

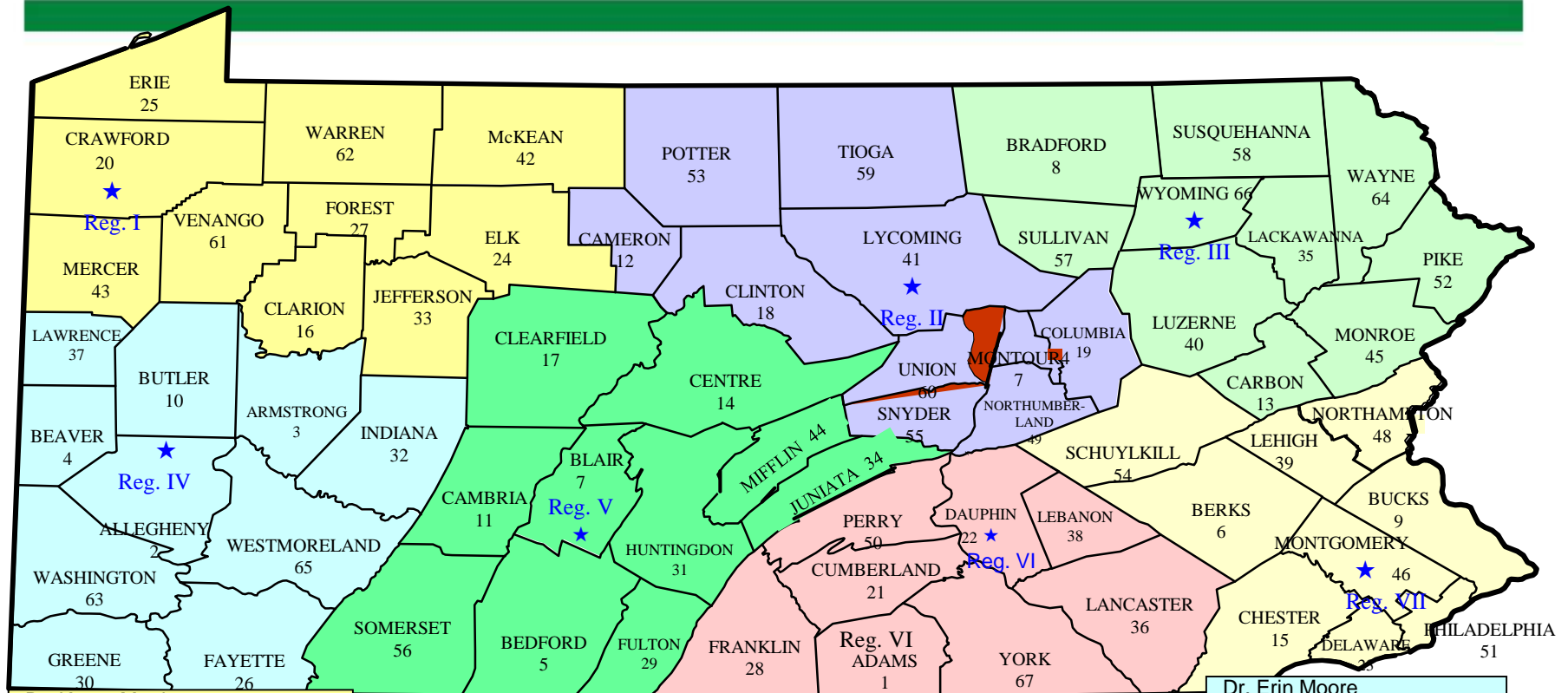
High Pathogenic Avian Influenza



Amy J. Nesselrodt, DVM
Veterinary Medical Field Officer
PA Department of Agriculture
Bureau of Animal Health
and Diagnostic Services



PDA Regional Map



Dr. Karen Martin
REGION I
13410 Dunham Rd.
Meadville, PA 16335
(814) 332-6890

Dr. Amy Nesselrodt
REGION II
542 County Farm Rd., Suite #102
Montoursville, PA 17754
(570) 433-2640

Dr. Tony LaBarbera
REGION III
Rt. 92 South, P.O. Box C
Tunkhannock, PA 18657
(570) 836-2181

Dr. Erin Moore
REGION IV
226 Donohoe Road
Greensburg, PA 15601
(724) 832 - 1073

Dr. Elizabeth Santini
REGION V
403 E Christiana Street, Suite 3
Martinsburg, PA 16662
(814) 793 - 1849

Dr. John Roberts
REGION VI
2301 N. Cameron Street, G-5
Harrisburg, PA 17110
(717) 836 - 3237

