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# PLANNING FOR BIOSECURITY IN THE PENNSYLVANIA POULTRY INDUSTRY

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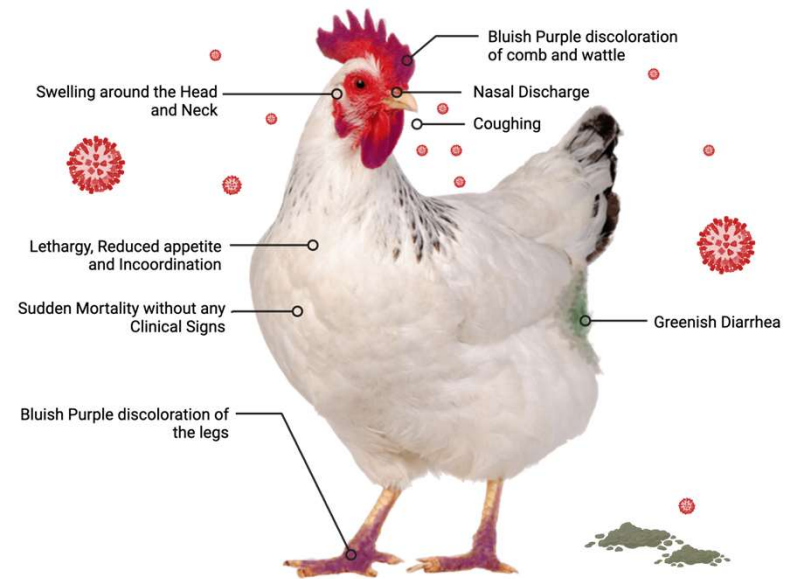
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# OUTLINE

- Highly Pathogenic Avian Influenza (HPAI) outbreaks in PA's Poultry industry
- HPAI veterinary epidemiology 101
- Risk Factors associated with HPAI
- HPAI mitigation and the PA Municipalities Planning Code (MPC)
- From evidence to ordinance: choose your planning pathway



Credit: University of Maryland Extension

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# HPAI OUTBREAKS IN PA'S POULTRY INDUSTRY

- North American 2022/25 HPAI H5N1 clade 2.3.4.4b epizootic
- USDA has confirmed 94 outbreaks
  - Affecting over 7 million birds
- PA Department of Agriculture very effective at stamping virus out
  - \$13.5 million through HPAI Recovery Reimbursement Grant program
  - \$9.8 million in admin costs
- Public health implications as HPAI is a zoonotic disease
  - **Article VI, § 603(h) of the MPC:** *"Zoning ordinances may not restrict agricultural operations or changes to or expansions of agricultural operations in geographic areas where agriculture has traditionally been present, unless the agricultural operation will have a direct adverse effect on the public health and safety."*



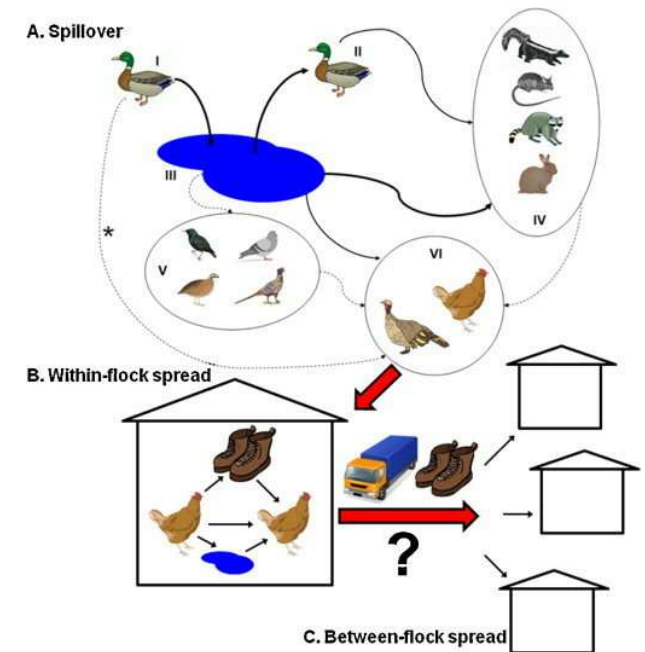
Credit: Creative Safety Supply

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# HPAI VETERINARY EPIDEMIOLOGY 101

