



credit: Grant Sizemore

# Domestic Cats and Bird Conservation: Tools for Zoo Messaging

Grant Sizemore, Director of Invasive Species Programs  
American Bird Conservancy  
[gsizemore@abcbirds.org](mailto:gsizemore@abcbirds.org), 202-888-7480

AZA | ASAG | North American Songbirds  
March 26, 2018

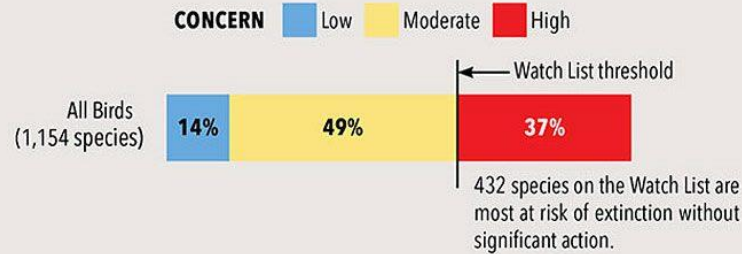
*speaker notes in italics*



California Quail, Owen Deutsch



## ONE-THIRD OF ALL NORTH AMERICAN BIRD SPECIES NEED URGENT CONSERVATION ACTION



Common Yellowthroat, Greg Homel



*What I hope to achieve with this talk is to impress upon you the magnitude of the threat facing North America's birds (and other species) from domestic cats and to encourage a larger role from AZA institutions in public education. We in the conservation community have a critical job to play in acknowledging this inconvenient truth and encouraging responsible actions by managers, policymakers, and the public.*

*One-third of all North American bird species are in need of urgent conservation action, and many other species are in decline either range-wide or locally.*

