CA-NV GOLDEN EAGLE WORKING GROUP MEETING NOTES

20 February 2019, Folsom, CA

AGENCY UPDATES

California BLM

On course with permitting policy – National Instruction Memo with how BLM should be addressing eagle take

BLM funded golden eagle research in 2016 and 2017, which will be presented later today

They provide GOEA info in CNNDB

USFS

How to deal with abundance in north, but less abundant in south

Adding protection of raptor nests to Forest Plans, also area closures for raptors (from recreation)

Sharing data with CDFW and CNNDB and NV; updates every six months

Have acoustic data for spotted owls (and some other target species) – potentially mine the recordings for other non-target species

NDOW

Joe is the eagle person for the state

Statewide effort to document known eagle nests in NV

~2000 GOEA nests – internal NDOW surveys and external surveys

Inventory flights

Statewide effort to know location and distribution of nests

Template as a start for your survey effort

Data can be 10, 20, 30 years old

Study area in SE NV of 15 territories – telemetry on 20 individuals since 2015, breeding size, productivity, diet, prey remains, nest cameras

Partnered with Hycroft Mine – 4 transmitters on GOEAs

Rob Miller report to analyze mid-winter raptor counts

NDOW doesn't deal very much with USFS for eagles in NV (just because of location of eagles)

East Bay Parks

[*See presentation*]

Have a golden eagle monitoring team

Densest nesting area of golden eagles in the world

May be crippling bias for number of eagle fatalities – eagles will move away from the area if injured, so won't be found

Acquired conservation lands in the Altamont – some have wind leases grandfathered in to them, so don't control the turbines, but have them operating on the land

Repowering - Opportunity to figure out where to put the turbines to reduce blade strikes

Observation points to observe flight behavior, and telemetry for location use

DEM of entire Altamont with grid cell overlaid to describe the topography --- relate flight behavior to that topography – can predict how eagles interact with the landscape

Whole bunch of eagles went offline, not sure why

Most hang out in the Diablo range, but juvenile went to Mexico and one to Ivanpah and never came back

Birds colliding with turbines spent a lot of time near 100% upslope (near top of ridgelines)

Collision Hazard map developed with all that data, and a Telemetry Risk map

Risk mapping data improves with each generation of map

Determining what companies can implement

Agency is looking for landscape mitigation to help offset take

Monetary number of how ground squirrel management affects eagles, can't poison ground squirrels

USFWS

Permitting, Tracy Borneman and Heather Beeler
[*See presentation*]

WGET, Brian Woodbridge
WGET focuses on western half of lower 48

Loose agenda of what the team does

Number of publications due to come out – would like to post data, maps, and publications on WGET website

WGET has spent the last summer working on "low-risk" category for eagle permitting, and now back on track with what program was working on before

Funding for WGET has been cut back substantially---Team being downsized and morphed a bit -- Will probably take 3-4 staff positions (full-time) and have people work under Brian Millsap – put leftover money towards surveying or research

INDUSTRY UPDATES

AWWI
[*See presentation*]

10th year

Board split equally between NGOs and industry

Focus on research

Products coming out of AWWI – additional options for compensatory mitigation: lead poisoning reduction, vehicle collision reduction, habitat enhancement

Habitat Enhancement: process model – habitat mapping, based on ground cover what do we know about prey,

Funding out to Boise State University --- disease and parasites in nests affecting productivity and mortality – investing treatments to potentially use for mitigation option

Detection and deterrence technology: IdentiFlight and DTBird systems --- these systems can be challenging in locations where there are houses as tracks neighbors as well as birds. IdentiFlight is only detection and relies on curtailment, DTBird is both detection and deterrent (challenging when have human neighbors because of the noise from deterrent devices) --- DTBird pilot study is published as an AWWI Technical Report – included testing of system with UAVs -- this study is being expanded and continued over next couple years

