for meat harvest establishments, rendering and spray dried blood / plasma facilities can be found in the ASF Response Plans suite (see Section 1.3.2.4.3)

For more information on disinfectants approved for use against ASFV, see here. The document at this link is updated as needed.

Further information can be found in the *FAD PReP Cleaning and Disinfection SOP* and in the *NAHEMS: Cleaning and Disinfection*.

4.11.4 National Veterinary Stockpile Operations

The National Veterinary Stockpile (NVS) provides key resources, equipment, and services for animal disease outbreaks in the United States. NVS has, and

continues to, prioritize ASF preparedness activities. It is in the process of building an inventory of supplies and equipment, such as that listed below, to aid in a response to an ASF outbreak.

- Diagnostic sampling supplies
- Mobile incinerators
- Electric stunners
- Captive bolt stunners and repair parts
- Manual and automated swine carcass carts
- Carcass bags
- Grinders
- Portable wash stations
- PPE
- Swine handling equipment, such as hog snares and sorting panels

NVS can be reached by email, nvs@usda.gov; or in an emergency situation, call 800-940-6524.

4.12 APHIS Wildlife Services

USDA APHIS works in close collaboration, communication, and coordination with DOI and other Federal, State, Tribal, and local wildlife agencies that have primary jurisdictional authority and subject matter expertise for wildlife, including feral swine. This collaboration, communication, and coordination occurs in both the unified IC as well as in Multiagency Coordination Groups when established.

The *NAHEMS Guidelines: Wildlife Management and Vector Control for an FAD Response in Domestic Livestock* discusses personnel and equipment required for wildlife management, quarantine and movement control for wildlife, wildlife risk assessment, wildlife surveillance, and related activities.

4.12.1 Feral Swine Management

In any ASF response, epidemiologists and wildlife experts will need to quickly assess the presence of feral swine populations in or near the area of infection. ASFV can infect many different members of the Suidae family including wild

boar which can be found in the United States. However, peccaries, which are also found in North America, are believed to be resistant to infection with ASFV.

A wildlife management plan that addresses transmission of ASF in feral swine will need to be developed as soon as possible after identification of the index case in either domestic pigs or feral swine. This plan should aim to mitigate transmission pathways, preventing the exposure of domestic pigs and naïve feral swine populations to ASFV, ultimately preventing introduction to or eliminating ASF from feral swine populations. The decision to implement control measures in wildlife will be based on not only the risk assessment and surveillance, but also the feasibility of conducting successful control measures. In all cases, the wildlife management plan must be conducted within local laws and regulations, and management activities to control and eradicate ASF in feral swine must be conducted by trained personnel proficient in wildlife health, capture, restraint, biosecurity, and humane euthanasia.

Additional operational details for implementing ASF response activities for feral swine in the field will be available on ASF FAD PReP website.

4.12.1.1 Management Activities

Management activities are based on the initial epidemiological assessment and may change as the outbreak evolves. ASF measures would include, but are not exclusive to

- Feral swine population surveys,
- ASF surveillance in feral swine populations,
- Control measures, including removal of carcasses from the landscape as necessary,
- enhanced biosecurity measures to separate feral swine and domestic pigs,
- stamping-out, and
- population reduction.

These specific measures will be conducted depending on the zone and area designation determined by the epidemiological assessment. Within the IZ, habitat manipulation, such as fencing, may be employed to limit feral swine dispersal and further dissemination of the virus. Feral swine reduction will occur systematically in an attempt to limit disturbance.[42]

[42] Satran, P. (2019). *African swine fever in the Czech Republic*. Retrieved from https://ec.europa.eu/food/sites/food/files/animals/docs/reg-com_ahw_20190225_asf_cze.pdf.

The BZ will also be subject to management activities, including feral swine population reduction. Heightened surveillance activities will assist in the detection of ASF in feral swine outside of the Control Area. The SZ will also employ carcass detection methods, in addition to trail camera monitoring, and periodic removal and sampling of feral swine populations for ASF testing. Outside of the SZ, activities would focus on enhanced public outreach to encourage reporting of sick or dead feral swine. Controlling and eliminating feral swine may be a difficult, resource-intensive activity.

