

# Briefing on: Bats and White-nose Syndrome in Washington

Abby Tobin, Biologist  
Diversity Division, Wildlife Program  
Washington Department of Fish and Wildlife



# Natural History

Bats are the second most common group of mammals

- 1,400+ documented species in world
- 15 species in WA

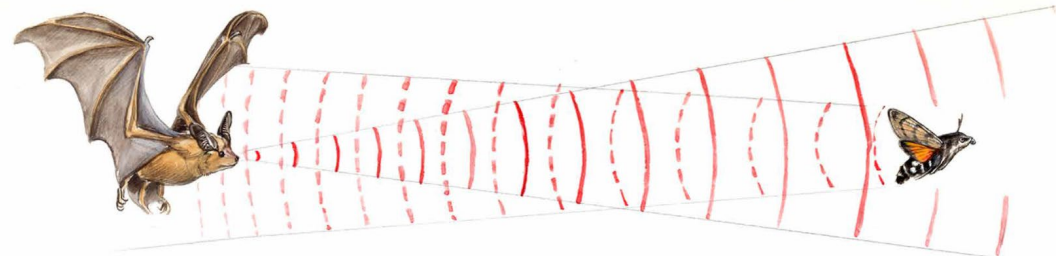
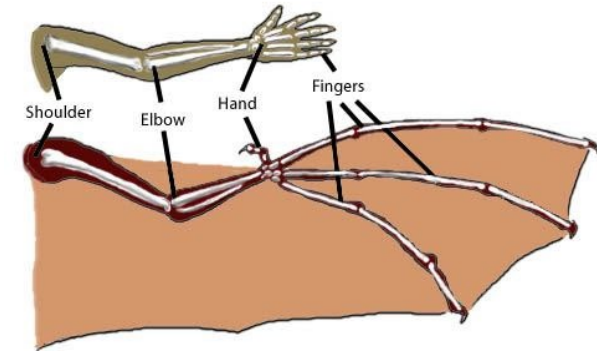
Only true flying mammal

- Wing structure similar to human hands

Long-lived animals with slow reproduction rates

- Oldest recorded age of wild live bat is 40 years
- 1-2 pups per year, population slow to recover from threats

Use echolocation to navigate and hunt



# Natural History - Washington

Return to summer areas seeking productive foraging areas

- Pregnancy occurs if healthy and suitable conditions

Females form maternity colonies

- Colony size varies by species
- Energetically demanding time, vulnerable to disturbance

Spring  
Mar-May

Summer  
May-Aug

Winter  
Nov-Mar

Fall  
Sept-Oct

Differing overwintering strategies

- Hibernators
- Resistors
- Migrators

Disperse from summer colonies to productive foraging areas

- Mating ensues, delayed fertilization in spring



Photo: S. Thomas/BCI



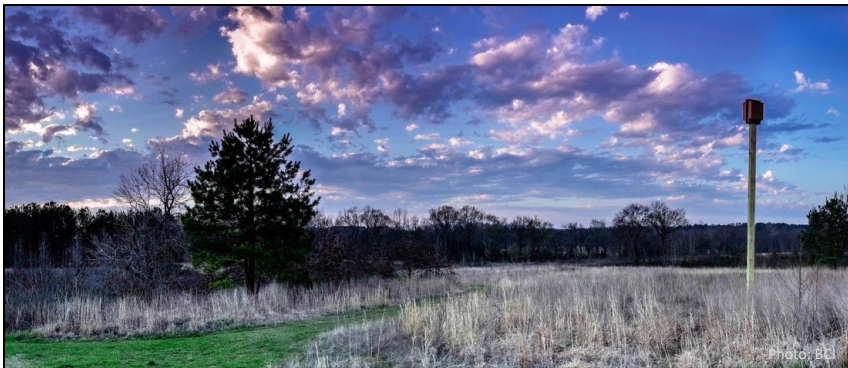
Photo: Z. Hawn/NW Trek



# Natural History

Bats play critical role in ecosystem

- In Washington:
  - **Insect control** – estimated to save more than \$3 billion per year in crop damage and pesticide costs in U.S.
- Elsewhere:
  - Pollinators – over 500 plant species rely on bats, e.g., agave, banana, mango.
  - Seed dispersal - reforestation