Wood Thrush, Paul Reeves

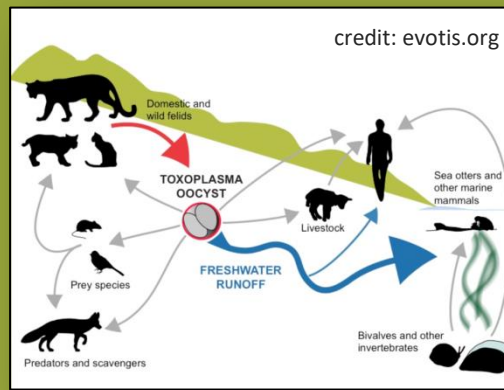


Hawaiian Petrel, Andre Raine



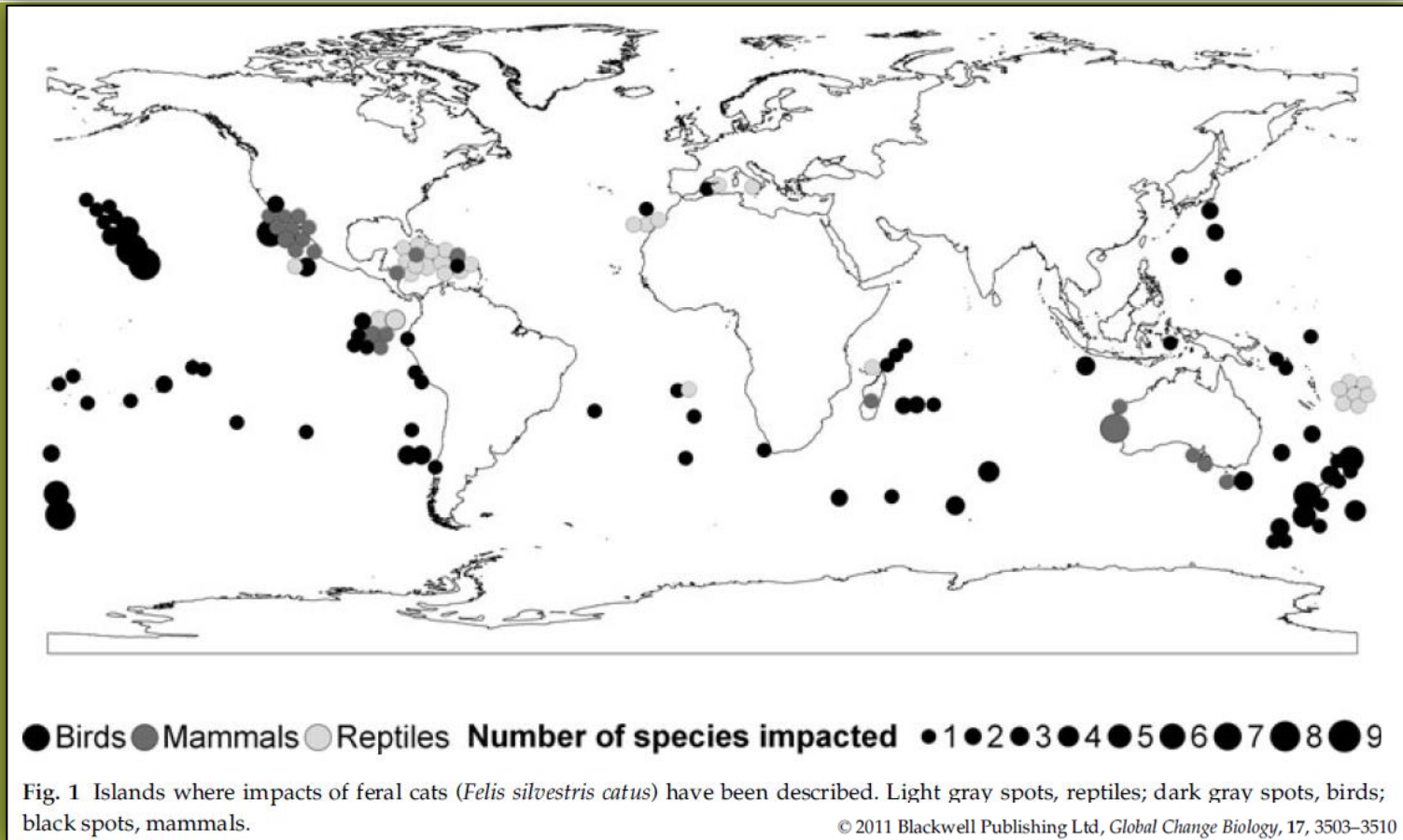
# Overview

1. Domestic cats are an invasive predator.
2. Domestic cats indirectly affect wildlife health.
3. Zoos have an opportunity to effect change.



# Cats: An Invasive Predator

# Worldwide Distribution

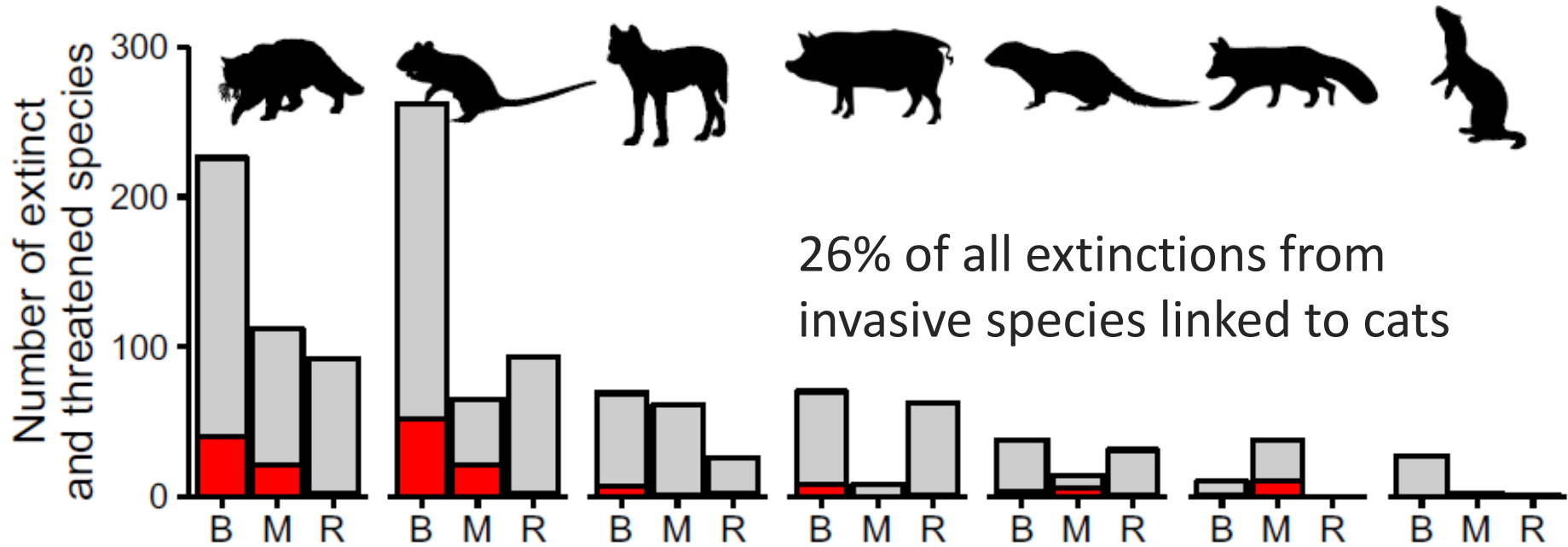


credit: Medina et al. (2011)

