
credit: Grant Sizemore

Feral Domestic Cats: Managing an Invasive Predator

Grant Sizemore, Director of Invasive Species Programs
gsizemore@abcbirds.org, 202-888-7480

Montana Invasive Species Summit
November 15, 2018

AMERICAN BIRD CONSERVANCY

Worldwide Distribution

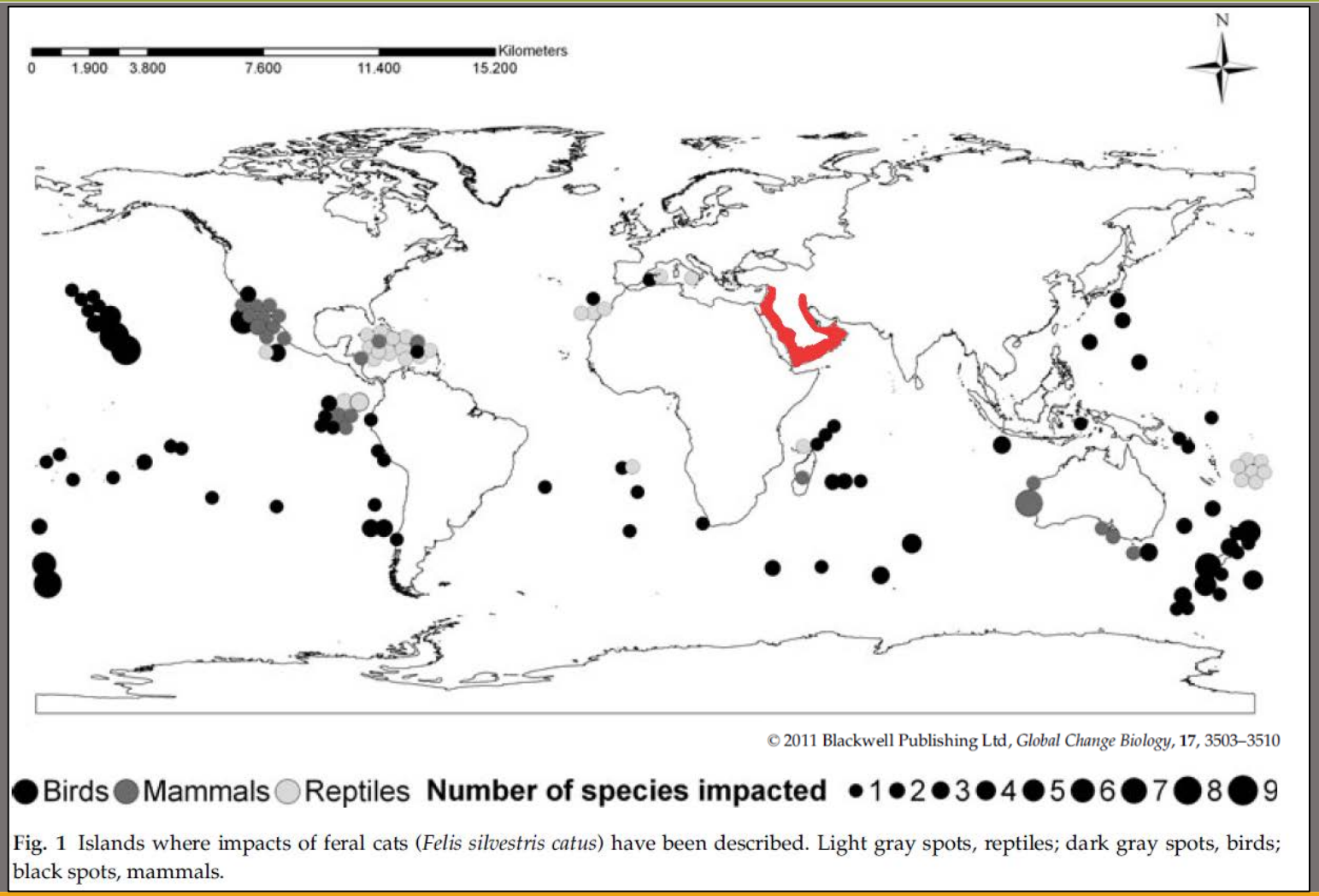


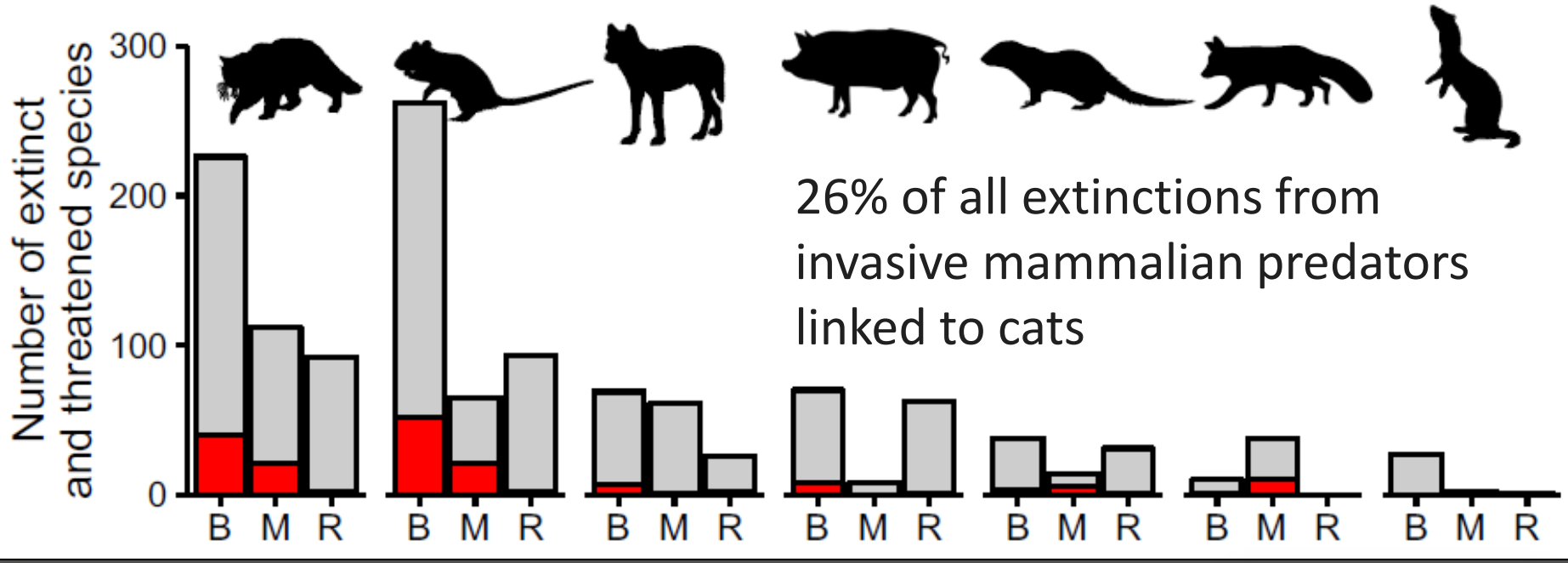
Fig. 1 Islands where impacts of feral cats (*Felis silvestris catus*) have been described. Light gray spots, reptiles; dark gray spots, birds; black spots, mammals.

