

# A RETROSPECTIVE TIERED ENVIRONMENTAL ASSESSMENT OF THE MOUNT STORM WIND ENERGY FACILITY, WEST VIRGINIA, USA

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Efroymsen, R.A., R.J. Day and M. Dale Strickland. 2012. A retrospective Tiered Environmental Assessment of the Mount Storm Wind Energy Facility, West Virginia, USA. ORNL/TM-2012/515  
66 pp.

# Objectives of the Case Study



- Provide a real-world example of the use of the USFWS Land-based Wind Energy Guidelines
- Indicate how use of tiered assessment framework might alter outputs of previously undertaken wildlife assessments
- Assess benefits of tiered ecological assessment framework for siting wind energy facilities

# The Project



- Mount Storm Wind Energy Facility in Grant County, West Virginia, USA.
- Site mainly used for logging and strip mining
- 132 turbines (264 MW) on a strip of land ~0.8 km wide and 22.5 km long along Allegheny Front
- 2004: Pre-construction environmental assessments completed
- Fall 2011: Post-construction fatality studies completed

# Tier 1



- WEG objective #2: to screen a set of potential sites to avoid those with high habitat value
- Developer divided proposed project area into the Central, Northern, and Southern Phases
- Developer Proposal: Construct the Central Phase first, then the Northern and Southern Phases

