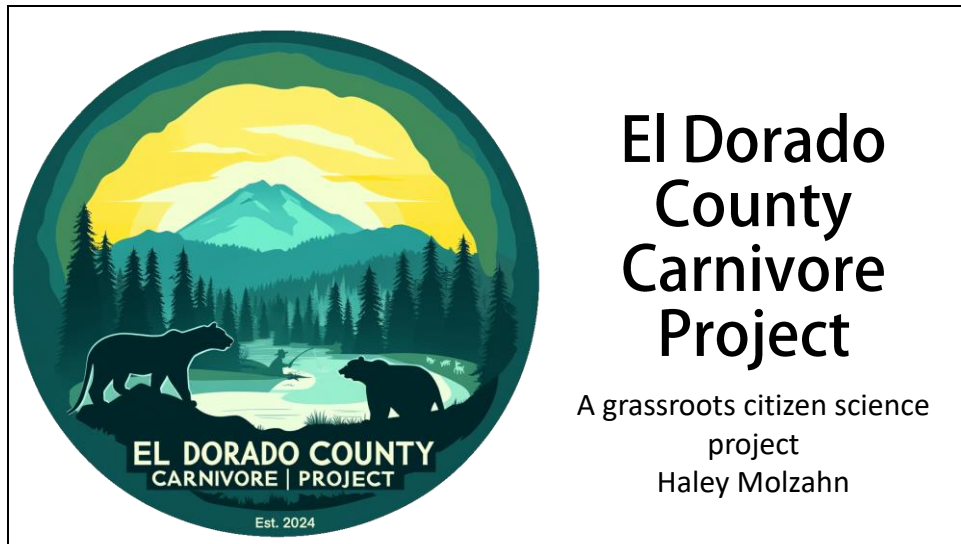


Slide 1



Who are we?

Who are we...

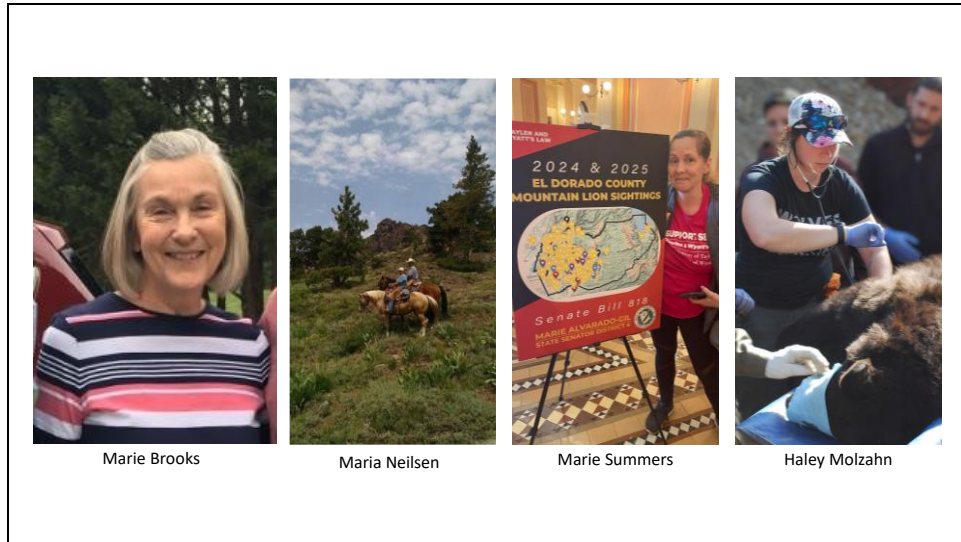
- WE ARE

- Residents of El Dorado County
- A diverse background of individuals who have come together to represent the PEOPLE of El Dorado County through data-driven research
- Volunteers

- WE ARE NOT

- A governmental organization such as CDFW or USDA
- A non-governmental organization or 501©3 nonprofit

Slide 4



Marie Brooks

Maria Neilsen

Marie Summers

Haley Molzahn

Marie Brooks – grandmother to the Brooks brothers

Maria Neilsen – local commercial cattle rancher, advises on all matters of livestock operations