4.12.2 Vectors

ASF can be transmitted by soft ticks (*Ornithodoros* spp.). The *Ornithodoros* spp. that have played a role in ASF persistence and reoccurrence of disease in Africa and Europe (Iberian Peninsula) – namely *O. porcinus* (of the *O. moubata* species complex) and *O. erraticus* – are not present in the United States.[43,44] Some *Ornithodoros* spp. do exist in certain areas of the United States.[45] Currently, only three *Ornithodoros* spp. that are endemic in the United States (*O. coriaceus*, *O. puertoricensis*, and *O. turicata*) have experimentally been shown to become infected with ASFV and transmit the virus to swine.[42] Depending on the species, these ticks remained infected with ASFV between 23 and 506 days. Based on records from the U.S. National Tick Collection database, only one collection record between 1891 and 2004 documented *Ornithodoros spp.* as associated with swine (*O. coriaceus* in Sonoma County, California).[42] APHIS and State officials would need to assess if vectors are present in the Control Area and determine if control measures are necessary and/or cost-effective.

4.13 Indemnity and Compensation

4.13.1 Authority

See AHPA, 7 *U.S. Code* 8301 et seq., for the authority to pay claims for animals, articles, or means of conveyance that are destroyed.

9 CFR 53 provides more information on the regulatory authority governing indemnity and compensation during an ASF outbreak.

[43] Sanchez-Vizcaino, J.M.; Mur, Lina; Bastos, Armanda D.S.; Penrith, Mary-Louise. 2015. New insights into the role of ticks in African swine fever epidemiology. Rev. Sci. Tech. Off. Int. Epiz. 34(2). 503-511.

[44] Golnar, A. J., Martin, E., Wormington, J. D., Kading, R. C., Teel, P. D., Hamer, S. A., & Hamer, G. L. (2019). Reviewing the Potential Vectors and Hosts of African Swine Fever Virus Transmission in the United States. Vector borne and zoonotic diseases (Larchmont, N.Y.), 19(7), 512–524. https://doi.org/10.1089/vbz.2018.2387.

[45] Brown, V. and Bevins, S. (2018). A review of African swine fever and the potential for introduction into the United States and the possibility of subsequent establishment in feral swine and native ticks. Front. Vet. Sci., 06. Vol 5.

See Section 3.4.1 on APHIS' authority for indemnity, upon confirmation of ASFV.

4.13.2 Procedures

State and APHIS officials must approve depopulation prior to its occurrence in order for producers to receive indemnity. This requires rapid communication between producer, company, State officials, APHIS and laboratory officials. Depopulation will occur after the *USDA APHIS Appraisal & Indemnity Request Form* is signed by appropriate parties. Every attempt will be made to collect inventory information and other required data as quickly as possible to ensure rapid depopulation as epidemiological circumstances require.

Appraisal and compensation documents released by the ICG or the unified IC during an incident specify personnel responsibilities, appraisal procedures, assessment of compensation eligibility, payment of indemnity, and required forms and reports during an ASF outbreak.

4.14 Animal Welfare

During an ASF outbreak, humane treatment must be provided to swine given the specific circumstances of the outbreak as prescribed by veterinary authorities of the affected States or Tribal nations. Humane care should be conducted during any type of movement standstill, and for infected animals until they are euthanized or depopulated. The *Overview of Animal Welfare SOP* contains additional information.

4.15 Vaccination

To date there is no treatment or commercially available, effective vaccine available for ASFV that meets requirements for emergency use in the United States, although significant advances in vaccine research continue to be made. The USDA Agricultural Research Service continues to work to develop a vaccine that is both safe and effective for use.

Chapter 5
Recovery

5.1 Criteria for Proof of Freedom

WOAH does not grant official recognition for ASF-freedom, but as a member of WOAH, the United States can self-declare the entire country, zone, or compartment free of ASF. Please refer to the most current WOAH *Terrestrial Animal Health Code* for provisions on ASF-freedom in a country or zone, compartment, establishment of a containment zone free from ASF, recovery of free status, and recommendations for importation of swine and swine products from countries not free of ASF.