Dr. Aliza Simeone
REGION VII
1015 Bridge Street, Suite 100
Collegeville, PA 19426
(610) 489-1003



pennsylvania
DEPARTMENT OF AGRICULTURE

Topics for Discussion

- ✓ Definitions
- ✓ Timeline of HPAI events in PA and US
- ✓ Current updates on HPAI incident
- ✓ Identifying signs of AI
- ✓ **BIOSECURITY!!** *The name of the game*
- ✓ *Depopulation*
- ✓ *Carcass Disposal*

Helpful Definitions

Avian Influenza (AI) – a highly contagious disease caused by the influenza A virus; can be zoonotic; affects fowl, turkeys, pheasants, wild birds (sometimes); favors cool, damp environments; inactivated by heat; no vaccine

AI Virus Classifications – Many different strains or subtypes characterized by combining 2 groups of proteins labeled as H (Hemagglutinin) and N (Neuraminidase)

H1 – H16 and N1 – N9,
up to 144 subtypes can exist

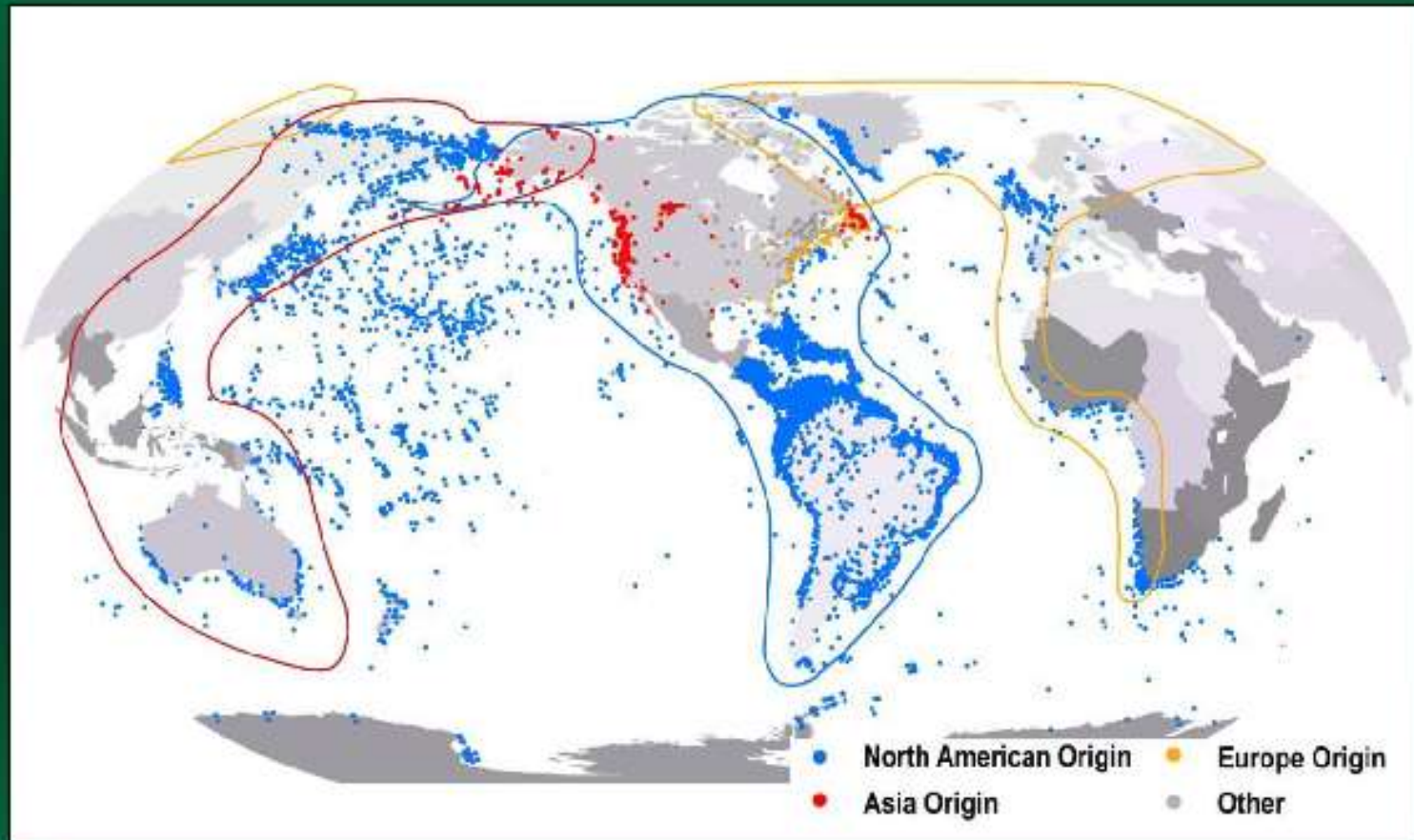
Helpful Definitions

Biosecurity – measures taken to minimize disease risks

Flyway Zone – major route of travel for migratory birds (Pacific, Central, Mississippi, Atlantic)

