ASSESSING PRE-CONSTRUCTION BAT ACTIVITY AT PROPOSED WIND ENERGY FACILITIES

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PRE-CONSTRUCTION ASSESSMENTS

Avoid building facilities in high risk areas
Areas of high concentration (e.g., Texas Hill Country) should be identified and avoided...
What is the “risk” to bats at a given site?
Factors Influencing Pre-Construction Monitoring and Confidence of Data

- What question is being asked?
- Inappropriate sampling design and methods used for question of interest
- Failure to account for spatial and temporal variation
- Poor sample sizes
- Pseudoreplication
- Financial and logistical constraints
No linkage between pre-construction assessments and post-construction fatality...
Can indices of activity gathered pre-construction with acoustic detectors predict bat fatality post-construction?
What We’ve Learned So Far...
Consistent Patterns Among Studies

Activity is highly variable both temporally and spatially

NW Massachusetts

avg number of passes/tower/night

Date

But...similar patterns among sites
Annual activity indices are HIGHLY variable!

Data from Casselman, PA site
Activity differs among species groups in relation to altitude (Massachusetts)
Climatic Variables Influence Bat Activity

Ambient Temperature
- Most bat activity occurs on warmer nights
- Activity generally increases with increasing temperature
- May relate to insect activity, thermal and energetic constraints

Wind Speed
- Peak activity at low wind speed:
  - Most activity (up to 90%) occurs below 6 m/s
  - High percentage of activity occurs below 4 m/s
Temperature-Wind Speed Relationships

Spring 2008 – Dillon, CA

Mean Temperature (°C)

Mean Wind Speed (m/s)

Passes/Det
- 0
- < 0.25
- 0.25 – 0.5
- 0.50 – 1.0
- 1 – 2
- > 2

Provided by Ted Weller, USFS
Patterns of bat activity in relation to wind speed are highly variable, but appear consistent with patterns of fatality...
The effect of cutting on bat activity differed significantly in 2007 (post) compared to 2005-06 (pre):

Activity was 5.5-25.6x greater post vs pre-cutting at 1.5 m high at “cut” sites compared to uncut sites (P<0.0001)

Activity was 1.8-4.0x greater post vs pre-cutting at 22 m high at “cut” sites compared to uncut sites (P=0.15)
How many sampling sites to get within x% of the mean?

- 10% of mean
- 20% of mean
Survey Protocol Implications

- Multiple sites
- Multiple detectors
- Multiple years!
- Must consider sampling location relative to habitat manipulation
Pre-construction: where to next?

Continue intensive acoustic monitoring at numerous facilities...

Several acoustic studies underway...

Must coordinate these efforts to build the dataset needed for analyzing pre- and post data using the site as the exp. unit...

Finalize and disseminate protocols...
A Framework for Decision Making is Generally Lacking

Myotis sodalis present

USFWS Consultation
HCP or Conservation Agreement
Abandon Project

8.2 bat calls/night vs 82 calls/night

???
MANY THANKS!!!

QUESTIONS...