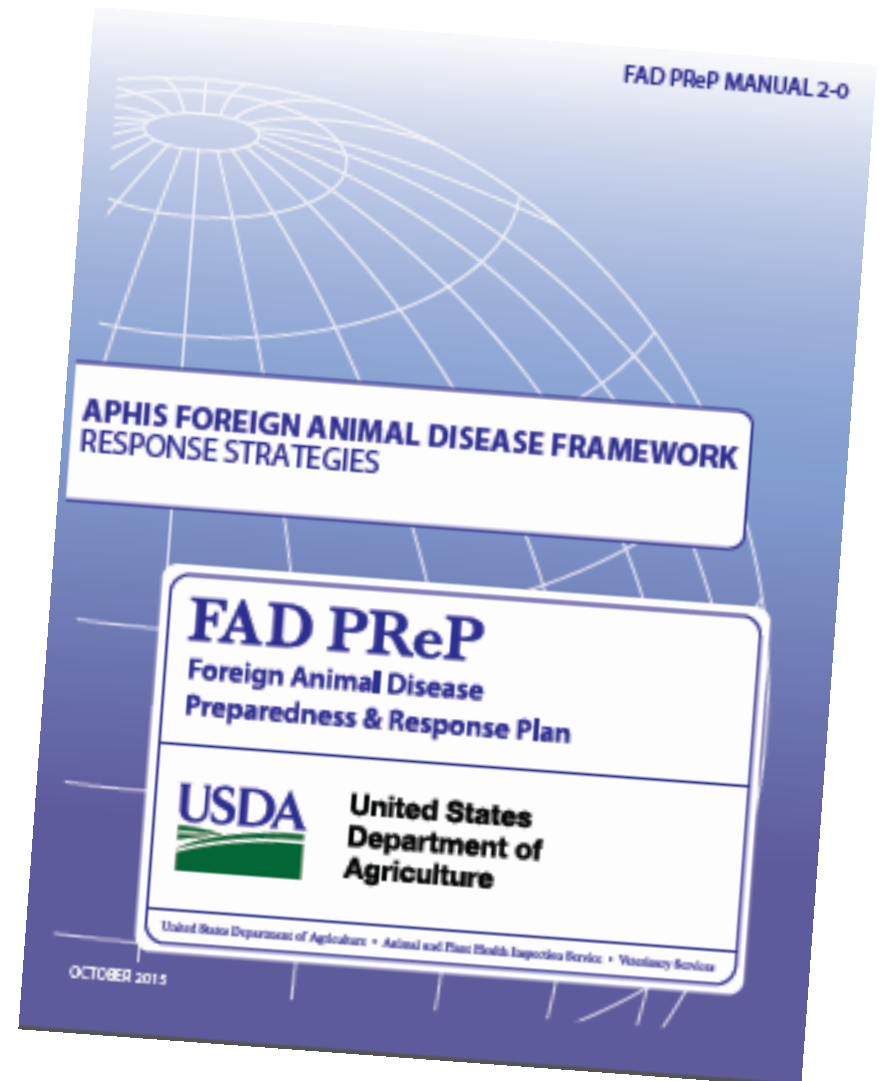


Response Strategies

APHIS Foreign Animal
Disease Framework

FAD PReP Manual 2-0



Document Overview

- Preparedness and response planning for foreign animal disease (FAD) incidents is crucial to protect animal health, public health, the environment, and to stabilize animal agriculture, the food supply, and the economy.
- The *FAD Framework: Response Strategies* (FAD PReP Manual 2-0) describes response goals, FAD response strategies and principles, and zone and premises designations.



