

Avian Investigations, 2022



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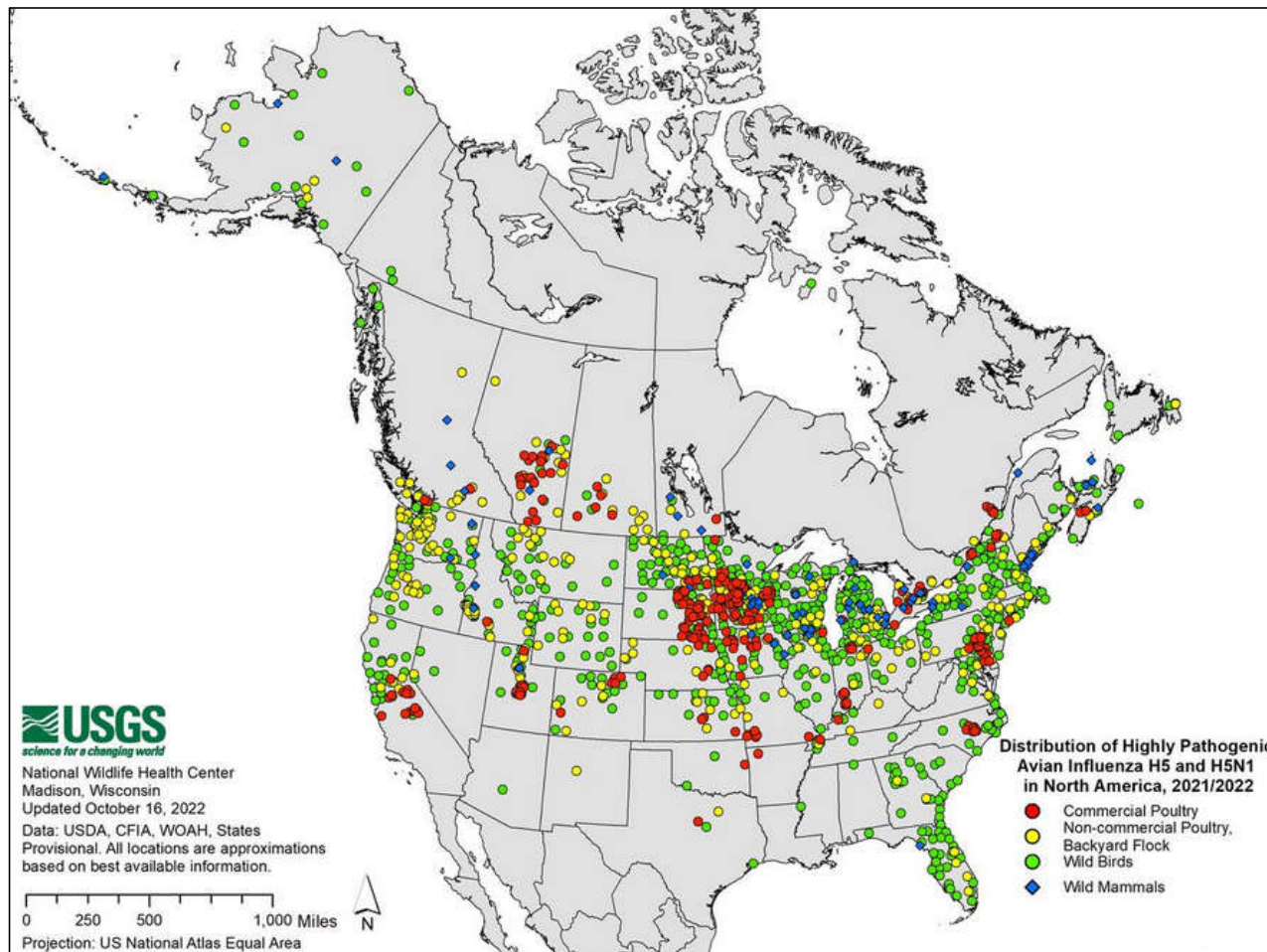
Outline

- Highly pathogenic avian influenza updates
 - Activity in North America
 - Activity in California
- Species susceptibility
- Clinical signs reported in California wild birds
- Surveillance testing
- Greater-white fronted goose mortality, fall 2022
- Red-tailed hawk mortality, winter 2021-22

