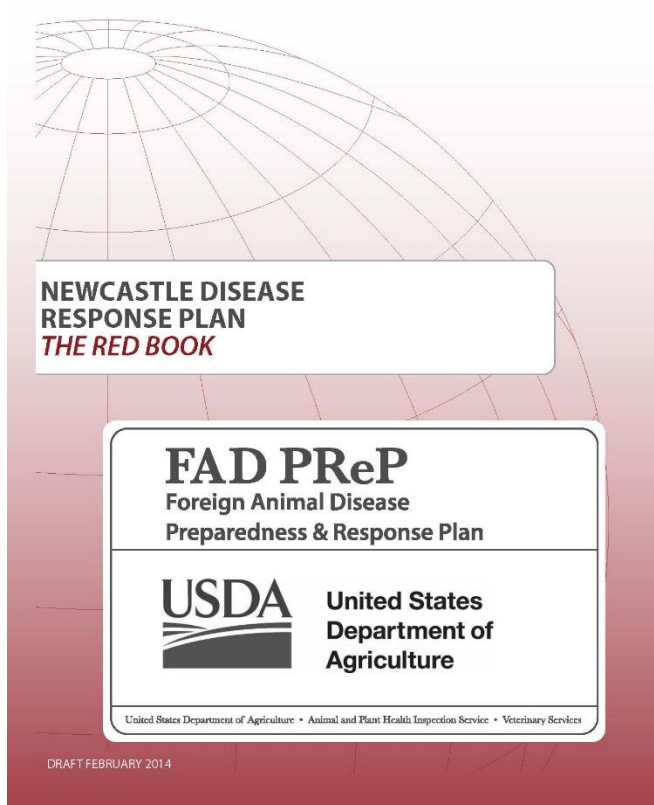


# NEWCASTLE DISEASE RESPONSE PLAN: THE RED BOOK



*Presentation  
updated **April 2016**,  
based on the  
February 2014 Plan*

The draft version of the *Newcastle Disease Response Plan: The Red Book (2014)* incorporates comments received on the *Exotic ND Response Plan: The Red Book (2013)* and reflects updates to Foreign Animal Disease Preparedness and Response Plan (FAD PReP) materials.

This plan does not replace existing regional, State, Tribal, local, or industry preparedness and response plans relating to ND. Regional, State, Tribal, local, and industry plans should be aimed at more specific issues in ND response.

- States should develop response plans focused on the specific characteristics of the State and its poultry industry.

# Outline

- **Introduction and Information**
- **Framework for Preparedness and Response**
- **Preparedness and Response**
- **Response Goals and Strategy**
- **Specific Response Critical Activities and Tools**
- **Recovery after an Outbreak**



# ND RESPONSE PLAN



## Introduction and Information

# Objectives of this Plan

- Identify the capabilities needed to respond to an ND outbreak.
- Identify critical activities that are involved in responding to that outbreak and associated time-frames.

In an outbreak situation, critical activities are under the authority of an Incident Command (IC).

# Definitions

- Avian paramyxovirus serotype 1 (APMV-1) is the etiologic agent of Newcastle disease (ND) in birds.
- APMV-1 viruses that cause ND are either virulent (vNDV) or low virulence (loNDV).
- In the Code of Federal Regulations (CFR), Newcastle Disease (ND) refers to an infection of poultry with vNDV.
- NDV refers to the virus in general, for example, when discussing environmental persistence.

# Etiology

- ND is an infection of birds caused by vNDV, an avian paramyxovirus serotype-1 (APMV-1).
- Nine serotypes of avian paramyxovirus have been identified.
  - There is one serotype of APMV-1 and six phylogenetic lineages.
- There are three major pathotypes based on virulence:
  - Lentogenic (low virulence viruses),
  - Mesogenic, and
  - Velogenic (virulent viruses).
    - The velogenic viruses are further classified as either neurotropic or viscerotropic.



# History

- ND was first identified in England in 1927.
- The first major outbreak of ND in the United States was identified in the early 1970s; this outbreak was epidemiologically linked to the transmission of ND from infected parrots to commercial poultry.
  - The last ND outbreaks in the United States included the States of California (2002–2003), Nevada (2003), Arizona (2003), and Texas (2003).
  - Virulent NDV is endemic in wild cormorants in the United States and Canada, but commercial poultry are currently free of velogenic isolates.
- Virulent NDV remains endemic in many parts of the world, including Asia, the Middle East, and Africa.

# Economic Impact

- In 1971, the ND outbreak in the United States resulted in the destruction of 12 million birds at a cost of \$56 million to eradicate the virus in 3 years.
- The 2002–2003 epidemic in the western United States resulted in industry losses estimated at \$5 billion, and a direct cost of \$160 million to control the outbreak.
- An ND outbreak in the United States today could exceed these economic costs and also result in significant disruptions to the U.S. food supply.

# Zoonotic Potential

- Virulent NDV can cause infection in humans.
- This infection is mild and self-limiting.
  - It usually causes conjunctivitis but can also result in mild influenza-like symptoms.
- Direct contact with infected birds is the most common transmission pathway; it is not transmitted through the consumption of poultry products.
- Responders—particularly poultry workers and vaccination crews—should be protected from the virus through appropriate health and safety measures and personal protective equipment (PPE).

# Susceptible Species

- More than 250 avian species can be infected with NDV. The most severely affected avian species are typically Galliformes, an order that includes:
  - chickens,
  - guinea fowl,
  - peafowl,
  - pheasant, and
  - quail.
- Turkeys can be infected, but usually present less severe clinical signs than chickens.



# Reservoirs

- Wild birds and waterfowl can be reservoirs for NDV.
- Upon transmission to domestic poultry, these strains may mutate into more virulent viruses.
- In addition, some psittacine species may shed virus for extended periods of time (several months to a year) but may not show clinical signs.



# Transmission

- Animal to animal contact
- Fomites
- Wildlife
- Airborne



# Persistence in the Environment and Animal Products

- NDV can be easily inactivated, but it remains viable for long periods of time, particularly at ambient temperatures and in the presence of feces.
- NDV may be present in eggs and egg products.



# Diagnosis in Avian Species

- Incubation period for ND typically ranges from 5–6 days.
  - World Organization for Animal Health (OIE) *Terrestrial Animal Health Code (2015)* gives the incubation period for AI infection as 21 days.





# Clinical Signs: Low Virulence Strains

- Strains of lοNDV typically result in little mortality.
- Common clinical signs:
  - Coughing,
  - Gaspung,
  - Sneezing, and
  - Rales.



# Clinical Signs: Virulent Strains

- Mesogenic strains of NDV typically result in low mortality but can cause acute respiratory and neurologic signs.
- Velogenic strains cause severe disease, particularly in chickens.
  - Lethargy,
  - Inappetence,
  - Ruffled feathers,
  - Edema,
  - Greenish or watery diarrhea,
  - Dyspnoea,
  - Inflammation of the head and neck,
  - Cyanotic discoloration,
  - Death.

# Gross Pathological Lesions

- Only velogenic strains will result in significant gross lesions.
- Lesions can be variable within neurotropic and viscerotropic forms. In general, velogenic gross lesions may include the following:
  - Swelling of the periorbital area or head,
  - Edema of the interstitial or peritracheal neck tissue,
  - Petechiae and small ecchymoses on the mucosa of the proventriculus,
  - Necrosis, ulcerations, or hemorrhages of respiratory, digestive, or lymphoid tissue, and
  - Enlarged spleen.

# Differential Diagnosis

- Virulent NDV can resemble
  - highly pathogenic avian influenza (caused by *influenzavirus A*),
  - laryngotracheitis (caused by infectious laryngotracheitis virus),
  - psittacosis (caused by *Chlamydophila psittaci*), mycoplasmosis (caused by *mycoplasma gallisepticum*),
  - and fowl cholera (caused by *Pasturella* spp.).

# Vaccination

- Vaccination has long been used in the United States as a control measure for IoNDV in many commercial poultry operations.
- Mesogenic strains of vaccine are available. However, these strains are not used as live vaccines in many countries, including the United States, because mesogenic and velogenic NDV infections have been eradicated in poultry.

# ND RESPONSE PLAN



**Framework for Preparedness  
and Response**

# Foundation of Preparedness and Response

- Successful emergency preparedness for and response to ND requires integration between the National Response Framework (NRF), National Incident Management System (NIMS), and National Animal Health Emergency Management System (NAHEMS).



# National Response Framework

- The NRF is a guide to how the Nation conducts all-hazards response.
- It describes specific authorities and establishes a comprehensive approach for responding to domestic incidents that range from serious but purely local events to large-scale terrorist attacks or catastrophic natural disasters.
- The NRF is available at [www.fema.gov/national-response-framework](http://www.fema.gov/national-response-framework).



