

A photograph of two black bears in a residential area. One bear is on the left, leaning over a concrete wall and eating from a red cup. Another bear is in the middle ground, looking towards the right. In the foreground, a third bear is standing near a green trash can, looking up. The background shows green foliage and a dirt path.

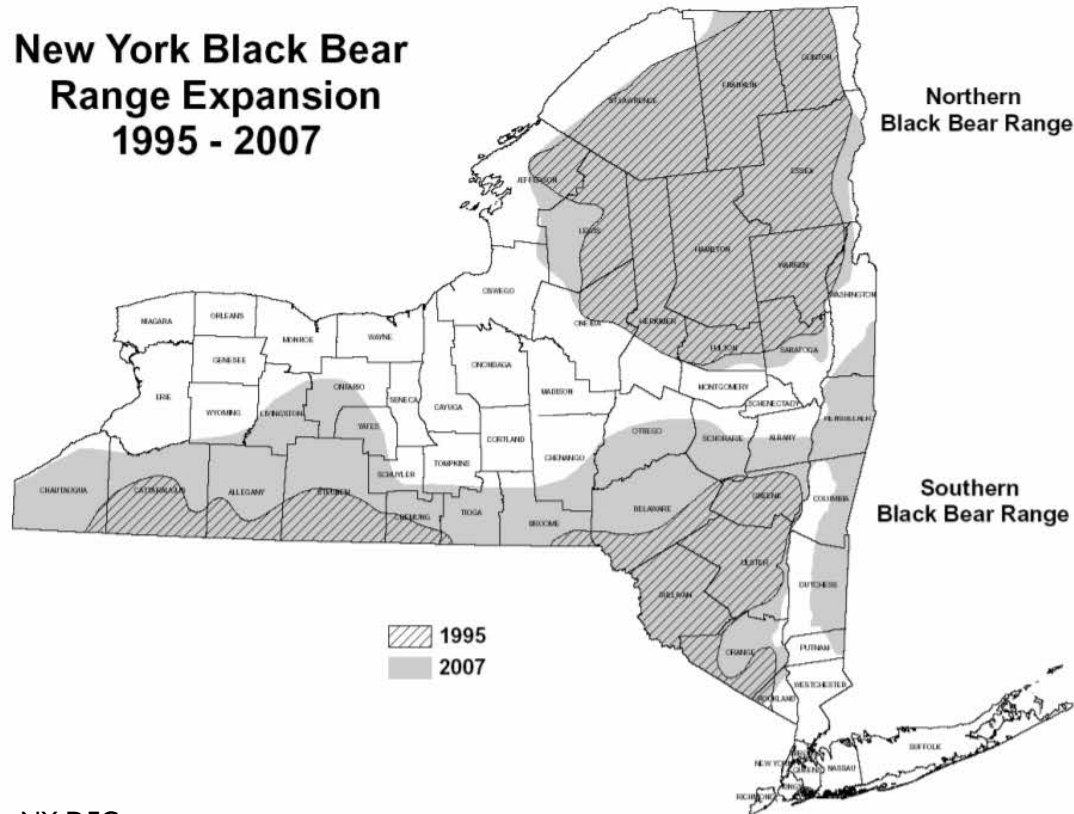
AN INTERDISCIPLINARY APPROACH TO REDUCING HUMAN-BLACK BEAR INTERACTIONS IN THE CATSKILLS

Jason Hagani • Sara Kross

Ecology, Evolution, and Environmental Biology @ Columbia University

BLACK BEARS: GROWTH & EXPANSION

New York Black Bear Range Expansion 1995 - 2007



NY DEC



BLACK BEARS: GROWTH & EXPANSION



Tom Sears

Black Bear Population

- In New York State: 8,000 bears
- In the Catskills region: 35% of the statewide population (~2,500 bears)

INTERACTIONS WITH PEOPLE



PREVIOUS MANAGEMENT SUCCESSES



New York State

Department of Environmental Conservation

Black Bear Management Plan for New York State 2014-2024



Division of Fish, Wildlife and Marine Resources
Bureau of Wildlife



NY DEC



- More Catskill residents are using “bear-free” garbage cans, and not leaving food outside



Bearwise

- Residents are encouraged to remove bird feeders from backyards prior to April 1st

TOURISM IN THE CATSKILLS



The NY Times



Visittheusa.com

HOW DO WE EDUCATE SHORT-TERM TRAVELERS TO THE
CATSKILLS ON HOW TO SAFELY VISIT IN BLACK BEAR
TERRITORY?

PROJECT COMPONENTS

Part I: Survey AirBnB/Vrbo/cabin/property owners in the Catskills to establish baseline knowledge and perceptions of black bears, and to determine areas where more bear-safety education is needed

Part II

Part III

PROJECT COMPONENTS

Part I

Part II: Design educational brochures, and test their effectiveness on a representative population of future Catskills tourists using a second survey

Part III

PROJECT COMPONENTS

Part I

Part II

Part III: Model human-black bear conflict in New York state using a combination of anthropogenic and environmental variables, and use that model to create a high resolution map

HOMEOWNER SURVEYS: METHODS

Part I

Black Bears in the Catskills: Homeowners

We are interested in understanding the interactions that short-term renters have with black bears in the Catskills. As a property owner providing a short-term rental to visitors, your knowledge and insights are incredibly important.

Please fill out this short 10-15 minute survey to help Columbia University and the NY Department of Environmental Conservation develop educational materials that promote "black-bear safe" tourism in the Catskills.

Your input and involvement in this study is incredibly valuable, and completely voluntary.

Note: emails, but no other personal identifiers, will be collected in order to be contacted for optional participation in future components of this project.

By responding to this survey you have given your consent to participate in this study. Only persons 18 years or older may consent to participate.

Please contact Jason Hagani at jsh2207@columbia.edu or Dr. Sara Kross at smk2258@columbia.edu with any questions or concerns.

Email address *

Valid email address

This form is collecting email addresses. [Change settings](#)

