Avian Flu Planning in MA
A lesson in Inter-Agency GIS Cooperation

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Highly Pathogenic Avian Influenza

BIRD FLU...

ME??
I FEEL GREAT!
HONESTLY!
JUST FINE.
NOT EVEN A HINT OF A SNIFLE...
NEVER BEEN BETTER...

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fewings.ca
What’s the big deal?

24/7 Science Behind the Scenes Medical Files

When Birds Get Flu and Cows Go Mad!

How Safe Are We?

John D. Consiglio

True-Life Cases!

Scholastic
No Laughing Matter!
“Plans are worthless, but planning is everything”

Dwight D. Eisenhower

1957
<table>
<thead>
<tr>
<th><strong>Primer</strong></th>
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<tbody>
<tr>
<td><strong>Low Pathogenic Avian Influenza</strong></td>
<td><strong>Highly Pathogenic Avian Influenza</strong></td>
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<tr>
<td>• Occurs in wild birds</td>
<td>• Spreads rapidly</td>
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<tr>
<td>• Can spread to domestic birds</td>
<td>• Is often fatal to domestic birds</td>
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<td>• Minor symptoms</td>
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<td>Previous Outbreaks:</td>
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<td>• 1924: East Coast</td>
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<td>• 1983-84: 17 million chickens, turkeys &amp; guinea fowl PA and VA</td>
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<td>• 2004: Texas</td>
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Highly Pathogenic Avian Flu is:

- Highly contagious disease
- Short incubation period
- Spread by water fowl & other wild birds
  - Meat birds & layers vulnerable - limited genetic variation
- High Mortality Rates
- Economic Impacts
- Food Supply Issues
- Zoonotic Potential
  - Flu shots for emergency workers
    - minimize chance virus can mutate and cross species
How Did it Get Here?

Migratory Flyways

- HPAI entered USA via Pacific Flyway Dec, 2014
- Mutation of Asian Bird Flu with resident Low Pathogenic Influenza
- Concern it would arrive via Atlantic Flyway - Fall, 2015

Source: USGS
Just a reminder - Scale Matters!

Generalized Migratory Flyways

More Detailed Flyways (note overlap)
What Areas Were Affected?

Figure 5. All HPAI Detections in All Birds, by Type, as of 8/31/2015 (as reported on www.aphis.usda.gov) *one or more detections may have occurred in county.
How Bad Was It?

- December 2014 – December 2015
  - 21 states
  - 212 farms/other premises
  - 7.5 million turkeys
  - 42.1 million chickens
  - Costs exceeded $950 million

- “It’s totally frightening. If we had a sick bird before Thanksgiving, it would have put us out of business. There would be no recovering from that.”
  
  Treasurer for a Lancaster, MA Turkey Farm as quoted in the Boston Globe Dec 14, 2015
How might MA deal with an outbreak of HPAI?

- Respond aggressively...
- Eradicate the disease quickly...
- Minimize Spread and Impact

- Response is going to require substantial resources

Kurt Schwartz,
Director, MEMA
Let’s get Busy...
Many State Agencies, Many Roles
Public Safety
Public Health
Environment
Lots of Overlap...
Federal and Local agencies too...

- Municipal Boards of Health,
- Police & Fire Departments,
- Boards of Selectmen, Mayors & City Councils

- to name but a few of the Local ones...

- What might the workflow look like?
6 Steps of Outbreak Management

• Detection
• Site Assessment
• Depopulation
• Disposal
• Decontamination
• Site Clearance / Repopulation

• Where might GIS fit in?
6 Steps of Outbreak Management

- Detection & Containment – where?
- Site Assessment – OK to contain and manage on site?
- Depopulation
- Disposal – onsite or elsewhere?
- Decontamination
- Site Clearance / Repopulation
GIS to the Rescue!
Additional GIS Resources
Interagency GIS Priorities:

- Who needs what, when, who has it, who can get it?
  - Data – gather and develop as needed
  - Analysis Output – spreadsheets/tables or maps?
  - Maps – paper or digital? Interactive? Update frequency?
  - GIS support - 24 x 7 coverage?

