



CA/NV Golden Eagle Working Group Notes Sacramento, CA, November 4

Outstanding Action Items

- Develop data availability/sensitivity policy summary
 - Assigned to Cris Tomlinson and Heather Beeler
- Draft Research Subgroup Purpose and Distribute for Comments
 - Assigned to Laura Nagy to draft, and Heather Beeler to distribute
- Distribute notes from May 2012 eagle meeting at USFWS R8
 - Assigned to Heather Beeler

Agency Updates

- **USFWS: Regulations/Permits** – Heather Beeler
 - Recent updates on the Eagle Act permitting Regulations
 - Court Remand –Loss of 30 year permit option
 - Maximum permit duration will be a 5-year term
 - Draft EIS for Eagle Rule coming soon
 - USFWS Draft Environmental Assessment (EA) for the Alta East Wind Project out for public comment. EA public comment period closes December 28, 2015
 - Other EAs FWS is working on include Solano Wind, Spring Valley, Ocotillo Express Wind, and Rising Tree
 - EIS development ongoing for Pacific Gas and Electric Company (PG&E), Hycroft Gold Mine (NV)
 - For Hycroft, currently working on a Bird and Bat Conservation Strategy document and an Eagle Conservation Plan involving removal of 1-2 golden eagle nests
- **USFWS Western Golden Eagle Team (WGET)** – Brian Woodbridge
 - Changes in structure of the Team from 8 people to 4 people, plus coordinator, in 2016
 - Continue funding for projects and cooperators. 37 ongoing projects with 20 presentations at the RRF
 - Ecoregion modeling throughout the west: Breeding habitat Revised models expected in November 2015
 - Predictive Mid-winter landscape use – will be useful at the landscape scale. The draft landscape models predict PRESENCE and ABSENCE with 84% accuracy.
 - Modeling patterns of eagle movements and dispersal and what correlates are driving eagle movements. A 2-step objective: (1) describe and model patterns of movement and (2) model factors influencing movement routes

- Meta-analysis of telemetry data across the country has involved 23 collaborators with a total of 574 eagles being tracked with over 4.4 million locations
 - Predictive Electrocutation Risk Model for golden eagles
 - EDM International, Inc. is developing a pilot project looking at pole density and habitat suitability modeling results for breeding and wintering habitat. The goal is to provide a hazard model when overlaid with predictive habitat models.
- **Nevada BLM** - Sandra Brewer
 - Funding of research projects – researchers will provide updates on these projects
 - Permitting of renewable energy projects (Hycroft mine expansion project) will impact eagle nests, working with FWS on permitting options
 - National Eagle IM on renewable energy permitting almost ready to be signed.
 - John Ruhs will be the new NV BLM State Director, will be starting within the next couple of months.
- **California BLM** – Todd Katzner standing in for Amy Fesnock
 - BLM funding research projects in CA desert region, including eagle surveys, eagle movements, age related differences in movements of eagles in S. CA.
 - A new study in N. California is just starting to inform eagle movements in this area.
 - Sequencing genome of golden eagles 192 SNIPS, paper is in review on use of SNIPS panel to detect structure of eagle populations in N. America. Purdue University is doing the genetic work.
- **USFS** – Patti Krueger
 - US Forest Service is undergoing Forest Plan updates throughout CA. Golden eagles will not be listed as a species of conservation concern.
- **NDOW** – Joe Barnes
 - State-wide nest data is available to share under agreements with the State that limits the use of the data and requires reciprocity regarding nests discovered during surveys based on the State data.
 - There are data gaps in some areas of the State due to military installation fly over restrictions. Aerial cliff nesting raptor surveys primarily catalog and inventory nest locations; secondary objective is to note breeding activity at nests. Approximately 3200 eagle nest records from 1972-2015 included confirmed eagle nests and likely of eagle origin based on size and nest material. Over 700 active nests found since 2010 with confirmed golden eagle use at the time of visit.
 - Mid-winter Raptor surveys started in 2007, 7,265 miles driven in 2014. This effort contributes to the annual National Midwinter Bald Eagle Survey. Golden eagles were the second most commonly documented species, with 224 eagles recorded in 2014.