# Tier 2

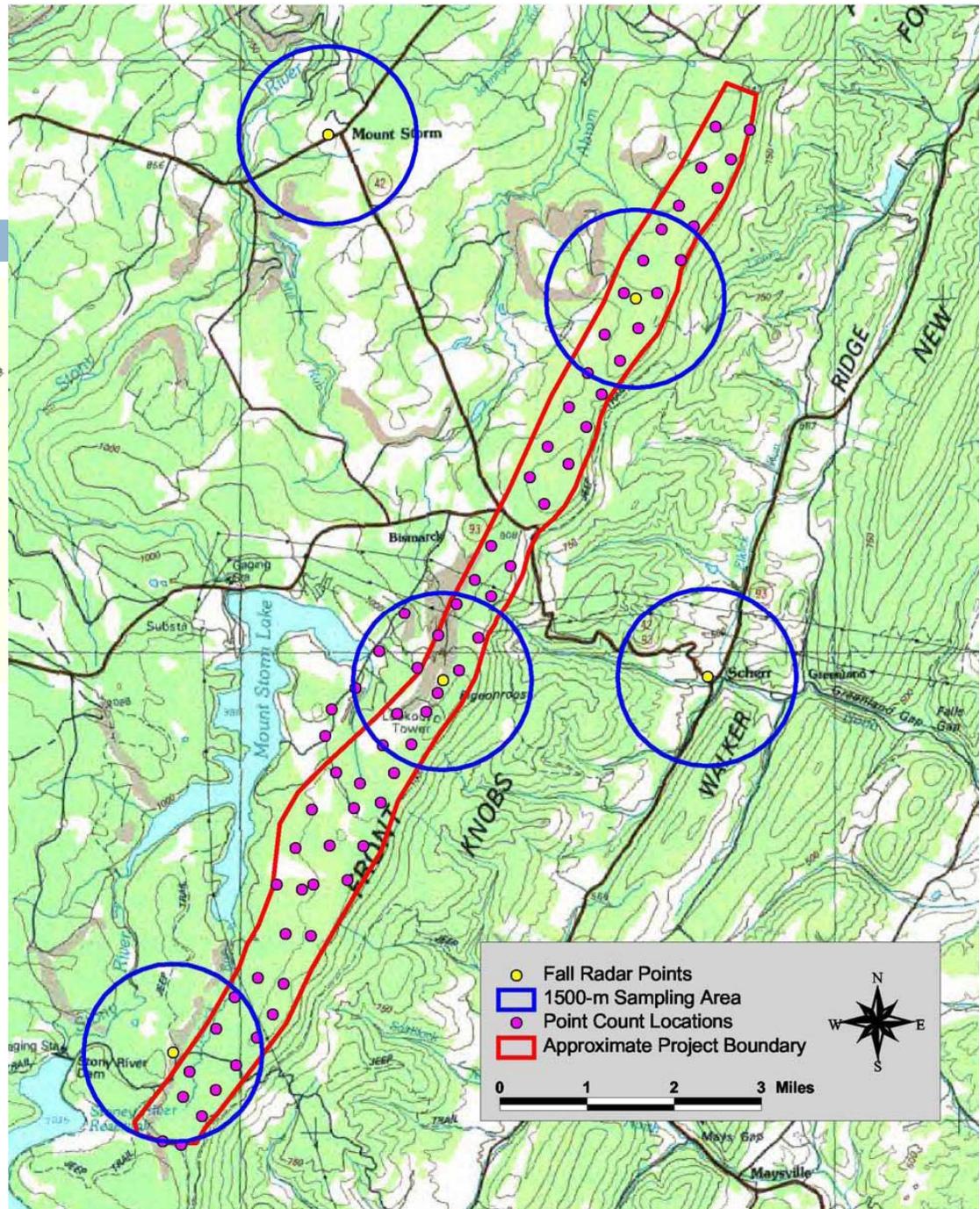


- “Phase I avian risk assessment” (Canterbury 2002)
- FWS and state DNR identified potential spp of concern requiring Tier 2 or Tier 3 studies
- Helmick Run Bog – avoided but risk not documented, as suggested by the WEG
- Two T&E bat species identified, but low risk

# Tier 3



Figure 1. Radar sampling station locations and fixed-point survey plot locations, taken from the avian baseline assessment for Mount Storm, Young et al. (2004).



# Tier 3 Decision Process and Outcome



- Concerns about most spp eliminated based on abundance and/or project design
- Passerine fatalities likely low relative to exposure and similar to other projects in the region
- No evidence supporting “leading edge” hypothesis for migrating birds
- Bats
  - ▣ Evaluation of significance would be necessary today
  - ▣ WEG would have recommended 2 years of fatality monitoring
  - ▣ Permit issued required 3 years of fatality monitoring