- Get information to Key Personnel in Multiple Agencies

- Avoid Duplication of Effort
Big Picture & some Data Holes...
Overview of GIS Support:

- Map virus detections & “hot zones”
- Determine site suitability
  - Natural resources, sensitive receptors
- Identify and locate disposal options
  - Resources for on-site disposal
  - Feasibility of off-site options
Detection and Containment:

- Identify farms within radius of concern
- Quarantine flocks
- No movement in/out of “hot zone”
Managing 10 km “hot zone” in MA:

Sample Situational Awareness Map

FarmID 12345
Fake Chicken Ranch
0 Some Street.
Medfield, MA
108 known bird farms
within this 10K Radius circle.
16 Towns within 10 km
30 Major road crossings

For Illustrative purposes only
NO INFECTION FOUND!

Sample Output Date 10/19/15
Produced by BRB MassDEP

Legend
- Bird Farm Positive HPAI
- Bird Farms within 10 km
- Other Bird Farms
- 3 & 10 km Circles

Road Type
- Limited Access Highway
- Multi-lane Hwy, not limited access
- Other Numbered Highway
- Major Road, Collector
- Minor Road, Arterial
- Ramp
- MA Towns

0 2.5 5 10

FRANKLIN NORFOLK
HOLLISTON
SHERBORN
CANTON
GLOUCESTER
DANVERS
MEDFIELD
NEEDHAM
WESTWOOD
NEEDHAM
BOSTON
BROOKLINE
DEDHAM
BROOKLINE
0
DRAFT!!
Numbers of Birds and Locations:

Massachusetts Registered Farms

<table>
<thead>
<tr>
<th>Number of Farms</th>
<th>Number of Birds</th>
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<tbody>
<tr>
<td>1 to 9</td>
<td>1960</td>
</tr>
<tr>
<td>10 to 99</td>
<td>2677</td>
</tr>
<tr>
<td>100 to 999</td>
<td>146</td>
</tr>
<tr>
<td>1,000 to 9,999</td>
<td>14</td>
</tr>
<tr>
<td>10,000 to 99,000+</td>
<td>2</td>
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</tbody>
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Detection and Containment:

- Identify farms within 3 & 10 km radius.
- Quarantine flocks.
- What about dairy cattle?
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“Waste” Management:
- Manage birds on site?
- If not on-site, where?
- Treat protective eqpt as hazardous waste - incinerate
“Waste” Management issues

- Compost on site?
  - Environmental criteria
    - Setbacks to resources/receptors
  - Site-related restrictions
    - Logistics of meat birds vs. layers
- Bulking material for on-site composting
  - Yard waste, wood chips, manure
  - Free or fee? Where, what volume, when?
- If not on-site, where?
  - Landfills – “grading” concerns
  - Incinerators – “fluffing” concerns
Preliminary Discussions...
Site Assessment: Small farm example of Large Farm plan

Avian Flu Carcass Management Plan
For inter-agency planning purposes - Fall 2015
Timing is everything

- Before or after Thanksgiving...

- Flu viruses like cold weather,
  - If it comes, let’s hope it’s after the holidays...
High expansion foam (carbon dioxide)

Farmer disinfecting shoes
Suzanne Kreiter/Globe Staff

Decontamination of vessels and other equipment
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Wild Bird Species:

- 1. American green-winged teal
- 2. American wigeon
- 3. Gadwall
- 4. Mallard
- 5. Northern pintail
- 6. Northern shoveler
- 7. Ring-necked duck
- 8. Wood duck
- 9. Canada goose
- 10. Lesser snow goose
- 11. Bald eagle
- 12. Cooper’s hawk
- 13. Peregrine falcon
- 14. Red-tailed hawk
- 15. Snowy owl

Appendix 1: Surveillance Plan for Highly Pathogenic Avian Influenza in Wild Migratory Birds in the United States, July 1, 2016