*Cats were domesticated approximately 10,000 years ago from the Near Eastern Wildcat. Since that time, cats have been spread near and far by people.*

*Outdoor cats are now a problem worldwide. Medina et al. (2011) illustrated the spread of cats across islands across the world.*

# Global Impacts



credit: Doherty et al. (2016)




**GLOBAL INVASIVE SPECIES DATABASE**

HOME ABOUT THE GISD HOW TO USE CONTACTS

**100 OF THE WORLD'S WORST INVASIVE ALIEN SPECIES**

A SELECTION FROM THE GLOBAL INVASIVE SPECIES DATABASE



Published by ISSG  
 Contribution to the Global Invasive Species Programme (GISP)  
 In Association with IUCN  
 The World Conservation Union  
 Species Survival Commission  
 IUCN

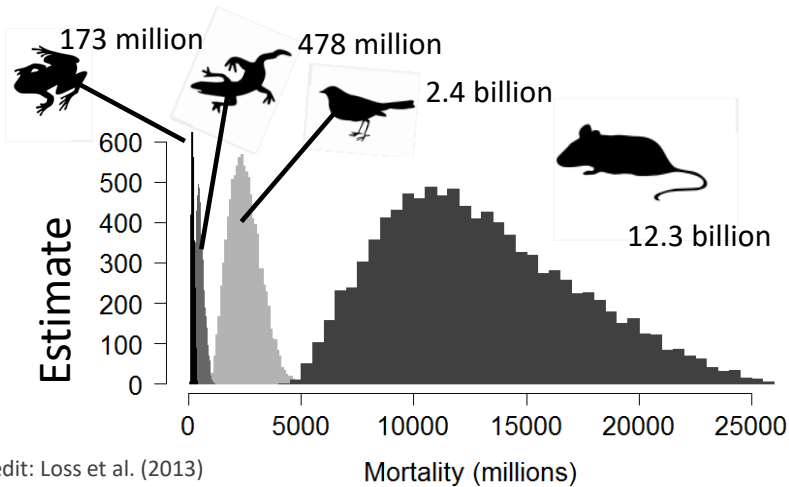
*Doherty et al. (2016) estimated that cats are linked to the extinction of 63 species (40 birds, 21 mammals, and 2 reptiles). Cats account for 26% of all birds, mammal, and reptile species extinctions caused by invasive species. 430 species of threatened and endangered birds, mammals, or reptiles are impacted by cats.*

*This image from Doherty et al. (2016) indicates the numbers of threatened and endangered birds, mammals, and reptiles negatively affected by invasive mammalian predators. The gray bars represent the total number of extinct and threatened species (including extinct in the wild). Red bars represent extinct species. Note that the cat (farthest left) negatively affects the most species.*

*The International Union for the Conservation of Nature actually recognizes feral cats to be among the world's most harmful invasive species globally.*

# North American Impacts

credit: The State of the Birds, 2014



credit: Loss et al. (2013)



credit: Gaetan Priour

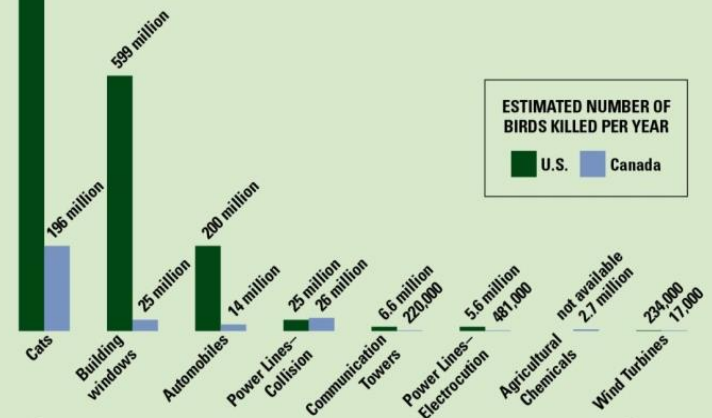
2.4 billion

## ADDITIONAL DRIVERS OF BIRD DECLINES

Habitat loss is by far the greatest cause of bird population declines. Humans also kill billions of birds in the U.S. annually through more direct actions, such as allowing outdoor cats to prey upon birds. Canadian bird mortality estimates show remarkably similar patterns. Data-driven assessments of how different human-caused sources of bird mortality contribute to population declines are essential for developing strategic conservation objectives and science-based policies.

