Eagles and Wind Energy: Understanding and Managing Risk

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TETRA TECH

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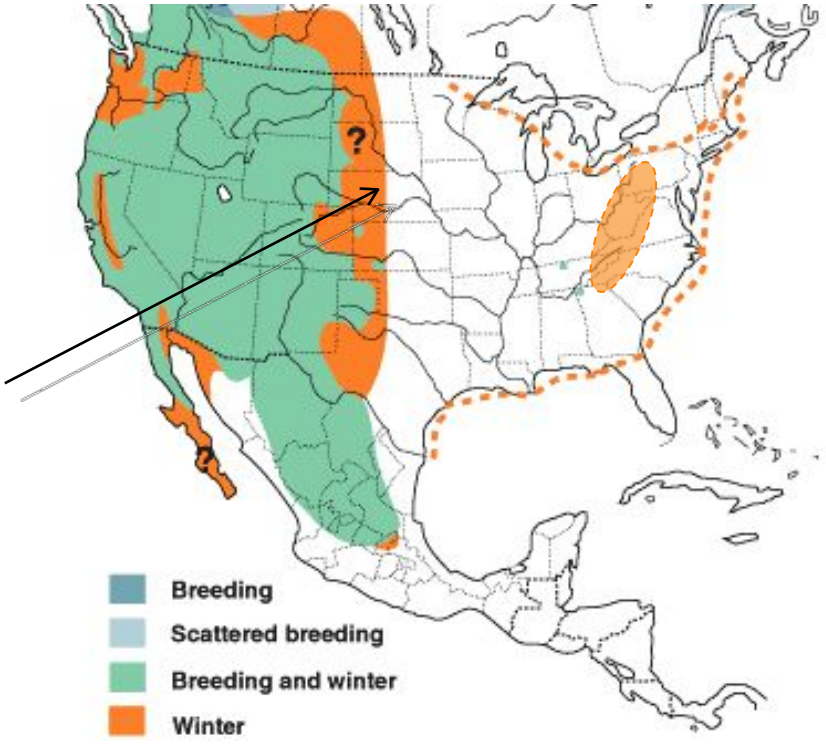
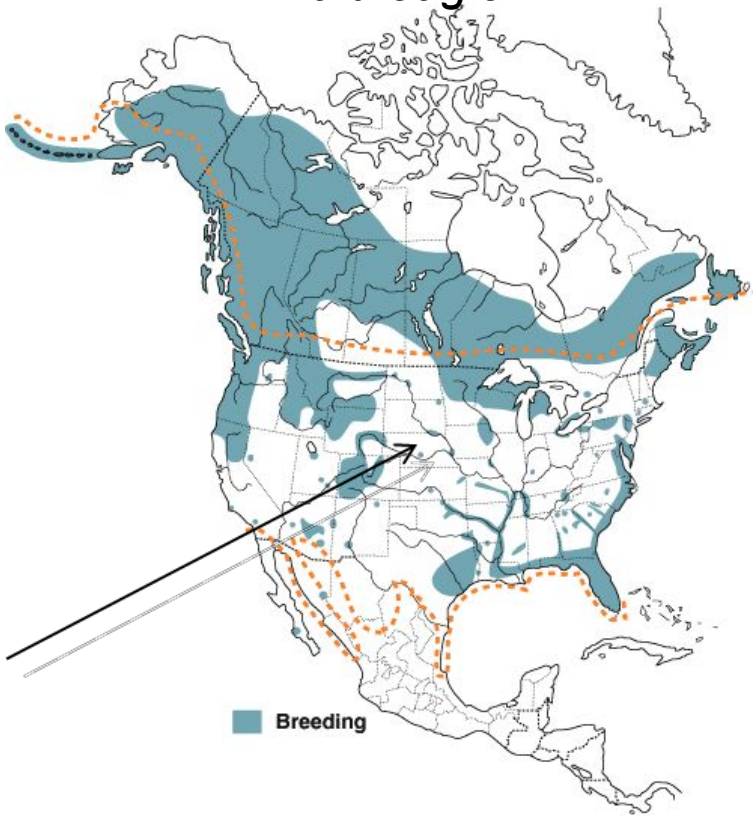
- Protected under BGEPA
- Rule allowing for take went into effect November 10, 2009
- Draft Eagle Conservation Plan Guidance released February 2011
- ECP Guidance Technical Appendices released August 2012

Golden eagle



Bald eagle



- Opportunistic feeding
  - Fish, waterfowl, small mammals
  - Carrion
  - Piracy
- Aquatic habitats
- 5 fatalities
  - 3 in U.S.
  - 2 in Canada
- Lower risk profile

- Active hunters
  - Small mammals
  - Carrion
- Contour hunting
- 54 fatalities outside Altamont
- Higher risk profile