- Primary Spread (Wild bird)
  - Waterfowl and shorebirds shed the virus through feces and nasal secretions contaminating the environment
- Transmission to poultry
  - Direct contact or indirectly via contaminated water, equipment, or human activity
- Secondary Spread (Lateral)
  - Spread between farms via movement of people, equipment, shared resources, pests, and airborne particles



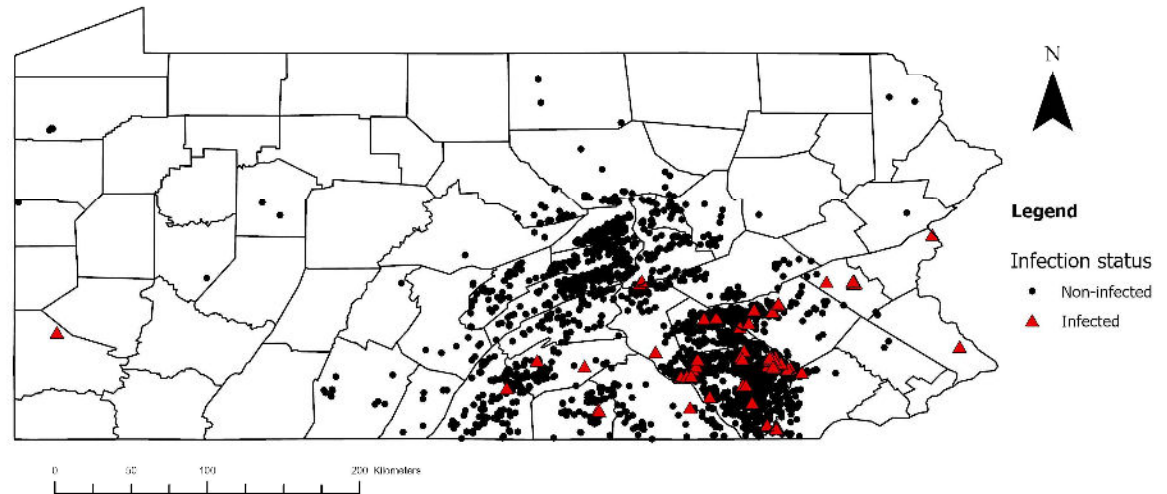
Credit: Pepin et al., 2013

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# RISK FACTORS ASSOCIATED WITH HPAI

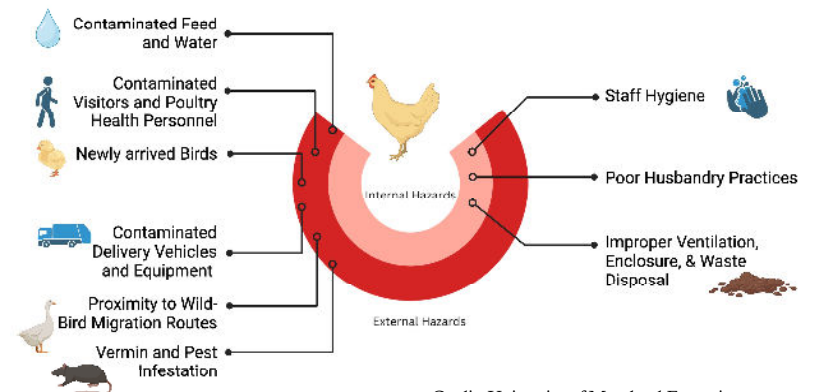
- Biosecurity measures
- Poultry census
- Anthropogenic variables
- Socio-economic indicators
- Wild bird distribution
- Wild bird habitat
- Land cover and cropping
- Topography



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# BIOSECURITY MEASURES

- Includes controlling access, maintaining cleanliness, managing pests, and handling animals/equipment carefully
- Poor biosecurity heightens HPAI risk
- Farm design affects biosecurity success
- MPC enables zoning, site reviews, environmental standards
- Planners can embed biosecurity into land use regulations