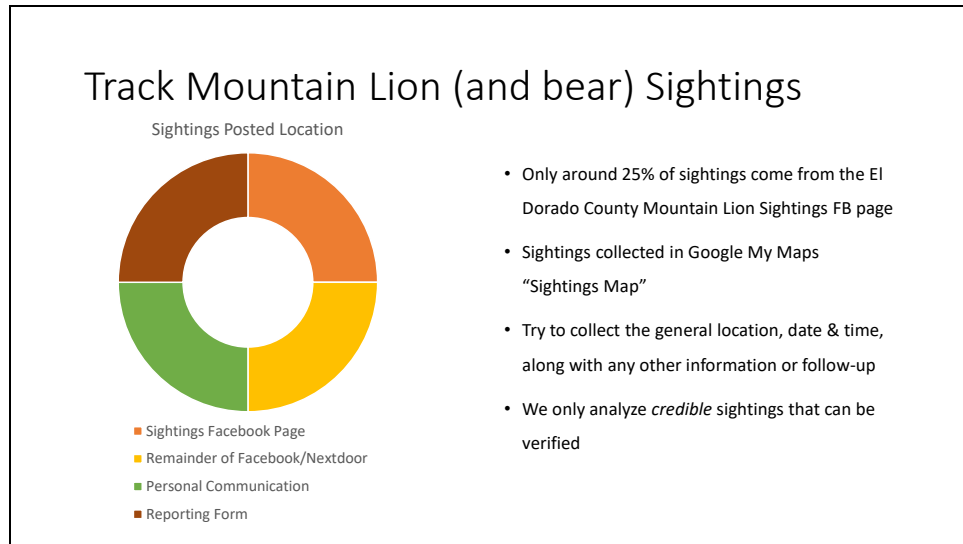
Marie Summers – Recent San Francisco transplant, creator of the Google Sightings Map

Haley Molzahn – Lead researcher and creator of EDC Carnivore Project, I have my BS in wildlife conservation & management and specialize in carnivore conflict mitigation

Brittany Goins – GIS Analyst, Sac State recent graduate, also resident of El Dorado County

What do we do?

Slide 6



¼ of sightings are collected from the dedicated sightings Facebook page, the rest are collected mostly from personal communications sent to us directly or through our JotForm, which is set up to ask all the pertinent questions we need for a sighting

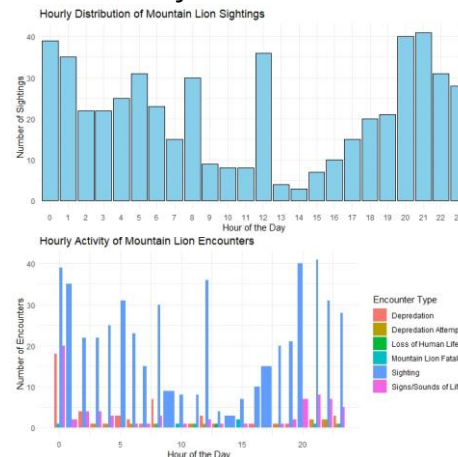
All of these sightings are put into the Google My Map, which creates a data table where I can organize and pull data from for analysis

We try to collect as much info as possible, especially if there is a depredation, but generally there is only the date, time, and location. If there's a depredation, we try to follow-up with the individual on what animals and how many were taken, if they called the Ag department or CDFW, how that went for them, and follow how it's going when we have an open case.

We only run analysis on verifiable data such as firsthand sightings, camera sightings, and depredations. Attempted depredations and sign/sounds aren't included as it's impossible to verify what someone heard if they heard a lion