# National Incident Management System

- NIMS is a companion document to the NRF.
- It provides a systematic, nationwide, proactive approach guiding departments and agencies at all levels of government, the private sector, and non-governmental organizations.
- Its goal is to help these organizations work seamlessly to prepare for, prevent, respond to, recover from, and mitigate the effects of incidents, regardless of cause, size, location, or complexity, to reduce the loss of life, liberty, property, and harm to the environment.
- NIMS information is available at [www.fema.gov/national-incident-management-system](http://www.fema.gov/national-incident-management-system).

# NIMS Key Components

- Preparedness
- Communications and information management
- Resource management
- Scalability
- Ongoing management and maintenance

# National Animal Health Emergency Management System

- APHIS and its stakeholders established NAHEMS to provide a functional framework for responding to foreign animal disease (FAD) incidents through NAHEMS Guidelines, disease response plans (such as this ND-specific plan), SOPs, and other associated documents.
- The purpose of the NAHEMS Guidelines is to ensure a successful response commensurate with the severity of the outbreak.

## FAD PReP offers...

- competent veterinary guidance on cleaning and disinfection, disposal, mass depopulation, and other activities;
- information on disease control and eradication strategies and principles;
- guidance on health, safety, and PPE issues;
- biosecurity information and site-specific management strategies; and
- training and educational resources.

# USDA Roles and Responsibilities

- As the primary Federal agency for incident management during an FAD event of livestock or poultry, USDA APHIS
  - coordinates Incident Management Teams (IMTs),
  - manages incident response,
  - manages public messages, and
  - takes measures to control and eradicate ND.

# Measures to Control and Eradicate ND

- Active surveillance for additional cases
- Quarantine and movement control
- Epidemiologic investigations
- Appraisal and compensation
- Depopulation (euthanasia) of affected poultry
- Carcass disposal
- Cleaning and disinfection
- Diagnostics
- Emergency vaccination (may be used in some cases)

# Requesting Support

- During the course of an ND outbreak response, USDA may request support as necessary from other Federal agencies.
- If the President declares an emergency or major disaster, or if the Secretary of Agriculture requests the Department of Homeland Security (DHS) lead coordination, the Secretary of Homeland Security and DHS assume the lead for coordinating Federal resources.
- USDA maintains the lead of overall incident management.

# ND RESPONSE PLAN



## Preparedness and Response



# Domestic Activities

USDA has a variety of ongoing preparedness and response activities with respect to ND.

The following list is a selection of ongoing USDA activities:

- National Import Export Services (NIES)
- Smuggling Interdiction and Trade Compliance (SITC)
- Emergency veterinary assistance

# International Activities

In addition to domestic activities, the USDA also has ongoing international activities to bolster ND preparedness planning and response capabilities:

- International coordination
- Emergency veterinary assistance

# USDA APHIS Organizational Strategy

- APHIS has adopted NIMS and Incident Command System (ICS) organizational structures to manage the response to an
- The ICS is designed to enable efficient and effective domestic incident management by integrating facilities, equipment, personnel, procedures, and communications operating within a common organizational structure.

# APHIS Incident Management Structure

- The APHIS Administrator is the Federal executive responsible for implementing APHIS policy during an ND outbreak.
- The APHIS Administrator will delegate much of the actual multiagency coordination (MAC) functions to the Veterinary Services (VS) Deputy Administrator, who is the Chief Veterinary Officer (CVO) of the United States, and the APHIS Emergency Management Leadership Council (EMLC).

# APHIS Incident Management Structure, continued

- The VS Deputy Administrator and the EMLC will establish an APHIS Incident Coordination Group (ICG) to oversee the staff functions associated with the incident at the APHIS headquarters level.
- The APHIS ICG will work closely with the personnel in charge of establishing operations for the incident response at the Area Command (AC) or Incident Command Post (ICP) in the field and coordinate with the APHIS MAC Group.

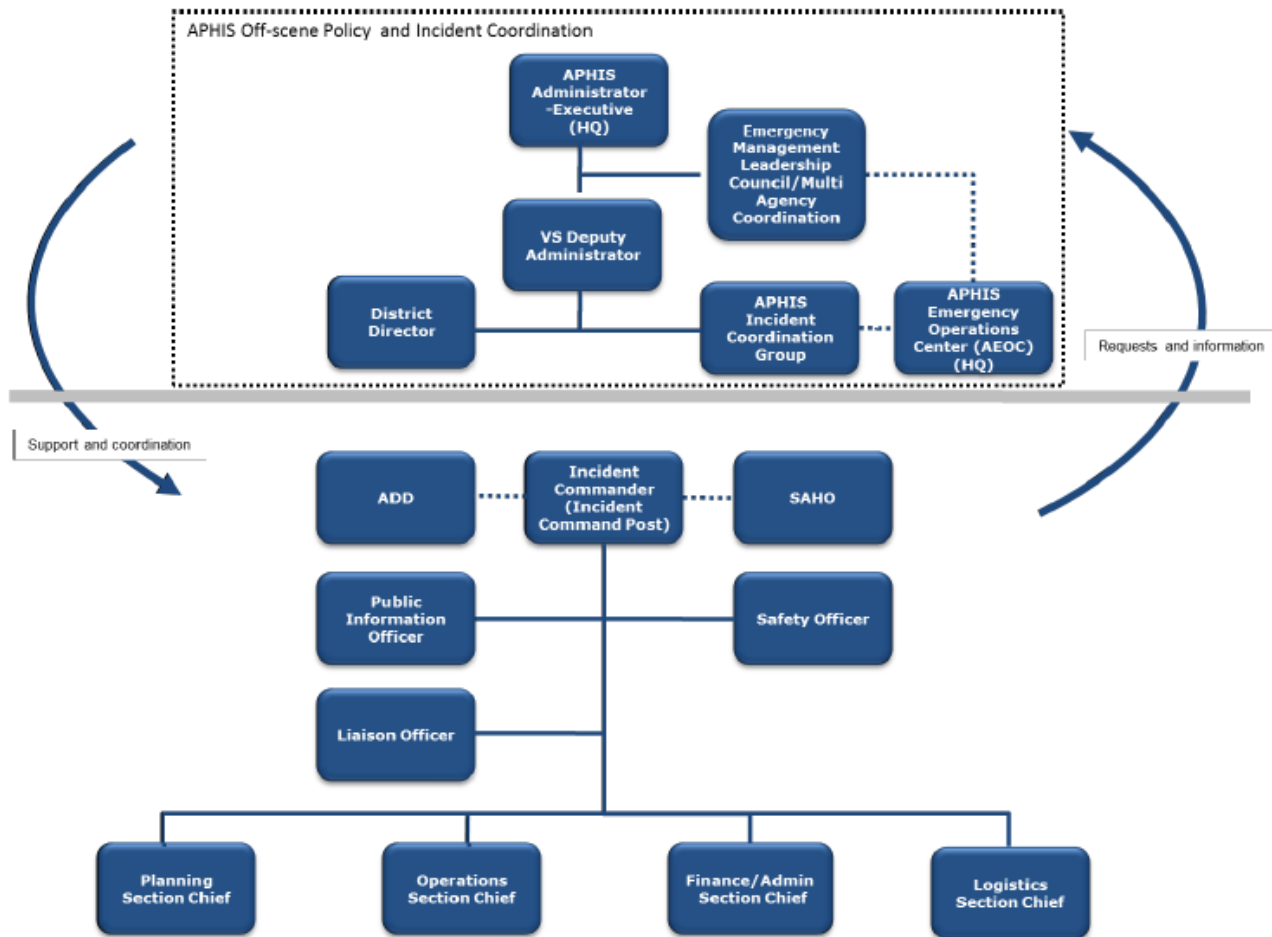
# Multiagency Coordination

- In the event of an ND outbreak, the EMLC typically serves as the APHIS MAC Group, unless the members decide to transfer responsibility for a specific incident.
- The APHIS MAC Group structure is adaptable and easily expands and contracts to provide flexibility.
- The MAC Group—formed if the ND response needs more support—establishes supportive relationships among the agencies preparing for and responding to an ND outbreak.

# APHIS Incident Coordination Group

- APHIS ICG responsibilities in an ND outbreak include:
  - providing guidance to ensure responder and public health and safety,
  - supporting ICP(s) and AC(s),
  - assisting in coordinating resources and integrating response organizations into the ICS, and
  - providing information to the Joint Information Center (JIC) for use in media and stakeholder briefings.