Big project: compile as many of the mortality monitoring reports from all over the US as possible (not incidental reports, but protocol surveying reports) ---- gathered about 22% of U.S. onshore data (18GW represented) – both bat and bird technical report published – results are specific to what was found in the formal monitoring (does not include any incidental finds) --- Variation between geographic regions for estimated fatalities --- wind farms may be clustered in their locations

AWEA

[*See presentation*]

Wind Wildlife Research Fund - collaborative research fund to leverage pooling of money from multiple projects
May be an RFP process or may be more informal for proposal submissions
Anyone can apply for now, but still figuring it out so may be restrictions in the future

Looking at alternative fatality monitoring methodology – eagle scanning searches

Nevada Mining Association document

Released document: *Golden Eagle Protection Best Practices: Nevada Mineral Exploration and Mining Industry* in August 2018

Contact Allen Biaggi for more information
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Prepared in technical coordination with USFWS, NDOW, USFS, and BLM

Assist mining companies with better compliance with BGEPA and protect members of association

Habitat assessment approach – supplements, but doesn't replace required protocols - if GOEA habitat is present, operators encouraged to incorporate measures in the document

Still some things to work through with mines, but definitely working towards a strategy of addressing eagles at mine sites

APLIC

Released Eagle Risk Framework last fall. Awaiting feedback from federal agencies. Help utilities assess eagle risk: A number of questions for how the utility is operating, what the eagle habitat looks like. Toolkit for utilities to assess compliance with Eagle Act.

Next APLIC meeting in April 2019 in New Orleans

GBBO

Golden Hills North site – dog-based monitoring

Crescent Dunes (near Tonopah) monitoring –BLM will decide when this data will be published (data has been provided to the BLM) – provides data to FWS, NDOW on regular basis

Dataset that grids out the entire state of NV – helicopter surveys to map GOEA nest sites (mostly done by NDOW) – preferentially searched most likely terrain that might have GOEAs. Ground surveys had time constraints, quick scan of likely habitat, but couldn't search all habitat. Other group of surveyors were given as much time as they needed

Will analyze these three datasets

Continuing bird counts in NV – the data from these counts includes GOEAs
thought they could add some level of surveying for prey of GOEAs to the count surveys

PERMITTED WIND FACILITIES UPDATES

Shiloh IV

[*See presentation*]

Hull and Muir 2010 assesses distance animals will fall from turbines when struck

How handle incidental finds? Not sure how will handle incidental finds – ACTION ITEM: FWS has to determine how we will incorporate incidental finds into take calculations and predictions

No incidental finds at Shiloh IV

Working with utilities to address the electrocutions they are causing – the electric utility must retrofit their own poles

Why not just use EofA once have mortality monitoring data – why incorporate it back into the Bayesian model that's used for predicting eagle take? Think this may change in the future, but for now being consistent.

Is the Service considering using the 50th credible level instead of 80th (so only 50% sure estimate is the number or less)? --- Service is considering this, but hasn't yet been decided.

Alta East

[*See presentation*]

DATABASE MANAGEMENT

[*See presentation*]

GOEA SCIENCE TEAM

[*See presentation*]

Now an independent body from the GEWG, the Science Team is now lead by the state agencies (this happened ~ 2018 or 2017) – first meeting is Feb 2019

Focus is research priorities for eagles

CDFW WILDLIFE INVESTIGATIONS

Krysta Rogers provided an update on assessing remains of golden eagles, covering information learned on select diseases and contaminants. Please contact Krysta for more information.

SURVEYING

Dave Wiens

[*See presentation*]

Using different methods than a lot of people

Two areas doing occupancy surveys – random census design – going to focus on work in Northern Diablo Range, but duplicating this in Western San Diego County (only preliminary results from this area)

Three wind areas in the Northern Diablos (Pacheco Pass, Altamont, Montezuma Hills) -- not a lot of monitoring having been done at Pacheco Pass

What are the population consequences of these high levels of fatality at the Altamont?

