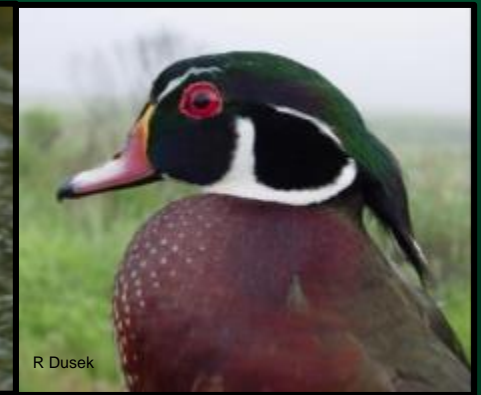


# Highly Pathogenic Avian Influenza: The Role of Wildlife



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National Wildlife Research Center**

# Outline

- **Intercontinental spread of Avian Influenza**
- **Migratory Bird Flyways**
- **Spread of Eurasian HPAI H5**
- **Current Status in Wild Birds**
- **Future Surveillance Plans**

# Natural Reservoirs



Asymptomatic carriers

# Intercontinental Spread

## Poultry and Poultry Products



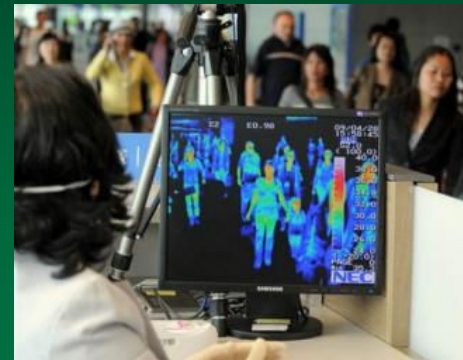
## Pet and Wildlife Trade



## Smuggling



## People

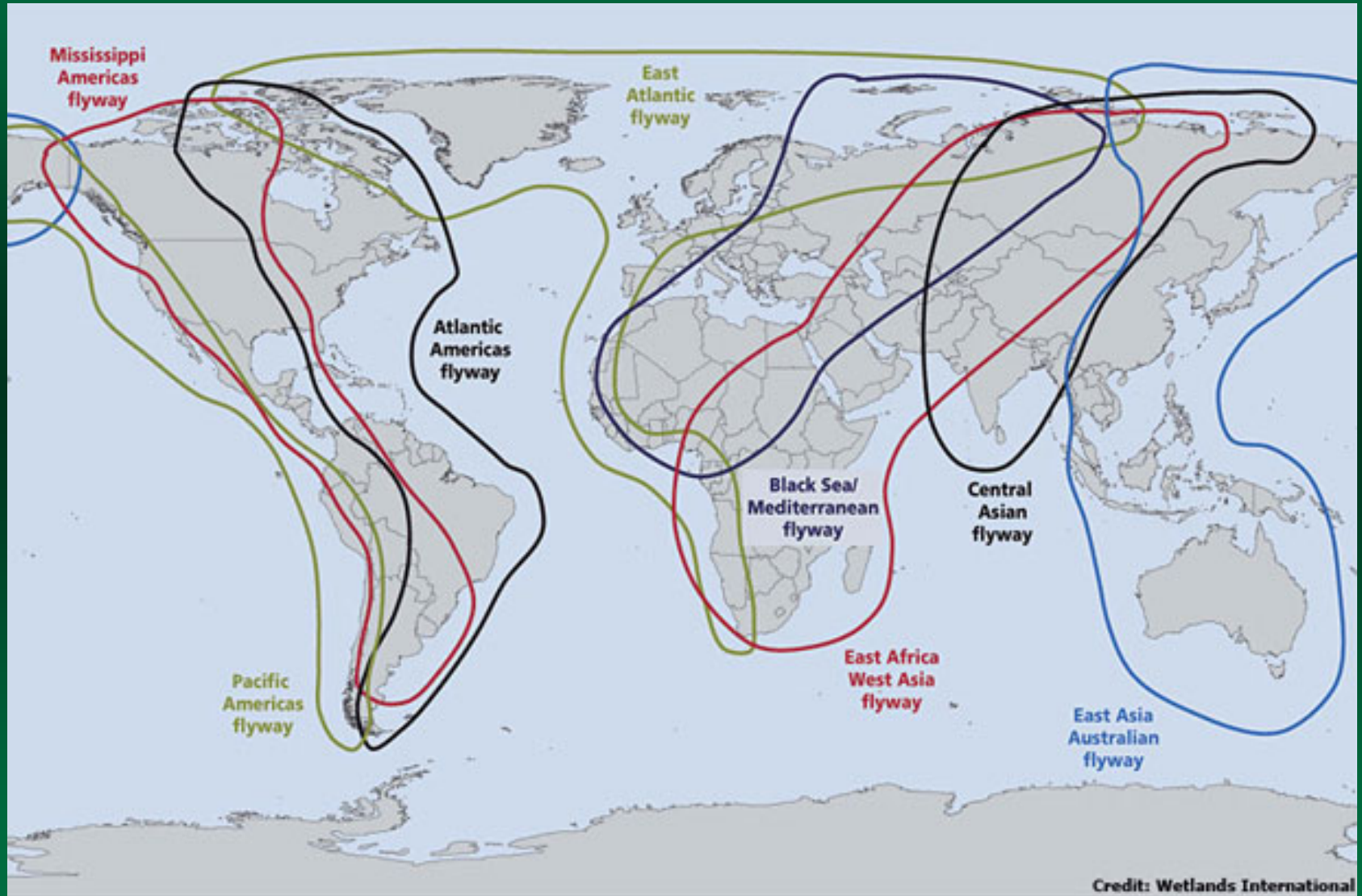


# Intercontinental Spread

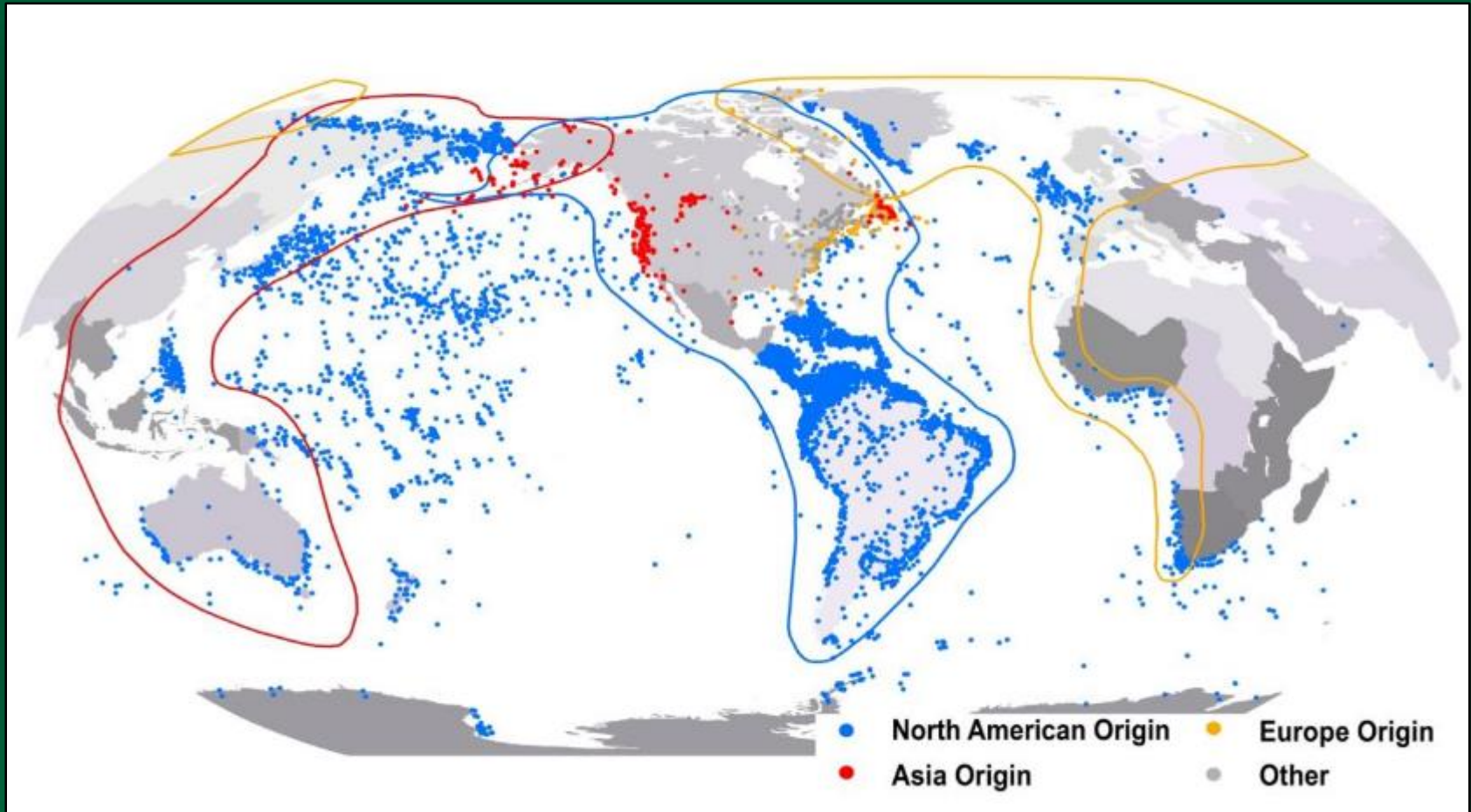
