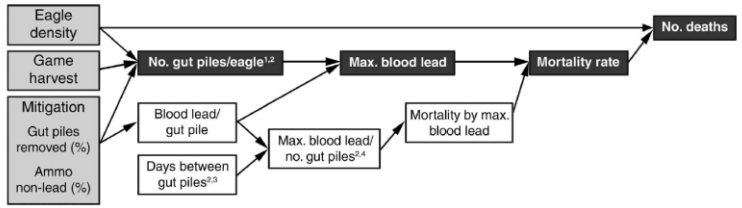
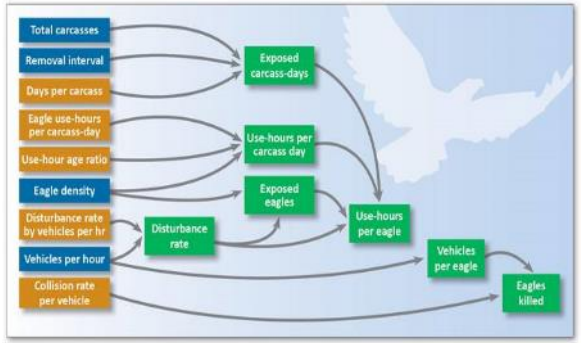


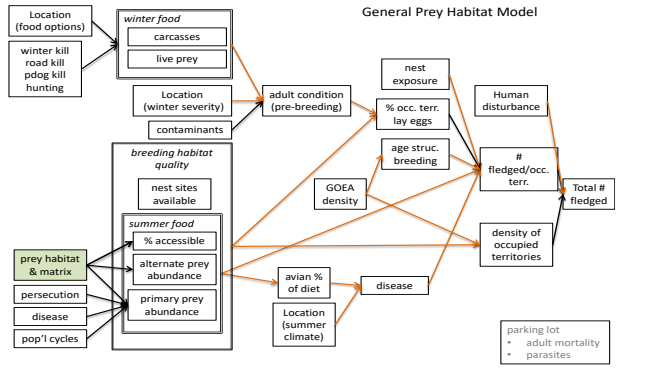
AWWI Updates for CA/NV Eagle Working Group

Garry George & Laura Nagy, AWWI Board, February 20, 2019

Compensatory Mitigation for Eagles







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Modeling with uncertain science: estimating mitigation credits from abating lead poisoning in Golden Eagles

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Abstract. Challenges arise when renewable energy development triggers "no net loss" policies for protected species, such as where wind energy facilities affect Golden Eagles in the western United States. Where established mitigation approaches are insufficient to fully avoid or offset losses, conservation goals may still be achievable through experimental implementation of unproven mitigation methods provided they are analyzed within a framework that deals transparently and rigorously with uncertainty. We developed an approach to quantify and analyze compensatory mitigation that (1) relies on expert opinion elicited in a thoughtful and structured process to design the analysis (models) and supplement available data, (2) builds computational models as hypotheses about cause-effect relationships, (3) represents scientific uncertainty in stochastic model simulations, (4) provides mortality with and without mitigation, (5) presents g risk management preferences (regulatory standards) gation for immediate action, and (6) defines predictive itored effectively, to support experimental adaptive inity. We illustrate the approach with a case study underlying biological processes and high conservation cts of voluntary strategies to abate lead poisoning in stion of spent game hunting ammunition.

ad Golden Eagle Protection Act; compensatory mitigation; opinion; incidental take; lead abatement; lead poisoning;