2024 Sightings Data – A Pilot Project

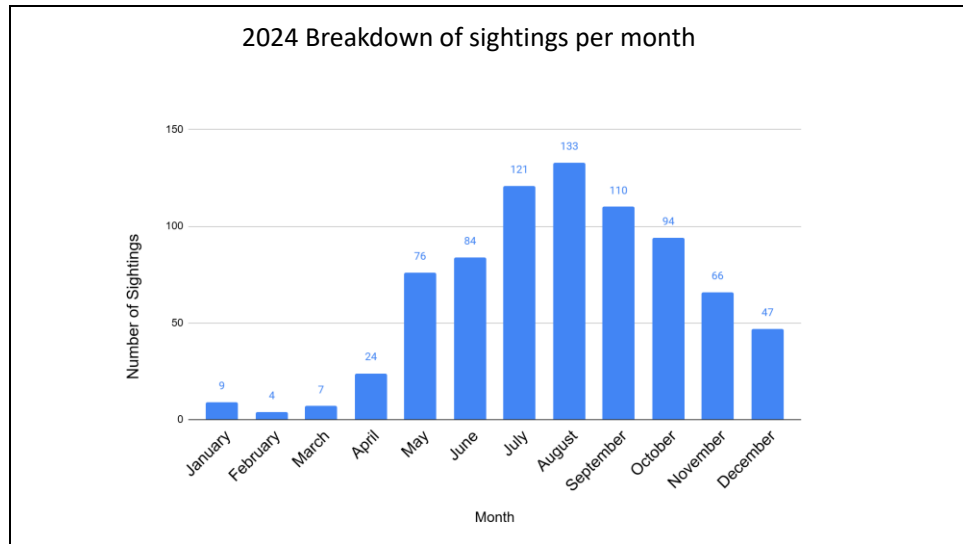
- 2024 mountain lion data: ~800 points, of which 523 sightings
- Most data incomplete, typically including only location, sometimes date/time
- Times often vague (e.g., "daytime," "afternoon"); assigned specific hours (e.g., 12:00 for daytime, 15:00 for afternoon)
- Overnight or morning activity (e.g., depredations) marked as 24:00



TOP – histogram of number of sightings per hour of the day in 24 hours. There's a spike at noon due to several sightings needing to be 'assigned' the time of noon when labeled 'daytime' or 'noon'

BOTTOM – histogram of number of encounters, each outlined by color, in 24 hours.

Slide 8

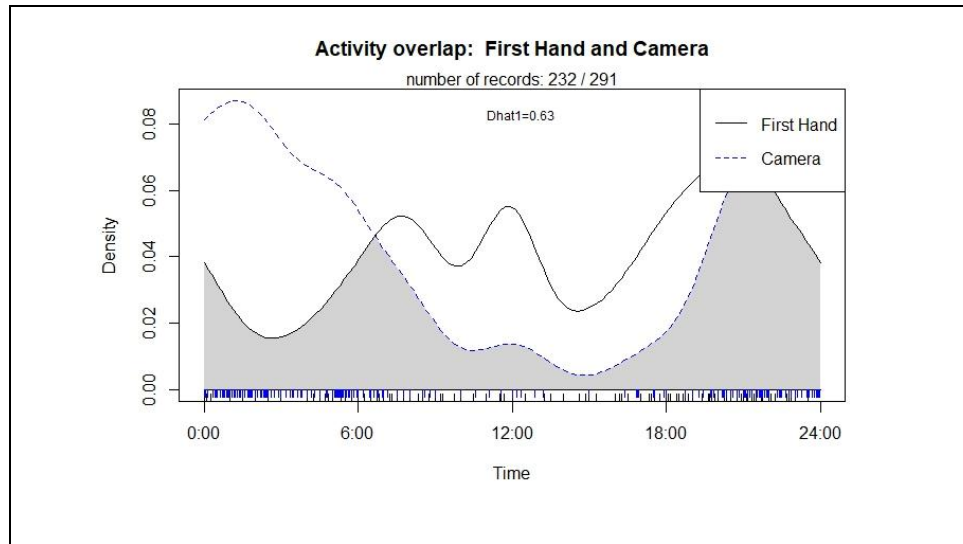


Sightings FB page wasn't created till April by Teresa Brewster

Google Maps wasn't created till the beginning of July by Marie Summers

Winter pattern starts to show the decline in outdoor activity in people, aligned with winter holidays

Slide 9



Created in R using the CamtrapR package, the overlap of firsthand and camera sightings for 2024.