credit: modified from Medina et al. (2011)

AMERICAN BIRD CONSERVANCY

Global Impacts

credit: Doherty et al. (2016)

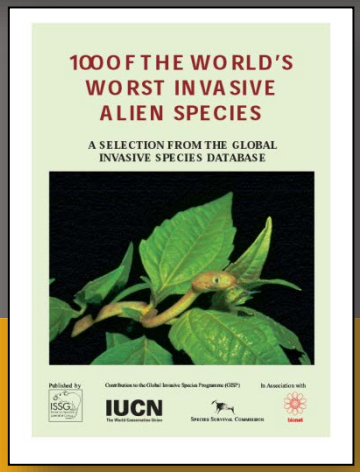


26% of all extinctions from invasive mammalian predators linked to cats

ISSG Invasive Species Specialist Group

GLOBAL INVASIVE SPECIES DATABASE

HOME ABOUT THE GISD HOW TO USE CONTACTS



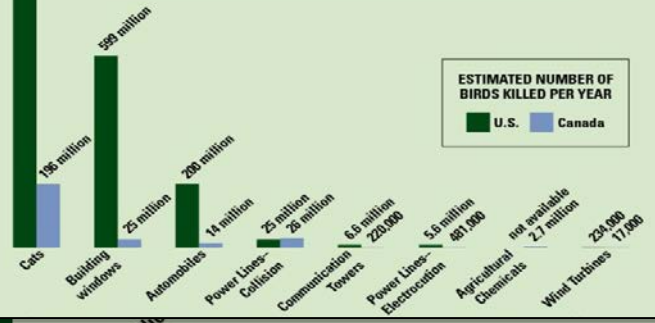
credit: The State of the Birds, 2014

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.



credit: Hawkins et al. (2004)