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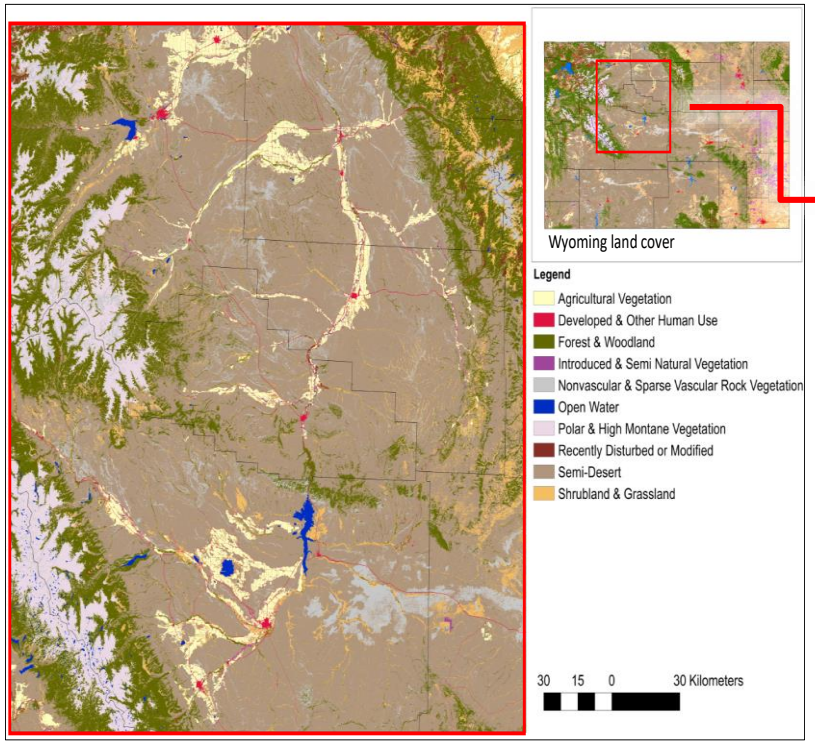
insufficient to meet offsetting demand. The gap between pressing needs for mitigation and available methods can be bridged with experimental implementation of "unproven" methods, provided care is taken to deal transparently and rigorously with uncertainty throughout permitting analysis and implementation. Such is the case in the