What is your gender? *

Male

Part II

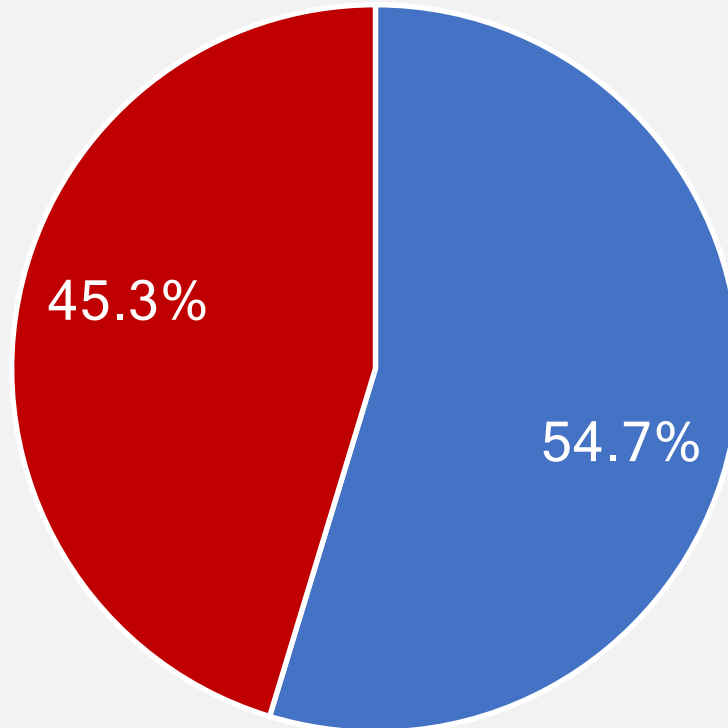
Part III



HOMEOWNER SURVEYS: RESULTS

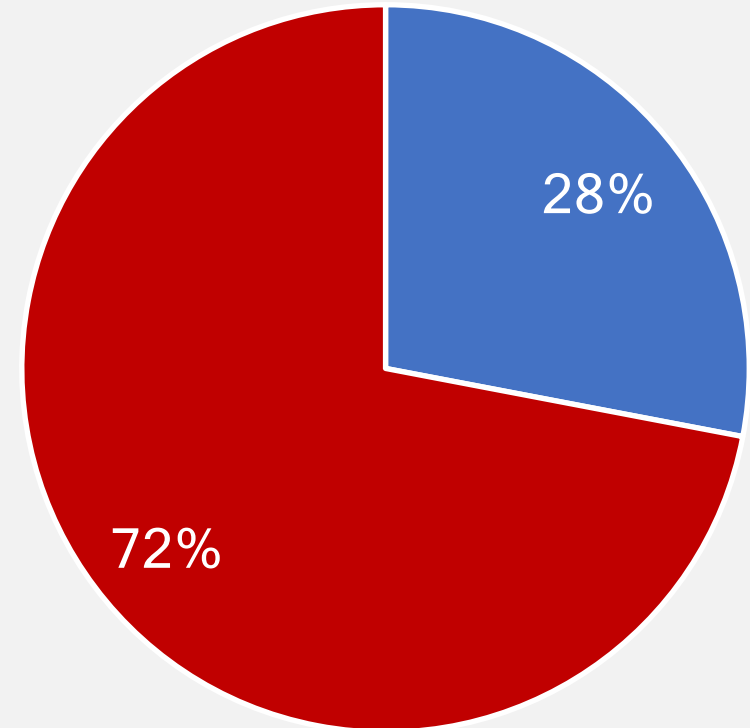
Part I

Do you provide visitors who rent your property information about black bear safety?



■ No ■ Yes

Have you ever seen a black bear on your property?



■ No ■ Yes

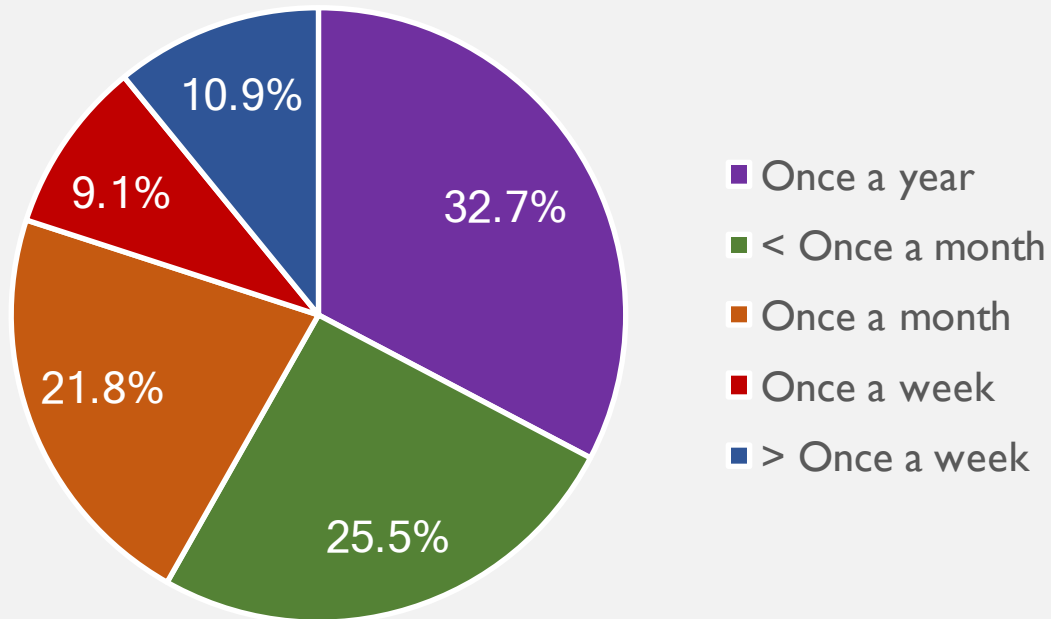
Part II

Part III

HOMEOWNER SURVEYS: RESULTS

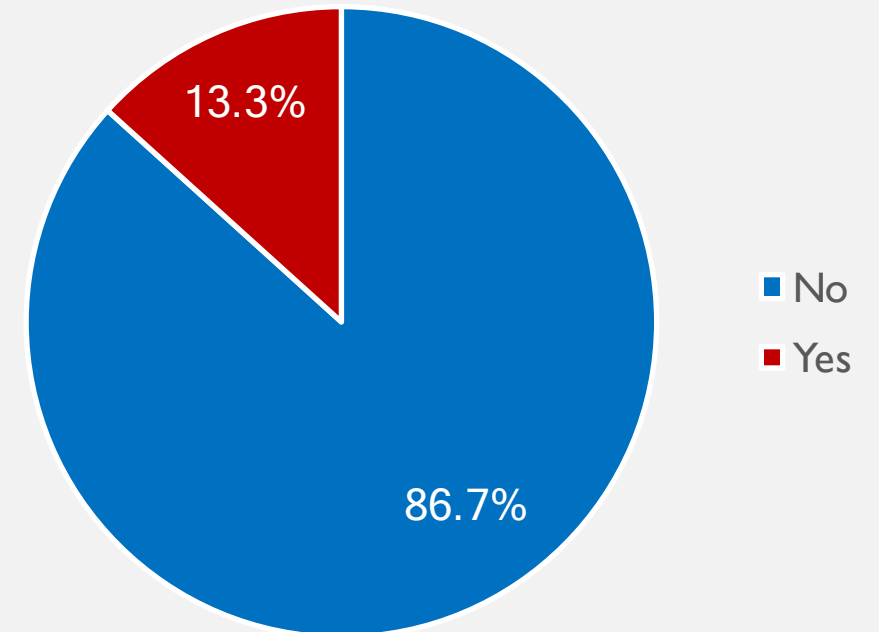
Part I

How often have you seen black bears on your property?



Part II

Have you ever called the DEC to report black bears on your property?