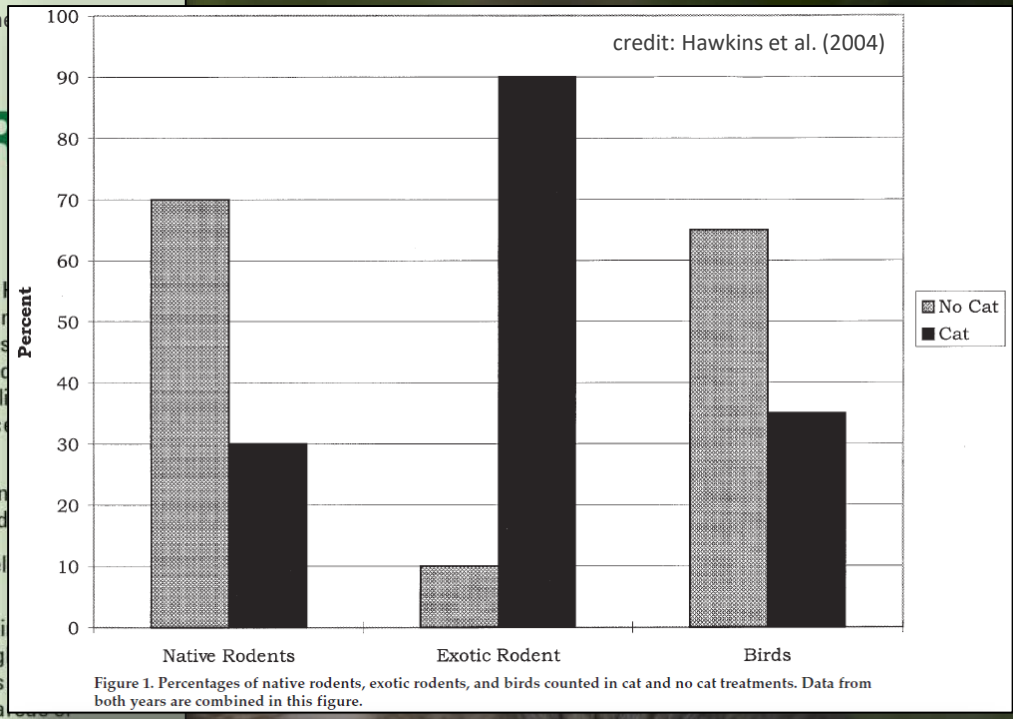


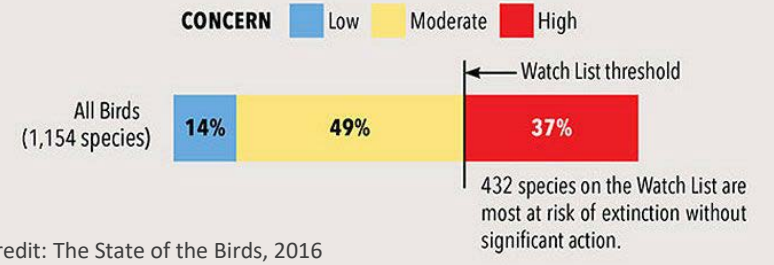
Figure 1. Percentages of native rodents, exotic rodents, and birds counted in cat and no cat treatments. Data from both years are combined in this figure.

50 YEARS WITH IMPACT
Journal of Applied Ecology
British Ecological Society
Journal of Applied Ecology 2014, **51**, 1486–1493
doi: 10.1111/1365-2664.12323

Experimental evidence that feral cats cause local extirpation of small mammals in Australia's tropical savannas

Anke S. K. Frank[1,2*], Chris N. Johnson[1], Joanne M. Potts[3], Alaric Fisher[4], Michael J. Lawes[5], John C. Z. Woinarski[6], Katherine Tuft[2], Ian J. Radford[7], Iain J. Gordon[8,9], Mary-Anne Collis[10] and Sarah Legge[6,2,11]

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



credit: The State of the Birds, 2016

Mesopredator release and avifaunal extinctions in a fragmented system

Kevin R. Crooks* **& Michael E. Soulé†**

* *Department of Biology, University of California, Santa Cruz, California 95064, USA*
† *The Wildlands Project, PO Box 1302 2010, Hotchkiss, Colorado 81419, USA*

Name	Infectious Agent	Description
Campylobacteriosis	Campylobacter	Bacterial disease
Cat Scratch Disease	Bartonella henselae	Bacterial disease associated with cat scratches and bites
Cryptosporidiosis	Cryptosporidium	Parasitic disease associated with cats, dogs, and farm animals
Giardiasis	Giardia	Parasitic disease associated with animals and their environment
Hookworm		Parasitic disease associated with cats, dogs, and their environment
Leptospirosis	Leptospira	Bacterial disease
Plague	Yersinia pestis	Bacterial disease associated with cats, rodents, and fleas
Q Fever	Coxiella burnetti	Bacterial disease
Pasteurellosis	Pasteurella	Bacterial disease associated with animal bites and scratches, especially cats and dogs
Rabies		Viral disease
Ringworm	Microsporum	Fungal disease
Roundworm, Toxocariasis	Toxocara	Parasitic disease associated with cats, dogs, and their environment
Salmonellosis	Salmonella	Bacterial disease
Sporotrichosis	Sporothrix schenkii	Fungal disease associated with animals and environment
Tapeworm, Dipylidium **Tapeworm, Echinococcus**	Dipylidium Echinococcus	Parasitic disease associated with cats, dogs, and fleas; canids, cats, rodents
Toxoplasmosis	Toxoplasma	Parasitic disease associated with cats and their environment

Zoonotic Diseases

Outbreak News Today

Plague: 3 domestic cats confirmed in Park County, Wyoming

by STAFF

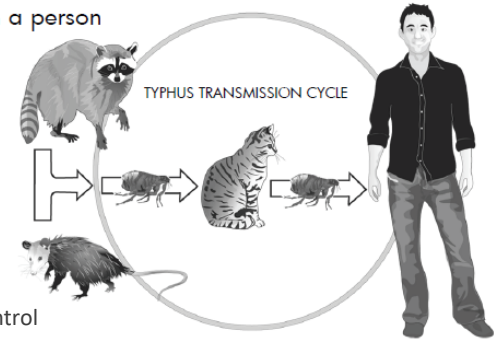
April 22, 2016 | Animal diseases, US News | 1 Comment

credit: Associated Press

credit: Orange County Vector Control

HOW YOU GET THE DISEASE:

