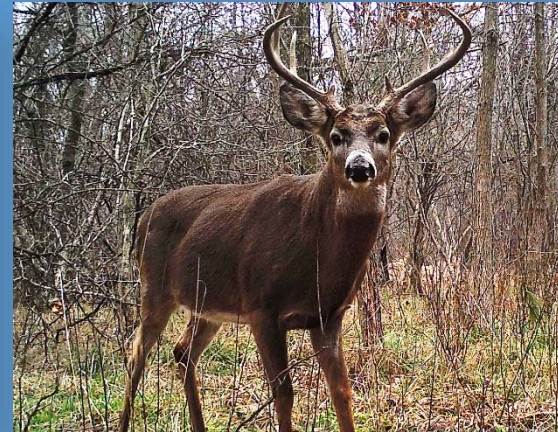
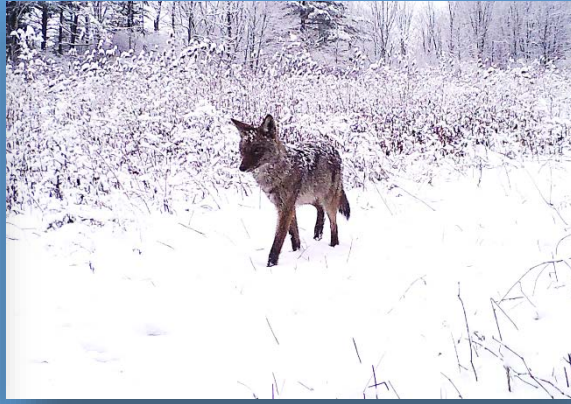


# UNDERSTANDING THE ANIMALS THAT CALL THE METROPARKS HOME



AN UPDATE FROM THE *FOCUS ON WILDLIFE* PROJECT

**REMINGTON MOLL**  
JONATHON CEPEK  
PATRICK LORCH  
PAM DENNIS  
**ROBERT MONTGOMERY**  
TERRY ROBISON



**A large-scale, long-term  
urban wildlife ecology  
project**

## **Local Relevance**

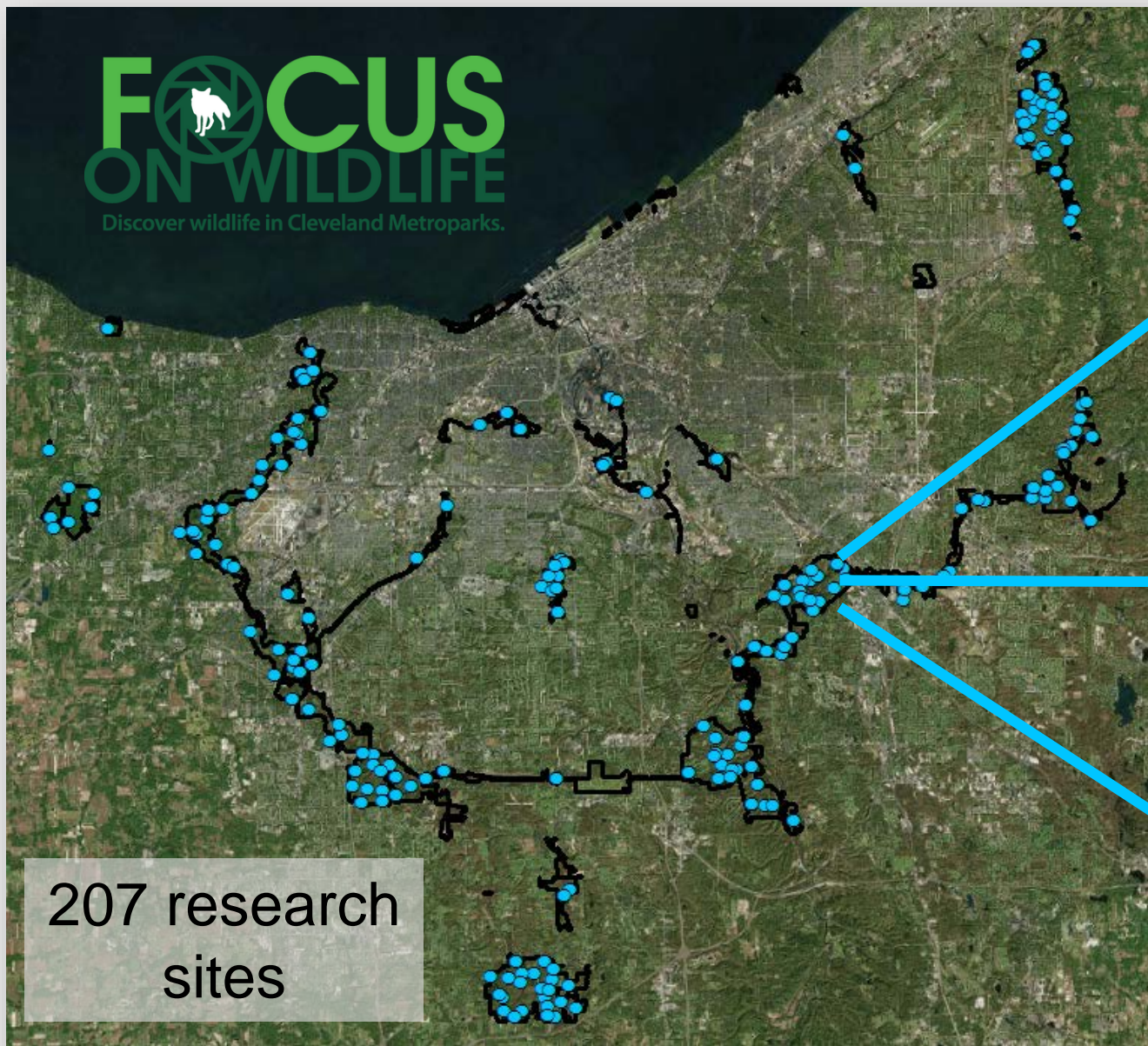
- Monitor rare species
- Study human-wildlife interactions & conflict
- Inform deer management
- Engage citizen scientists