- Golden eagle GIS tracking project (assisted FWS in 2014): deployed 6 PTTs on nestlings in 2014 and 9 in 2015. They plan to deploy 5 more PTTs in 2016 and collect prey delivery data with nest cameras.
- **CDFW** – Carie Battistone
 - Noted some changes and additions to the Golden Eagle Working Group webpage
 - Golden eagle database is structured as a single-species observation database. Database will house all eagle data (including nesting and non-nesting data), except it will not house mortality data. CDFW's Wildlife Investigation Lab (WIL) has initiated a disease and contamination surveillance study. Results are preliminary. So far 81 golden eagle carcasses were received between Jan 2013 and Sept 2015. Of these, 49 of them were suitable for testing. Results discussed in a presentation during in the RRF conference later this week. Anticoagulant rodenticide exposure prevalent was (89% of birds tested).
 - CDFW has developed data forms for submission to WIL (hard copies were provided and will be posted to the GEWG webpage).
 - Mange Update: 4 eagles confirmed to have mange from Central CA from 2012-2015; 11 more are suspected
 - CDFW has developed guidance on handling of eagles to prevent transmission (hard copies were provided and will be posted to the GEWG webpage).
- **Pacific Flyway** – Carie Battistone
 - Eagle subcommittee has been established that covers 12 western States. They will help coordinate research needs across the flyway, among other things.

Industry Updates (9:10-9:40)

- **AWWI** – Taber Alison
 - The American Wind Wildlife Institute, organized in 2008, is a collaboration between the wind industry, state agencies, and conservation organizations. AWWI also works with scientists at the USFWS, USGS, and academic institutions
 - Mission is to promote timely and responsible development of wind energy while minimizing impacts to wildlife and wildlife habitat.
 - A major focus of current activity is the conservation of golden eagles by improving implementation of and compliance with the USFWS Eagle Rule.
 - AWWI is working with eagle experts to develop additional options for offsetting unavoidable eagle take, with a current focus in Wyoming.
 - The first option is based on predicting the effects of a voluntary lead abatement program on eagle mortality
 - A second option has been completed on reducing eagle deaths from vehicle strikes, and a manuscript is in peer-review
 - AWWI working on a model to predict the effects of eagle prey habitat enhancement and effects on eagle productivity
 - AWWI has started a technology verification program to rigorously and independently evaluate technologies intended to detect and deter raptors,

including eagles. AWWI will select and work with investigators to design and implement field evaluations of the technology. Study designs and results will be peer-reviewed and made public.

- You can find more information on these and other AWWI programs at www.awwi.org

- **AWEA** – Renee Culver (Nextera)

- Provided a presentation on a brief history of wind facilities and historical milestones for the Altamont Pass Wind Resource Area (APWRA) (~70 square miles).
- Historically, there were as many as 7,582 turbines installed in the APWRA, which had been reduced to 3,436 by 2013 (ICF) as older turbines were taken offline; turbine counts continued to decline annually. More efficient newer generation turbines had been replacing older generation turbines, and in 2013 the installed capacity was 471 megawatts (ICF).
- All old generation NextEra Energy turbines in the Altamont were shut down November 2015 and will be removed in 2016; 2100 NextEra turbines will have been removed and will be replaced by ~106 more efficient new generation turbines, when the company completes its three phases of repowering.
- Mortality rate reductions at a single repowering project as compared to the old generation turbines previously at that same location are estimated to be: 75-82% for golden eagles, 34-47% for red-tailed hawks, 48-57% for American kestrels, and 45-59% for burrowing owls.

- **Nevada Mining Association** – Deborah Lassiter

- Golden Eagle Protection Best Practices - process for evaluating a mineral exploration or mining in context of GOEA management guidelines and BGEPA.
- Has created a Nevada Mining Golden Eagle Working Group
- Focus on golden eagle protection, best practices, take evaluation and agency coordination.
- Golden Eagle Protection Best Practices in draft form with final expected end of 2015

- **APLIC** – Mike Best

- PG&E is the first electric utility to apply for an eagle take permit
- Challenges with permitting being the first utility permit
- APLIC celebrating its 25 anniversary in 2015

- **Database Subgroup Updates** – Kate Keiser

- Eagle Database Update and Demo

- Database collaborators: GEWG database subgroup, CDFW Data Branch, USFWS WGET, NDOW
- They are working on finalizing a complete dataset. Currently have 4,231 records from California and Nevada.
- See presentation for description of database fields