North America, Dec 20, 2021 - Oct 28, 2022

Highly Pathogenic Avian Influenza H5N1: Wild Birds

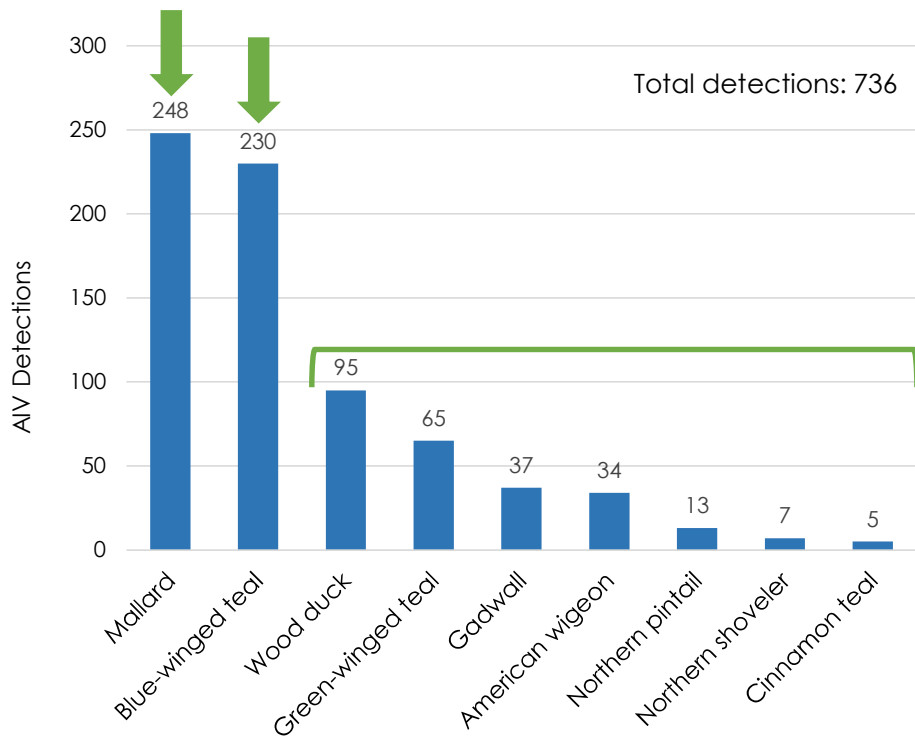
- Canada, first detection: Dec 2021
 - 1,455 detections to date
- United States, first detection Jan 2022
 - 3,375 detections to date
 - 46 states plus D.C.
 - 94 wild bird species
- Mexico, first detection 20 Oct 2022
 - 1 blue-winged teal reported