## **Global Relevance**

- CMP as model urban system
- Test fundamental ecological theories
- Project of unprecedented size & scope

# FOCUS ON WILDLIFE

Discover wildlife in Cleveland Metroparks.



Mammals



Plants



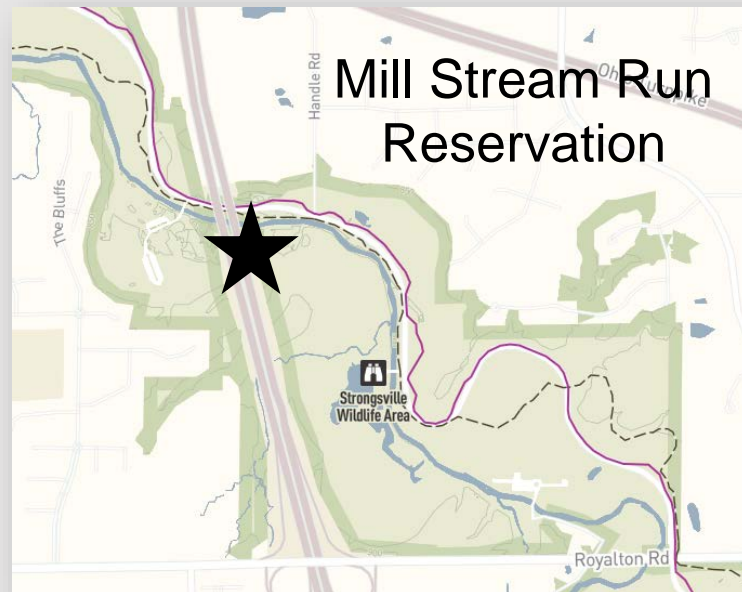
Birds



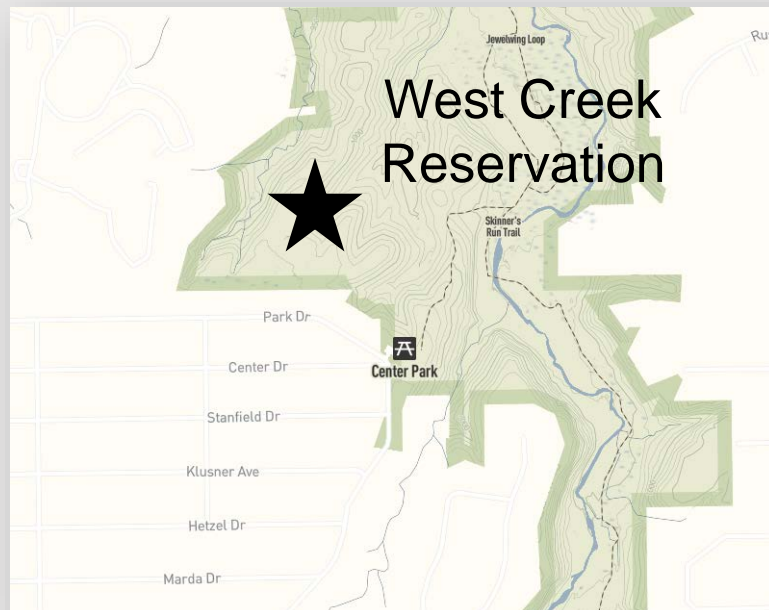
## Images that tell fascinating stories



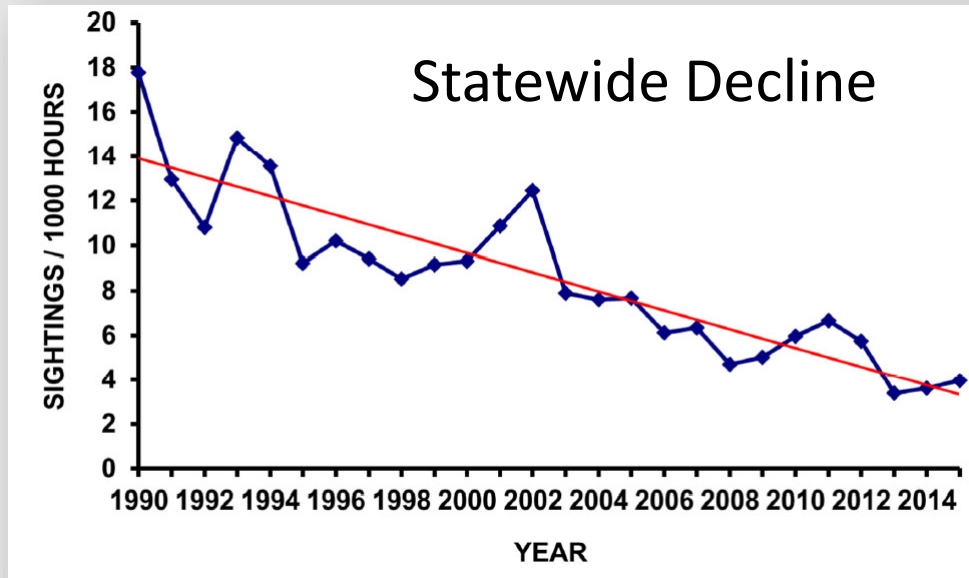