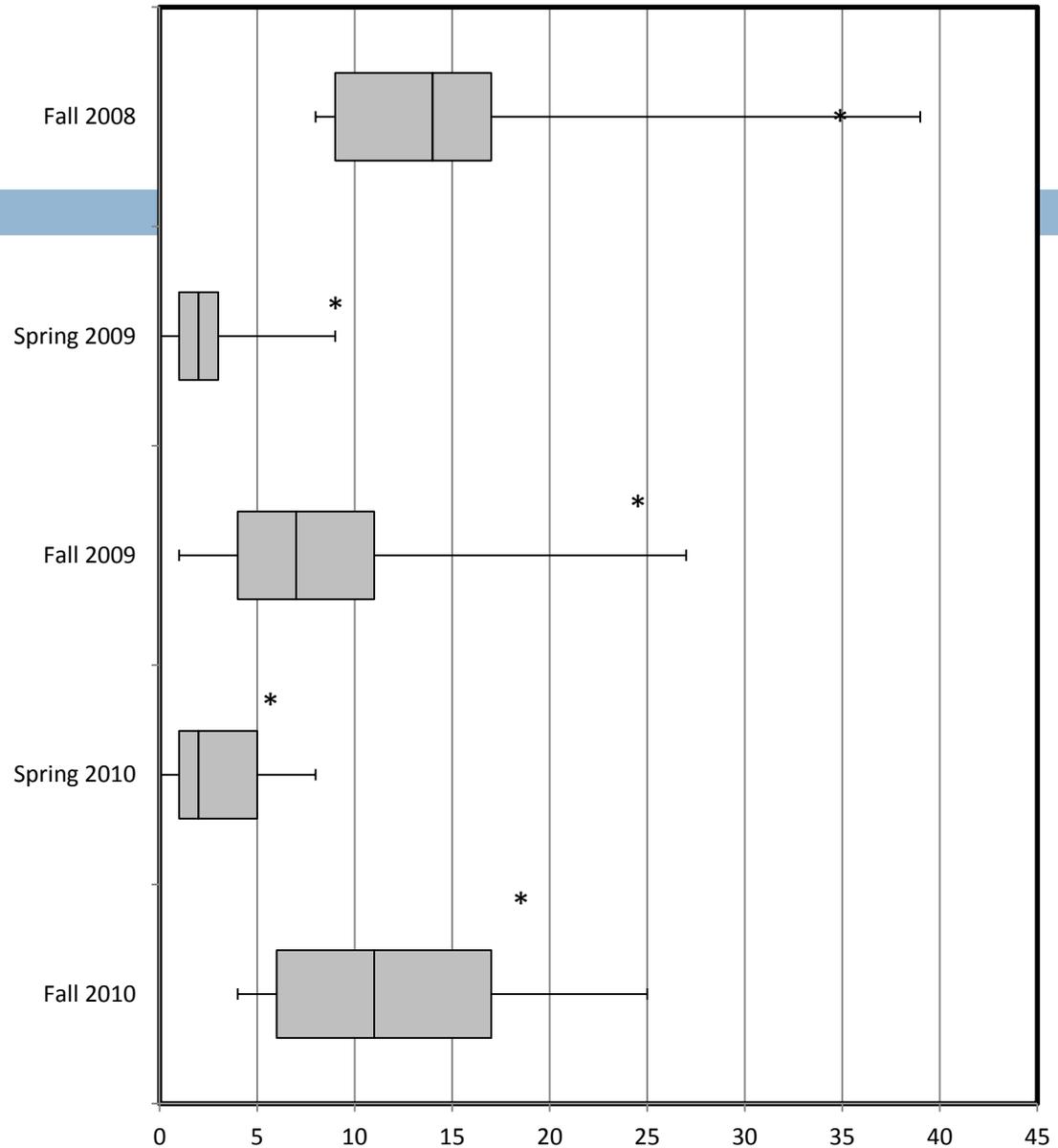
# Tier 4a



- Permit required 3-year migration period fatality monitoring for birds and bats
- 0.35 - 3.9 birds/MW/study period (comparable to other Eastern projects); majority passerines; somewhat higher than predicted
- 2.88 - 12.11 bats/MW/study period (top quartile, lower than top 10%); primarily 3 spp of migratory tree-bats; rates lower than predicted based on nearby Mountaineer Wind Energy Center

# Tier 4

Figure 2. Numbers of bat carcasses found at turbines searched daily. Asterisks show Turbine 81. For Fall 2008, Spring 2009, and Fall 2009, Turbine 81 was an extreme outlier for bat fatalities, using the conservative definition of three times the interquartile range.



# Tier 4 Decision Process and Outcome

- Bird fatalities close to predicted values
- Most species of concern not represented
- Primarily passerines, some migratory
- Bat fatalities close to predicted values
- Turbine outlier may have been habitat related
- Primarily migratory tree-bats in numbers  $\leq$  neighboring facilities
- No T&E fatalities documented
- No species of habitat fragmentation concern

# Tier 5



- Synthesized info from 10 operational mitigation studies in North America
- Conclusion: Substantial reduction in bat fatalities by increasing cut-in speed to 1.5-3.0 m/s or feathering blades & slowing rotor to manufacturer's cut-in speed
- Implemented study of blade feathering for 2 years in conjunction with Tier 4a
- Feathering currently operational and automated at all turbines

# Discussion and Conclusions



- May apply to all wind projects, especially in Eastern mountainous areas
- Lacked species of habitat fragmentation concern
- Tiered structure did not change conclusions
- Suggested some Tier 3 studies unnecessary based on Tier 2 risk assessment
- Suggested more risk to bats than identified by original study
- Suggested there would have been more thorough evaluation of risk to Indiana bat under today's standards
- Illustrated benefits of tiered assessment framework