Part III

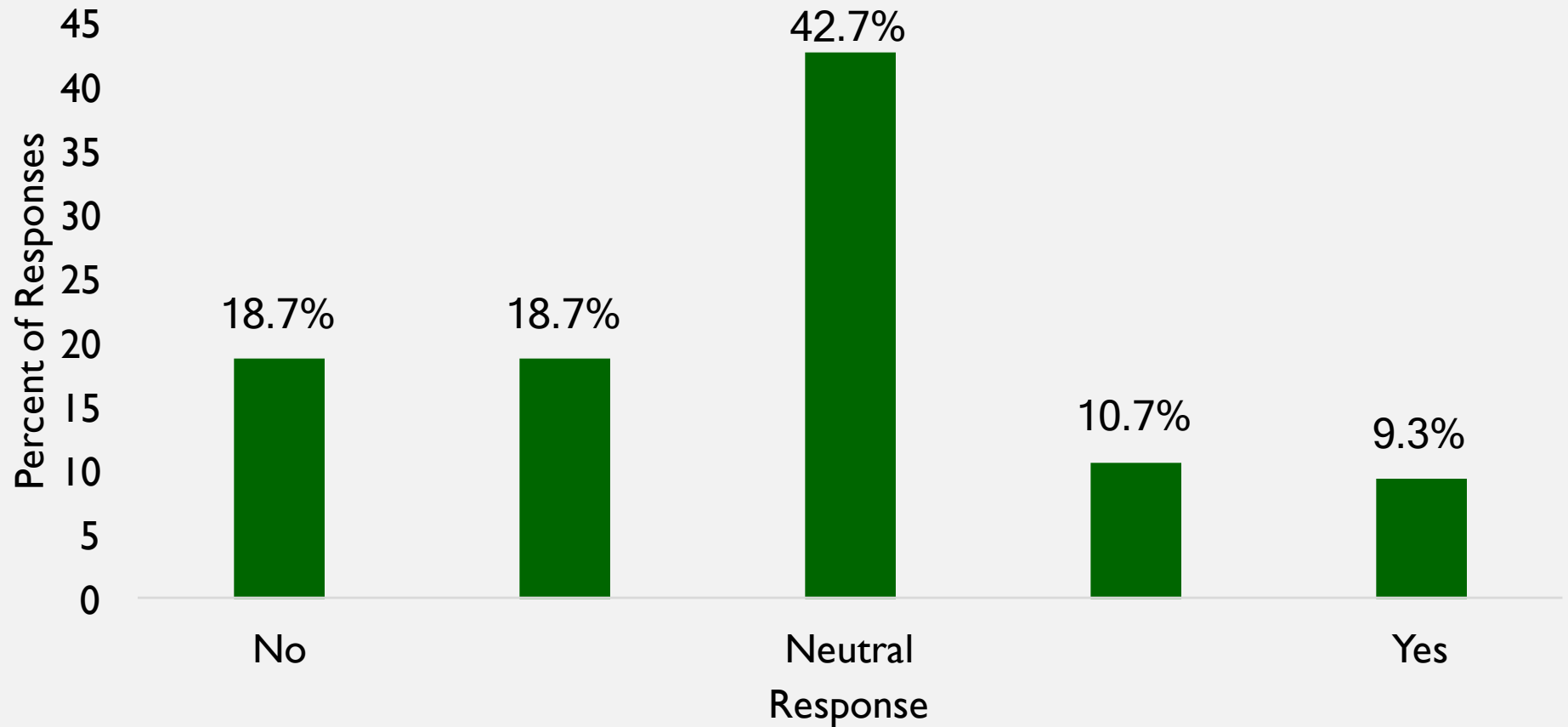
HOMEOWNER SURVEYS: RESULTS

Part I

Part II

Part III

Do you believe the DEC has done enough to educate Catskill visitors on coexisting with black bears?



HOMEOWNER SURVEYS: RESULTS

Part I

“The interactions we've had with the DEC have been wonderful, but I would love to see a coherent education campaign for visitors - and for vacation rental owners - many of whom do not live here full time, and often don't know the nuances of managing bears and other wildlife on their property.”

Part II

“Educate the residents, make up brochures or handouts to put in all residents mailboxes to teach people about this issue so they will know to take it seriously.”

Part III

“[We need] informational flyers for a start, which could be distributed to all tenants and subrenters, as well as posted on the building - instructions on how to behave if you see bear close by”

THE EDUCATIONAL BROCHURES

YOU'RE IN BLACK BEAR COUNTRY



BE BEAR WISE

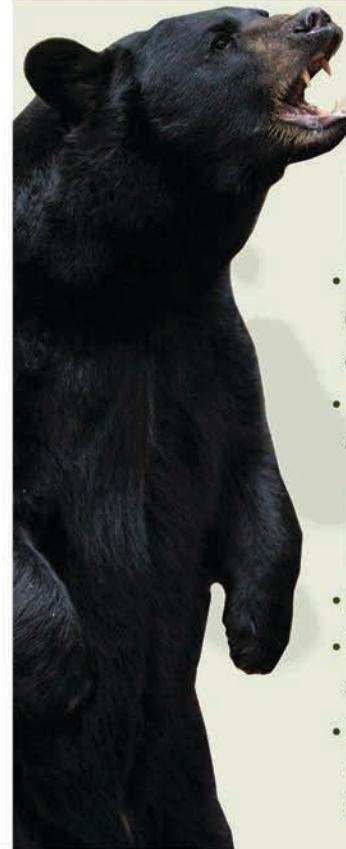
Leaving food and garbage unattended outside can attract black bears.

To report unsafe black bear behaviors during your stay, contact the NY Department of Environmental Conservation (DEC) at 845-256-3098.



The Ecology, Evolution, and Environmental Biology Department at Columbia University, in collaboration with the NY DEC and the Cary Institute, is committed to promoting the coexistence of humans and black bears in the Catskills through education and outreach.

BEAR SAFETY TIPS



DO

- Keep all trash in sealed garbage cans, and keep those cans inside a garage or shed.
- Remove grease from grills after every use.

DON'T

- Feed any pets outside.
- Feed wildlife, including birds, squirrels, or deer.
- Leave any food outside unattended, even if the intent is not to feed wildlife.

THE EDUCATIONAL BROCHURES

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TESTING THE BROCHURES: METHODS

Part I

1. Demographic and background questions
Ex: “Have you ever visited or lived in areas with any kind of bear populations before?” (Yes/No/Not sure)

Part II

2. Seven “quiz” questions/scenarios
Ex: “How likely do you think it is that you’d see a black bear while staying at a home in the Catskills?” (Very likely → Very unlikely)

Part III

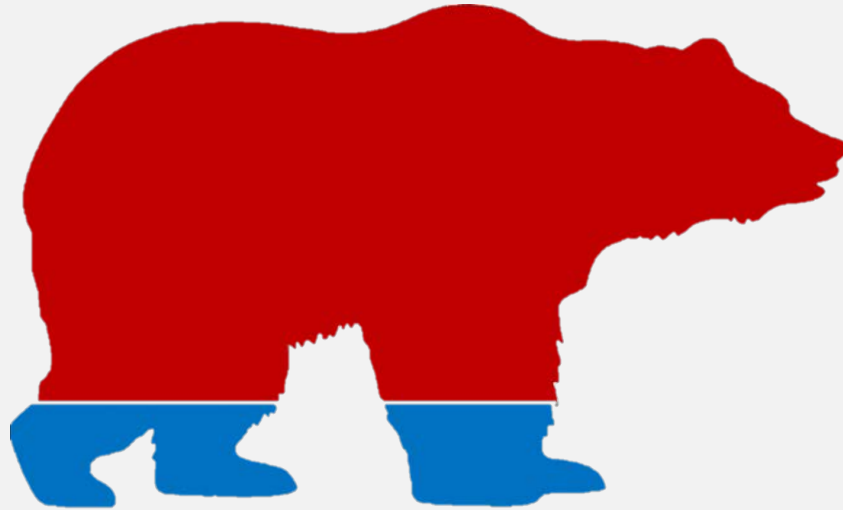
3. Viewing of one of the two educational brochures
50% saw the aggressive, 50% saw the friendly

4. The seven “quiz” questions revisited to examine how responses have changed

TESTING THE BROCHURES: RESULTS

Part I

86%

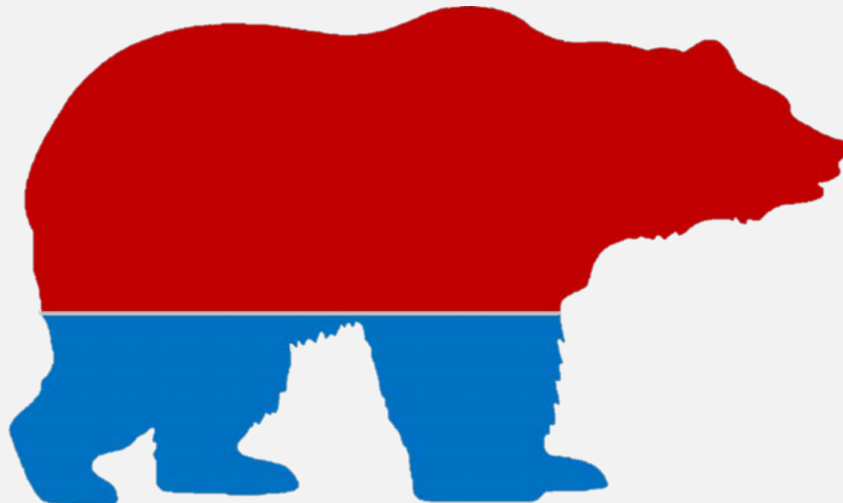


Have you ever lived in or visited areas with any species of bear populations before?