Foreign and Emerging Animal Diseases

- An FAD is defined as a transboundary animal disease or pest not known to exist in the U.S. animal population.
- An emerging animal disease may include any terrestrial animal, aquatic animal, or zoonotic disease not yet known or characterized, or any known or characterized terrestrial or aquatic animal disease in the United States or its territories, that changes or mutates in pathogenicity, communicability, or zoonotic potential to become a threat to animals or humans.
 - APHIS VS developed a framework for responding to emerging animal diseases, “*Veterinary Services Proposed Framework for Response to Emerging Animal Disease in the United States*,” available at https://www.aphis.usda.gov/animal_health/downloads/vs_emerging_diseases_framework.pdf

FAD Response Goals

- In the event of an FAD outbreak, three key response goals are to:
 - 1) Detect, control, and contain the FAD in animals as quickly as possible;
 - 2) Eradicate the FAD using strategies that seek to stabilize animal agriculture, the food supply, and the economy, and to protect public health and the environment.
 - 3) Provide science- and risk-based approaches and systems to facilitate continuity of business for non-infected animals and non-contaminated animal products.

FAD Response Goals

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



Epidemiological Principles of Response

Three key epidemiological principles form the foundation of any FAD response:

1. Prevent contact between the disease and susceptible animals.
2. Stop the production of the FAD agent in infected or exposed 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.

Regulatory Intervention During an FAD Outbreak

- An FAD outbreak in the United States may result in emergency regulatory intervention by States, Tribal Nations, and/or Federal authorities.
- The USDA and the affected States and Tribes will work together in a Unified Command, per the National Incident Management System, to detect, control, and contain the disease as expeditiously as possible.

Regulatory Intervention During an FAD Outbreak

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
 - Rate of contagious disease agent transmission
 - Potential for zoonotic transmission
 - Number and types of susceptible animal species.
- Consequences of the FAD outbreak
 - To national security, food security, public health, animal health, the environment, and the economy
 - Regulatory impacts for owners, growers, stakeholders, and the general public.

Regulatory Intervention During an FAD Outbreak

(continued)

- Acceptance
 - Social and political acceptance of the response policy by different communities.
 - Local, State, Tribal, U.S. regional, U.S. national, North American, and international.
- Scale of the outbreak
 - Number of animals, species, and premises infected
 - The susceptible animal population density for infected or high-risk areas.
- Rate of outbreak spread
 - Numbers and types of premises
 - Numbers and types of animals
 - Rate at which each Infected Premises (IP) leads to infection of one or more additional IP.
- Veterinary countermeasures available
 - Availability and efficacy of countermeasures, such as FAD vaccines.

Regulatory Intervention During an FAD Outbreak

(continued)

- Resources available to implement response strategies
 - Capabilities and resources available to:
 - eradicate an FAD in domestic animals and
 - to control and eradicate and FAD in potential wildlife reservoirs.
- Domestic animal disease management capabilities
 - Capability, feasibility, and resources available to:
 - eradicate an FAD in domestic animals as an emergency response control as an animal disease program
 - monitor as an endemic animal disease.
- Wildlife management capabilities
 - Capability, feasibility, and resources available to eradicate, control, or monitor an FAD in wildlife reservoirs.

Examples of State-Federal-Tribal Emergency Interventions during 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 twelve months, regulatory intervention at time of outbreak by State- Federal-Tribal authorities.

National animal disease control program

Long-term regulatory control program conducted by State-Federal-Tribal authorities.

Individual State or Tribal Nation animal disease control program

Short-term or long-term, with State or Tribal Nation requirements.

Animal disease monitored with limited or no regulatory intervention

Short-term or long-term, with little or no regulatory intervention by State-Federal-Tribal authorities.

Transmission Characteristics of FAD Agents

- An animal disease is either:
 - contagious, meaning it is transmitted through animal-animal contact or fomite-animal contact, or
 - not contagious, meaning it is transmitted by another means (for example, an arthropod vector).
- Contagious diseases can be classified as:
 - Highly contagious.
 - Require a rapid and coordinated response to control and eliminate the agent.
 - Not highly contagious.
 - May require a response for reasons other than the rapid spread of the agent, including disruptions to interstate commerce, international trade, or zoonotic potential.
 - Classification depends on how rapidly the disease agent can move from animal to animal and farm to farm.