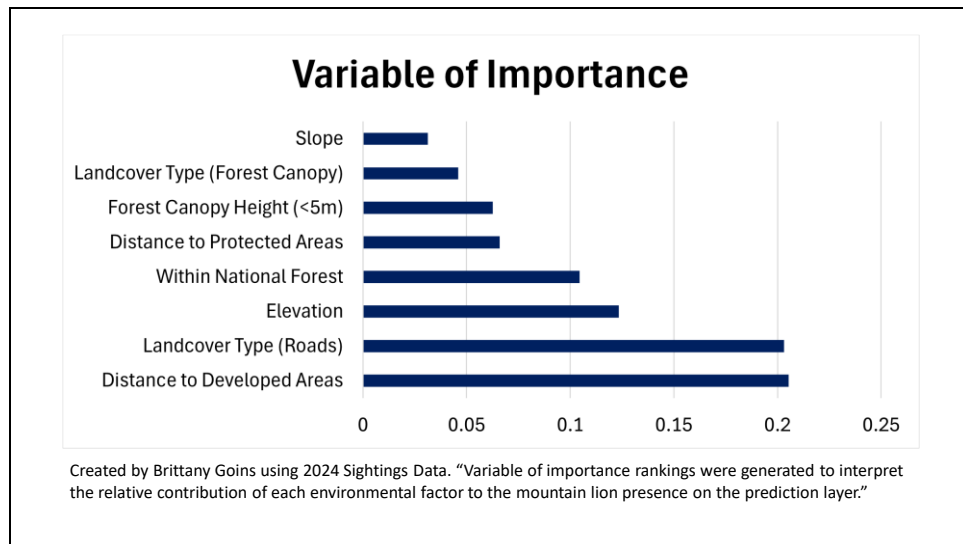
Again, there's a spike in the middle of the day for firsthand sightings, which is a sort of artifact. People are very poor at collecting sightings at night between midnight and 6 am, as most people are asleep. But cameras are still active, so that explains the change in sightings.

But sightings in the evening are still predominantly happening between cameras AND firsthand sightings.

GIS analysis of 2024 data

Results provided by Brittany Goins

Slide 11

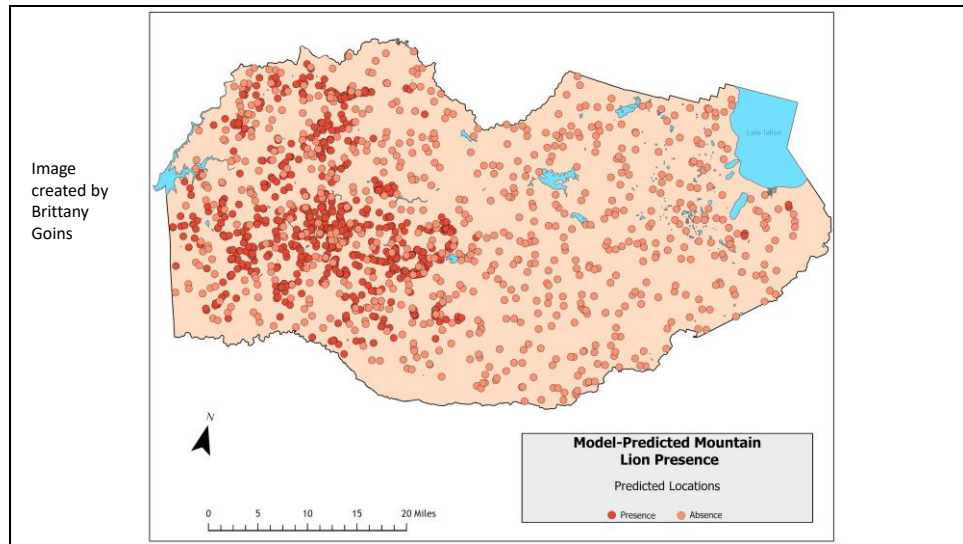


We understand that this data is biased, so the model thinks that distance to developed areas and roads is the main predictor.

However, it can also make predictions based on everything else.

