

# Basic Learning Points:

## Research Update: Bats, Songbirds, Prairie Grouse

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- 1)** Operational minimization (e.g. raising cut-in speeds) is being used at many wind facilities to reduce bat fatalities.
  - a.** Several studies show bat fatalities can be significantly reduced by raising turbine cut-in speed by a little as 1.5 m/s above the manufacturer's cut-in speed
  - b.** Economic costs are variable and relatively unknown
  - c.** Not applicable in low wind regions
  - d.** May not meet conservation goals for all species
  - e.** May refine method using additional weather variables
  
- 2)** Ultrasonic acoustic deterrents use sound to disrupt bat's sonar, causing them to avoid the rotor-swept area.
  - a.** Unproven technology
  - b.** Attenuation of high frequencies limits area in which deterrents are effective, especially during some weather conditions
  - c.** R&D needs: placement, orientation, transmission pattern, frequency
  

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- 3)** Small passerines (songbirds) sources of mortality include:
  - a.** Habitat loss/climate change
  - b.** Collision with manmade structures
  - c.** Cats and other predators
  - d.** Contaminants and pesticides
  - e.** Natural disasters
  
- 4)** Best Management Practices for songbirds include:
  - a.** Minimize lighting on turbines, blinking white or red
  - b.** Avoid substation lighting and turn the lights off in the nacelle
  - c.** Unguyed permanent met towers

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- 5)** Greater Sage Grouse
    - a.** Decreased nest and brood survival may be attributed to increased predation, ecological trap habitats, subsidized predators, and compromised defense mechanisms.
    - b.** Strong site fidelity to habitats selected prior to wind development
  - 6)** Greater Prairie Chicken
    - a.** Nest site selection, nest survival, female survival not impacted by wind development; influenced more by rangeland management
    - b.** Other energy development experienced opposite impacts. Discrepancy likely result of differences in associated infrastructure.
    - c.** Female greater prairie-chickens avoided wind turbines but there were no negative impacts on demographic performance
  - 7)** Mitigation and future research for prairie grouse species:
    - a.** Site specific rangeland management practices
    - b.** Long-term BACI studies estimating impacts in different ecosystems
    - c.** Mechanisms affecting sage-grouse nest and brood survival
  - 8)** Predation is the main source of nest and brood failure and female mortality for both grouse species.
  - 9)** Greater sage-grouse nest and brood survival decreased in close proximity to turbines; no effect for greater prairie-chicken nest survival.
  - 10)** Greater sage-grouse female survival not affected by turbines; greater prairie-chicken survival increased with turbines on the landscape.
  - 11)** Female greater prairie-chickens avoided turbines whereas greater sage-grouse selected habitats in close proximity to wind turbines.
  - 12)** Dissemination of research results helps industry and wildlife managers understand impacts and determine best conservation measures.
  - 13)** Landscape level conservation can be aided by research through better understanding of species needs and appropriate mitigation.

- 14) Meta-analyses, such as the small passerine study, detect trends and assemble existing information needed to assess cumulative impacts.