



The Western Section of The Wildlife Society and Wildlife Research Institute

Western Raptor Symposium
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Riverside, California



Symposium
Sponsors



February 8 – 03:55-04:10 pm Session: Department of Interior Eagle Session

A Unified Approach for Using Telemetry to Assess Risks to and Take of Golden Eagles at Energy Developments in the Western United States

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Telemetry is the primary tool for documenting spatial use patterns and mortality at renewable energy projects in the western United States. Telemetry units currently used on Golden Eagles include older VHF transmitters, or newer PTT-GPS or PTT-GSM modules. Researchers using telemetry on Golden Eagles must look beyond their study questions and consider how they can, at the same time, help address critical range-wide information needs for the species. By incorporating simple, universal details into their methods, researchers can collaboratively support strong meta-analyses with broad inferential value and in many cases help support replicated study designs in an Adaptive Management framework. Data collection can extend beyond what is needed for evaluating impacts of energy projects, such as sources of mortality, age-specific survival rates, natal dispersal patterns, and evidence of regional breeding populations and connectivity. This paper summarizes basic aspects and questions regarding telemetry applications for Golden Eagles, with emphasis on PTT-GPS. A plea is made to researchers to incorporate universal design components in their studies and share data.

The authors and institutions that have provided the following presentations are happy to share their information, data, and opinions. However, these are not, necessarily, peer-reviewed presentations and the potential to take something out of context also exists. In order to avoid that, you are requested to contact the respective lead author(s) before using specific information contained in any of the following papers. Once you have done that, the proper citation is: "[Author(s). Date. Title.] Presented at the Western Raptor Symposium. Jeffrey L. Lincer and David Bittner (Co-Chairs). Hosted by Wildlife Research Institute and The Wildlife Society, Western Section. Riverside Convention center, Riverside, California, USA. February 8-9, 2011

Using Telemetry to Assess Risks to Golden Eagles at Energy Developments in the western United States



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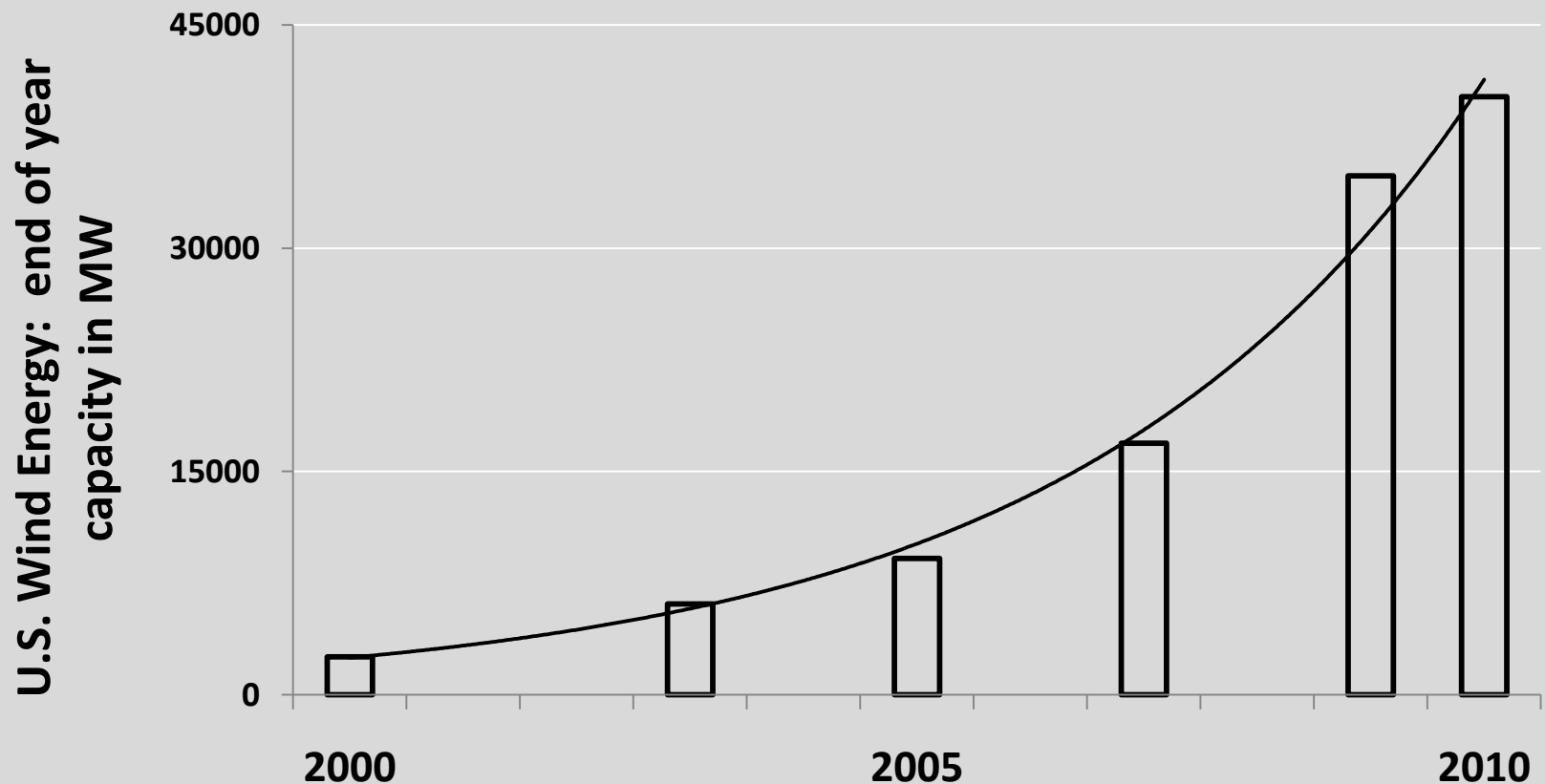
Robert K. Murphy
Division of Migratory Birds
USFWS Region 2
8 February 2011

