

APHIS FOREIGN ANIMAL DISEASE FRAMEWORK RESPONSE STRATEGIES

FAD PReP

Foreign Animal Disease
Preparedness & Response Plan

National Center for Animal
Health Emergency Management



United States Department of Agriculture • Animal and Plant Health Inspection Service • Veterinary Services



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USDA APHIS, Veterinary Services
National Center for Animal Health Emergency Management
Preparedness and Incident Coordination Staff

The *USDA APHIS Framework for Foreign Animal Disease Preparedness and Response* was released as a draft for comment in July 2010. We were pleased to receive many comments, from a wide range of stakeholders including industry, academic experts, and Federal and State officials.

As we were revising this document, other FAD PReP documents were drafted and released for comment, including disease-specific response plans, National Animal Health Emergency Management System Guidelines, and standard operating procedures. We have continued to revise this document to reflect the changes made in other FAD PReP materials, and to reflect the comments we received and continue to receive on these complex topics.

In this process, we elected to transform the 2010 document into two distinct new documents:

1. *APHIS Foreign Animal Disease Framework: Roles and Coordination* (FAD PReP Manual 1-0, May 2012), and
2. *APHIS Foreign Animal Disease Framework: Response Strategies* (FAD PReP Manual 2-0, May 2012).

While much of the material of these two documents remains the same, there have been critical changes both in substance and organization. The first of these two documents contains information on APHIS authorities and funding, incident management, Federal department roles and responsibilities, and communication for an FAD outbreak. The second document contains information on APHIS FAD response strategies, zone and premises designations, and critical activities in an FAD response. The bulleted list below summarizes the key changes we made in creating these new documents.

- Reorganization and separation of the overall concept of operations (approaches, systems, and relationships) for FAD preparedness and response from the more detailed information on response strategies and activities.
- Revision of all information, including information on response strategies, to ensure consistency with existing FAD PReP response plans.
- Clarification of zones, areas, and premises based on comments received.
- Modifications to the chapter on the Incident Command System to better explain multiagency coordination and the incident management structure, including new figures.
- Adjustments to preparedness and response goals to reflect practical realities and challenges.
- Corrections made in response to comments on the 2010 version.

We are excited about these new documents, but realize that further revisions will need to be made as planning continues and best practices are developed. As such, we will continue to accept comments on both of these new documents for incorporation into future versions. We realize that preparing for and responding to an FAD outbreak, particularly a highly contagious disease outbreak, will be a complex effort which requires collaboration from multiple stakeholders. Thank you for your participation and input into this effort.



The Foreign Animal Disease Preparedness and Response Plan (FAD PReP) mission is to raise awareness, define expectations, and improve capabilities for FAD preparedness and response.

For more information, please go to:

<https://fadprep.lmi.org> (Request access)

<http://inside.aphis.usda.gov/vs/em/fadprep.shtml> (APHIS employees)

or e-mail FAD.PReP.Comments@aphis.usda.gov.

The Foreign Animal Disease Preparedness and Response Plan (FAD PReP) Manuals provide an introduction to USDA APHIS FAD preparedness and response, and the framework for responding to an animal health emergency in the United States.

These manuals are under ongoing review. This document was last updated **May 2012**. Please send questions or comments to:

National Center for Animal Health Emergency Management
Veterinary Services
Animal and Plant Health Inspection Service
U.S. Department of Agriculture
4700 River Road, Unit 41
Riverdale, Maryland 20737-1231
Telephone: (301) 851-3595
Fax: (301) 734-7817
E-mail: FAD.PReP.Comments@aphis.usda.gov

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Executive Summary

There are significant potential consequences of a foreign animal disease (FAD) outbreak in the United States. In addition to the economic impact, the social and psychological impact on both producers and consumers could be severe. The foot-and-mouth disease (FMD) outbreak in the United Kingdom had an estimated impact of between \$12–18 billion.¹ Studies have estimated a likely national welfare loss of between \$2.3–69 billion for an FMD outbreak in California, depending on delay in diagnosing the disease. The impact would come primarily from lost international trade, as well as costs directly associated with the eradication effort, including the expenses of depopulation, indemnity, carcass disposal, and cleaning and disinfection. In addition, there would be direct and indirect costs related to foregone production, unemployment, and losses in related businesses. The social and psychological impact on owners and growers would also be severe.

The U.S. Department of Agriculture (USDA) Animal and Plant Health Inspection Service (APHIS) has established the Foreign Animal Disease Preparedness and Response Plan (FAD PReP) to provide a framework for FAD preparedness and response. This document provides the response strategies, zone and premises designations, and critical activities for controlling, containing, and eradicating an FAD. This document also has a companion document—*APHIS Foreign Animal Disease Framework: Roles and Coordination* (FAD PReP Manual 1-0)—which provides an overview of FAD PReP, Federal roles, APHIS authorities and funding process, incident management, and communication strategy.

This document—*The APHIS Foreign Animal Disease Framework: Response Strategies* covers

- ◆ response goals,
- ◆ FAD response strategies, and
- ◆ zone and premises designations.

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

¹ See [page 1-1](#) for citations from this section.

possible. They will also allow the United States to regain disease-free status without the response effort causing more disruption and damage than the disease outbreak itself.

There are four traditional strategies for the control and eradication of an FAD in domestic livestock that are not mutually exclusive: stamping-out, stamping-out modified with emergency vaccination to slaughter, stamping-out modified with emergency vaccination to live, and emergency vaccination to live without stamping-out. Any response strategy or strategies implemented will be based on the best available information during the incident.

In order to achieve the goals of an FAD response, critical activities and tools must be implemented to execute the response strategy. Box 1 lists these critical activities and tools. Additionally, to assist in executing the response strategy, zones, areas, and premises will be designated.

Box 1. Critical Activities and Tools for an FAD Response

Critical Activities and Tools for Containment, Control, and Eradication

- Public awareness campaign
- Swift imposition of effective quarantine and movement controls
- Rapid diagnosis and reporting
- Epidemiological investigation and tracing
- Increased surveillance
- Continuity of business measures for non-infected premises and non-contaminated animal products
- Biosecurity measures
- Cleaning and disinfection measures
- Effective and appropriate disposal procedures
- Mass depopulation and euthanasia (as response strategy indicates)
- Emergency vaccination (as response strategy indicates)

This document, and the documents referenced within this document, are available at <https://fadprep.lmi.org>. Together, these documents provide a comprehensive preparedness and response framework for an FAD outbreak. Your comments and recommendations on this document are invited. Send them to the following e-mail address: FAD.PReP.Comments@aphis.usda.gov.

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Chapter 1

Introduction

An outbreak of a foreign animal disease (FAD)—particularly a highly contagious disease—in the United States has many consequences. Animal health will obviously be threatened, and production agriculture may face significant challenges. An FAD outbreak may impact the supply, cost, and safety of the U.S. food supply. In addition to the economic impact, the social and psychological impact on both producers and consumers could be severe. The foot-and-mouth disease (FMD) outbreak in the United Kingdom had an estimated impact of between \$12–18 billion.¹ Studies have estimated a likely national welfare loss of between \$2.3–69 billion² for an FMD outbreak in California, depending on the delay in diagnosing the disease.³ The impact would come from lost international trade, as well as from costs directly associated with the eradication effort, including the expenses of depopulation, indemnity, carcass disposal, and cleaning and disinfection. In addition, there would be direct and indirect costs related to foregone production, unemployment, and losses in related businesses.

While the United States undertakes many preventive measures to keep FAD agents out of susceptible animal populations—including import restrictions, exclusion activities at borders, and public education—it remains critical to prepare and plan to execute a timely, efficient, and appropriate FAD response effort.

The U.S. Department of Agriculture (USDA) Animal and Plant Health Inspection Service (APHIS) has established the Foreign Animal Disease Preparedness and Response Plan (FAD PReP) to provide a framework for FAD preparedness and response. This document—*APHIS Foreign Animal Disease Framework: Response Strategies* (FAD PReP Manual 2-0) provides significant detail on response strategies for a highly contagious FAD outbreak, information on zone, area, and premises designations, and an overview of other critical activities needed for an effective FAD response. This document also has a companion document—*APHIS Foreign Animal Disease Framework: Roles and Coordination*

¹ Thompson D, Muriel P, Russell D, Osborne P, et al. 2001. Economic costs of the foot-and-mouth disease outbreak in the United Kingdom in 2001. *Rev Sci Tech Off Int Epiz.* 21: 675-687; Grubman MJ, Bast B. 2004. Foot-and-Mouth Disease. *Clin Microbiol Rev.* 17(2): 465-493; USDA Foreign Agricultural Service. 2007. UK Foot & Mouth Disease—recovery timetable, the economic impact and who pays? *Global Agriculture Information Network Report*. Available from <http://www.fas.usda.gov/gainfiles/200708/146292150.pdf>.

² Carpenter TE, O'Brien JM, Hagerman AD, & McCarl BA. 2011. "Epidemic and economic impacts of delayed detection of foot-and-mouth disease: a case study of a simulated outbreak in California." *J Vet Diagn Invest.* 23:26-33.

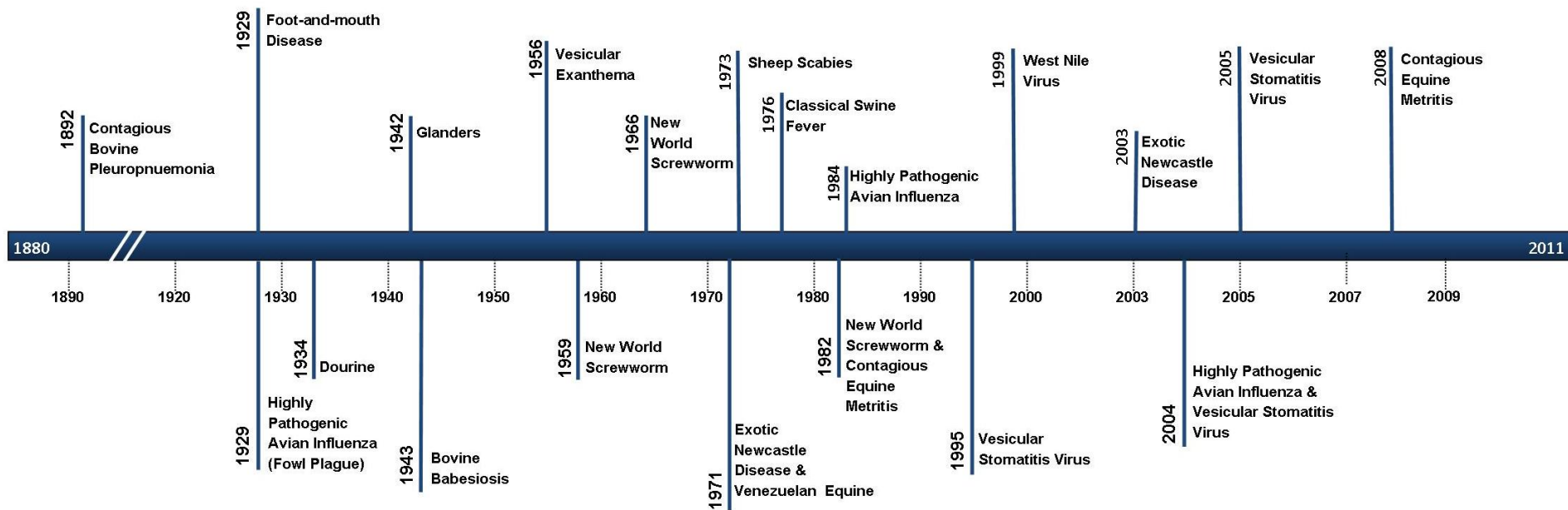
³ Estimates based on models may vary: Ekboir (1999) estimated a loss of between \$8.5 and \$13.5 billion for an FMD outbreak in California. Ekboir JM. 1999. "Potential Impact of Foot-and-Mouth Disease in California: the Role and Contribution of Animal Health Surveillance and Monitoring Services." *Agricultural Issues Center*. University of California, Davis.

(FAD PReP Manual 1-0)—which provides an overview of Federal roles, APHIS authorities and funding processes, incident management, and communications. Together, these and other FAD PReP documents provide a comprehensive preparedness and response framework for an FAD outbreak. [Appendix A](#) contains a list of current FAD PReP documents.

1.1 FADS IN THE UNITED STATES

The United States has been involved in a number of animal disease outbreaks over the past 125 years. Lessons learned from the very first eradication campaign that successfully eliminated contagious pleuropneumonia in 1892 through successive control efforts to the present day have shaped our current strategies. Please refer to Figure 1-1 for selected FAD events in the United States.

Figure 1-1. Selected FAD Events in the United States 1880-2011



1.2 RESPONSE GOALS

In the event of an FAD outbreak in the United States, State, Federal, and Tribal authorities, as well as agriculture stakeholders, will initiate a series of response activities. The type and magnitude of activities depends on the response goals and regulatory intervention for the FAD outbreak.

The APHIS goals of an FAD response are to (1) detect, control, and contain the disease in animals as quickly as possible; (2) eradicate the disease using strategies that seek to stabilize animal agriculture, the food supply, the economy, and protect public health; and (3) provide science- and risk-based approaches and systems to facilitate continuity of business 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 disease-free status without the response effort causing more disruption and damage than the disease outbreak itself.

1.3 OVERVIEW OF CRITICAL ACTIVITIES FOR AN FAD RESPONSE

In order to achieve the goals of an FAD response, critical activities and tools must be implemented to execute the response strategy. Box 1-1 lists key critical activities and tools.

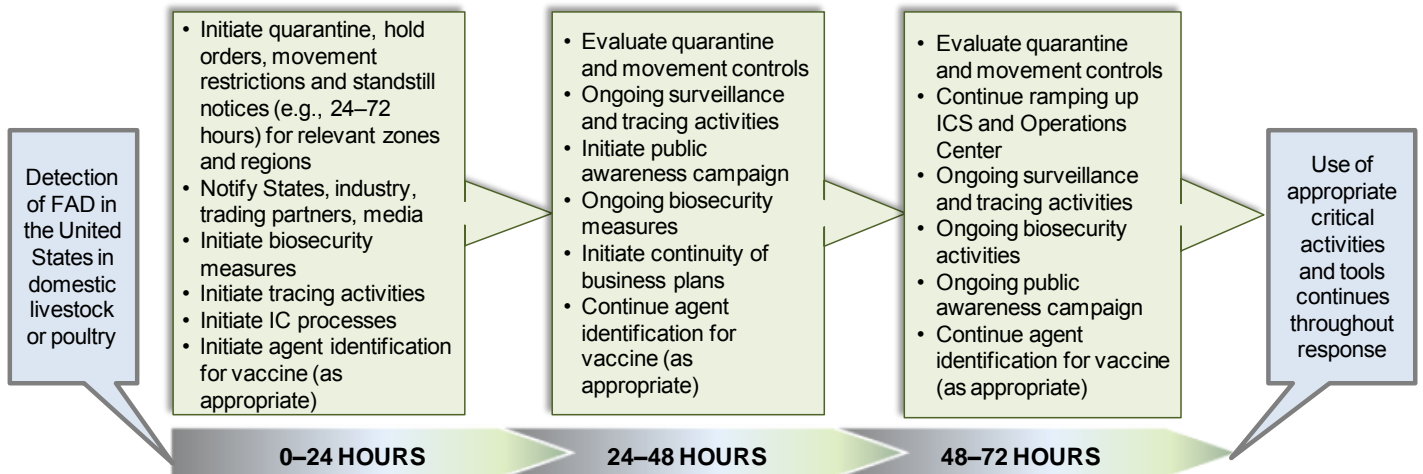
Box 1-1. Critical Activities and Tools for an FAD Response

Critical Activities and Tools for Containment, Control, and Eradication

- Public awareness campaign
- Swift imposition of effective quarantine and movement controls
- Rapid diagnosis and reporting
- Epidemiological investigation and tracing
- Increased surveillance
- Continuity of business measures for non-infected premises and non-contaminated animal products
- Biosecurity measures
- Cleaning and disinfection measures
- Effective and appropriate disposal procedures
- Mass depopulation and euthanasia (as response strategy indicates)
- Emergency vaccination (as response strategy indicates)

Figure 1-2 shows the critical activities that will take place in the first 72 hours of an outbreak. These critical tasks are fundamental to the rapid control and containment of the disease.

Figure 1-2. Critical Activities in the First 72 Hours of an FAD Outbreak



Note: IC = Incident Command; ICS = Incident Command System.

Chapter 2

Response Strategies and Principles

2.1 EPIDEMIOLOGICAL PRINCIPLES OF RESPONSE

Three basic epidemiological principles form the foundation of any response strategy to contain, control, and eradicate an FAD, in particular highly contagious FADs, in the U.S. domestic livestock and poultry population.

1. *Prevent contact between the disease and susceptible animals.*
 - a. This is accomplished through quarantine of infected animals, movement controls in the Infected Zone(s) (IZ) and Buffer Zone(s) (BZ) (Control Area [CA(s)]), and biosecurity procedures to protect non-infected animals.
 - b. Certain circumstances may warrant accelerating the depopulation of animals at risk for exposure to the disease to decrease the population density of susceptible animals.
 - c. There is a serious but lesser transmission risk posed by people, material, conveyances, and animals that may have been in contact with the disease and serve as mechanical vectors. Contact with susceptible animals should be prevented and transmission risk mitigated through biosecurity and cleaning and disinfection measures.
2. *Stop the production of the FAD agent in infected or exposed animals.* This is accomplished by slaughter or mass depopulation (and disposal) of infected and potentially infected animals.
3. *Increase the disease resistance of susceptible animals to the disease or reduce the shedding of the FAD agent in infected or exposed animals.* This can be accomplished by emergency vaccination if a suitable vaccine is available and can be administered in a timely manner.

2.2 REGULATORY INTERVENTION DURING AN FAD OUTBREAK

Each State has statutes/regulations governing animal disease reporting. Federally accredited veterinarians are required to report suspected cases of FADs. An FAD outbreak in the United States may result in emergency regulatory intervention by State, Tribal Nation, and/or Federal authorities. The regulatory interventions will

depend upon the disease agent, the circumstances of the outbreak, and the consequences of the outbreak. The U.S. Department of Agriculture (USDA) and the affected States and Tribal Nations will work together in a Unified Command, per the *National Incident Management System* (NIMS), to detect, control, contain, and eradicate the disease as expeditiously as possible. Incident management for a unified State-Federal-Tribal-stakeholder response is discussed in Chapter 4 of the *Animal and Plant Health Inspection Service (APHIS) Foreign Animal Disease Framework: Roles and Coordination* (FAD PReP Manual 1-0).

The following are examples of State-Federal-Tribal emergency regulatory interventions for an FAD outbreak:

- ◆ *Emergency eradication effort.* Twelve months or less. Regulatory intervention at time of outbreak by State-Federal-Tribal authorities.
- ◆ *Extended emergency eradication effort.* Greater than 12 months. Regulatory intervention at time of outbreak by State-Federal-Tribal authorities.
- ◆ *National animal disease control program.* Long-term program. Regulatory control program conducted by State-Federal-Tribal authorities.
- ◆ *Individual State or Tribal Nation animal disease control program.* Short-term or long-term. State requirements or Tribal Nation requirements.
- ◆ *Animal disease monitored with limited or no regulatory intervention.* Short-term or long-term. Little or no regulatory intervention by State-Federal-Tribal authorities.

The scope of regulatory intervention and the selection of a response strategy or strategies in an FAD outbreak will depend on the following:

- ◆ *Transmission characteristics of the FAD agent.* The rate of contagious animal disease agent transmission, potential for zoonotic transmission, and the number and types of susceptible animal species. Transmission characteristics of FAD disease agents are discussed in [Section 2.3](#).
- ◆ *Consequences of the FAD outbreak.* The consequences of the disease outbreak, and the impact of the response, in terms of disruptions to:
 - National security
 - Food security
 - Public health
 - Animal health
 - Environment

- Economy—short- and long-term impacts for owners, growers, rural economy, and overall economy
 - Local economy and intrastate commerce
 - Interstate commerce
 - International trade
- Regulatory impacts, including short- and long-term for owners, growers, stakeholders, and general public
 - Local, State, and Tribal regulatory impacts
 - Interstate commerce regulatory impacts
 - International trade regulatory impacts
- ◆ *Acceptance.* Acceptance of response policy (social and political) by different communities:
 - Local, State, and Tribal
 - U.S. regional
 - U.S. national
 - North American
 - International
- ◆ *Scale of outbreak.* The number of animals infected, species infected, number of premises infected, and susceptible animal population density for infected areas or high-risk areas of becoming infected with an FAD.
- ◆ *Rate of outbreak spread.* The rate of spread of infection in terms of number of premises, types of premises, number of animals, and types of animals; rate at which each Infected Premises (IP) leads to infection of one or more additional IP.
- ◆ *Veterinary countermeasures available.* The availability and efficacy of veterinary countermeasures such as FAD vaccines.
- ◆ *Resources available to implement response strategies.* The capabilities and resources available to eradicate an FAD in domestic animals and to control and eradicate an FAD in potential wildlife reservoirs.
- ◆ *Domestic animal disease management capabilities.* The capability, feasibility, and resources available to eradicate an FAD in domestic animals as

an emergency response operation, or control as an animal disease program, or monitor as an endemic animal disease.

- ◆ *Wildlife management capabilities.* The capability, feasibility, and resources available to eradicate, control, or monitor an FAD in wildlife reservoirs.