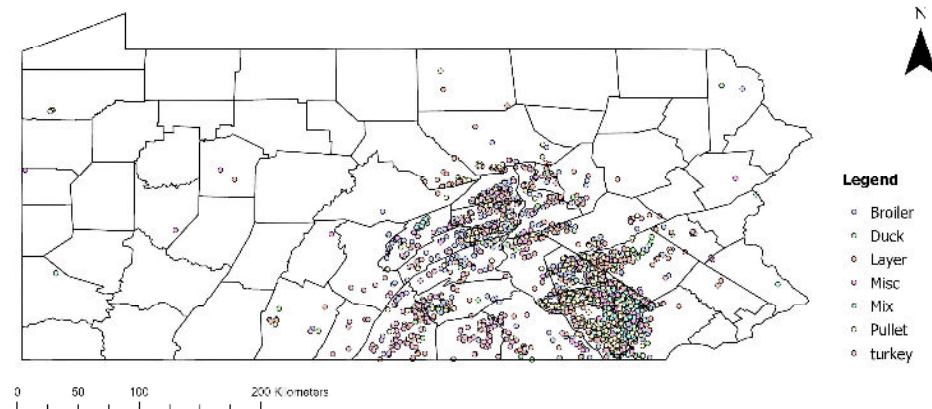
Credit: University of Maryland Extension

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# POULTRY CENSUS

- Duck and turkey farms pose higher HPAI risk
- Duck farm density linked to outbreaks in PA
- Maintaining updated poultry inventories aids planning
- Backyard flocks may increase risk due to weaker biosecurity
- Zoning and buffers can help separate backyard flocks, commercial farms, and wild bird areas

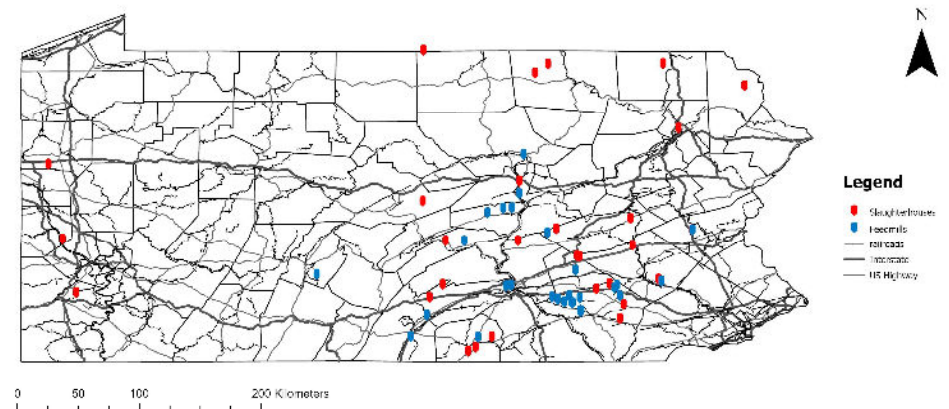




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# ANTHROPOGENIC VARIABLES

- Roads, feed mills, slaughterhouses, and population density linked to disease spread
- High principal arterial density near farms identified as predictor of HPAI in PA
- Setbacks and landscaping buffers can reduce potential contamination
- MPC supports setbacks, buffers, and performance standards in zoning

