Operations (Post-Construction) Monitoring: Assessing Bird and Bat Impacts From Wind Energy Development in California

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Purpose of Operations Monitoring

- Compare information to pre-permitting fatality estimates
- Evaluate the effectiveness of mitigation measures
- Assess unanticipated impacts

Development of an Operations Monitoring Program

- Consider operations monitoring protocol during pre-permitting surveys
- Coordinate with CDFG in developing protocol and duration

Duration of Operation Monitoring

Multi-year monitoring if:

- High potential for bird or bat fatalities, substantial seasonal/annual variation, using adaptive management/testing mitigation effectiveness

Minimal monitoring if:

- proposed project adjacent to existing facility, low bird and bat impacts, data recent and applicable to microsite and habitat conditions

Bird and Bat Use Studies

- Put fatality data in context of relative abundance
- Assess changes in species composition/numbers
- Characterize flight behavior, changes in use

Factors to Consider in Carcass Search Protocol

- Search area
- Frequency of searches
- Corrections for:
  - Searcher error
  - Scavenger removal

Carcass Search Plots

- Determine search radius with pilot searches
- Size of plot should vary with height of turbine, adjacent slope
- Bats, small birds closer to turbine

Search Frequency

- Establish with pilot scavenging trials
- Searches minimum every two weeks, more frequent if warranted
- For projects with many turbine, stratify sampling

Searcher efficiency

- Searcher variability due to inherent individual differences and changing field conditions
- Conduct searcher trials to correct for variability throughout monitoring period

Scavenging/Removal Estimates

- Scavenging trial: plant carcasses and check daily at first
- Repeat scavenging trials throughout monitoring period.

Sources of Bias in Removal Estimates

- Background mortality
- Scavenger learning, seasonal change in scavenger numbers
- Inappropriate surrogate for carcass (e.g., domestic species, not freshly killed), inappropriate density of carcasses

Metrics and Data Analysis

- Number of fatalities per megawatt of installed capacity
- Corrected fatality rate is observed rate divided by probability that carcass is available during a search and is found

Monitoring Reports

- Sufficient detail so reviewing agencies/peer reviewers can evaluate methods and check independently
- Discuss effectiveness of mitigation
- Public participation in development of monitoring programs, review of monitoring reports?