Trading partners will evaluate, on an individual or multilateral basis, all self-declarations from the United States for ASF-freedom both after an incident and for any regionalization activities that may occur during an incident. Trading partners determine whether to lift or modify trade restrictions based on information that is provided by the United States.

5.2 WOAH Terrestrial Animal Health Code

For the purposes of the WOAH *Terrestrial Animal Health Code* (2022), there is a distinction between domestic and captive wild pigs, wild and feral swine, and African wild suid species. Per Article 15.1.2, "commodities of suids can be traded safely in accordance with the relevant articles of this chapter."

5.2.1 Article 15.1.4 Country or Zone Free from ASF

1. Historical freedom

A country or zone may be considered free from ASF without pathogen-specific surveillance if the provisions of Article 1.4.6 are complied with and commodities of suids are imported in accordance with the relevant articles of this chapter.

2. Freedom in all suids

A country or zone which does not meet the conditions of point 1) above may be considered free from ASF in all suids when it complies with all the criteria of Article 15.1.3, especially point 7, and when:

a. surveillance in accordance with Articles 15.1.28 to 15.1.33 has been in place

for the past three years;

b. there has been no case of infection with ASFV in domestic or captive wild pigs during the past three years; this period can be reduced to 12 months when the surveillance has demonstrated no evidence of presence or involvement of *Ornithodoros* ticks;

c. commodities of suids are imported in accordance with the relevant articles of this chapter.

3. Freedom in domestic and captive wild pigs

A country or zone which does not meet the conditions of point 1) or point 2(b), i.e. when there are cases of infection with ASFV in feral or wild suids, may be considered free from ASF in domestic and captive wild pigs when it complies with all the criteria of Article 15.1.3, especially point 7, and when:

a. surveillance in accordance with Articles 15.1.28 to 15.1.33 has been in place for the past three years;

b. there has been no case of infection with ASFV in domestic or captive wild pigs during the past three years; this period can be reduced to 12 months when the surveillance has demonstrated no evidence of presence or involvement of *Ornithodoros* ticks;

c. commodities of suids are imported in accordance with the relevant articles of this chapter.

5.2.2 Article 15.1.7 Recovery of Free Status

Should an outbreak of ASF occur in a previously free country or zone, its status may be restored three months after the disinfection of the last infected establishment, provided that:

1. a stamping-out policy has been implemented and, in the case where ticks are suspected or known to be involved in the epidemiology of the infection, has been followed by the use of sentinel pigs in the infected establishments for two months;

2. surveillance in accordance with Article 15.1.31 has been carried out with negative results.

Otherwise, the provisions of point 2) of Article 15.1.4 apply.

The WOAH *Terrestrial Animal Health Code* (2022)*, Chapter 15.1,* can be found here.

5.3 RESTOCKING

During an ASF incident in the United States, APHIS and/or State officials will provide additional guidance for restocking previously Infected Premises, including any sentinel pig activities that may be required. A primary goal of the response is to ensure that response efforts do not cause more damage and disruption than the disease outbreak itself; however, caution is urged in restocking premises since re-infection strains resources and perpetuates the risk of ASF transmission. Depending on outbreak-specific circumstances, APHIS may not indemnify premises that are restocked without APHIS and State approval that subsequently become re-infected.

The total time in which it takes a premises to go from an IP with sick pigs, to a premises that has finished virus elimination, to a restocked premises is based on many factors, including: the type of premises, epidemiology of the outbreak, location of other ASF IPs, evidence provided to State and APHIS officials, and method of disposal. Restocking on previously IPs may take place before the end of the outbreak has been declared, under conditions established by the unified IC.

For more specific guidance on restocking after ASF-infection, please refer to the ASF policy guidance and procedures that is provided on www.aphis.usda.gov/fadprep.

Appendix A
Glossary

For the purposes of [*Chapter 15.1 Infection With African Swine Fever Virus* in the World Organisation of Animal Health (WOAH) *Terrestrial Animal Health Code*], a distinction is made among:

- domestic and *captive wild* pigs, permanently captive or farmed free range, used for the production of *meat*, or other commercial products or use, or for breeding;
- *wild* and *feral* pigs[46];
- African *wild* suid species.