## First confirmed image of gray fox in 8 years



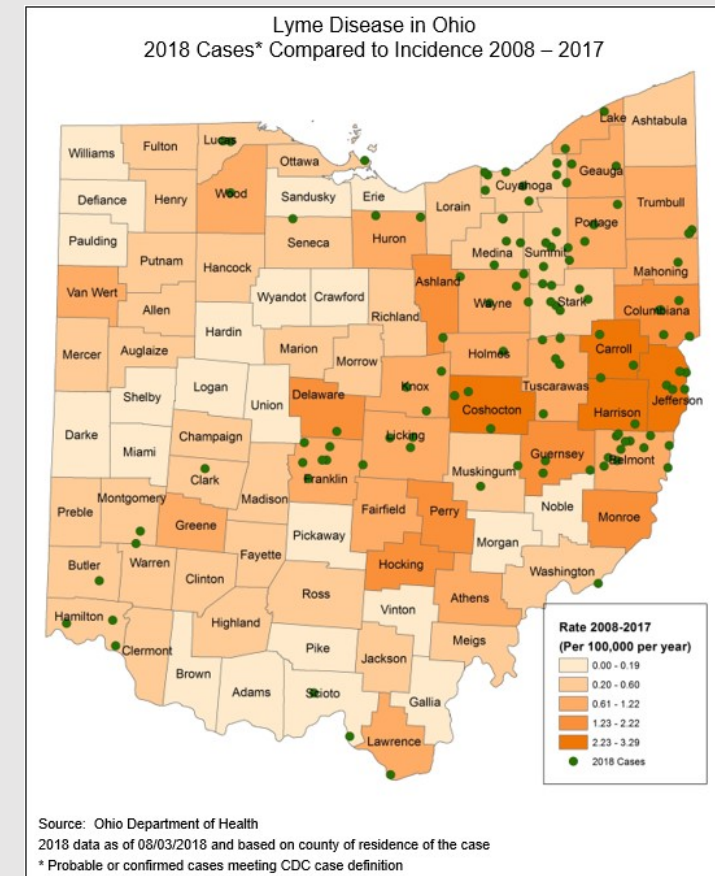
## Locations of coyote dens



## A widespread red fox population revealed?



## Investigating predator-prey-disease relationships





## Peer-reviewed Articles

- **Two articles published in 2018**
- Moll *et al.* *Urban Ecosystems* paper reached ~63,000 Twitter users