Terrestrial FAD Threats

FAD	Primary type of animal affected	Highly contagious disease	Vector-borne disease	Zoonotic disease potential
Diseases with FAD PReP Response Plans (Red Books)				
Highly pathogenic avian influenza (HPAI)	Avian, others	Yes	No	Yes
Foot-and-mouth disease (FMD)	All cloven hoofed animals	Yes	No	No
Classical swine fever (CSF)	Swine	Yes	No	No
Newcastle disease (ND) (virulent ND virus)	Avian	Yes	No	Yes Minor
Diseases with FAD PReP Disease Response Strategies				
African swine fever	Swine	Yes	Yes	No
Japanese encephalitis	Equine, swine	No	Yes	Yes
Peste des petits ruminants	Caprine, ovine	Yes	No	No
Rift Valley fever	Bovine, ovine, caprine	No	Yes	Yes
Diseases with VS Response Materials				
Contagious equine metritis	Equine	No	No	No
Equine piroplasmiasis	Equine	No	Yes	No
Schmallenberg virus	Bovine, caprine, ovine	No	Yes	No
Vesicular stomatitis virus	Equine, bovine, swine, ovine, caprine	No	Yes	Yes Rare



Terrestrial FAD Threats (continued)

FAD	Primary type of animal affected	Highly contagious disease	Vector-borne disease	Zoonotic disease potential
Other FAD Threats (Alphabetical Order)				
African horse sickness (AHS)	Equine	No	Yes	No
Akabane	Bovine, ovine, caprine	No	Yes	No
Bovine babesiosis	Bovine	No	Yes	No
Contagious bovine pleuropneumonia	Bovine	Yes	No	No
Contagious caprine pleuropneumonia	Caprine	Yes	No	No
Dourine	Equine	No	No	No
Glanders	Equine	Yes	No	Yes
Heartwater (<i>Ehrlichia ruminantium</i>)	Bovine, ovine, caprine, other ruminants	No	Yes	No
Lumpy skin disease	Bovine	No	Yes	No
Nairobi sheep disease	Ovine, caprine	No	Yes	Yes Minor
Nipah, Hendra (Henipavirus)	Swine, equine respectively	Yes (Nipah)	No	Yes
Rabbit hemorrhagic disease	Wild and domestic rabbits (sp. <i>Oryctolagus cuniculus</i>)	Yes	No	No
Sheep pox, goat pox	Ovine, caprine	Yes	No	No
Surra (<i>Trypanosoma evansi</i>)	Equine, bovine, others	No	Yes	No
Swine vesicular disease	Swine	Yes	No	No
Theileriosis (East Coast fever)	Bovine	No	Yes	No
Venezuelan equine encephalitis	Equine, avian	No	Yes	Yes



FAD Pest Threats

Foreign pest common name	Foreign pest scientific name	Primary type of animal affected	Disease transmitted; condition caused	Zoonotic disease potential
Foreign Animal Pest Threats with FAD PReP Disease Response Strategies				
Screwworm—New World	<i>Cochliomyia hominivorax</i>	Warm-blooded animals	Myiasis	Myiasis
VS Control Program Exists				
Cattle fever tick	<i>Rhipicephalus annulatus</i> (formerly <i>Boophilus annulatus</i>)	Bovine, ovine, caprine, other species	Bovine babesiosis	No
Southern cattle tick	<i>Rhipicephalus microplus</i> (formerly <i>Boophilus microplus</i>)	Bovine, ovine, caprine, other species	Bovine babesiosis	No
Other Foreign Animal Pest Threats (Alphabetical Order by Pest Scientific Name)				
Bont tick	<i>Amblyomma hebraeum</i>	Bovine, reptiles, other species	Heartwater	African tick-bite fever Tick typhus
Tropical bont tick	<i>Amblyomma variegatum</i>	Bovine, reptiles, other species	Heartwater Bovine dermatophilosis Nairobi sheep disease	African tick-bite fever Tick typhus Crimean-Congo hemorrhagic fever (CCHF) Yellow fever
Screwworm— Old World	<i>Chrysomya bezziana</i>	Warm-blooded animals	Myiasis	Myiasis
Louse fly	<i>Hippobosca longipennis</i>	Canine, livestock, other species	Bite only	Bite only
European castor bean tick	<i>Ixodes ricinus</i>	Bovine, ovine, caprine, other species	Bovine babesiosis	CCHF Lyme disease Bovine babesiosis (splenectomized population)
Licking fly	<i>Musca vitripennis</i>	Bovine	Bovine filariosis	No
Sheep scab, sheep mange	<i>Psoroptes ovis</i>	Bovine, ovine, other species	Mange	No
Brown ear tick	<i>Rhipicephalus appendiculatus</i>	Bovine, ovine, caprine, other species	East Coast fever Nairobi sheep disease	Tick typhus

