


**Feral Cats and the Zombie
Apocalypse?**

**Infectious Diseases in
Community (Stray and Feral) Cats**

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**Greene's Infectious Diseases of the
Dog and Cat**

5th Edition

Authors: Jane Sykes
Hardcover ISBN: 9780323509343
Imprint: Saunders



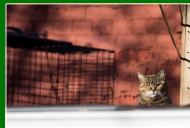
**FREE-ROAMING CATS, INFECTIOUS DISEASES, AND
THE ZOMBIE APOCALYPSE**

<http://www.voxfelina.com/2012/10/zoonotic-diseases-associated-with-free-roaming-cats/>

- Cats are classified by
 - Ownership status
 - Access to the outdoors
 - Socialization to humans
- Unowned cats – who is “feral” and who is “stray”?
- **Community cat** is an accepted umbrella term for un-owned, free-roaming cats



Hanna Booth, Toronto Street Cats



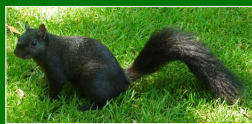
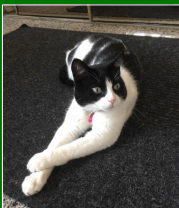
Annex Cat Rescue, Toronto

- **TNR**: Trap-Neuter-Return
- **Colony**: Group of community cats, typical size ~2-20
- **Colony caregiver**: Individual who provides food and shelter, often trapping for TNR



Annex Cat Rescue, Toronto

Where do they fit in?




torontolife.com;
thestar.com;
occasionaltoronto.
blogspot.com

Where do they fit in?



Neighborhood Cats, NY

Issues



REVIEW ARTICLE
A review of feral cat control

- 1) Predation on wildlife, extinction of native species, disruption of ecosystems
- 2) Welfare of the cats themselves
- 3) Public health and zoonotic disease
- 4) Spread of disease to pet cats
- 5) Spread of disease to other species
- 6) Public nuisance

Robertson 2008, Jnl Fe Med Surg 10-366

Predation



independent.co.uk; mnn.com; abcbirds.org

BIODIVERSITY LOSS


Decline of the North American avifauna

“..urgent need to address the ongoing threats of habitat loss, agricultural intensification, coastal disturbance, and direct anthropogenic mortality, all exacerbated by climate change”

Rosenberg 2019, Science 366:120

Challenges

- Convenience surveys vs. studies of disease ecology
- Different test methods
 - flotation vs. necropsy
 - serology vs. PCR



Neighborhood Cats, NY

Challenges

- Prevalence \neq risk
- Exposure \neq active infection
- Active infection \neq clinical illness



Annex Cat Rescue, Toronto

Challenges

- Transmission dynamics
 - prevalence in relation to transmission mode (Hwang)
- Biased or overstated conclusions



Hwang 2018, Peer J 6:e4988



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Disease transmission to/from pet cats



Hanna Booth, Toronto Street Cats

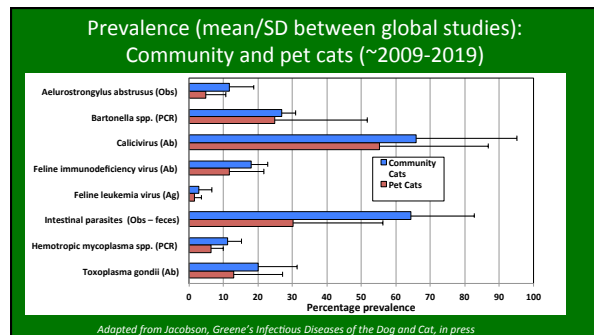


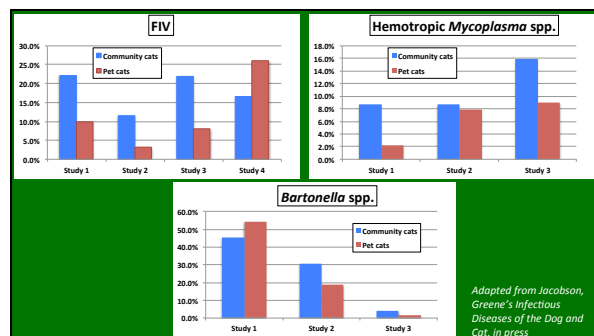
shilohvet.com

Seroprevalences of antibodies against *Bartonella henselae* and *Toxoplasma gondii* and fecal shedding of *Cryptosporidium* spp, *Giardia* spp, and *Toxocara cati* in feral and pet domestic cats

- 100 community cats, 76 pet cats, N. Carolina
- Similar: *Cryptosporidium*, *Giardia*, *Toxocara cati*
- Higher in community cats: *Bartonella henselae*, *Toxoplasma gondii*

Nutter 2004, JAVMA 9:1394







- Several pathogens common to felid species
- Sporadic reports of transmission to wildlife and zoo animals
- Little overlap of home ranges other than with urban wildlife
- Habitat fragmentation results in more overlap



wideopenpets.com



pinterest.com

Main concerns

- Rabies from wildlife to cats
- *Toxoplasma* from cats and other felids, to wildlife



aquablog.ca

Infectious diseases and the cats themselves



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How sick are they?