western United States where the Bald and Golden Eagle Protection Act of 1940 (Eagle Act), as interpreted by the U.S. Fish and Wildlife Service (Eagle Rule; USFWS 2009*a*), allows for development of innovative mitigation approaches to offset incidental taking of Golden Eagles (*Aquila chrysaetos*) associated with wind energy development.

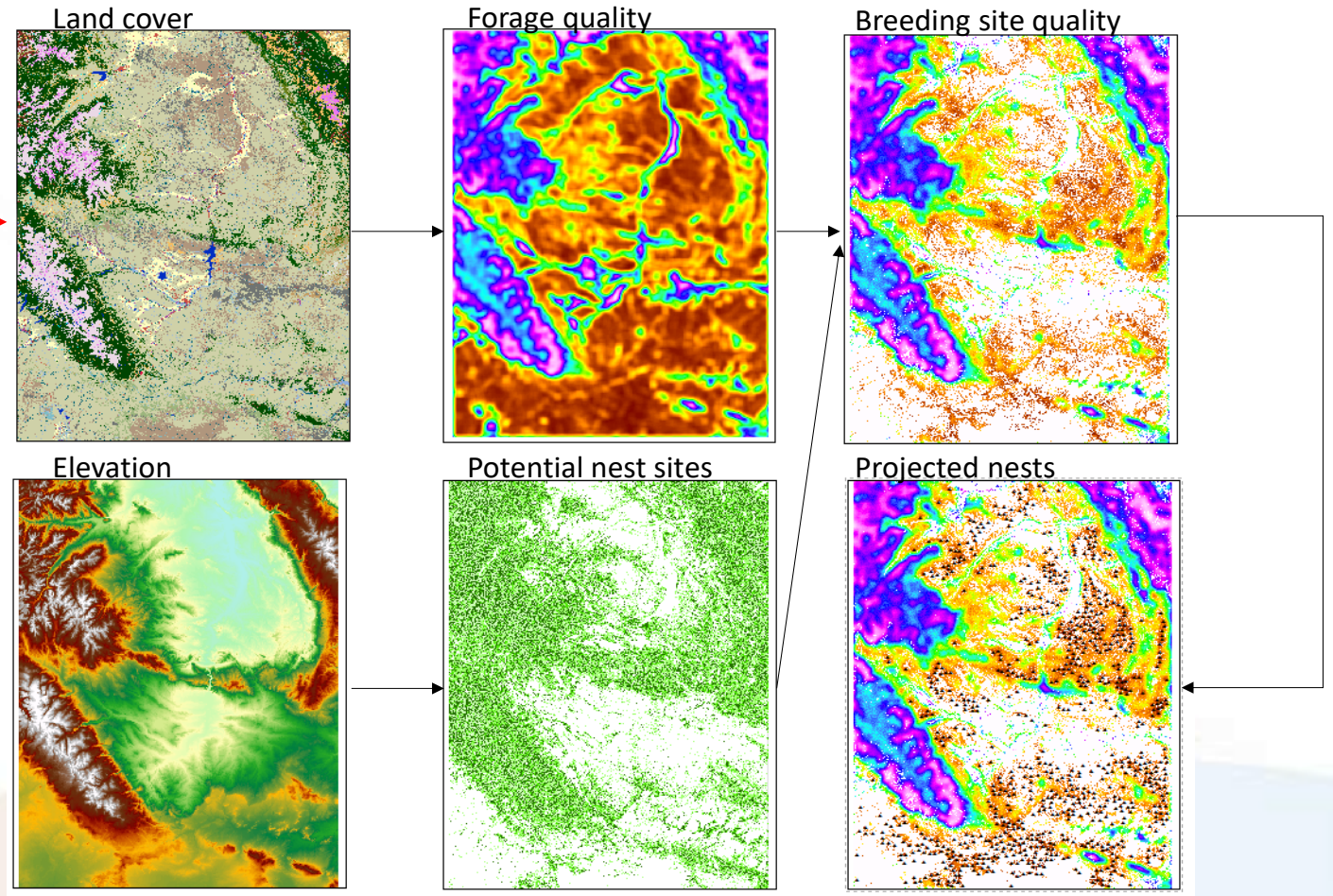
Lead Poisoning Reduction:
Published (Ecol. App.)