Ignoring distance to roads and developed areas, land type predictors of sightings is primarily elevation with slope being the least predictive variable

Slide 12



Random-Forest Model using 2024 sightings data, predicting presence and absence of mountain lion sightings based on several variables, including distance to protected area, slope, aspect, elevation, distance to forest type, either open or closed, canopy cover, and distance to water. It also takes into account distance to roads and developed areas.

This is a new, machine-learning model and has been used in mountain lions for a large-scale project across the US, and is highly effective at predicting the presence/absence of mountain lions based on environmental factors. So, the more data we feed it, the smarter it gets. Plus, we can feed it the temporal data moving forward to also predict presence/absence sightings based on time of day or night. We can also exclude data through a process called 'take one out' in modeling to test the model for accuracy. This will be happening over this summer as we receive more 2025 data.

What did we learn from 2024?

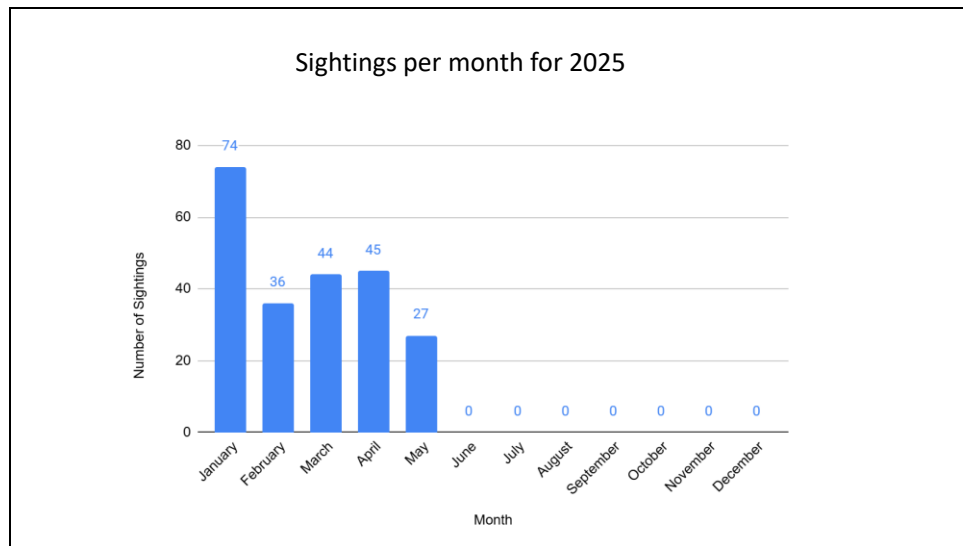
How to *actually* collect sightings data

We've gotten better at understanding how, where, and when to collect data and how to engage with the community to communicate what we need in sightings data

What have we learned in
2025?

Something!

Slide 15



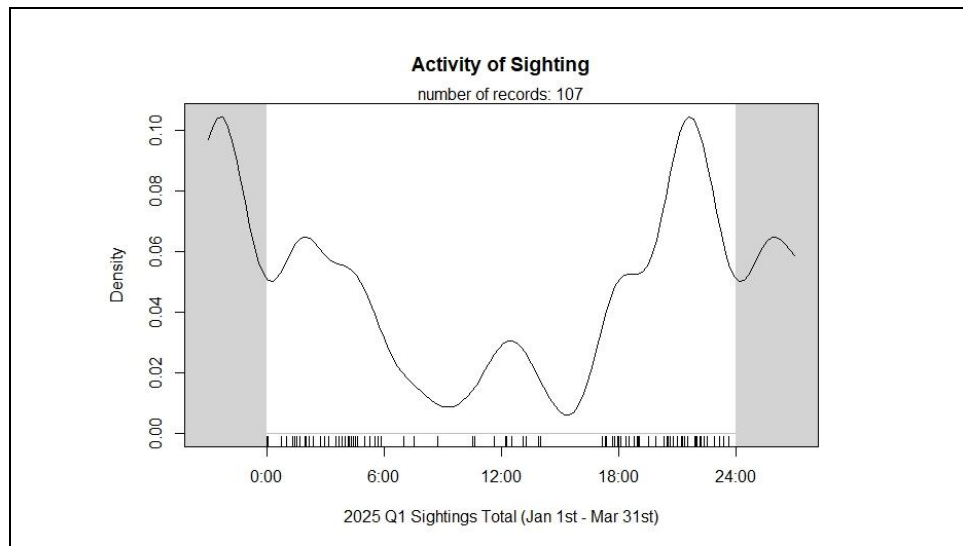
Taken as of 05/19/2025

We still have more data to collect obviously, and we're not done yet with May, but I believe this to be a better representation of activity