2.2.1 Authorization for Response and Associated Activities

When the criteria for a presumptive case have been met, the APHIS Administrator or the Veterinary Services (VS) Deputy Administrator, who is the U.S. Chief Veterinary Officer (CVO), can authorize APHIS personnel—in conjunction with State, Tribal, and Incident Command (IC) personnel—to initiate response activities.

When an FAD is detected, USDA, State, and/or Tribal authorities will immediately quarantine the relevant regions or zones, restrict specific movements, humanely depopulate affected animals as determined necessary, dispose of carcasses, disinfect property, and increase surveillance in the area to ensure that the FAD has not spread. The Incident Commander works with the Operations Section and Situation Unit in the Planning Section to determine zone, area, and premises designations during an FAD outbreak.

2.2.2 Management of Incident

The outbreak response effort should be implemented through a Unified Command with an appropriate span of control and delegation of authority, employing NIMS. Responses will be as local as possible. Good communication within the chain of command is imperative.

An Incident Commander should be identified and an Incident Command Post established. In-State resources (whether State, Federal, Tribal, or privately owned) should be used to manage a local response. Out-of-State resources may be used to support the State impacted by the outbreak.

Incident management will include quarantine and movement control, tracing, and activation of response plans to communicate these actions to all stakeholders, the public, and the international community. Cooperative Federal, State, Tribal, local, and industry response measures will be carried out with extreme urgency using the most appropriate geographic and jurisdictional scope required to manage the situation. Incident management for unified State-Federal-Tribal-stakeholder response is discussed in Chapter 4 of the *APHIS Foreign Animal Disease Framework: Roles and Coordination* (FAD PReP Manual 1-0).

2.3 TRANSMISSION CHARACTERISTICS OF FAD AGENTS

When evaluating the response strategies to contain, control, and eradicate an FAD affecting livestock, poultry, or other animals, it is necessary to consider the disease agent's transmission characteristics. An animal disease agent is either contagious (transmitted through animal-to-animal contact or fomite-to-animal contact) or not contagious (transmitted through some other means, often an arthropod vector). Contagious diseases may further be categorized as either "highly" contagious or "not highly" contagious. This characterization is based on the epidemiology of the disease and is related to how fast an animal disease agent can move from animal to animal and farm to farm.

A highly contagious disease is one that spreads rapidly from animal to animal and, if uncontrolled, from herd to herd or flock to flock. Transmission can occur via direct and indirect modes. A highly contagious disease may be recognized by greater than normal morbidity or mortality per unit time (high incidence rate or high attack rate). Sometimes morbidity can be characterized by a loss of production (for example in milk or eggs) even without overt signs of clinical illness.

Some non-contagious diseases can be spread by insect or arthropod vectors. Some of these vectors are found in the United States, while others are foreign to the United States. As such, detecting foreign pests is also critical in preventing the introduction and transmission of FADs to the United States.

Any highly contagious FAD agent will require very rapid response actions to control its spread. An animal disease outbreak caused by an agent that is not highly contagious may allow for a less rapid response and still result in elimination of the agent of concern. However, disease agents that are not highly contagious often require a rapid response for reasons other than rapid spread of the agent, including disruptions to interstate commerce, international trade, or zoonotic potential.

The basic pathway for success in eliminating a highly contagious FAD agent is to control infected and exposed (potentially infected) animals, prevent exposure of susceptible animals, and eliminate an animal's ability to produce the agent. Unfortunately, depending upon the number of animals infected and their locations, the basic pathway for eliminating an agent can become disruptive to the normal business operations of both infected and non-infected premises.

2.3.1 Terrestrial FAD Threats

Table 2-1 identifies terrestrial FADs that pose a risk to the United States. This list is not all-inclusive and does not contain all potential terrestrial FAD threats, but shows the diseases most likely to occur based on known methods of transmission. The agents identified as highly contagious diseases will require a rapid and coordinated response to control and eliminate the agent.

Table 2-1. Terrestrial FAD Threats to the United States and its Territories

| FAD | Primary type of animal affected | Highly contagious disease | Vector-borne disease | Zoonotic disease potential |
|--|---------------------------------|---------------------------|----------------------|----------------------------|
| Highly pathogenic avian influenza | Avian and others | Yes | No | Yes |
| Foot-and-mouth disease (FMD) | All cloven hoofed animals | Yes | No | No |
| Rift Valley fever | Bovine, ovine, caprine, canine | No | Yes | Yes |
| Exotic Newcastle disease (ND) (virulent ND virus) | Avian | Yes | No | Yes Minor |
| Nipah Hendra (Henipavirus) | Swine, equine respectively | Yes (Nipah) | No | Yes |
| Classical swine fever | Swine | Yes | No | No |
| African swine fever | Swine | Yes | Yes | No |
| Japanese encephalitis | Equine, swine | No | Yes | Yes |
| African horse sickness | Equine, donkey, mules | No | Yes | No |
| Venezuelan equine encephalitis | Equine, avian | No | Yes | Yes |
| Contagious bovine pleuropneumonia | Bovine | Yes | No | No |
| Heartwater (<i>Ehrlichia ruminantium</i>) | Bovine, ovine, caprine, others | No | Yes | No |
| Akabane | Bovine, ovine, caprine | No | Yes | No |
| Swine vesicular disease | Swine | Yes | No | No |
| Lumpy skin disease | Bovine | No | Yes | No |
| Peste des petits ruminants | Caprine, ovine | Yes | No | No |
| Sheep pox, goat pox | Ovine, caprine | Yes | No | No |
| Glanders | Equine, donkey, mules | Yes | No | Yes |
| Dourine | Equine | No | No | No |
| Contagious equine metritis | Equine | No | No | No |
| Contagious caprine pleuropneumonia | Caprine | Yes | No | No |
| Nairobi sheep disease | Ovine, caprine | No | Yes | Yes Minor |
| Surra (<i>Trypanosoma evansi</i>) | Equine, donkey, bovine, others | No | Yes | No |
| Theileriosis (East Coast fever) | Bovine | No | Yes | No |

Table 2-1. Terrestrial FAD Threats to the United States and its Territories

| FAD | Primary type of animal affected | Highly contagious disease | Vector-borne disease | Zoonotic disease potential |
|----------------------------|---------------------------------------|---------------------------|----------------------|----------------------------|
| Bovine babesiosis | Bovine | No | Yes | No |
| Vesicular stomatitis virus | Equine, bovine, swine, ovine, caprine | No | Yes | Yes Rare |
| Equine piroplasmiasis | Equine | No | Yes | No |
| Rabbit hemorrhagic disease | Domestic rabbits (European breeds) | Yes | No | No |

2.3.2 FAD Pest Threats

Table 2-2 identifies the known FADs introduced by pests that may pose a risk to the United States. This list is not all inclusive and does not contain all potential terrestrial FAD threats, but shows diseases most likely to occur based on known methods of transmission.

Table 2-2. Foreign Pest Threats to the United States and its Territories

| Foreign pest common name | Foreign pest scientific name | Primary type of animal affected | Disease transmitted; condition caused | Zoonotic disease potential |
|---------------------------|---|---------------------------------------|---|---|
| Screwworm—New World | <i>Cochliomyia hominivorax</i> | Warm-blooded animals | Myiasis | Myiasis |
| Screwworm—Old World | <i>Chrysomya bezziana</i> | Warm-blooded animals | Myiasis | Myiasis |
| Bont tick | <i>Amblyomma hebraeum</i> | Bovine, reptiles, other species | Heartwater | Tick typhus |
| Tropical bont tick | <i>Amblyomma variegatum</i> | Bovine, reptiles, other species | Heartwater, Nairobi sheep disease, Crimean Congo hemorrhagic fever (CCHF) | Tick typhus CCHF Yellow fever |
| Brown ear tick | <i>Rhipicephalus appendiculatus</i> | Bovine, ovine, caprine, other species | Heartwater, East Coast fever, Nairobi sheep disease | Tick typhus |
| European castor bean tick | <i>Ixodes ricinus</i> | Bovine, ovine, caprine, other species | Bovine babesiosis | CCHF Lyme disease |
| Southern cattle tick | <i>Rhipicephalus microplus</i> (formerly <i>Boophilus microplus</i>) | Bovine, ovine, caprine, other species | Bovine babesiosis Anaplasmosis | Susceptible human population—splenectomized |
| Cattle fever tick | <i>Rhipicephalus annulatus</i> (formerly <i>Boophilus annulatus</i>) | Bovine, ovine, caprine, other species | Bovine babesiosis Anaplasmosis | Susceptible human population—splenectomized |
| Sheep scab, sheep mange | <i>Psoroptes ovis</i> | Bovine, ovine, other species | Mange | No |

Table 2-2. Foreign Pest Threats to the United States and its Territories

| Foreign pest common name | Foreign pest scientific name | Primary type of animal affected | Disease transmitted; condition caused | Zoonotic disease potential |
|--------------------------|-------------------------------|----------------------------------|---------------------------------------|----------------------------|
| Licking fly | <i>Musca vitripennis</i> | Bovine | Bovine filariosis | No |
| Louse fly | <i>Hippobosca longipennis</i> | Canine, livestock, other species | Bite only | Bite only |

Note: Myiasis = fly larvae feeding on the host living tissue; mange = hair loss, itching, and inflammation from mite infestation; tick typhus = *Rickettsia conorii* (human disease).

An emerging animal disease may also become a threat to animal health or public health. An emerging animal disease is defined as any terrestrial animal, aquatic animal, or zoonotic disease not yet known or characterized, or any known or characterized animal disease that changes or mutates in pathogenicity, communicability, or zoonotic potential to become a threat to animals or humans.

In the event of an FAD or emerging animal disease involving wildlife, APHIS will work in close collaboration, communication, and coordination with State, Tribal, and Federal wildlife agencies that have primary jurisdictional authority and subject matter expertise for wildlife.

2.4 FAD INVESTIGATIONS

Identification of an FAD begins with the suspected index case investigation and National Veterinary Services Laboratories (NVSL) diagnostic testing. Veterinary Services (VS) Memorandum No. 580.4, defines APHIS policies and procedures for FAD investigations, including response and communication procedures during the investigation period. The FAD/emerging disease incidents investigation period is defined as the time from when the investigation is initiated until the time an FAD/emerging disease incidents is ruled out or confirmed. The objectives of an FAD/emerging disease incidents investigation are to provide a veterinary medical assessment, provide presumptive and definitive diagnostic testing results, and ensure that the appropriate veterinary medical countermeasures, regulatory actions, and communications are recommended and implemented during the investigation period.

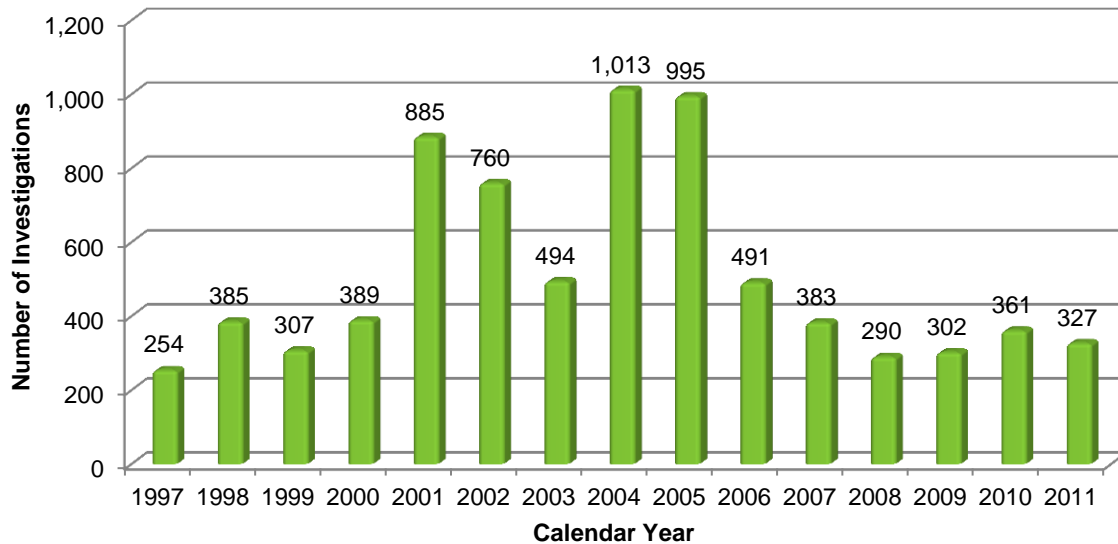
Once an FAD agent is detected, then incident management will be tailored to the specific disease agent and circumstances of the outbreak.

A goal for investigations is to provide presumptive and confirmative diagnostic testing results as rapidly as possible by the classification of investigation and designation of diagnostic sample priority, including the extraordinary rapid diagnostic sample collection, transport, and testing for investigations classified as “high suspicion” for an FAD. Rapid diagnostic results facilitate the implementation of appropriate regulatory actions, the application of relevant medical countermeas-

ures, and effective communications, all of which can prevent and/or mitigate the dissemination of the FAD agent by interstate commerce or international trade.

In the past 15 years there have been over 7,600 foreign animal disease (FAD) investigations conducted throughout the United States, ranging from a yearly low of 254 investigations in calendar year 1997 to a high of 1,013 investigations in 2004 (Figure 2-1).

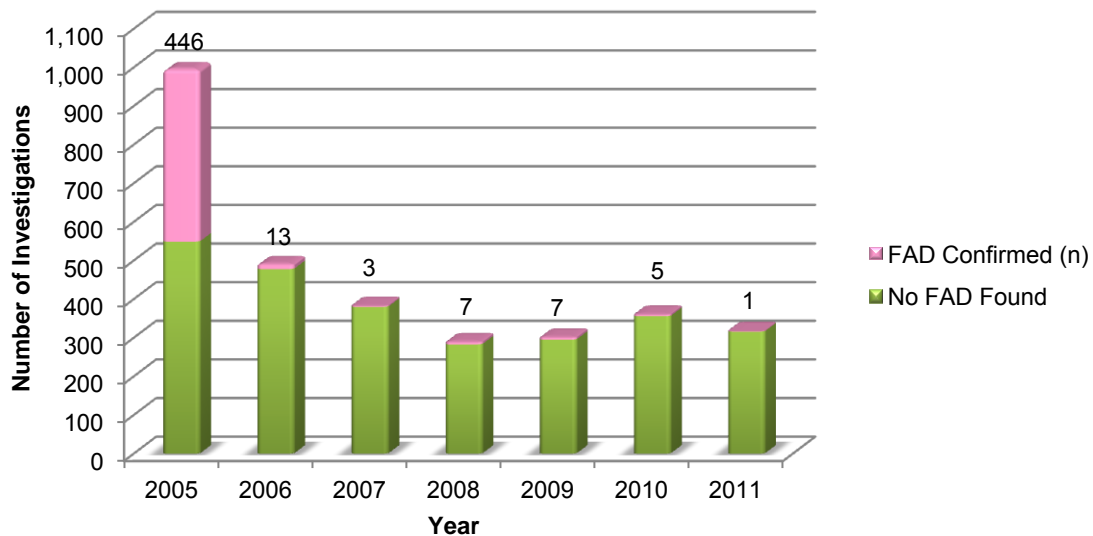
Figure 2-1. FAD Investigations from 1997 to 2011



In 2005, Veterinary Services (VS) of USDA APHIS began publishing extensive annual reports on animal health in the United States (available at http://www.aphis.usda.gov/animal_health/animal_health_report/). This summary of FAD investigations was compiled from information in those reports and data from the World Organization for Animal Health (OIE) World Animal Health Information Database Interface (<http://web.oie.int/wahis/public.php?page=home>).

From 2005 through 2011, 3,149 possible FAD or emerging disease incidents were investigated, however, only a small percentage of those were confirmed to be actual emerging or foreign animal diseases. The exception during this period was the occurrence of a wide spread vesicular stomatitis outbreak that resulted in 446 confirmed FAD findings in 2005 (Figure 2-2).

Figure 2-2. FAD Investigations by Result, 2005 to 2011



2.5 EXAMPLE RESPONSE STRATEGIES

The response strategy or strategies used for the control and eradication of an FAD in domestic livestock or poultry depends on the disease agent, zoonotic potential, ability to control the agent, economic impact, and availability of emergency vaccines. There are four traditional strategies for the control and eradication of a highly contagious FAD in domestic livestock or poultry following an outbreak; these strategies are not mutually exclusive. They are as follows:

- ◆ Stamping-out;
- ◆ Stamping-out modified with emergency vaccination to slaughter;
- ◆ Stamping-out modified with emergency vaccination to live; and
- ◆ Emergency vaccination to live without stamping-out.

This section defines and describes each of these strategies in turn. Depending upon the circumstances and scale of the outbreak, a combination of one or more of these strategies can be applied. Analogous strategies for FMD are recognized in the World Organization for Animal Health (OIE) [Terrestrial Animal Health Code \(2011\)](#), Article 8.5.47.

2.5.1 Stamping-Out

2.5.1.1 DEFINING STAMPING-OUT AS A RESPONSE STRATEGY

Box 2-1 defines stamping-out.

Box 2-1. Stamping-Out

Stamping-Out

Depopulation of clinically affected and in-contact susceptible animals.

2.5.1.2 DESCRIBING STAMPING-OUT AS A RESPONSE STRATEGY

Stamping-out has been a common approach in a number of past FAD outbreaks. This strategy is most appropriate if the outbreak is contained to a jurisdictional area or a region in which the FAD can be readily contained and further dissemination of the agent is unlikely. Stamping-out is currently defined in the OIE [*Terrestrial Animal Health Code \(2011\)*](#), as

carrying out under the authority of the Veterinary Authority, on confirmation of a disease, the killing of the animals which are affected and those suspected of being affected in the herd and, where appropriate, those in other herds which have been exposed to infection by direct animal to animal contact, or by indirect contact of a kind likely to cause the transmission of the causal pathogen. All susceptible animals, vaccinated or unvaccinated, on an infected premises should be killed and their carcasses destroyed by burning or burial, or by any other method which will eliminate the spread of infection through the carcasses or products of the animals killed.

This policy should be accompanied by the cleansing and disinfection procedures defined in the Terrestrial Code.

The term modified stamping-out policy should be used in communications to the OIE whenever the above animal health measures are not implemented in full and details of the modifications should be given.

Box 2-2 lists the critical elements of stamping-out. The OIE recognizes that if outbreaks cannot be confined to a Containment Zone (equivalent to a CA), response strategies other than just stamping-out may be necessary.

Box 2-2. Critical Elements of Stamping-Out

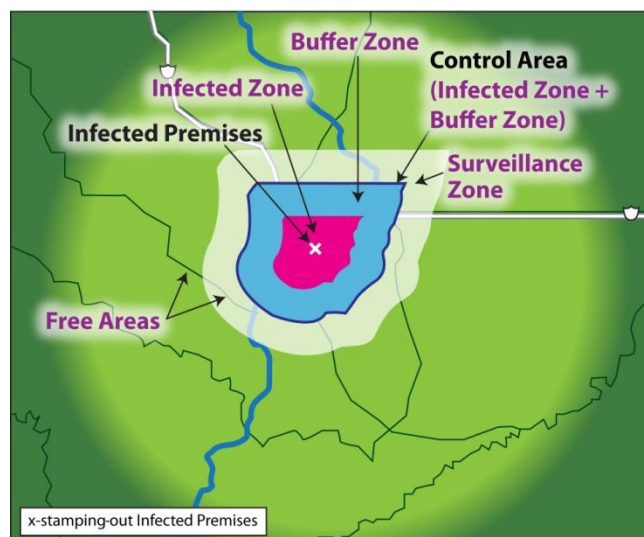
Stamping-Out: Critical Elements

- Within 24 hours, or as soon as possible, after classification of premises as IP, the infected and susceptible livestock will be euthanized or depopulated. In many cases, susceptible livestock or poultry on CP may also be depopulated as soon as possible.
- Where resources are limited, premises will be prioritized so that those with the highest potential for active FAD spread are “stamped-out” first.
- Based on an epidemiological assessment, animals with clinical signs may be prioritized for depopulation to reduce agent excretion.
- Public concerns about stamping-out will require a well-planned and proactive public relations and liaison campaign. Stakeholders, the public, and the international community must be involved.
- Care should be taken to consider mental health implications for owners and responders in the event a stamping-out strategy is implemented.

2.5.1.3 ZONES AND AREAS IN RELATION TO STAMPING-OUT

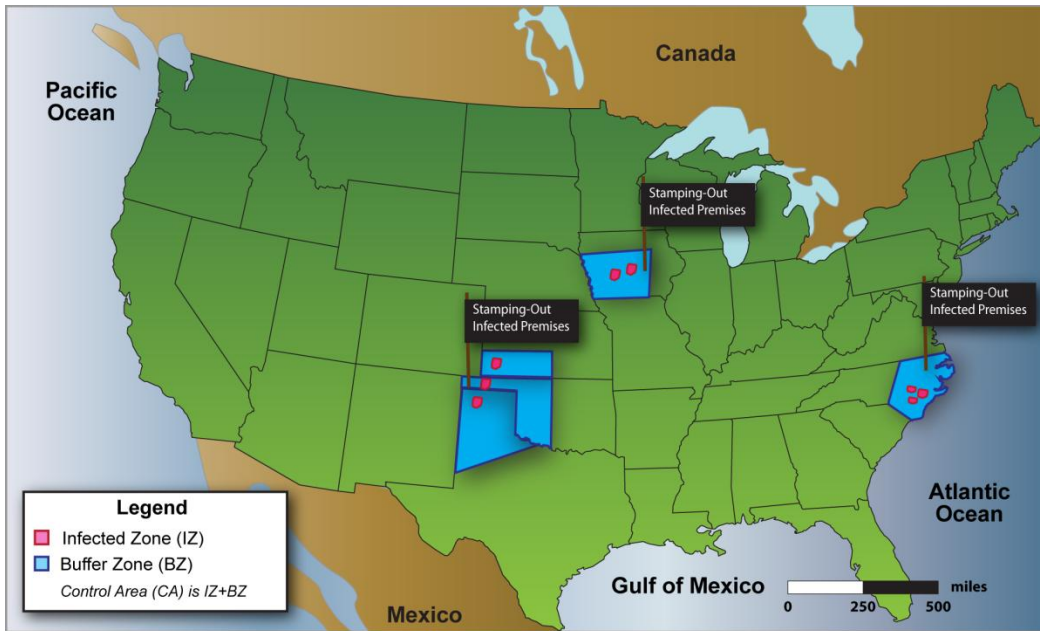
Figures 2-3a and 2-3b show an example of a stamping-out response strategy, where IP are depopulated.