Vehicle Collision Reduction:
Published (JWM)

Habitat Enhancement:
Report in Review

Habitat Enhancement – Process Model

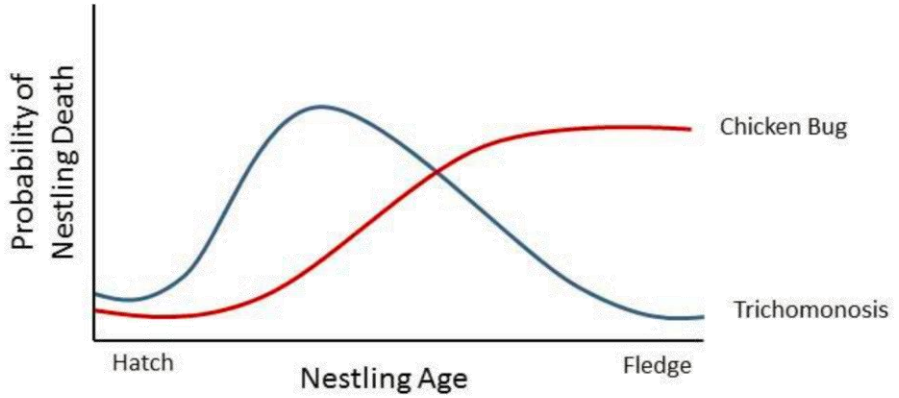


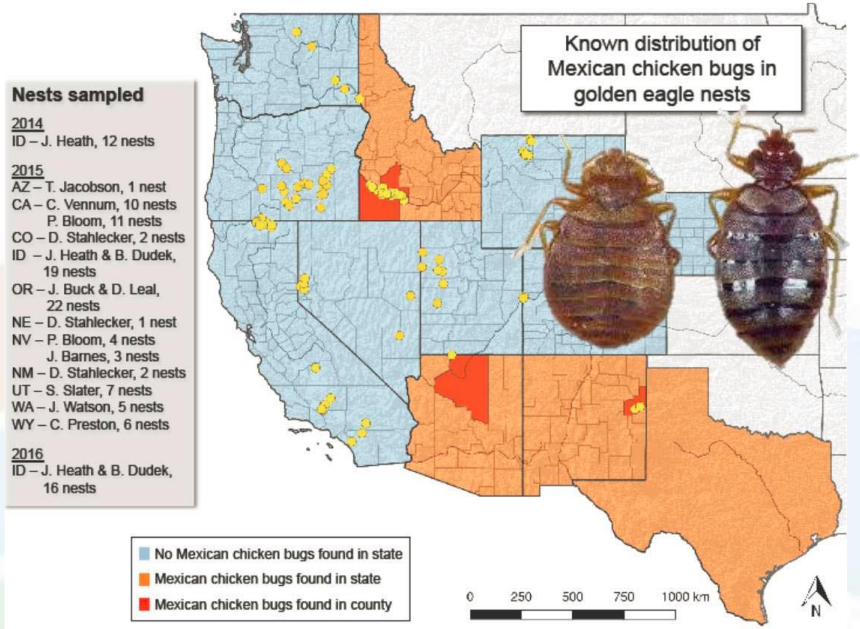


- Predicts nest number with reasonable accuracy
- Focus on intermediate quality habitat
- Caveat – qualitative mitigation predictions

Additional Mitigation Options: Diseases and Parasites

- Casey B. Pozzanghera and Julie A. Heath, Boise State University, Boise, ID
- Avian Trichomonosis
  - Contracted by eating infected rock pigeons
  - 25% (± 3%) of golden eagle nestlings in study area contracted trichomonosis; disease can be fatal
  - Treatable with single injection of anti-fungal
- Mexican Chicken Bugs (*Haematosiphon* sp.)
  - Results in anemia and poor nestling health and survival
  - Killed 16% (± 4%) of Golden Eagle nestlings each year for the last 3 years
  - Treatment being investigated





IdentiFlight Proof of Performance Test (McClure et al. 2018)

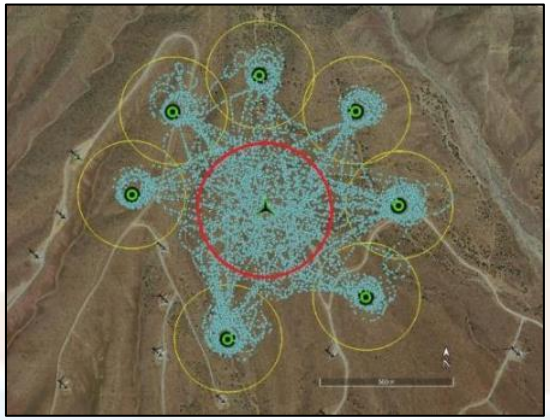
- Rapid classification at substantial distance from the towers
- Detection reliability
  - **96% of the birds detected by human observers**
  - **Substantially higher detection rate over a larger area**
- Accurate classification
  - **Low false negatives (6%; humans = 26%)**
  - **Higher false positives (28%; humans = 2%)**
  - **Classification independent of distance from the cameras**

DOE Study: IdentiFlight

- 2-year study at Top of the World Windpower (WY) and Elkhorn Valley Wind Farm (OR)
- Study design has undergone peer review facilitated by NREL
- Evaluating IdentiFlight detection, classification, curtailment decisions
- GPS-tagged birds at Top of the World Windpower: “true detection rate”
- Field surveys for detection/classification underway at WY site