Typhus bacteria are transferred to humans usually as the result of flea bites. Infected fleas have the bacteria in their feces and will often defecate while biting and feeding. When a person scratches the flea bite, he/she can allow some of the bacteria in the flea feces to enter the blood stream. People can also become infected by transferring the bacteria to their eyes, nose, or mouth.



credit: Orange County Vector Control

Toxoplasmosis

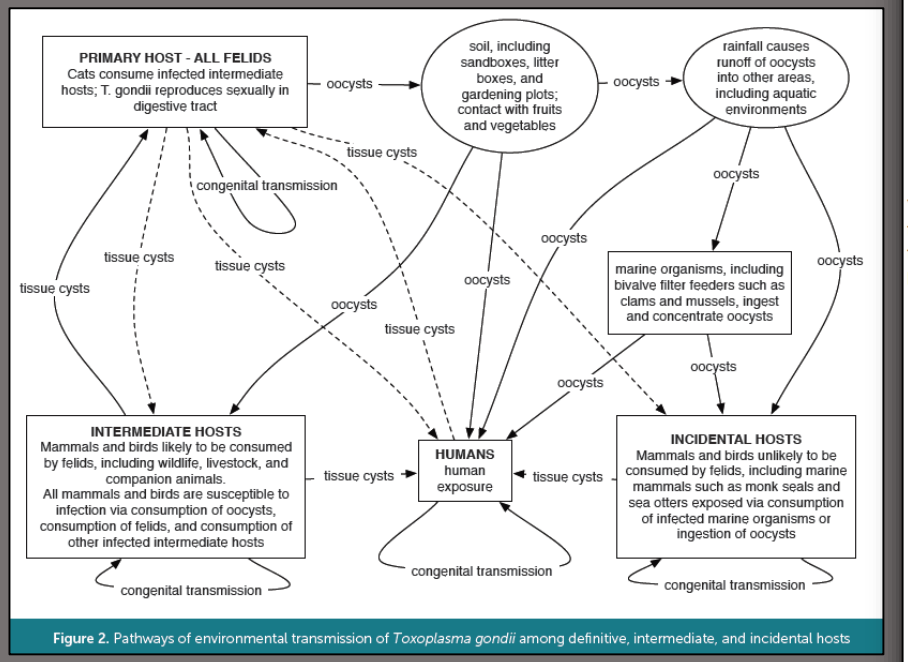
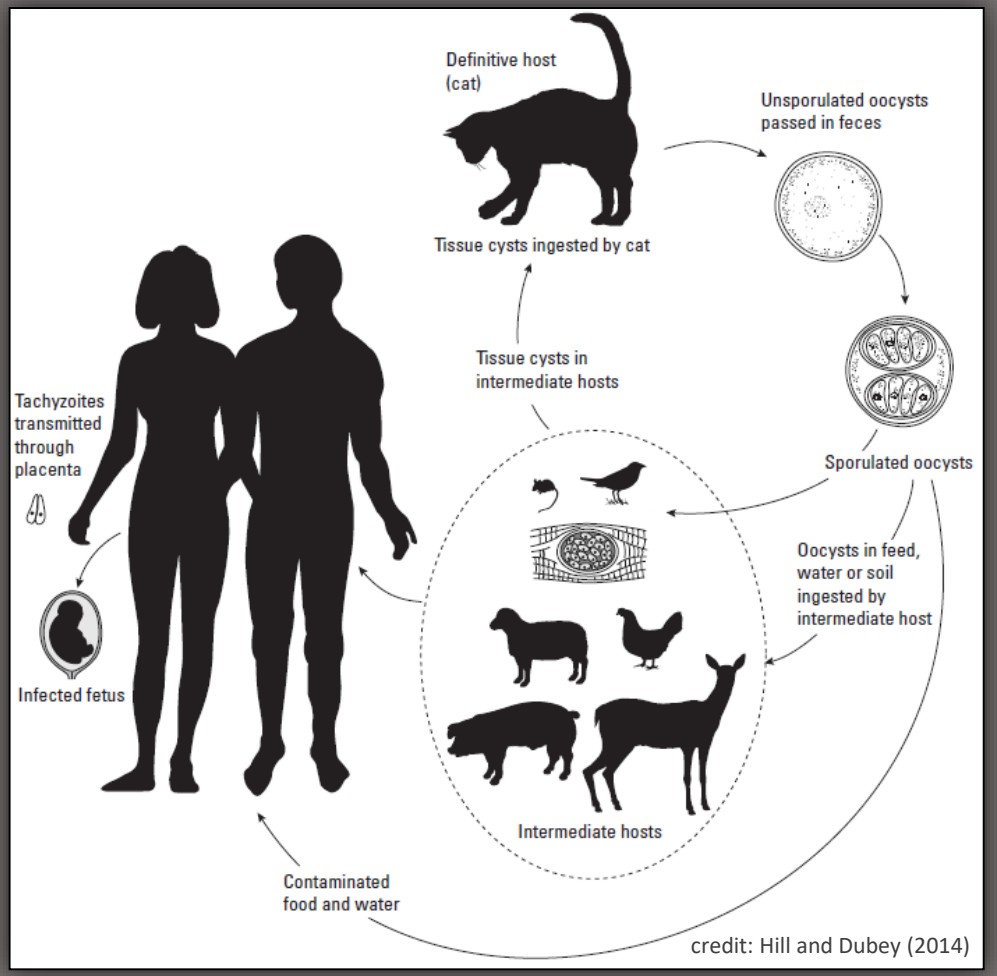


