



living webinar  
series  
with lions

# Mountain Lion Spying 101

Dr. Hari Viswanathan

living webinar  
series  
with lions



# Outline

- ◇ Bird & Wildlife Photography has been a hobby for 30 years
- ◇ Scientist at Los Alamos National Laboratory working on climate and energy
- ◇ I grew up in Los Alamos, New Mexico (Pajarito Plateau) and hardly saw any large mammals other than elk and deer
- ◇ Camera trapping hobby started as surveillance after a mountain lion killed our dog in our backyard in 2011
- ◇ After little success, I have now gotten 100s of DSLR photos of mountain lions and have learned a lot about these amazing apex predators

# Wildlife Photography Hobby

- ◆ Photographed wildlife on safari around the world
- ◆ Successful in bird photography on Pajarito Plateau but hardly any mammals despite hiking a lot and growing up in Los Alamos, New Mexico
- ◆ The nature guides show plenty of mammals in Los Alamos but I only saw deer around town

# I thought birds are reliable, mammals less so

Australia



Belize



Borneo



Ecuador & Galapagos



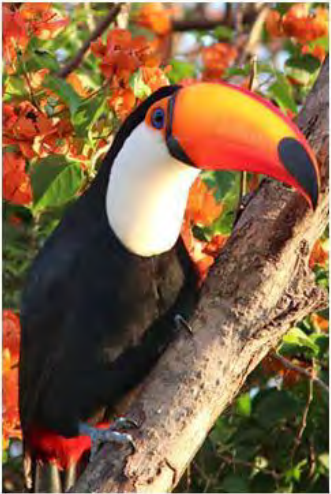
Hawaii



Honduras



Brazil



Brazil 02



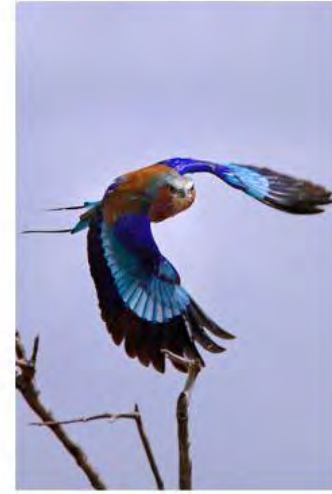
Costa Rica



India & Singapore



Kenya & Tanzania



Los Alamos



# Birds

India & Singapore



Kenya & Tanzania



Los Alamos



North America



Peru



Captivity



North America



Peru



Captivity



Colors, Shapes & Patterns



Displays, Behavior and In Flight



Highlights



# Finally Saw a Tiger, Bandhavgarh, India



# Leopard Acrobatics, Masai Mara, Kenya





# Lion Pride, Masai Mara, Kenya



# Jaguar killing a Caiman, Pantanal, Brazil



# Grizzlies, Brookes Falls, Alaska



# Orangutan, Borneo



# Polar Bear, Churchill, Canada



# Arctic Fox, Churchill, Canada



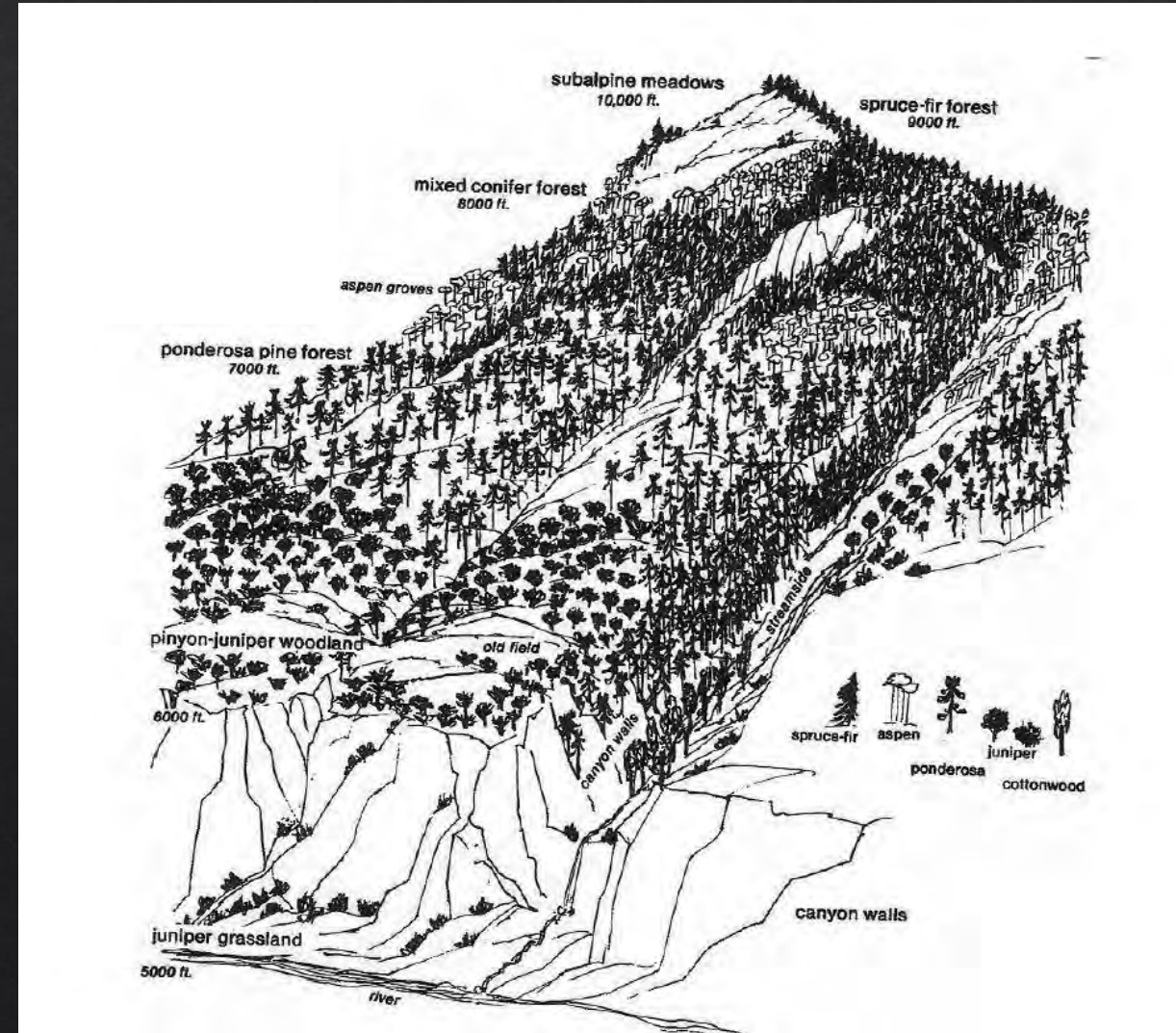