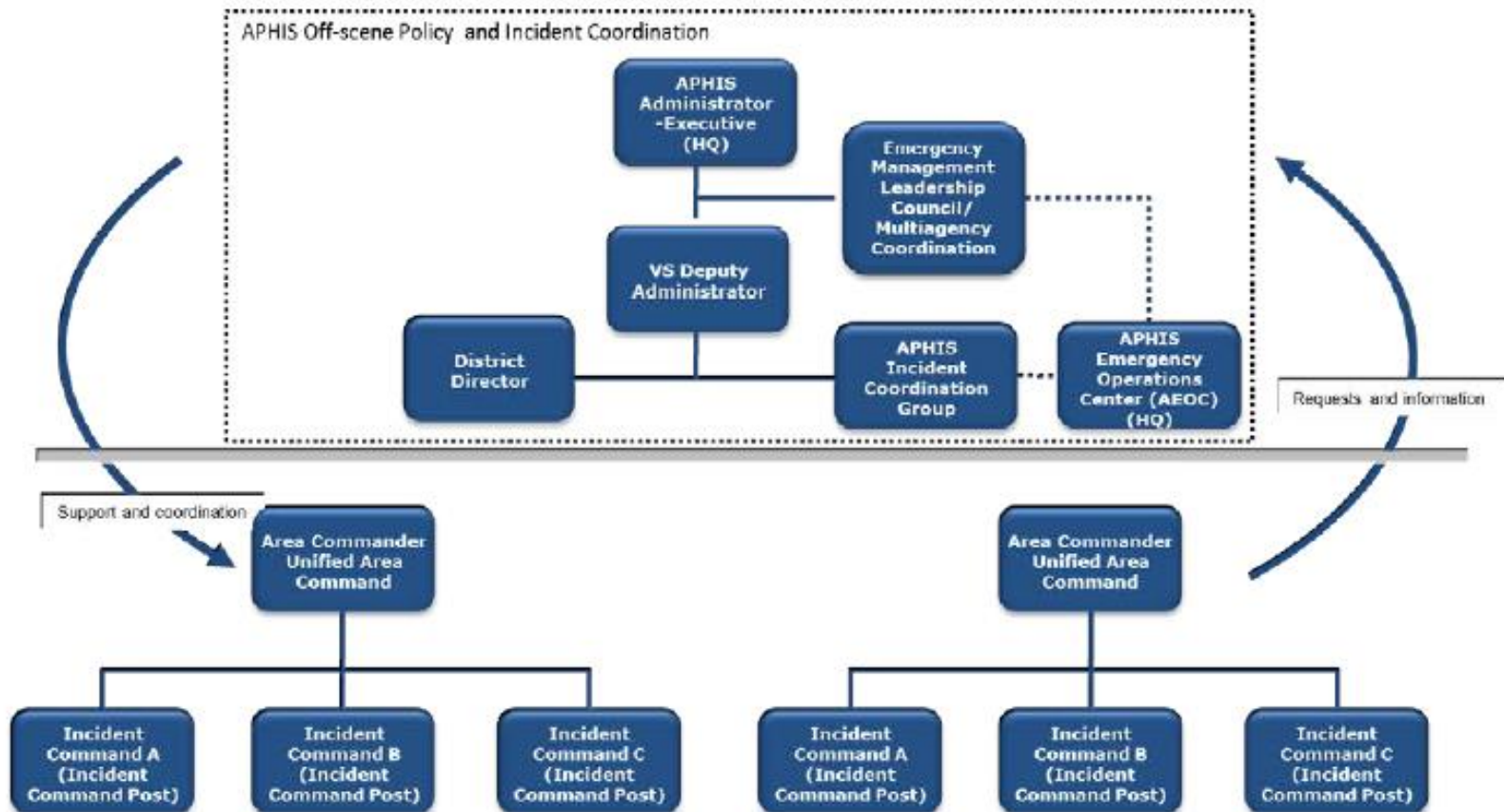
# APHIS Multiagency Coordination Structures and APHIS Emergency Operations Center: Relationship to Incident Management Team (Assuming Single Incident)



Note: ADD = Assistant District Director; SAHO = State Animal Health Official.



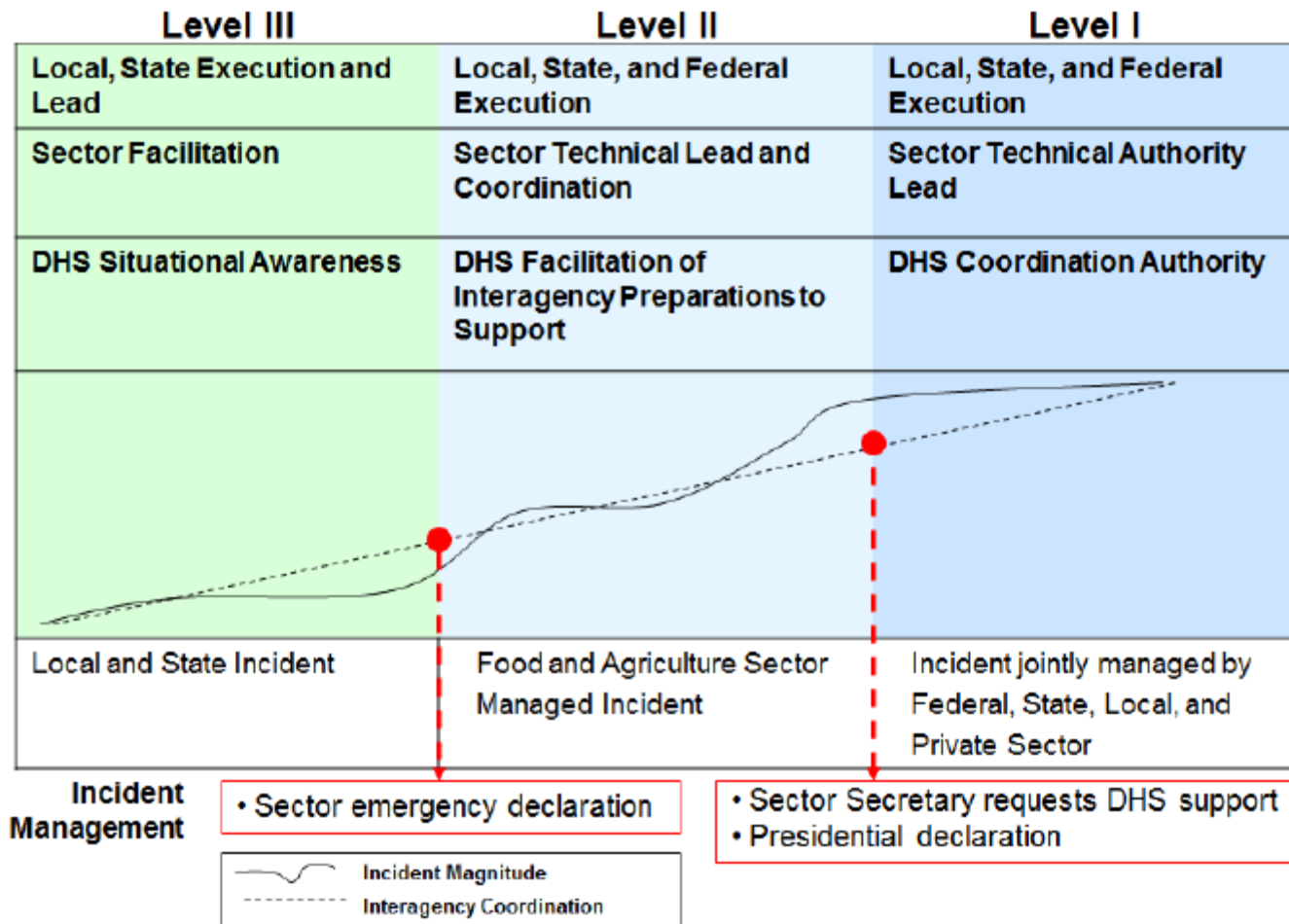
# APHIS Multiagency Coordination Structures and APHIS Emergency Operations Center: Relationship to Multiple Incident Management Team Structures (Assuming Multiple Incidents and Unified Area Command)



# APHIS Incident Management Levels

- APHIS uses a three-level system of emergency response types .
- The levels range from Level III, which has the lowest significance, to Level I, which is an event of national significance.
- The levels are used both within APHIS and externally to communicate the resource requirements for an event or incident.

# Incident Management Levels



# National Animal Health Emergency Response Corps

- NAHERC assists and augments Federal and State response to domestic and international animal disease outbreaks, threats, or natural disasters.
- NAHERC is composed of veterinarians and veterinary technicians who volunteer to become temporary Federal employees in the event of a national animal health emergency.



# Diagnostic Resources and Laboratory Support

## National Veterinary Services Laboratories

- The National Veterinary Services Laboratories (NVSL) is the official reference laboratory for FAD diagnostic testing and study in the United States.
  - The NVSL provides *all* confirmatory testing for ND on all specimens found presumptively positive at a National Animal Health Laboratory Network (NAHLN) laboratory or other USDA-approved laboratory.
  - The NVSL has two locations for FAD diagnostic testing:
    - Ames, IA (NVSL-Ames).
    - Foreign Animal Disease Diagnostic Laboratory (FADDL), Plum Island, NY (NVSL-FADDL).