Reducing or eliminating direct sources of mortality could save millions, if not billions, of birds annually. The best ways to reduce bird mortality include:

- **CATS:** Keeping pet cats indoors and implementing policies to eliminate feral cat colonies.
- **COLLISIONS:** Following bird-friendly window practices, reducing night lighting in and on tall buildings, warning auto drivers in high-collision areas, installing flashing rather than steady-burning lights on communication towers, and locating wind turbines away from areas of high bird concentrations (especially areas that pose threats to particular species such as eagles).
- **CHEMICALS:** Limiting the broadcast spraying of pesticides and insecticides and introducing integrated pest management practices (which reduce or eliminate chemical applications) in agricultural areas.





Outdoor cats in North America have also had serious impacts. Loss et al. (2013) estimated that outdoor cat in the contiguous U.S. kill 2.4 billion birds and 12.3 billion mammals every year. This number sounds outrageous until you realize just how many outdoor cats there are: 65-115 million. Canada has a similar problem, which was detailed by Blancher (2013). These cats are now the top source of direct, anthropogenic mortality to birds both in the U.S. and Canada.

One of the reasons that cats are so harmful is because they are closely aligned with people, able to take advantage of human resources and immune to the natural swings in prey populations that might otherwise reduce their numbers. E.g., lynx and hares.

Cats are a major contributor to wildlife rehabilitation facility intakes. Cats account for approximately 80% avian mortality (Loyd et al. 2017; McRuer et al. 2017).

# Indirect Harm

# Ecology of Fear



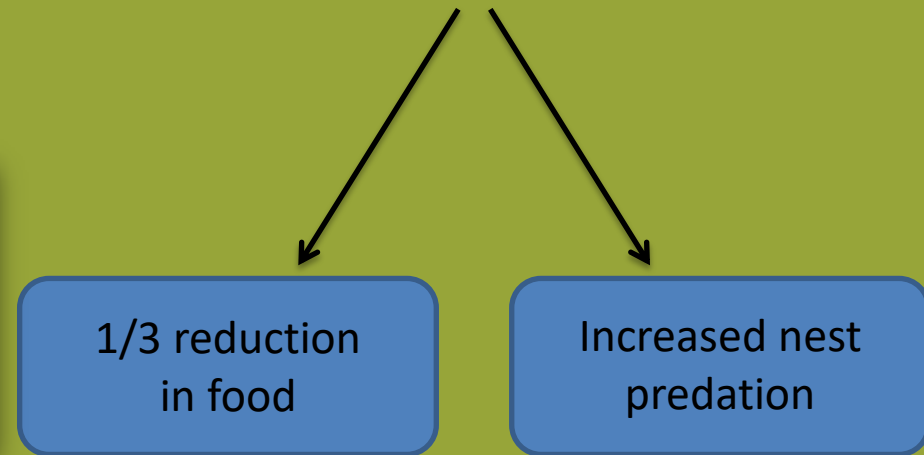
**50 YEARS WITH IMPACT** **Journal of Applied Ecology** 1913 2013 British Ecological Society CELEBRATING 100 YEARS


*Journal of Applied Ecology* 2013, 50, 15–24 doi: 10.1111/1365-2664.12025

**Fearing the feline: domestic cats reduce avian fecundity through trait-mediated indirect effects that increase nest predation by other species**

Colin Bonnington<sup>1</sup>, Kevin J. Gaston<sup>2</sup> and Karl L. Evans<sup>1\*</sup>

Cat Near Nest



**ethology** international journal of behavioural biology 

**RESEARCH PAPER**

**Foraging and Calling Behavior of Carolina chickadees (*Poecile carolinensis*) in Response to the Head Orientation of Potential Predators**