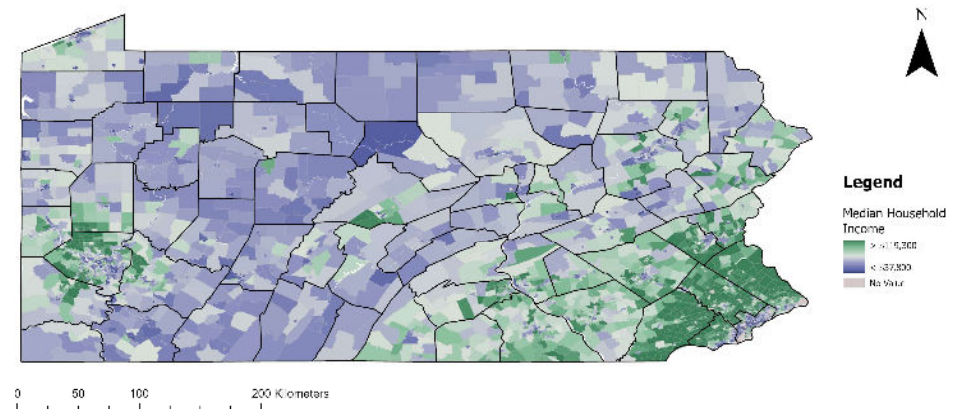




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# SOCIO-ECONOMIC VARIABLES

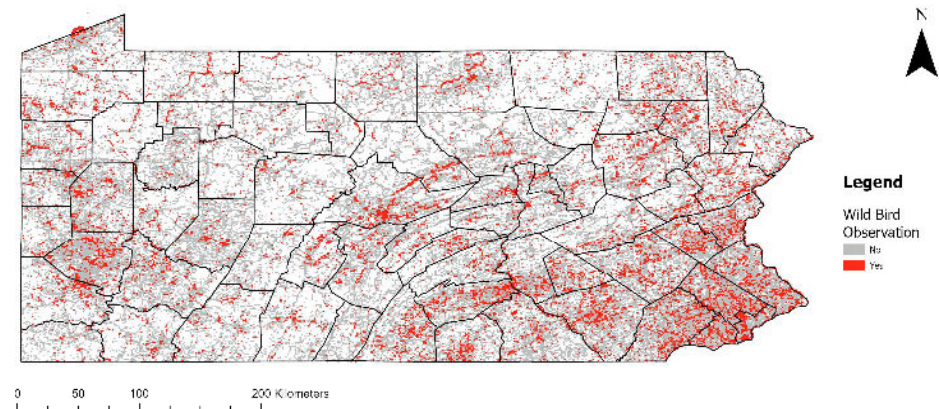
- Income, education, and employment data difficult to include in HPAI risk models
- Higher income areas may reflect suburban sprawl compressing bird habitats
- Socio-economic factors may be a proxy for ecological changes
- Buffers and setbacks can help manage development-wildlife-poultry interfaces



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# WILD BIRD DISTRIBUTION

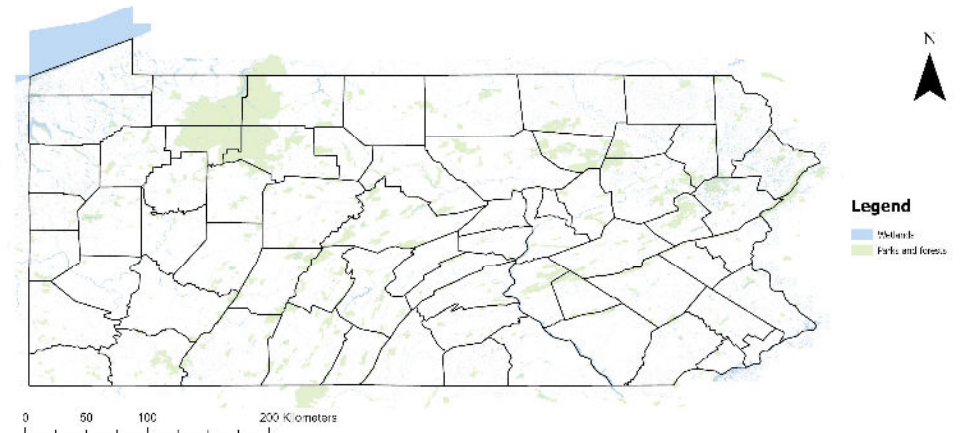
- Migratory waterfowl/shorebirds shed virus contaminating wetland environments
- Lateral spread factors are stronger predictors in PA than wild bird data
- Need improved monitoring and habitat management
- MPC supports wetland and resource preservation aiding biosecurity