Figure 2-3a. Example of Zones and Areas in Relation to Stamping-Out (Infected Premises Would Be Depopulated)



Note: Figure is not to scale.

Figure 2-3b. Example of Stamping-Out
(Infected Premises Would Be Depopulated)



2.5.2 Stamping-Out Modified with Emergency Vaccination to Slaughter

2.5.2.1 DEFINING STAMPING-OUT MODIFIED WITH EMERGENCY VACCINATION TO SLAUGHTER AS A RESPONSE STRATEGY

Box 2-3 defines stamping-out modified with emergency vaccination to slaughter.

Box 2-3. Stamping-Out Modified with Emergency Vaccination to Slaughter

Stamping-Out Modified with Emergency Vaccination to Slaughter

Depopulation of clinically affected and in-contact susceptible animals and vaccination of at-risk animals, with subsequent slaughter of vaccinated animals. Stamping-out modified with emergency vaccination to slaughter can be as follows:

- a. Delayed depopulation and disposal of vaccinated animals.
- b. Slaughter of vaccinated animals, if animals are eligible for slaughter under USDA Food Safety and Inspection Service (FSIS) authority and rules and/or State and Tribal authority and rules.

2.5.2.2 DESCRIBING STAMPING-OUT MODIFIED WITH EMERGENCY VACCINATION TO SLAUGHTER AS A RESPONSE STRATEGY

This strategy involves the depopulation of clinically affected and in-contact susceptible animals and vaccination of at-risk animals, *with* subsequent slaughter of

vaccinated animals. Stamping-out modified with emergency vaccination to slaughter can be (a) delayed depopulation and disposal of vaccinated animals, or (b) slaughter of vaccinated animals, if animals are eligible for slaughter under FSIS authority and rules and/or State and Tribal authority and rules. This strategy involves the following:

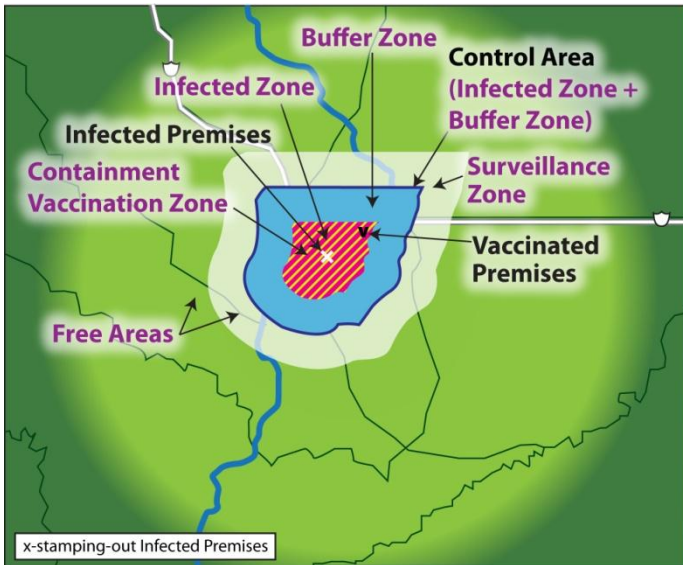
- ◆ A suppressive emergency vaccination strategy;
- ◆ The goal is to suppress agent replication in high-risk susceptible animals by using emergency vaccination and then slaughtering vaccinates at a later date as determined by IC and the VS Deputy Administrator, the U.S. CVO;
- ◆ The targeted vaccination of high-risk susceptible animals in an IZ, CA, or Vaccination Zone (VZ). Ring or regional vaccination around an IP or IZ is a frequently cited example for this strategy;
- ◆ May require vaccinated animal traceability and the diagnostic capability to differentiate between infected and vaccinated animals (DIVA) for movement between zones, interstate commerce, and international trade; and
- ◆ Vaccinated animal identification, movement controls, traceability, and an effective, scalable permitting system may be necessary.

2.5.2.3 ZONES AND AREAS IN RELATION TO STAMPING-OUT MODIFIED WITH EMERGENCY VACCINATION TO SLAUGHTER

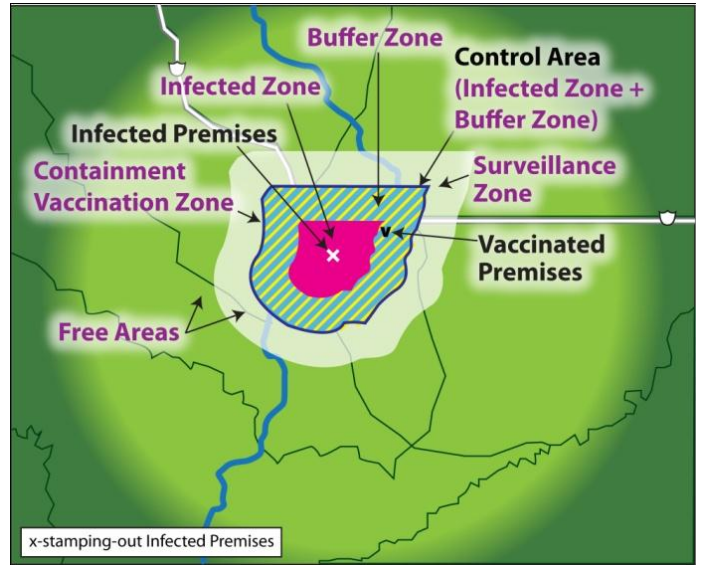
Figures 2-4a and 2-4b show examples of how a stamping-out modified with emergency vaccination to slaughter response strategy might be implemented. Animals on IP would be depopulated, while other animals in a Containment Vaccination Zone (CVZ) may be vaccinated. Stamping-out modified with emergency vaccination to slaughter can be (a) delayed depopulation and disposal of vaccinated animals, or (b) slaughter of vaccinated animals, if animals are eligible for slaughter under USDA FSIS authority and rules and/or State and Tribal authority and rules.

Figure 2-4a. Examples of Zones and Areas in Relation to Stamping-Out Modified with Emergency Vaccination to Slaughter (Infected Premises Would Be Depopulated)

Emergency Vaccination in Infected Zone



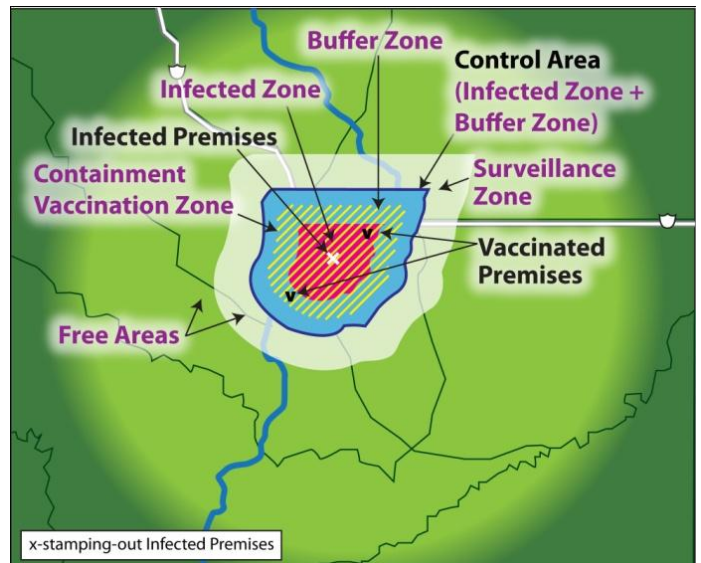
Emergency Vaccination in Buffer Zone



Emergency Vaccination in Control Area

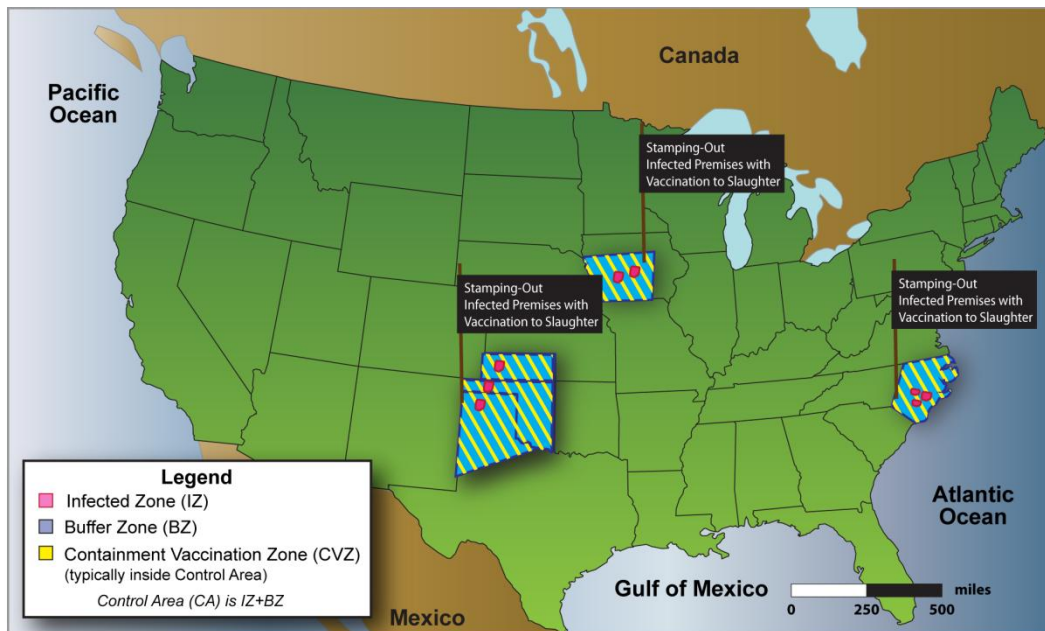


Emergency Vaccination in Infected Zone and Partial Buffer Zone



Note: Figures are not to scale.

Figure 2-4b. Examples of Zones and Areas in Relation to Stamping-Out Modified with Emergency Vaccination to Slaughter (Infected Premises Would Be Depopulated)



2.5.3 Stamping-Out Modified with Emergency Vaccination to Live

2.5.3.1 DEFINING STAMPING-OUT MODIFIED WITH EMERGENCY VACCINATION TO LIVE AS A RESPONSE STRATEGY

Box 2-4 defines stamping-out modified with emergency vaccination to live.

Box 2-4. Stamping-Out Modified with Emergency Vaccination to Live

Stamping-Out Modified with Emergency Vaccination to Live

Depopulation of clinically affected and in-contact susceptible animals and vaccination of at-risk animals, without subsequent slaughter of vaccinated animals. Stamping-out modified with emergency vaccination to live can be as follows:

- a. vaccinated animals intended for slaughter can go to slaughter, if animals are eligible for slaughter under USDA FSIS authority and rules and/or State and Tribal authority and rules; or
- b. vaccinated animals intended for breeding, milking, or other purposes can live out their useful lives.

2.5.3.2 DESCRIBING STAMPING-OUT MODIFIED WITH EMERGENCY VACCINATION TO LIVE AS A RESPONSE STRATEGY

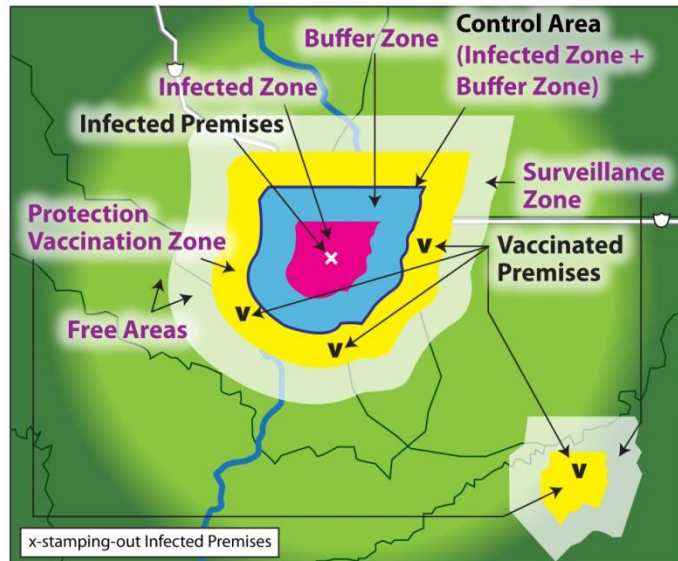
This strategy involves the depopulation of clinically affected and in-contact susceptible animals and vaccination of at-risk animals, *without* subsequent slaughter of vaccinated animals because of their vaccination status. Stamping-out modified with emergency vaccination to live can be as follows:(a) vaccinated animals intended for slaughter can go to slaughter, if animals are eligible for slaughter under USDA FSIS authority and rules and/or State and Tribal authority and rules, or (b) vaccinated animals intended for breeding, milking, or other purposes can live out their useful lives. This strategy involves the following:

- ◆ A protective emergency vaccination strategy;
- ◆ The goal is to protect susceptible animals from infection using emergency vaccination with the deliberate intent to maintain vaccinates for the duration of their usefulness;
- ◆ The targeted vaccination of non-infected animals. This may include valuable genetic stock, long-lived production animals, or areas with a high-density population of susceptible animals at high risk of becoming infected;
- ◆ Requires the establishment of one or more VZs free of disease, the establishment of one or more CAs for infected animals, and movement controls to keep infected animals out of VZs free of disease;
- ◆ DIVA testing may be necessary for movement between zones, interstate commerce, and international trade; and
- ◆ Vaccinated animal identification, movement controls, traceability, and an effective, scalable permitting system may be necessary.

2.5.3.3 ZONES AND AREAS IN RELATION TO STAMPING-OUT MODIFIED WITH EMERGENCY VACCINATION TO LIVE

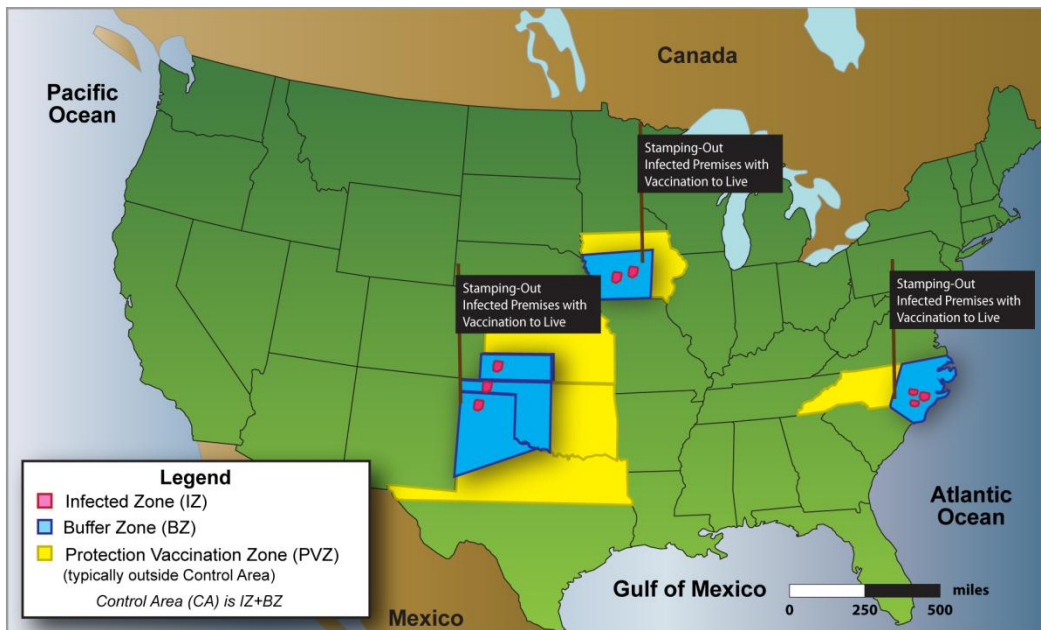
Figure 2-5a and 2-5b show how a stamping-out modified with emergency vaccination to live response strategy might be implemented. Animals on IP would be depopulated, while other animals in a Protection Vaccination Zone (PVZ) would be vaccinated. Any animals vaccinated would not be subsequently slaughtered on the basis of vaccination status.

Figure 2-5a. Examples of Zones and Areas in Relation to Stamping-Out Modified with Emergency Vaccination to Live (Infected Premises Would Be Depopulated)



Note: Figure is not to scale. The smaller zone on the lower right hand corner of the above figure illustrates an example PVZ, and associated Surveillance Zone (SZ), which is not surrounding a CA.

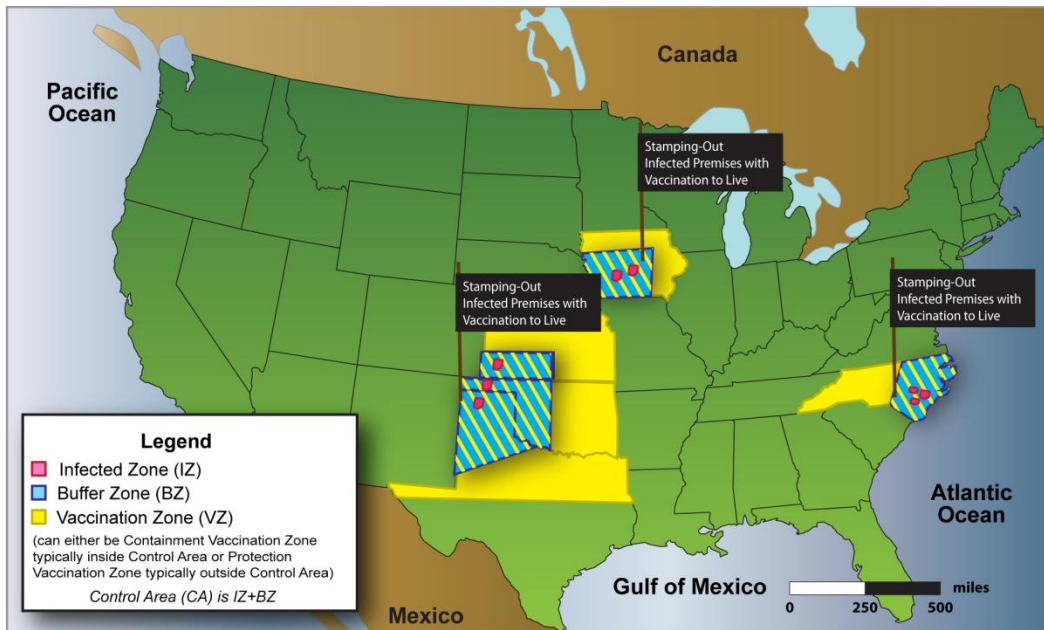
Figure 2-5b. Examples of Zones and Areas in Relation to Stamping-Out Modified with Emergency Vaccination to Live (Infected Premises Would Be Depopulated)



2.5.3.4 STAMPING-OUT MODIFIED WITH EMERGENCY VACCINATION TO SLAUGHTER AND EMERGENCY VACCINATION TO LIVE

It is possible to implement multiple emergency vaccination response strategies in the event of an FAD outbreak. In Figure 2-6, both emergency vaccination to slaughter and emergency vaccination to live strategies are implemented in different regions, alongside stamping-out on IP.

Figure 2-6. Examples of Implementing Multiple Emergency Vaccination Strategies with Stamping-Out: Stamping-Out with Vaccination to Slaughter and Vaccination to Live



2.5.4 Emergency Vaccination to Live without Stamping-Out

2.5.4.1 DEFINING EMERGENCY VACCINATION TO LIVE WITHOUT STAMPING-OUT AS A RESPONSE STRATEGY

Box 2-5 defines emergency vaccination to live without stamping-out.

Box 2-5. Emergency Vaccination to Live without Stamping-Out

Emergency Vaccination to Live without Stamping-Out

Vaccination used without depopulation of infected animals or subsequent slaughter of vaccinated animals. This can be described as emergency vaccination to live without stamping-out.

2.5.4.2 DESCRIBING EMERGENCY VACCINATION TO LIVE WITHOUT STAMPING-OUT AS A RESPONSE STRATEGY

This strategy involves targeted emergency vaccination of susceptible animals, with the intention of not slaughtering these animals at a later date because of their vaccination status. This strategy is reserved for a disease outbreak in which the disease is widely disseminated across the United States, affecting many animal industries, where resources are not available for stamping-out, and a policy decision has been made not to stamp-out. Although this strategy is highly unlikely to be employed initially in an FAD outbreak response, it is possible that given the course of an outbreak that the decision might be made to switch to this strategy if the disease becomes widespread.