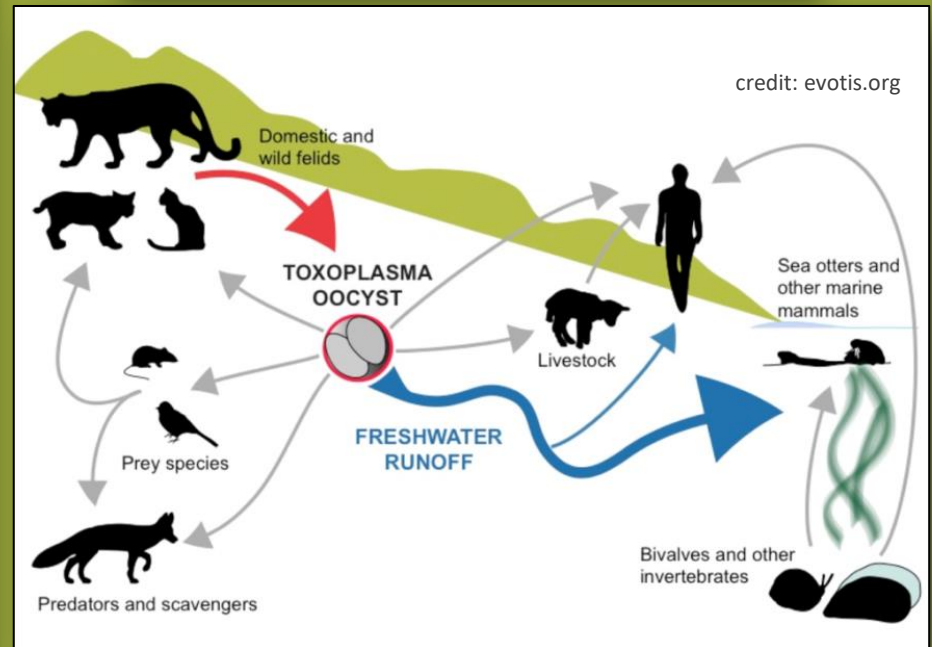
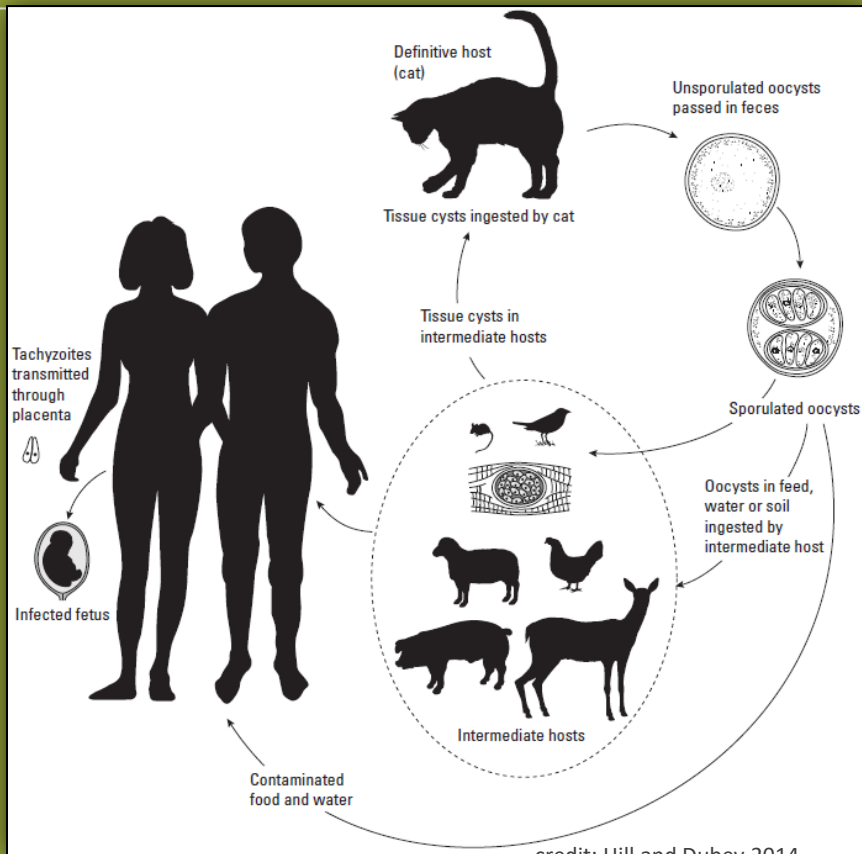
Todd M. Freeberg\*†, D. L. Book\* & Rebecca L. Weiner†

*Freeberg et al. (2016) found that Carolina Chickadees, like Tufted Titmice, respond to predator presence and orientation by decreasing visits to a feeder and increasing calls.*



# Toxoplasmosis

Veterinary Parasitology 106 (2002) 121–153  
**A review of toxoplasmosis in wild birds**  
 J.P. Dubey\*



