



COLORADO BAT WORKING GROUP
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2022 Colorado Bat Working Group Meeting
9 am - 4 pm, October 7, 2022
Denver, Colorado

9:00 - Greetings and introductions, housekeeping (Neubaum)

- Agenda, virtual check-in
- Western Bat Working Group updates (Schorr)
 - 2023 Meeting in person, Victoria, B.C.
- Officer/Board member service, web administrator

Dan Neubaum (Colorado Parks and Wildlife), Kirk Navo (Head First Biological), Rob Schorr (Colorado Natural Heritage Program - CSU), Karen Fox (CPW), Mary Wood (CPW), Andrea Schuhmann (CNHP - CSU), Rachel Shively (NABat - US Geological Survey), Michelle Verant (National Park Service), Aaron Corcoran (UC Colorado Springs), Mylea Bayless (BCI - Durango), Mikele Painter (USFS), Aaron Sidder (BCI), Sarah Gaulke (NABat - USGS), Franky Tousky (NABat - USGS), Brian Reichert (NABat - USGS), Renata Platenberg (VI Bat Team), Karen Voltura (CPW Energy), Robin Sell (BLM), Tina Jackson (CPW), Jeremy Siemers (CNHP), Ash Mamlov (Bat Health Foundation), Paul Fowler (Colorado Cave Survey), Paul Cryan (USGS), April Estep (CPW), Lance Carpenter (CPW), Cinnamon Levi (CDOT), Matt Rustand (BLM), Jaclyn Martin (NPS), Jonas Hanakasson (UCCS), Lisa Thompson (Colorado Department of Reclamation Mining and Safety), Missy Dressen (USFS), Ryan Pioreseschi, Jake Lammi (Diamond Dog Detection Teams), Troy and Tayler (CPW technicians), Anna Fagre (Bat Health Foundation), Bethany Straw (NABat - USGS), Jennifer Zedalis (Colorado Cave Survey)

Update on Western Bat Working Group news (Rob)

- Diversity, Equity and Inclusion Statement - WBWG has a new DEI statement that will be posted to the website soon.
- Treasurer transfer/upgrade - after 20 years of Brad Phillips being WBWG Treasurer he has resigned his post, so WBWG is working to: 1. Transfer the historic fund management knowledge; and 2. Create a process for easy transition as new Treasurers take the post.
- WBWG Biennial Conference - Victoria, BC (April 18-21, 2023; whale watching, bird watching, good beer, and a chance to connect with bios. WBWG is investigating investment in carbon offsets to reduce the carbon footprint of our conference and increase attendance.
- Bat Research News (?) - editors are hoping to hand-off the management of Bat Research News, WBWG is debating publishing the journal (as a different name) with NE Bat Working Group, MW Bat Working Group, and Southeast Bat Diversity Network. Working with Eagle Hill Publishing (*SE Naturalist*, *NE Naturalist*, *SW Naturalist*) to develop a workflow and costs.
- Species Accounts updates - Bill Haas is coordinating the update of Species Accounts for the website
- MYLU Species Status Assessment USFWS - with proposed listing of little brown bat there is much consternation about how populations (and our understanding of those populations) in the East are different than those in the West. WBWG invited USFWS to chat about the SSA process and how western bios can inform that process.

- Collaborative BWG meeting in 2025 - looking to have a collaborative conference with the other 3 bat working groups in 2025. Location/timing to be determined.
- Elections: WBWG needs YOU as an officer; please run for an office

CBWG Website (Dan) - we now have a tab on the website that discusses the proper methods for bat exclusion. There was a request to include a discussion of the proper timing for exclusion activities should occur. Some of that discussion is on the website, but something more glaring and obvious (like a separate tab) would be helpful. Can we expand this to include timelines of when any bat-impact activities should occur?

Additionally, we have a CO bat research/literature file online to have an easily accessible summary of bat-related research in CO. ACTION ITEM: Check out this list and if you know of any reports or work that are not included, please send to Dan or Rob.

Rob has served as the webmaster but is always willing to let someone with more knowledge take the reins.