2025 Q1 Report

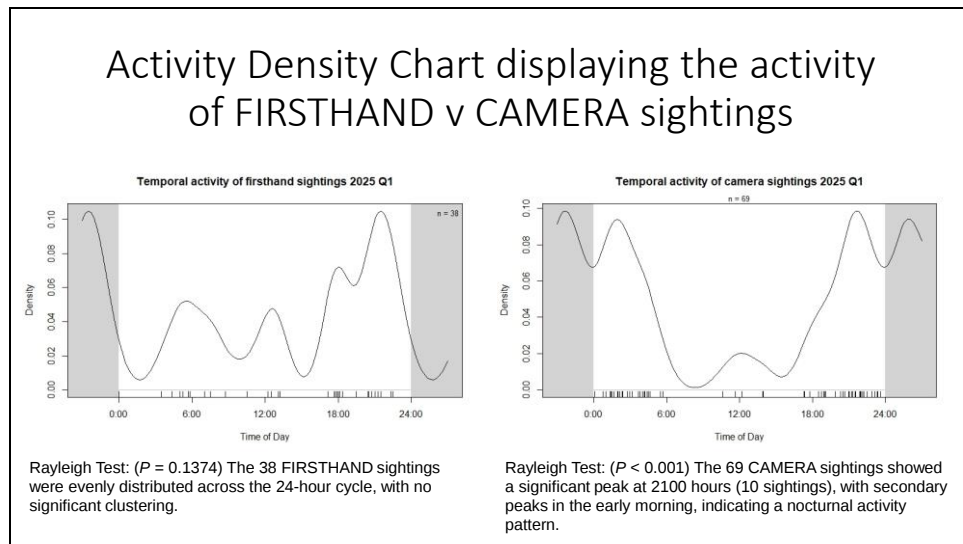
A temporal analysis using the CamtrapR package in R

Slide 17



Of the 154 sightings we got for the first quarter of 2025, only 107 had a date and time necessary for this analysis

This shows combination of firsthand AND camera sightings (without overlap)

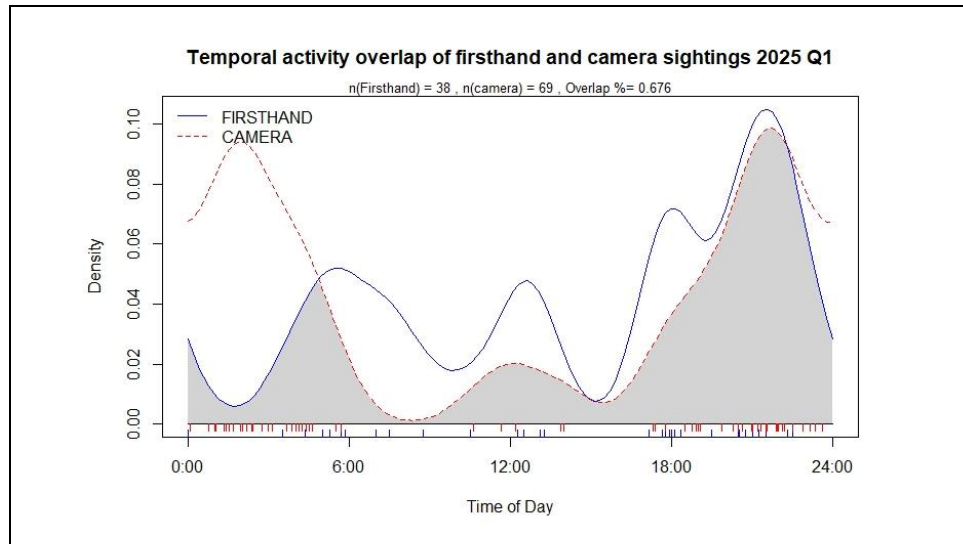


Daytime sightings were not significantly clustered to one time of day, but more evenly distributed, while camera sightings were significantly clustered to a certain time of day.