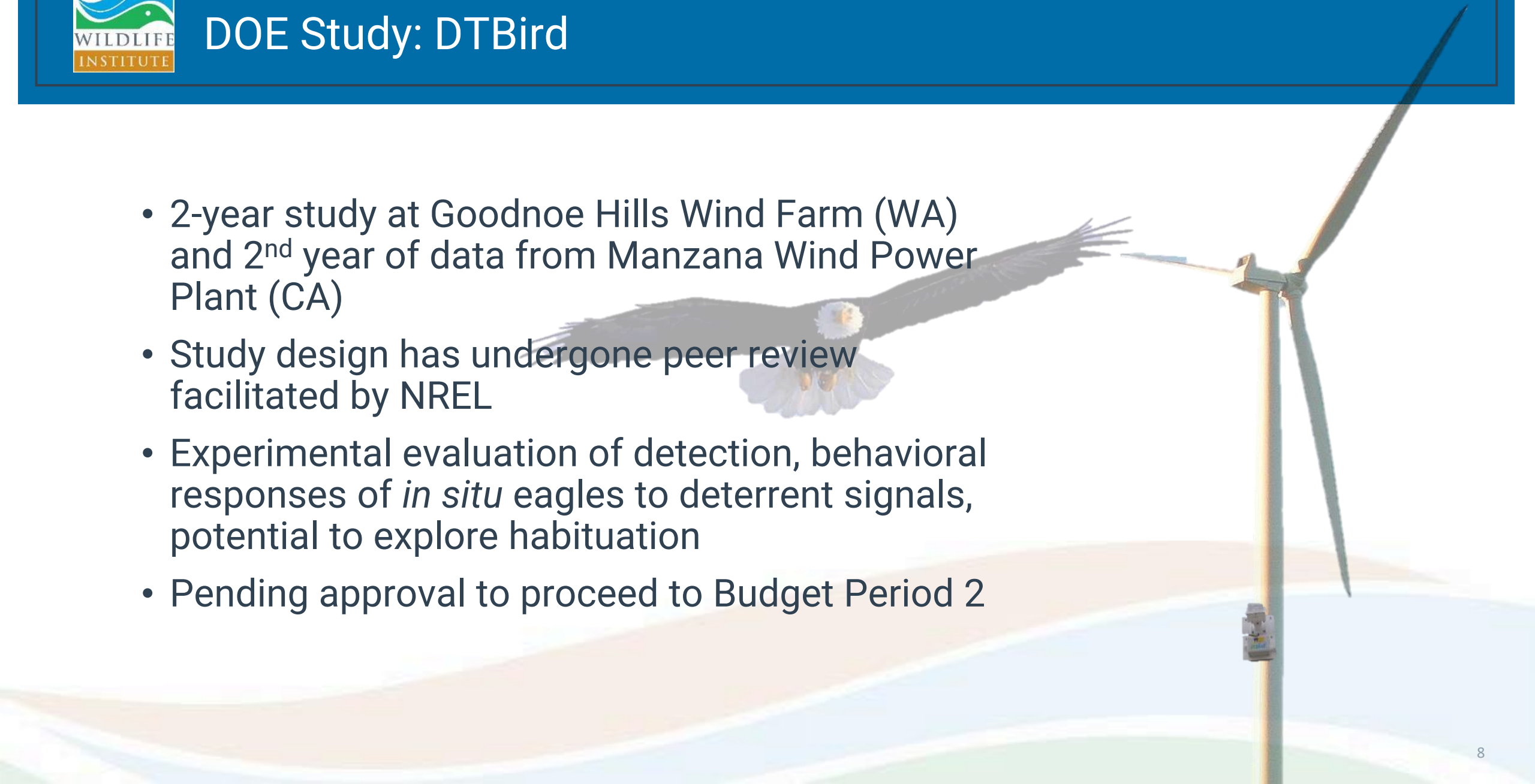
DTBird Pilot Study

- Detection rate from UAV flight trials: 63% ± 10%
- Deterrence rate of *in situ* Golden Eagles: 52-83%
- Estimate of collision risk reduction: 33-55%
- Sun glare, variable cloud cover reduced detection
- 36% of records were false positive detections: airplanes, small birds, insects, etc.
- Published as AWWI Technical Report



DOE Study: DTBird

- 2-year study at Goodnoe Hills Wind Farm (WA) and 2nd year of data from Manzana Wind Power Plant (CA)
- Study design has undergone peer review facilitated by NREL
- Experimental evaluation of detection, behavioral responses of *in situ* eagles to deterrent signals, potential to explore habituation
- Pending approval to proceed to Budget Period 2



American Wind Wildlife Information Center (AWWIC)

Post-construction monitoring studies currently in database:

- Total number of GWs represented: 18 GW (22% of U.S. onshore)
- Number of U.S. projects: 157
- Number of post-construction studies: 243
- Total number of turbines searched: 6,800
- Total number of carcass searches: 285,000