# Very Rare Puma (aka Mountain Lion) and Cub, Pantanal, Brazil



In 11 years of guiding our guide had never seen a puma during the day or more than a fleeting glimpse at night

# Los Alamos and The Pajarito Plateau

- ◇ Vertical mile (5000-10000 ft)
- ◇ Rio Grande
- ◇ Juniper grasslands
- ◇ Ponderosa pines
- ◇ Sub alpine meadows
- ◇ Canyons provide wildlife corridors
- ◇ Major bird migration route
- ◇ Home of the Manhattan Project in WWII (Oppenheimer Film)





# NWF Backyard and Community Habitat

helping wildlife without making them a nuisance



**Natural Food**



**Water**



**Cover**



**Places to Raise Young**

# Our Houses in Los Alamos



We certified both houses as National Wildlife Federation certified backyard wildlife habitats : [www.nwf.org](http://www.nwf.org)

My mom helped make Los Alamos county a NWF community wildlife habitat

# Lotus Pond at Parent's House (1997)



- Built myself and became a fun hobby
- For water plants like Lotus, morning sun is needed for blooms
- It was clear some animals were visiting pond at night since plants were eaten and disturbed
- Pond resulted in many birds and butterflies visiting but rarely saw large mammals visiting

Lotus and water plants in newly constructed pond

# Lotus Pond Became Warbler Pond!



Wilson's Warbler



Lazuli Bunting



Western Tanager



Bullock's Oriole

Spent lots of time photographing birds but did not see large mammals

# Amazing Butterflies



Juniper Hairstreak

# Cougar Attack at our house (12/24/2011)



- Early morning let dog out before walk and she started barking
- I assumed it was a raccoon
- Went out to investigate and saw dog was fighting something at the fence
- Used snow shovel to break up fight and realized it was a cougar
- Our dog Gwennie was killed
- Game & Fish killed Cougar after 1 hr since it wouldn't leave or show fear