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

Example Response Strategies

- The response strategy 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 five strategies for controlling and eradicating a highly contagious FAD in domestic livestock or poultry.
 - These strategies are not mutually exclusive.

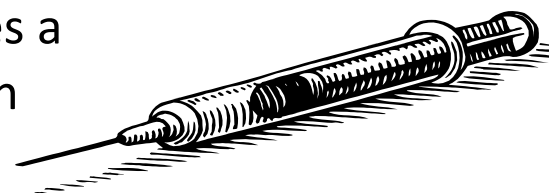


The Five Response Strategies

1. Stamping-Out
 - Depopulation of clinically affected and in-contact susceptible animals.
2. Stamping-Out Modified with Emergency Vaccination to Kill
 - Depopulation of clinically affected and in-contact susceptible animals.
 - Vaccination of at-risk animals, with subsequent depopulation and disposal of vaccinated animals.
 - Depopulation and disposal can be delayed until logistically feasible.
3. Stamping-Out Modified with Emergency Vaccination to Slaughter
 - Depopulation of clinically affected and in-contact susceptible animals and vaccination of at-risk animals.
 - Slaughter and processing of vaccinated animals, if animals are eligible for slaughter under:
 - USDA Food Safety and Inspection Service (FSIS) authority and rules
 - State and Tribal authority and rules.

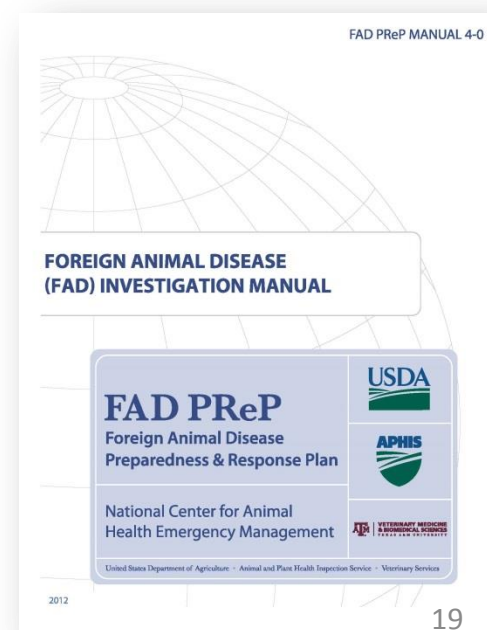
The Five Response Strategies (continued)

4. Stamping-Out Modified with Emergency Vaccination to Live
 - Depopulation of clinically affected and in-contact susceptible animals and vaccination of at-risk animals.
 - No subsequent depopulation of vaccinated animals.
 - Vaccinated animals intended for breeding, slaughter, or other purposes live out their useful lives.
5. Emergency Vaccination to Live without Stamping-Out
 - Vaccination used without depopulation of infected animals or subsequent depopulation or slaughter of vaccinated animals.
6. Manage Outbreak Without Widespread Stamping-Out or Vaccination
 - In some cases, as when the disease agent is already widespread prior to detection or when it involves a large number of animals, *and* when no vaccine is readily available.