This indicates that unbiased, unmanned cameras are capturing lions at their typical activity period of late evening and nighttime, while humans are only seeing lions during the day by likely pure the 'right place, right time' principle.

This could be an indication of both population-level activity (camera sightings) and individual-level activity (firsthand), or even an indication of habituation of individuals. Future analysis will include Brittany's GIS mapping and Random-Forest Modeling, to look at firsthand sightings only. In theory, if firsthand sightings are randomly distributed across the county, then firsthand sightings are a result of the 'right place, right time' principle. However, if they're clustered, or significantly clustered, this could indicate a single or handful of individuals, which could be habituated to people and thus take less care to stay hidden in residential areas.

Slide 19



The overlap is 67% of the time

You can see that cameras are really good at capturing activity across a 24-hour period, while humans are really good at capturing activity between 6am-10pm

The small pattern of overlap with daytime firsthand v camera sightings lets us know that this isn't just artifact, lions are active during the day

However, they are predominantly active at night

This further supports the 'right place, right time' theory of firsthand sightings when it comes to daytime reports

How can we help?

Community outreach

- Our research enables concise risk mapping to inform residents about sightings or depredations, and establishes a baseline database for future studies, including my proposal for a Master's Thesis (Habituation Thesis)
- We can help distribute information on what to do in a lion encounter. Specifically, who to call
- Despite a year of outreach, many still don't know who to contact about mountain lions, especially depredations

Through temporal and GIS analysis we can create risk maps of where someone might encounter a lion more likely. We can create these maps monthly, quarterly, or seasonally and then compare across years.

Our research through interviews can also inform the public, immediately, on what methods of protection are found more effective against depredations than others. This can then be compared to official studies on lions across the US

I've been working for the last several months on developing a proposal for official, university research, hopefully through UC Davis, looking at comparing GPS-collared lions' activity with sightings data to try and understand habituation in a whole new way. Research previously has not relied on, or put any stock in, sightings data, no matter how officially it was collected. I propose collaring lions and fitting them with easily recognizable ear tags to then cross reference GPS data with sightings data (aka, ask the resident if it had an ear tag, what side and what color) to understand not just how often are individuals in or near developed areas but how often they're seen by people.

We can help perform outreach to the public on who to call during an encounter, such as the Ag department, CDFW Conflict office, Sheriff's office, or 911, since even a year later, people, by and large, don't know who to call

I'd also like to, in the future, compare our data to official reports. I have a FOIA request currently in with APHIS within the USDA for all reports of mountain lion depredations on livestock in El

Dorado County from 2020-2024 but 5 months into my request, they still don't know if these records exist or what I'm asking for. Hopefully, I can eventually obtain these records to compare unreported depredations to reported depredations and better understand the rates of SSS

The logo is a circular emblem. The top half features a stylized yellow sun or moon rising over a range of green mountains. Below the mountains is a dense forest of dark green evergreen trees. In the foreground, two black silhouettes of bears are shown: one on the left facing right, and one on the right facing left. Below the bears, the text "EL DORADO COUNTY" is written in a bold, sans-serif font, followed by "CARNIVORE | PROJECT" in a smaller font. At the very bottom of the circle, "Est. 2024" is written in a small font.

Thank you

Haley Molzahn – HaleyMolzahn@EDCCarnivoreProject.com 530-444-9697

Marie Summers – MarieSummers@EDCCarnivoreProject.com 650-630-6343

Brittany Goins – BrittanyGoins@EDCCarnivoreProject.com

Visit us at www.EDCCarnivoreProject.com

NOTE – I am pregnant and on maternity leave. I will not be available in person or over the phone after June 28th (due date). Leading up to my due date, I am available by phone or email, though sparingly. Marie Summers and Brittany Goins will be taking over my duties until I am back (sometime in September)