■ = Yes ■ = No/Not sure

Part II

14%



Have you ever encountered educational material on living/visiting areas with bears before? (For example signage, pamphlets, or videos)

■ = Yes ■ = No/Not sure

Part III

31%

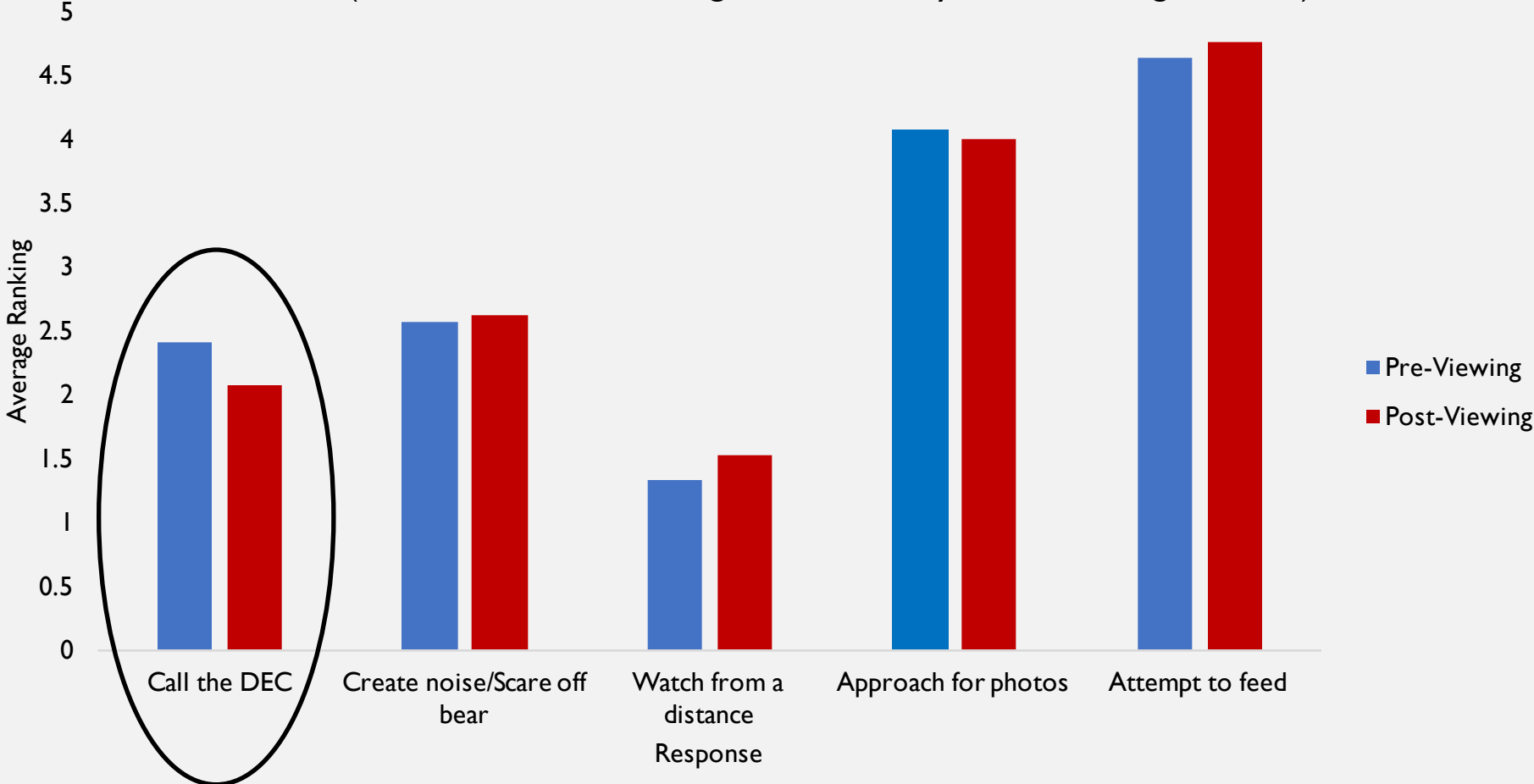
TESTING THE BROCHURES: RESULTS

Part I

Part II

Part III

If you were renting a vacation home in the Catskills and saw a bear on or near your property, you would... (rank from 1 to 5: 1 being the most likely action, 5 being the least)



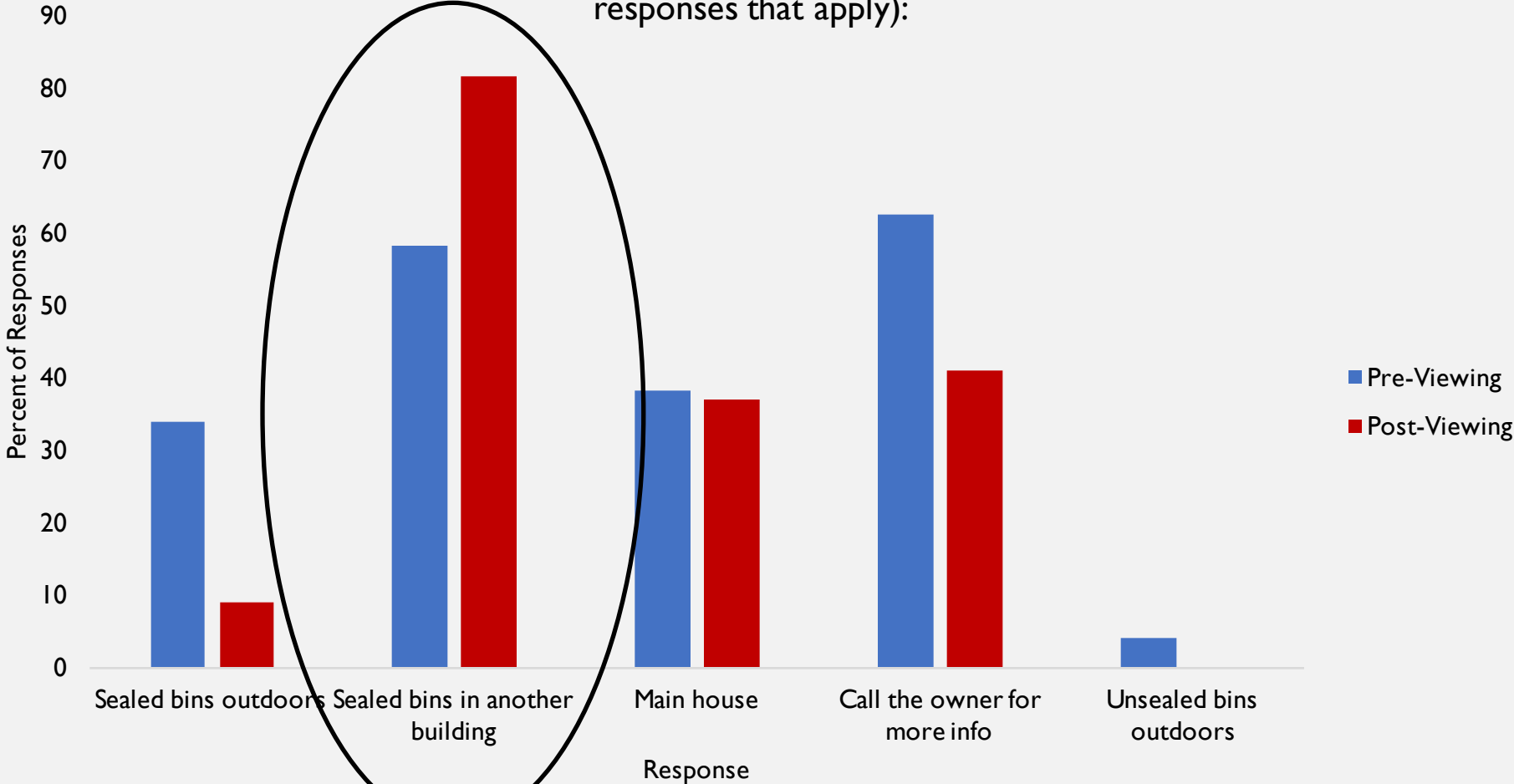
TESTING THE BROCHURES: RESULTS

Part I

Part II

Part III

If the vacation home you were staying at had an outdoor area for garbage storage, would you... (select all responses that apply):