Gwennie Dog with Mom and 3 yr old Aditya

# Cougar Autopsy



- Initially, most assumed cougar was sick forcing it to attack our dog
- Expert Ken Logan found that he was a healthy male cougar in good lion territory due to lots of natural prey
- Had recovered from bullet wound, hole in skull from fighting other males
- Doing what predators do
- Easily avoided if I hadn't let dog out alone in the dark
- Cougar issues were very rare in Los Alamos in 2011 but have increased with exploding deer population

Cougar that attacked Gwennie

# Living with Wildlife Education



- Cougar has been used to educate communities on how to coexist with large predators
- Accompany dogs into back yard at dawn, dusk and dark
- Keep house cats indoors for many reasons
- Avoid dawn, dusk, night activity
- If cougar is encountered make noise, wave arms, keep eye contact, don't run

Cougar used to educate the community



# What is really in our backyards? (4/20/12)



- I had hardly seen any large mammals in Los Alamos (other than deer)
- Cheap critter cam (\$100)
- Despite cougar attack, our backyard was more quiet
- My parent's house with the canyon in front and back with the pond was busy!

Day 1: Fox with critter cam that takes black and white pictures at night and color during day. I had never seen a fox living in Los Alamos but they visit at night often at parents house

# Cougar (5/6/2012)

## Ghost Cat



Month 1: Critter cam captures cougar coming in at 3 am at Warbler Pond, visits at our house really rare.

- Just one month after putting in critter cam, cougar visits Warbler Pond!
- Common? No, only returned 5/12/13 and 5/6/14 to parent's house
- Took 3 years for a cougar to return to our house
- Cougars rare but raccoons, foxes, deer, ringtails and bobcats visited multiple times a week
- In the summer, on trash days or when fruit ripe, bears visited

Camera Trapping:  
Amazing Wildlife at Point Blank Range

but Mediocre Photos with color  
white flash trail camera

# Coyote Pack



- Some white flash trail cams can take nice photos if setup at the correct distance and angle
- This was a Scoutguard camera

# A Game of Cat and Mouse



- It was interesting to see all the different things wildlife were up to when we weren't watching

# Black Bear Drink



- Daytime pictures from a trail cam can be high quality depending on the model
- Convenient with long battery light and weather proofing built in
- Today many cellular cams exist

# Black Bear Mother and Cubs



- Even with these guys the pond would be untouched when I'd check my camera and I had no idea they had visited.

# Rare Cougar Visit in 2014



HCO ScoutGuard

09.30.2014 21:03:42

- Often eye glow is an issue for white flash trail cams
- Most cannot take shots in burst mode (Reconyx can but it is expensive)
- Pictures will look flat due to the on camera flash
- No artistic lighting options
- Resolution is not very good even though may look ok on this webinar