This strategy involves the following:

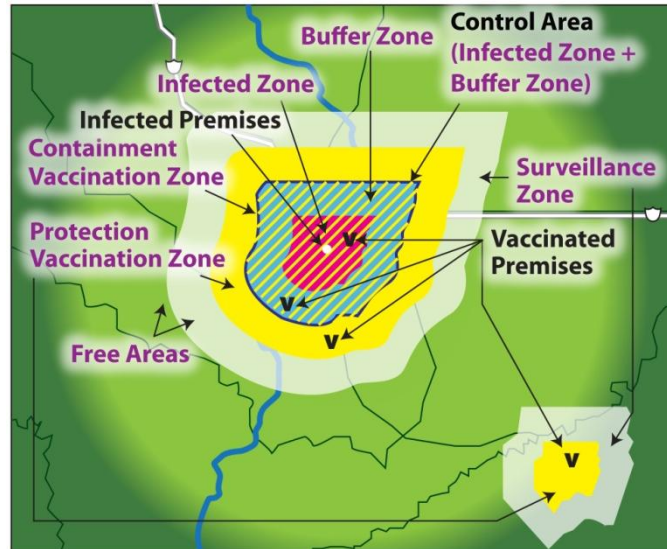
- ◆ A protective emergency vaccination strategy;
- ◆ The goal is to protect susceptible animals from infection with emergency vaccination, with the intention of not slaughtering vaccinates at a later date because of vaccination status;
- ◆ Requires the establishment of one or more VZs free of disease, the establishment of one or more CAs for infected animals, and movement controls to keep infected animals out of VZs free of disease;
- ◆ DIVA testing may be necessary for movement between zones, interstate commerce, and international trade; and
- ◆ Vaccinated animal identification, movement controls, traceability, and an effective, scalable permitting system may be necessary.

2.5.4.3 ZONES AND AREAS IN RELATION TO EMERGENCY VACCINATION TO LIVE WITHOUT STAMPING-OUT

Figures 2-7a and 2-7b provide examples of emergency vaccination to live without stamping-out. There would be no stamping-out under this response, only emergency vaccination to live. This strategy would not be employed unless the disease is widely disseminated across the United States, resources are not available for stamping-out, and a policy decision has been made to not stamp-out. While it is highly unlikely that this would be the initial strategy employed in an FAD outbreak response, it is possible that given the course of an outbreak that the decision might be made to switch to this strategy if disease becomes widespread.

Figure 2-7a. Examples of Zones and Areas in Relation to Emergency Vaccination to Live without Stamping-Out

Containment Vaccination Zone and Protection Vaccination Zone



Note: Figure is not to scale. Yellow signifies a VZ. CVZs are typically inside a CA; PVZs are typically outside a Control Area. PVZs are intended to be zone(s) without infected animals. The smaller zone on the lower right hand corner of the above figure illustrates an example PVZ, and associated SZ, which is not surrounding a CA.

Figure 2-7b. Examples of Zones and Areas in Relation to Emergency Vaccination to Live without Stamping-Out



2.6 SUMMARY OF SELECTING A RESPONSE STRATEGY

The previous sections have identified and described the response strategies. Choosing one strategy, multiple strategies, or modifying strategies as an outbreak unfolds is a complex decision process. Depending upon the circumstances and scale of the outbreak, a combination of one or more of the response strategies can be applied.

If it becomes apparent at any point in the response that stamping-out will not achieve control, containment, and ultimately eradication of the disease, alternative strategies will immediately be considered. Currently, it is not possible to delineate *a priori* the specific factors that might signal the need to modify the response to an FAD outbreak.

No single FAD control or eradication strategy may be perfect or appropriate for all scenarios. Regardless of the FAD agent, the response will use a science- and risk-based approach that protects public health and animal health, and stabilizes animal agriculture, the food supply, and the economy.

Stamping-out is a viable eradication strategy if an outbreak is detected early while still reasonably localized and contained by quarantine and movement control and biosecurity measures. An essential prerequisite for stamping-out is the existence of good epidemiological investigation functions and FAD tracing capabilities, which allow the locations and extent of the IP and areas to be rapidly and accurately determined.

Regulatory officials and stakeholders who plan for stamping-out must also have other viable response strategies, in case the spread of the FAD outpaces the resources for stamping-out, or if other factors direct the response away from a stamping-out strategy alone.

In circumstances or scenarios where stamping-out alone will not be a viable eradication strategy, modified stamping-out with vaccination to slaughter, modified stamping-out with vaccination to live, and vaccination to live without stamping-out are all potential options. Emergency vaccination strategies can be adopted for agents having an effective, safe, available vaccine, and when those strategies are consistent with national and international standards.

In any situation involving emergency vaccination, movement control, FAD traceability, and a robust information technology system to support permitting, epidemiology, and tracing are essential for the timely continuity of business for non-infected animals, emergency vaccinated animals, and animal products.

Regardless of the response strategy or strategies adopted, early detection and field operations that act with speed and certainty to identify the source of infection and

stop the FAD agent from spreading further will decrease the size and duration of the outbreak.

See Table 2-3 for factors that determine whether emergency vaccination strategies are advantageous for responding to an FAD outbreak.

Table 2-3. Factors Determining Viability of Emergency Vaccination

| Factor or criterion | Vaccination Decision Points | |
|--|--|--|
| | For vaccination | Against vaccination |
| Suitable vaccine for FAD agent | Available | Not available |
| Public health assessment | Supports vaccination | Does not support vaccination |
| Population density of susceptible animals at high risk of becoming infected | High | Low |
| Movement of infected animals, products, or fomites out of Control Area | Evidence of widespread movement | No evidence of widespread movement |
| Origin of outbreak | Unknown | Known |
| Spread of outbreak | Rapid | Slow |
| Distribution of outbreaks | Widespread | Limited or restricted |
| Public reaction to total stamping-out strategy (Public reaction may vary by animal species, scale of stamping-out policy, and disease agent) | Strong opposition | Neutral reaction or weak opposition |
| Domestic stakeholders' acceptance of regionalization with vaccination zones | Yes | No |
| Third country acceptance of regionalization with vaccination zones | Known | Unknown |
| Assessments and economic analysis of competing control strategies | It is likely that a control strategy <i>without</i> emergency vaccination will lead to significantly higher economic losses or longer duration of the outbreak | It is likely that a control strategy <i>with</i> emergency vaccination will lead to significantly higher economic losses, or longer duration of the outbreak |

Note: This table was adapted from: Council Directive 2003/85/EC of 29 September 2003. 2003. *Official Journal of the European Union*. Annex X.

Box 2-6 summarizes FAD response and emergency vaccination strategies.

FAD Response and Vaccination Strategies

The use of emergency vaccination strategies may be considered in an FAD outbreak. An emergency vaccination strategy can help to achieve the goals of an FAD response effort, and is founded upon the three epidemiological principles of response. There are many challenges to using emergency vaccination in an FAD response, but also many benefits. An FAD response may use one strategy or a variety of strategies in order to detect, control, contain, and ultimately eradicate the disease in domestic animals. The use of emergency vaccination will be determined by the IC, the State Animal Health Officials (SAHOs), and the VS Deputy Administrator (U.S. CVO).

2.7 OIE-LISTED ANIMAL DISEASES AND INTERNATIONAL STANDARDS FOR RESPONSE

2.7.1 Recognition of Disease-Free Status

In May 1994, the World Assembly of Delegates of the OIE requested the FMD and Other Epizootics Commission (now called the Scientific Commission for Animal Diseases) to develop a procedure for OIE to officially recognize the FMD-free status of members. The procedure has since been expanded to include official recognition of disease status for rinderpest, contagious bovine pleuropneumonia (CBPP), and bovine spongiform encephalopathy (BSE). In 1998, the official agreement between the World Trade Organization and the OIE further confirmed the OIE's mandate to recognize disease- and pest-free areas and/or risk status (Agreement on the Application of Sanitary and Phytosanitary Measures) for trade purposes.

Any Member that wishes to be included in the list of designated disease-status countries or to change its status (for example, to move from the list of free countries or zones where vaccination is practiced to the list of free countries or zones where vaccination is not practiced) sends a request to the OIE Director General, accompanied by specific documentation and the relevant questionnaires (FMD, rinderpest, CBPP, and BSE). The Director General then submits the request to the Scientific Commission for evaluation.

OIE Members can also self-declare their entire territory or a zone within their territory free from certain OIE-listed diseases other than FMD, rinderpest, CBPP, and BSE. In this case, delegates are advised to consult the [Terrestrial Animal Health Code](#) or the [Aquatic Animal Health Code](#) to verify whether specific requirements for self-declaration of freedom from that particular disease are available. By providing the relevant epidemiological evidence, the OIE Member can demonstrate to a potential importing country that the entire country or a zone under discussion meets the provisions of the specific disease chapter. Any submitted

self-declaration should contain evidence demonstrating that the requirements for the disease status have been met in accordance with the OIE standards. The self-declaration of freedom from a given OIE-listed disease (other than FMD, rinderpest, CBPP, and BSE) is the responsibility of the Member concerned, and the OIE is not responsible for inaccurate publication of self-declarations of country or zonal disease status based on inadequate information, changes in epidemiological status, or other significant events that were not promptly reported to the headquarters after the self-declaration of freedom for that given disease.

The self-declaration must be signed by the official OIE delegate of the OIE Member concerned. The data provided must conform to the requirements described in the standard measures contained in the *Terrestrial* or *Aquatic Codes*. Upon request of the OIE delegate, a self-declaration may be published in the OIE *Bulletin* for information of all OIE Members. The self-declaration for publication must contain information demonstrating that the requirements are met as described in the OIE standards.

For example, the OIE-categories for official country recognition for FMD virus are as follows ([Terrestrial Animal Health Code \(2011\)](#) Articles 8.5.2., 8.5.3., 8.5.4., 8.5.5., 8.5.6., 8.5.7.):

- ◆ FMD-free country where vaccination is not practiced (Article 8.5.2.)
- ◆ FMD-free country where vaccination is practiced (Article 8.5.3.)
- ◆ FMD-free zone where vaccination is not practiced (Article 8.5.4.)
- ◆ FMD-free zone where vaccination is practiced. (Article 8.5.5.)
- ◆ FMD-free compartment (Article 8.5.6.)
- ◆ FMD-infected country or zone (Article 8.5.7.).

2.8 EXECUTING A RESPONSE STRATEGY

Many critical activities and tools are employed to execute the response strategies during an FAD outbreak. This section describes some of those activities.

- ◆ Epidemiological investigation and FAD tracing:
 - Critical in minimizing the size and duration of an FAD outbreak.
 - Includes activities such as the trace-forward and trace-back of infected animals, exposed animals, contaminated animal products, and fomites in order to determine the source of infection and stop the spread of infection from animals on IP and Contact Premises (CP).

-
- ◆ Biosecurity:
 - Necessary to (1) contain the agent on IP (biocontainment), and (2) prevent the introduction of the agent via movement of personnel and material to naïve animals and premises (bioexclusion).
 - A careful balance must be maintained between facilitating response activities and ensuring personnel do not expose naïve animals and premises to the disease.
 - ◆ Surveillance:
 - Determines the extent of infection for premises and zones with defined plans for clinical observation and diagnostic testing.
 - Also provides information for disease-freedom for premises and zones with defined plans for clinical observation and diagnostic testing.
 - ◆ Quarantine and movement control:
 - Quarantines will be implemented for IP, Suspect Premises, and CP. Movement controls will be implemented for At-Risk and Monitored Premises within a CA.
 - Movement control of susceptible animals and animal products within, into, and out of a CA is accomplished by risk assessments, surveillance requirements, biosecurity procedures, and permitting.
 - Movement controls of susceptible animals may also be implemented on broader geographical areas or by jurisdictions, such as a State, regionally, or nationally, to limit the “silent spread” of infection (for certain disease agents, such as FMD). The time period for this type of movement control needs to be defined, such as for an incubation period for the disease or other specified period.
 - Movement controls may be limited to the CA or may be broader in scale (for certain disease agents, such as FMD) to include concentration centers that are determined to be high risk for spreading infection, such as sale yards or auction markets.
 - ◆ Continuity of business:
 - Provides science- and risk-based approaches and systems for the continuity of business involving non-infected animals and non-contaminated animal products.
 - Establishes a transparent and effective system for risk assessments, surveillance requirements, biosecurity procedures, and a permit

process in order to promote stakeholder acceptance and compliance with regulatory interventions by State, Federal, and Tribal authorities.

- ◆ Cleaning and disinfection:
 - This activity eliminates a contagious agent from contaminated premises and fomites with proper sanitary procedures.
- ◆ Disposal:
 - In the event animals are depopulated, or succumb to an FAD agent, this activity eliminates the threat of disease spread and adverse environmental impacts by proper sanitary disposal.
- ◆ Public awareness campaign:
 - Public awareness campaigns engage and leverage State, Federal, Tribal, and stakeholder relationships to provide unified public messages for local, national, and international audiences.
 - This activity addresses issues and concerns relating to food safety, public health, and animal welfare.
 - This activity addresses issues and concerns related to interstate commerce, continuity of business, and international trade.
- ◆ Emergency vaccination:
 - Emergency vaccination may be employed depending upon the availability and efficacy of a vaccine, the goals of the outbreak response, the circumstances of the outbreak, approval of the IC, the SAHOs, and the VS Deputy Administrator (U.S. CVO).
 - DIVA testing may be necessary for movement between zones, interstate commerce, and international trade.

[Appendix B](#) contains a list of example preparedness and response goals for selected activities and tools.

Chapter 3

Designating Zones and Premises

3.1 AREAS AND ZONES

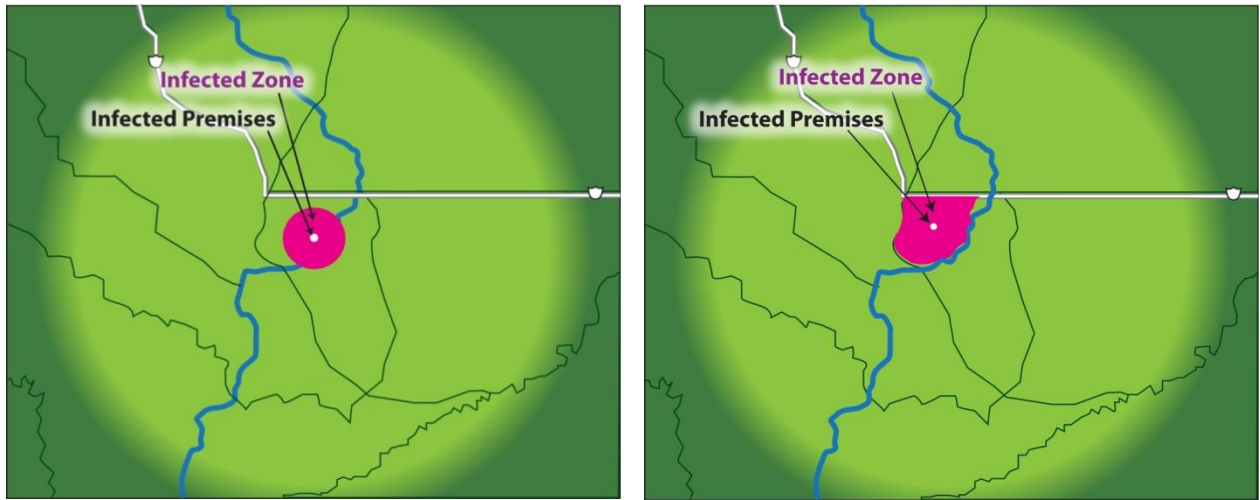
In general, an animal disease outbreak response involves seven types of zones/areas. These zones and areas are the 1) Infected Zone (IZ); 2) Buffer Zone (BZ); 3) Control Area (CA); 4) Surveillance Zone (SZ); 5) Free Area (FA); 6) Containment Vaccination Zone (CVZ); and 7) Protection Vaccination Zone (PVZ).

3.1.1 Infected Zone

- ◆ An IZ immediately surrounds an Infected Premises (IP) (see Figure 3-1).
- ◆ IP, Suspect Premises (SP), and Contact Premises (CP) are subject to individual premises quarantine. At-Risk Premises (ARP) and Monitored Premises (MP) are subject to movement control.
- ◆ An IZ will initially encompass all presumptive or confirmed positive premises and include CP as required epidemiologically or logistically.
 - The size of an IZ depends upon the foreign animal disease (FAD) agent and may be modified or redefined as needed by the circumstances of the outbreak.
 - The perimeter of an IZ should be at least 3 km (1.86 miles) beyond the perimeters of the presumptive or confirmed Infected Premises.
 - An IZ may initially be as large as a county, township, district, or other jurisdictional area.
 - Considerations for establishing the size of an IZ:
 - potential consequences of not containing the disease agent to a particular jurisdictional or geographical area; and
 - potential consequences of movement restrictions (or implementation of a permit process) on a large geographical or jurisdictional area.

- ◆ See the Tables in [Section 3.4](#) and the disease specific response plans for more guidance on moving animals and animal products into, within, and out of a CA.

Figure 3-1. Infected Zone



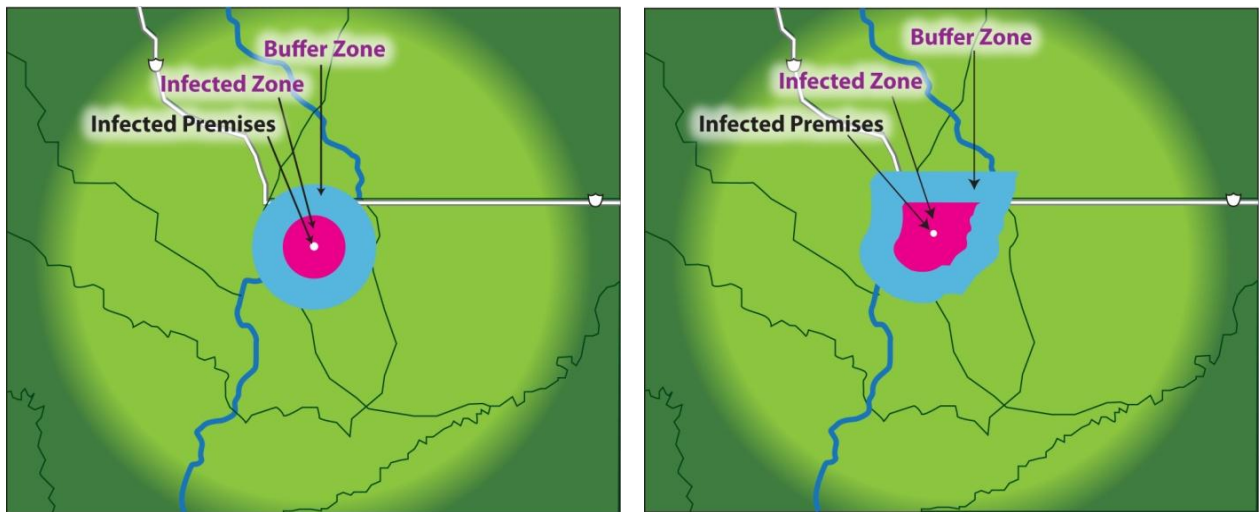
Note: Figures are not to scale.

3.1.2 Buffer Zone

- ◆ A BZ immediately surrounds an IZ or a CP (see Figure 3-2). A BZ and IZ together constitute a CA.
- ◆ Within a BZ, CP are subject to individual premises quarantine. ARP and MP are subject to movement control.
- ◆ A BZ is a scalable area with a width that is never less than the minimum radius of the associated IZ, but may be much larger.
 - The perimeter of a BZ should be at least 7 km (4.35 miles) beyond the perimeter of the IZ.
 - The size of a BZ depends upon the FAD agent and circumstances of the outbreak.
 - The boundaries of a BZ may be modified or redefined as needed by the circumstances of the outbreak.
 - Considerations for establishing the size of a BZ.
 - potential consequences of not containing the disease agent to a particular jurisdictional or geographical area; and

- potential consequences of movement restrictions (or implementation of a permit process) on a large geographical or jurisdictional area.
- ◆ See the Tables in [Section 3.4](#) and the disease specific response plans for more guidance on moving animals and animal products into, within, and out of a CA.
- ◆ If a CP is identified outside a CA, it may be surrounded by a BZ until the disposition of the CP is determined.

Figure 3-2. Buffer Zone



Note: Figures are not to scale.

3.1.3 Control Area

- ◆ A CA consists of an IZ and a BZ (see Figure 3-3).
- ◆ IP, SP, and CP are subject to individual premises quarantine. ARP and MP are subject to movement control.
- ◆ The size of a CA depends upon the FAD agent and circumstances of the outbreak and may be modified or redefined as needed by the circumstances of the outbreak.
 - The perimeter of a CA should be at least 10 km (6.21 miles) beyond the perimeter of the closest IP.
 - Initially a CA may be much larger, such as multiple counties, a State, a Tribal Nation, or multiple States. The size of a CA is scalable to the risk, or the uncertainty of the risk, posed by the disease agent and the circumstances of the outbreak.

- The boundaries of a CA can be modified or redefined when tracing and other epidemiological information becomes available.
- Table 3-1 lists factors that should be considered when determining the size of a CA.
- Considerations for establishing the size of a CA
 - potential consequences of not containing the disease agent to a particular jurisdictional or geographical area; and
 - potential consequences of movement restrictions (or implementation of a permit process) on a large geographic or jurisdictional area.