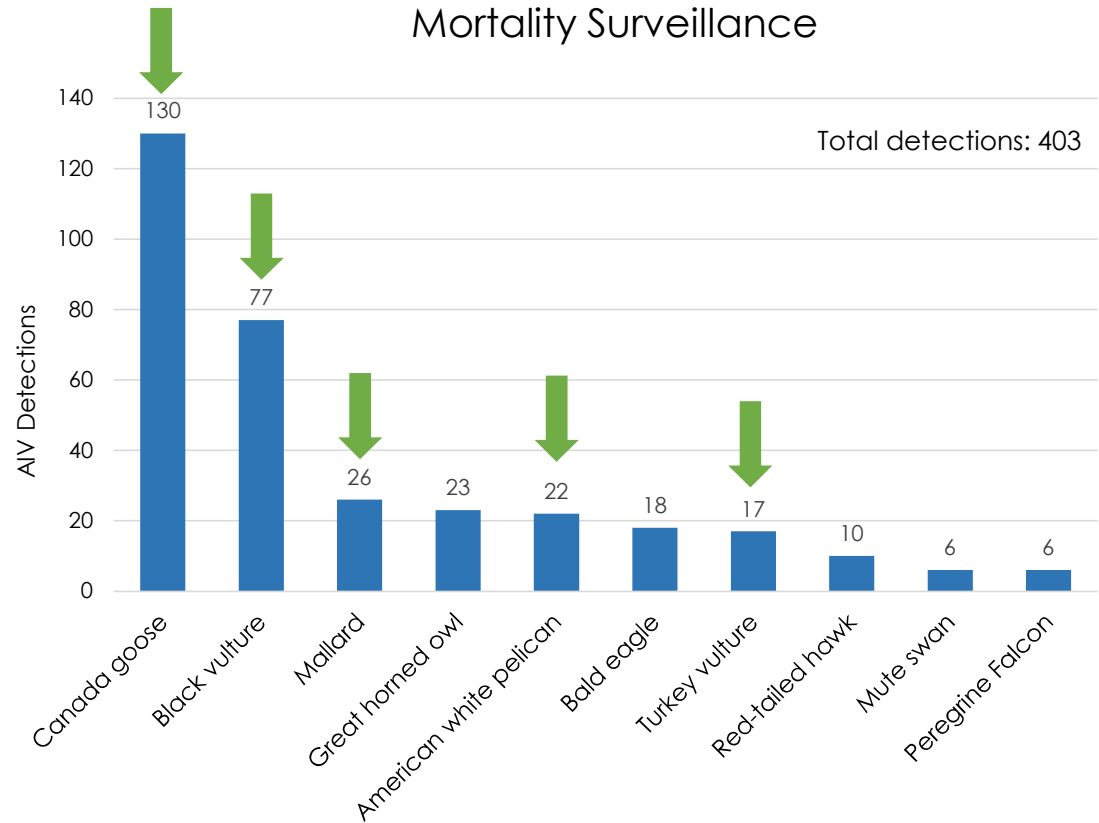
Wild Bird Detections

United States, Sep 1 – Oct 25, 2022

Live-bird & Hunter-harvest Surveillance



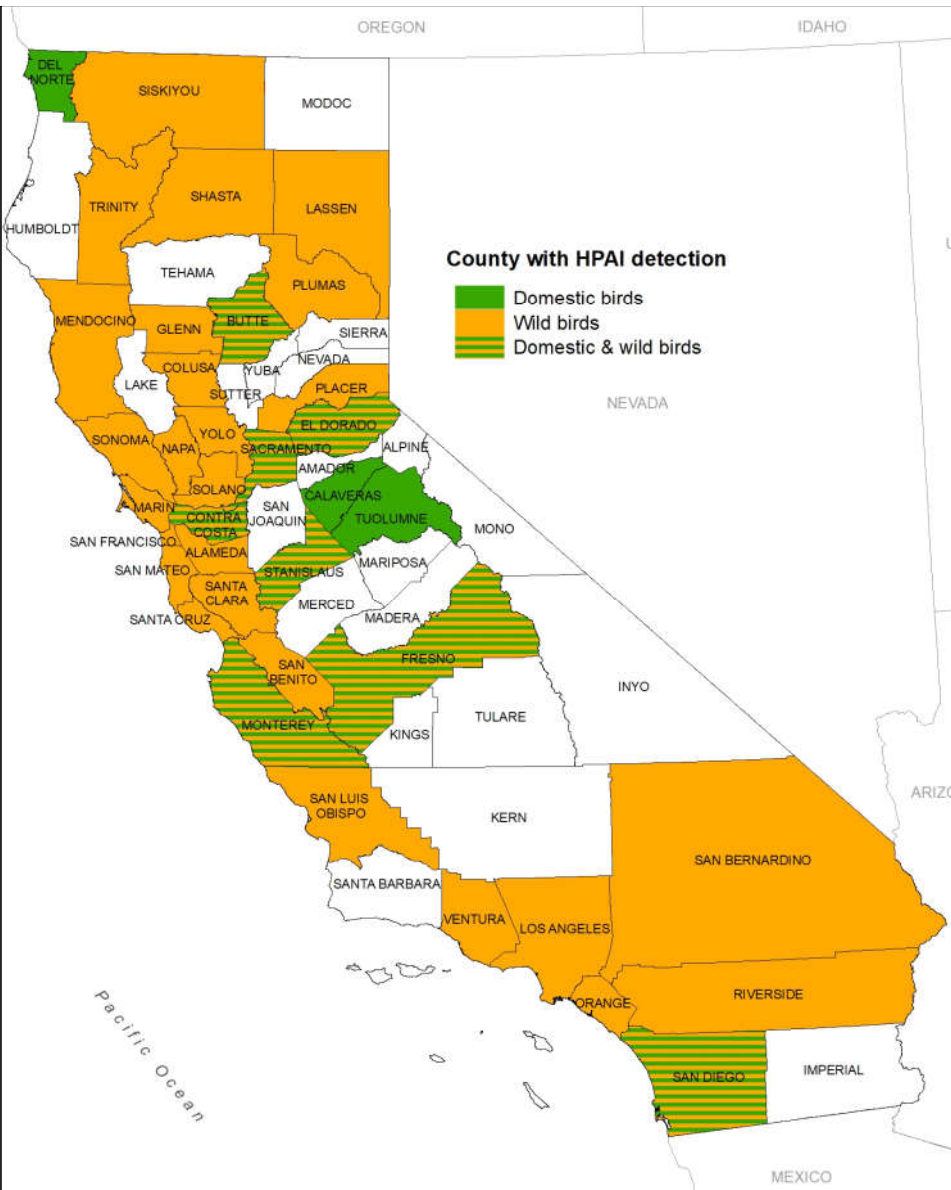
Mortality Surveillance



California, Jul 13 – Oct 31, 2022

Highly Pathogenic Avian Influenza H5N1

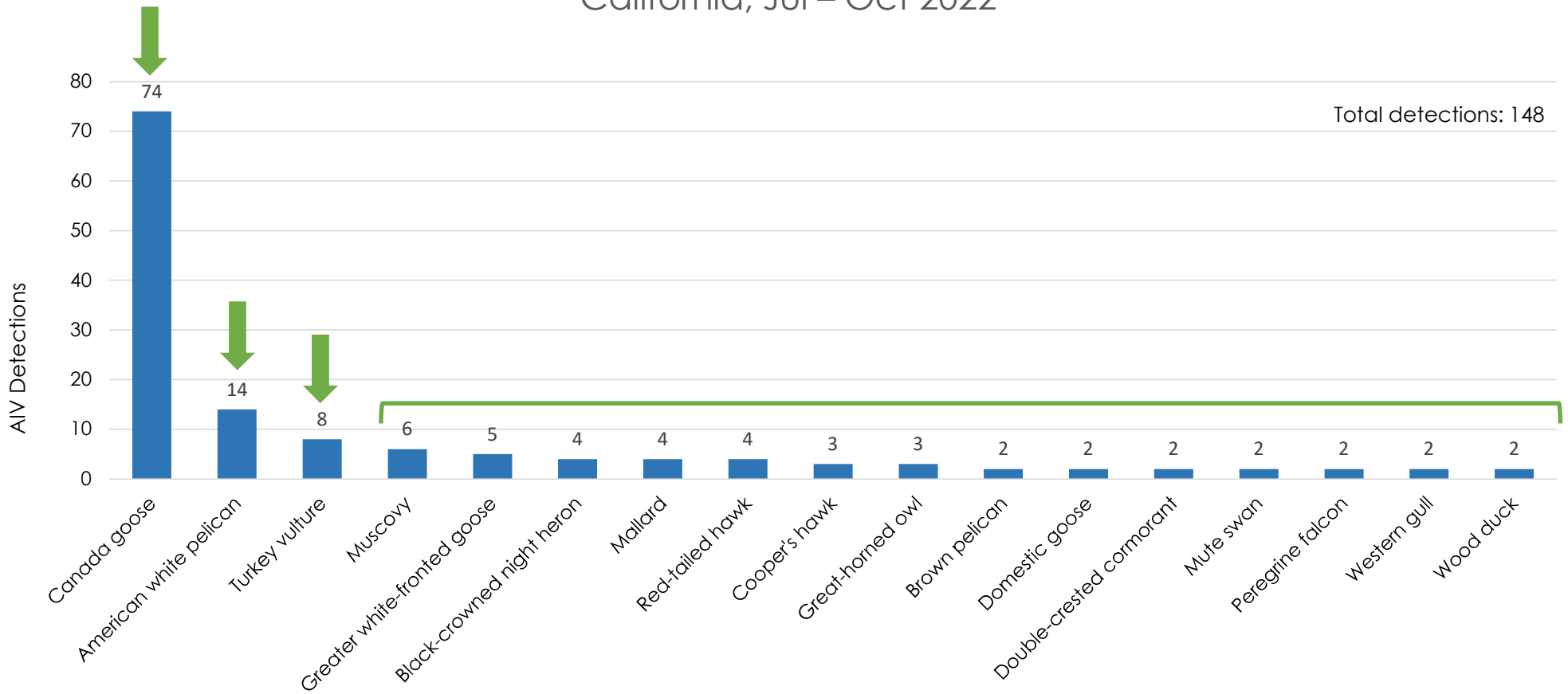
- Wild birds (orange)
 - Approx. 269 birds tested from 38 counties
 - Detections: 148 individuals from 34 counties
- Domestic birds (green)
 - Detections in 11 counties



PRELIMINARY DATA – RESULTS SUBJECT TO CHANGE

Wild Bird Detections

California, Jul – Oct 2022



1 detection = American crow, bald eagle, black swan, California gull, northern pintail, red-shouldered hawk, snow goose, & snowy egret

PRELIMINARY DATA – RESULTS SUBJECT TO CHANGE

Species Susceptibility

- Anseriformes (ducks, geese, & swans) are primary reservoir for low pathogenic avian influenza viruses
 - Water is important factor for transmission among these species
- Highly pathogenic avian influenza H5N1
 - Appears to be well-adapted to certain waterfowl species enabling it to survive short- & long- distance movements
 - Dabbling ducks relatively resistant to fatal infection e.g., mallards, wood ducks, teals, wigeons, gadwalls, etc.
 - Some waterfowl species highly susceptible to fatal infection
 - Canada geese (across U.S.)
 - Snow & Ross's geese (elsewhere in U.S.)
 - Trumpeter & tundra swans (elsewhere in U.S.)
 - Diving ducks (eiders, scaup, mergansers, ring-necked ducks, & ruddy ducks (elsewhere in U.S.)