# Diagnostic Resources and Laboratory Support

## National Animal Health Laboratory Network

- NAHLN consists of more than 60 laboratories and coordinates the veterinary diagnostic laboratory capacity of State animal health laboratories and their extensive infrastructure, including facilities, equipment, and professional expertise.
- Of these laboratories, over 50 are currently approved to perform ND testing diagnostics.
  - The NAHLN provides a means for early detection of ND, rapid response through surge capacity to test outbreak samples, and recovery by the capability to test large numbers of samples to show freedom from ND.

# ND RESPONSE PLAN



## Response Goals and Strategy

# Response Goals

- The goals of an ND response are to:
  - detect, control, and contain ND in domestic poultry as quickly as possible;
  - eradicate ND using strategies that seek to protect public health and the environment, and stabilize animal agriculture, the food supply, and the economy; and
  - provide science- and risk-based approaches and systems to facilitate continuity of business for non-infected animals and non-contaminated animal products.



# Critical Activities

- 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
- Mass depopulation and euthanasia, potentially including preemptive depopulation
- Effective and appropriate disposal procedures
- Cleaning and disinfection measures
- Emergency vaccination (as the response strategy indicates)

# Epidemiological Principles

- Three basic epidemiological principles form the foundation to contain, control, and eradicate ND in the U.S. domestic poultry population:
  - Prevent contact between the ND virus and susceptible poultry.
  - Stop the production of ND virus by infected or exposed poultry.
  - Increase the disease resistance of susceptible poultry to the ND virus.

# Critical Activities in the First 72 Hours of U.S. ND Response



# Response Strategy for Control and Eradication of ND in Poultry

- The United States' primary control and eradication strategy for ND in poultry is stamping-out.
- If the spread of ND outpaces the resources for stamping-out, or if other factors direct the response away from a stamping-out strategy alone, emergency vaccination strategies may be considered.



## Stamping-Out Definition

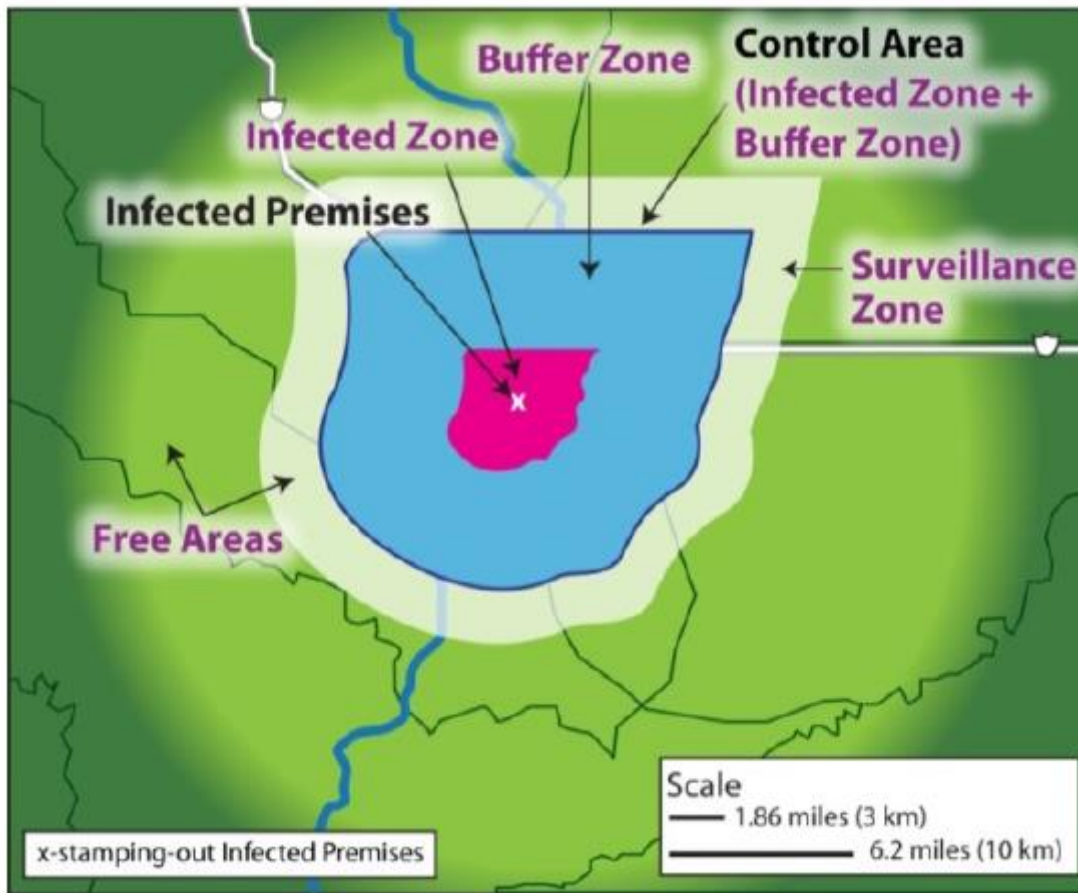
“Stamping-out” is defined in the OIE *Terrestrial Animal Health Code* as the “killing of animals which are affected and those suspected of being affected in the herd and, where appropriate, those in other herds which have been exposed to infection by direct animal to animal contact, or by indirect contact with the causal pathogen; this includes all susceptible animals, vaccinated or unvaccinated, on infected establishments.”

# Stamping-Out

## Critical Goals

- Within 24 hours of (or as soon as possible after) a premises being classified as an Infected Premises (IP), infected poultry will be depopulated in the quickest, safest, and most humane way possible. In many cases, poultry on Contact Premises (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 ND spread are 'stamped-out' first.
- Based on the epidemiology of the outbreak, prioritizing the poultry to depopulate first may be necessary.
- Public concerns about stamping-out require a well-planned and proactive public relations and liaison campaign. Stakeholders, the public, and the international community must be involved.

# Zones and Areas in Relation to Stamping-Out



# Assessing a Possible Outbreak

- During the investigation of premises suspected of having ND, animal health responders use clinical signs, history, and professional judgment to determine the likelihood that ND exists on the premises. This assessment includes
  - a history of clinical and epidemiological findings,
  - results of physical examinations,
  - necropsy findings,
  - specimen collection and submission to an approved laboratory,
  - reporting, and
  - initiating appropriate control measures.



# Authorization for Response and Associated Activities

When the criteria for a presumptive ND case have been met, the APHIS Administrator or VS Deputy Administrator (Chief Veterinary Officer [CVO] of the United States) can authorize APHIS personnel—in conjunction with State, Tribal, and IC personnel—to initiate depopulation, cleaning and disinfection procedures of the index case and investigation of Contact Premises (CP).

# Management of Incident

- The outbreak response effort should be implemented through ICS with an appropriate span of control and delegation of authority.
- An Incident Commander should be identified and an ICP established.
- In-State resources (whether Federal, State, Tribal, local, 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.
- The USDA will notify and coordinate with public health agencies in response to ND in poultry.

# Factors Influencing Response

- Consequences of the ND outbreak
- Acceptance
- Scale of the outbreak
- Rate of outbreak spread
- Veterinary countermeasures available
- Resources available to implement response strategies

## ND-Free Status

- The criteria needed for ND-free status as described in Article 10.9.2 of the OIE *Terrestrial Animal Health Code (2013)*. :
- It has been shown that NDV infection in poultry has not been present in the country, zone or compartment for the past 12 months, based on surveillance in accordance with Articles 10.9.22. to 10.9.26
- If infection has occurred in poultry in a previously free country, zone, or compartment, ND free status can be regained three months after a stamping-out policy (including disinfection of all affected establishments) is applied, providing that surveillance in accordance with Articles 10.9.22. to 10.9.26. has been carried out during that three-month period.

# ND RESPONSE PLAN



## Critical Activities and Tools

# Suspect Case Definition

- Domesticated bird or flock having clinical signs consistent with virulent Newcastle disease virus.



# Presumptive Positive Case Definition

- A suspect case that has either:
  - Positive screening test (rRT-PCR) for Newcastle disease virus (APMV-1); **OR**
  - Epidemiological information indicating exposure to virulent Newcastle disease virus.



# Confirmed Positive Case Definition

- Domesticated bird or flock from which:
  - Newcastle disease virus (APMV-1) has been isolated and identified at the NVSL or laboratory designated by the Secretary of Agriculture; **AND**
  - The Newcastle disease virus (APMV-1) has an ICPI in day-old chicks (*Gallus gallus*) of 0.7 or greater; **OR**
  - Presumptive positive and presence of multiple basic amino acids in the virus (either directly or by deduction) at the C-terminus of the F2 protein and phenylalanine at residue 117, which is the N-terminus of the F1 protein.
    - Failure to demonstrate the characteristic pattern of amino acid residues as described above would require virus isolation and further characterization by an ICPI test.