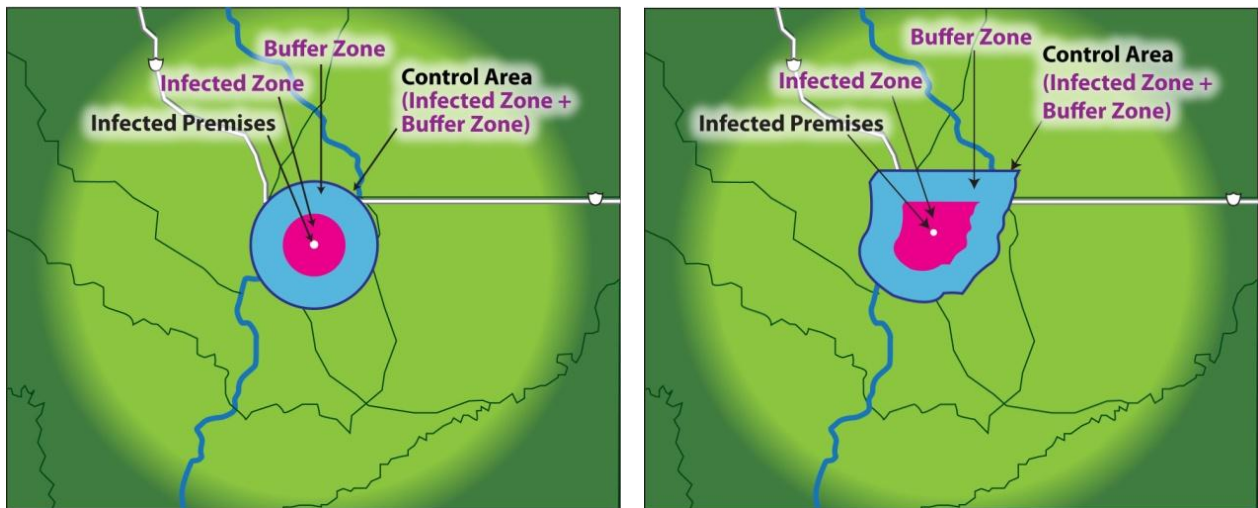
Table 3-1. Factors to Consider in Determining Control Area Size

| Factors | Additional details |
|-----------------------------------|--|
| Jurisdictional areas | <ul style="list-style-type: none"> ◆ Effectiveness and efficiency of administration ◆ Multi-jurisdictional considerations: local, State, Tribal, and multistate |
| Physical boundaries | <ul style="list-style-type: none"> ◆ Areas defined by geography ◆ Areas defined by distance between premises |
| Disease epidemiology | <ul style="list-style-type: none"> ◆ Reproductive rate ◆ Incubation period ◆ Ease of transmission ◆ Infectious dose ◆ Species susceptibility ◆ Modes of transmission (fecal-oral, droplet, aerosol, vectors) ◆ Survivability in the environment ◆ Ease of diagnosis (for example, no pathognomonic signs; requires diagnostic laboratory testing) ◆ Age of lesions |
| Infected Premises characteristics | <ul style="list-style-type: none"> ◆ Number of contacts ◆ Transmission pathways and transmission risk <ul style="list-style-type: none"> ▪ Extent of animal movement ▪ Number of animals ▪ Species of animals ▪ Age of animals ▪ Movement of traffic and personnel to and from premises (fomite spread) ▪ Biosecurity measures in place at time of outbreak |
| Contact Premises characteristics | <ul style="list-style-type: none"> ◆ Number and types of premises ◆ Susceptible animal populations and population density ◆ Animal movements ◆ Movement of traffic and personnel to and from premises (fomite spread) ◆ Biosecurity measures in place prior to outbreak |
| Environment | <ul style="list-style-type: none"> ◆ Types of premises in area or region ◆ Land use in area or region ◆ Susceptible wildlife and population density ◆ Wildlife as biological or mechanical vectors |

Table 3-1. Factors to Consider in Determining Control Area Size

| Factors | Additional details |
|--|--|
| Climate (for aerosol spread diseases) | <ul style="list-style-type: none"> ◆ Prevailing winds ◆ Humidity |
| General area, region, or agricultural sector biosecurity | <ul style="list-style-type: none"> ◆ Biosecurity practices in place prior to outbreak ◆ Biosecurity practices implemented once outbreak detected |
| Number of non-commercial or transitional premises | <ul style="list-style-type: none"> ◆ Types of premises, animal movements, and network of animal and fomite movements |
| Continuity of business | <ul style="list-style-type: none"> ◆ Continuity of business plans and processes in place or activated at beginning of outbreak (such as surveillance, negative diagnostic tests, premises biosecurity, and risk-assessments) ◆ Permit processes, memorandums of understanding, and information management systems in place or activated at beginning of outbreak |

Figure 3-3. Control Area



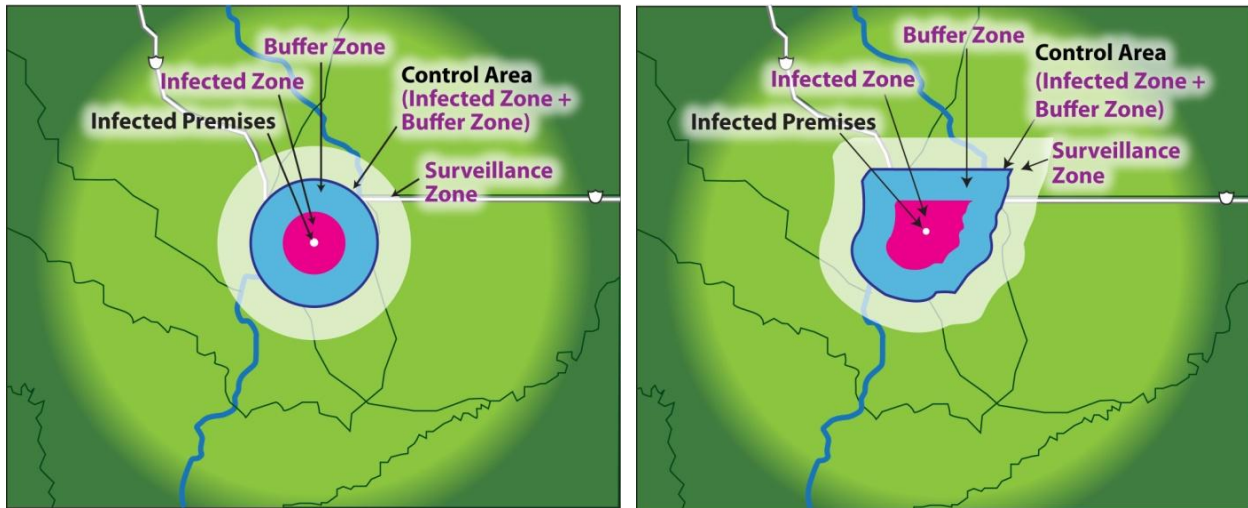
Note: Figures are not to scale.

3.1.4 Surveillance Zone

An SZ should be established in the FA, outside and along the border of a CA, separating the remainder of the FA from a CA (see Figure 3-4).

Surveillance in an SZ will focus on premises determined to be at the highest risk of infection. The width of an SZ should be at least 10 km (6.2 miles). The maximum size of an SZ may be much greater.

Figure 3-4. Surveillance Zone

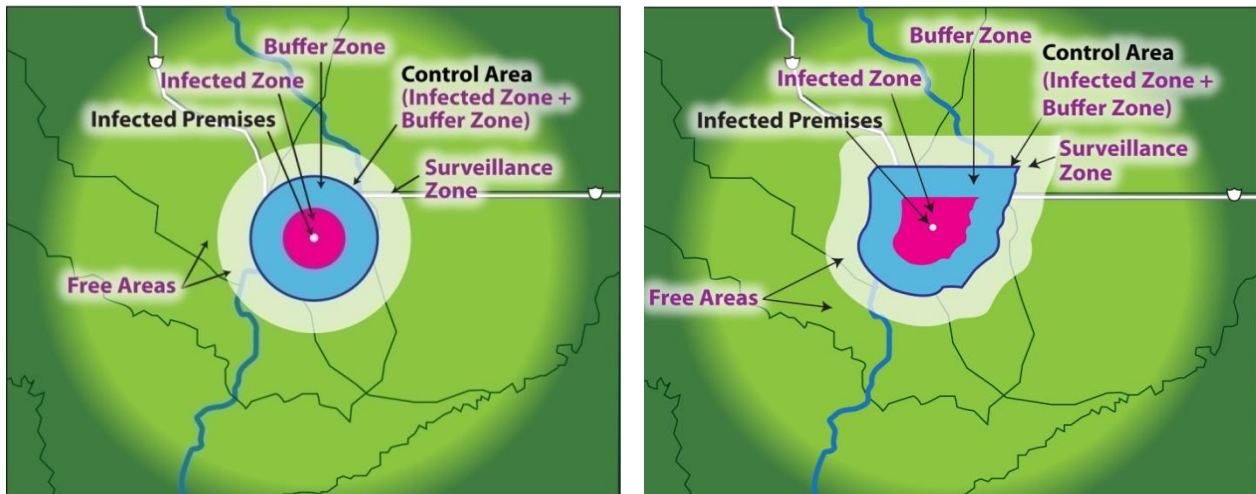


Note: Figures are not to scale.

3.1.5 Free Area

The FA is the area not included in any CA. The FA includes an SZ but extends beyond it (see Figure 3-5). The FA may also include a PVZ.

Figure 3-5. Free Area



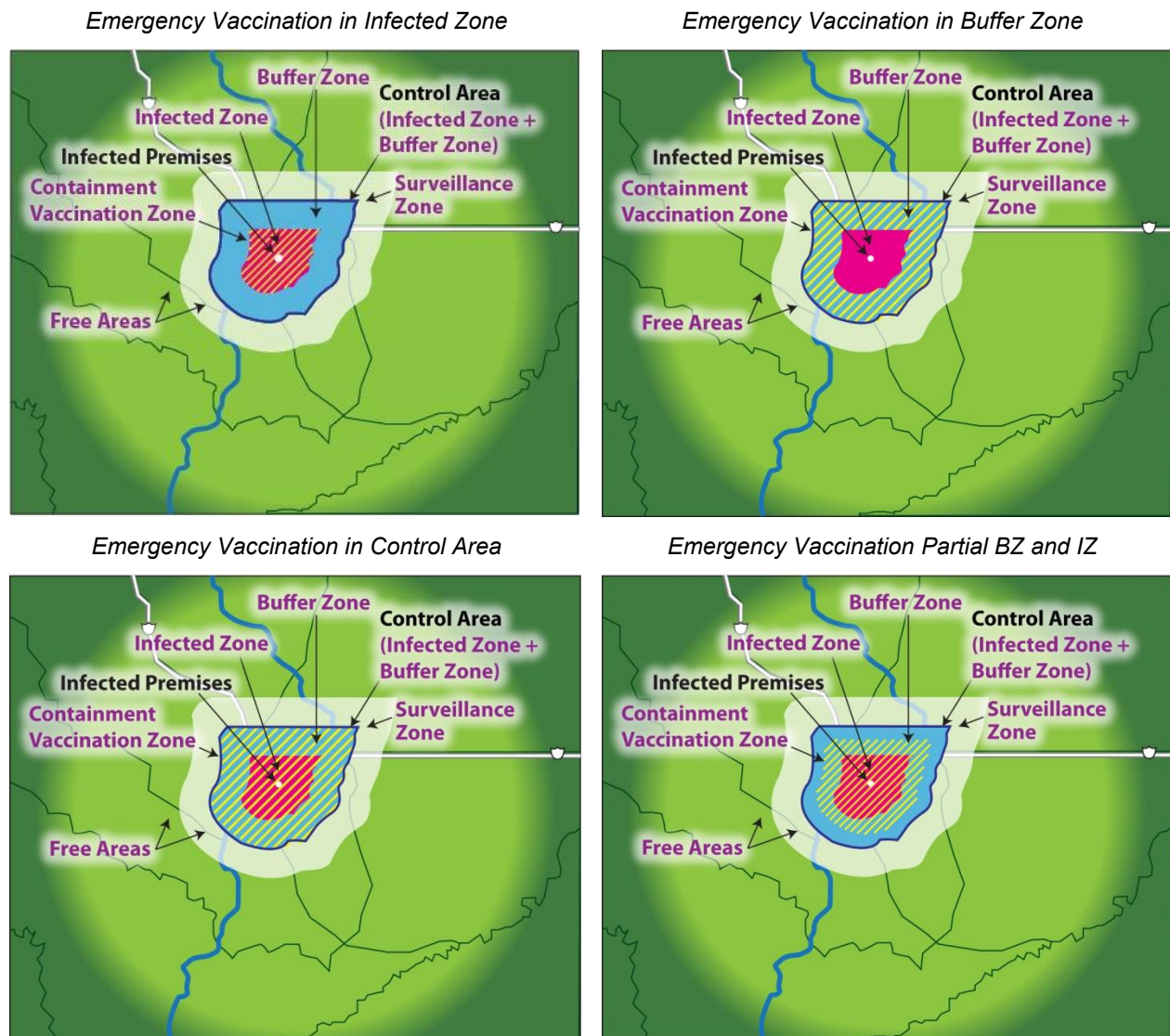
Note: Figures are not to scale.

3.1.6 Containment Vaccination Zone

- ◆ A CVZ is an emergency vaccination zone, typically inside a CA. It may include all or part of an IZ and/or a BZ (see Figure 3-6).

- ◆ A CVZ may be a secondary zone designation. Quarantine and movement control requirements, surveillance requirements, and biosecurity procedures for a CA (IZ and BZ) apply to a CVZ.
- ◆ Animals receiving emergency vaccination within a CVZ may be subject to vaccinated animal traceability and DIVA testing, as determined by Incident Command (IC).
- ◆ Depending upon the circumstances of the outbreak, the emergency vaccination strategy within a CVZ may be one or more of the following:
 - Suppressive vaccination strategy (for example, stamping-out modified with emergency vaccination to slaughter).
 - Protective vaccination strategy (for example, stamping-out modified with emergency vaccination to live).
 - Protective vaccination strategy (for example, emergency vaccination to live without stamping-out).

Figure 3-6. Examples of Containment Vaccination Zones



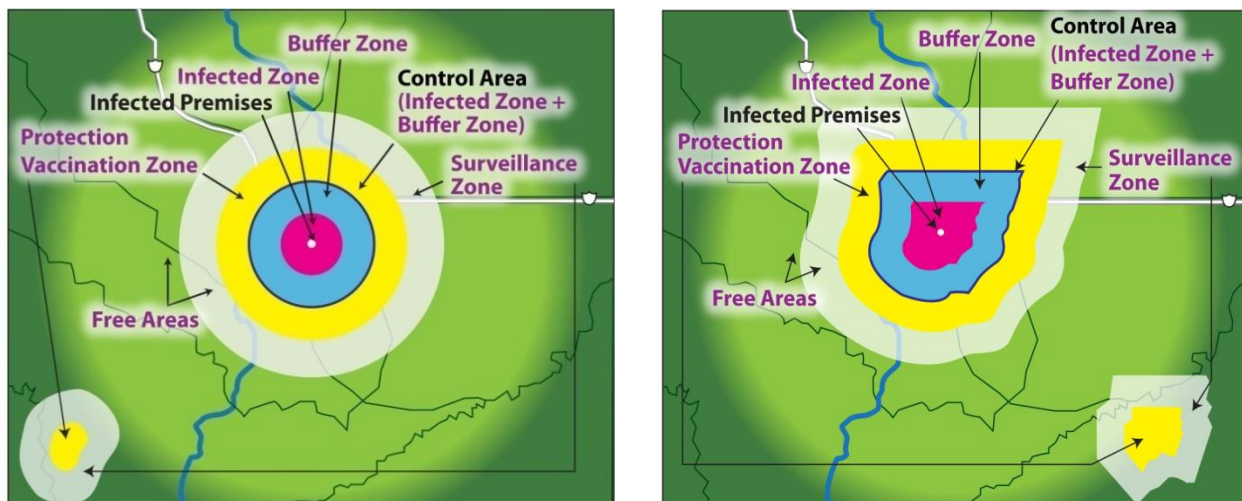
Note: Figures are not to scale.

3.1.7 Protection Vaccination Zone

- ◆ A PVZ is an emergency vaccination zone, typically outside the CA (see Figure 3-7).
- ◆ A PVZ may be subject to movement control requirements, surveillance requirements, and biosecurity procedures. A PVZ may be a secondary zone designation.
- ◆ Animals receiving emergency vaccination within a PVZ may be subject to vaccinated animal traceability and DIVA testing, as determined by IC.

- ◆ A PVZ is consistent with the World Organization for Animal Health (OIE) definition for a Protection Zone. A Protection Zone is defined by the OIE as “a zone established to protect the health status of animals in a free country or free zone, from those in a country or zone of a different animal health status, using measures based on the epidemiology of the disease under consideration to prevent spread of the causative pathogenic agent into a free country or free zone. These measures may include, but are not limited to, vaccination, movement control and an intensified degree of surveillance.” More information can be found at the OIE website, www.oie.int.
- ◆ Depending upon the circumstances of the outbreak, the emergency vaccination strategy within a PVZ may be one or more of the following:
 - Protective vaccination strategy (for example, stamping-out modified with emergency vaccination to live).
 - Protective vaccination strategy (for example, emergency vaccination to live without stamping-out).
 - Suppressive vaccination strategy (for example, stamping-out modified with emergency vaccination to slaughter).

Figure 3-7. Protection Vaccination Zone



Note: Figures are not to scale. The smaller zones on the lower left or right hand corner of the above figures illustrate an example of another PVZ, and associated SZ, which is not surrounding a CA.

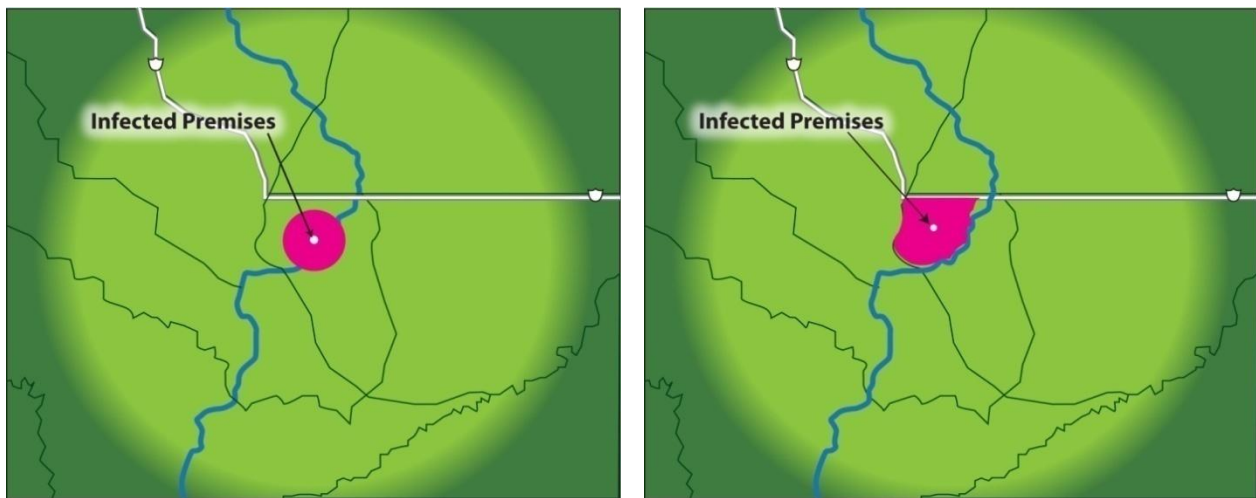
3.2 PREMISES

In general, any animal disease outbreak involves six types of premises: 1) IP; 2) CP; 3) SP; 4) ARP; 5) MP; and 6) Free Premises (FP). If emergency vaccination is used, there will be a seventh type, Vaccinated Premises (VP).

3.2.1 Infected Premises

- ◆ An IP is located in an IZ (see Figure 3-8).
- ◆ An IP is a premises where a presumptive positive case or confirmed positive case exists as determined by laboratory results, compatible clinical signs, case definition, and international standards.
- ◆ All presumptive and confirmed positive premises are classified as an IP. In addition, all other premises that meet the current case definition are classified as an IP.

Figure 3-8. Infected Premises



Note: Figures are not to scale.

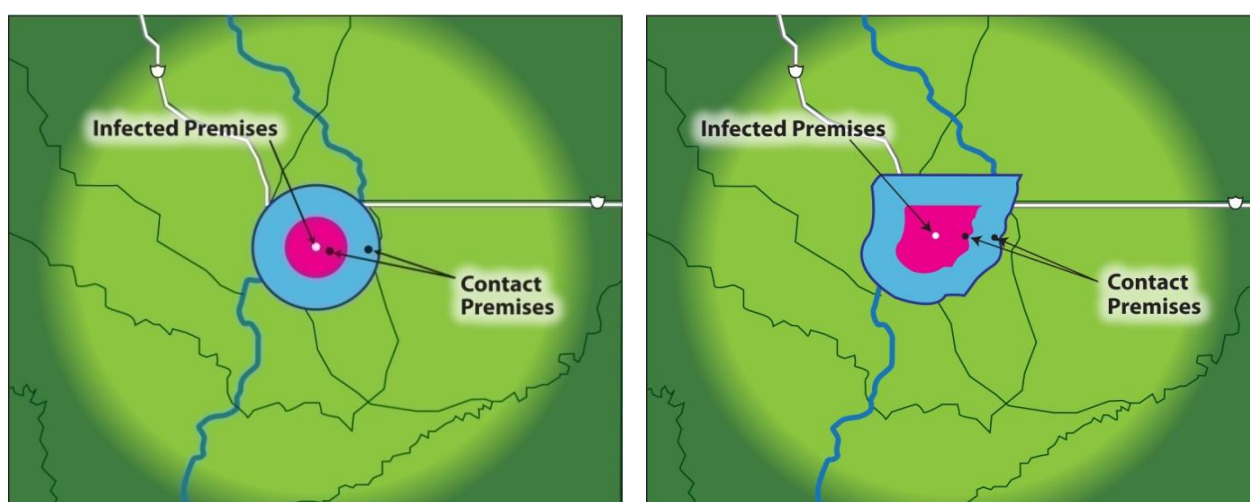
3.2.2 Contact Premises

- ◆ A CP can be located in an IZ or BZ (see Figure 3-9).
- ◆ A CP is a premises with susceptible animals that may have been exposed to the FAD agent, either directly or indirectly, including but not limited to exposure to animals, animal products, fomites, or people from an IP. The specific transmission characteristics of the FAD agent should be considered when assigning the CP designation.
- ◆ A premises that is contiguous to an IP may also be classified as a CP.
- ◆ If a CP is identified outside a CA, it may be surrounded by a BZ until the disposition of the CP is determined. A CP designation outside of a CA in a BZ is intended to be a short-term designation.
- ◆ A CP will be subject to quarantine and movement controls, surveillance requirements, and strict biosecurity procedures. Other disease control

measures may include depopulation and disposal of susceptible animals as determined by IC.