Species Susceptibility

Non-waterfowl species

- Species in close association with infected waterfowl &/or environment heavily contaminated with waterfowl saliva & feces
 - Waterbirds like white pelicans, double-crested cormorants, gulls, herons, & egrets
- Raptors preying on infected waterfowl like bald eagles, red-tailed hawks, & peregrine falcons
- Raptors foraging in areas with high waterfowl activity, might acquire infection through an intermediate host possibly including rodents relatively resistant to infection
- Scavengers feeding on infected waterfowl remains like vultures, crows, & ravens
- Nesting seabirds may be susceptible if the virus is introduced into the colony



General Signs Reported

- Variable depending on species & individual animal (e.g., age, other debilitation or stress)
- Asymptomatic infection possible
 - Most likely species of dabbling ducks
- Clinical signs reported in California
 - Sudden or unexpected death
 - Weakness, not flying, difficulty or not standing
 - Uncoordinated, unsteady gait
 - Swimming or walking in circles
 - Star-gazing
 - Head ticks, tremors, &/or seizures
 - Head tremoring in circular motion, torticollis
 - Repeated opening & closing of the mouth
 - Fecal matting
 - Corneal opacity

Wild Bird Surveillance

- Mortality-based surveillance testing
 - Mortality events involving ≥ 5 wild birds (any species)
 - Individual to < 5 wild birds of a species known to be at higher risk of infection
 - Waterfowl (e.g., geese, ducks) & other waterbirds (e.g., American white pelican, herons, egrets)
 - Predators (e.g., bald eagle, great horned owl, red-tailed hawk) & scavengers (e.g., turkey vulture, gull species) found near locations with waterfowl activity
- Follow-up testing within a county will occur periodically (e.g., bi-weekly, monthly) to monitor outbreak activity over the longer-term
- Species at lower risk of infection (e.g., songbirds, columbids) will be tested case-by-case
 - Location: was bird found in or near location with known outbreak in waterfowl
 - History: did bird present with suspicious clinical signs at intake
- Utilize online mortality reporting system to help monitor virus activity & identify potential target areas for surveillance
 - Refer public to report wild bird deaths to the WHL mortality reporting system:
 - <https://wildlife.ca.gov/Conservation/Laboratories/Wildlife-Health/Monitoring/Mortality-Report>