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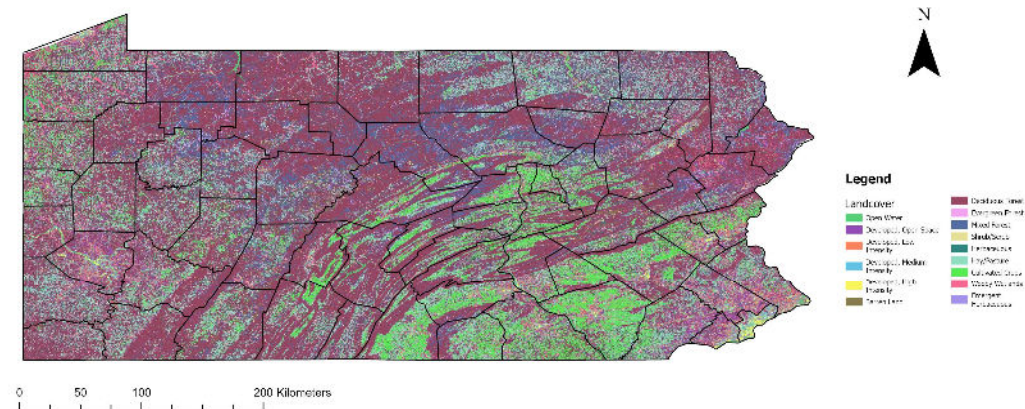
# WILD BIRD HABITAT

- Wetlands and waterways used as wild bird proxies in risk models
- Raptors and scavengers also linked to HPAI in PA, broadening habitat risk scope
- Traditional habitat-based proxies may be insufficient alone
- MPC's natural resource protection allows integration of new science



# LAND COVER AND CROPPING

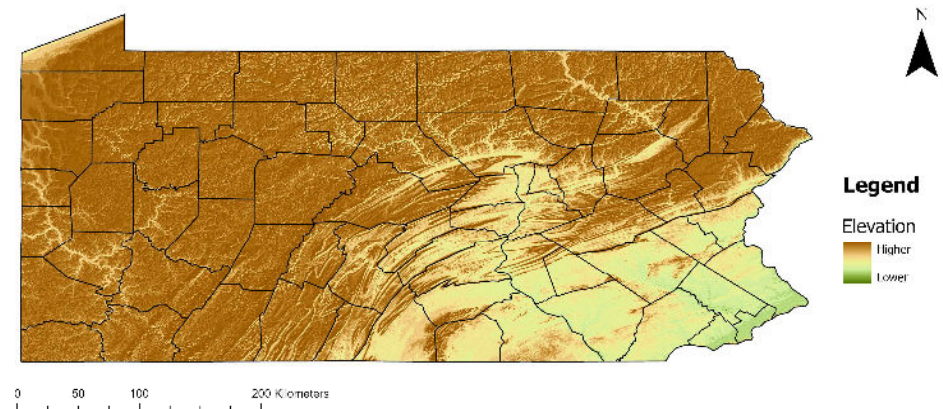
- Land use patterns influence where wild birds and poultry farms potentially overlap
- Incorporating detailed land cover data into comp plan can guide siting to lower-risk areas
- Forests and low-intensity agriculture can act as natural buffers
- MPC enables multimunicipal plans for agricultural preservation and natural resource protection



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# TOPOGRAPHY

- Low, flat areas near water favored by wild birds and poultry farms
- Overlap creates high-risk zones
- Mapping overlaps guides safer farm siting
- MPC encourages protecting floodplains, slopes, hazards to reduce risk



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# RISK FACTORS ASSOCIATED WITH HPAI

- Summary of risk factors:
  - Farm-level biosecurity practices
  - Poultry census and bird types (e.g., ducks, turkeys)
  - Human-related influences like roads and infrastructure
  - Socio-economic patterns linked to land use and development
  - Wild bird distribution and habitat, including wetlands and broader bird species
  - Land cover, cropping patterns, and topography