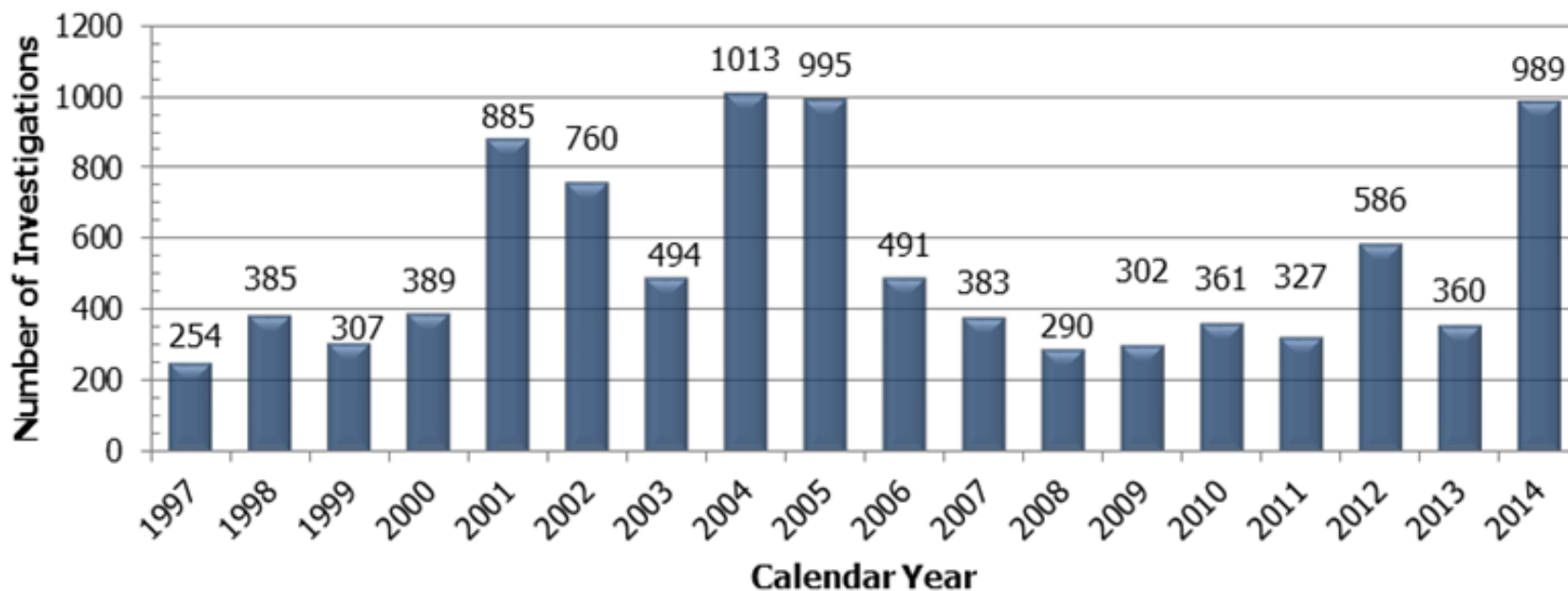
FAD Investigations

- The objectives of FAD and emerging disease investigations 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.
- Investigations provide confirmative diagnostic testing results as rapidly as possible.
 - Once an FAD agent is detected, incident management will be tailored to the specific disease agent and circumstances of the outbreak.
- The APHIS policies and procedures for FAD investigations are defined in the:
 - *FAD Investigation Manual (FAD PReP Manual 4-0)*
 - *Veterinary Services Guidance Document 12001.*



FAD Investigations

FAD Investigations from 1997 to 2014



Designating Zones, Areas, and Premises

Establishment of zones and premises is essential for FAD response efforts. In general, a response involves 7 types of zones/areas and 7 types of premises.