## Wild Migratory Birds



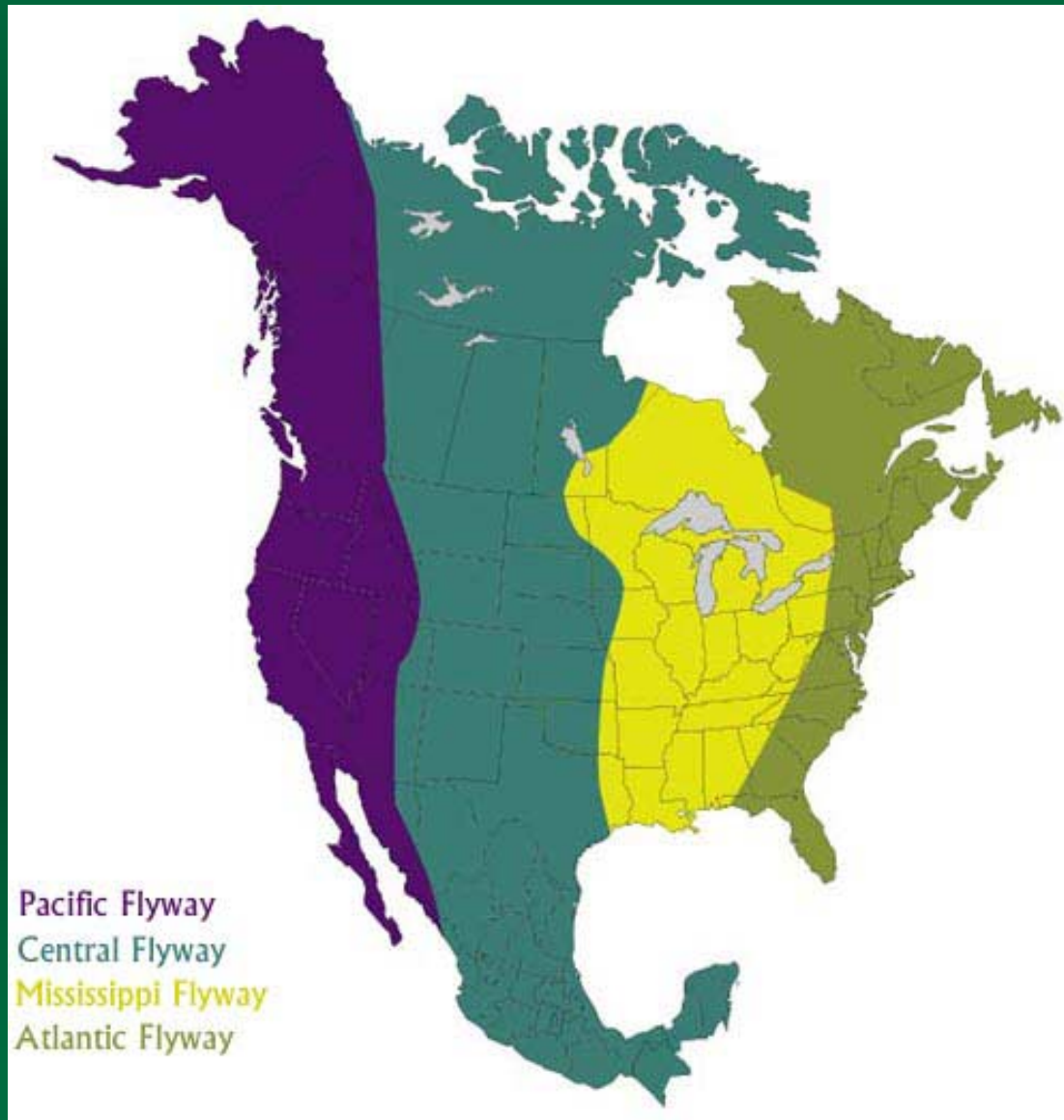
# World Migratory Flyways



# World Migratory Flyways



# North American Flyways

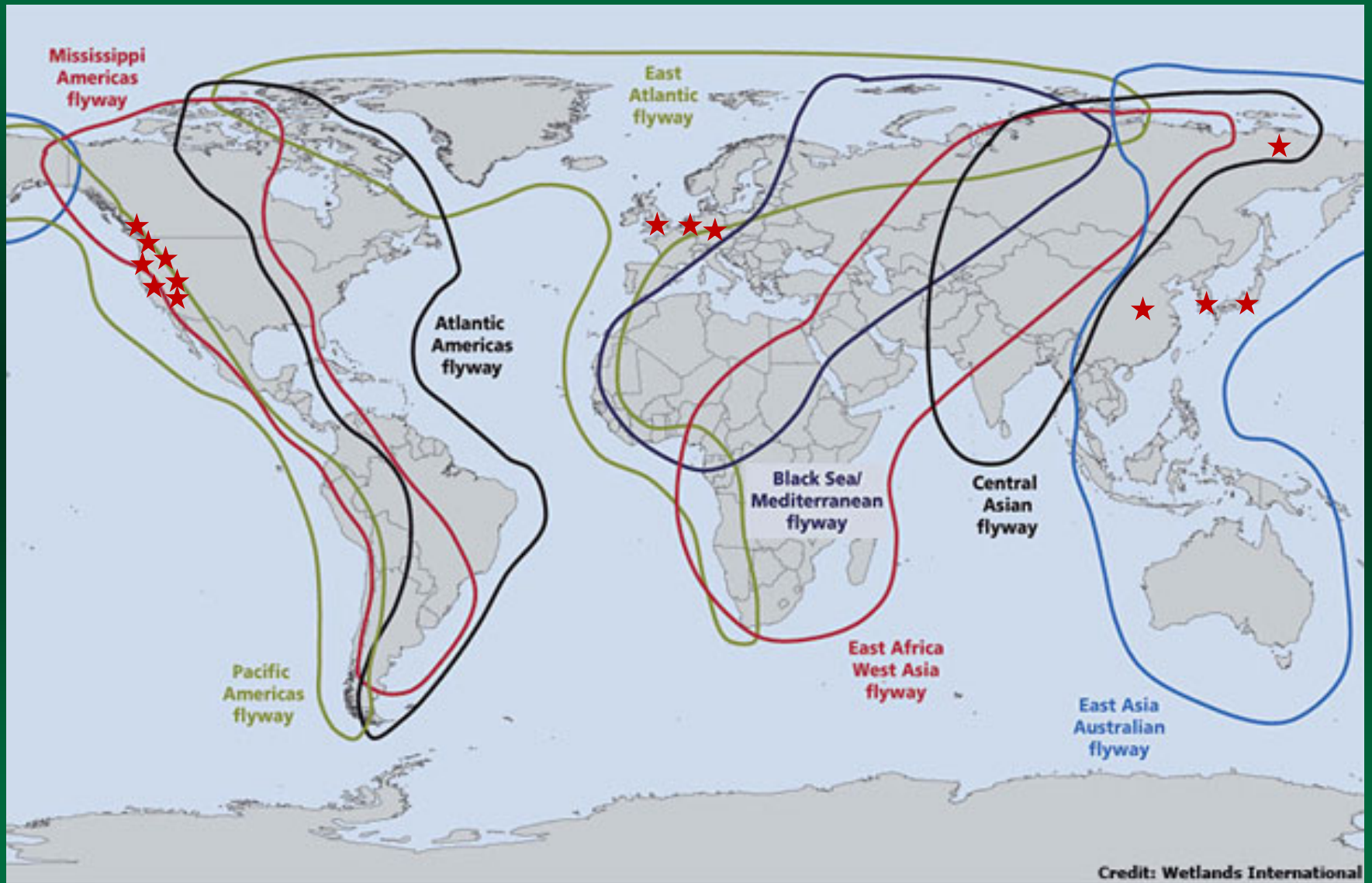




# North American Flyways

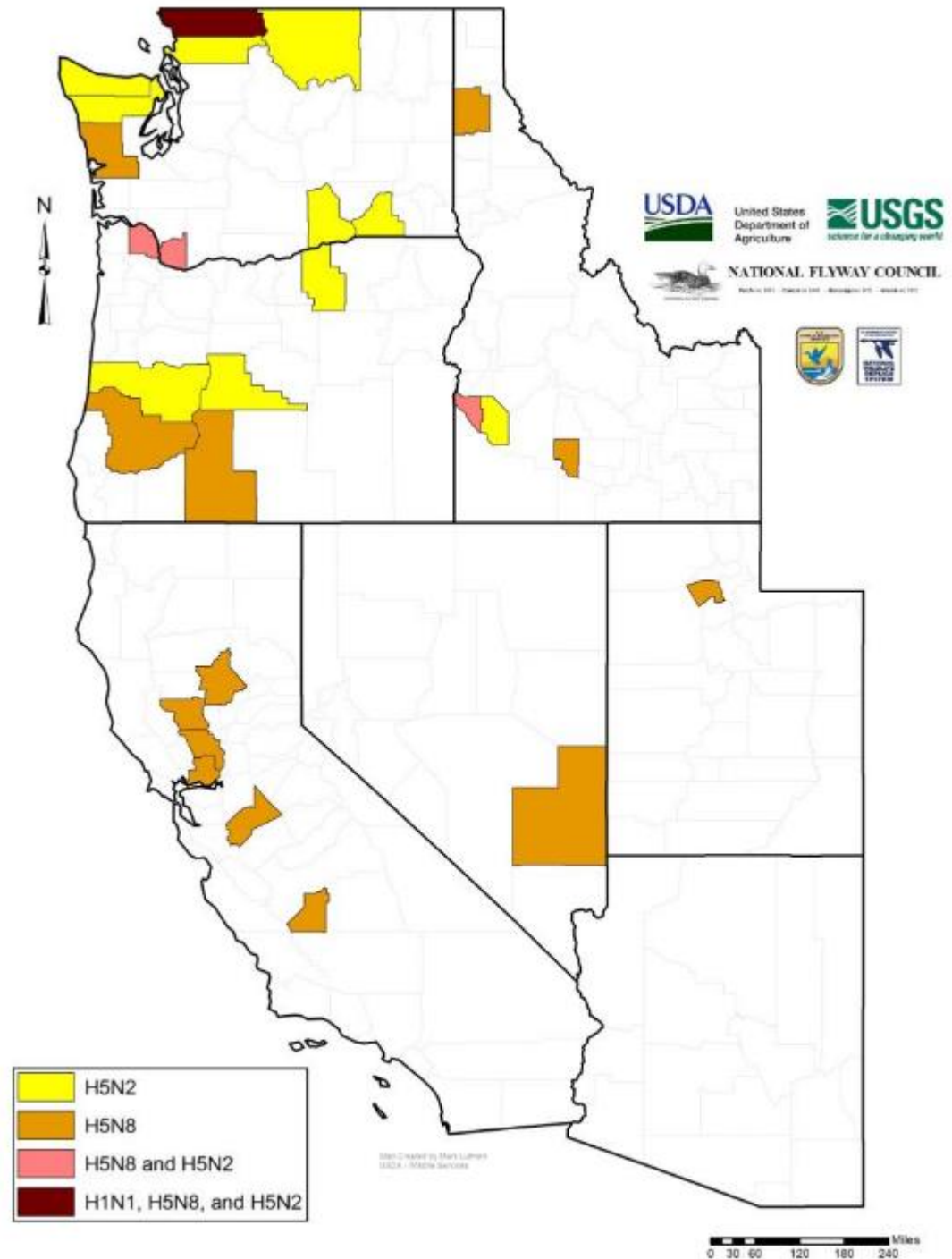


# Global Spread of Eurasian H5



# Pacific Flyway

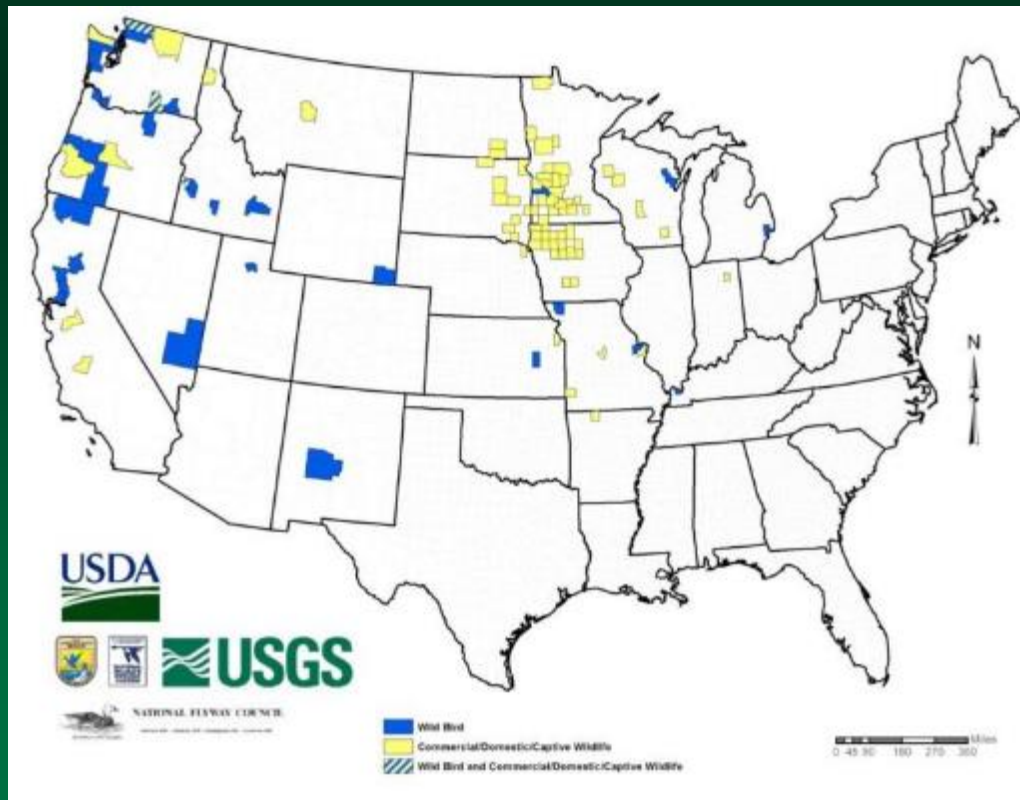
- 3 HPAI viruses detected
  - Eurasian H5N8
  - Mix origin H5N2 and H5N1
- All three HPAI viruses
  - Whatcom Co, WA
- H5N8 & H5N2
  - Washington, Idaho, Oregon
- H5N8
  - Throughout the flyway



# Central and Mississippi Flyway

## March-June 2015

- Wild Birds
  - 20 sick/dead geese and raptors
  - 3 apparently healthy waterfowl
    - Caveat: Little apparently healthy duck surveillance



# Current Status

- **Wildlife**
  - **Dabbling Ducks are primary reservoir**
    - Exhibit little to no signs
  - **Unidentified number of raptors affected**
  - **Canada Geese**
    - Primarily die from infection
    - Goslings acutely sensitive
    - Good morbidity/mortality sentinel



# Current Status

- **Wildlife**

- **Other wildlife**

- **First identified case in a wild passerine in MN**
      - PCR lung tissue positive, no virus isolated
    - **No virus isolated from peridomestic species in IA**
      - Including: Passerines and Small mammals
      - Exposure (antibody positive): 5 passerines
        - One PCR positive