- Bat Technical Report
  - Available at www.awwi.org/results-catalog
- Bird Technical Report
  - Public release mid-February 2019

AWWIC: Bird Fatality Incidents

Bird Species Composition

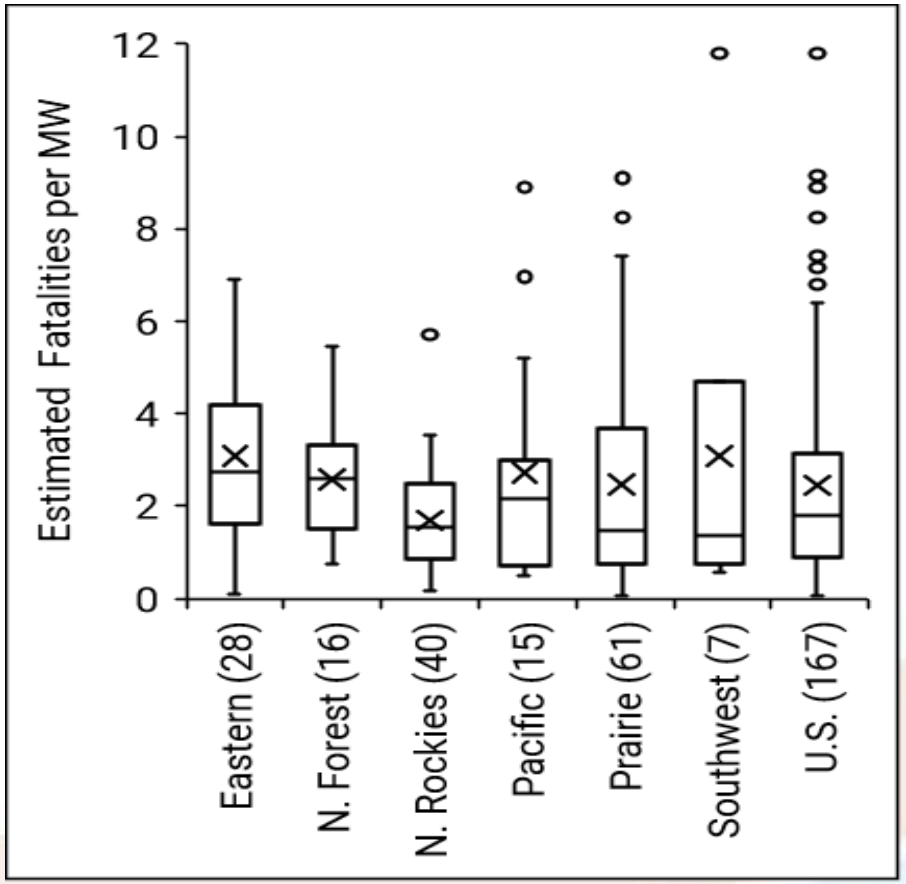
- 6,655 fatality incidents found during scheduled searches
- 281 were found during scheduled searches (of 600+ species in U.S.)
- Ten bird species accounted for 42% of all incidents
- 108 species ≤3 incidents and combine to account for 3% of all incidents
- Passerines account for 56.5% of all incidents
- Raptors account for 8.2% of all incidents
- **17 Golden Eagles at 11 Facilities and zero Bald Eagle fatalities found during scheduled searches**