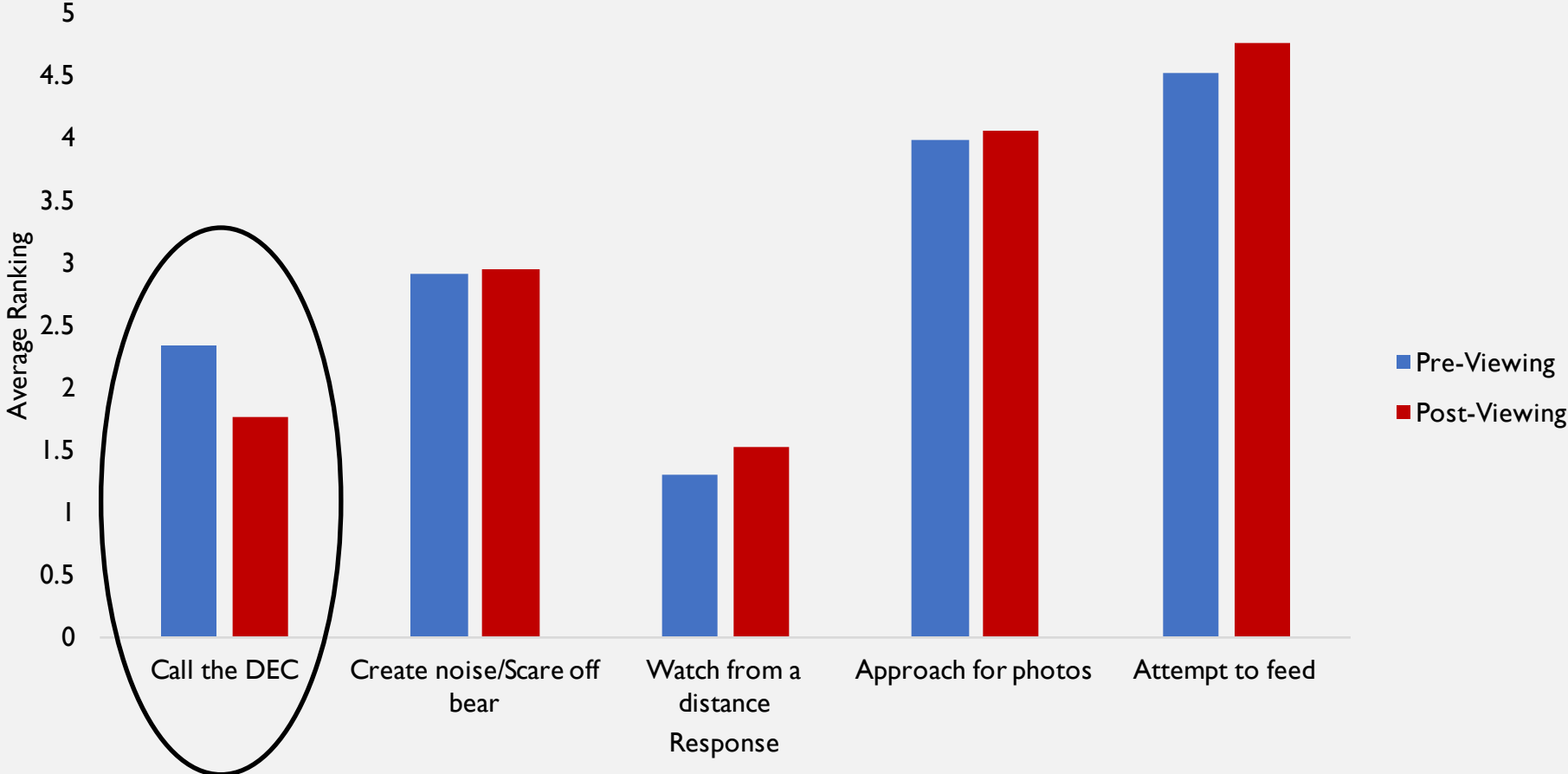
TESTING THE BROCHURES: RESULTS

Part I

Part II

Part III

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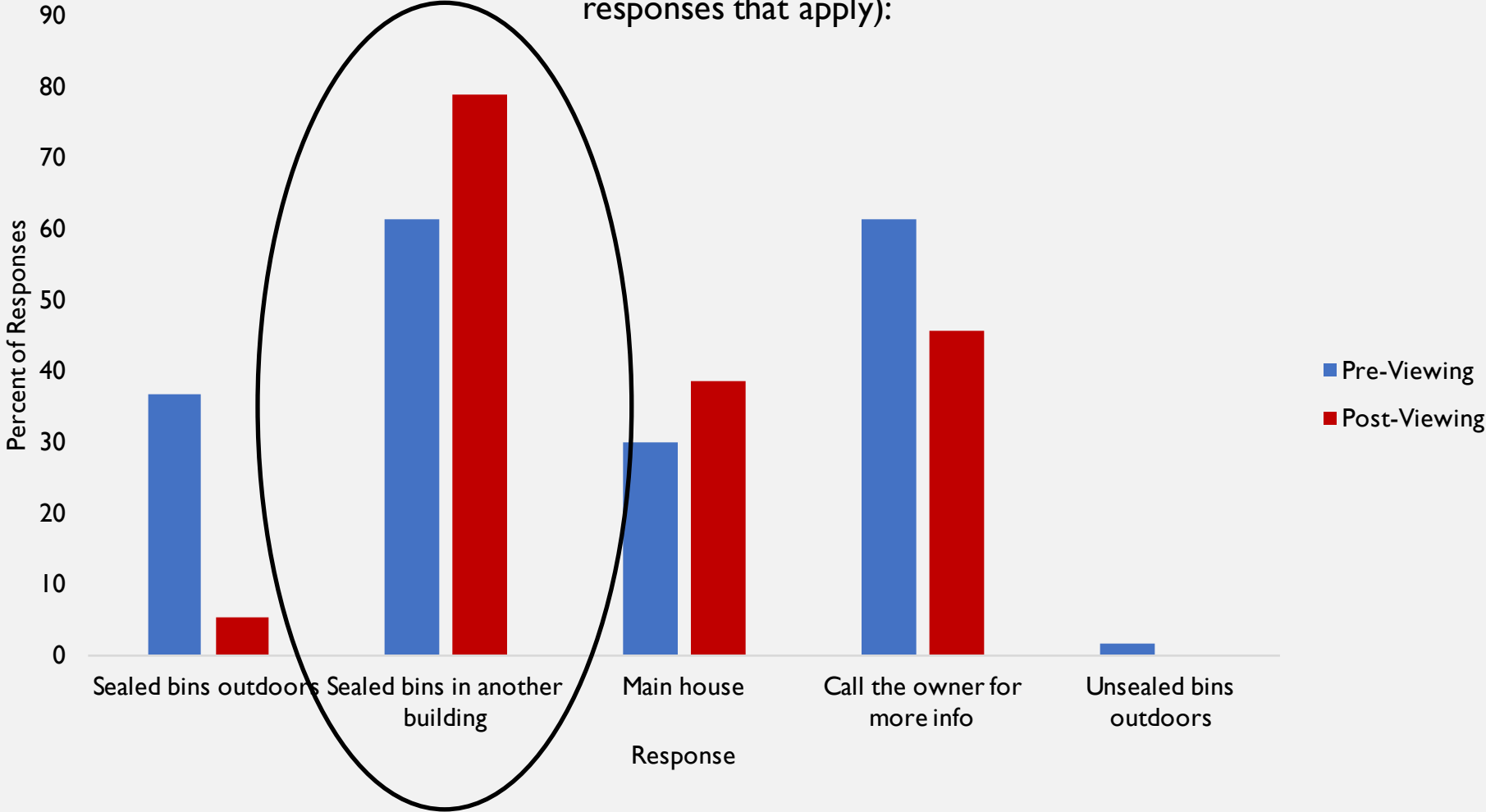
TESTING THE BROCHURES: RESULTS

Part I

Part II

Part III

If the vacation home you were staying at had an outdoor area for garbage storage, would you... (select all responses that apply):