Zones

- Infected Zone
- Buffer Zone
- Control Area
- Surveillance Zone
- Free Area
- Containment Vaccination Zone
- Protection Vaccination Zone

Premises

- Infected Premises
- Contact Premises
- Suspect Premises
- At-Risk Premises
- Monitored Premises
- Free Premises
- Vaccinated Premises

Example Zones, Areas, and Premises



Note: Figures are not to scale. The Vaccination Zone can be either a Protection Vaccination Zone or Containment Vaccination Zone.

Recognition of Disease-Free Status

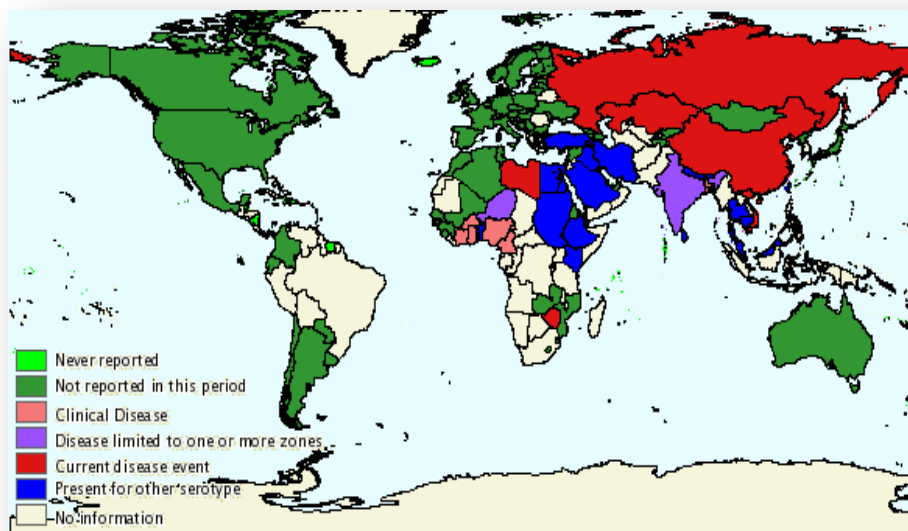
- The World Organization for Animal Health (OIE) recognizes official disease statuses for member countries for
 - foot-and-mouth disease (FMD),
 - rinderpest,¹
 - contagious bovine pleuropneumonia (CBPP),
 - bovine spongiform encephalopathy (BSE),²
 - African horse sickness (AHS),
 - classical swine fever (CSF), and
 - peste de petits ruminants (PPR).
- Through an agreement between the World Trade Organization, the OIE is responsible for recognizing disease-free areas, pest-free areas, and/or risk status for trade purposes.

¹ Rinderpest is no longer listed due to its worldwide eradication, officially declared in May 2011 by the OIE.

² OIE recognizes freedom of all diseases listed here except for BSE, which it recognizes as “negligible” or “controlled” risk status

Recognition of Disease-Free Status

- OIE categories for official country recognition for FMD virus are:
 - FMD-free country where vaccination is not practiced
 - FMD-free country where vaccination is practiced
 - FMD-free zone where vaccination is not practiced
 - FMD-free zone where vaccination is practiced
 - FMD-free compartment
 - FMD-infected country or zone.



Recognition of Disease-Free Status

- Any member that wishes to be included in the list of designated disease-status countries or to change its status sends a request to the OIE Scientific and Technical Department.
 - The request should include specific documentation and relevant questionnaires for the disease.
- The Director General submits the request to the Scientific Commission for evaluation.
- For diseases other than FMD, CBPP, BSE, AHS, CSF, and PPR, Member countries can self-declare their entire country, zone, or compartment disease-free.
 - They must provide relevant epidemiological evidence that requirements for disease status have been met in accordance with OIE standards.

Executing a Response Strategy

- Some of the critical activities and tools that are employed to execute response strategies during an FAD outbreak, including:
 - Epidemiological investigation and tracing
 - Biosecurity
 - Surveillance
 - Diagnostics
 - Quarantine and movement control
 - Continuity of business
 - Cleaning and disinfection
 - Disposal
 - Public awareness campaigns.



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- Questions? Comments? FAD.PReP.Comments@aphis.usda.gov