Urban Ecosystems (2018) 21:765–778  
<https://doi.org/10.1007/s11252-018-0758-6>



### Humans and urban development mediate the sympatry of competing carnivores

Remington J. Moll<sup>1</sup> · Jonathon D. Cepek<sup>2</sup> · Patrick D. Lorch<sup>3</sup> · Patricia M. Dennis<sup>4,5</sup> · Terry Robison<sup>3</sup> · Joshua J. Millsbaugh<sup>6</sup> · Robert A. Montgomery<sup>1</sup>

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#### Abstract

Humans can profoundly shape animal community dynamics, but such effects have rarely been evaluated for terrestrial carnivores. Humans affect carnivores in both spatial and temporal dimensions via the chance of human encounter and alteration of the landscape through urban development. We investigated three hypotheses regarding how humans mediate the sympatry of larger, dominant carnivores with their smaller, subordinate counterparts. We tested these hypotheses by examining the spatio-temporal dynamics of a dominant carnivore (coyote *Canis latrans*) and its subordinate competitor (red fox *Vulpes vulpes*) across an extensive urban park system. We found that dominant and subordinate carnivores exhibited strong and often opposing spatio-temporal responses to the probability of human encounter and urban development. Spatially, coyotes visited more highly developed sites less frequently while red foxes exhibited an opposing response. Temporally, both species avoided humans via nocturnal activity. Spatio-temporally, red foxes avoided coyotes at all sites and avoided humans at highly developed sites, whereas coyotes showed a positive association with humans at such sites. Our analysis indicates that areas with higher urban development might act as spatial refugia for some subordinate carnivores against interference from larger, dominant carnivores (a “human shield” effect). Our findings also reveal that broad-scale spatial avoidance is likely a crucial component of coexistence between larger, dominant carnivores and humans, whereas finer-scale spatio-temporal avoidance is likely a key feature of coexistence between humans and smaller, subordinate carnivores. Overall, our study underscores the complex and pervasive nature of human influence over the sympatry of competing carnivores inhabiting urban systems.



**Remington Moll**  
@remington\_moll

New paper out examining how humans, coyotes, and red foxes coexist in cities.

- Two additional manuscripts to be submitted this fall

## Academic Conferences & Scientific Meetings

- **19 presentations and posters since 2016**
- 4 best presentation awards
- Ohio Natural History Conference
- The Wildlife Society Annual Conference
- National Council for Science and the Environment Conference (Wash. DC - Invited)