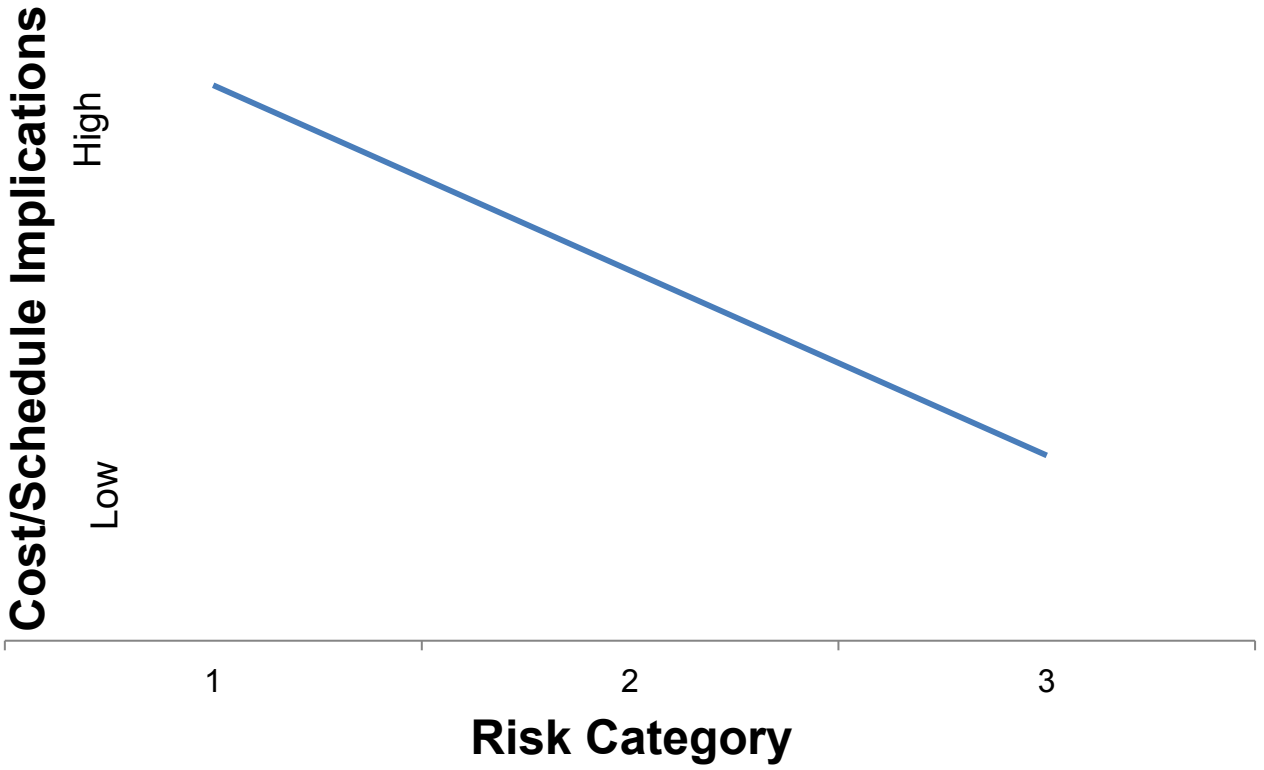
- Bird and Bat Conservation Strategy (BBCS)
- Eagle Conservation Plan (ECP)
- Eagle Take Permit

- Project-specific plan to address risk to eagles from wind developments
- Step-wise approach
  - Identify if eagles are an issue early
- Understand ECP contents
  - Data requirements
  - Consider long-term impacts to project
    - Cost
    - Schedule

- Gather existing, available information
  - Balance suitability for development with potential risk to eagles
  - Refine potential project sites
  - Risk category
- Important use areas within 10 miles of the project
  - Nests
  - Prey concentrations
  - Communal roost site
  - Migration corridor
  - Migration stopover
- USFWS coordination

1. High risk to eagles – little opportunity to minimize effects
   - Should be moved, significantly redesigned, or abandoned
2. High to moderate risk to eagles, opportunity to minimize/mitigate effects
   - ECP should be prepared
3. Minimal risk to eagles
   - ECP may be prepared to document low risk
4. Uncertain risk to eagles
   - Need site-specific surveys to place in a category

The lower the category, the higher the project risk



- Eagle point counts
  - 1-2 hours or more
  - Distributed over entire project
  - At least 30% coverage
  - All daylight hours
  - Year-round preferable
  - At least 2 years

Coordinate with USFWS

- Nest surveys
  - Aerial
  - 10 miles
  - February - May
  - 2 breeding seasons

- Electrocution
- Displacement/disturbance
  - Nests
- Habitat Fragmentation
- Collision
  - Use data from Stage 2
  - Initial fatality prediction

- Determine measures to avoid and/or minimize the predicted risks to eagles
  - Follow APLIC guidance
  - Avoid guy wires
  - Carcass removal
  - Speed limits

- Re-run fatality model after consideration of measures
  - Standard: has proponent avoided and minimized risks to the <u>maximum extent achievable?</u>

- Mitigation for predicted eagle fatalities
- No-net-loss
  - For each take, need to ‘save’ one eagle
  - 2 fatalities predicted, 2 eagles saved
- Translate mitigation action into eagles
  - Resource Equivalency Analysis
  - Power pole retrofits
  - Others could be considered
  - Project-specific

- Develop strategy if fatalities exceed predicted
- Curtailment
  - Prescribed
    - Based on risk factors
    - Turbines might be curtailed when eagles are not present
  - Controlled
    - Based on risk to eagles
    - Monitors or technology
    - Turbines curtailed when eagles are present

- Post-construction Mortality Monitoring Studies
  - Objective: generate data for comparison with baseline
- Turbine searches
  - Year-round
  - Searcher efficiency trials
  - Carcass persistence trials
  - At least 3 years
- Other studies
  - May be other studies to validate baseline data
    - Occupancy/productivity of nests
    - Behavioral observations

- Eagles becoming a potential fatal flaw
- Begin thinking about data collection early in the process
- Recognize that eagle guidance is changing
- Consult USFWS early and often
- Keep a formal record of all avoidance and minimization efforts during project siting
- Keep a record of consultation with federal and state agencies
- Consider cost of post-construction monitoring and adaptive management as early as possible