AWWIC: Nationwide Species Composition – All Studies

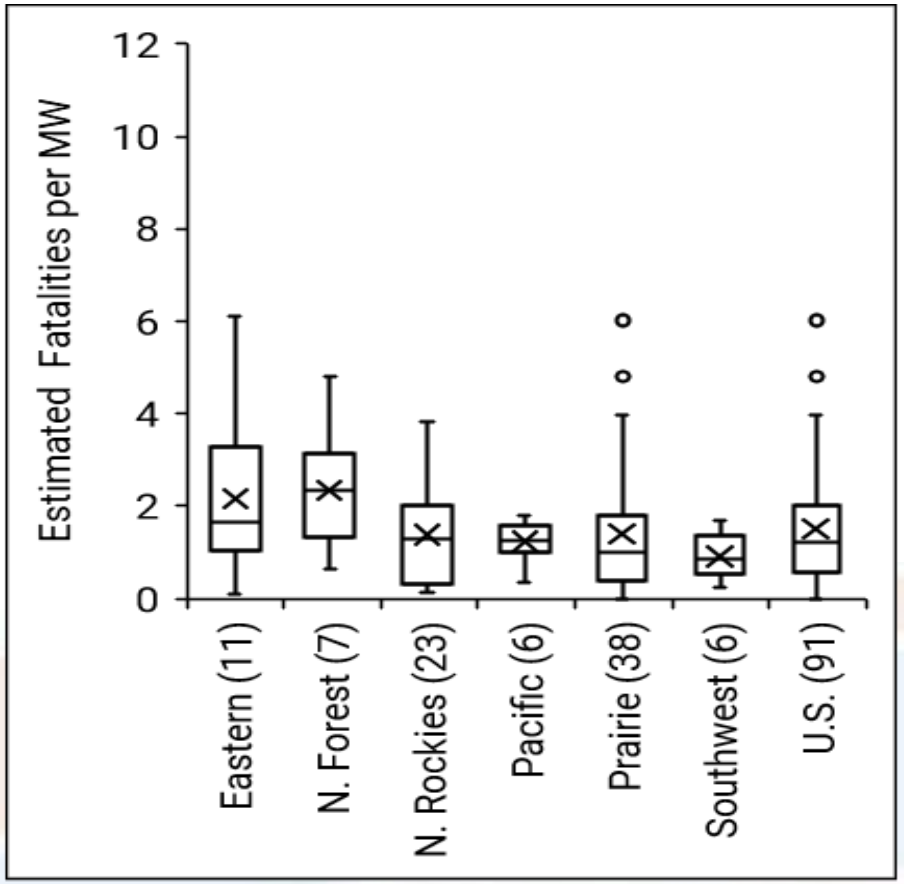
Species	% of all incidents	Studies Reporting
Horned Lark	12.6%	83
Mourning Dove	4.7%	71
Red-eyed Vireo	4.6%	58
Western Meadowlark	4.2%	40
Golden-crowned Kinglet	4.0%	69
American Kestrel	3.1%	44
Red-tailed Hawk	2.9%	63
Turkey Vulture	2.3%	44
Red-winged Blackbird	2.1%	25
Killdeer	1.6%	26
Ring-necked Pheasant	1.4%	29
European Starling	1.4%	45
Ruby-crowned Kinglet	1.2%	52
Rock Pigeon	1.2%	38
Magnolia Warbler	1.0%	30
Total	**6655**	**193**