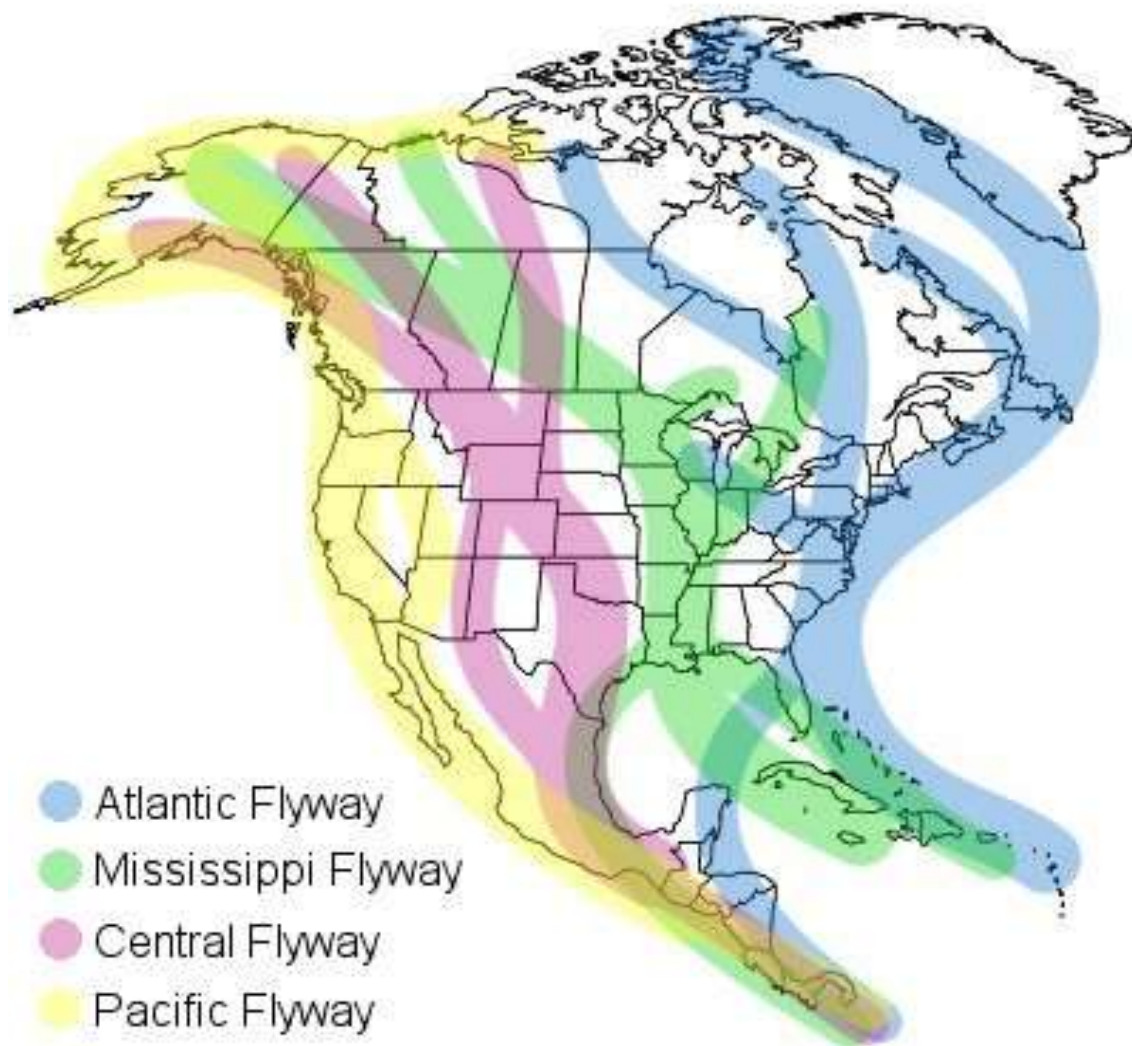
HPAI (High Pathogenic Avian Influenza) – often fatal to chickens and turkeys, spreads rapidly

Wild Bird Migration



Distribution of bird bands for birds banded in North America and recovered in other continents (blue) and for birds banded in Asia (red) and Europe (orange) and recovered in North America between 1913 to present. Crude representations of the Americas flyway (blue polygon) and the East Asian/Australia flyway (red polygon) and East Atlantic (orange polygon) are included ([USGS, 2013](#)).