Wind energy development in Colorado (Karen Voltura - CPW Energy SE Region)

- Karen revisited the data behind bat migrations, wind energy collisions
- Wind E development has been 26% of E development in CO, with the next 5 years of substantial growth
- Currently, ~5,000 MW installed (~3,000 turbines)
- Evaluating 2 million ac for development
- 11.5 GW is planned for SE region of CO
- Tallest turbines are about 100 m hub height
- Development in CO is even eyeing some of the less optimal wind E zones because blades are getting longer and can generate energy even in areas that are not prime wind development zones
- The consultation process - voluntary consultation meetings with client/USFWS, if you go through this process and you have an impact you won't be prosecuted. With bats, we don't get a lot of information - usually 1 year prior (spring, summer, fall) of bat passage rates (from nearby met towers). We don't get species info and there is pushback from clients to provide that. Is it possible that NABat acoustic monitoring locations would provide better data?
- CPW has no control over siting; that is handled by the counties and the PUC (Public Utility Commission)
- There are 700 miles of transmission lines planned in the SE
- Siting away from species' use patterns is ideal, but we don't know those patterns well
- There is a need for more post-installation monitoring

Can we influence the degree to which wind E companies use cut-in speeds for bats by creating marketing labels for "bird/bat-safe" wind E providers? Bethany reminded us that the average consumer is so far removed from energy generation they have no framework for making market decisions. Also, a problem that there isn't a level playing field for enforcing/using market-based incentives

An open question: How do we get developers to share their monitoring data?

Brian: It is important that we work collaboratively with the Wind E developers to address what impacts exist, especially until we figure out the population-level impacts. Pitting wind E development as an antagonist to bird/bat conservation will be an uphill battle since there is greater focus on renewable energy.

Mylea: BCI has resources on the BWEBC (batsandwind.org) website for understanding curtailment and deterrents.

Use of detection dogs for bat work (Suzie Marlow & Jake Lammi) - Jake and Suzie started at University of Washington conservation canine facility and have conducted canine surveys for a host of species, including pangolin in Vietnam. They cofounded Diamond Dog Detection Teams and have 15 years of combined experience. They are a team of 4 dogs/2 handlers. They can offer researchers ways of addressing questions using scent detections.

- Wind facility monitoring - higher efficiency in detection; dogs can sniff out smaller species, scavenged pieces, buried carcasses. Much more efficient than human searching. Dogs = 96% of bat and 96% bird carcasses compared to 6% and 30% for humans, respectively. Dogs don't have the visual bias of humans. Typically, dogs start upwind and work transects perpendicular to wind. Can also do "sweeps" where the team works through the system without transects.
- Locating bat hibernacula - 2021 with Karen Blejwas in AK to look for hibernacula. Using transmitters, cameras, detection dogs. How do we locate swarming sites near talus? Used guano, bat fur, desiccated bats to train dogs. Guano is easier, but what about when a bat lands and climbs on a rock. They had a fly shop tie flies with bat fur and cast these flies out over the landscape. They also used desiccated bats to touch rocks and train dogs. Lastly, took dogs to "hotspots" of bat swarming where we knew bats land.

Software for automated video counting and tracking of bats (Aaron Corcoran)

Videography is an underutilized tool. Benefits: noninvasive, generate accurate counts, presence/absence, assess behaviors. Why don't we use it more?: Costs (FLIR \$3150, Axis Security Camera Q1952E \$5000); Training for deployment (equip, experience, familiarity), and Analysis. To aid in the analysis Aaron and his team developed ThruTracker Software - computer vision (AI in development) that is compatible with standard video formats, is designed for large-scale projects, and is free.

What are some uses?: Near real-time population counts, continuous population monitoring, track migration/hibernation, assess population dynamics. Applications: cave/mine counts, bridge exit counts, wind turbines. On one project Aaron utilized 3D stereoscopic videography FLiR using 6 cameras over 2 months. This was 720 camera nights (10 hours/night) = 7200 hrs of video (almost a full year of time day/night). Currently, the ThruTracker is analyzing those data. All activity appears to be hub height or lower. Aaron is working on a project with BCI to monitor a TABR colony with high traffic (27,000 bats/min).

Aaron took us for a tour of the software. Larger colonies in >250,000 can decrease accuracy.