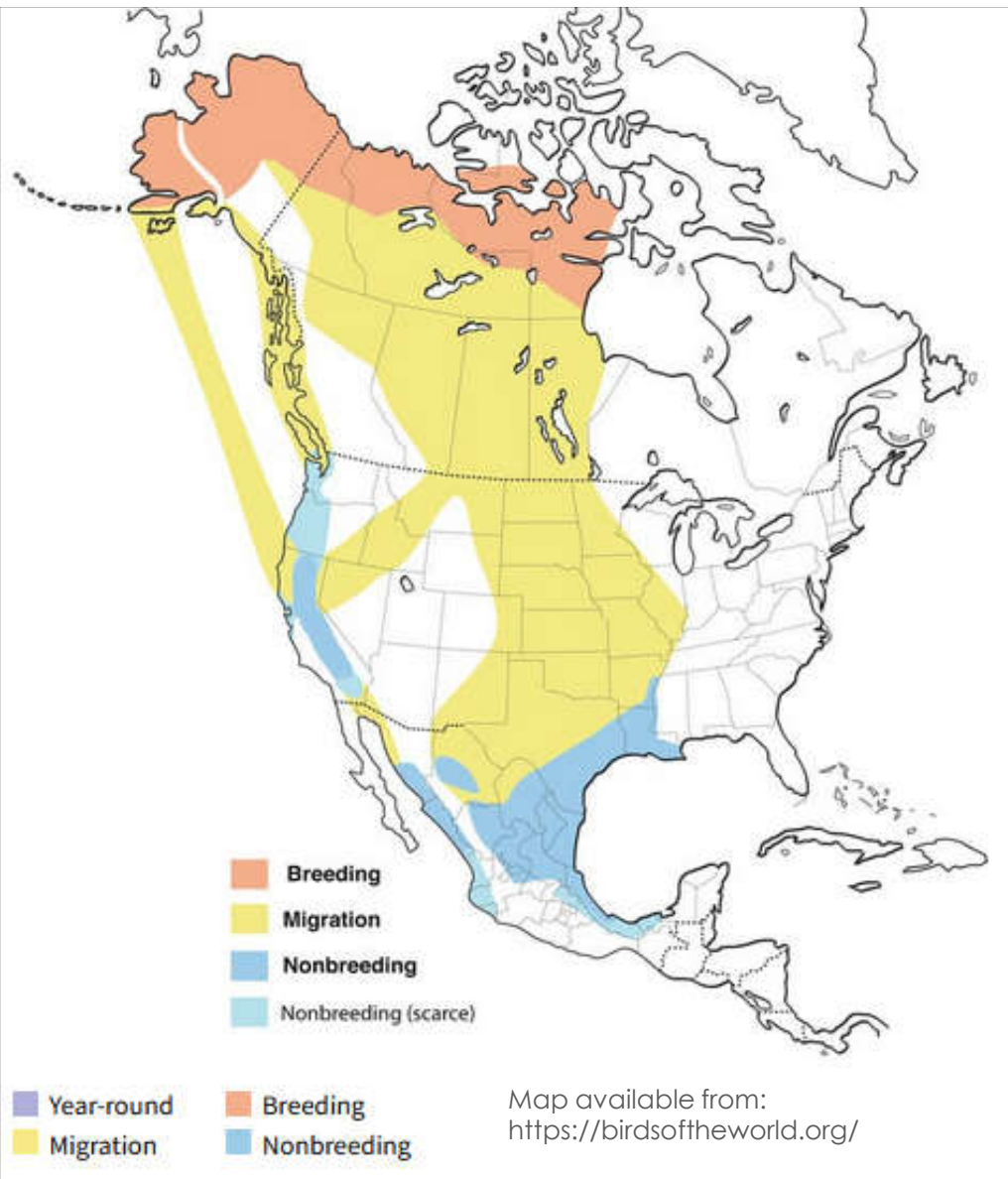
Greater White-fronted Geese

- Increased admissions & mortality, start Oct 10, 2022
 - Generalized weakness, dull mentation, &/or mild neurological signs
 - Sometimes found in odd locations, away from water
- 23 birds submitted from 7 counties mostly along the south coast including the Channel Islands
 - Avian influenza (n = 19)
 - Not detected: 14
 - Detected: 3 (2 with high Ct value)
 - Suspect, pending: 2 (high Ct value)
 - Postmortem findings (n = 14; 5 adults, 7 juveniles, 2 not reported)
 - Emaciated body condition (13/14; 1 not reported)
 - Female: 1,250 g (range 960-1,480 g; n = 6) (normal avg 1,809-2,075g)
 - Male: 1,270 g (range 1,100-1,440 g; n = 6) (normal avg 2,221-2,348g)
 - Histopathology (n = 3)
 - Kidneys (2/3): mild to moderate tubular mineralization to necrosis
 - Intestinal parasitism (1/3)

PRELIMINARY DATA – RESULTS SUBJECT TO CHANGE

Greater White-fronted Geese

- Fall migration
 - Some individuals migrating from Alaska to Mexico may stop-over in California to refuel
 - Appear to be stopping over in larger numbers than usual in some parts of southern California
- Findings to date indicate poor nutritional condition is primary issue
 - Significance of AIV is unclear
- Potential causes
 - Leaving breeding grounds in subpar body condition
 - Poor or diminished food resources in regular stop over areas in northern California