Figure 2. Pathways of environmental transmission of *Toxoplasma gondii* among definitive, intermediate, and incidental hosts

credit: Aguirre et al. (in press)



credit: Hill and Dubey (2014)

AMERICAN BIRD CONSERVANCY

T. gondii Infection

Unrecognized Ingestion of *Toxoplasma gondii* Oocysts Leads to Congenital Toxoplasmosis and Causes Epidemics in North America

Kenneth Boyer,[1,2] Dolores Hill,[3] Ernest Mui,[4] Kristen Wroblewski,[5] Theodore Karrison,[5] J. P. Dubey,[3] Mari Sautter,[4] A. Gwendolyn Noble,[4,6] Shawn Withers,[5] Charles Swisher,[7] Peter Heydemann,[1,8] Tiffany Hosten,[4] Jane Babiarz,[4] Daniel Lee,[4] Paul Meier,[5,9,*] Rima McLeod,[4,10,11,12] and other members of the Toxoplasmosis Study Group[a]

[1]Department of Pediatrics, and [2]Division of Pediatric Infectious Diseases, Rush University Medical Center, Chicago, Illinois, and [3]United States Department of Agriculture, Agricultural Research Services, Animal and Natural Resources Institute, Animal Parasitic Diseases Laboratory, Beltsville, Maryland; [4]Department of Ophthalmology and Visual Sciences, and [5]Department of Health Studies, University of Chicago, Illinois; [6]Department of Ophthalmology, and [7]Division of Pediatric Neurology, Children's Memorial Hospital, Westchester, Illinois; [8]Department of Neurology, Rush University Medical Center, Chicago, Illinois; [9]Department of Biostatistics, Columbia University, New York, New York, Deceased; [10]Department of Pediatrics, Division of Infectious Diseases, University of Chicago, Illinois; [11]Division of Infectious Diseases, University of Chicago, Illinois; and [12]Department of Medicine, Division of Infectious Diseases, Michael Reese Hospital and Medical Center, Chicago, Illinois

Seroprevalence of *Toxoplasma gondii* in White-Tailed Deer (*Odocoileus virginianus*) and Free-Roaming Cats (*Felis catus*) Across a Suburban to Urban Gradient in Northeastern Ohio

Gregory A. Ballash,[1] J. P. Dubey,[2] O. C. H. Kwok,[2] Abigail B. Shoben,[3] Terry L. Robison,[4] Tom J. Kraft,[4] and Patricia M. Dennis[1,5]

[1]*Department of Veterinary Preventive Medicine, Ohio State University, 1920 Coffey Rd., Columbus, OH 43210*
[2]*Animal Parasitic Diseases Laboratory, Beltsville Agricultural Research Center, United States Department of Agriculture, Agricultural Research Service, Building 1001, Beltsville, MD 20705-2350*
[3]*Division of Biostatistics, College of Public Health, Ohio State University, 1841 Neil Avenue, Columbus, OH 43210*
[4]*Department of Planning, Design, and Natural Resources, Cleveland Metroparks, 4500 Valley Parkway, Fairview Park, OH 44126*
[5]*Sarah Allison Steffee Center for Zoological Medicine, Cleveland Metroparks Zoo, 4200 Wildlife Way, Cleveland, OH 44109*

Research article *BMC Infectious Diseases* 2002, 2:11

Increased risk of traffic accidents in subjects with latent toxoplasmosis: a retrospective case-control study

Jaroslav Flegr*[1], Jan Havlícek[2], Petr Kodym[3], Marek Malý[4] and Zbyněk Smahel[5]

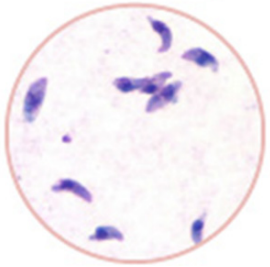
Address: [1]Department of Parasitology, Faculty of Science, Charles University, Prague, Czech Republic, [2]Research Centrum of Personality and Ethnic Studies, Faculty of Humanities, Charles University, Prague, Czech Republic, [3]National Reference Laboratory for Toxoplasmosis, National Institute of Public Health, Prague, Czech Republic, [4]Department of Biostatistics, National Institute of Public Health, Prague, Czech Republic and [5]Department of Anthropology and Human Genetics, Faculty of Science, Charles University, Prague, Czech Republic

E-mail: Jaroslav Flegr* - flegr@cesnet.cz; Jan Havlícek - havel@natur.cuni.cz; Petr Kodym - kodym@szu.cz; Marek Malý - mmaly@szu.cz; Zbyněk Smahel - smahel@natur.cuni.cz

*Corresponding author

NEGLECTED PARASITIC INFECTION:

Toxoplasmosis



Toxoplasmosis is **a leading cause of death** from foodborne illness in the United States.