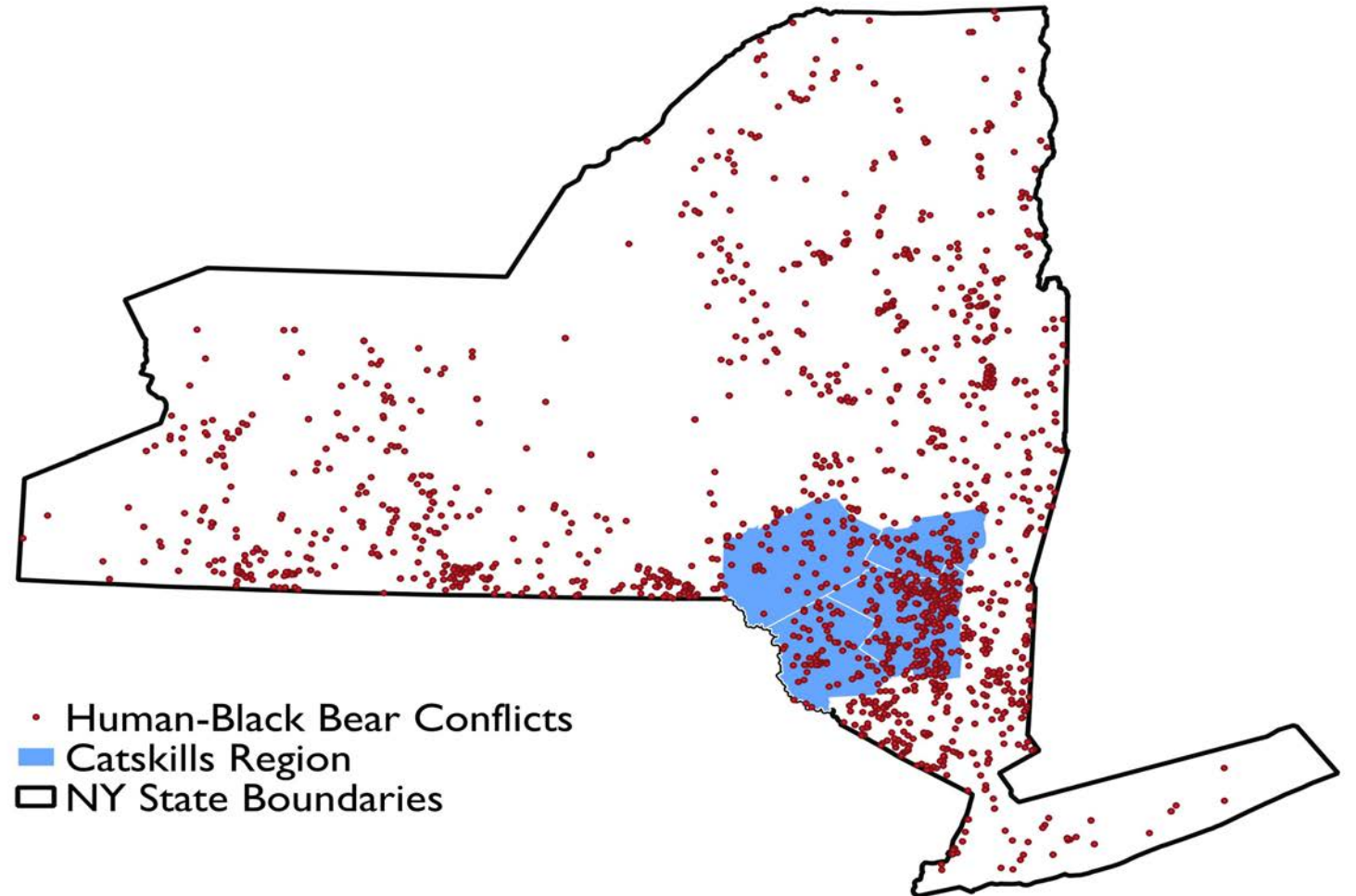


MAPPING AND MODELING CONFLICT: METHODS

Part I

Part II

Part III



MAPPING AND MODELING CONFLICT: METHODS

Predictor Variables

Part I

Environmental

Anthropogenic

Aspect

Population density

Elevation

Distance to recreational areas

Terrain ruggedness

Distance to roads

Part II

Distance to forest cover

Road density

Canopy cover density

Distance to urban areas

Land cover

Part III

Distance to streams

Distance to large water bodies

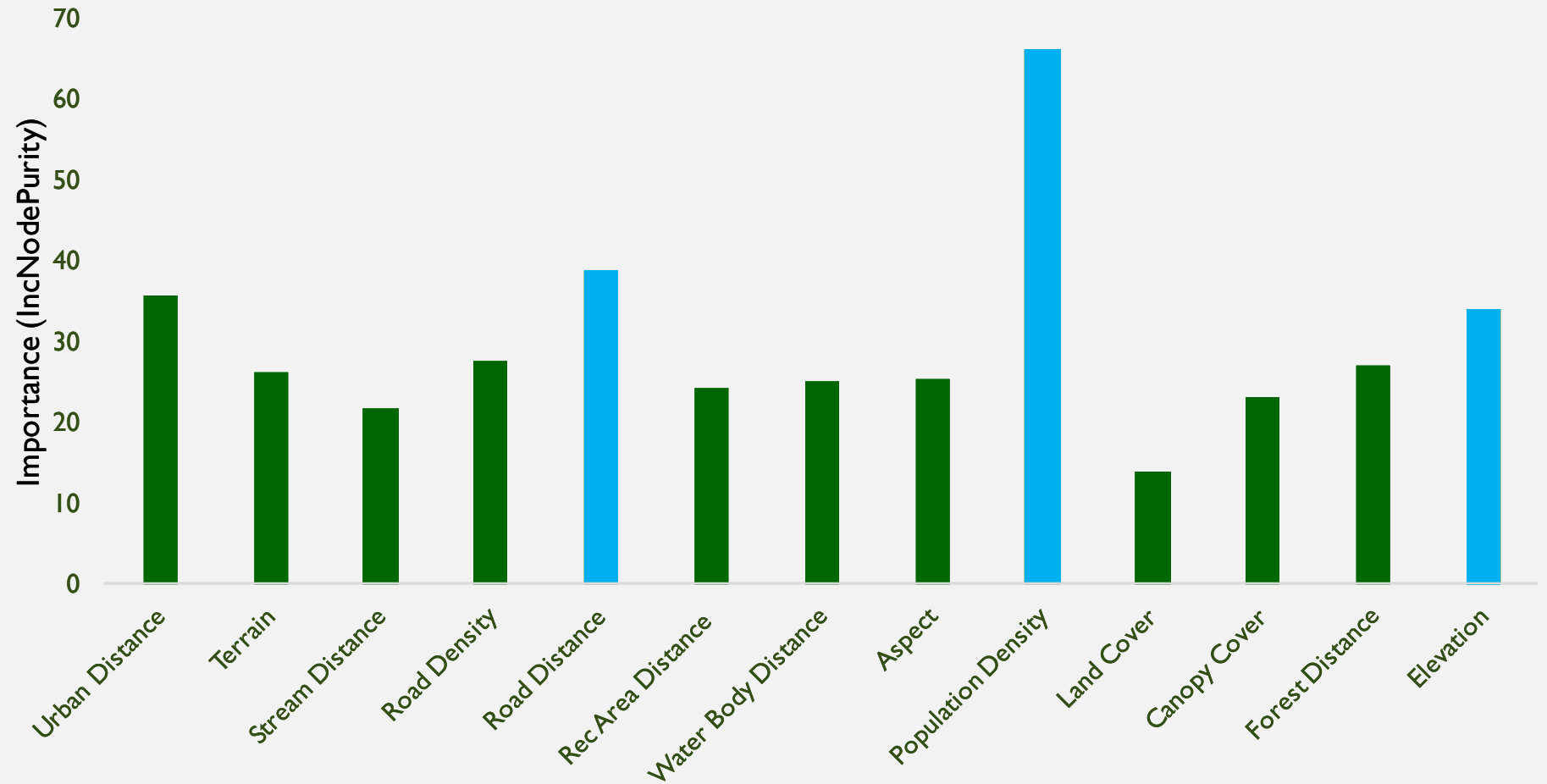
MAPPING AND MODELING CONFLICT: RESULTS

Part I

Part II

Part III