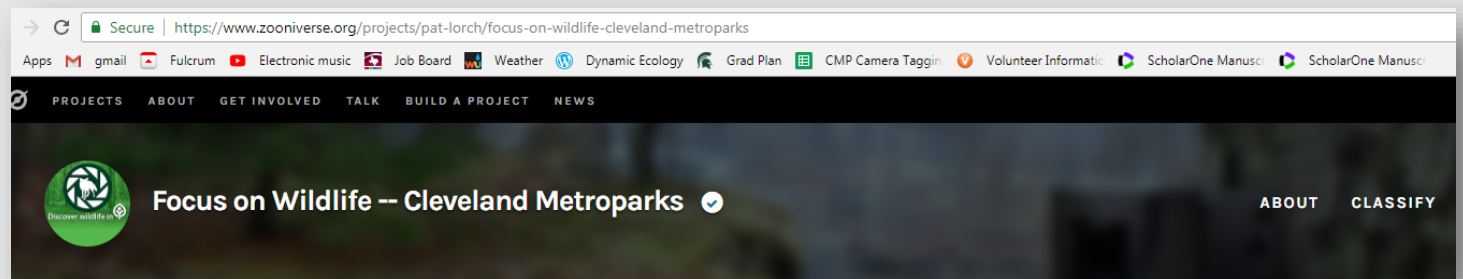
## Public Presentations



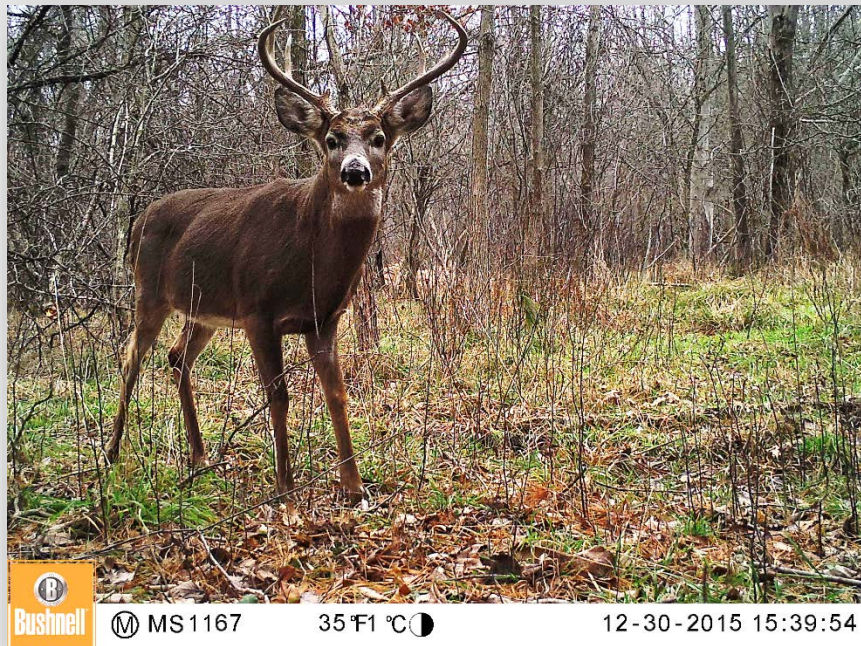
- **26 presentations since 2016**
- Western Cuyahoga Audubon
- League of Women Voters
- MSU K-12 Educator's Summit Institute

## Outreach & Citizen Science

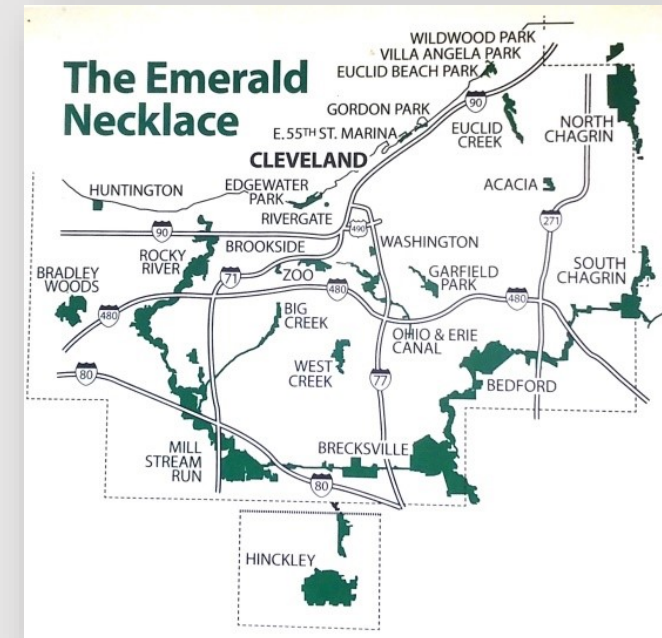
- MSU's Multicultural Apprenticeship Program
- 66 Metroparks volunteers: ~5,000 hours of photo ID and camera maintenance
- Zooniverse website: >5,000 citizen scientist volunteers in photo ID



## Monitoring deer population dynamics & management outcomes



## Expanding fox-mouse-Lyme disease research



Continued engagement and training of under-represented students and citizen scientists



# Acknowledgements & Questions

**CMP personnel:** Jon Cepek, Pat Lorch, Pam Dennis, Terry Robison, Liz Clingman, Tim Krynak, Eric Shaffer

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**MSU students:** Waldemar Ortiz, Clara Leopard, Grant Woodard, Mikki Smith, Logan Brissette, Jeremiah Eaton, Genesha Burton, Gena Leksche, Tutilo Mudumba, Kyle Redilla, Steve Gray, Herbert Kasozi, Symon Masiaine