# Top Threats to Bats

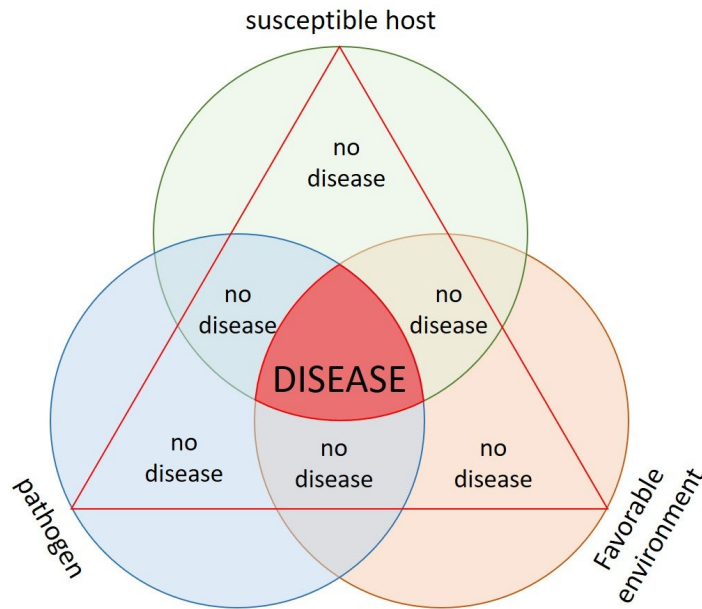
1. Loss or degraded forage and roost habitat
  - Urbanization, deforestation, agriculture, human disturbance, pollution
2. Renewable energy
  - 1.4 bats/MW per year in WA for 3,480 MW = 4,872 bat mortalities at wind turbines annually
3. Climate change
  - Drought, heat and severe weather effect reproduction and survivorship
4. **White-nose Syndrome**



# White-nose Syndrome



# White-nose Syndrome (WNS)



## Susceptible Host

Hibernating bats

Spread by bat-bat, bat-environment, and humans

## Favorable Environment

Cool, dark loving fungus (4-14°C, >90% rh)

Caves, mines, talus, crevices, other?

## Pathogen

Fungal disease – *Pseudogymnoascus destructans* (Pd) causative fungus

Invasive, foreign origin



# White-nose Syndrome

Hibernating bats have limited stored fat for winter

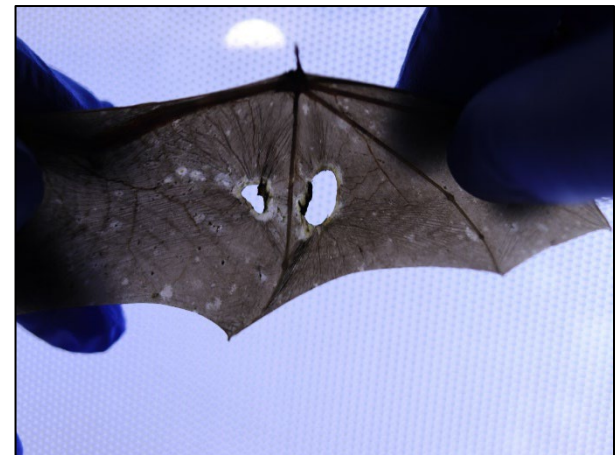
Infected bats:

- Fungus invades epidermis, disrupts healthy cell function
- More frequent arousals
- Increased energy expenditures