# Surveillance

The following are goals in an ND outbreak:

- To implement surveillance plans within 48 hours of the confirmation of an outbreak.
- To implement a surveillance plan that will (1) define the present extent of ND and (2) detect unknown IP quickly.
- To have the surveillance plan consider the susceptible wild bird population in the area, to coordinate with APHIS, U.S. Department of the Interior, State wildlife agencies, and State agriculture departments to perform appropriate ND surveillance in these populations.
- To provide complete surveillance data summaries and analysis at intervals as specified by IC.
- To develop effective surveillance plans that can achieve desired outcomes by leveraging available resources, satisfying jurisdictional requirements, and implementing continuity of business measures

# Surveillance

The following are goals in an ND outbreak:

- Detect ND infected premises during an outbreak.
- Determine the size and extent of an ND outbreak.
- Supply information to evaluate outbreak control activities.
- Provide information for poultry and product movement within the CA.
- Provide information for poultry and product movement out of the CA.
- Prove disease freedom (DF) and regain disease-free status after eradication of the outbreak.

# Surveillance Planning for ND Outbreak

- A surveillance plan indicates the frequency, number, and distribution of poultry and premises to be sampled. This requires tradeoffs be made among six surveillance parameters:
  - design (threshold) prevalence,
  - confidence level,
  - types of tests,
  - sampling frequency,
  - risk-based sampling, and
  - sampling scheme.



# Surveillance Objectives by Time Period

- *The initial 72 hours post-ND outbreak declaration.*
  - Detect existing infected flocks and premises as quickly as possible.
- *The control and eradication period (from initial 72-hour period until last case is detected and eradicated).*
  - Detect infected premises so that control measures can be put in place.
  - Provide evidence that premises are free of ND, thereby permitting poultry and poultry product movements in the CA.
  - Evaluate outbreak management control activities.
  - Provide evidence that disease is absent from the free area to enable unrestricted poultry and poultry product movement.
- *Post eradication.*

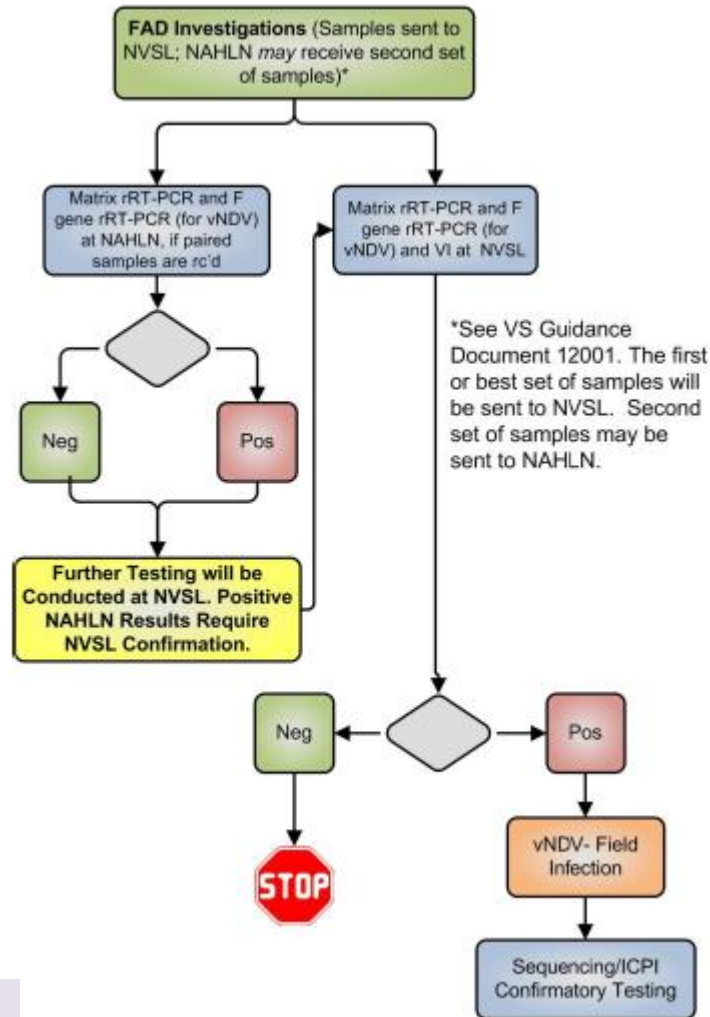
# Diagnostics

- During a suspected or actual ND outbreak, the key goals of response are to:
  - meet the surge requirements for diagnostic testing at specific intervals, starting at time zero and at 24-hour intervals as the response escalates, and
  - report all diagnostic test results to appropriate personnel *and* information management systems within 12 hours of diagnostic test completion.

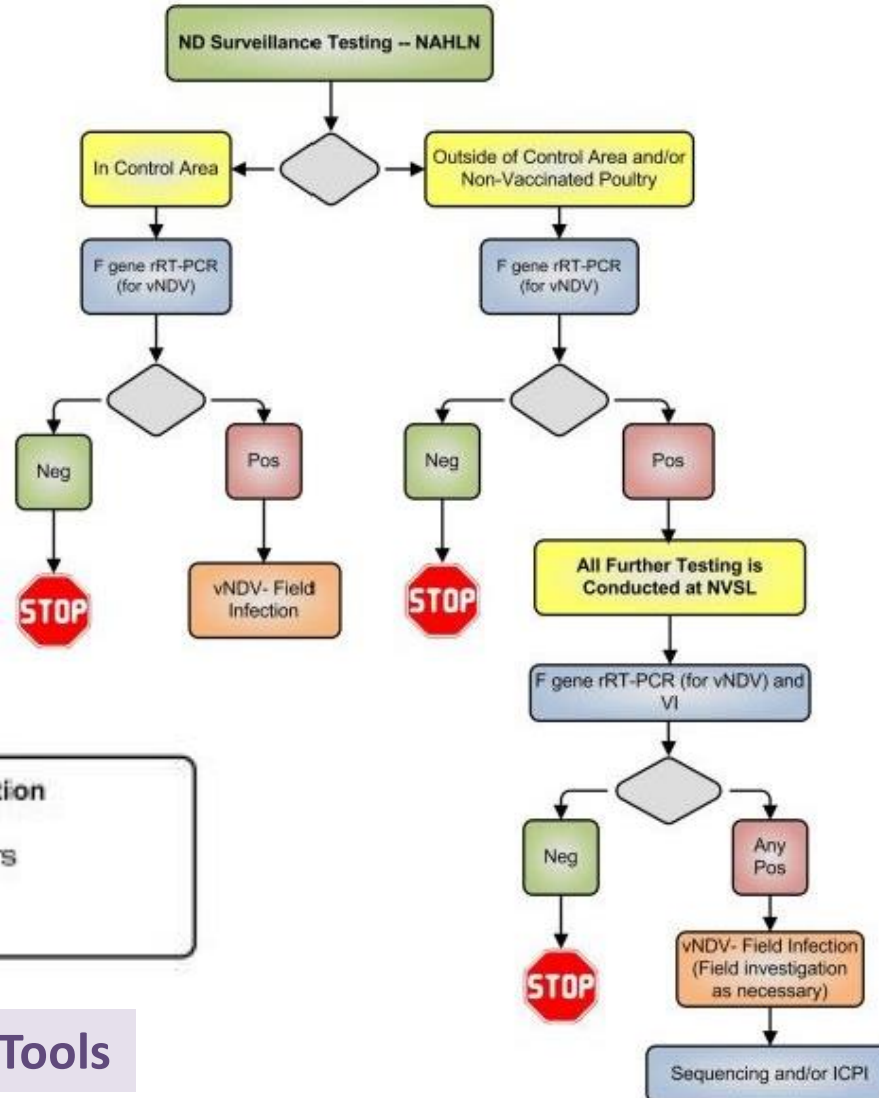
The *FAD Investigation Manual* (FAD PReP Manual 4-0) offers detailed information on diagnostic sample collection, diagnostic testing, and reporting.

# Diagnostic Flow for FAD Investigations for ND

## FAD Investigations



# Diagnostic Flow for FAD Investigations for ND Outbreak Surveillance Testing



**Estimated Time to Test Completion**  
 Virus Isolation (VI)- 5-10 days  
 F-gene or Matrix rRT-PCR- 4 hours  
 Sequencing- 24 hours  
 ICPI- 8 days

# Surge Capacity

- Surge capacity may be needed in an ND outbreak. Additional resources, such as personnel and materials, will be needed for sample collection.
  - Additional capacity may also be required for laboratory sample testing.
- Surge capacity can help facilitate a rapid response and continuity of business for non-infected premises.
- In the event that the State NAHLN laboratory and NVSL-Ames are overwhelmed by the diagnostic testing requirements, NAHLN labs from across the country will provide surge capacity for diagnostic testing.