- The Draft Golden Eagle dataset is available in the BIOS Viewer for CNDDDB Government Subscribers.
- For non-government entities, requests for data must be made to Carie Battistone.
- A buffered version of the final dataset may be made available for public viewing in the future
- Two options for contributing data:
 - Direct contribution to eagle database via database template for single to many detections. See <https://www.wildlife.ca.gov/Conservation/Birds/Golden-Eagles>, scroll to section titled “Submission of Golden Eagle Data”
 - Online entry using CNDDDB Online Field Survey Form for single to few detections. See http://www.dfg.ca.gov/biogeodata/cnddb/submitting_data_to_cnddb.asp
- CNDDDB Online Entry Tool
 - The current draft is specific to California with Nevada to be added soon.
 - See presentation for details and demonstration for data entry

Research Subgroup Updates – Carie Battistone

- **Raptor Declines in California**
 - CDFW is aware that raptor reproduction may be in decline in parts of California and sent letter out to raptor researchers in spring 2014 asking people to submit findings on raptor breeding throughout CA. CDFW plans to write up a white paper summarizing what is known about the apparent declines. This somewhat depends on the amount of information CDFW is provided or can find.
- **Draft Golden Eagle Observation Database and data submission**
 - CDFW is working with the GEWG Database Subgroup and the Western Golden Eagle Team (WGET) on the GOEA database that has been a subject of conversation since the conception of the GEWG. Group developed an observation database (not to include information on dead eagles) and is working to populate the database with data from large databases, such as NRIS, researcher data, and reports. The database template will be posted to the GEWG webpage and will be the avenue for contributing large datasets to the database. Small numbers of records can be submitted via CDFW’s online submission form. You can access the new online data submission form by going to Wildlife.ca.gov - > CNDDDB -> Submitting data to CNDDDB. To fill out the form you do not need a subscription, you just need to register to create an account. Relevant forms, spreadsheets, wav files, etc., can be attached to your online submission as long as attachments under 27 MB.
- **Online Coordination Tool**

- Link to the online coordination tool is on the GEWG webpage. Intent of the tool was to help GOEA researchers, and those conducting monitoring, coordinate on who was doing what, where. Tool does not house eagle data. This is a basic contact database that maps where projects are occurring on the landscape. Note: there are some issues entering data on this tool, these issues are currently being worked through with the computer programmer.
- **Data Sharing Sensitivities**
 - A general discussion ensued regarding the value of wildlife data for science versus sensitive data and conservation; and providing exact locations of wildlife as well as important use areas (i.e. large winter raptor use areas, colonial nests, etc.). A detailed discussion on this topic will be queued up for the next meeting.
- **Mortality data and carcass submissions**
 - USFWS creating a new database (USFWS Bird and Bat Injury and Mortality Reporting System) to house mortality data. DIED will eventually be incorporated into the USFWS Bird and Bat Injury and Mortality Reporting System database. DIED receives all dead and injured eagle data that is collected. Data will be put into that database to look at potential trends on fatalities of eagles. Data in DIED is for research purposes and not for the general public. Data will be released to researchers after being vetted by USFWS. A guide has been developed on how to photograph dead eagles in the field – this is in peer review and should be out shortly. Recommendation within that guide that a card with the location, etc., will go into the DIED system.
- **Mentoring Program**
 - The GEWG was interested in a mentoring program from the start to gain/keep budding raptor biologists rather than lose them. Time limitations are a reality for many seasoned field researchers who may participate in such a program. However, there are definite benefits for data sharing and information exchange between experiences and non-experienced scientists/researchers. Full update will be given at the November 2015 meeting.
- **Dead Eagle Protocol for California**
 - Generally, USFWS directs that all eagle carcasses be shipped to the repository. Eagles that die a suspicious death are generally sent to Ashland. Some USFWS Regions are authorizing deviations, e.g., Region 8 allows eagle carcasses to be sent to CDFW's Wildlife Investigation Lab (WIL) for processing, in coordination with law enforcement.
 - To assist in an all-raptor (including eagles) disease/contaminant surveillance study, WIL requests fresh carcasses (dead less than 48-72 hours), if possible, but if over 3 days old, frozen carcass is better. Carcasses should be placed in individual plastic bag (maybe even double-bagged). Bag needs to be big enough for the bird. Place identification tag on the eagle as well as inside the bag so the tag and eagle do not get accidentally separated. Record name of collector, date found, location of discovery, land use at the location of discovery, estimate of

how long the carcass was at location of discovery, recent weather information, clinical signs or behaviors observed before death, photos. Contact WIL for shipping information.

- WIL Contact: Krysta Rogers, 916-358-1662, Krysta.Rogers@wildlife.ca.gov

- **Statewide Monitoring Program**

- GEWG has expressed interest in starting a statewide monitoring effort in CA, similar Frank Isaac's work in Oregon. Working group was identified to evaluate feasibility of conducting such an effort. Currently the group is in preliminary stages of developing proposal and investigating funding opportunities.