CDC

Learn more: www.cdc.gov/parasites/npi/

credit: Grant Sizemore

credit: Shutterstock

Economics

J. Food Prot., Vol. 75, No. 7

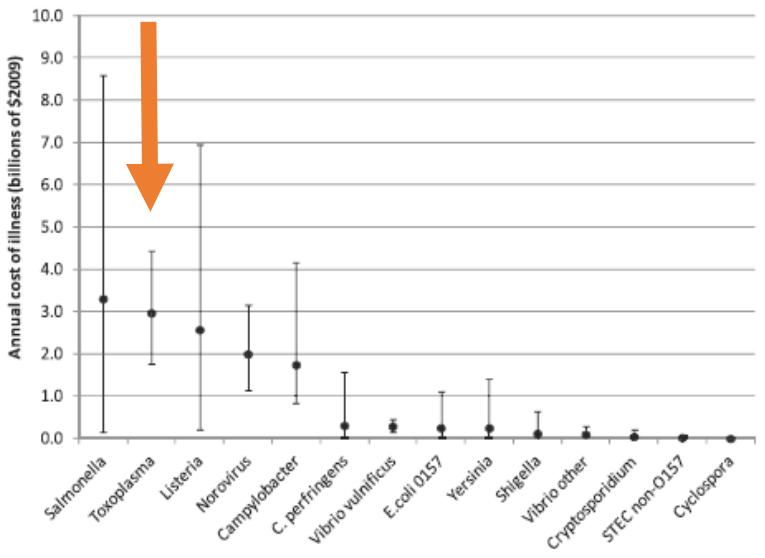


FIGURE 1. *Annual cost of illness due to 14 foodborne pathogens, ranked by mean. Ranges reflect low and high scenarios modeled with 90% credible intervals for estimated numbers of acute foodborne illnesses, hospitalizations, and deaths drawn from Scallan et al. (55). ''*Vibrio *other'' includes* V. parahaemolyticus *and other noncholera* Vibrio *spp.*

credit: Hawkins et al. (2005)

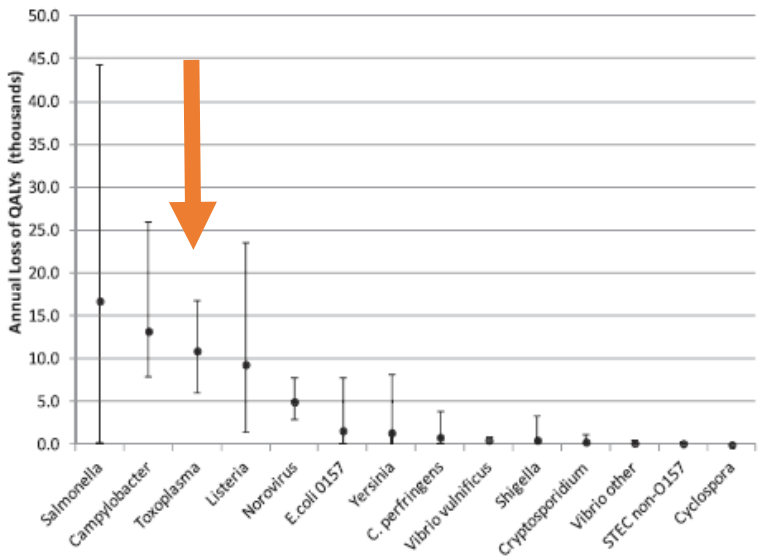
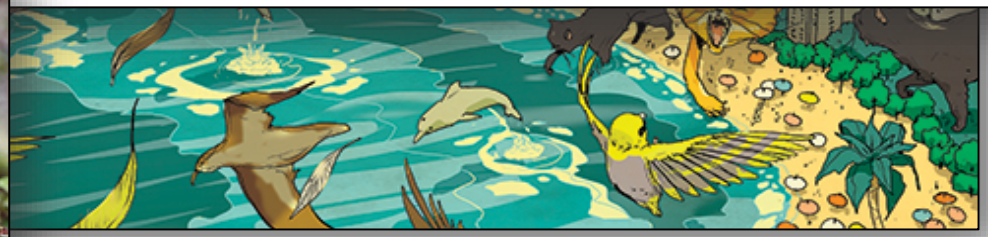


FIGURE 2. *Annual QALY loss due to 14 foodborne pathogens, ranked by mean. Ranges reflect low and high scenarios modeled with 90% credible intervals for estimated numbers of acute foodborne illnesses, hospitalizations, and deaths drawn from Scallan et al. (55). ''*Vibrio *other'' includes* V. parahaemolyticus *and other noncholera* Vibrio *spp.*