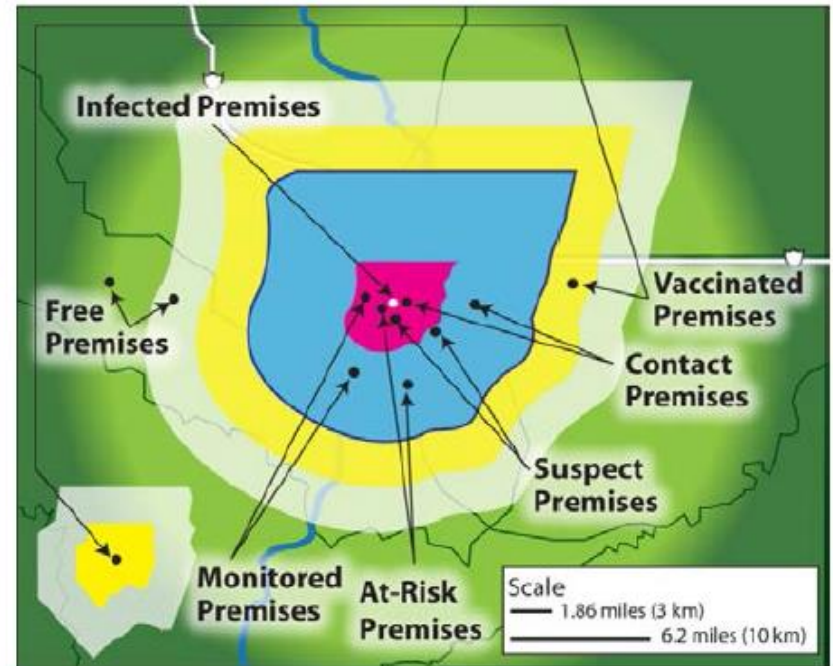
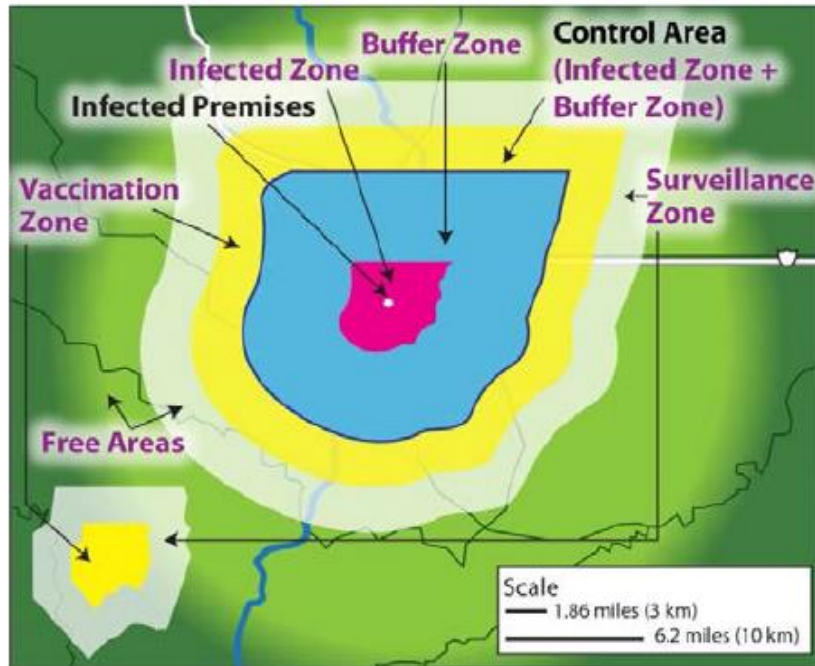
# Reporting and Notification

- Cases considered a presumptive positive for ND at NVSL-Ames, based on the current case definition, will be reported to the affected States, other States, Tribal nations, industry, other Federal agencies, trading partners, and the OIE.
- This includes breeder and commercial poultry flocks, domestic waterfowl and upland game birds, backyard flocks, and live bird marketing system (LBMS).
- Appropriate Federal-State-Tribal-industry response and containment measures are initiated during ND investigations.

# Example of Zones, Areas, and Premises in ND Outbreak Response

*Zones and Areas*

*Premises*



Note: The Vaccination Zone can be either a Protection Vaccination Zone or Containment Vaccination Zone. Stamping-out is not pictured in these figures. The Surveillance Zone is part of the Free Area.



# Epidemiological Investigation

- Epidemiological investigation and movement tracing during an outbreak are critical in controlling and eradicating ND.
- In an ND outbreak, the goals are to:
  - within 6 hours of identifying potential IP or CP through tracing activities, assign a premises classification and a priority of investigation;
  - within 24 hours of identifying the IP or initial CP, identify all additional CP; and
  - within 96 hours of identifying the index case, characterize the nature of the ND outbreak, identify the risk factors for transmission, and develop mitigation strategies.

# Tracing

- One of the single most important and urgent veterinary activities during an ND outbreak is to rapidly and diligently trace-back and trace-forward movements from an IP.
- This tracing will aid in the control of the spread of ND virus and limit the impact of the outbreak.
- Tracing should cover all movements from the premises, including susceptible poultry, non-susceptible species, animal products, vehicles, crops and grains, and people.
- Tracing also includes consideration of all potential modes of transmission and possible contact with wild birds.

# Communication

- Establish a network of stakeholders and systems for communication prior to an incident or outbreak.
- Brief the media, public, industry, Congress, trading partners, and others on the ND outbreak status and the actions being taken to control and eradicate the disease.
- Coordinate with Federal, State, and local agencies, Tribal entities, producer groups, and Land Grant University-based Cooperative Extension Services to ensure consistent messaging regarding animal health, public health, and food safety.
- Assure consumers that USDA is working on animal health issues, in an informed and timely manner, along with HHS, which is working on human health issues.

# Communication Objectives

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



# Key Communication Messages

- For consumers:
  - ND is not a food-safety issue.
  - Properly prepared eggs and poultry are safe to eat.
  - We are responding quickly and decisively to eradicate the disease.
- For producers:
  - You are the best protection your birds have.
  - Protect your flocks with good biosecurity practices.
  - Know the signs of ND, and be vigilant in reporting signs of illness.

# Health and Safety and Personal Protective Equipment

- During an ND outbreak, responders are exposed to many hazards.
- In an ND response, personal protection and safety is particularly essential to protect individuals from ND infection.
- Those at increased risk for ND infection are personnel in prolonged and direct contact with infected birds in an enclosed setting.





# Biosecurity

- An ND outbreak will have a serious impact on the agricultural industry.
- Strict biosecurity measures need to be implemented immediately to prevent or slow the spread of ND.
- Biosecurity procedures should be implemented within 24 hours of the identification of an index ND case.
- Because some people in contact with ND virus may develop conjunctivitis or a mild “flu-like” illness, USDA will coordinate with public health agencies to minimize risks to responders and others exposed.

# ND Biosecurity Hazards and Appropriate Biosecurity Measures

Biosecurity Hazards	Biosecurity Measures to Mitigate Risk
<ul style="list-style-type: none"> <li>• Movement of poultry, other livestock, vehicles, equipment, and people.</li> <li>• Contaminated feed and water.</li> <li>• Contact with susceptible birds.</li> </ul>	<ul style="list-style-type: none"> <li>• Clean and disinfect premises, vehicles, and equipment, and dispose of materials that cannot be disinfected in an appropriate manner.</li> <li>• Account for the movement of all poultry, livestock, and equipment for accurate records.</li> <li>• Provide a location for all individuals to carry out appropriate cleaning and disinfection procedures and insist these measures be followed.</li> <li>• Ensure that housed poultry remain housed and that entry of rodents, ground water, and live birds is prevented.</li> <li>• Prevent close or direct contact between poultry and wild birds.</li> </ul>

# Biosecurity

## Closed Flocks

- To the fullest extent possible, close the flock to the introduction of new poultry (with population increases occurring only from offspring).
- If closing a flock is not possible, isolate newly purchased poultry (from the healthiest possible sources) and those returning from existing flocks for 30 days or more.
- Vaccination status of introduced poultry should be known.

# Quarantine and Movement Control

- By restricting the movement of infected animals, animal products, and contaminated fomites, quarantine and movement control can be a powerful tool in controlling and eradicating an ND outbreak.
- Movement control is accomplished through a permit system that allows entities to make necessary movements without creating an unacceptable risk of disease spread.
  - EMRS 2.0 is the system of record for these movements.



# Inactivation of AI in Eggs, Egg Products, and Meat

## Inactivation of Newcastle Disease in Eggs and Egg Products

	Temperature (°C)	Time
Whole egg	55.0	2,521 seconds
Whole egg	57.0	1,956 seconds
Whole egg	59.0	674 seconds
Liquid egg white	55.0	2,278 seconds
Liquid egg white	57.0	986 seconds
Liquid egg white	59.0	301 seconds
10% salted yolk	55.0	176 seconds
Dried egg white	57.0	50.4 hours



## Inactivation of Newcastle Disease in Meat

	Temperature (°C)	Time
Poultry meat	65.0	39.8 seconds
	70.0	3.6 seconds
	74.0	0.5 seconds
	80.0	0.03 seconds

# Continuity of Business

- Continuity of business is the management of non-IP and non-contaminated animal products in the event of an ND outbreak.
- This helps agriculture and food industries facilitate routine business, or a return to business, during a disease response, while the risk of disease spread and threat to public health is effectively managed.