Flyway Zones



Timeline of HPAI Events in PA & US

History HPAI:

1878 – AI first recorded in Italy, known as Fowl Plague

1924 – first US reported case H7 strain detected and contained in East Coast live bird market

1983/1984 – begins as LPAI, 6 months later H5N2 strain identified in NE US, 17 millions birds destroyed, \$60 million in product lost (PA)

2004 – H5N2 strain in chickens only, S/US, contained to 1 flock

No significant cases of human illness resulted from these outbreaks



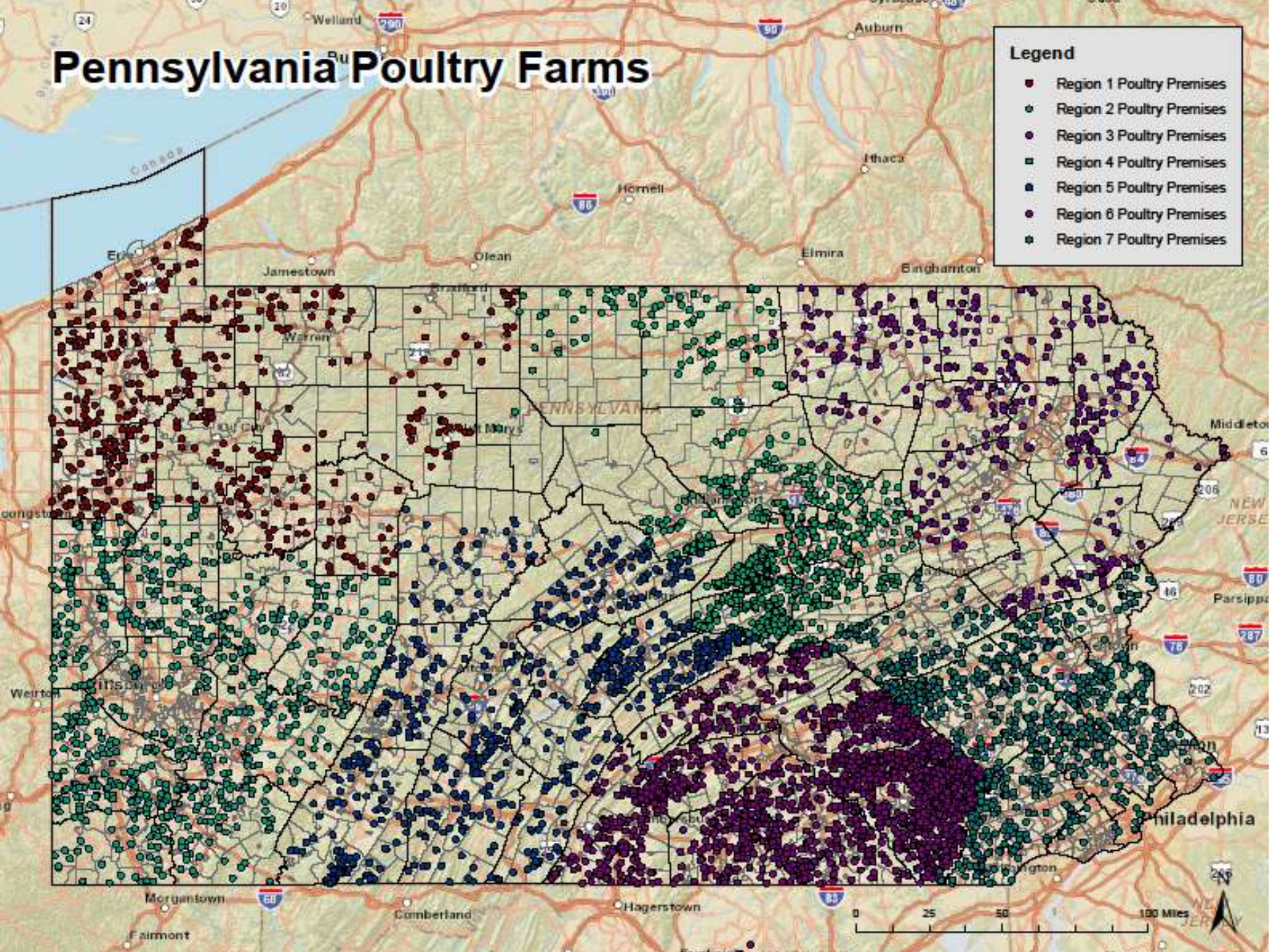
Pennsylvania Poultry Farms

This map displays the locations of poultry farms across Pennsylvania, categorized into seven regions. The regions are defined by color-coded markers: Region 1 (dark red), Region 2 (green), Region 3 (purple), Region 4 (dark blue), Region 5 (light blue), Region 6 (dark purple), and Region 7 (dark green). The map includes major highways, county boundaries, and city names. A legend in the top right corner identifies the regions. A scale bar at the bottom right indicates distances up to 100 miles.