AMERICAN BIRD CONSERVANCY

Hawaiian Case Study

Figure 2. Feral cat stalking and killing endangered ‘Alae ‘ula on nest, HAMO-30, Hanalei NWR, April 2017.



credit

AMERICAN BIRD CONSERVANCY

Feral Cat Management

AMERICAN BIRD CONSERVANCY

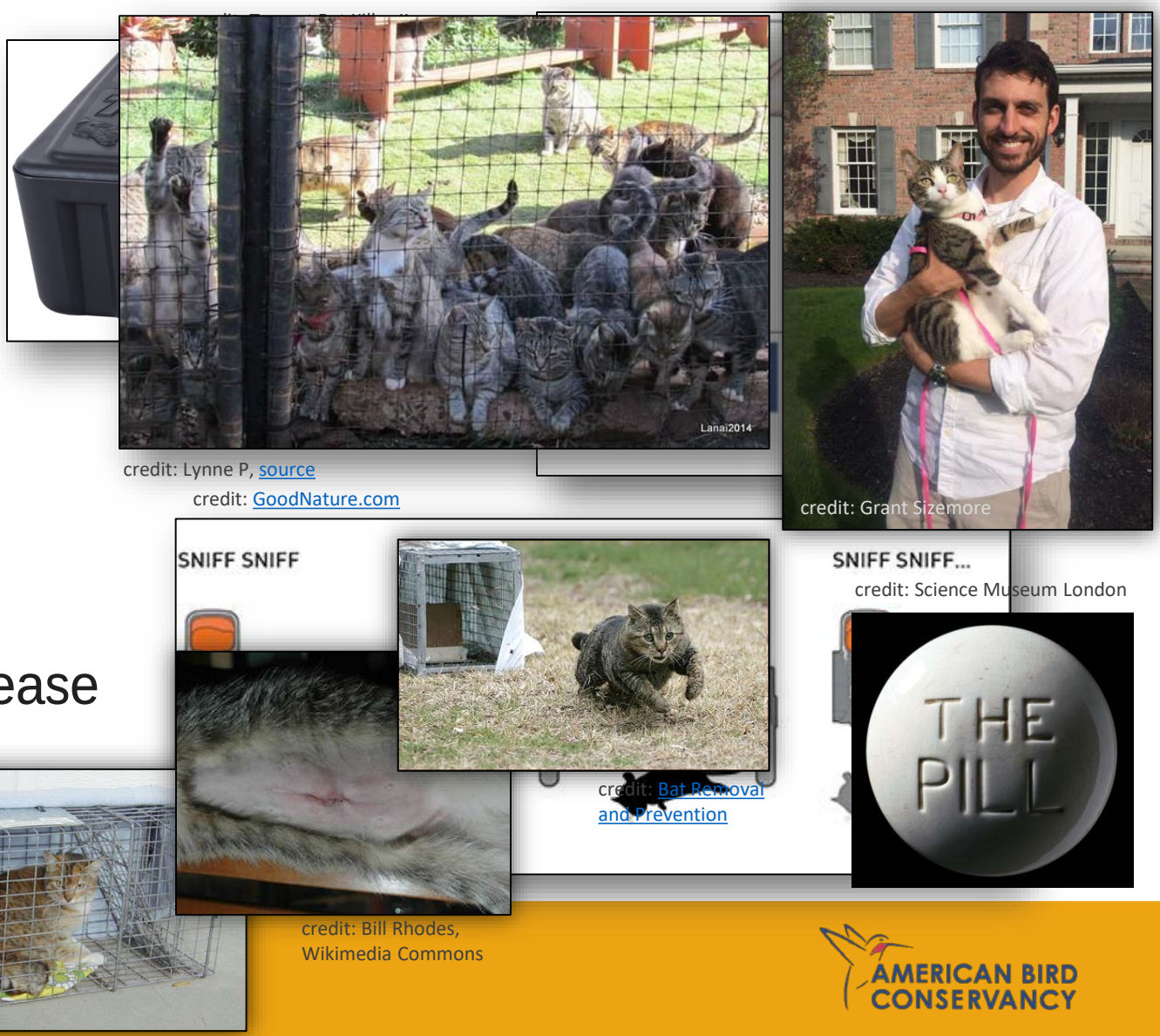
Management Alternatives

Lethal Control

- Euthanasia
- Poison
- Kill Traps

Non-lethal Control

- Adoption
- Sanctuaries
- Contraceptives
- Trap, Neuter, Release (TNR), etc.
- No Action



credit: Lynne P, source

credit: GoodNature.com

credit: Grant Sizemore

credit: Science Museum London

credit: Bat Removal and Prevention

credit: Bill Rhodes, Wikimedia Commons

credit: FelineAvenger, Wikimedia Commons

AMERICAN BIRD CONSERVANCY

Management Alternatives

Population Dynamics

(Births + Immigration) – (Deaths + Emigration) = Δ Population

If the goal is population elimination, then (B+I) < (D+E)