Mentoring Program - Zach Ormsby, introduced by Jeff Lincer

- Overview of the usefulness and need for mentoring new biologists, and defining what a mentor is.
- Training new GOEA researchers, conducting new research and identifying a new GOEA population.
- Challenged group on whether they will continue to mentor colleagues. How will a new generation of GOEA biologists be developed?
- A mentor project underway to assess benefits and feasibility of mentor program. 3 mentors (Bloom, Lincer, Ormsby) and 3 mentees (Ormsby, White, Snook).
- Responsibility of mentee to not overburden mentor.
- See presentation for details
- For project progress see www.raptorsofreno.org

Mini Symposium: Monitoring Terminology and Ecology of Golden Eagle Prey

Moderated by Jeff Smith

Abstract summary provided and posted to GEWG webpage.

1. Coming to Terms: Why We Need to Use Consistent Terms to Describe Territory Occupancy and Breeding Activities, Karen Steenhof

Program Abstract: Inconsistent and ambiguous terminology can make it difficult to interpret and compare scientific results. Inconsistent use of the term "active" in the raptor literature may lead to confusion, particularly about long-lived raptor species that occupy nesting territories but do not lay eggs every year. Sergej Postupalsky defined the term "active" in 1974 to refer to raptor nests or territories that contained eggs or young. Unfortunately, nearly 40 years after his recommendations, many raptor researchers still use the term "active" in different contexts, and many fail to define terms used to describe territory occupancy and breeding activities. We reviewed articles in the Journal of Raptor Research from 1973 through 2013 and found 102 that used the term "active" to describe nests, territories, or breeding areas. We also found 16 articles published from 2010 to 2013 in other wildlife journals that used the term. Only 41 (35%) of these 118 articles defined the term "active" in their papers. Of these 41, only 26 (63%) defined it consistently with Postupalsky's definition. Other definitions expanded the concept of "active" to include the presence of adults or a refurbished nest: evidence usually used to confirm an "occupied" nest or territory. As Postupalsky noted 40 years ago, this lack of

standardization often makes meaningful comparison of data from different studies all but impossible. We recommend avoiding the term “active” unless it is clearly and carefully defined, and we recommend using terminology recommended by Steenhof and Newton (2007) instead.

Authors: CAROL MCINTYRE, US National Park Service, KAREN STEENHOF, Owyhee Desert Studies, MICHAEL N. KOCHERT, US Geological Survey, Forest and Rangeland Ecosystem Science Center

Q&A, Discussion

- Discussion on regulatory (law enforcement) vs. research use of terms.
 - “Active” is codified in various regulatory definitions and, therefore, cannot be entirely eliminated from the management lexicon.
 - Regulatory definitions are not necessarily consistent with standardized definitions presented in primary literature nor with desirable research definitions, which adds to the confusion.
- Terms need to be defined early in the research design process, accompanied by specific, standardized field protocols and classification criteria. Categorical terms can become meaningless if poorly defined and subject to inconsistent or ambiguous field criteria and classifications. Modelers may add additional terms, suggesting a need for interdisciplinary definitions.
- Steenhof and Newton 2007 definitions can be further refined to address situations not currently covered, but that have regulatory significance.
- H. Wilson asked about data quality for “negative” data, for situations where a nesting behavior is not detected. Are territories Occupied vs Unoccupied or Occupied vs Undetected? This has regulatory significance due to the consequences of management decisions that depend on such distinctions, and may need further discussion.

2. Spatial and Temporal Patterns in Golden Eagle Diets in the Western United States, with Implications for Conservation Planning, Geoff Bedrosian

Program Abstract: The diet of Golden Eagles (*Aquila chrysaetos*) is of increasing interest to wildlife managers seeking to mitigate the impacts of energy development across the western United States. We compiled published and unpublished Golden Eagle prey data to characterize spatial and temporal patterns in prey use, investigate ecological relationships between Golden Eagles and prey communities, and inform conservation planning. We analyzed 36 studies in 45 locations from 1940–2015 and found primary prey groups differed among western ecosystems during the breeding season. Lower dietary breadth was associated with desert and shrub-steppe ecosystems and higher breadth in mountain ranges and the Columbia Plateau. The frequency of leporids (Family Leporidae) was significantly negatively correlated ($P < 0.001$) with dietary breadth, frequencies of sciurids (Family Sciuridae), other mammals, and birds. Leporids were the primary prey of breeding Golden Eagles in 78% of study areas, with sciurids reported as primary prey in 18% of study areas. Golden Eagles were most frequently observed feeding on leporids and carrion during the nonbreeding season. Golden Eagles are generalist and opportunistic predators, as they can feed on a wide range of prey species but will preferentially feed on abundant medium-sized prey species in a given habitat. Spatial variations in Golden Eagle diet likely reflect differences in prey community whereas temporal variation likely reflects prey population responses to environmental factors, such as drought and invasive species. However, increasing