Legend

- Region 1 Poultry Premises
- Region 2 Poultry Premises
- Region 3 Poultry Premises
- Region 4 Poultry Premises
- Region 5 Poultry Premises
- Region 6 Poultry Premises
- Region 7 Poultry Premises

- Region 1 Poultry Premises
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- Region 7 Poultry Premises



US 2014/2015 HPAI Outbreak

- November/December 2014 - Asian sourced H5N8 virus spreads to Pacific flyway via migratory birds
- December 19, 2014 – first reported US case of H5N8 found in Douglas County, Oregon
(Pacific Flyway)
- Backyard flock consisting of 130 mixed poultry
- Additional H5N8 cases in backyard flocks were reported in Washington and Idaho

US 2014/2015 HPAI Outbreak

- USDA places import restrictions on poultry and poultry products from designated areas in BC, Canada
- January 3, 2015 – first case of H5N2 is reported in backyard flock (140) Benton County, WA
- Original Eurasian HPAI H5N8 strain recombines w/NA LPAI strains resulting in 2 **NEW** HPAI viruses H5N1 and H5N2
- H5N8 virus begins to migrate throughout Pacific flyway zone into commercial chicken and turkey operations

US 2014/2015 HPAI Outbreak

- January 23, 2015 – first reported case of H5N8 in commercial **turkey** operation affecting 134,400 turkeys in Stanislaus County, CA
- February 12, 2015 – first reported case of H5N8 in commercial **chicken** operation affecting 112,900 chickens in Kings County, CA
- February until present – virus migrates from Pacific flyway zone to Mississippi flyway zone; consistent cases of H5N2 reported

US 2014/2015 HPAI Outbreak

- March 4, 2015 – first reported case of H5N2 in Mississippi flyway in Pope County, **Minnesota** (44,000 commercial turkeys affected)
- May 18, 2015 – first reported case of H5N2 in Central flyway in Moody County, **SD** (642, 700 commercial layers affected)
- June 9, 2015 – first reported case of H5N2 in mixed game fowl (2500 birds) **Iowa**
- June 17, 2015 – last reported case of H5N2 in Wright County, **Iowa**

(1 million commercial chickens!!)