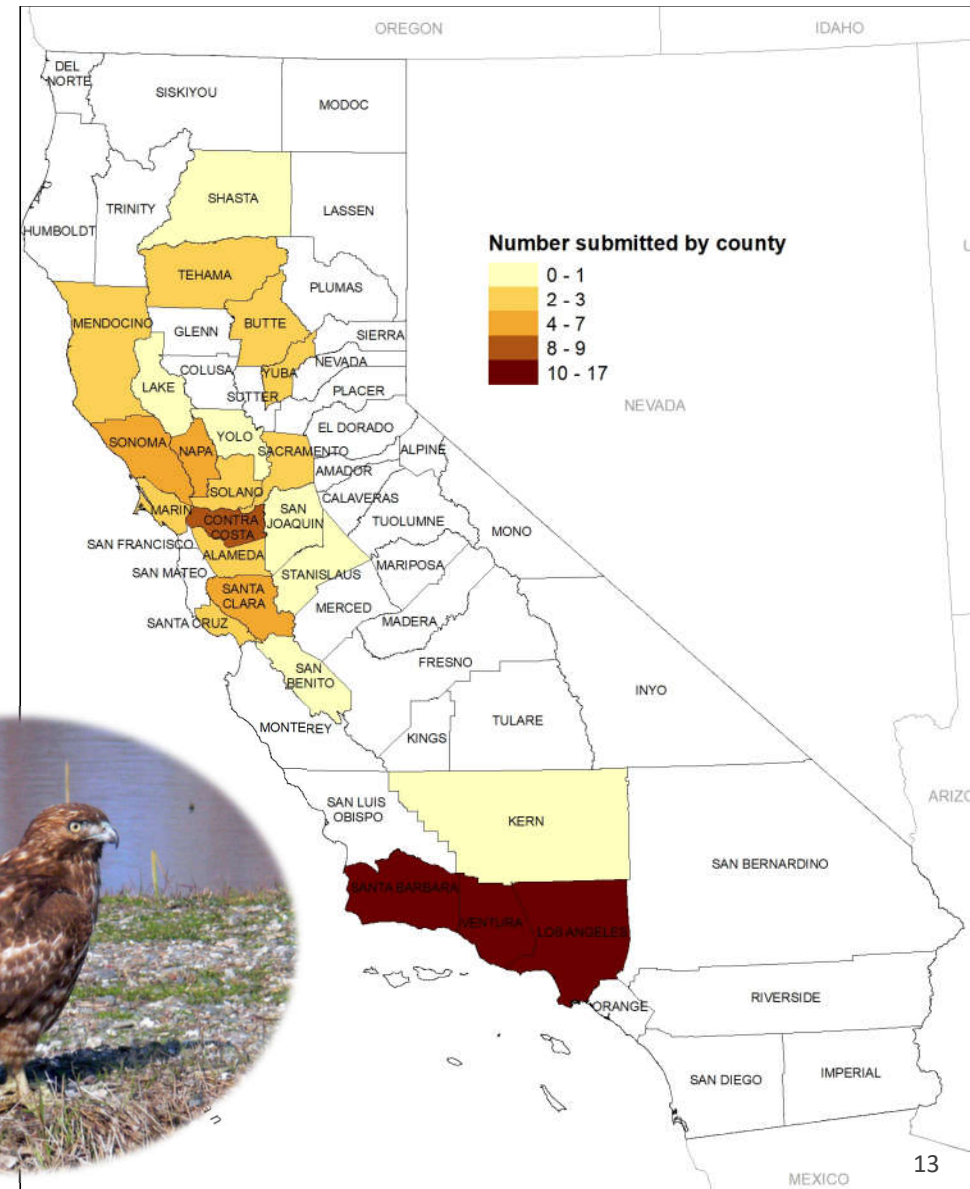


Red-tailed Hawks

- Increased admissions & mortality, Nov 2021 - Mar 2022
 - Reports nearly statewide
 - Thin body condition, generalized weakness
 - Sometimes multiple birds reported in single location
 - 101 birds submitted from 23 counties
- Postmortem findings (n = 101)
 - Starvation (n = 76; 56 juveniles, 20 adults)
 - Avian chlamydiosis
 - Other infections (e.g., fungal, other bacterial)
 - Trauma, collision-type (n = 10)
 - Electrocution (n = 4)
 - Toxin, suspected (n = 4)
 - Feather contamination (n = 2)
 - Avian trichomonosis (n = 1)
 - Visceral gout (n = 1)
 - Undetermined (n = 1)