**Unrecognized Ingestion of *Toxoplasma gondii* Oocysts Leads to Congenital Toxoplasmosis and Causes Epidemics in North America**  
 Kenneth Boyer,<sup>1,2</sup> Dolores Hill,<sup>3</sup> Ernest Mui,<sup>4</sup> Kristen Wroblewski,<sup>5</sup> Theodore Karrison,<sup>5</sup> J. P. Dubey,<sup>3</sup> Mari Sautter,<sup>4</sup> A. Gwendolyn Noble,<sup>4,6</sup> Shawn Withers,<sup>5</sup> Charles Swisher,<sup>7</sup> Peter Heydemann,<sup>1,8</sup> Tiffany Hosten,<sup>4</sup> Jane Babiarz,<sup>4</sup> Daniel Lee,<sup>4</sup> Paul Meier,<sup>5,9,\*</sup> Rima McLeod,<sup>4,10,11,12</sup> and other members of the Toxoplasmosis Study Group<sup>9</sup>

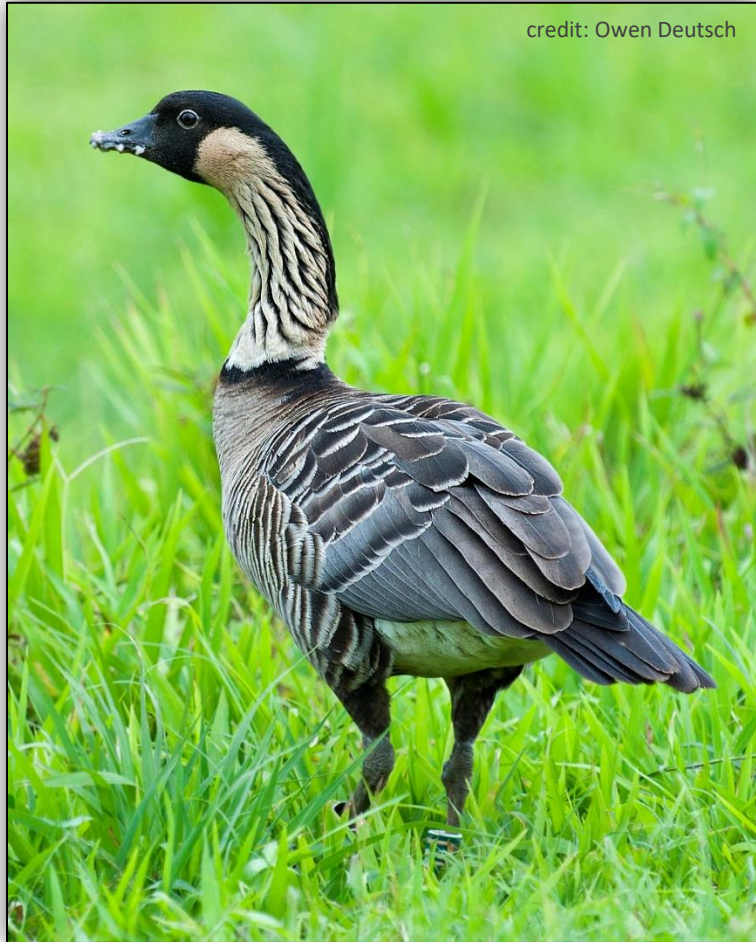
## *Toxoplasma gondii*

1. Felines as definitive host, excretion numbers (up to hundreds of millions), and environmental persistence (years)
2. Impacts domestic animals, wildlife, and people
3. Boyer et al. (2011): 78% of 76 mothers of NCCTS study were infected by oocysts.





# Hawai'i: A Case Study



*Hawaii as a case study. Hawaii is extremely isolated and has only one native, terrestrial mammal, a bat. However, numerous species have been introduced by people, including domestic cats. Domestic cats are the only felid in the islands. Because of the absence of other felids, Hawaii serves as a useful laboratory for understanding the role of domestic cats in the transmission of T. gondii. 100% of the oocysts spread into the environment in Hawaii are from domestic cats. Research led by Thierry Work et al. has established that T. gondii is a serious conservation concern for many bird species in Hawaii and emphasizes the unavoidable conclusion that domestic cats are a major purveyor of the parasite. T. gondii has been identified as a major threat to Hawaiian crows, the most endangered Corvid in the world, and critically impeded reintroduction efforts of these birds.*