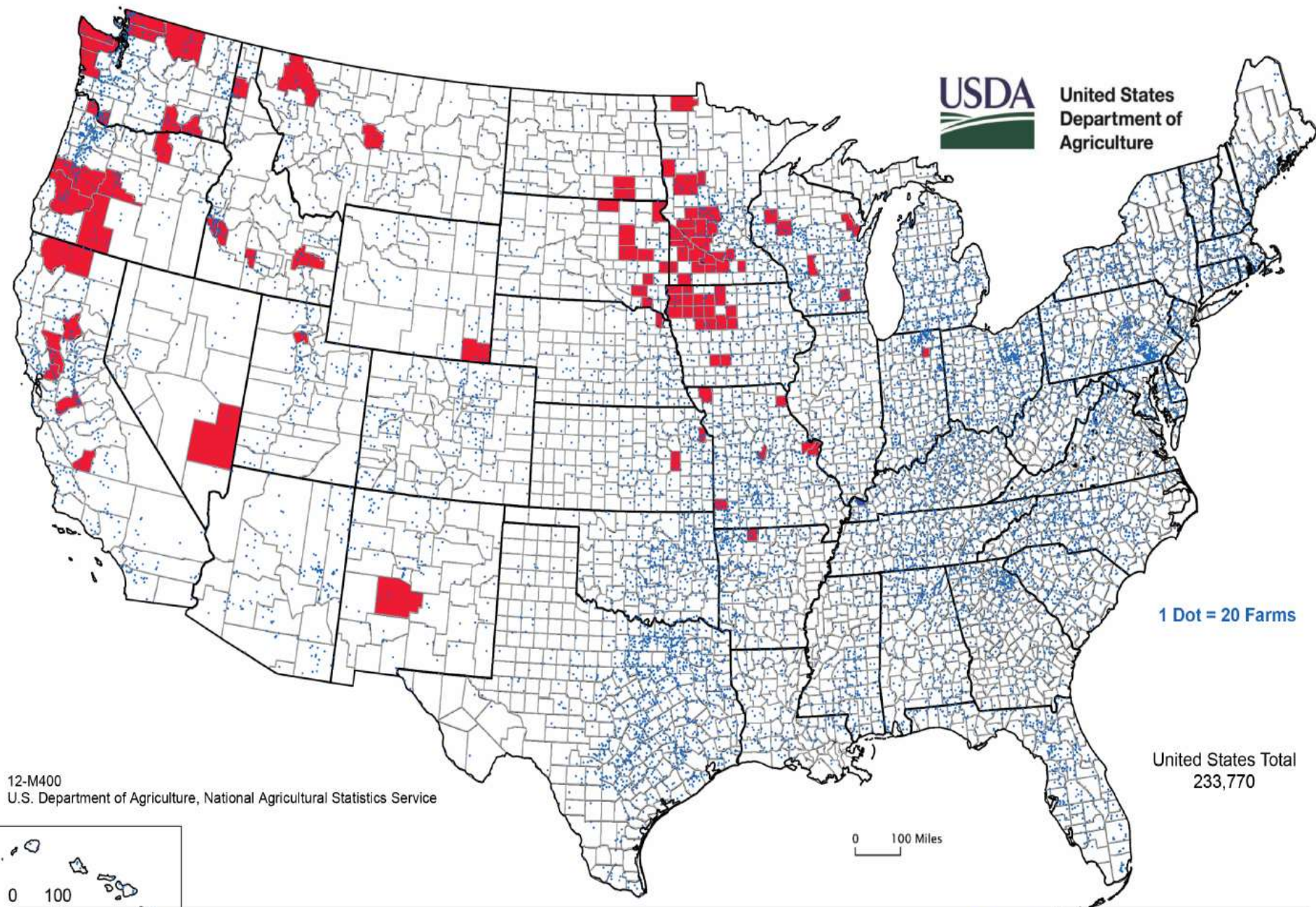
US 2014/2015 HPAI Outbreak

Most Current Information:

- ✓ 232 reported detections (211 comm., 21bkyd)
- ✓ 21 states affected: California, Minnesota, Missouri, Arkansas, South Dakota, North Dakota, Wisconsin, Iowa, Nebraska, Oregon, Washington, Idaho, Kentucky, Montana, Michigan, New Mexico, Nevada, Utah, Wyoming, Kansas and Indiana (closest to PA)
- ✓ 48, 091, 293 birds affected: turkeys: approx. 7.5 million
chickens: approx. 42.1 million
- ✓ 84 wild bird detections/ 5 captive wild bird det.
- ✓ Approximately 1 billion dollars in control costs



United States
Department of
Agriculture



12-M400
U.S. Department of Agriculture, National Agricultural Statistics Service

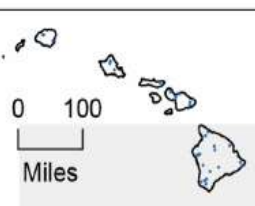


Figure 1. All HPAI Detections As Of June 5, 2015 PM (as reported on www.aphis.usda.gov)

*one or more detections may have occurred in county

US 2014/2015 HPAI Outbreak

Current Trade Impact:

- 20% of US poultry meat production is exported
- Total exports in 2014 = \$6.5 billion

Anticipated that HPAI will cause 1/3 reduction in exports

- 11 countries have suspended imports on all US-origin poultry and poultry products: *China, Russia, S. Korea, Indonesia, S. Africa, Thailand, Morocco, Argentina, Sri Lanka, Uruguay, and Algeria*
- 35 countries have “regionalized” the US by allowing trade to continue from HPAI non-affected areas

2016 –A New Strain of AI

- January 15, 2016: **H7N8** Southern Indiana Turkeys: high mortality
- Testing at nearby farms week turned up a low-pathogenic version of the virus in 9 more farms.
- Virus likely mutated to a more lethal strain as it spread.
- One layer flock also destroyed (“dangerous contact”)

US 2014/2015 HPAI Outbreak

- ✓ Virus is spread by migrating wild waterfowl
- ✓ Virus is shed in large amounts in feces
- ✓ One gram from an infected duck contains 10,000 infectious doses for turkeys
- ✓ Survives in the environment for long periods during cool damp days

US 2014/2015 HPAI Outbreak

What we are learning:

- ✓ Virus is not consistently being spread via migratory waterfowl, sea/shore birds
- ✓ New theories include: poor biosecurity, wind, weather, feathers, rodents, eggs, insects
- ✓ CDC reports risk to humans as LOW
- ✓ Poultry products are *still safe to consume* if prepared properly
- ✓ Communication is key!

Signs of HPAI

- ✓ Extremely infectious and fatal
- ✓ Spreads rapidly (3 -4 days)
- ✓ Birds are quiet and lethargic
- ✓ Swollen head, wattles, combs
- ✓ Leg hemorrhages
- ✓ Neurologic signs
- ✓ Respiratory signs are not typical with HPAI
- ✓ Signs are usually absent in wild waterfowl
- ✓ Sudden increase in death losses