evidence suggests dietary shifts from traditional prey can have adverse effects on Golden Eagle productivity. Land management practices that support or restore shrub-steppe ecosystem diversity should therefore benefit Golden Eagles. More information is needed on nonbreeding season diet to determine what food resources, such as carrion, are important for over-winter survival.

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3. Hare Today, Gone Tomorrow? Analyses of Lagomorph Populations in the Western United States, Todd Esque

Program Abstract: When available, jackrabbits and other lagomorphs comprise a significant portion of golden eagle (*Aquila chrysaetos*) prey items in North America. It is thought that past land use conversions from untilled lands to agriculture coupled with predator management have influenced lagomorph populations resulting in large population fluctuations. Recent increases in renewable energy development, as well as potential climate change have raised questions about further changes in rabbit habitats, rabbit populations, and potential impacts to golden eagle populations. Within the western United States, lagomorph species in the diets of golden eagles vary locally and include the black-tailed (*Lepus californicus*), white-tailed jackrabbit (*Lepus townsendii*), and cottontail rabbit (*Sylvilagus* spp.). Jackrabbit abundance also influences reproductive success and population trends of other predators such as coyotes (*Canis latrans*), bobcats (*Lynx rufus*), and other raptors, increasing lagomorph importance in communities across western landscapes. To understand trends in lagomorph populations, we analyzed data pertaining to common lagomorph species dating from the mid 19th century to the present. Additionally, we summarize the results of annual hunter surveys (i.e. hunt success) and road surveys for jackrabbits and cottontails for across 15 western states dating back to the 1950's, including 15 long-term hunt success surveys and 19 road surveys. Data from the majority of surveys indicate stable or declining trends with only one survey showing a significant upward trend. Both jackrabbit and cottontail species exhibited large inter-annual fluctuations in hunt success and road count indices, complicating interpretations of long-term trends. Although frequent and large in magnitude, these fluctuations were not clearly cyclic, with temporal autocorrelation coefficients generally indicating significant correlations at lags of only 1 year. Population trends were not strongly or consistently linked to precipitation events of current years, previous (lag) years, or Pacific Decadal Southern Oscillation. We speculate that these patterns are due to the synergistic nature of lagomorph populations in relation to other factors such as predator populations or disease. We also present the results of recently designed and implemented lagomorph surveys for the Mojave Desert Ecoregion. We found minor fluctuations in density and distribution surveys from the first two years of data. Densities of black-tailed jackrabbit were influenced by landscape roughness, vegetation parameters, and the distribution of desert washes. We will also discuss the benefits of coordinated landscape analyses to inform landscape management issues in the western United States.

Authors: TODD C. ESQUE, USGS Western Ecological Research Center, MATTHEW T.

SIMES, USGS Western Ecological Research Center, DANIEL F. SHRYOCK, USGS Western Ecological Research Center, DAVID E. BROWN, Arizona State University, GREG BEATTY, US Fish and Wildlife Service, KENNETH E. NUSSEAR, University of Nevada – Reno, BRIAN WOODBRIDGE, US Fish and Wildlife Service, DIEGO R. JOHNSON, USGS Western Ecological Research Center, M. LONGSHORE, USGS Western Ecological Research Center

4. Suitability of Ground Squirrels as Prey for Golden Eagles in a Changing Climate, Leo Salas

Program Abstract: The success of nesting golden eagles in providing adequate food for their young depends on the ability of the parents to consistently find large-bodied prey during the 10-week nestling period. Prey are also important for post-fledging for adults, and at all times for the “floater” population, mostly comprised of subadults. Thus, the prey species must be visible above ground in adequate local densities to assure a high probability of daily capture events. The purpose of this paper is to compare ground squirrel species from different genera with different life histories, habitat relationships, and patterns of dispersion, and highlight the factors that influence their availability to raptors. In order to explore the likely effects of predicted climate change on these ground squirrels we modeled the impact of climate change through a two-step approach, by fitting first an occupancy model, and then using the predicted occupancy values in a landscape-level model that included vegetation and climate covariates. For recent historical (20th century) climate data we used the 1km WorldClim data (<http://www.worldclim.org/>), aggregated to 2km resolution. For future climate data we used future climate projections by Conservation International (<http://futureclimates.conservation.org/>), which comprise outputs from five GCM's downscaled to 5km resolution, which we further re-sampled to 2km resolution. Results indicate that California Ground Squirrels will expand their range further north and east. This relatively large generalist terrestrial rodent may become a more significant prey in the diet of Golden Eagles in the future.