PRELIMINARY DATA – RESULTS SUBJECT TO CHANGE



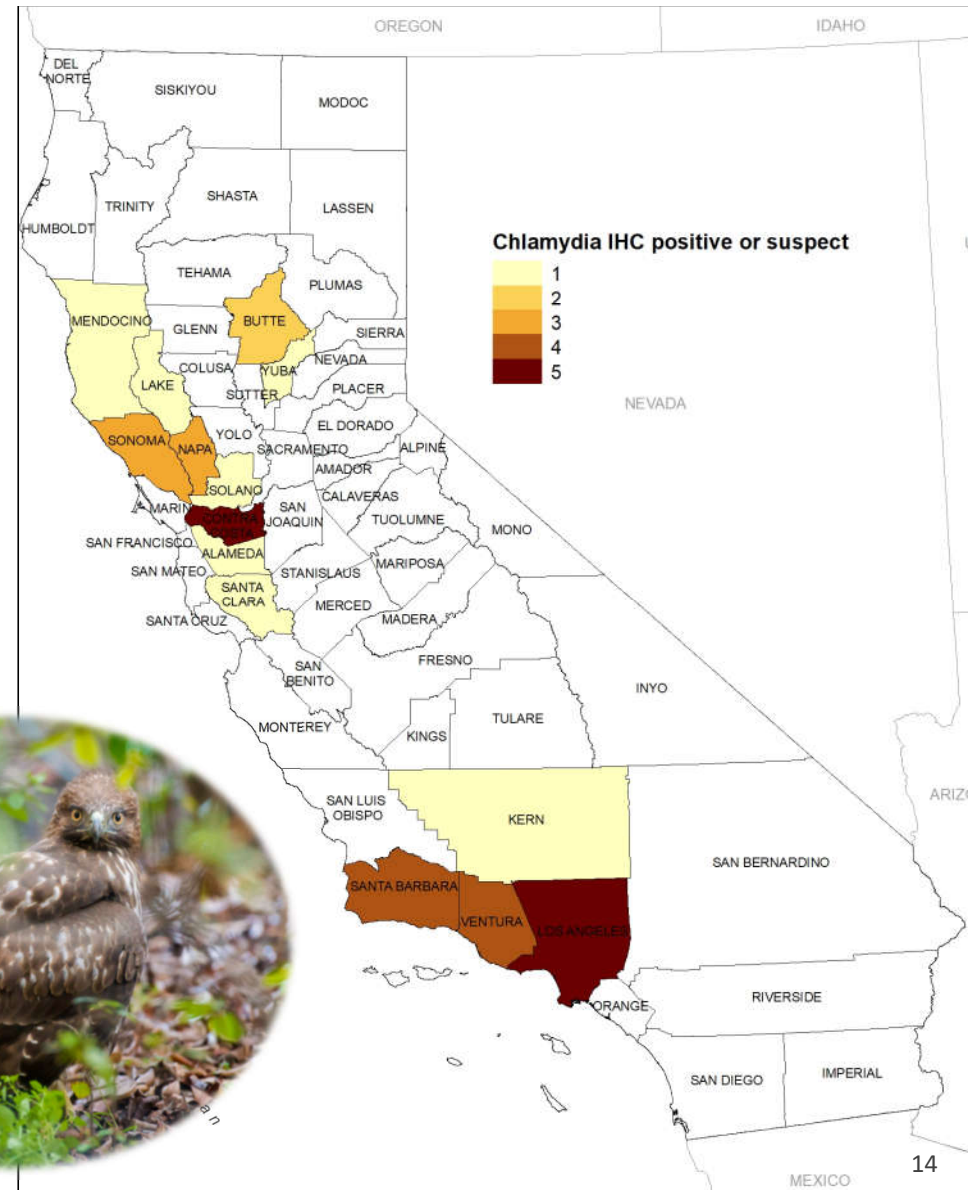
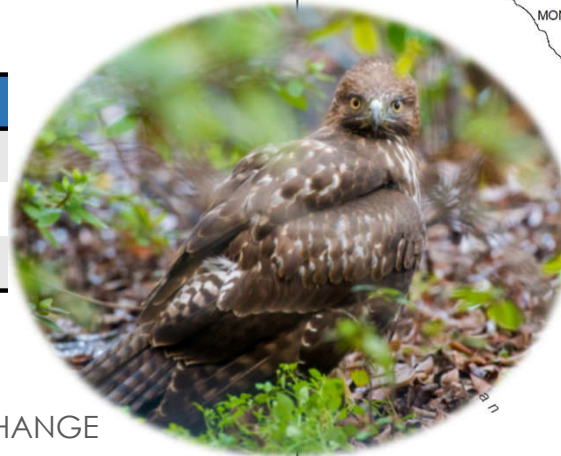
Red-tailed Hawks

- Avian chlamydiosis (76.2%; 32/42)
 - Majority with emaciated body condition
 - Mildly to markedly enlarged spleen
 - Mildly to markedly rounded liver
 - Fibrinous air sacs
- Immunohistochemistry (IHC, n = 42)

Age	Positive IHC	Suspect	Negative IHC
Juveniles	17	6	8
Adults	8	1	3
Total	25	7	11

- Histopathology (IHC, n = 42)

Age	Splenitis	Hepatitis
Juveniles	17	17
Adults	8	7
Total	25	24



PRELIMINARY DATA – RESULTS SUBJECT TO CHANGE



Thank you

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