HPAI Clinical Signs, Lesions



Slide courtesy of Dr. Eva Pendlelton, PSU/ADL

BIOSECURITY

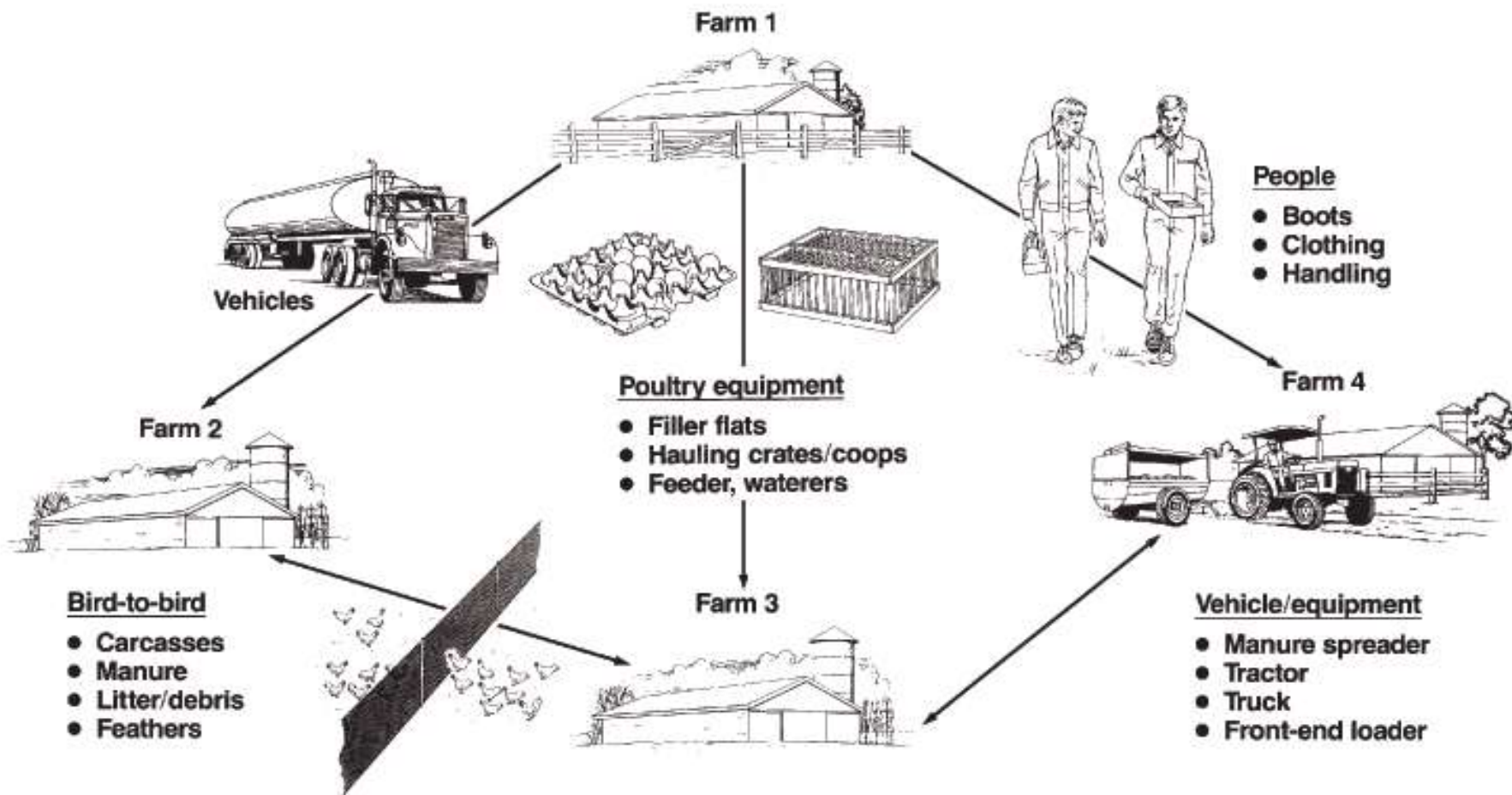
THE NAME OF THE GAME!

- ✓ Avoid contact with wild waterfowl, poultry auctions/swap meets, and live bird markets
- ✓ Avoid sharing equipment that is difficult to disinfect (wooden crates)
- ✓ Restrict visitors/unauthorized personnel
- ✓ Disinfect footwear and vehicles properly!!
- ✓ Communicate biosecurity protocols to other farm personnel and family members

BIOSECURITY

- ✓ Purchase products, birds from credible sources
- ✓ Isolate new birds for 2 weeks or more
- ✓ Register your premises with PDA
Ron Miller 717-836-3235
- ✓ Change clothes and footwear when visiting other common poultry areas
- ✓ Dispose of dead birds promptly and properly
- ✓ Eliminate rodents and insects
- ✓ Create a visitor's log
- ✓ Post biosecurity signs

How Poultry Disease Spreads



HPAI RESPONSE PROCESS

1. Detect- PADLS Lab and confirmation at NVSL
2. Quarantine placed on premises
3. Appraise
4. Depopulate
5. Compensate
6. Manage disposal
7. Eliminate virus- C&D
8. Test
9. Restock
10. Maintain increased biosecurity

HPAI Response Principles

Depopulation Methods

- High or medium expansion foam- ideal for floor birds
- CO2 Gas – one option for multiple-deck egg laying operations