DSLR Camera Trapping:  
Amazing Wildlife at Point Blank Range

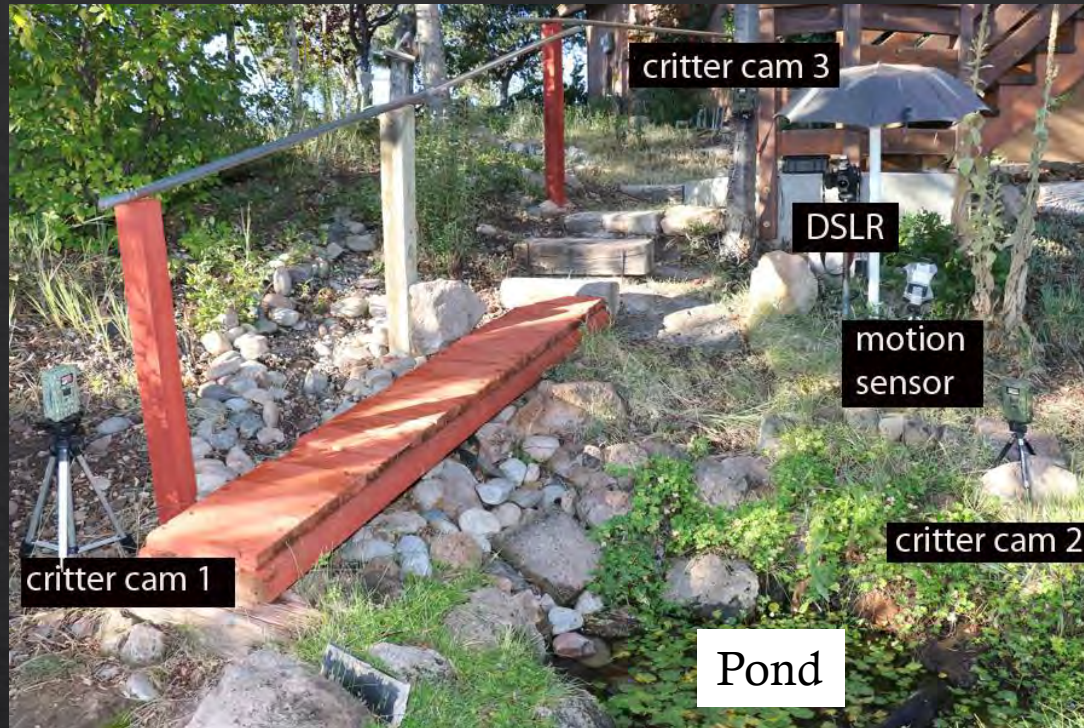
For High Quality Artistic Images

# Warbler Pond



- Tim Laman, National Geographic, photographer of the year visited Los Alamos National Laboratory for seminar
- Room mate of my colleague at Harvard
- He said Warbler Pond is perfectly situated to highlight the Pajarito Plateau's wildlife and scenery
  - Foreground can be lit by off-camera flash
  - Background has the canyon, Rocky Mountains and amazing clouds/stars
- Take short exposures with good depth of field (F10) for the pond
- Take long exposures for background to capture background canyon and stars
- Setup 24/7 to capture behavior at ground level

# DSLR Camera Trapping (2012)



Critter cam and DSLR camera setup at parents house



Close up DSLR phototrap

- Critter cam has motion/heat sensor built in and just needs a memory card and batteries to photograph wildlife (white flash for color night pics)
- DSLR takes better pictures but needs separate beam/motion/heat sensor, camera trigger, weather proofing
- Worked with Phototrap to have it work with heat/motion sensor (instead of beam)

# Game of Fox and Mouse



Mouse



# Black Bear Bath at Sunrise



# Black Bear Mother and Cubs



# No Cougar with DSLR Phototrap

- Cougar visits were very rare but there were visits on 5/6/2012, 5/12/2013, and 5/6/2014
- Experts thought this could be a migration from wintering area to summer area
- In 2015, Decided to setup mid April and all of May to get high quality cougar photos
- No Cougar after setting up almost every day from May to September 2015
- What happened to our migrating cougar?
- Had many photos of most mammals other than cougar and DSLR Phototrap was quite cumbersome to set up day after day

# Finally: Cougar at Sunrise with DSLR Trap

9/15/2015





# Increased Cougar Activity (Starting November 2020)



- Starting in November 3, 2020, cougar visits became more regular and started occurring monthly
- Deer populations in town had been exploding
- Some blamed people feeding the deer but biologists think the recent forest fires and forest thinning have led to far more shrubs which are great for deer
- With door cams and social media cougar sightings were also exploding
- Some conflict has resulted
- Animal population has shifted

# Camtraptions transformed my camera trapping

- Portable and simple DSLR camera trapping with numerous programs
  - Stills and video
  - Compatible with Canon, Nikon, Sony
  - Wireless and wired setups
  - Multiple flash and exposure setups
  - Battery and housings for prolonged outdoor setups
  - Camtraptions trail cam a good compromise with off camera flash



# Setup at Warbler Pond



- Boly SG562-D Critter Cam for 24/7 video
- Stills
  - Canon 80d
  - Camtraptions flash
  - Camtraptions sensor
- Video
  - Canon EOS-R
  - Camtraptions video light
  - Camtraptions sensor

# Off Camera Flashes



© Hari V iswanathan

- 3D look to photos with shadows
- Eliminate Eye Glow
- One flash for stark shadows
- Multiple flashes to avoid fully black shadows

# Freeze the Action and Capture Ambient Light in Aperture Priority



# First of Many with Camtraptions



© Hari Viswanathan

- Canon 7d
- Off camera flash
- F10, 1/200 second manual exposure, burst mode
- Advantages: Many shots often critical to get mountain lion in a good pose
- Disadvantage: No ambient light to capture canyon unless cougar visits when there is a lot of ambient light