AWWIC: Estimated Avian Fatalities – Avifaunal Biomes

All Birds

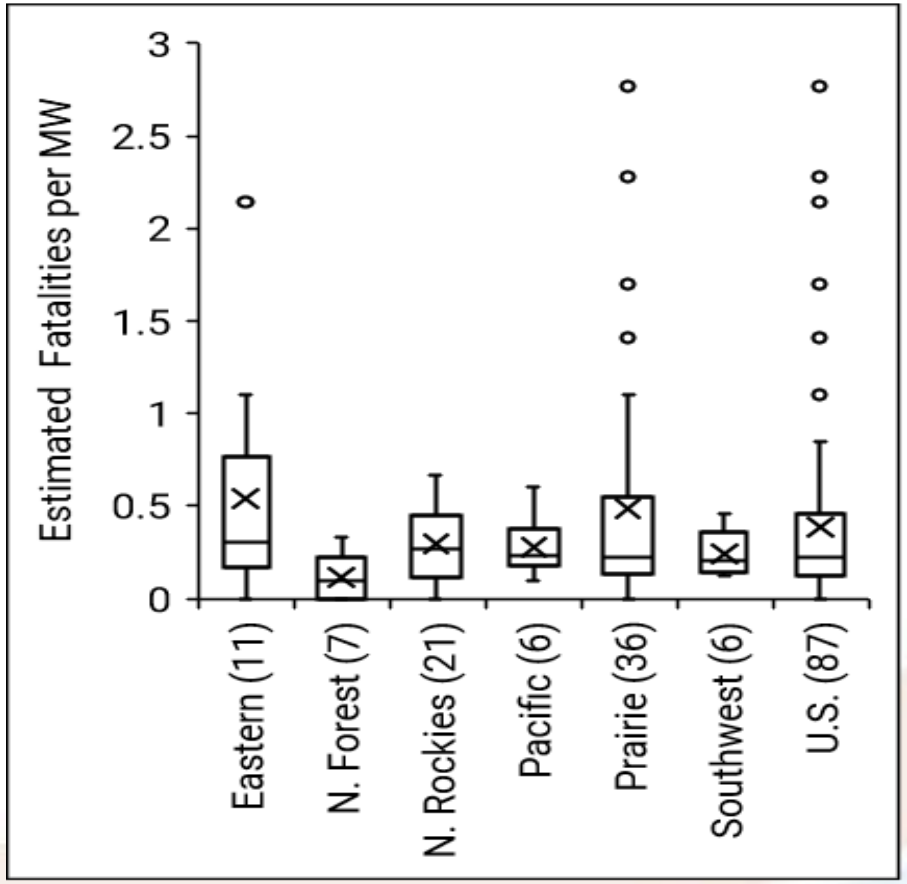


Small Birds

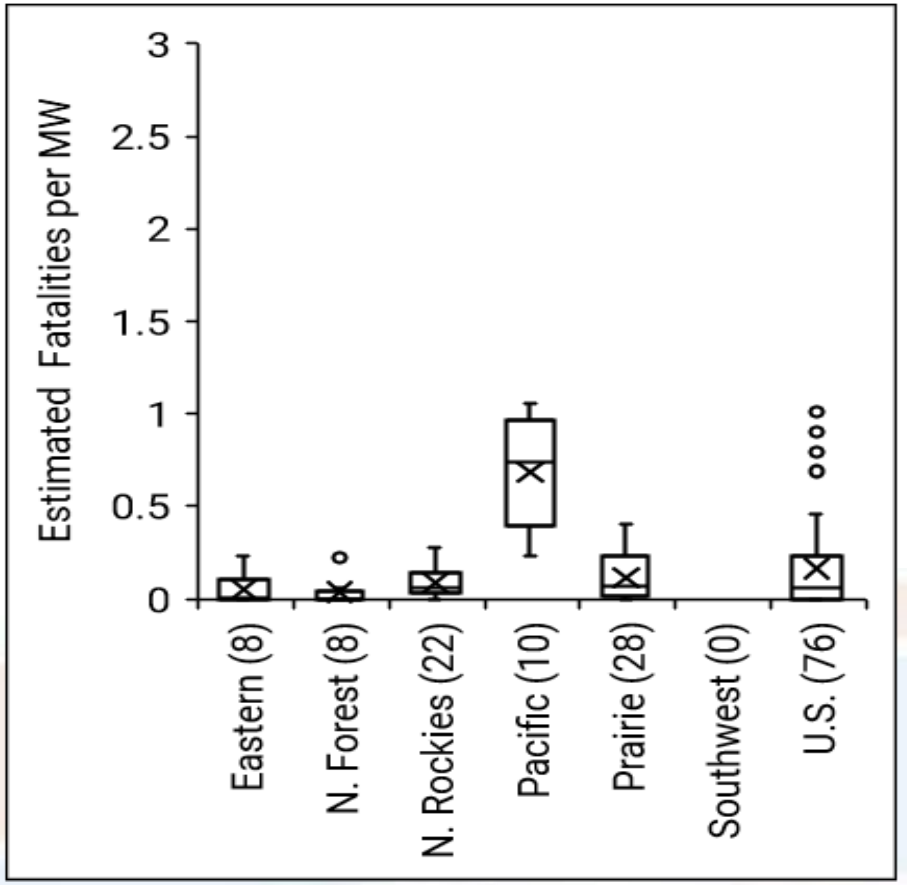


AWWIC: Estimated Avian Fatalities – Avifaunal Biomes

Large Birds



Raptors



Thank You

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