- ◆ If the susceptible animals on a CP are not depopulated, they will be placed under surveillance in accordance with the surveillance plan.
- ◆ Following epidemiological investigation, surveillance requirements, diagnostic test results, and biosecurity requirements, a CP within a CA can be designated as an IP, ARP, or an MP. If a CP is in a BZ outside of a CA, the BZ will be removed if the premises is not infected. If the premises is infected, a CA, comprising an IZ and BZ, will be placed around the IP.

Figure 3-9. Contact Premises

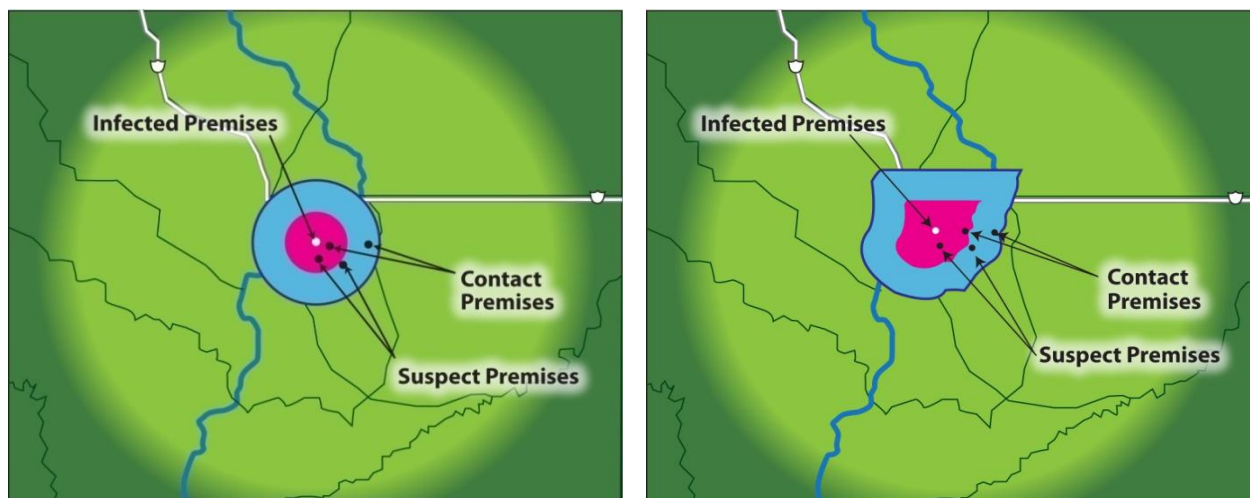


Note: Figures are not to scale.

3.2.3 Suspect Premises

- ◆ An SP can be located in an IZ, BZ, SZ, or VZ (see Figure 3-10).
- ◆ An SP is a premises under investigation due to the presence of susceptible animals reported to have clinical signs compatible with the FAD. This is intended to be a short-term premises designation.
- ◆ An SP is subject to quarantine and movement controls, surveillance requirements, and strict biosecurity procedures.
 - Surveillance will be conducted in accordance with the surveillance plan.
 - Following complete epidemiological investigation, surveillance requirements, and biosecurity requirements, an SP can be designated as an IP, CP, ARP, or MP if in a CA, as an FP if in an SZ or VZ.

Figure 3-10. Suspect Premises

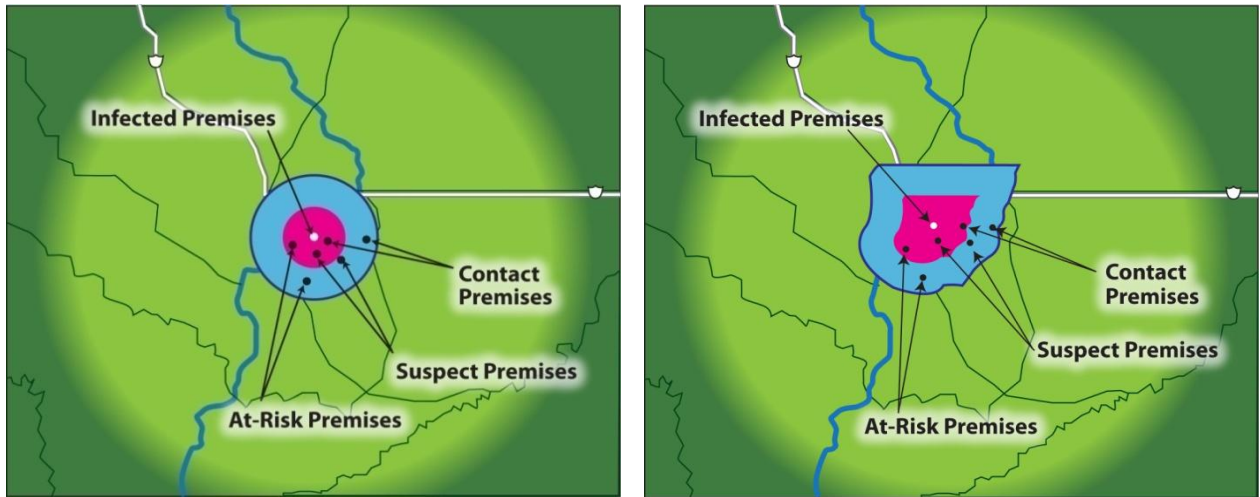


Note: Figures are not to scale.

3.2.4 At-Risk Premises

- ◆ An ARP can be located in an IZ or BZ (see Figure 3-11).
- ◆ An ARP is a premises with susceptible animals, but none have clinical signs compatible with the FAD.
- ◆ An ARP must objectively demonstrate that it is not an IP, CP, or SP.
- ◆ An ARP is subject to movement control requirements, surveillance requirements, and biosecurity procedures established for a CA.
- ◆ An ARP that seeks to move susceptible animals or animal products within a CA will require a permit approved by IC and must use appropriate biosecurity procedures.
- ◆ An ARP that seeks to move susceptible animals or animal products out of a CA will need to meet the requirements to be reclassified as an MP.

Figure 3-11. At-Risk Premises

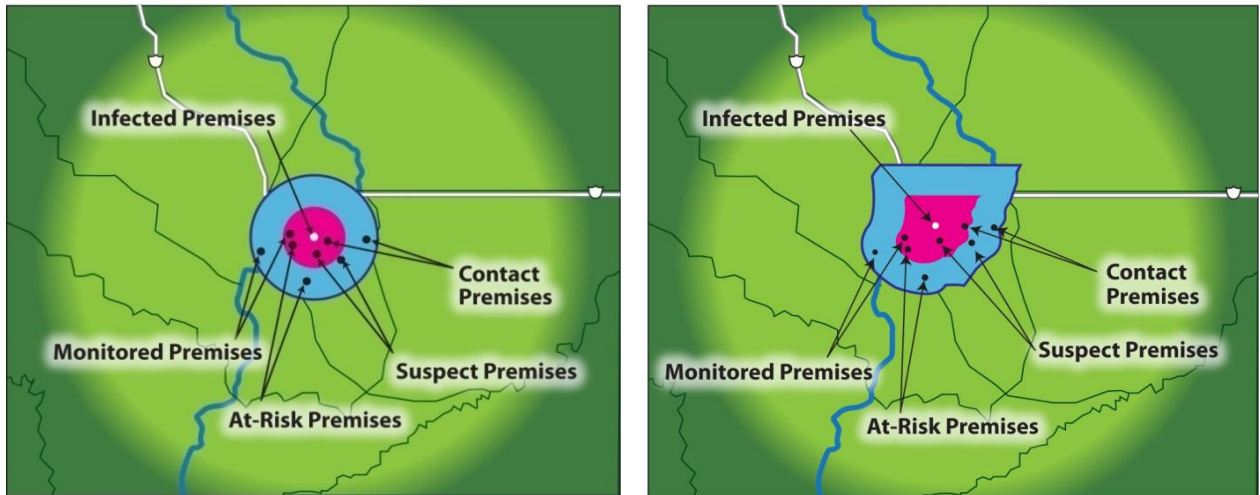


Note: Figures are not to scale.

3.2.5 Monitored Premises

- ◆ An MP is located in a CA (IZ or BZ).
- ◆ An MP objectively demonstrates that it is not an IP, CP, or SP (see Figure 3-12).
- ◆ Only an ARP is eligible to become an MP.
- ◆ An MP is subject to epidemiological investigation, risk assessments, surveillance requirements, and biosecurity procedures.
- ◆ An MP meets a set of defined criteria in seeking to move susceptible animals or animal products out of a CA by permit.
- ◆ For movement of susceptible animals and animal products out of a CA to the FA, the permit process must take into consideration any international standards or conditions for such movement. In addition, commodity-specific proactive risk assessments, continuity of business plans, and movement and marketability plans will be considered.

Figure 3-12. Monitored Premises

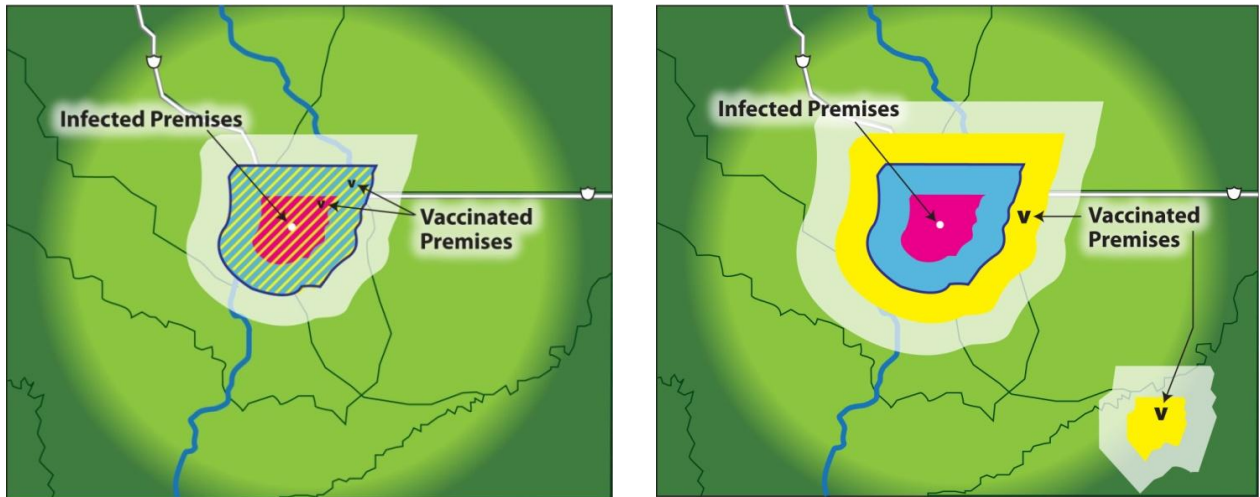


Note: Note: Figures are not to scale.

3.2.6 Vaccinated Premises

- ◆ A VP may be located in a CVZ, typically inside a CA (IZ and BZ) or in a PVZ, typically outside a CA.
- ◆ A VP is a premises where emergency vaccination has been performed. VP may be a secondary premises designation (see Figure 3-13).
- ◆ A VP may be subject to the risk assessments, surveillance requirements, and biosecurity procedures established for the primary premises designation as established by IC.
- ◆ Animals receiving emergency vaccination on a VP may be subject to vaccinated animal traceability and DIVA testing.
- ◆ For movement of emergency vaccinated animals, consideration must be given to any national or international standards or conditions for such movement.

Figure 3-13. Vaccinated Premises

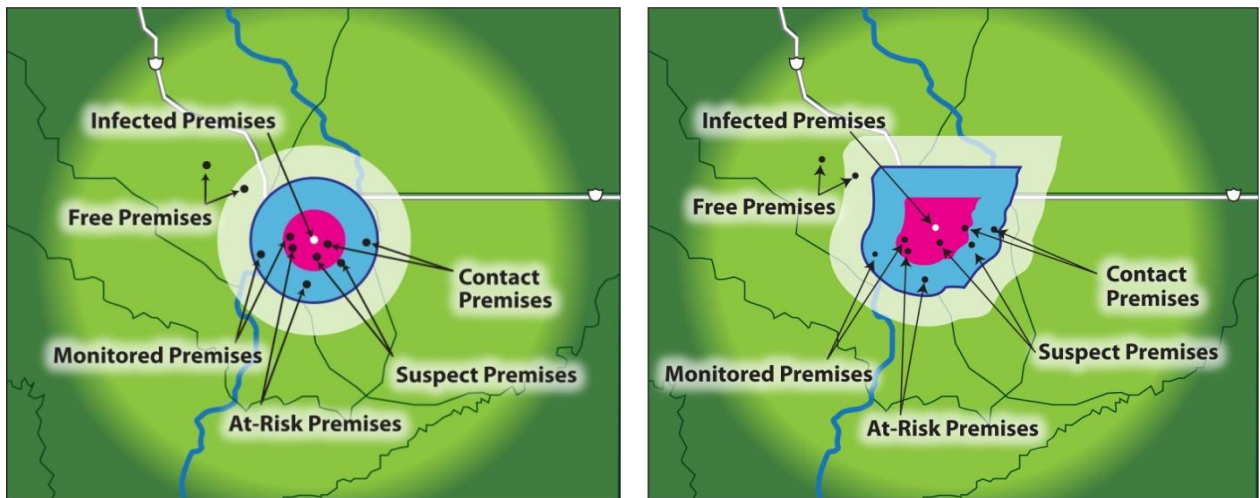


Note: Figures are not to scale. The smaller zone on the lower right hand corner of the above figure illustrates an example PVZ, and associated SZ, which is not surrounding a CA.

3.2.7 Free Premises

- ◆ An FP is a premises outside of a CA and not a CP or SP (see Figure 3-14).
- ◆ An FP can be located within an SZ or elsewhere in the FA.

Figure 3-14. Free Premises



Note: Figures are not to scale.

3.3 SUMMARY: ZONES, AREAS, PREMISES

Table 3-2 summarizes the premises designations that would be employed in an FAD outbreak response. Table 3-3 summarizes the zone and area designations that would be used in an FAD outbreak response.

Table 3-2. Summary of Premises Designations

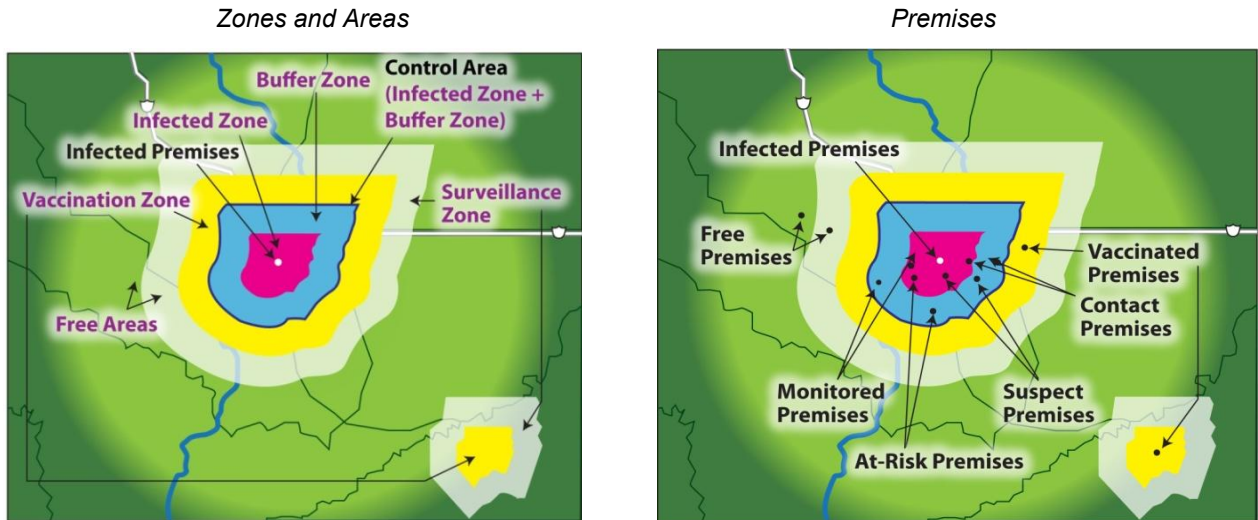
| Premises | Definition | Zone |
|--------------------------|--|---|
| Infected Premises (IP) | Premises where a presumptive positive case or confirmed positive case exists based on laboratory results, compatible clinical signs, case definition, and international standards. | Infected Zone |
| Contact Premises (CP) | Premises with susceptible animals that may have been exposed to the FAD agent, either directly or indirectly, including but not limited to exposure to animals, animal products, fomites, or people from Infected Premises. | Infected Zone, Buffer Zone |
| Suspect Premises (SP) | Premises under investigation due to the presence of susceptible animals reported to have clinical signs compatible with the FAD. This is intended to be a short-term premises designation. | Infected Zone, Buffer Zone, Surveillance Zone, Vaccination Zone |
| At-Risk Premises (ARP) | Premises with susceptible animals, but none have clinical signs compatible with the FAD. Premises objectively demonstrates that it is not an Infected Premises, Contact Premises, or Suspect Premises. At-Risk Premises seek to move susceptible animals or products within the Control Area by permit. Only At-Risk Premises are eligible to become Monitored Premises. | Infected Zone, Buffer Zone |
| Monitored Premises (MP) | Premises objectively demonstrates that it is not an Infected Premises, Contact Premises, or Suspect Premises. Only At-Risk Premises are eligible to become Monitored Premises. Monitored Premises meet a set of defined criteria in seeking to move susceptible animals or products out of the Control Area by permit. | Infected Zone, Buffer Zone |
| Free Premises (FP) | Premises outside of a Control Area and not a Contact or Suspect Premises. | Surveillance Zone, Free Area |
| Vaccinated Premises (VP) | Premises where emergency vaccination has been performed. This may be a secondary premises designation. | Containment Vaccination Zone, Protection Vaccination Zone |

Table 3-3. Summary of Zone and Area Descriptions

| Zone/area | Definition |
|------------------------|---|
| Infected Zone (IZ) | Zone that immediately surrounds an Infected Premises. |
| 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. |
| Free Area (FA) | Area not included in any Control Area. |
| Vaccination Zone (VZ) | Emergency Vaccination Zone classified as either a Containment Vaccination Zone (typically inside a Control Area) or a Protection Vaccination Zone (typically outside a Control Area). This may be a secondary zone designation. |

Figure 3-15 illustrates all the zones and premises.

Figure 3-15. Example Zones, Areas and Premises

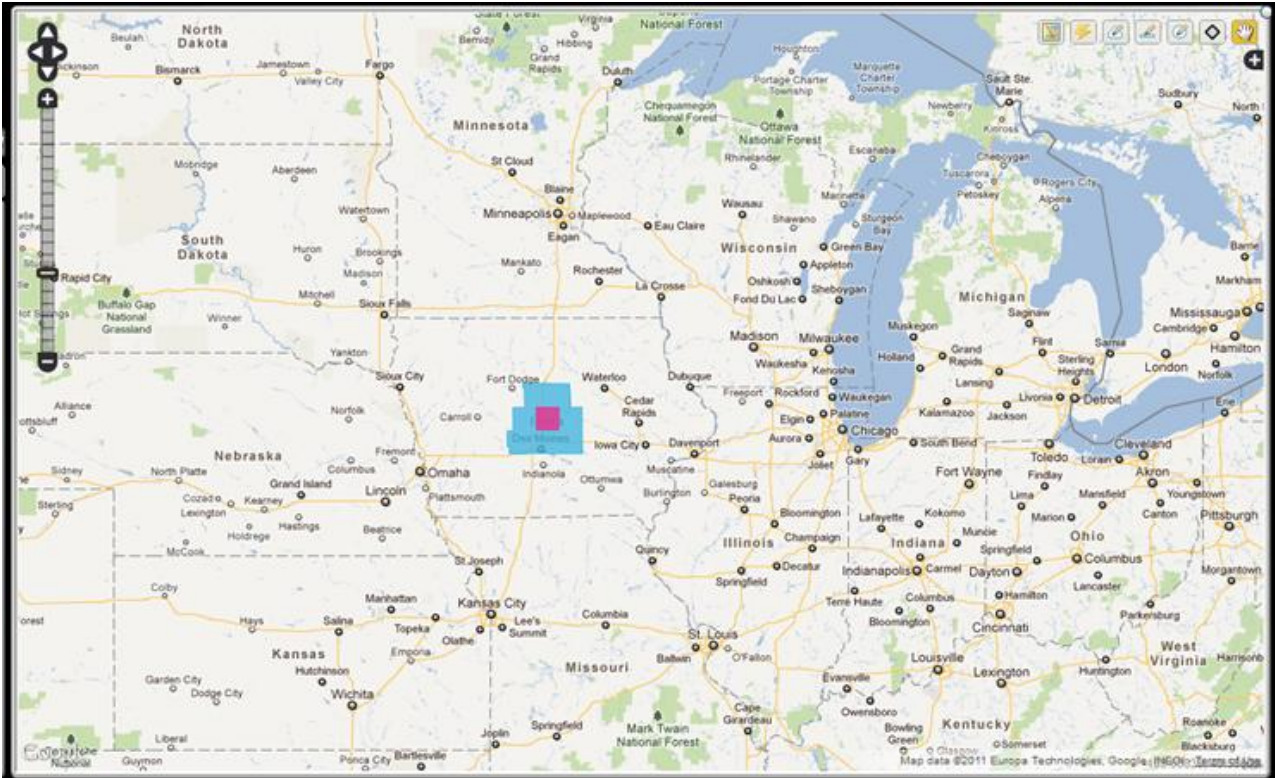


Note: Figures are not to scale. The VZ can be either a PVZ or CVZ. The smaller zones on the lower right hand corner of the above figures illustrate an example of another PVZ, and associated SZ, which is not surrounding a CA.