**SES**  
SECURE  
EGG SUPPLY



**SBS**  
SECURE  
BROILER SUPPLY



**STS**  
SECURE  
TURKEY SUPPLY

# Mass Depopulation and Euthanasia

- Poultry on an IP will be depopulated as soon as possible after declaration of an ND outbreak.
- Poultry on CP may also be depopulated as soon as possible after the premises are classified as CP.

The *NAHEMS Guidelines: Mass Depopulation and Euthanasia* contains additional information on euthanasia and mass depopulation.

# Disposal

- Appropriate disposal of animal carcasses and materials is a critical component of a successful ND response.
- The *Disposal SOP* discusses how to dispose of thousands of bird carcasses, contaminated and potentially contaminated materials, poultry products, items that cannot be properly cleaned and disinfected (such as manure, litter, and bedding), products of the response effort (such as PPE), and products of vaccination response.
- Disposal will occur as soon as possible after flock depopulation.

The *NAHEMS Guidelines: Disposal* also contains further guidance on disposal activities.



# Cleaning and Disinfection

- Because of ND's high survival rate on both organic and inorganic materials, aggressive cleaning and disinfection practices are required for control and eradication.
- Cleaning and disinfection are to be conducted within 48 hours of the disposal of depopulated poultry.

The *NAHEMS Guidelines: Cleaning and Disinfection* contains additional information on cleaning and disinfection.

# Vaccination

- Vaccination using lentogenic (low virulence) vaccines is widely practiced in the U.S. poultry industry, particularly in broiler breeders, layers, and turkeys.
- Vaccination does prevent clinical signs, and can thereby mitigate production losses from low virulence strains of APMV-1.
  - However, poultry will still shed the virus, and typical lentogenic vaccination may not be sufficient to protect poultry from a velogenic challenge.

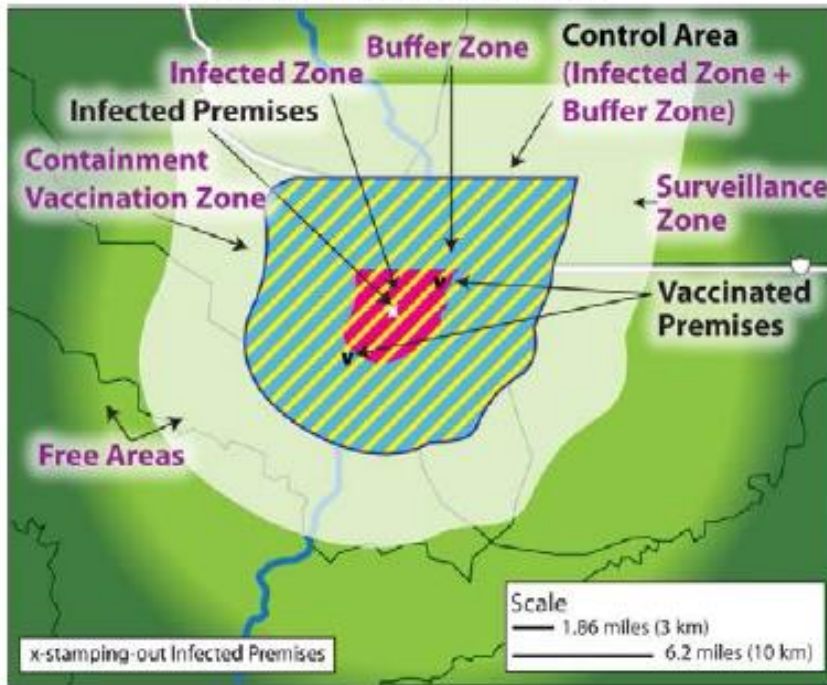
# Deciding to Vaccinate for ND

The decision for emergency vaccination will be based on:

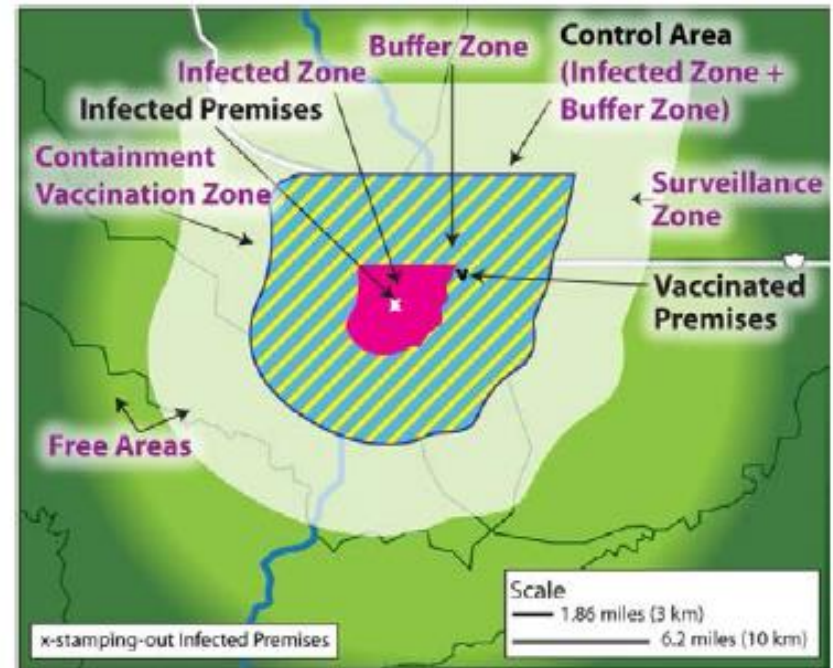
- Probability that the disease can or cannot be rapidly contained;
- Proximity of high-value genetic birds to the rapidly spreading disease focal point;
- Risk of infection of valuable, rare, or endangered nondomestic species;
- Poultry density in an area;
- Increased risk of introduction due to the presence of ND in neighboring countries;
- The extent to which disease is found in waterfowl, other wild birds, backyard flocks, or in live bird markets;
- Availability of physical and human resources;
- Sociopolitical factors (public confidence in commercial poultry products);
- Impact on international trade; and
- Economic consequences of failure to control the disease.