# Composite foreground and background



© Hari Viswanathan

- Workaround for burst model: Composite to combine long exposure background and short exposure foreground
- Can't enter in a photo contest but fine for capturing realistic foreground and background with multiple shots

# Adult Male



- Adult male at Warbler Pond
- Manual exposure can capture ambient light at dawn and dusk
- Even 1/200 second and f8 captures this sunrise



# Adult Male



- Dominant male
- Often visits happen at dawn and dusk
- Bordering the canyon and having a water source in the high desert makes this a good spot

# Composite with Stars



- Flash for foreground
- Long exposure background on a moonless, clear night

# Taking Advantage of Camtraps Portability



© Hari Viswanathan

- Nervous about leaving my camera down in the canyons but thought I'd try trails next to the ponds to get photos of canyons and mountain
- Worked great and could be a lot more artistic about composition

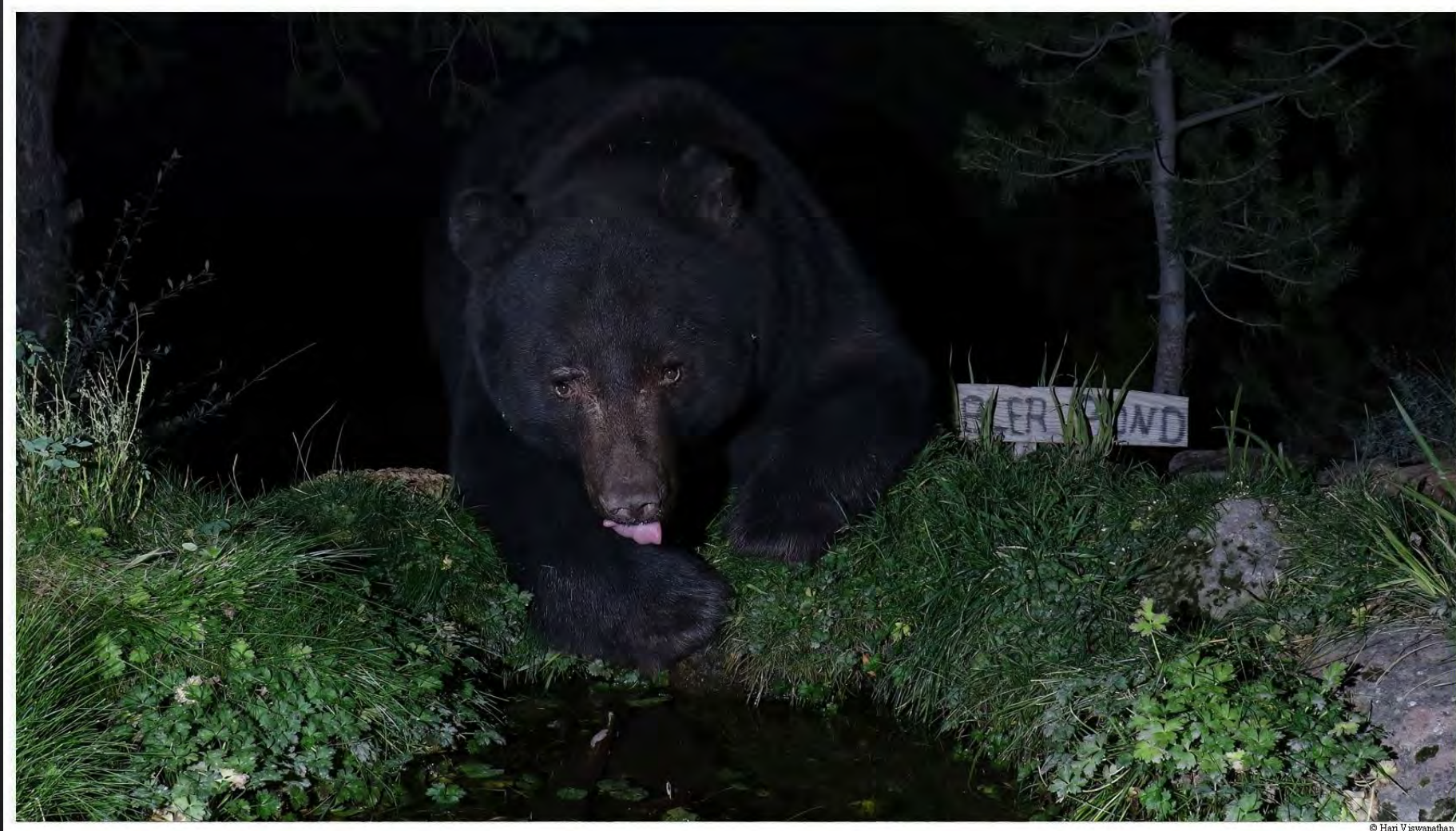
# Trail Leading to Warbler Pond



# Santa Fe Lights, Canyon and Rocky Mountains



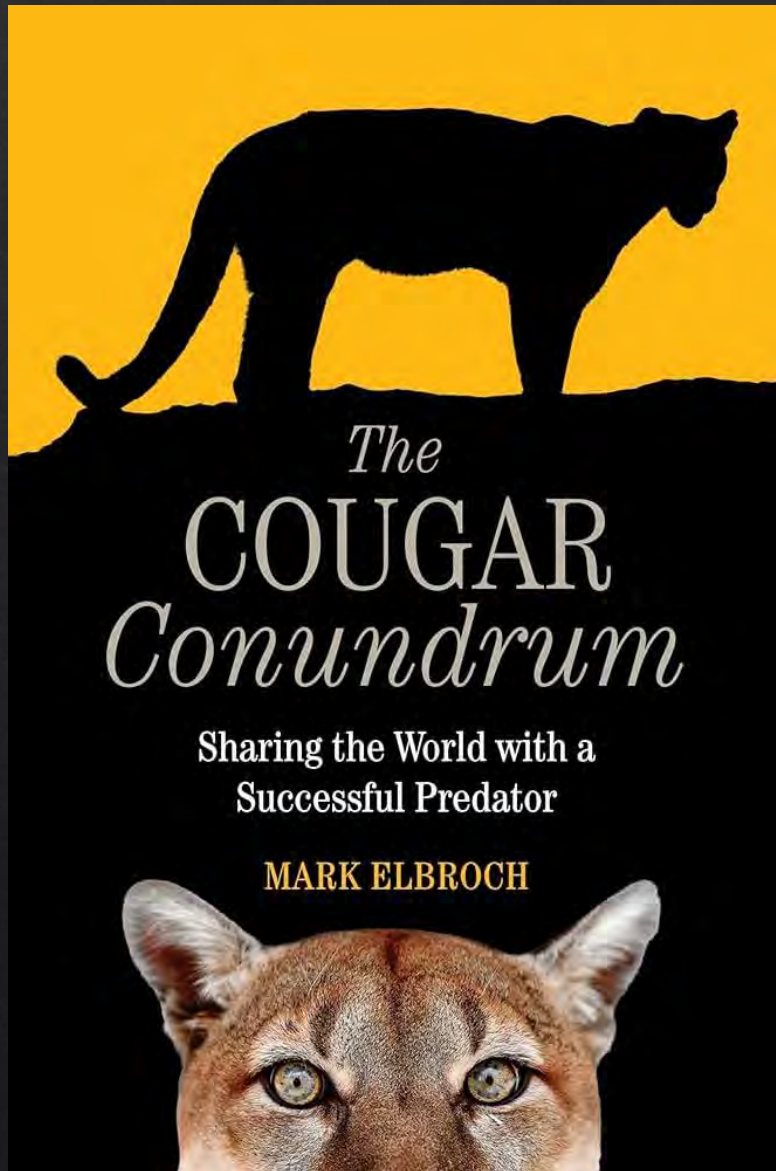
# Do Animals Destroy My Equipment?