Bats emerge too early in winter or spring

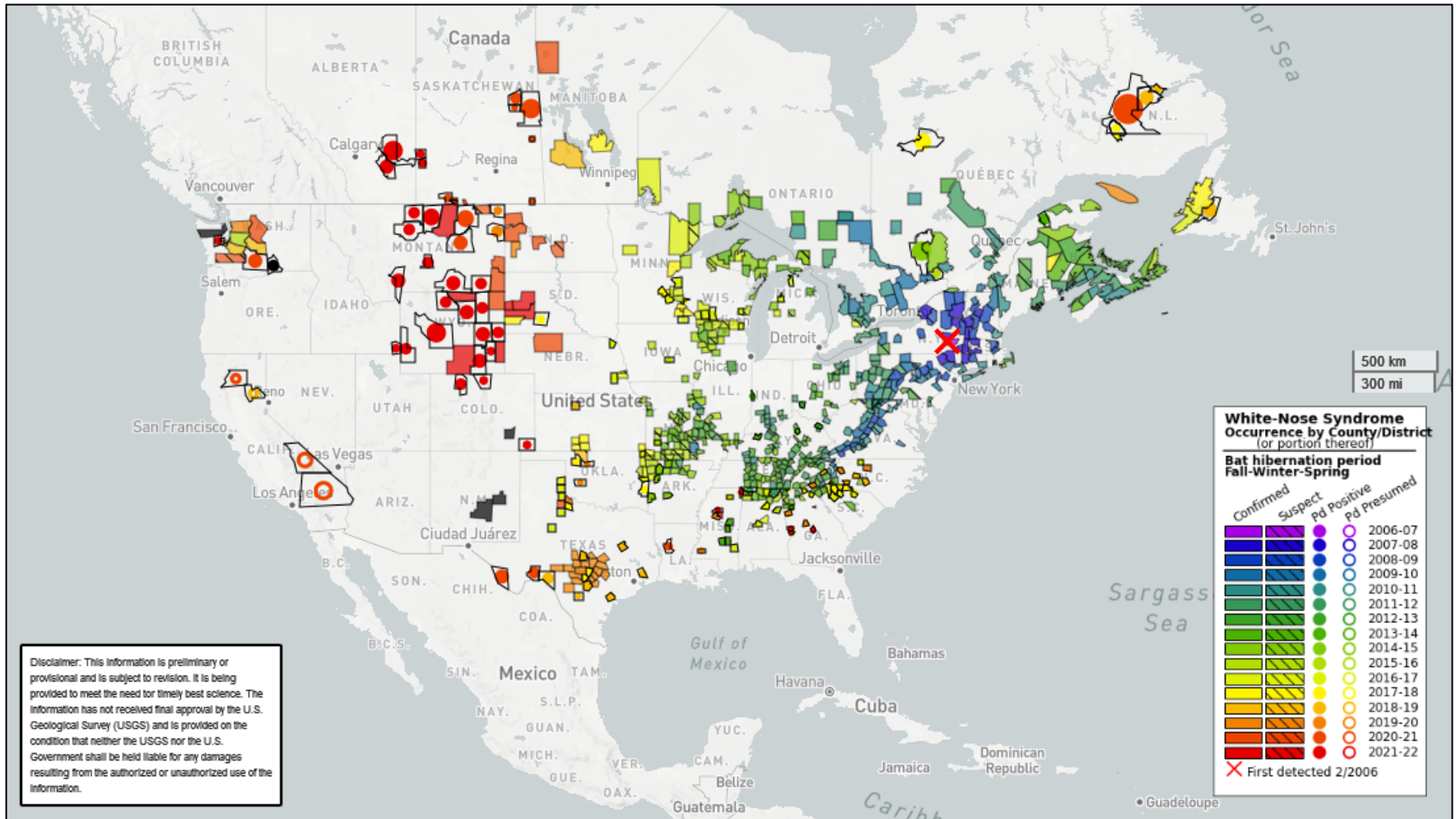
- Emaciated and dehydrated
- Tissue damage to wings

In Washington, we have not seen clinical signs like eastern U.S., the “white-nose”