Figures 3-16a–d are applied examples of zones using the State of Iowa. None of the figures include a depiction of an SZ because the size of the zone may vary and change depending on factors such as the nature of the disease agent, demographics of surrounding area, and known epidemiological information.

Figure 3-16a. Small Infected Zone and Buffer Zone



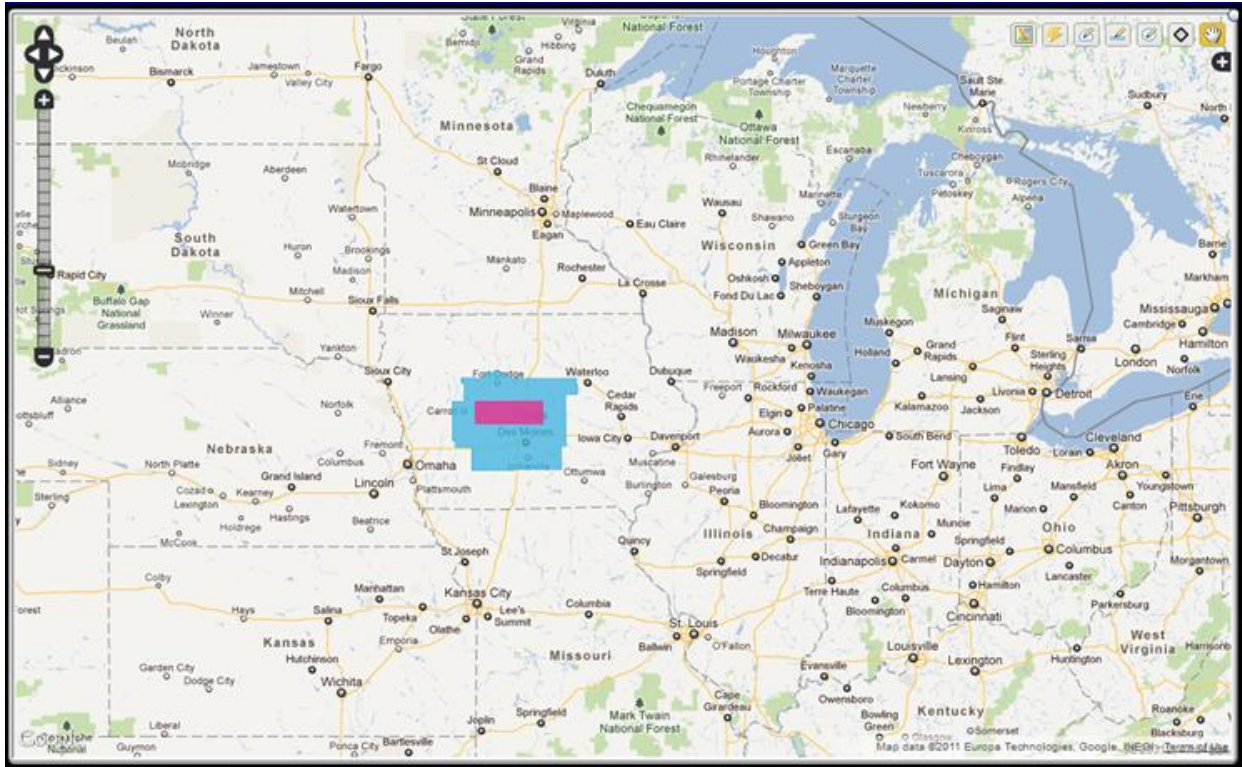
Iowa Outbreak: One Infected County

| Where | Bovine | Swine | Sheep/ Goats | Operations |
|----------------------|---------|-----------|-----------------|------------|
| Infected Zone (pink) | 14,933 | 66,515 | 3,893 | 404 |
| Buffer Zone (blue) | 143,866 | 1,860,968 | 20,107 | 2,525 |
| Total | 158,799 | 1,927,483 | 24,000 | 2,929 |

Total livestock affected: 2,110,282

Note: Data from the National Agricultural Statistics Service (2007) <http://quickstats.nass.usda.gov/>.

Figure 3-16b. Medium Infected Zone and Buffer Zone



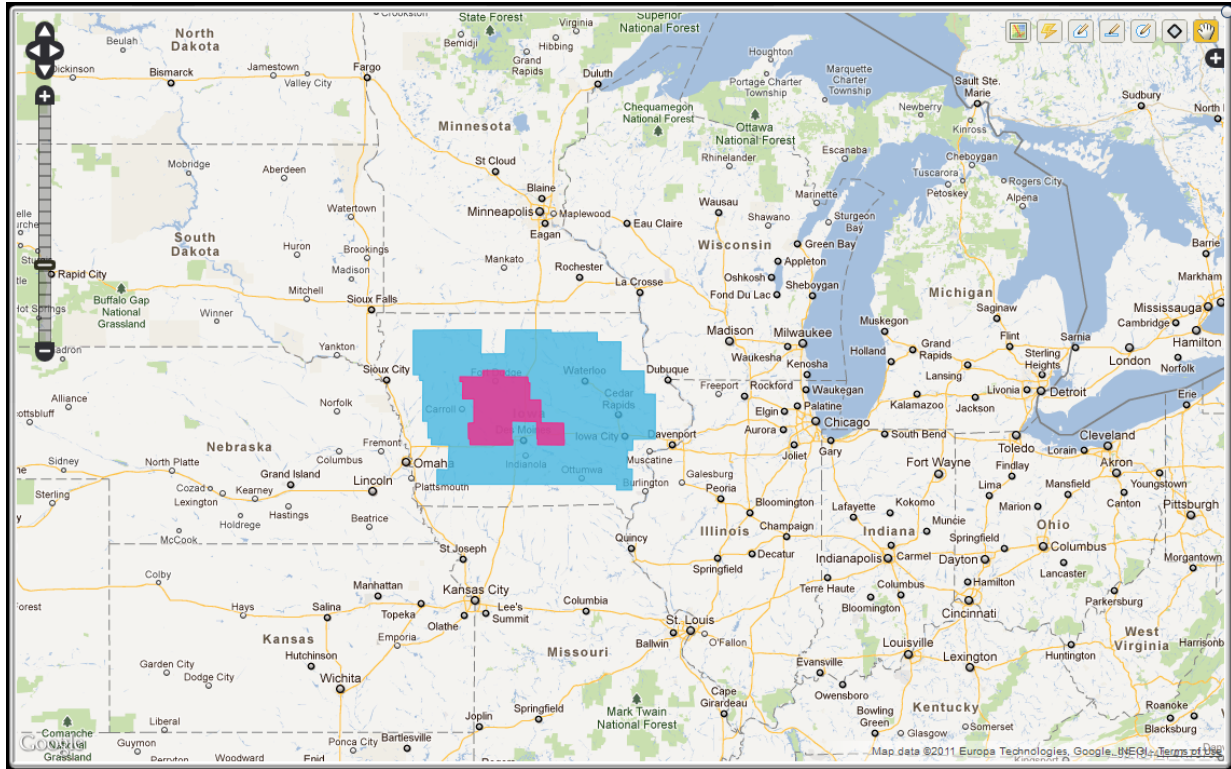
Iowa Outbreak: Three Infected Counties

| Where | Bovine | Swine | Sheep/Goats | Operations |
|----------------------|---------|-----------|-------------|------------|
| Infected Zone (pink) | 63,548 | 240,484 | 8,067 | 1,025 |
| Buffer Zone (blue) | 463,637 | 3,534,164 | 32,844 | 6,245 |
| Total | 527,185 | 3,774,648 | 40,911 | 7,270 |

Total livestock affected: 4,342,744

Note: Data from the National Agricultural Statistics Service (2007) <http://quickstats.nass.usda.gov/>.

Figure 3-16c. Large Infected Zone and Buffer Zone



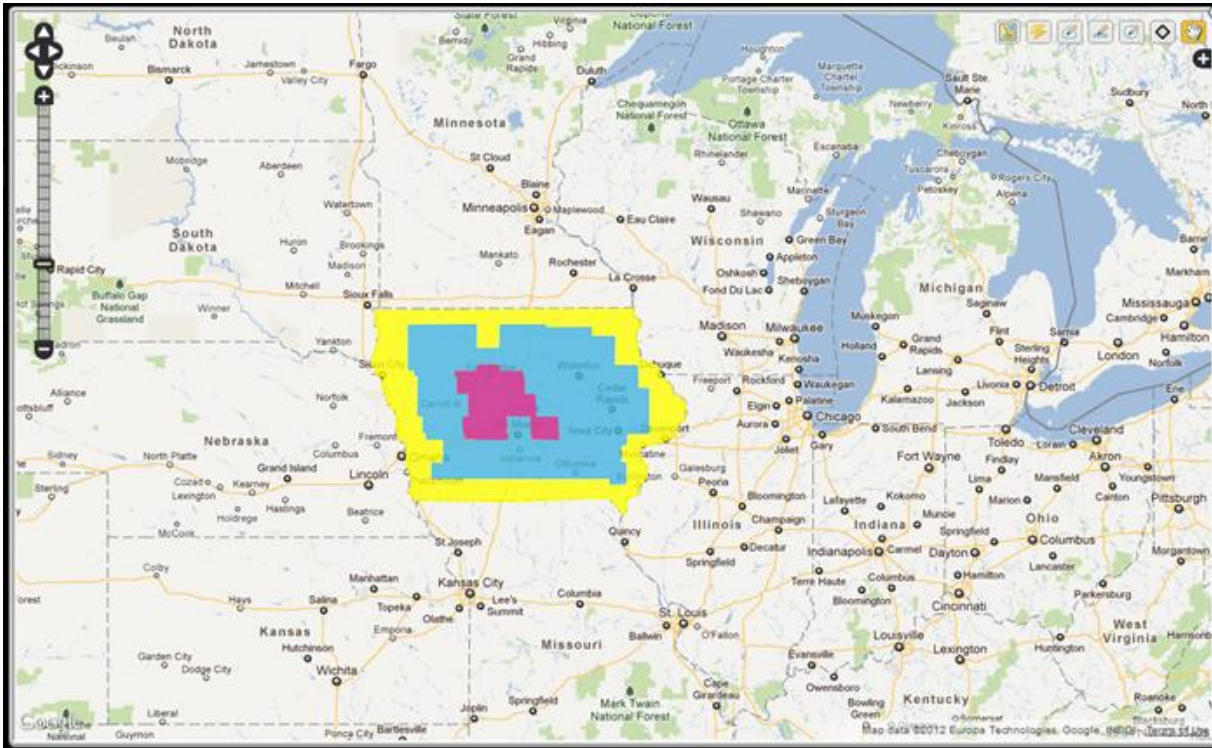
Iowa Outbreak: Nine Infected Counties

| Where | Bovine | Swine | Sheep/ Goats | Operations |
|-------------------------|-----------|------------|-----------------|------------|
| Infected Zone (pink) | 181,106 | 1,567,560 | 18,690 | 3,108 |
| Buffer Zone (blue) | 1,927,955 | 11,423,618 | 133,979 | 23,723 |
| Total | 2,109,061 | 12,991,178 | 152,669 | 26,831 |

Total livestock affected: 15,252,908

Note: Data from the National Agricultural Statistics Service (2007) <http://quickstats.nass.usda.gov/>.

Figure 3-16d. Protection Vaccination Zone



Iowa Outbreak: Nine Infected Counties + Vaccination Zone

| Where | Bovine | Swine | Sheep/ Goats | Operations |
|---------------------------|-----------|------------|-----------------|------------|
| Infected Zone (pink) | 181,106 | 1,567,560 | 18,690 | 3,108 |
| Buffer Zone (blue) | 1,927,955 | 11,423,618 | 133,979 | 23,723 |
| Vaccination Zone (yellow) | 1,873,283 | 6,225,637 | 101,501 | 19,698 |
| Total | 3,982,344 | 19,216,815 | 254,170 | 43,799 |

Total livestock affected: 23,453,329

Note: Data from the National Agricultural Statistics Service (2007) <http://quickstats.nass.usda.gov/>.

Table 3-4 lists the minimum sizes of zones and areas during an FAD outbreak.

Table 3-4. Minimum Sizes 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. Will depend on disease agent and epidemiological circumstances. This zone may be redefined as the outbreak continues. |
| Buffer Zone (BZ) | ◆ Perimeter should be at least 7 km (~4.35 miles) beyond the perimeter of the Infected Zone. Width is generally not less than the minimum radius of the associated Infected Zone, but may be much larger. This zone may be redefined as the outbreak continues. |
| Control Area (CA) | ◆ Perimeter should be at least 10 km (~6.21 miles) beyond the perimeter of the closest Infected Premises. Please see Table 3-1 for factors to consider in determining the size of a Control Area. This area may be redefined as the outbreak continues. |
| Surveillance Zone (SZ) | ◆ Width should be at least 10 km (~6.21 miles), but may be much larger. |

3.4 SUMMARY: PERMITS TO MOVE INTO, WITHIN AND OUT OF A CONTROL AREA

Tables 3-5, 3-6, and 3-7 provide guidelines for moving into, within, and out of a CA. See disease-specific response plans as well as continuity of business plans for commodity-specific information.

Table 3-5. Movement into Control Area from Outside Control Area to Specific Premises^a

| Item Moving into a Control Area to a/an... | Infected Premises | Suspect Premises [^] | Contact Premises [^] | At-Risk Premises | Monitored Premises |
|--|--|---|---|---|---|
| Susceptible live-stock or poultry | Prohibited, except under certain circumstances as determined by the Incident Command (IC), such as slaughter. | Prohibited, except under certain circumstances as determined by the IC, such as slaughter. | Prohibited, except under certain circumstances as determined by the IC, such as slaughter. | Permit for movement must be approved by the IC with appropriate biosecurity measures. | Permit for movement must be approved by the IC with appropriate biosecurity measures. |
| Susceptible animal products | See disease specific or continuity of business plans for information on susceptible animal products or guidance as determined by the IC. | | | | |
| Other animals (non-susceptible livestock or poultry) from premises with susceptible species | Prohibited unless permit approved by IC and appropriate biosecurity measures. | Prohibited unless permit approved by IC and appropriate biosecurity measures. | Prohibited unless permit approved by IC and appropriate biosecurity measures. | Allowed with appropriate biosecurity measures. IC may require a permit for movement depending upon FAD and characteristics of destination premises. | Allowed with appropriate biosecurity measures. IC may require a permit for movement depending upon FAD and characteristics of destination premises. |
| Other animals or animal products (non-susceptible livestock or poultry/ products) from premises without susceptible species | IC will determine movement restrictions based on FAD and characteristics of destination premises. | IC will determine movement restrictions based on FAD and characteristics of destination premises. | IC will determine movement restrictions based on FAD and characteristics of destination premises. | Allowed with appropriate biosecurity measures. IC may require a permit for movement depending upon FAD and characteristics of destination premises. | Allowed with appropriate biosecurity measures. IC may require a permit for movement depending upon FAD and characteristics of destination premises. |
| Equipment, vehicles, and other fomites from premises with susceptible species | Allowed with appropriate biosecurity measures. | Allowed with appropriate biosecurity measures. | Allowed with appropriate biosecurity measures. | Allowed with appropriate biosecurity measures. | Allowed with appropriate biosecurity measures. |
| Semen, embryos from susceptible livestock or poultry | Prohibited. | Prohibited. | Prohibited. | Allowed with appropriate biosecurity measures. | Allowed with appropriate biosecurity measures. |

^a Movement control and permit processes will change over time depending on situational awareness and operational capabilities.

[^] Contact Premises and Suspect Premises are intended to be short-term premises designations. Ideally these premises should be re-designated before movements occur.

Table 3-6. Movement within a Control Area^a

| Item Moving within a Control Area from a/an.... | Infected Premises | Suspect Premises [^] | Contact Premises [^] | At-Risk Premises | Monitored Premises |
|--|--|--|--|--|--|
| Susceptible livestock or poultry | Prohibited, except under certain circumstances as determined by the IC, such as slaughter. | Prohibited, except under certain circumstances as determined by the IC, such as slaughter. | Prohibited, except under certain circumstances as determined by the IC, such as slaughter. | Allowed to move by permit approved by the IC; surveillance, negative diagnostic tests, premises biosecurity, and risk-assessment may be required for permit. | Allowed to move by permit approved by the IC; surveillance, negative diagnostic tests, premises biosecurity, and risk-assessment may be required for permit. |
| Susceptible animal products | See disease specific or continuity of business plans for information on susceptible animal products or guidance as determined by the IC. | | | | |
| Other animals (non-susceptible livestock or poultry) from premises with susceptible species | Prohibited unless specific permit granted by IC and appropriate biosecurity measures. | Prohibited unless specific permit granted by IC and appropriate biosecurity measures. | Prohibited unless specific permit granted by IC and appropriate biosecurity measures. | Allowed to move by permit approved by the IC; surveillance, negative diagnostic tests, premises biosecurity, and risk-assessment may be required for permit. | Allowed to move by permit approved by the IC; surveillance, negative diagnostic tests, premises biosecurity, and risk-assessment may be required for permit. |
| Other animals or animal products (non-susceptible livestock or poultry/ products) from premises without susceptible species | n/a (Infected Premises have susceptible species) | n/a (Suspect Premises have susceptible species) | n/a (Contact Premises have susceptible species) | n/a (At-Risk Premises have susceptible species) | n/a (Monitored Premises have susceptible species) |
| Equipment, vehicles, and other fomites from premises with susceptible species | Prohibited unless specific permit granted by IC and appropriate biosecurity measures. | Prohibited unless specific permit granted by IC and appropriate biosecurity measures. | Prohibited unless specific permit granted by IC and appropriate biosecurity measures. | Allowed by permit approved by IC and appropriate biosecurity measures. | Allowed by permit approved by IC and appropriate biosecurity measures. |
| Semen, embryos from susceptible livestock or poultry | Prohibited. | Prohibited. | Prohibited. | Allowed by permit approved by IC and appropriate biosecurity measures. | Allowed by permit approved by IC and appropriate biosecurity measures. |

^a Movement control and permit processes will change over time depending on situational awareness and operational capabilities.

[^] Contact Premises and Suspect Premises are intended to be short-term premises designations. Ideally these premises should be re-designated before movements occur.

Table 3-7. Movement from Inside a Control Area to Outside a Control Area from Specific Premises^a

| Item Moving out of a Control Area from a/an... | Infected Premises | Suspect Premises [^] | Contact Premises [^] | At-Risk Premises | Monitored Premises [*] |
|---|--|--|--|---|---|
| Susceptible livestock or poultry | Prohibited, except under certain circumstances as determined by the IC. | Prohibited, except under certain circumstances as determined by the IC. | Prohibited, except under certain circumstances as determined by the IC. | At-Risk Premises must become Monitored Premises to move susceptible livestock or poultry out of a Control Area. | Allowed to move by permit approved by IC; surveillance, negative diagnostic tests, premises biosecurity, and risk-assessment may be required for permit. |
| Susceptible animal products | See disease specific or continuity of business plans for information on susceptible animal products or guidance as determined by the IC. | | | | |
| Other animals (non-susceptible livestock or poultry) from premises with susceptible species | Prohibited unless specific permit approved by IC and appropriate biosecurity measures and risk-assessment. | Prohibited unless specific permit approved by IC and appropriate biosecurity measures and risk-assessment. | Prohibited unless specific permit approved by IC and appropriate biosecurity measures and risk-assessment. | Allowed to move by permit approved by IC; surveillance and negative diagnostic tests for susceptible animals on premises, premises biosecurity, and risk-assessment may be required for permit. | Allowed to move by permit approved by IC; surveillance and negative diagnostic tests for susceptible animals on premises, premises biosecurity, and risk-assessment may be required for permit. |
| Other animals or animal products (non-susceptible livestock or poultry/ products) from premises without susceptible species | n/a (Infected Premises have susceptible species) | n/a (Suspect Premises have susceptible species) | n/a (Contact Premises have susceptible species) | n/a (At-Risk Premises have susceptible species) | n/a (Monitored Premises have susceptible species) |
| Equipment, vehicles, and other fomites from premises with susceptible species | Prohibited unless permit approved by IC and appropriate biosecurity measures. | Prohibited unless permit approved by IC and appropriate biosecurity measures. | Prohibited unless permit approved by IC and appropriate biosecurity measures. | Allowed by permit approved by IC and appropriate biosecurity measures. | Allowed by permit approved by IC and appropriate biosecurity measures. |
| Semen, embryos from susceptible livestock or poultry | Prohibited. | Prohibited. | Prohibited. | At-Risk Premises must become Monitored Premises to move semen, embryos from susceptible livestock or poultry out of a Control Area. | Monitored Premises only allowed by permit approved by IC and appropriate biosecurity measures. |

^a Movement control and permit processes will change over time depending on situational awareness and operational capabilities.