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- Putting camera in closed enclosure can make bears more curious
- Bears do not mess with open cameras in our area
- I don't leave cameras out for more than a week so don't need much protection in NM climate
- Cover camera and flash with bags for rain/snow protection

# Cougar Conundrum



- Often cougars will patrol close to populated areas but may not come to yards often
- Wondered why we hadn't seen cubs and learned that females will often be with cubs about 50% of the time
- Very informative book that lays out the challenges of sharing territory with this successful predator

# What is happening in the canyons?





# What is happening in the canyons?



# What is happening in the canyons?



# Finding a scrape



© Hari Viswanathan

- Male cougars scrape to leave their scent and mark their territory
- They use their hind legs to dig a shallow pit often with leaves and pine needles
- They pick dry areas like under a branch
- Multiple cougars may visit these sites (e.g. female looking for mate)
- Don't tell people about these locations to keep cougars safe

# Flehmen Response



© Hari Viswanathan

- Male cougar exhibit a flehmen response as he takes in the scents at a scrape

# Male stalking camera



# Freezing the action



# Cameras are fine in the snow



# Even in Blizzards





# Canyons Allow Daytime Visits



# Dark Canyons with the Stars!



# Predator Prey Sightings



# Predator Prey Sightings: Raccoon



# Predator Prey Sightings: Raccoon



# Predator Prey Sightings: 10 point stag



# Predator Prey Sightings: Starlight



# Predator Prey Sightings: Dragging Kill





# Family Group This Fall



# Family Group This Fall



# Family Group This Fall



# Family Group This Fall



# Some Sightings with My Own Eyes



# Working with the NPS Rangers



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- Setup up DSLR camera traps at mountain lion cache sites for research and outreach
- Mark Peyton doing his PhD on mountain lions at NMSU
- Priscilla Hare and Sarah Milligan, Bandelier NPS Rangers
- Large Mammal Project is looking at the effects of climate, fire and drought on large mammals
- Research at Valles Calderas and Bandelier National Monuments

# Two Subadult Cubs



# Feeding on Mule Deer





# Partners in Crime



# Trailcams still great: Find the Cougar



# Pouncing at His Brother



# 90 lb Mom with 500 lb Elk



# Family Group Composite: From Video Stills (3/28/2024)



# Outreach and Knowledge Transfer

Mark Peyton now camera traps for research

 U.S. Department of the Interior   
July 15, 2023 ·  

"I told you no photos!" 📸

Mountain lion 1, camera 0. This young cougar thought the camera was a fun new toy. Good thing [Bandelier National Monument](#) had two, so they could capture this cute moment.

Mountain lions are territorial and require large swaths of wilderness habitat to thrive. Bandelier National Monument in New Mexico provides 23,000 acres of wilderness for these cougars to roam. This cute cub still has some more play time with its siblings before it grows up and g... [See more](#)



   You, JeeYeon Plohr, Robert Martinez and 67K others 1.5K comments 9.4K shares



# Advantages of Mirrorless Cameras



- For still pictures can have silent shutter
- For video can focus in low light
- Makes no sound and animals don't mind constant low light
-