Trying to figure out how occupancy etc. is affected by anthropogenic activities

Size of grid cells is based on territory size of pairs of golden eagles (based a lot on telemetry work by Granger Hunt)

Assess reproduction as well - are pairs successfully fledging young

Also noting how many individuals are detected

A lot of variation in the habitat in the study area

A lot of scrublands in the middle of the study area – don't think eagles can access their prey as easily

Unfortunately weren't out there surveying in 2017, which is the year the 5-year drought broke – surveyed in 2014-2016, then again in 2018

Using rainfall as a variable for analysis --- good gradient of climatic conditions across the study area

Grasslands respond immediately to any kind of water – then ground squirrels respond to grass growth

West side of study area receives more rain, good prey availability

East side of study area very dry, less prey availability

230 pairs in entire study area (regularly detect some pairs just outside of focal sites – this allows them to pretty easily distinguish pairs even without having individuals marked – so think the 230 pairs is an accurate estimate

Diablo Range has GOEA pair densities much higher than studies in other areas of the country and world – haven't been able to find any data in the literature to show a higher density of GOEA pairs anywhere else in the world

GOEAs easy to detect during courtship period as they're doing their displays --- if birds successfully fledge young, their detection remains high throughout the breeding season, however, pairs that don't successfully breed, get harder and harder to detect as the season progresses.

Eagles seem to prefer a mix of grasslands (foraging) and woodlands (nesting) in their territories, and prefer rugged terrain

Nest detection – tree nesting population – nests can be very hard to detect. Modeling approach can allow for determining detection probability and incorporate it into models.

Detecting young is heavily dependent on whether you know the pair has historically nested successfully in an area

Nesting success strongly influenced by amount of precipitation – particularly during brood rearing period

Occupancy is easier to determine than reproduction (relatively easy to see eagles, but difficult to detect nests)

If there are cliffs in the territory, do eagles prefer the trees or the cliffs? Seeing very few pairs nesting in cliffs

Trying to figure out nest site selection – why do they choose certain trees?

Tree nesting birds really need ground surveys, while cliff nesting birds really need helicopter surveys --- if eagles nest in both substrates, should use a mix of survey methods for highest detection.

Joe Barnes

[*see presentation*]

Felt the timing of the surveys was leading to low occupancy estimates - consider nesting phenology

Divided into northern Great Basin birds and southern Great Basin birds (didn't focus on Mojave desert)

Southern and northern birds had very similar breeding schedules

Incubation initiation – mid-Feb; Hatching: early April; fledging: mid-June

Have to work around bighorn sheep lambing period, which frequently overlaps with golden eagle breeding both spatially and temporally --- but can't sacrifice one species for another. But, can you do ground-based surveys during the lambing season? Depending on topography, this may or may not work. Second preference is to do aerial survey on either end of lambing season. Third recommendation is to work with agencies to figure out a common solution

Has to do ground-based surveys because of very small budget

2 hour monitoring period

Habitat type really matters – Joe has really open landscapes ringed by mountains and cliffs – lots of two tracks, so can usually get within 500-1600 meters of nests

Jack rabbit and cotton tail rabbits is 85% of the GOEAs diets -- Lagomorph numbers dropped in 2018

2019 first year seeing any unoccupied territories

Low prey years, it's going to take a lot longer to determine occupancy

GOEA staying on site year round in Nevada

Aerial surveys seem quite good for assessing reproduction, but not as much occupancy

RESEARCH

Western Golden Eagle Team (WGET) Research, Brian Woodbridge

[*see presentation*]

Breaking down life history into breeding areas, migration, wintering areas

Predicting relative density of use based on relative habitat suitability at scale of breeding territory

Great Basin: The model is very stable for determining habitat suitability

Southwestern Deserts: AZ Game and Fish does a ton of surveying, but find very minimal sites

California Foothills: model performance for this region hasn't been evaluated yet --- tried to compare this model to Dave Wiens's model (WGET model predicts to a much larger area than Wiens) --- much of California's nest data is proprietary