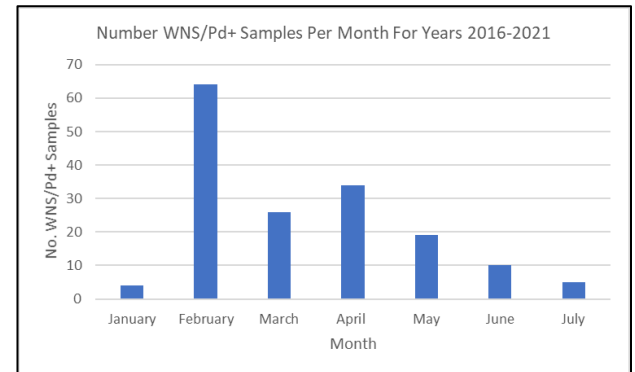
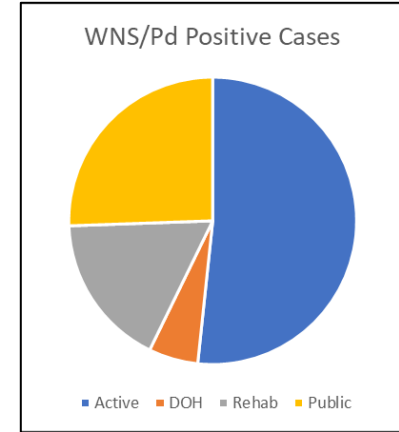
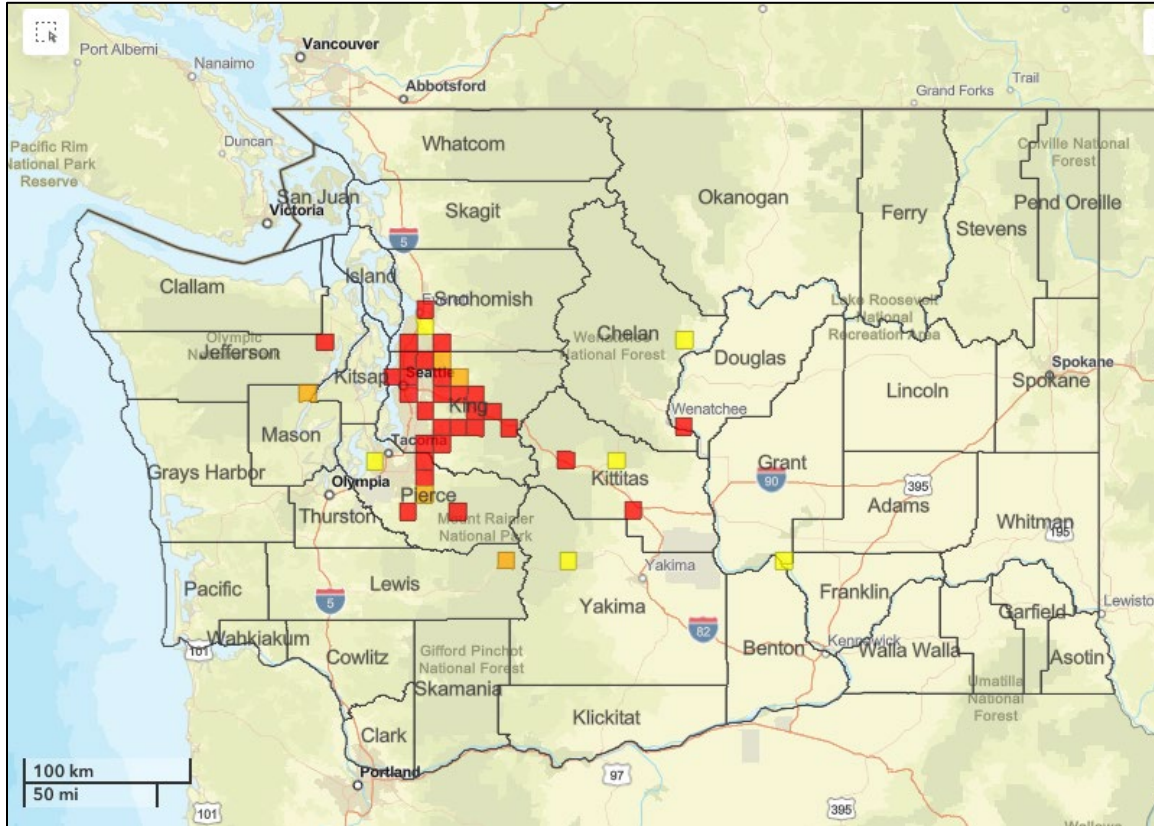




# WNS/Pd Occurrence Map



# WNS/Pd Occurrence in Washington



First case in 2016, and as of 2023 have 190 WNS/Pd cases



# White-nose Syndrome

Confirmed WNS in 4 species in WA

- Other hibernators are vulnerable
- Non-hibernators can be vectors

>90% mortality rate for some species

Millions of bats killed by WNS in eastern and central North America

Impacts have warranted federal listing of bat species under Endangered Species Act

- Little brown bat currently being assessed by USFWS



Little brown bat  
(*Myotis lucifugus*)



Yuma myotis  
(*Myotis yumanensis*)



Long-eared myotis  
(*Myotis evotis*)



Fringed myotis  
(*Myotis thysanodes*)



# Challenges

Natural life history limited or unknown for many species

- Which species use hibernation and thus vulnerable?
- Summer and winter roost locations?

Different hibernation ecology than eastern species – small, dispersed, inaccessible or unknown.

Limited baseline data on population trends and status when WNS arrived

Simultaneously needed to elucidate natural history while developing new monitoring and surveillance approaches



*One of WA larger Myotis hibernacula (n=7)*



# Management Actions for WNS



## Elucidate natural history

- Identify summer and winter roosts, difficult to assess impacts and monitor population without