Challenges to Golden Eagle Conservation



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- increasingly threatened on multiple fronts (i.e., many forms of “take”)
- scale of several major threats is increasing



how to avoid & minimize impacts?

Wind Energy:

Golden eagles vulnerable to turbine blade strikes (Hunt 2002, Thelander et al. 2003, Chamberlain et al. 2006, Fielding et al. 2006)

USFWS guidance:

- 4- (or 1-?) mile buffer around nest sites

OR

- document area use (especially breeding pairs)

= proliferation of telemetry studies (?)

DRAFT “DOCUMENTING GOLDEN EAGLE SPATIAL USE AT RENEWABLE ENERGY AREAS”

- I. FIELD METHODS FOR ASSESSING HOME RANGE AND
UTILIZATION DISTRIBUTION**
- II. ANALYSIS AND INTERPRETATION OF SPATIAL DATA**
- III. EFFECTS OF PTTs (AND GSMs) ON BEHAVIOR AND
SURVIVAL OF GOLDEN EAGLES**
- IV. RECOMMENDATIONS**

DRAFT “DOCUMENTING GOLDEN EAGLE SPATIAL USE AT RENEWABLE ENERGY AREAS”

TODAY’S FOCUS – objective #3

1. *review field approaches*
2. *review analysis & interpretation of UD data*
- 3. review potential harm of telemetry devices to golden eagles and provide recommendations for minimizing risks and assessing outcomes**
4. *suggest universal components for telemetry studies at wind energy projects*
5. *urge researchers to look beyond study questions and contribute to critical rangewide information needs*



telemetry for documenting utilization distribution by golden eagles



- VHF (very high frequency)
- PTT (platform transmitter terminal, a.k.a. “satellite” transmitter; with GPS capacity)
- GSM (global system for mobile communications; GPS capacity)



credit: Mark & Craig Blakemore

info needs/concerns:

**do telemetry packages negatively affect
golden eagles?**

hypothesis:

***PTT and GSM harness (“backpack”)
packages have negative impacts of
concern to the species’ conservation***

(especially re: adults)

background: why concerns?

- telemetry known to affect birds (Fuller et al. 2005)
- PTTs mostly used on juveniles, not many adults marked in North America
- some evidence published (Marzluff et al. 1997, Gregory et al. 2003)
- anecdotal, unpublished evidence (Watson & Davies 2009)
- uncertainty or concern expressed by some leading experts

PTTs & GSMs/harnesses



- exceed 3% of mass of some fledglings
- create drag, increasing energy needs (Pennycuick & Fuller 1987)
- discomfit adults; affect behavior & success of breeders (esp. if trapped in breeding season)
- harnesses: potential abrasion, constraint, entanglement . . . must be designed, constructed, fit, attached with utmost care
- impede copulation? evidence = probably not

recommendations

- proceed cautiously
- develop and test hypotheses about effects, e.g., direct observation, activity budgets
- incorporate post-marking evaluation protocol into auxiliary marking authorizations from BBL
- justify use on adults vs. alternative approaches
- use inferences from appropriate surrogates (e.g., red-tailed hawk)
- consider and avoid periods of stress (e.g., severe temperature, breeding season)

recommendations, cont'd

- use smallest possible package (Fuller et al. 2005) ...is GPS needed for PTTs?
- max. 2.5% of mass for fledglings
- develop & test suitable PTT tail-mount for adults (< 25 g, beneath rectrices)
- subsample with PTTs/GSMs, mark most with VHF
- acknowledge potential biases (e.g., implications for survival estimates, avoidance of small fledglings for marking)

systematic observation (Walker et al. 2005)

grid squares; direct obs. from vantage points

1. total flight path length or time/grid cell *OR*
2. subsample points along flight paths

...also can use hybrid approaches with VHF (McGrady et al. 2002)

positives:

- blind to residency & breeding status!
- don't have to rely on capture /marking

negatives:

- \pm labor-intensive, variable resolution & visibility issues
- cost-effective in arid regions/big home ranges?

above: 21-g Argos battery PTT, ventral mount; below: 28-g Argos-GPS solar PTT, dorsal mount



recommendations, cont'd: experience

- ***hands-on instruction from experienced mentors is an absolute must...*** those new to PTT/GSM attachment should deploy their first 6+ transmitters only with direct guidance of experienced researchers
- Researchers should deploy transmitters via harness attachment only when at least 2 other researchers with equal or greater personal experience in telemetry harness attachment are present to verify that construction, fit, and final attachments are satisfactory
- Anyone assisting the process should have experience and confidence in handling raptors, e.g., through banding, rehabilitation, or falconry

Ideas/discussion from:

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