All varieties of *Sus scrofa* are susceptible to the pathogenic effects of ASFV, while the African *wild* suids are not and may act as reservoirs of the virus. Ticks of the genus *Ornithodoros* are the only known natural arthropod hosts of the virus and act as reservoirs and biological *vectors*.

Active Surveillance	Surveillance where officials initiate the collection, collation, and analysis of animal health data to define the extent of disease, to detect new outbreaks, and to establish disease-free zones utilizing defined surveillance protocols.
Animal product	Blood or any of its components, bones, bristles, feathers, flesh, offal, skins, and any by product containing any of those components that originated from an animal or bird.
African swine fever (ASF) (WOAH)	An *infection* of suids with ASFV (From the WOAH *Terrestrial Code, Chapter 15.1*). ASFV has been isolated from samples from a suid; or antigen or nucleic acid specific to ASFV has been identified in samples for a suid showing clinical signs or pathological lesions suggestive or ASF or epidemiologically-linked to a suspected or confirmed case of ASF, or from a suid giving cause for suspicion of previous association or contact with ASFV; or antibodies specific to ASFV have been detected in samples from a suid showing clinical signs or pathological lesions consistent with ASF, or epidemiologically-linked to a suspected or confirmed case of ASF, or giving cause for suspicion of previous association or contact with ASFV.

[46] Feral/wild/free-ranging suids are also referred to as *non-captive swine.*

Backyard swine	Domestic swine raised for food production and confined to a housing facility with access to the outdoors surrounded by a fence or other barrier.
Breeder swine	Sexually intact swine over 6 months of age (from 9 CFR 71).
Case	Any pig infected by ASFV, with or without clinical signs.
Commercial swine	Domestic swine raised for food production and confined to a housing facility designed to prevent exposure to feral swine.
Continuity of Business	The managed movement of non-infected animals and non-contaminated animal products from non-infected premises in an ASF outbreak.
Control Area	A Control Area (an Infected Zone and Buffer Zone) has individual premises quarantine for Infected Premises, Suspect Premises, and Contact Premises and movement restrictions for At-Risk Premises and Monitored Premises.
Domestic pig	Any swine species owned in a captive environment, whether the confinement is in a building or behind a fence or other barrier. Domestic pig may be further characterized as backyard swine or commercial swine.
Etiology	The causes or origin of disease, or the factors that produce or predispose toward a certain disease or disorder.
Euthanasia (WOAH)	The act of inducing death using a method that causes a rapid and irreversible loss of consciousness with minimum pain and distress to animal.
FAD PReP (Foreign Animal Disease Preparedness and Response Plan)	Documents used to identify overall strategies, veterinary functions, organization, and countermeasures necessary to contain and control an FAD outbreak. It is also used to integrate functions and countermeasures with emergency management systems and operations conducted in joint and unified command by Federal, State, Tribal, and local personnel.
Feeder swine	Swine under 6 months of age that are not slaughter swine (from 9 CFR 71).
Feral animal	An *animal* of a domesticated species that lives without requiring human supervision or control (from WOAH *Terrestrial Code Glossary*).
Feral swine	Free-roaming swine (from 9 CFR 78). Feral swine are not domestic swine.
Fomites	Inanimate objects that can transmit infectious agents from one animal or person to another.
Foreign animal disease	A transboundary animal disease not known to exist in the U.S. animal population.