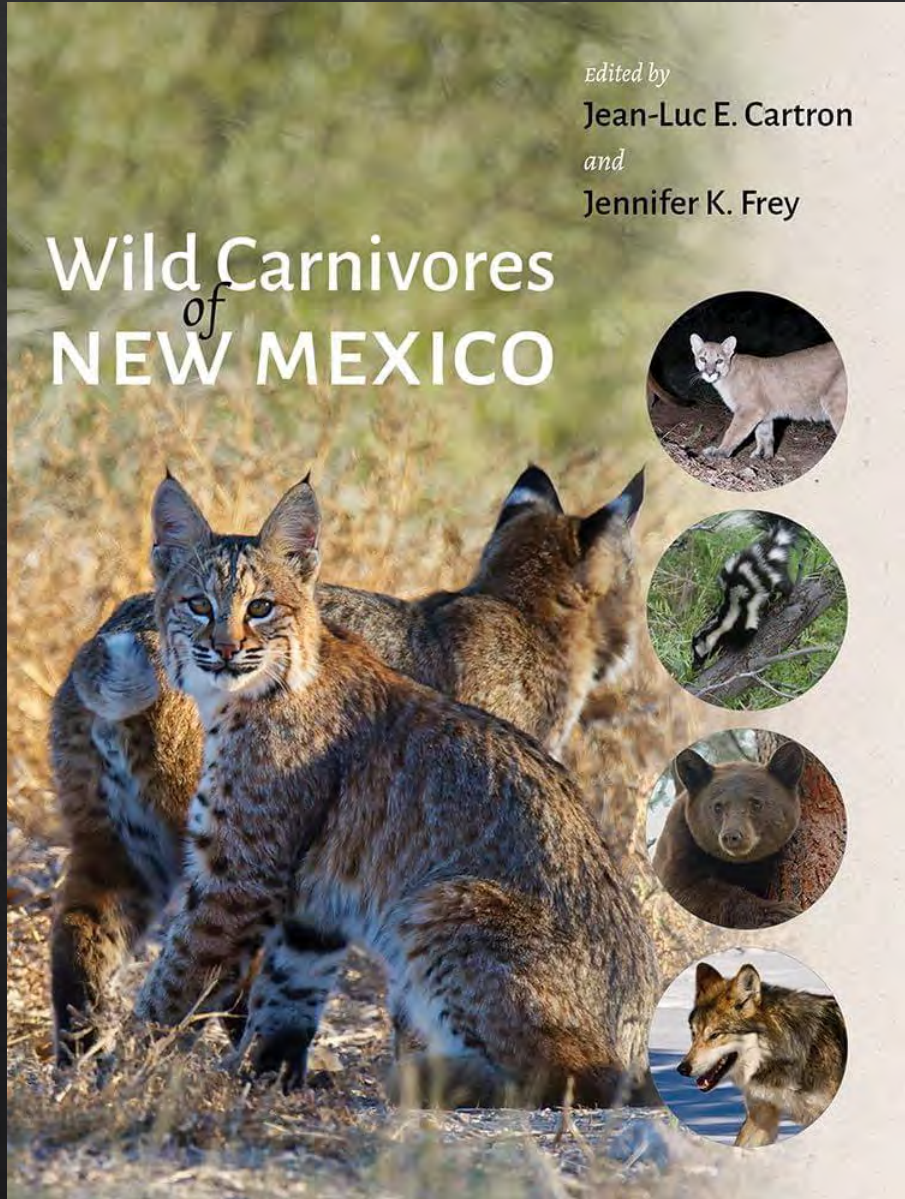
# Just as easy as still photos



- Can filter out flash if still images also being taken
- Mirrorless autofocus for video very helpful



# Citizen Science



- ◇ Interacting with the NPS rangers has taught me a lot and has been fun and impactful citizen science
- ◇ Large mammal project findings do overlap with some research areas at work that relate to climate change impacts
- ◇ Providing Jean-Luc Cartron photos for his book was fun and the book just came out this year
- ◇ Mountain Lion chapter written by Ken Logan who examined our mountain lion attack back in 2011

# Helping Raise Awareness

## Mountain Lion Classification Challenge



This repository contains a machine learning project aimed at classifying images into two categories: containing a mountain lion or not. The core of this project is a Jupyter notebook that outlines the process of training a model for this binary classification task.

### Project Overview

The goal of this project is to accurately classify images based on the presence of mountain lions. This can have applications in wildlife monitoring, research, and conservation efforts. The model is trained on a labeled dataset and validated using a separate set of images.

- ❖ Cougars have been killed at our local stables for killing livestock
- ❖ PEEC Nature Youth Group working with Mountain Lion Foundation, NPS Large Mammal Project images for targeted mitigation approach
- ❖ Cellular Cam + Machine Learning + Talk Radio to deter cougars?

### DuBois & Viswanathan: Keeping Pets, Mountain Lions Safe

an October 1, 2023 No Comments



By Terry DuBois and Hari Viswanathan  
Los Alamos

We wanted to let the public know that as winter approaches, the activity of mountain lions has increased in Los Alamos as it does every year. Since Los Alamos County is now home to many new residents in recent years, we wanted to make a public service announcement reminding folks that we live amongst the wilderness here.

# My Thoughts on Camera Trapping

- ◆ Fun hobby that can be done daily compared to an exotic safari that happens once a year for us (endless animal antics)
- ◆ Knowing animal habits is critical for increasing ones chances (use cheap trail cams for surveillance)
- ◆ Game trails and water are good for all wildlife
- ◆ Even if you don't get a mountain lion you will likely get many interesting animals and behavior (made me really appreciate where I live)
- ◆ Fun to try and predict how an animal will approach, how to get a good composition
- ◆ Patience, for each good picture shown here there are many more of a cougars backside or shots of nothing but the wind blowing

# Question Time

Please type your questions into the Q&A.



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Register for our Next Webinar

The Story of P-22 and the  
Building of the Wallis Annenberg Wildlife Crossing  
with Beth Pratt

May 15 @ 12pm PT



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SCAN TO REGISTER