Foamer for floor bird depopulation



Water Sources for Foamer



Foam Generator

- Typical response
 - Time: 20 min actual, 20 – 30 min set up
 - Personnel: 1 in, 1 out, typically 1 – 3 extra
 - Average houses
 - Water: ~5,000 gal (42 x 400'), ~11,000 gal (66 x 560')
- Requires strong tow vehicle

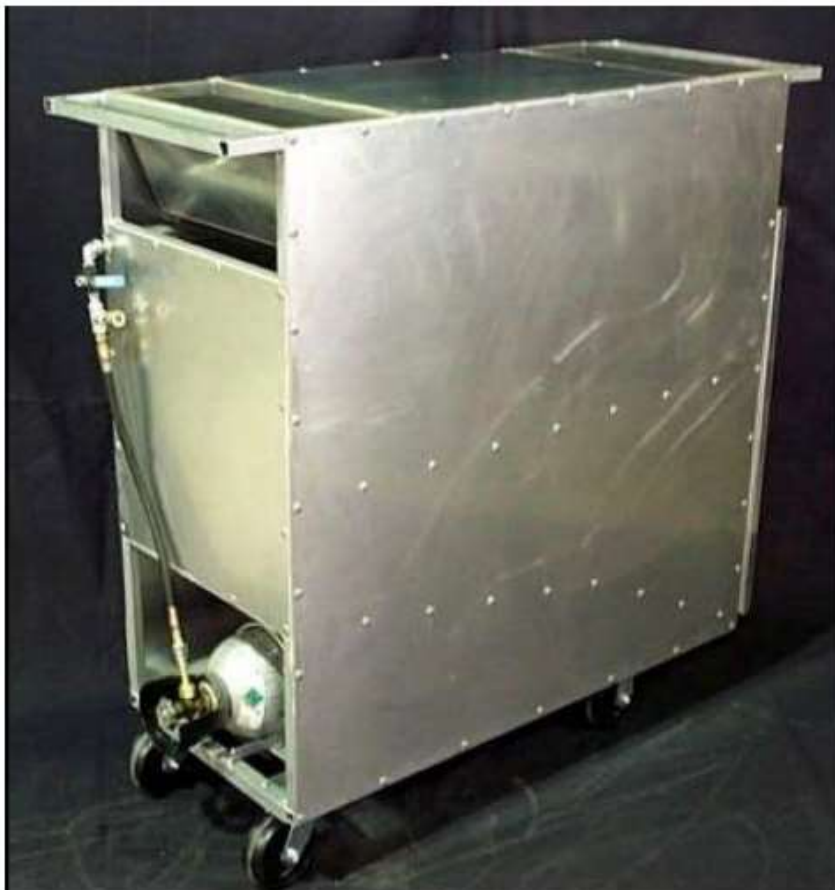


Single and dual generator systems.

Multi-Deck Layer Facility



CO2 Euthanasia Carts



HPAI Response Principles

Disposal Methods

USDA **prefers** on-site management to minimize viral spread

- Composting
- Burial

HPAI Response Principles

Disposal Methods

Instances where on-site disposal is not suitable (DEP regulations)

- Geology inappropriate
- Nearby drinking water sources

Secure transport to and off-farm disposal site

- Municipal solid waste landfill
- Roll-offs with liners and tarps

HPAI Response Principles

DEP Assistance

- DEP (South Central Field Office) and others are visiting all poultry CAFOs now to identify the appropriate disposal method for each unique CAFO and review any existing HPAI work plans they have
- DEP and PDA are working together with all landfills and waste authorities to prepare them for receiving birds

HPAI Response Principles

DEP Assistance

- In consultation with USDA, DEP is in the process of developing biosecurity procedures for the hauling and decontamination processes for HPAI landfill operations
- During response, PDA or USDA will assign a “site manager” to the quarantined premises
- The site manager will work with DEP on the disposal activities

- Biosecure movement to licensed landfill is another possibility
- Is this dumpster biosecure?



Roll-Offs



Roll Offs

- Lined with Plastic
- Bio Bag (zippered)
- When filling must allow space for Decomposition
- Exercise caution when “burping” the bags.



Research by PSU: *Ensiling Poultry Carcasses for Bio-secure Preservation & Virus Destruction*

- Rapid and sustained drop in pH
- Bacteria:
 - Coliforms: eliminated by day 7 & 14
 - Lactic acid bacteria: maintained $1.0E8-4$
- Virus Isolation: No positive samples
All trachea & cloaca pools
& tubes virus negative!



Summary

- Meets the FAD-USDA guidelines for “storage”
- Mechanics & logistics of carcass handling +++



Summary

- Ensiling can scale-up for commercial application & take feed and eggs
- 100,000 hens, 10ft bag: 809 bds & 2630 lb/ft & 124 ft bag
- 1 mill hens, 14ft bag: 1588 bds & 5160 lb/ft & 630 ft bag



Questions???

So...Remember to Wear Your Boots!