## Community education

- Bat observations
- Conservation messages

## Population monitoring

- **Maternity colony counts**
- Acoustic monitoring

## WNS Surveillance

- Determine occurrence and species susceptibility

## WNS Treatments

- Pilot phases testing WNS vaccine and probiotic



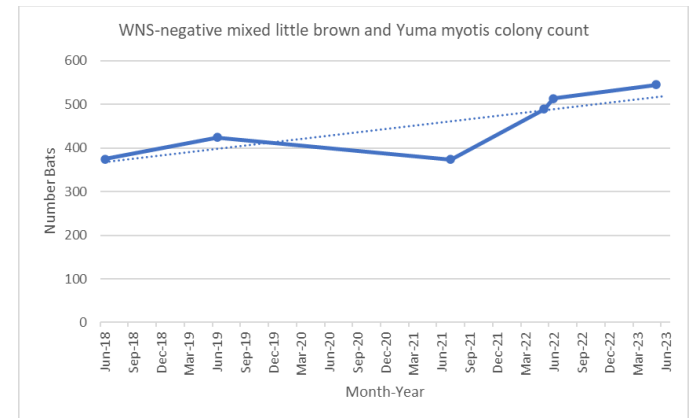
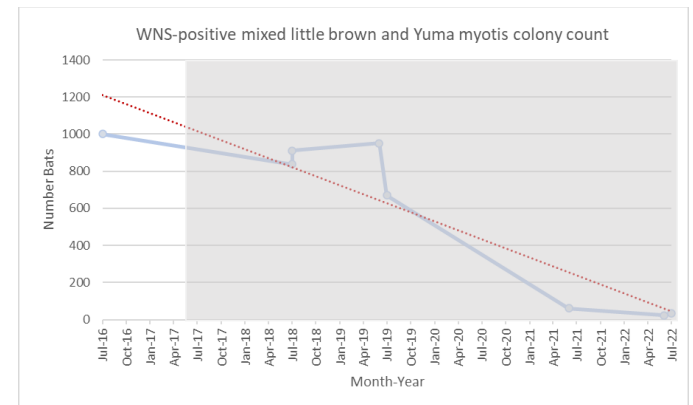
# Management Actions – Colony Counts

WDFW Biologists and partners conduct emergence counts at 50 maternity colonies annually

- Little brown bat and Yuma myotis colonies priority due to WNS susceptibility

One metric to detect changes due to WNS

- Declines in summer colony sizes mirror those in hibernacula
- Other factors can influence counts
- Declines in landscape acoustic activity also mirror those in hibernacula, another monitoring approach to detect change



# Management Actions – WNS treatments

WNS treatments were not feasible in WA until recently

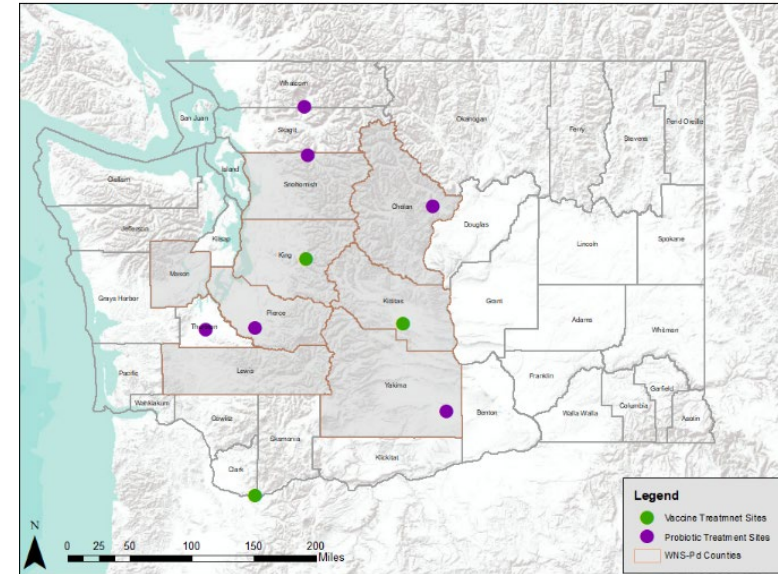
- Due to differences in roosting ecology
- Shifted from hibernacula centric to summer options

PROBIOTIC – cocktail of beneficial local microbes that inhibit growth of WNS causative fungus. Developed by collaborators, Wildlife Conservation Society Canada, Thompson River University, McMaster University

VACCINE – specific antigens elicit protective immune response in bats. Developed by USGS

\*first western state to participate, we are at the **forefront of summer treatments**

White-Nose Syndrome Treatment Sites in Washington 2022

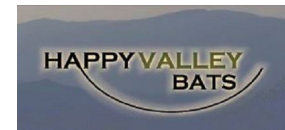
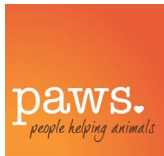
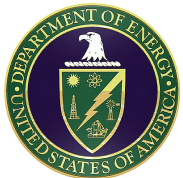


# Acknowledgements

*We have so many partners and private landowners dedicated to bat conservation, and we appreciate their continued support and collaboration!*



**Seattle  
Public  
Utilities**







Questions?

Abby Tobin

[Abigail.Tobin@dfw.wa.gov](mailto:Abigail.Tobin@dfw.wa.gov)

360-999-7958

Photo: B. Davis