# Examples of Containment Vaccination Zones

*Emergency Vaccination in IZ*



*Emergency Vaccination in BZ (Buffer Zone)*



# Examples of Containment Vaccination Zones, continued

*Emergency Vaccination in CA*

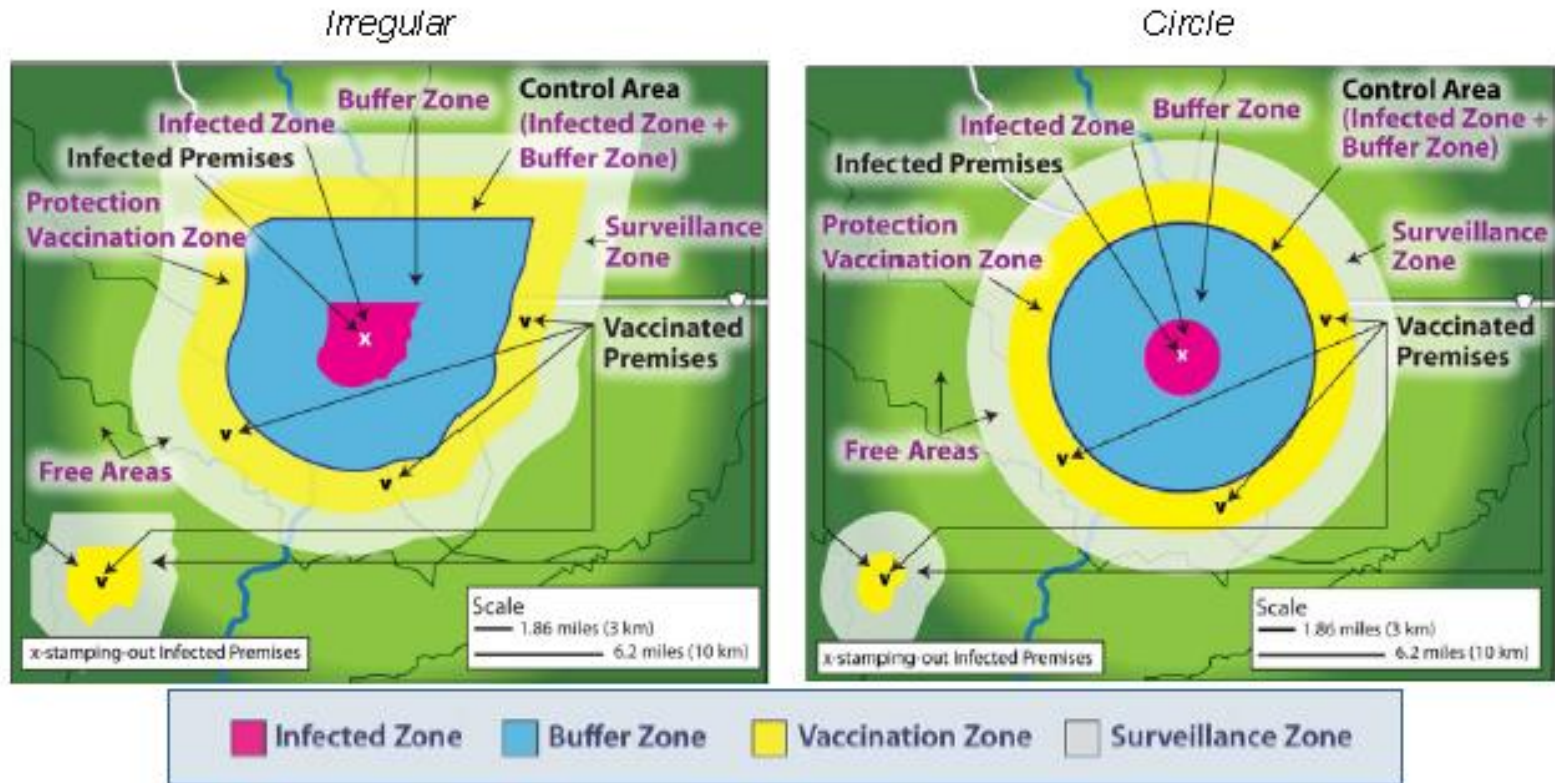


*Emergency Vaccination in IZ and Partial BZ*



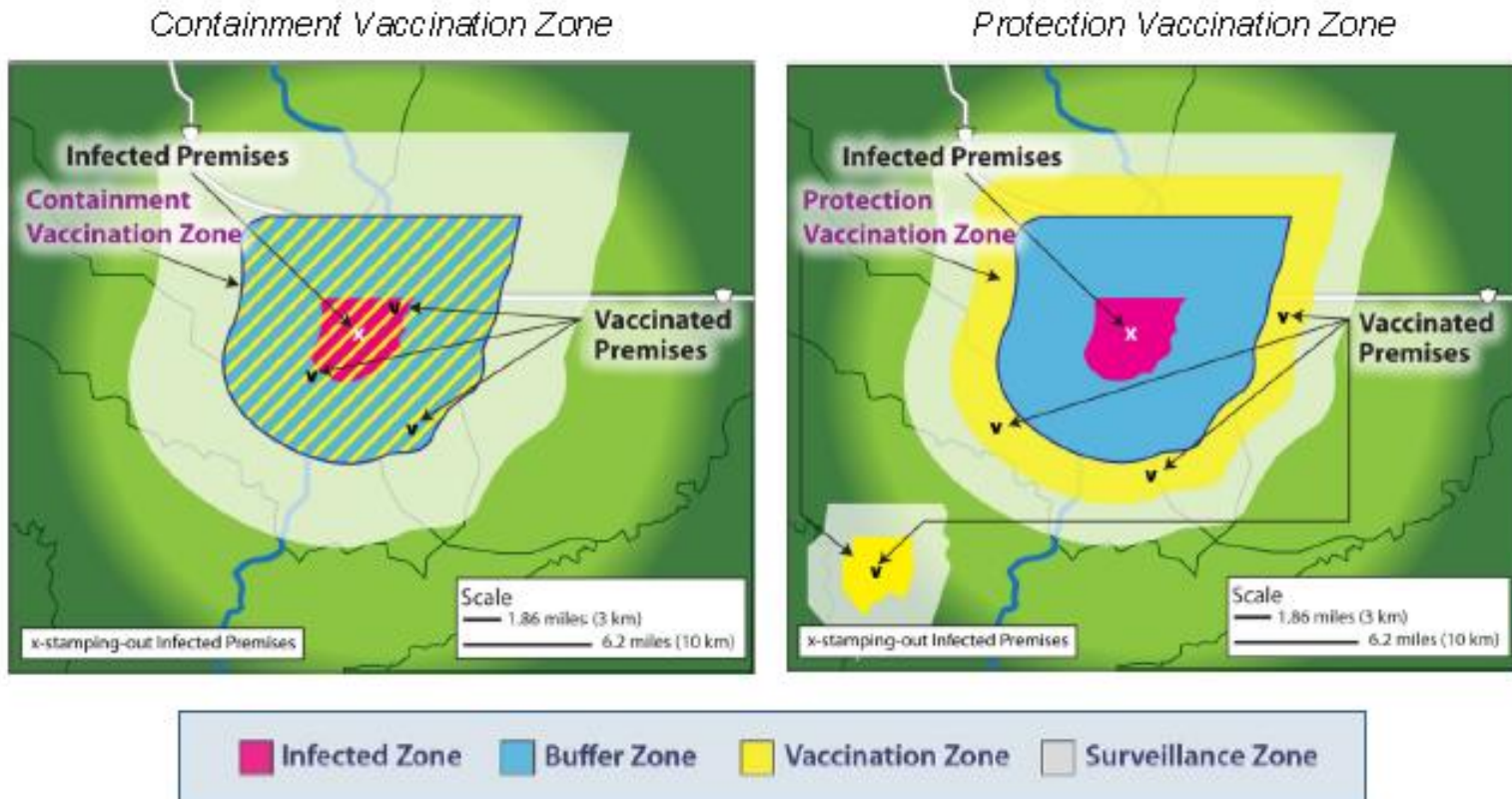
# Examples of Protection Vaccination Zones

Typically, a PVZ would be observed with stamping-out modified with emergency vaccination to live.



# Examples of Vaccinated Premises

VP is typically a secondary designation to another premises designation and is only used if vaccination is employed in an outbreak.



# Wildlife Management and Vector Control

- Wildlife surveillance and management must be conducted by persons trained and proficient in wildlife health, capture, collection, biosecurity, and restraint.
- ND can be transmitted mechanically by mice, vultures, and other vectors.
- Appropriate biosecurity measures should be in place during an ND outbreak to ensure that mechanical vectors do not have contact with infected flocks or other infected material.



# Appraisal and Compensation

- Indemnity is a key component of APHIS's disease control programs in that the promise of fair compensation for losses helps to ensure cooperation from the owners of affected poultry.
- In an ND outbreak, ordering the destruction of poultry on premises that are epidemiologically linked to an IP may be necessary to ensure that the ND does not spread.
- The Secretary of Agriculture has the authority to pay up to 100 percent of the fair market value of the poultry, as well as for disposal, cleaning, and disinfection.

# Finance

- During an ND outbreak, funding may be rapidly required. For responding to specific emergency situations, VS has access to a variety of sources for funding. The two most common sources are the APHIS Contingency Fund (CF) and the Commodity Credit Corporation (CCC).

# ND RESPONSE PLAN



## Recovery after an Outbreak

# Surveillance for Recognition of Disease Freedom

- Surveillance is fundamental in proving DF to regain disease-free status after an ND outbreak.
- The OIE does not grant official recognition for ND-freedom, but as a member of the OIE, the United States can self-declare a compartment, zone, or the country free from certain OIE-listed diseases such as ND.

# Release of Quarantine and Movement Control

- Quarantine and movement control restrictions are maintained until at least 21 days have elapsed since the decontamination of all confirmed IP and negative results of surveillance activities.



# Repopulation

- Following official approval of cleaning and disinfection procedures, IP will remain vacant for a minimum of 21 days to ensure that any residual virus has been eliminated.
- This period may be decreased if external heat is used to raise the temperature of the houses sufficiently to inactivate any residual virus in a shorter period.
- Source flocks for all introduced poultry must test negative through rRT-PCR and other diagnostics, as determined by IC.



# Further Information

# FAD PReP Supporting Documents and Materials

- Strategic Plans—Concept of Operations
- National Animal Health Emergency Management System (NAHEMS) Guidelines
- Industry Manuals
- Disease Response Plans
- Standard Operating Procedures (SOPs) for Critical Activities
- Continuity of Business Plans
  - Commodity specific plans developed by public-private-academic partnerships
- Ready Reference Guides



# Key Abbreviations

APMV-1	avian paramyxovirus serotype-1	NRF	National Response Framework
FAD	foreign animal disease	NVSL	National Veterinary Services Laboratories
FAD PReP	Foreign Animal Disease Preparedness and Response Plan	OIE	World Organization for Animal Health
loNDV	low virulence Newcastle disease virus	PPE	personal protective equipment
ND	Newcastle Disease	vNDV	virulent Newcastle disease virus
NDV	Newcastle disease virus	VS	Veterinary Services
NIMS	National Incident Management System	WHO	World Health Organization