White-nose Syndrome - general updates at the national and state levels (Tina Jackson/Michelle Verant)

- We all took a tour of the WNS map from whitenosesyndrome.org (“News Room” is a quick reference for seeing latest information on WNS, especially new records)
- Culverts are arising as centers for identifying WNS in the SE.
- Sad news from a hibernacula in MT (1,200 bats) with WNS at a cave with 98% decline in count numbers and ½ the remaining bats with evidence of *Pd*.
- First detection in ID (from Oct 2021 swabs) at a show cave and hibernacula for 7 species (MYLU, MYYU, MYVO effected).
- Fort Laramie, WY - large bat condo with estimated >2,000 MYLU. Confirmed *Pd* in 2019 with dead bats in 2022.
- CA has *Pd* but with some inconclusive records (4 Natl Parks in southern CA).

2022 CO surveillance efforts (capture, guano) - Michelle took us through some timing/surveillance methods figures that illustrate the best options/timelines we have for detecting *Pd*

Colorado - 2022 confirmed *Pd* locations in CO - Gateway Natural Area (Larimer Co), Bent’s Old Fort (Otero Co), Skull Canyon (Baca Co). CPW will be discussing how the discovery of *Pd* impacts wildlife rehabbers/sci coll permits. There was some discussion about the microclimate/setting of where *Pd* had persist in CO overwinter.

- USFS WNS decisions/directions (Missy Dressen) - under USFS adaptive management strategy with the new *Pd* location in SE Wyoming (within 250 miles of USFS lands) there was a change in management. Status of cave closures on public lands in CO - current status is the “Tier 1” - permit system/decontam/seasonal closures. “Tier 2” - all caves are closed when WNS is found within 250 miles. 315 cave permits - primarily for Fulford and Groening.
 - Are these caves gated? Not sure. Are there game cameras monitoring these sites? Not sure.
 - Spring Cave is gated Aug-Apr. Fulford is not gated. Groenig and Hubbard are gated year-round.
- BLM caves/abandoned mines (Matt Rustand) - BLM uses a 100-mile buffer from closest WNS confirmation. There are BLM lands within that buffer but most are small tracts of land. None of those tracts are known to have important bat resources.

11:35 - Recovering America’s Wildlife Act (Mylea Bayless) - bill working through Congress focused on resources for wildlife management agencies for species conservation prior to federal listing. \$1.3 billion to state wildlife agencies, \$97.5 million to tribal fish and wildlife managers with a focus on “magnitude of the solution matches magnitude of problem”. This bill would fund 75% of all the state wildlife management agencies action plans, with 25% match from non-federal. These funds are tied to state’s SWAP goals. These funds can be used for a host of activities including wetland conservation, restoration, invasive species control, monitoring, etc. The 25% match can be from federal funds to state (except DOI, USDA).

- How can we harness RAWA to fund bat conservation? We need to make sure bat species are represented on the SWAP.
- Projects that are likely to be valuable for bats in CO: understanding roost distribution/abundance, limiting roost disturbance, species/habitat distribution, population research/monitoring, energy/mining BMP implementation, control pathogens, life history/habitat research, WNS monitoring and control, alternative

roost use/location, education/public outreach, homeowner incentives, habitat restoration/protection.

COVID19 implications for bats (Angela Bosco-Lauth, CSU)

Mexican free-tailed bat challenge trials - Early studies of EPFU didn't find them susceptible to Covid-19. Fruit bats could be infected but low loads. Horseshoe bats of SE Asia are obvious carriers. Angela and her lab were already testing infection/shedding in a host of other wildlife species (skunks, deer mice, foxes, woodrats are susceptible/good at shedding).

Research plan: Wild TABR from Dan, acclimated for 3 weeks, challenged with 2 strains of Covid (WA01/Delta of SARS-CoV-2). Looked at loads in oral swabs, feces, tissues necropsy. Bats in nest boxes and some flight access with mealworm diet. No infected virus shedding in any bats. Lots of PCR+ oral swabs, but no evidence of high enough load for infection. ¼ tested seroconverted (low titer). No immuno-histological staining in bat tissues. Many bats had comorbidities (bacterial pneumonia, parasites). Conclusions: TABR permissive to infection but no clinical disease, no fecal shedding, not enough sufficient infectious virus to be detectable. No transmission among TABR. Low likelihood TABR can transmit or be infected.