Credit: Lancaster Farming

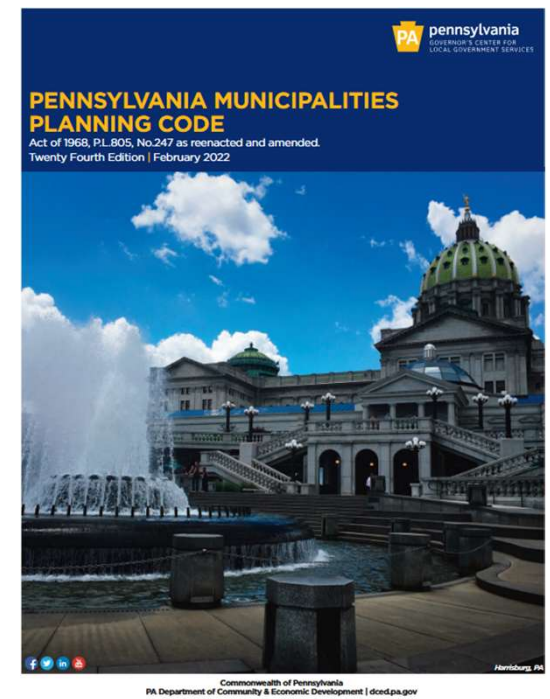
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# HPAI MITIGATION AND THE MPC

- Establish **zoning districts** that limit poultry farm placement near wetlands and wild bird habitats.
- Require **buffers and setbacks** to minimize contact between poultry operations, wild bird habitats, and human-related vectors.
- **Manage development intensity and guide infrastructure** placement, helping reduce lateral spread risks linked to traffic, feed mills, and slaughterhouses.
- **Preserve agricultural land** while still integrating biosecurity considerations, keeping poultry operations viable but within safer landscapes.
- **Collaborate with** agricultural, veterinary, and wildlife **partners** to make sure land use policies align with current disease prevention strategies.





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# FROM EVIDENCE TO ORDINANCE: CHOOSE YOUR PLANNING PATHWAY

## The Layer Township Challenge

- **The Evidence:** We've identified key environmental & operational risk factors.
- **The Task:** Translate this science into actionable land use policy.
- **The Challenge:** Choose a strategic pathway for Layer Township's new poultry development.



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# FROM EVIDENCE TO ORDINANCE: CHOOSE YOUR PLANNING PATHWAY

## PATHWAY A: Zoning & Overlay District

- **The Action:** Create an "Agricultural Biosecurity Overlay District" with strict, site-wide standards.
  - 250-ft setback from water bodies for new sheds.
  - Mandatory 50-ft maintained vegetation buffer around sheds.
  - Prohibition of compost/waste storage within 100 ft of any shed.
- **Advantage:** Clear, preventative, and addresses multiple risk factors at once.
- **Challenge:** Politically difficult; can be seen as overly restrictive on property rights.

## PATHWAY B: Conditional Use Permit (CUP)

- **The Action:** Require a CUP for all new/expanding operations over a certain size (e.g., 10,000 birds).
  - Mandate a certified Site-Specific Biosecurity Plan.
  - Require a vehicle wash station at entrance and concrete pad in front of shed.
  - Enforce a gated and signed, single access point.
- **Advantage:** Targeted, powerful, and enforceable. Focuses on the largest risk.
- **Challenge:** Resource-intensive for staff; relies on consistent enforcement.

## PATHWAY C: Incentives & Guidelines

- **The Action:** Focus on voluntary measures and education.
  - Update the Comprehensive Plan with biosecurity goals.
  - Create a "Biosecurity Certified" program with tax rebates.
  - Publish non-binding Design Guidelines.
- **Advantage:** Politically popular, builds farmer goodwill, and low-conflict.
- **Challenge:** Slow, uneven adoption; may not be sufficient to meaningfully reduce risk.

**TASK: WHAT PATHWAY WOULD YOU RECOMMEND? WHY? WHAT'S YOUR TOP PRIORITY?**

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# KEY TAKEAWAYS

1. **Prevention, not just response:** Land use planning can reduce HPAI risk before outbreaks occur.
2. **MPC toolkit:** Zoning, subdivision, conditional use permits, and comprehensive plans give municipalities practical tools to integrate biosecurity into policy.
3. **Multiple risk factors:** Both environmental (wetlands, buffers, habitat) and human-related (roads, infrastructure, density) conditions shape disease spread.
4. **Collaboration is essential:** Working with producers, veterinarians, and wildlife experts ensures land use strategies stay grounded in science.
5. **No one-size-fits-all:** The right mix of zoning, permits, or incentives depends on each community's context and politics.
6. **Bottom line:** Planners can help build safer, more resilient agricultural communities.



Credit: Creative Safety Supply

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# Q&A

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