Germplasm	Genetic material such as semen, embryos, tissues, and other DNA sequences maintained for the purposes of swine breeding.
Incubation period (WOAH)	For the purposes of the WOAH *Terrestrial Code (2022)* the incubation period for *Sus scrofa* (domestic and wild swine) shall be 15 days. The incubation period is the longest period that elapses between the introduction of the pathogenic agent into the animal and the occurrence of the first clinical signs of the disease.
Index case	The first or original case identified in a disease outbreak.
Lairage (WOAH)	Pens, yards, and other holding areas used for accommodating animals in order to give them necessary attention (such as water, feed, rest) before they are moved on or used for a specific purpose including slaughter.
Depopulation, Mass depopulation (AVMA)	Method by which large numbers of animals must be destroyed quickly and efficiently with as much consideration given to the welfare of the animals as practicable, but where the circumstances and tasks facing those doing the depopulation are understood to be extenuating.
Movement control	Refers to the movement of people, animals, animal products, vehicles, and equipment in a specific area subject to certain criteria typically accomplished through a permit system.
Movement standstill	Temporary prohibition of the initiation of any new movement of susceptible species in a defined area.
National Animal Health Laboratory Network (NAHLN)	NAHLN is a cooperative effort between two U.S. Department of Agriculture agencies and the American Association of Veterinary Laboratory Diagnosticians. It is a national network of State and University laboratories, which use common testing methods and software platforms to perform diagnostics and share information.
Non-susceptible animal	Animal that does not develop a particular disease when exposed to the causative infectious agent of that disease.
WOAH (World Organization for Animal Health)	Organization that collects and publishes information on animal diseases from approximately 182 member countries and develops standards for animal health.
Outbreak	The occurrence of cases of a disease that are in excess of what is normally expected in a given population.
Passive Surveillance	The voluntary reporting of suspect cases by producers and practitioners.
Personal protective equipment (PPE)	Clothing and equipment to prevent occupational injuries and diseases through control of exposure to potential hazards in the work place after engineering and administrative controls have been implemented to the fullest extent.