North American Bat (NABat) Monitoring efforts - Brian gives background on the NABat program. A new publication Udell et al. (2022) reports on long-term analysis of acoustic data to look at some species trends. "Status and Trends" on NABat website lets you look at trends for species. You can narrow your search/view to geographic areas based on what the user wants to see.

- 2020 Colorado accomplishments (Siemers/Jackson/Reichert) - Jeremy Siemers reports that there are a host of partners in Colorado contributing acoustic data. He manages a large chunk of acoustic data via work with Tina and gets data to Brian and NABat. Additionally, surveys are being contributed by CPW, USFS, BLM, NPS, etc. ~50 grid sites done in Colorado.
- Bridge TABR modeling efforts (Franky Tousley) - NABat One Health project to understand bat risk of human Covid 19 exposure by TABR. Using a host of landscape-specific variables to understand TABR roosting choices/sites, and now searching box-beam bridges for colonies. [National Bridge Inventory was the dataset of the bridge locations/descriptions]. In Colorado, did not find any TABR roosts. The CO roosts of reasonably large size (100-1000) was of *Myotis*. The model was successfully predicting TABR roosts in most SW states except CO.

Abandoned mine lands summary (Kirk Navo/Lisa Thompson) - There were no on-site surveys in 2022. All reviews are desktop exercises. In 2022, there were 241 mines reviewed in 12 different projects. 28 bat gates recommended and 37 slot gate options. There were no follow-up CPW bat surveys recommended. It is unknown how many gates are actually installed. Recommendations for follow-up bat surveys - these have decreased because there hasn't been feedback on which ones get surveyed. Also, need post-gate surveys to understand bat populations and effectiveness of gating. Should gates have access doors? They are costly and more-susceptible to breach/vandalism. Some discussion about future monitoring needs. BCI has conducted about 200 surveys in 2022 on BLM (primarily in uranium country) in SW CO. Lisa took us through the data on number of closures (we asked for copy of these data - Lisa is checking if it can be released).

- Withdrawal of Paradox Mine (Matt Rustand) - Uncompahgre Field Office is still pursuing a withdrawal but don't know when as they are struggling with staff capacity. Fortunately, the market for uranium is low.

Orient Mine Update (Jennifer Zedalis/Paul Fowler - Colorado Cave Survey)

Jennifer and Paul are conducting a resurvey of the mine and the cave complex in the mine. The Orient Mine was mined for iron ore 1880-1930. Between the 6 levels there is 600 ft of vertical space with a colony of ~250,000 TABR. They are conducting internal surveys to understand the TABR colony. Survey methodology: wearing N95/KN95 masks, not touching bats, staying quiet, and following decontamination protocol and dedicated equipment.

- June 2019 - observed non-migratory bats using Orient Mine (COTO).
- March 2020 - 63 COTO, 6 *Myotis. Hibernacula for COTO*. October 2021 - 4 COTO, 1 frozen bat (negative for Pd).
- April 2022 - 33 COTO and a few *Myotis*. September 2022 - TABR decreasing in abundance as some are leaving to migrate south, no COTO/*Myotis* noted during this survey.
- Great Guano Glacier - at Glory Hole, which is a huge room with partially collapsed roof. Guano pile ("glacier") is about 250 ft below Glory Hole.
- ACTION ITEM: Proposal to have a summer Bat Blitz at Orient to film bats and generate a new colony size estimate that is more accurate.

Matrix Revisions (Navo/Siemers) - ACTION ITEM: This topic was postponed but will be followed up with an email to group.

Climbers for Bat Conservation (Schorr) - Rob took us through the CBC data (~200 bat sightings from climbers). Records from as far away as Kenya, Bulgaria, Norway, but a majority from the US. CBC now has an online data portal and Dashboard for viewing records. Graduate student Emily Gross is conducting a human dimensions project to learn more about climbers' views on bats, bat conservation, and identify barriers to submitting data.

Developing data management resources to understand bat health (BataBase) - bat physiology data (Ash/Anna - Bat Health Foundation) - assessing impending disease usually relies on prognoses just prior to death. There are other wildlife databases, but not specific to bats/bat health. Can we take samples/physiological data to give information about prevalence of diseases/conditions prior to disease outbreaks/death. The relational database will use bat physiologic metrics (diets, condition, parasites, fungi, histology, bacteria, serology, genomics, blood chemistry, etc.).