Authors: BEATRICE VAN HORNE, US Forest Service, Pacific Northwest Research Station, LEO SALAS Point Blue Conservation Science, JOHN KIM, US Forest Service, Pacific Northwest Research Station

Q&A Discussion

- What is the relationship of models to agriculture?
 - Difficult to say due to challenges in predicting changes in cultural practices.
- Elevation incorporated into modeling through variation in climatic (and vegetation) variables, which are correlated with elevation. These will act together to limit modeling of the distribution of CA ground squirrel populations to west of the Sierras, as is currently the case.

5. Protocol for Golden Eagle Occupancy, Reproduction, and Prey Population Assessment, Daniel Driscoll

Program Abstract: Golden Eagles (*Aquila chrysaetos*) are long-lived, slowly-reproducing organisms that breed throughout much of the northern hemisphere. Human-related mortality factors that have emerged during the past century, along with considerable habitat degradation, have recently brought into question the issue of population health, particularly in the American West. Understanding the population ecology of Golden Eagles requires data compilation over vast regions, thus standardization of protocols for

occupancy, reproduction, and prey population assessment are imperative to the comparison of data from various studies. Essential to this task are the avoidance of bias and error between and among surveys and projects. Survey protocols for Golden Eagles and their primary prey species in the Southwestern United States, potential sources of bias and error, and calculations used to estimate animal numbers are presented.

Author: DANIEL DRISCOLL, American Eagle Research Institute

Summary for presentation:

- Uses Postupalsky 1974 terminology
- In general, based on their territorial nature and need to retain breeding grounds, established golden eagle breeding territories should be considered Occupied until fully documented as Unoccupied. Golden eagles do not easily abandon established territories, often do nest every year, and may not always be readily apparent in their territories during brief, periodic surveys. Therefore, repeated surveys and multi-year assessments typically are required to confirm that a territory has been abandoned and/or is truly unoccupied.
- It is critical that initial occupancy surveys be conducted early in the breeding season. For example, first surveys should be conducted in December or January (courtship/nesting building period) at central and southern latitudes where breeders are year-round residents and the winter climate is relatively mild (e.g., Arizona, New Mexico, southern Utah and Nevada, most of California, and some parts of the Pacific Northwest).
- Early season occupancy surveys are often the only way to determine occupancy at territories where pairs don't go on to lay eggs in a given year (common and often thought to be dependent on prey abundance/availability) or that experience early breeding failure.
- Territories should not be considered unoccupied for a given breeding season unless adequate survey effort is exerted. He recommends performing a minimum of four site visits of at least four hours in duration, on four separate days spread out through the breeding season.
- Discussion about treating nests with Mexican Chicken Bugs (Cimicidae) with diatomaceous earth

6. Panel discussion

- Partnerships can alleviate the need to "do it all".
- D. Driscoll assumes all "sites" occupied until proven otherwise. Definition of unoccupied for a given year is 4 visits of 4 hours each with no observations of eagles.
- J. Smith suggested developing a concept of "relative occupancy" based on similar levels of effort each year.
- L. Salas suggested that determining detection probabilities can allow occupancy to serve as an index.
- Discussed experience requirements for surveys. General agreement that there needs to be a senior biologist with at least 5 years of survey experience. For J. Smith, difficult to have 3 observers in a helicopter because of space limitations and cost, but D. Driscoll reiterated the value of 3 observers for slot canyons.
- S. Liguori asked about experience with free-standing nest platforms and prevalence of Sage Grouse in GOEA diet. WGET is conducting a review of the use of free-standing nest platforms; more info will be available in the future.

Anecdotal success stories were shared by panel and audience members.

- J. Smith asked for experience from the audience about prey monitoring. What are the challenges? Discussion followed on some challenges, including variation in hibernation and below ground behavior in different parts of ground squirrel ranges. This can be distinguished by separating prey abundance from prey availability to predator, which can be modeled from data collected through partnerships (L. Salas).