Very few nests in the northern portion of the California Foothills region; model is saying there should be nests here --- knowledge deficit in coniferous forests, particularly the edges --- Brian's personal experience is that eagles use these areas like crazy. Can't model data we don't have, but think there are most likely eagles there

Telemetry data for the GOEAs is really messy

No resident eagles in the east that we know of, some residents in the west – California and Nevada seem to be mostly resident birds that don't migrate

Wyoming has many more northern migrants

Model to parse out transiting behavior vs. sedentary model

All Behavior: e.g. territorial, floater, sub-adult, etc. all included

Home range size: Mediterranean California has small home range size

Core area size: low sample size creating some variability in certain regions – and also just the birds are more variable in these regions. Core areas much more conservative and about nest defense than about prey availability. Where do birds spend most of their time.

GOEA Research, Adam Duerr

[*see presentation*]

Adam presented an overview of the history of research that his group has done

Mojave Desert eagles

Home range size can change year to year (in Mojave Desert eagles)

Contraction in home range size in November, December, and January (during courtship period), then a lot of variation in home range size from incubation period on

Movement can vary quite a bit year to year

Telemetry in Tehachapis

Home range size varies by age class, young birds stick close to home, than go farther afield as they age, then after fifth year, home range size is small again.

5 birds tracked from Tehachapis: breeds return to breeding areas in the winter, and move to the north after breeding

Birds in California could be influencing populations and gene pool outside of California

Tehachapi birds move most in the Feb to Oct range

Movement distance peaks mid-day

Genetics and stable isotope analyses

Pattern based on rainfall

Birds from Altamont were from one population

But, ¼ of birds killed at Altamont were "non-local" and were predominantly non-adults

Population at Altamont sustained by immigration of 2Y-4Y birds

Point count usefulness

Assuming perfect detection

Want predicted time to be the same as actual time so that sampling error is zero

Error due to sampling gets worse as the project footprint increases

Stratified sampling is best

Not until we get to daily sampling frequency do we see a drop in error

Maybe Mojave Desert eagles are strange…

Modeling Eagle Flight Altitude for all of California

Birds that have moved in all five BCRs

Ignore weather, but focus on topography

Model flight altitude in a static manner for California – so can create a map of expected flight altitude based on topography

Next Steps

What drives an eagle to choose to be in flight or not and what speed will it be flying at – suggests everything influences this: topography, weather, etc.

Behavior will matter for risk of eagles to turbine collision – e.g. if eagle is foraging, probably turning a lot – if movement is directed, probably less risk of collision

Foraging Habitat model

What drives low altitude flights

Research in Southern California, Robert Fisher

Robert Fisher provided an update on research he and his team are doing in southern California. Please contact Robert for more information.

Urban avoidance in the Great Basin, Zachary Ormsby

[*see presentation*]

Reno rapidly expanding

Looked at 1 mile buffer outside of urban area

Territories are winking out

Development encroached to within 1 km of three nests that didn't successfully produce young

Monitored golden eagle use with baited game cameras.

Put transmitters on golden eagles

Elevation and distance to urbanization important – GOEAs tend to frequent area >2500 meters from urban areas

If impermeable surface was >24%, no eagles were found there

Reno working on the revision to the 20 year master plan for development – expecting the footprint of Reno is going to double in the next 20 years

Eagle-vehicle collisions (presented by Brian Woodbridge for Steve Slater)

[*see presentation*]

Can we quantify this to provide it as a mitigation option?

Dogs find many more carcasses than human observers, so really good to use when searching for the carcasses along roads

Lot of annual variation in roadkill numbers

Eagle carcasses disappear rapidly along roads that are heavily used

ACTION ITEMS

- Determine if Crescent Dunes report is available.
- FWS has to determine how incidental finds will be incorporated into take calculations and predictions
- FWS had to decide if using the 50^{th} or 80^{th} CI in Evidence of Absence analyses.