Management	Vital Rate	Cats Outdoors
Adoption	Emigration (Birth)	Maybe
Contraception	Birth	Yes
Euthanasia	Death	No
Poison/Kill Trap	Death	No
Sanctuaries	Emigration (Birth)	No
TNR	Birth	Yes
Nothing	None	Yes

AMERICAN BIRD CONSERVANCY

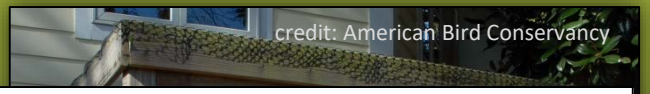
ABC Solutions

Goals

- Containment or direct control
- Free-roaming cats pro-actively removed

Strategies

- Elevated level of care for cats
- Common-sense, science-based ordinances (cats, wildlife, people)


credit: American Bird Conservancy

THE WILDLIFE SOCIETY

5410 Grosvenor Lane • Bethesda, MD 20814-2197
Tel: (301) 897-9770 • Fax: (301) 530-2471
E-mail: tws@wildlife.org

Final Position Statement

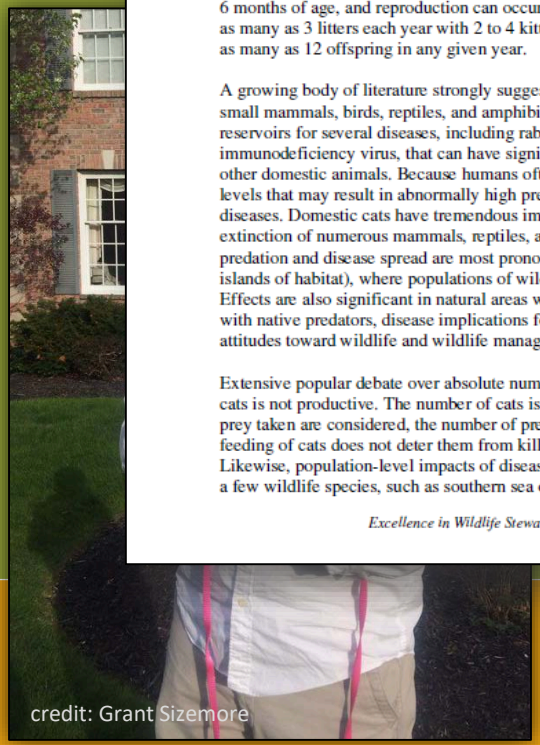
Feral and Free-Ranging Domestic Cats

Feral and free-ranging domestic cats are exotic species to North America. Exotic species are recognized as one of the most widespread and serious threats to the integrity of native wildlife populations and natural ecosystems. Exotic species present special challenges for wildlife managers because their negative impacts on native species are poorly understood by the public to the point that many exotic species are perceived as a natural component of the environment. Some exotic species have advocacy groups that promote their continued presence, and few policies and laws deal directly with their control. Perhaps no issue has captured more of the challenges for contemporary wildlife management than the impacts of feral or free-ranging domestic cats and their impacts on native wildlife.

Domestic cats originated from an ancestral wild species, the European and African wild cat (*Felis silvestris*). The domestic cat (*Felis catus*) is now considered a separate species, and is found on all 7 continents, with 600 million cats worldwide and 148-188 million within the U.S.. Domestic cats have great reproductive potential. Individuals become sexually mature as early as 6 months of age, and reproduction can occur throughout the year. A single female may produce as many as 3 litters each year with 2 to 4 kittens per litter, with the capacity to successfully raise as many as 12 offspring in any given year.

A growing body of literature strongly suggests that domestic cats are significant predators on small mammals, birds, reptiles, and amphibians. Feral and free-ranging cats also serve as reservoirs for several diseases, including rabies, toxoplasmosis, bartonellosis, typhus, and feline immunodeficiency virus, that can have significant effects on the health of humans, wildlife, and other domestic animals. Because humans often feed free-ranging cats, they can reach population levels that may result in abnormally high predation rates on wildlife and increase the spread of diseases. Domestic cats have tremendous impacts on wildlife and are responsible for the extinction of numerous mammals, reptiles, and at least 33 bird species globally. Effects of cat predation and disease spread are most pronounced in island settings (both actual islands and islands of habitat), where populations of wildlife are already low or stressed by other factors. Effects are also significant in natural areas where cat colonies become established. Competition with native predators, disease implications for native wildlife populations, and pet owners' attitudes toward wildlife and wildlife management also are important issues.

Extensive popular debate over absolute numbers or types of prey taken by feral and free-ranging cats is not productive. The number of cats is undeniably large. Even if conservative estimates of prey taken are considered, the number of prey animals killed is immense. The supplemental feeding of cats does not deter them from killing wildlife; often they do not eat what they kill. Likewise, population-level impacts of diseases associated with cats have only been established in a few wildlife species, such as southern sea otters (*Enhydra lutris nereis*), but negative individual


credit: Grant Sizemore

AMERICAN BIRD CONSERVANCY