[^] Contact Premises and Suspect Premises are intended to be short-term premises designations. Ideally these Premises should be re-designated before movements occur.

^{*} Continuity of business plans may apply.

Appendix A

FAD PReP Document Structure

A. FAD PReP STRATEGIC DOCUMENTS

- ◆ APHIS Foreign Animal Disease Framework: Roles and Coordination (FAD PReP Manual 1-0)
- ◆ APHIS Foreign Animal Disease Framework: Response Strategies (FAD PReP Manual 2-0)
- ◆ NCAHEM Stakeholder Coordination and Collaboration Resource Guide
- ◆ NCAHEM Incident Coordination Group Plan
- ◆ NCAHEM Incident Information Management Plan

B. NAHEMS GUIDELINES

- ◆ Health and Safety
- ◆ Personal Protective Equipment (PPE)
- ◆ Biosecurity
- ◆ Quarantine and Movement Control
- ◆ Mass Depopulation and Euthanasia
- ◆ Disposal
- ◆ Cleaning and Disinfection
- ◆ Vaccination for Contagious Diseases
 - Appendix A Foot-and-Mouth Disease (FMD)
 - Appendix B Classical Swine Fever (CSF)
 - Appendix C Highly Pathogenic Avian Influenza (HPAI)
- ◆ Wildlife Management and Vector Control
- ◆ Appraisal and Compensation

-
- ◆ Epidemiology, Surveillance, and FAD Tracing
 - ◆ Continuity of Business
 - ◆ Regionalization for International Trade
 - ◆ NAHERC Deployment Guide

C. INDUSTRY MANUALS

- ◆ Dairy
- ◆ Swine
- ◆ Poultry
- ◆ Beef Feedlot
- ◆ Cow-Calf

D. DISEASE RESPONSE PLANS

- ◆ HPAI
- ◆ FMD
- ◆ CSF

E. STANDARD OPERATING PROCEDURES

1. Overview of Etiology and Ecology
2. Case Definitions and Laboratory Definitions
3. Surveillance
4. Diagnostics (Sample Collection, Surge Capacity, and Reporting)
5. Epidemiological Investigation and Tracing
6. Overview of Information Management
7. Communications
8. Health and Safety and PPE
9. Biosecurity

10. Quarantine and Movement Control
11. Continuity of Business
12. Overview of Regionalization for International Trade
13. Mass Depopulation and Euthanasia
14. Disposal
15. Cleaning and Disinfection
16. Vaccination
17. Overview of the National Veterinary Stockpile
18. Overview of Wildlife Management and Vector Control
19. Overview of Animal Welfare
20. Overview of Modeling and Assessment Tools
21. Appraisal and Compensation
22. Overview of Finance
23. Overview of the National Response Framework and National Incident Management System

F. CONTINUITY OF BUSINESS PLANNING

- ◆ Secure Egg Supply Plan
- ◆ Secure Milk Supply Plan
- ◆ Secure Turkey Supply Plan
- ◆ Secure Pork Supply Plan

G. OUTBREAK RESPONSE TOOLS

- ◆ Outbreak Surveillance Toolbox
- ◆ Tool for the Assessment of Intervention Options
- ◆ Case Definitions
 - African horse sickness

-
- African swine fever
 - Avian influenza (notifiable)
 - CSF
 - Contagious bovine pleuropneumonia
 - Contagious equine metritis
 - Eastern equine encephalomyelitis
 - FMD
 - Hendra-Nipah
 - Japanese encephalitis
 - Newcastle disease (virulent)
 - Rift Valley fever
 - Rinderpest
 - Venezuelan equine encephalomyelitis
 - Western equine encephalomyelitis
 - West Nile virus

Appendix B

Example Preparedness and Response Goals for Selected Critical Activities

Table B-1 lists example preparedness and response goals for selected activities and tools. These preparedness and response goals help to bolster preparedness planning by providing objectives and improve response efforts by offering general guidelines for implementation of the critical activities and tools. It is important to remember that the goals offered in this section are provided for guidance: each FAD response will be unique, with different situations that must be considered by the State, local, Tribal, and Federal entities involved in a response effort.

These example goals are congruent with the Target Capabilities List (TCL) (2007) from the Federal Emergency Management Agency. The TCL is an important additional resource for States and Tribes in developing their own emergency response plans, to “assess capabilities, identify needs, and inform plans and strategies.”¹

¹ Federal Emergency Management Agency, 2007. Target Capabilities List: A companion to the National Preparedness Guidelines. <http://www.fema.gov/pdf/government/training/tcl.pdf>. Accessed May 14, 2012.

Table B-1. Selected Preparedness and Response Goals

| Critical activity | Preparedness goals | Response goals |
|---|---|--|
| Case Definitions and Laboratory Definitions | <ul style="list-style-type: none"> • The National Surveillance Unit in conjunction with the National Center for Animal Health Emergency Management will provide case definitions for foreign animal diseases (FADs) to local, State, Tribal, Federal, and industry stakeholders. | <ul style="list-style-type: none"> • Update case definitions at regular intervals and as needed throughout incidents or outbreaks. |
| Surveillance | <ul style="list-style-type: none"> • Develop capabilities and relationships to produce surveillance plans within 24-48 hours of a confirmed outbreak. • Develop effective surveillance plans that can achieve desired outcomes by leveraging available resources, satisfying jurisdictional requirements, and implementing continuity of business measures. | <ul style="list-style-type: none"> • Implement surveillance plans within 48 hours of the confirmation of an outbreak. • Implement a surveillance plan that will (1) define the present extent of FAD and (2) detect unknown Infected Premises (IP) quickly. • Have the surveillance plan consider the susceptible wildlife population in the area, and coordinate with APHIS Wildlife Services, the Department of Interior, State wildlife agencies, and State agriculture departments to perform appropriate surveillance in wildlife populations. • Provide complete surveillance data summaries and analyses at intervals as specified by Incident Command. |
| Epidemiological Investigation and Tracing | <ul style="list-style-type: none"> • Define expectations for epidemiological investigation and FAD tracing before an incident or outbreak, especially for highly contagious FADs. • Identify individuals who are trained or experienced in epidemiological investigation and tracing activities. • Identify and pre-position information management resources, and other resources necessary to support epidemiology activities and tracing in an actual incident or outbreak. • Establish priorities for contact tracing, and for establishing Infected Zone(s), Buffer Zone(s), and Surveillance Zone(s). • Identify the resources needed for different disease agents, and for outbreaks of varying size/scale. | <ul style="list-style-type: none"> • Assign a premises designation and priority of investigation within 6 hours of identifying a potential IP or Contact Premises (CP) through tracing activities. • Identify all CP within 24 hours of identifying the IP or the initial CP. • Determine within 96 hours of identifying the index case, the nature of the FAD outbreak, identify the risk factors for transmission, and develop mitigation strategies. |

Table B-1. Selected Preparedness and Response Goals

| Critical activity | Preparedness goals | Response goals |
|---------------------------|---|--|
| Information Management | <ul style="list-style-type: none"> • Ensure that local, State, Tribal, and Federal information management systems are compatible for sharing data and information. • Identify gaps or weaknesses in current information management systems related to a large-scale FAD outbreak, especially related communicating incident goals and objectives, status reports, tracing information, premises status information, diagnostic results, epidemiology reports, permits for movement, and resource information. • Improve capabilities for information management for large-scale or complex outbreak. | <ul style="list-style-type: none"> • Perform Emergency Management Response System data entry processes or information downloads in 24-hour intervals, or as requested by Incident Command. • Effectively communicate incident goals and objectives, status reports, tracing information, premises status information, diagnostic results, epidemiology reports, permits for movement, and resource information. |
| Communication | <ul style="list-style-type: none"> • Establish a network of stakeholders and systems for communication, prior to an incident or outbreak. • Test or exercise the systems for communication at regular intervals, before an outbreak. • Develop message maps prior to an outbreak. | <ul style="list-style-type: none"> • Brief the media, public, industry, Congress, trading partners, and others on the FAD outbreak status and the actions being taken to control and eradicate the disease. • Highlight the importance of sound biosecurity practices and steps that producers and other producers and owners can take to protect against infection. • Coordinate with Federal, State and local agencies, Tribal entities, producer groups, and land grant university-based cooperative extension services to ensure a consistent messaging regarding animal health, public health, and food safety. • Assure consumers that USDA is working on the animal health issues in an informed and timely manner. |
| Health and Safety and PPE | <ul style="list-style-type: none"> • Develop Site-Specific Health and Safety Plan templates before the incident or outbreak. • Train personnel and/or develop just-in-time training that can be readily available for additional personnel. | <ul style="list-style-type: none"> • Provide daily pre-entry safety briefings for all response personnel. • Prevent, to every extent possible, adverse human health events related to emergency response efforts. |
| Biosecurity | <ul style="list-style-type: none"> • Develop incident biosecurity plans, fixed operation biosecurity plans, and mobile operation biosecurity plans, before the incident or outbreak. • Train personnel and/or develop just-in-time training that can be readily available for additional personnel. | <ul style="list-style-type: none"> • Ensure that biosecurity procedures to prevent the spread of an FAD agent are implemented within 24 hours of identifying the index FAD case. |

Table B-1. Selected Preparedness and Response Goals

| Critical activity | Preparedness goals | Response goals |
|---|---|---|
| Quarantine and Movement Control | <ul style="list-style-type: none"> • Work with stakeholders to develop effective quarantine and movement control plans for affected premises. • Work with stakeholders to develop effective movement control and permit plans for non-infected premises. | <ul style="list-style-type: none"> • Once a Control Area is established, implement quarantine and movement controls as rapidly as possible. • Ensure quarantine and movement controls consider competing priorities, and weigh the risk of disease transmission against the need for critical movements (e.g., feed trucks) and business continuity. |
| Continuity of Business | <ul style="list-style-type: none"> • Work with industry stakeholders and experts to prioritize animal or commodity movements that have the potential to be affected by disease or disease response. • Establish a transparent and effective system for risk assessments, surveillance requirements, biosecurity procedures, and a permit process in order to promote stakeholder acceptance and compliance with regulatory interventions by State, Federal, and Tribal authorities. | <ul style="list-style-type: none"> • Implement an appropriate continuity of business plan for industries or industry segment affected. • Work with industry and Incident Command to facilitate movement of non-infected animals and non-contaminated animal products from non-infected premises. |
| Regionalization for International Trade | <ul style="list-style-type: none"> • Promote science-based international trade policy and procedures. • Develop guidance for regionalization in the United States to respond to an FAD outbreak in the country that facilitates the resumption of international trade involving non-infected animals and unaffected animal products. | <ul style="list-style-type: none"> • Initiate the implementation of regionalization plans tailored to the specific agent and epidemiological situation as soon as possible during the outbreak response. • Provide trading partners and the World Organization for Animal Health relevant outbreak information to support the regionalization plan, including the measures used to provide evidence of disease-freedom in the region. |
| Mass Depopulation and Euthanasia | <ul style="list-style-type: none"> • Develop contingency plans for mass depopulation and exercise those plans. • Develop non-traditional approaches or alternatives to mass depopulation for large scale or catastrophic outbreaks. • Train personnel and/or develop just-in-time training that can be readily available for additional personnel. | <ul style="list-style-type: none"> • Implement animal-sparing modalities, such as vaccination, where appropriate and permitted by law. • Provide aesthetically acceptable euthanasia to the affected animal species as quickly, efficiently, and humanely as possible, but in consideration of the extenuating circumstances that surround an animal health emergency. • Minimize, to the extent possible, the emotional and psychological impact on animal owners, caretakers, and their families, and those involved in the actual depopulation activities. • Optimize depopulation by selecting animals which are suffering or pose a significant risk of spreading infection first. |

Table B-1. Selected Preparedness and Response Goals

| Critical activity | Preparedness goals | Response goals |
|---------------------------|---|---|
| Disposal | <ul style="list-style-type: none"> • Establish disposal protocols or procedures before an outbreak, for consistency and safeguarding, and to meet regulatory requirements. • Identify suitable disposal personnel, supplies, materials, and equipment prior to the incident or FAD outbreak. • Prevent the spread of the disease agent, with little or no effect on the environment, considering community preferences, and conserving meat or animal protein if logistically supportable from a biosecurity viewpoint. | <ul style="list-style-type: none"> • Properly dispose of contaminated and potentially contaminated materials, including animal carcasses, as soon as possible while maximizing pathogen containment, environmental sustainability, stakeholder acceptance, and cost effectiveness. |
| Cleaning and Disinfection | <ul style="list-style-type: none"> • Establish cleaning and disinfecting protocols or procedures before an outbreak, for consistency and safeguarding. • Identify disinfectants (or pesticides) that are U.S. Environmental Protection Agency approved for specific FAD agents. Be able to acquire these disinfectants, both as a finite immediate quantity for the start of an FAD incident or outbreak, and as an indefinite estimated quantity for surge capacity requirements beyond the initial immediate need. | <ul style="list-style-type: none"> • Remove, inactivate, reduce, or destroy pathogens at infected premises. • Ensure that cleaning and disinfection is conducted on any premises where a disease agent is presumed or confirmed to exist within 48 hours of disposal of depopulated animals. |
| Vaccination | <ul style="list-style-type: none"> • Determine if an effective vaccine is available for the FAD agent. Enter into vaccine bank relationships and/or establish National Veterinary Stockpile logistics contracts to maximize preparedness potential in a strategically sound approach that is cost effective. • Work with stakeholders to identify the situations or scenarios where strategic vaccination for an FAD will be requested. • Develop contingency plans for emergency vaccination, and exercise those plans; identify resources and requirements to effectively implement plans. | <ul style="list-style-type: none"> • If a decision is made to use an emergency vaccination strategy, then order the resources to implement the emergency vaccination strategy as rapidly as possible. • Engage in a public awareness campaign to provide information and education regarding the use of vaccination for the emergency outbreak. |

Table B-1. Selected Preparedness and Response Goals

| Critical activity | Preparedness goals | Response goals |
|----------------------------|---|---|
| Animal Welfare | <ul style="list-style-type: none"> • Identify the resources and training necessary to provide humane treatment to animals in different outbreak circumstances. • Train personnel and/or develop just-in-time training that can be readily available for additional personnel. | <ul style="list-style-type: none"> • Provide humane treatment to animals given the outbreak circumstances, especially from the time they are identified for destruction or vaccination activities until they are depopulated, euthanized or slaughtered, as prescribed by veterinary authorities of affected States or Tribal Nations. |
| Appraisal and Compensation | <ul style="list-style-type: none"> • Pre-identify and train compensation specialists before the incident. Provide just-in-time training for compensation specialists as needed. • Exercise, evaluate, and improve administrative processes for performing appraisals and compensation functions before an outbreak. | <ul style="list-style-type: none"> • Provide fair market value appraisals to owners of animals and materials requiring destruction to prevent the spread of an FAD agent within 12–72 hours of destruction. Timelines may vary depending on the species and types of animals. |
| Finance | <ul style="list-style-type: none"> • Develop templates for cooperative agreements with States and Tribes before FAD outbreaks. • Develop templates and processes to rapidly submit contingency fund requests, Commodity Credit Corporation requests, and supplemental appropriation requests. | <ul style="list-style-type: none"> • Rapidly request funds through appropriate funding mechanisms. Rapidly provide general and detailed budget information as anticipated and requested. • Provide timely finance functions within the ICS structure. |

Appendix C

Glossary

| | |
|------------------------------------|---|
| 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. |
| Biosecurity | A series of management practices designed to prevent the introduction and spread of disease agents on an animal production facility. This may include measures to contain disease (biocontainment) and also prevent the introduction of disease (bioexclusion). |
| Case | Any individual animal infected by a foreign animal disease, with or without clinical signs. |
| Compartment (compartmentalization) | An animal subpopulation contained in one or more establishments under a common biosecurity management system with a distinct health status with respect to a specific disease or specific diseases for which required surveillance, control, and biosecurity measures have been applied for the purpose of international trade. |
| 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. |
| Emergency vaccination | A disease control strategy using the immunization of susceptible animals through the administration of a vaccine comprising antigens appropriate to the disease to be controlled. |
| Etiology | The causes or origin of disease, or the factors that produce or predispose toward a certain disease or disorder. |
| Euthanasia | The humane destruction of an animal accomplished by a method that produces rapid unconsciousness and subsequent death with a minimum of pain or distress or a method that utilizes anesthesia produced by an agent that causes painless loss of consciousness and subsequent death. |
| Foreign animal disease (FAD) | A transboundary animal disease not known to exist in the U.S. animal population. |

| | |
|--|---|
| Foreign Animal Disease Preparedness and Response Plan (FAD PReP) | Documents used to identify veterinary functions 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 Unified Command by local, State, and Federal personnel. |
| Fomites | Inanimate objects that can transmit infectious agents from one animal or person to another. |
| Incident Command System | A standardized, on-scene, all-hazards incident management approach that <ul style="list-style-type: none"> ◆ allows for the integration of facilities, equipment, personnel, procedures, and communications operating within a common organizational structure; ◆ enables a coordinated response among various jurisdictions and functional agencies, both public and private; and ◆ establishes common processes for planning and managing resources. |
| Incubation period | The incubation period is the longest period which elapses between the introduction of the pathogen 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. |
| Kill | Any procedure which causes the death of an animal. |
| Mass depopulation | 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. |
| Modified stamping-out | Animal health measures for stamping out that are not implemented in full. |
| Memorandum/Memoranda of understanding | A document describing a bilateral or multilateral agreement between parties. It expresses a scope of activities and expectations between parties, indicating an intended common line of action or communication. It does not indicate a financial commitment. |
| National Animal Health Laboratory Network (NAHLN) | NAHLN is a cooperative effort between two USDA 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-contagious disease agent | A non-contagious disease agent is one that is spread by some means other than contact with infected animals or contaminated fomites. |

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| Non-susceptible animal | Animal that does not develop a particular disease when exposed to the causative infectious agent of that disease. |
| World Organization for Animal Health (OIE) | Organization that collects and publishes information on animal diseases from 178 (March 2012) 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. |
| Personal protective equipment | 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 slaughter | Depopulation under the competent authority of susceptible animal species in herds or flocks on premises that have been exposed to infection by direct animal-to-animal contact or by indirect contact of a kind likely to cause the transmission of the FAD prior to the expression of clinical signs. |
| Premises | A geographically and epidemiologically defined location, including a ranch, farm, stable, or other establishment. |
| Regionalization (also known as zoning) | An animal subpopulation defined primarily on a geographical basis (using natural, artificial, or legal boundaries). |
| Slaughter | The killing of an animal or animals for food, often by bleeding. |
| Stamping-out (OIE definition) | Means carrying out under the authority of the Veterinary Authority, on confirmation of a disease, the killing of the animals which are affected and those suspected of being affected in the herd and, where appropriate, those in other herds which have been exposed to infection by direct animal to animal contact, or by indirect contact of a kind likely to cause the transmission of the causal pathogen. All susceptible animals, vaccinated or unvaccinated, on an Infected Premises (IP) should be killed and their carcasses destroyed by burning or burial, or by any other method which will eliminate the spread of infection through the carcasses or products of the animals killed. |
| Susceptible animal | Any animal that can be infected with and replicate the disease pathogen of concern. |
| Susceptible species | See susceptible animal. |
| Trace-back | The identification of the origin and movements of all animals, animal products, possible fomites, people, possible vectors, and so on that have entered onto an IP. |
| Trace-forward | The tracing of all animals, people, fomites, and so on that have left an IP. The premises that received the animals or goods should be investigated and kept under surveillance or quarantine. |

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| Vector | 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. |
| Zoonotic | Any disease or infection that is naturally transmissible from animals to humans. |

Appendix D

Abbreviations

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| APHIS | Animal and Plant Health Inspection Service |
| ARP | At-Risk Premises |
| BSE | bovine spongiform encephalopathy |
| BZ | Buffer Zone |
| CA | Control Area |
| CBPP | contagious bovine pleuropneumonia |
| CCHF | Crimean Congo hemorrhagic fever |
| CP | Contact Premises |
| CSF | classical swine fever |
| CVO | Chief Veterinary Officer |
| CVZ | Containment Vaccination Zone |
| DIVA | differentiation of infected from vaccinated animals |
| FA | Free Area |
| FAD | foreign animal disease |
| FAD PReP | Foreign Animal Disease Preparedness and Response Plan |
| FMD | foot-and-mouth disease |
| FP | Free Premises |
| FSIS | Food Safety and Inspection Service |
| HPAI | highly pathogenic avian influenza |
| IC | Incident Command |
| ICS | Incident Command System |
| IP | Infected Premises |
| IZ | Infected Zone |
| MP | Monitored Premises |
| ND | Newcastle disease |
| NIMS | National Incident Management System |
| NVSL | National Veterinary Services Laboratories |
| OIE | World Organization for Animal Health |

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| PPE | personal protective equipment |
| PVZ | Protection Vaccination Zone |
| SAHO | State Animal Health Official |
| SP | Suspect Premises |
| SZ | Surveillance Zone |
| USDA | U.S. Department of Agriculture |
| VP | Vaccinated Premises |
| VS | Veterinary Services |
| VZ | Vaccination Zone |

Appendix E

Selected References and Resources

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