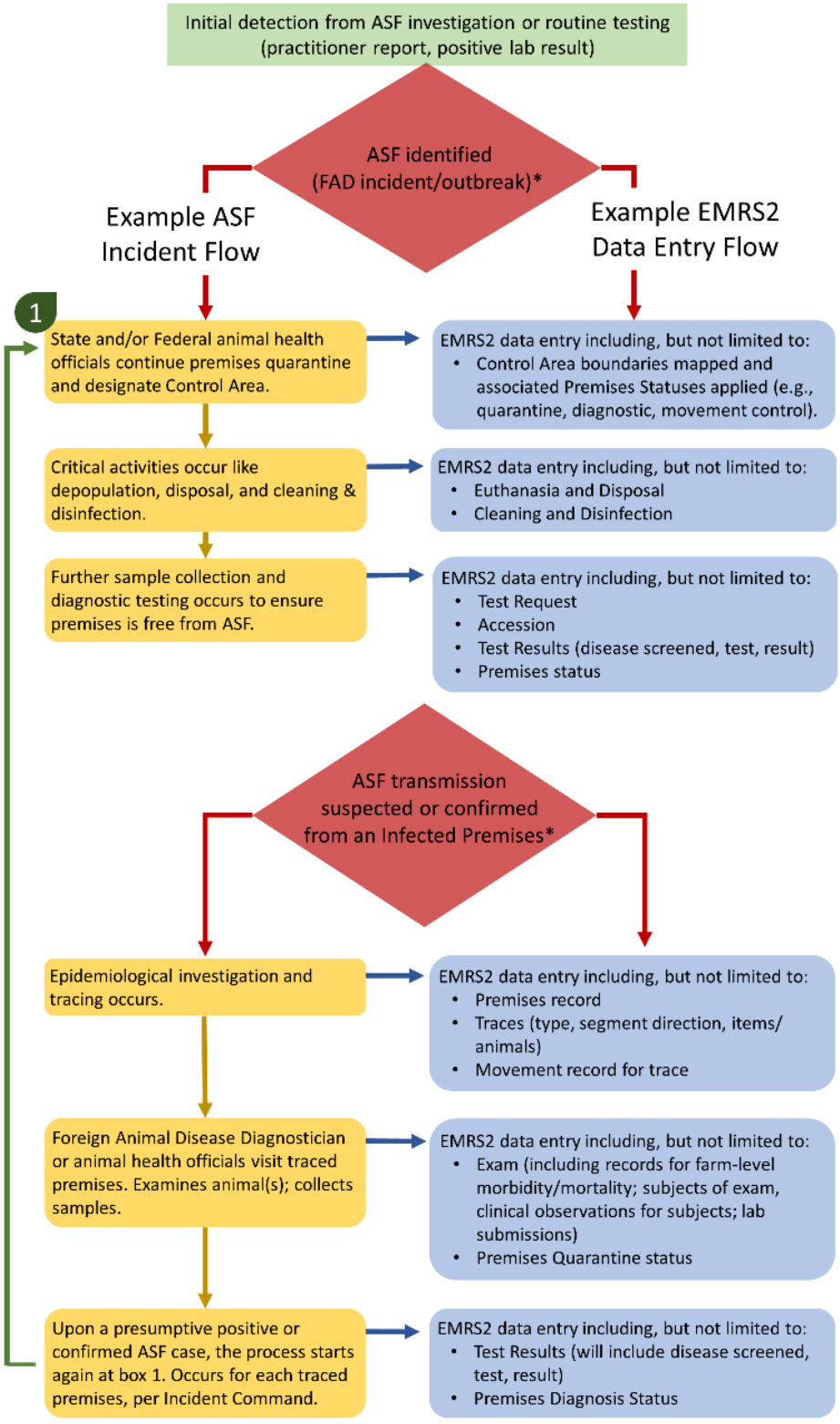
Preemptive depopulation	Depopulation under the competent authority of susceptible animal species in herds on premises that have been exposed to infection by direct animal-to-animal contact or by indirect contact of a kind likely to result in the transmission of ASFV prior to the expression of clinical signs.
Premises	A geographically and epidemiologically defined location, including a ranch, farm, stable, or other establishment.
Quarantine	Imposes restrictions on entering or leaving a premises, area, or region where disease exists or is suspected.
Sensitivity (WOAH)	The proportion of infected sampling units that are correctly identified as positive.
Slaughter swine	Swine being sold or moved for slaughter purposes only (from 9 CFR 71).
Specificity (WOAH)	The proportion of uninfected sampling units that are correctly identified as negative.
Stamping-out (WOAH)	A policy designed to eliminate an outbreak by carrying out under the authority of the Veterinary Authority the following: (a) the killing of the animals which are affected and those suspected of being affected in the herd or flock and, where appropriate, those in other herds or flocks which have been exposed to infection by direct animal to animal contact, or by indirect contact with the causal pathogenic agent; animals should be killed in accordance with Chapter 7.6; (b) the disposal of carcasses and, where relevant, animal products by rendering, burning or burial, or by any other method described in Chapter 4.13; (c) the cleansing and disinfection of establishments through procedures defined in Chapter 4.14.
Susceptible animal	Any animal that can be infected with and replicate the disease pathogen of concern. The susceptible animals of primary concern to this plan are swine.
Susceptible species	See susceptible animal.
Targeted Surveillance	A strategy that focuses on sampling premises or populations that may be at risk including sick pigs, and elevated mortality events with the purpose of enhancing vigilance for animal disease.
Trace-back	The identification of the origin and movements of all animals, animal products, conveyances, possible fomites, people, vehicles, and possible vectors from an Infected Premises to establish the original source of infection.
Trace-forward	The tracing of all animals, people, and fomites that have left Infected Premises and could have possibly transmitted ASF to a new premises. These premises should be investigated, evaluated, and placed under quarantine or other measures depending upon their risk.

Vector (WOAH)	An insect or any living carrier that transports an infectious agent from an infected individual to a susceptible individual or its food or immediate surroundings. The organism may or may not pass through a development cycle within the vector.
Virus Elimination	The cleaning and disinfection activities that are undertaken after depopulation and disposal with the primary purpose to destroy or eliminate all viruses on the premises as cost effectively as possible.
Wildlife	All free-ranging animals, including native and exotic wildlife species, as well as feral domestic animals in the United States.
Wildlife reservoir	A population of free ranging/free living species in which an infectious agent/vector has become established, lives, and multiplies and is therefore a potential source of infection/infestation to other domestic and free ranging species.

Appendix B
Example Overview Emergency Management Response System 2.0 Workflow

Figure B-1 provides an example workflow illustrating a broad overview of the Emergency Management Response System 2.0 (EMRS2) data entry activities undertaken when ASF response activities occur. Disease management involves a dizzying array of activities, which are recorded and managed within EMRS2.