*The parasite has also been found in other birds (and mammals), including the Hawaiian goose. Infectious disease remains one of the top threats to nene, and toxoplasmosis is chief among them. Deceptively though, deaths from infection could be masked by trauma. T. gondii can manipulate behaviors and may increase risky behaviors resulting in traumatic deaths. Of 94 geese sampled on Kauai, Maui, and Molokai, 21%, 23%, and 48% tested positive for exposure.*

# Zoo Experiences and Opportunities



# Zoo Experiences



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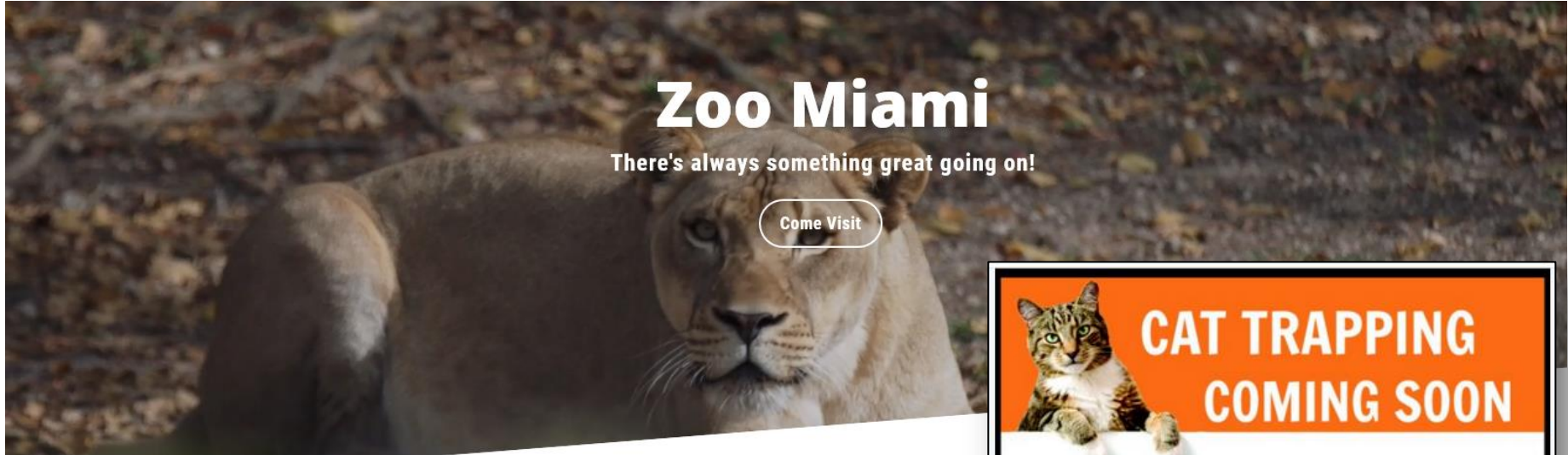


2014 *Toxoplasma gondii* outbreak



1. *The Virginia Zoo – Toxo Outbreak: 6 adult wallabies and several babies died in 2014 from toxoplasmosis; toxo was known to exist in the soil as result of feral cats; a previous marsupial exhibit had closed in the 1990s due to toxo, 5 kangaroos had died*
2. Sources: <http://hamptonroads.com/2015/01/most-virginia-zoos-wallabies-have-died>, <http://hamptonroads.com/2015/01/zoo-director-was-warned-danger-wallabies>, <http://hamptonroads.com/node/744255>

# Zoo Experiences



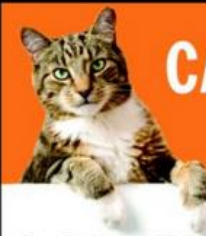
## Zoo Miami

There's always something great going on!

Come Visit



credit: Luc Viatour



## CAT TRAPPING COMING SOON

Dear Residents and Park Visitors,

The Miami-Dade County Parks, Recreation and Open Spaces (PROS), in collaboration with Zoo Miami, The Cat Network, and Miami-Dade Animal Services are collaborating to rehome cats that have been illegally abandoned on the Larry and Penny Campgrounds and Park through the **Trap, Neuter and Return (TNR) Program**, a humane and effective method used to reduce community cat populations in time through attrition by sterilization. TNR cats are trapped, spayed/neutered, vaccinated against rabies and ear-tipped to provide visual confirmation that they have been sterilized. The purpose of the project is to increase community awareness on the environmental impact caused by domestic animals dumped in the ecosystem within community parks and national preserve areas.