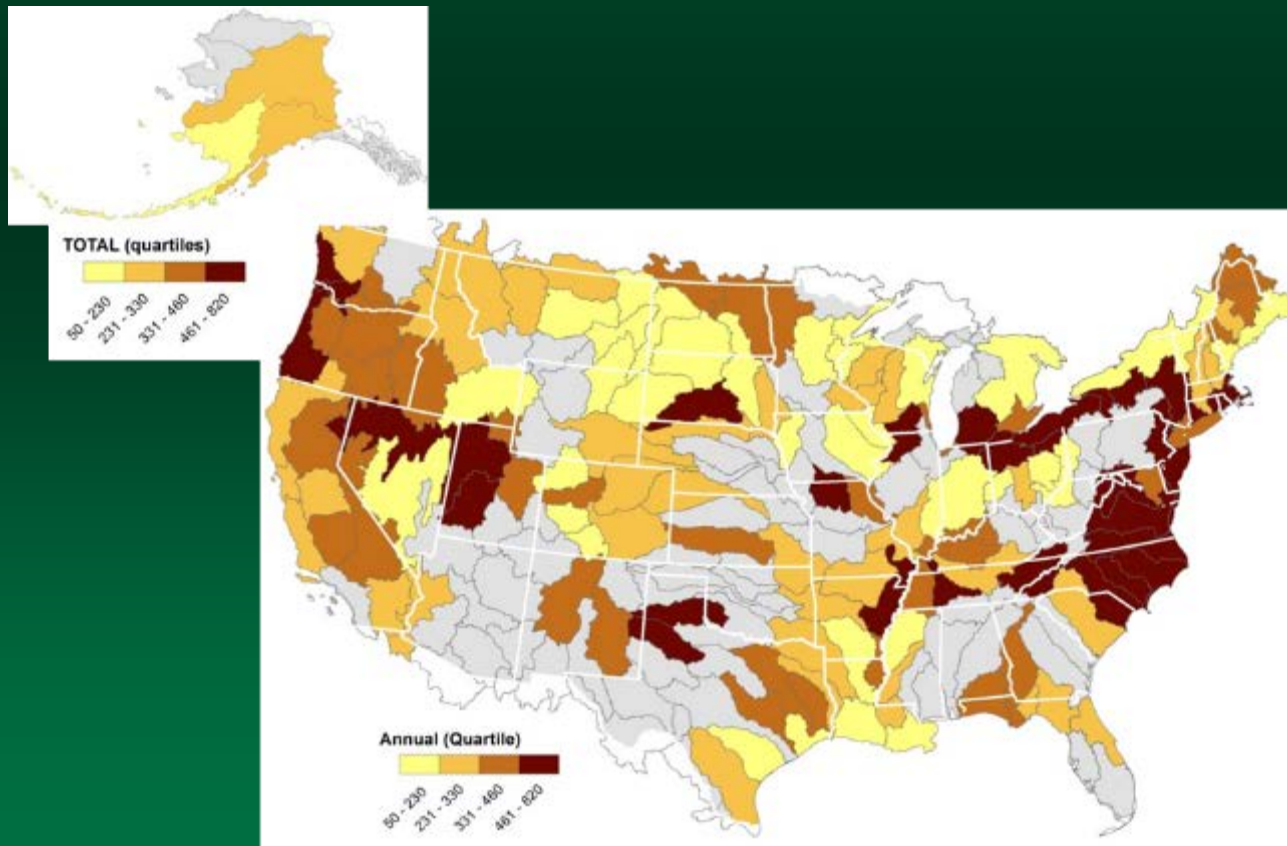


# Current Surveillance

- Identify distribution across U.S.
- Detect early spread into new flyways/regions
- Provide flexible surveillance framework that can monitor wild waterfowl populations for
  - re-assortments of influenzas
  - introductions of new viruses
  - estimate prevalence of important influenzas once detected in an area of concern

# Current Surveillance

- Based on:
  - What we know of wild duck movements
  - What we learned from previous AI surveillance





# Current Surveillance

- **Sampling**
  - **Passive (morbidity/mortality)**
    - Year round
    - All Species
  - **Active (apparently healthy birds)**
    - Dabbling ducks
    - In post nesting season (summer)
    - Fall/Winter Migration Season
  - **Environmental Fecal**
    - Targeted year round



# Current Status

- Since 1 July 2015:
  - 45,526 wild dabbling ducks sampled
    - Atlantic Flyway: 10,663
    - Mississippi Flyway: 13,783
    - Central Flyway: 9,202
    - Pacific Flyway: 11,854
    - American Oceania: 24
  - Only 2 PCR positives
    - Mallards
      - Great Salt Lake, UT
      - Oregon



# Acknowledgements

- Wild Bird HPAI Interagency Steering Committee
  - USGS
  - USFWS
  - CDC
  - State Departments of Natural Resources
  - APHIS
- USDA/APHIS/NVSL
- NAHLN
- USDA/ARS/SEPRL