Figure B-1. EMRS2 Data Entry Example Workflow for an ASF Outbreak



*Tracing may start with a presumptive or confirmed positive case. If there is concern an FAD has been transmitted off of the infected premises, tracing will occur simultaneously with other activities on the premises, like depopulation and disposal.

Appendix C
Abbreviations

3D	depopulation, decontamination, and disposal
AHPA	Animal Health Protection Act
Ab	antibody
Ab ELISA	enzyme-linked immunosorbent assay
AC	Area Command
ACIA	antigen capture immunoassay
AMT	APHIS Management Team
APHIS	Animal and Plant Health Inspection Service
ARIS	APHIS Response Information System
ARP	At-Risk Premises
AVMA	American Veterinary Medical Association
ASF	African swine fever
ASFV	African swine fever virus
AVIC	area veterinarian in charge
BZ	Buffer Zone
C&D	cleaning and disinfection
CEAH	Center for Epidemiology and Animal Health
CFR	Code of Federal Regulations
COB	continuity of business
CONUS	Continental United States
CSSC	Certified Swine Sample Collection
CVO	Chief Veterinary Officer of the United States (VS DA)
DFA	direct fluorescent antibody
DHS	Department of Homeland Security
DNA	deoxyribonucleic acid
DOI	Department of Interior
EDTA	Ethylenediaminetetraacetic acid
ELISA	enzyme-linked immunosorbent assay

EMRS2	Emergency Management Response System 2.0
EPC	emergency preparedness committee
FAD	foreign animal disease
FADD	Foreign Animal Disease Diagnostician
FAD PReP	Foreign Animal Disease Preparedness and Response Plan
FADDL	Foreign Animal Disease Diagnostic Laboratory
FFS	Federal-to-Federal support
FRS	financial reimbursement specialist
FSIS	Food Safety and Inspection Service
GIS	Geographic Information System
HHS	Department of Health and Human Services
HPAI	highly pathogenic avian influenza
IC	Incident Command
ICG	Incident Coordination Group
ICP	Incident Command Post
ICS	Incident Command System
IFA	immunofluorescence assays
IFAT	indirect fluorescent antibody test
IMT	Incident Management Team
IP	Infected Premises
IPT	immunoperoxidase test
IZ	Infected Zone
JIC	Joint Information Center
LPA	Legislative and Public Affairs
MAC	Multiagency Coordination
NAHEMS	National Animal Health Emergency Management System
NAHLN	National Animal Health Laboratory Network
NAMI	North American Meat Institute
NIMS	National Incident Management System
NIMT	National Incident Management Team
NLRAD	National List of Reportable Animal Diseases
NPIC	National Preparedness and Incident Coordination

NRF	National Response Framework
NVS	National Veterinary Stockpile
NVSL	National Veterinary Services Laboratories
NVSL-Ames	National Veterinary Services Laboratories-Ames, IA
NVSL-FADDL	National Veterinary Services Laboratories-Foreign Animal Disease Diagnostic Laboratory Plum Island, NY
PCR	polymerase chain reaction
PIO	public information officer
PMIP	pre-movement isolation period
PPE	personal protective equipment
PZ	Protection Zone
rRT-PCR	real-time reverse transcriptase polymerase chain reaction
SAHO	State Animal Health Official
SDA	Surveillance Design and Analysis
SHPA	Swine Health Protection Act
SOP	standard operating procedure
SPS	Secure Pork Supply
SPWG	Slaughter Plant Working Group
SZ	Surveillance Zone
TBTB	tris-buffered tryptose broth
TDD	telecommunications device for the deaf
USAHA	United States Animal Health Association
USDA	U.S. Department of Agriculture
US SHIP	U.S. Swine Health Improvement Plan
VI	virus isolation
VS	Veterinary Services
VSET	VS Executive Team
WOAH	World Organisation for Animal Health
WS	Wildlife Services

Appendix D
Selected References and Resources

Note: all FAD PReP documents are also references to this USDA APHIS *ASF Response Plan: The Red Book*, which are located at www.aphis.usda.gov/fadprep.

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