Please be advised that trapping efforts will begin on **April 20, 2016**. This project is an ongoing initiative in order to maintain a balanced and healthy ecosystem for native wildlife and neighboring Zoo Miami animal exhibits.

If you wish to participate in these efforts, please speak to a parks representative. Please refrain from feeding free-roaming cats on park grounds starting on **April 18, 2016** and please keep all privately owned cats indoors during this time.

Should you have any questions or concerns, please feel free contact The Cat Network at 305-255-3482 or email [info@catnetwork.org](mailto:info@catnetwork.org).

Thank you in advance for your cooperation.



1. Zoo Miami – In 2016 Zoo Miami erected fliers notifying the public of cat trapping on zoo property. Unowned cats from nearby parks were creeping onto zoo property and creating a hazard for zoo animals. The effort followed a new ordinance in Miami-Dade County in 2012 that favored maintaining cats in the environment (TNR).
2. Sources: <http://www.thenewstribune.com/news/nation-world/national/article73877752.html>,  
<http://www.miamiherald.com/news/local/news-columns-blogs/fred-grimm/article74283292.html>

# Zoo Opportunities

## Be a Responsible Cat Owner

There are millions of feral cats roaming free, and animal shelters are overwhelmed with them. Only 30% ever find homes; the rest are euthanized.

**Do your part to reduce the overpopulation problem by spaying or neutering your pet.**

*A single female cat can produce 100 kittens in her lifetime.*



**Keep your cat inside to save native wildlife.**

*Billions of birds, reptiles and small mammals are killed by cats each year.*



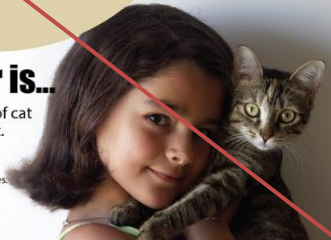
## Which Cat Makes The Best Pet?

				
				
I'm 12 times stronger than a man and my hunting instincts are even stronger.	I'll spray buckets of urine on everything in your house I wish to claim as my own.	You'll spend about \$10,000 per year on raw meat and medical care for me.	I'll use anything as a scratching post—your furniture, your walls, even you!	I love nothing more than to curl up in your lap and purr as you pet me.

## The Correct Answer is...

The **domestic housecat** is the only kind of cat that should be kept in your home as a pet.

Domestic housecats have been bred over thousands of years to live with people; wild cats have not. Since 1990, more than 300 dangerous incidents involving big cats have occurred in 44 states. Petting a purring cat has been found to reduce blood pressure, stress and loneliness, and even promote healing.



**Provide a good home. Every cat needs:**

- A Healthy Diet**
- A Loving Owner**
- A Bed Or Other Place To Call Their Own**
- WATER**
- Vaccinations And Routine Veterinary Care**
- A High Resting Place, Preferably With A Window View**
- A Litter Box And A Scratching Post**
- Toys To "Hunt" And For Exercise**

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The Cincinnati Zoo & Botanical Garden gratefully acknowledges the Joanne Bernard Foundation for its support of educational programming. The Joanne Bernard Foundation forwards the care of various organizations to animal shelters and in the care for feral cat communities, including the following: spaying/neutering and fund clinics that perform spay/neuter services.

The Joanne Bernard Foundation





# Zoo Opportunities

## RESEARCH ARTICLE

### Quantifying the Impact of Wellington Zoo's Persuasive Communication Campaign on Post-Visit Behavior

Edith MacDonald\*

#### Key Findings

1. High retention rates (91% and 100%)
2. High participation among pledge group (100%)
3. Onsite pledge strengthens at-home behavior (51% vs 100%)



credit: Grant Sizemore

1. *MacDonald (2015) – Visitors to Wellington Zoo in New Zealand were asked to keep cats indoors at night. The conservation behavior was suggested twice daily during an amphitheater animal presentation. Attendees answered a survey following the show that measured recall and intention to engage in behavior. Approximately half of participants were asked to sign a pledge card. Respondents were then contacted 6 weeks later.*

# Final Thoughts

1. Free-roaming cats are an invasive predator
2. Free-roaming cats affect wildlife directly and indirectly
3. Zoos have a unique opportunity to inform the public



credit: CatioSpaces.com



credit: DNF Style, Shutterstock



Better for cats. Better for birds. Better for people.

Grant Sizemore  
Director of Invasive Species Programs  
[gsizemore@abcbirds.org](mailto:gsizemore@abcbirds.org)  
[www.abcbirds.org](http://www.abcbirds.org)



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