Variable Importance

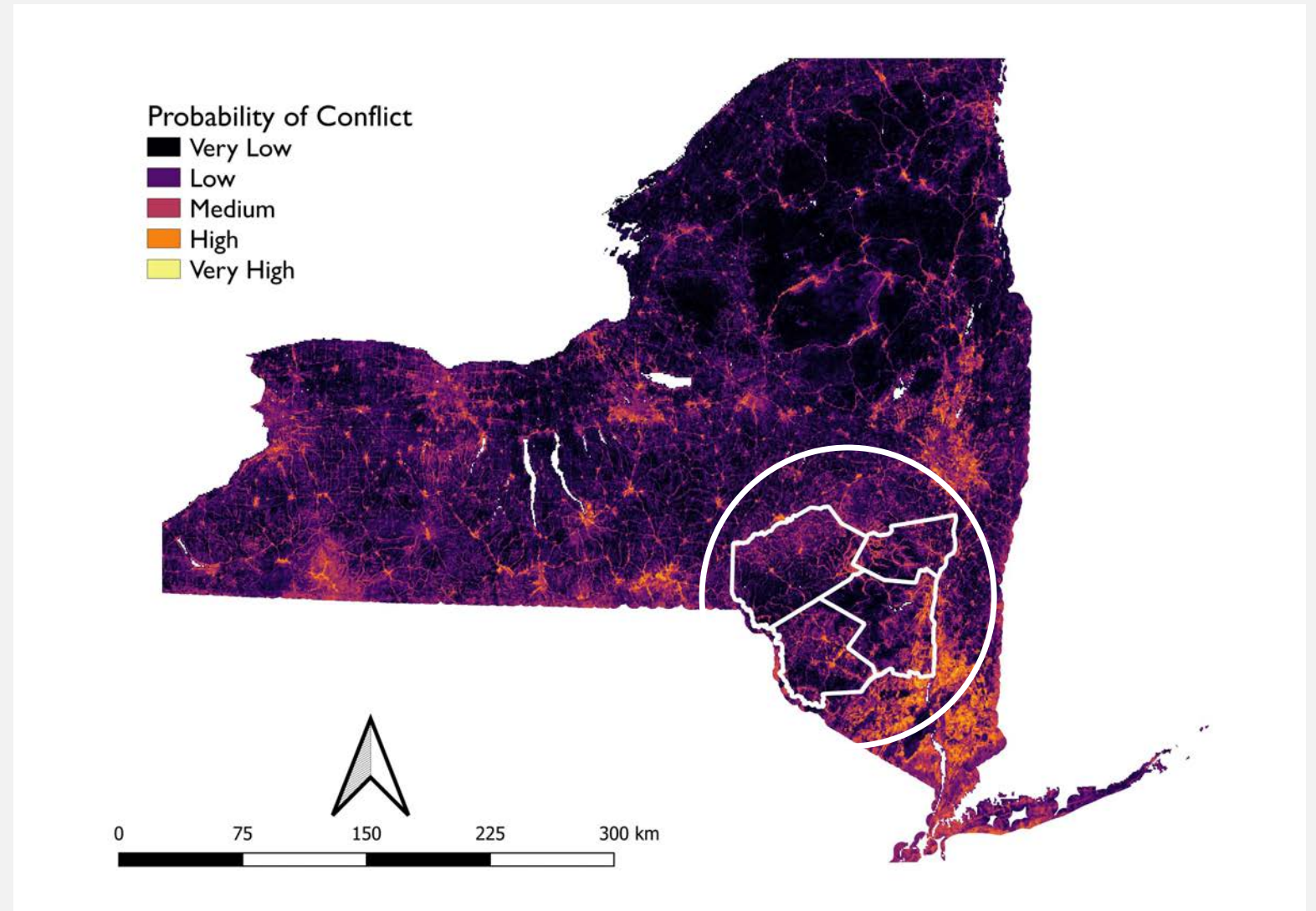


MAPPING AND MODELING CONFLICT: RESULTS

Part I

Part II

Part III

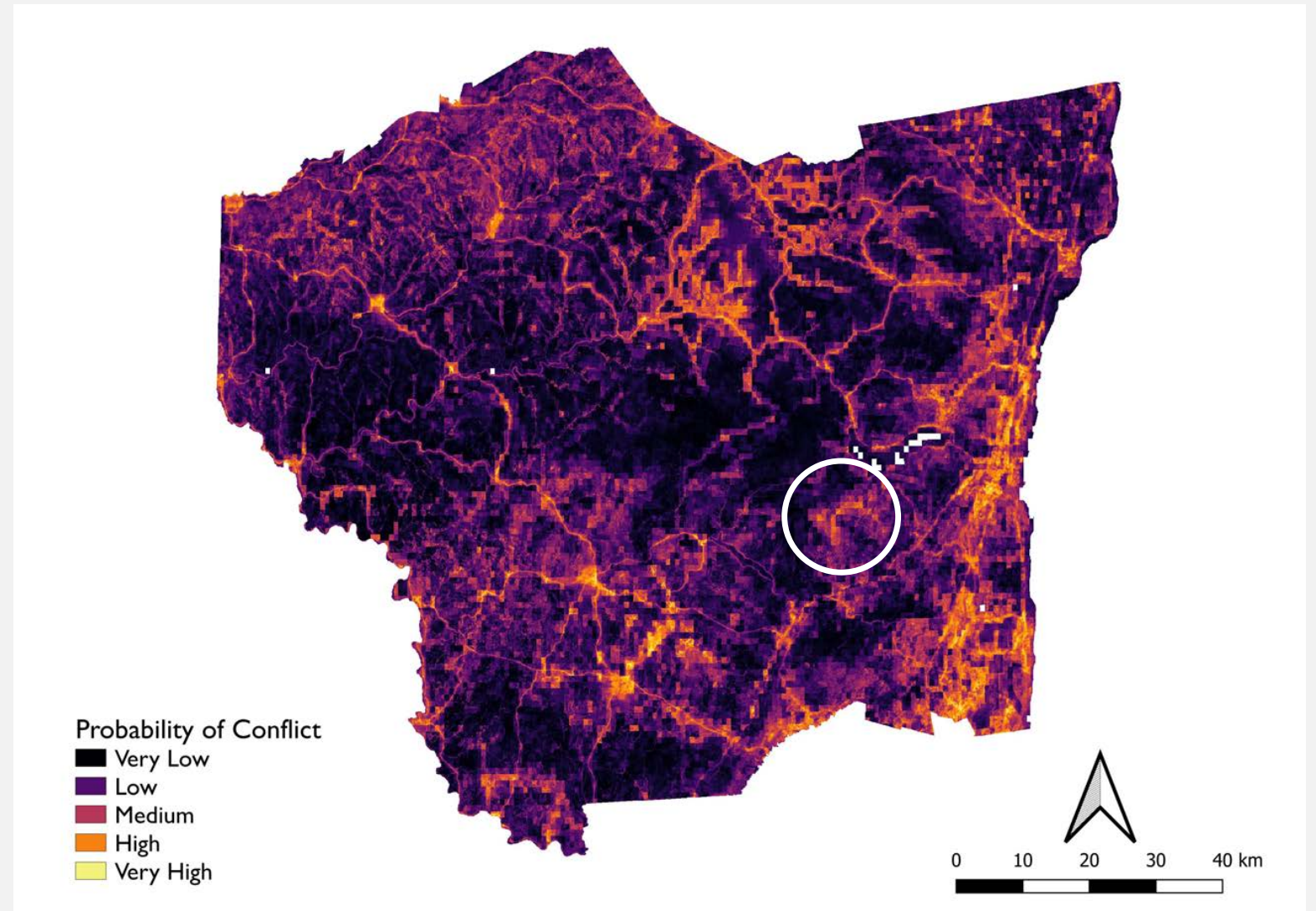


MAPPING AND MODELING CONFLICT: RESULTS

Part I

Part II

Part III

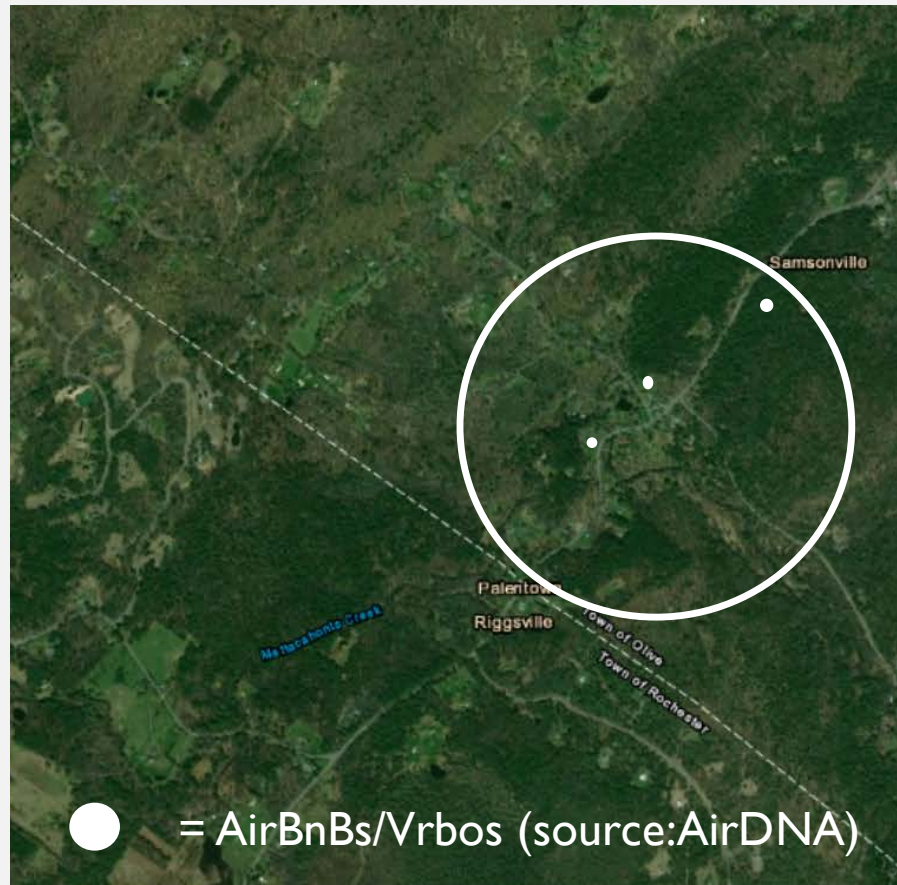


MAPPING AND MODELING CONFLICT: RESULTS

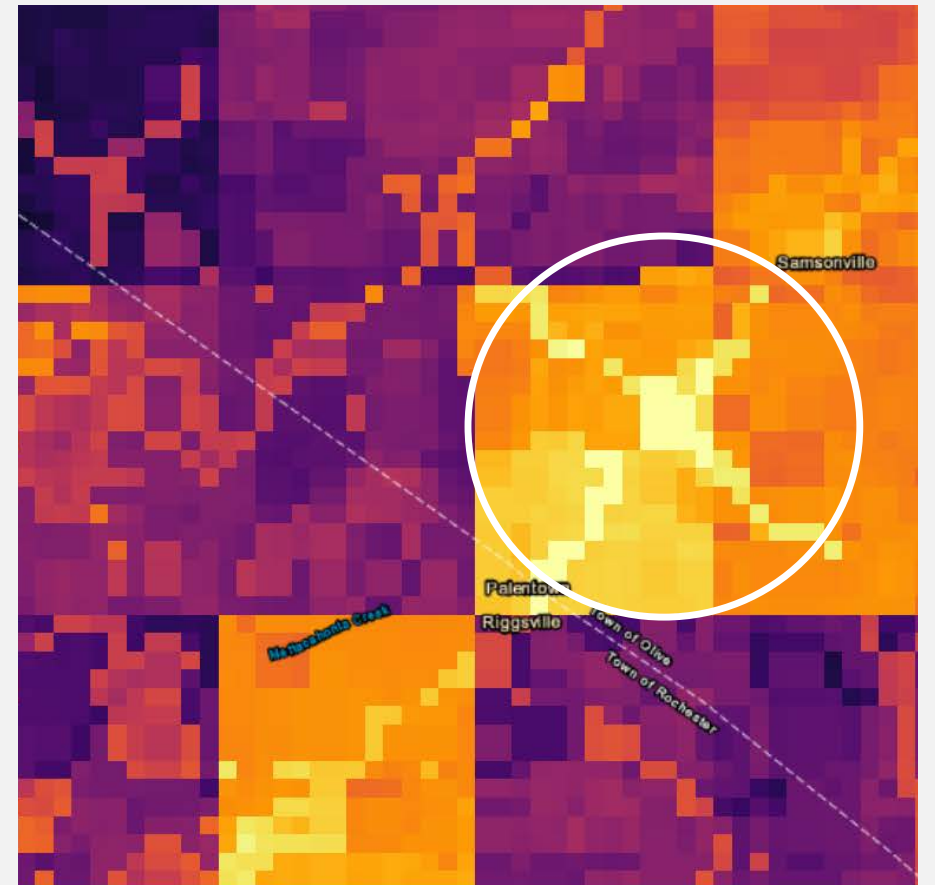
Part I

Part II

Part III

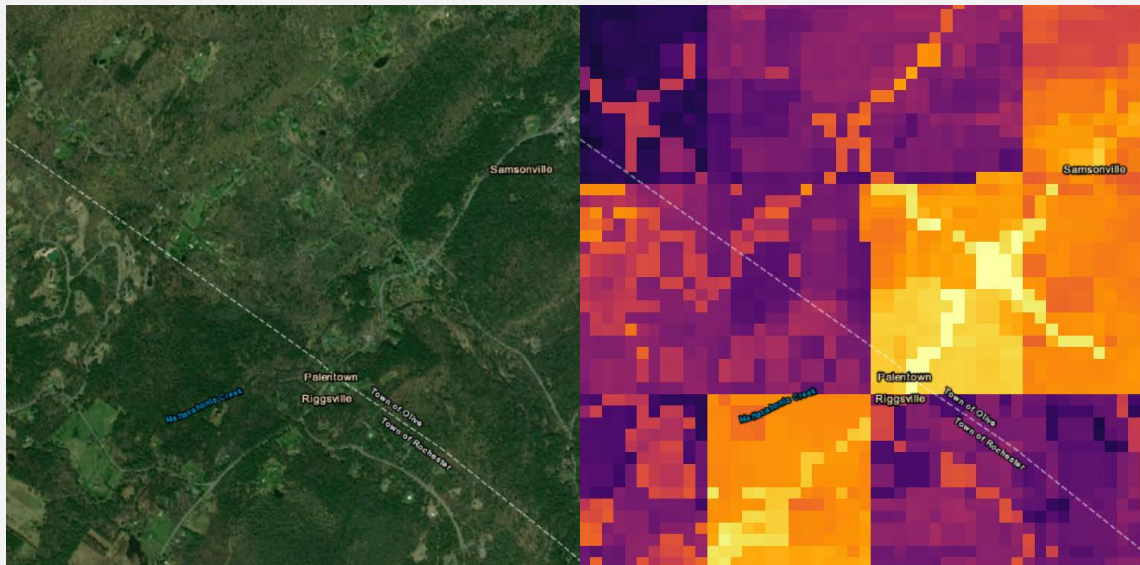
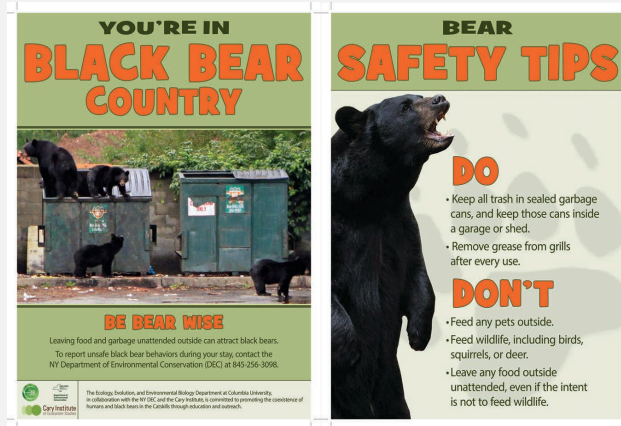


Satellite Imagery (3km x 3km)



Conflict Hotspot Map (3km x 3km)

IMPLICATIONS & FUTURE WORK



1. Finalize a design (or two) for the educational brochure, and distribute those brochures to AirBnBs/cabins/Vrbsos throughout the Catskills region
2. Validate our conflict model by continuously updating and comparing its predictive power with future records of negative interactions
3. Expand upon the methods and educational program designed here to include other forms of natural tourism in the Catskills (specifically, camping)

THANK YOU!

- Sara Kross (Columbia E3B)
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- Jamie Deppen and Gary Lovett (Cary Institute)



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