<https://www.peta.org/about-peta/why-peta/feral-cats/>



<https://bestfriends.org/our-work/best-friends-advocacy/protecting-community-cats>

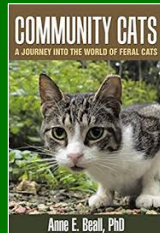
How sick are they?

- Morbidity and mortality data lacking
- High kitten mortality, cause typically unknown
- Outbreaks - ?
- Regional differences
 - Most reported to be healthy in US studies
 - More clinical concerns reported in European studies – underweight, stomatitis, skin conditions, respiratory infections, anemia

Colony caregiver experience



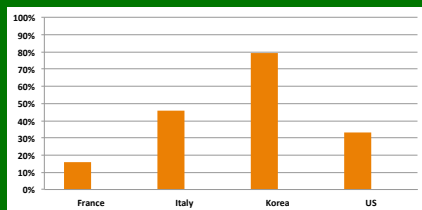
Cat Rescue Maritimes (CARMA)



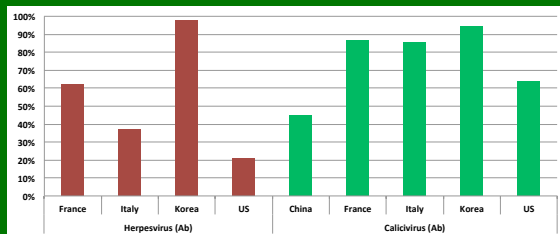
Treehouse HS, Chicago

Important feline diseases

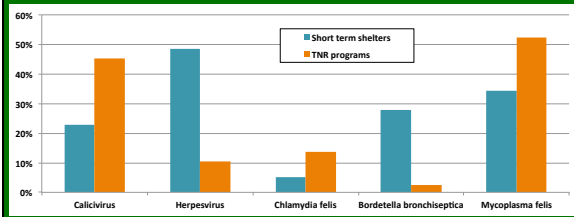
Panleukopenia seroprevalence (=exposure) in community cats



Respiratory pathogen seroprevalence in community cats



PCR prevalence of respiratory pathogens in shelter cats and TNR cats



Adapted from McManus 2014, Vet Int 2:196

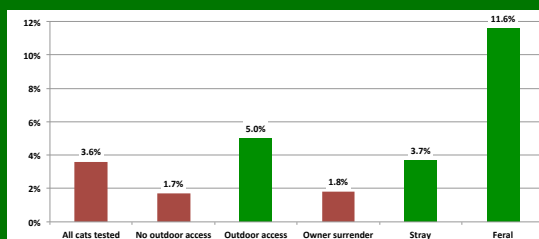
Feline retroviruses

- Variably higher prevalence among community cats compared with owned cats, esp. for FIV
- FIV more likely in:
 - Older intact males
 - Rural > urban
- FeLV:
 - No sex predisposition
 - Rural and urban similar

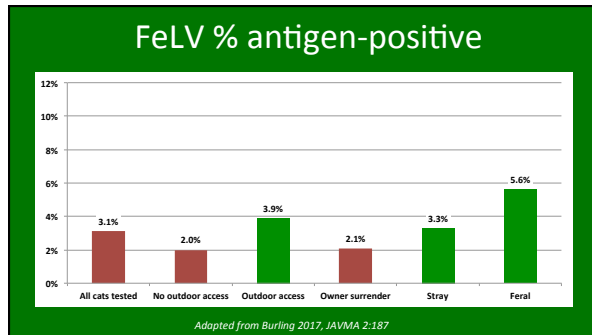


Hanna Booth, Toronto Street Cats

FIV % seroprevalence




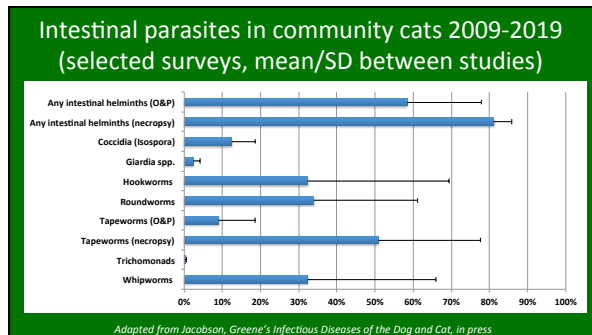
Adapted from Burling 2017, JAVMA 2:187



Endoparasites

- Common
- Co-infections more common vs. owned cats
- Kittens > adults; higher parasite burdens; greater morbidity





Most frequently identified species

- *Toxocara cati* >> other roundworms
- Hookworms usually reported at genus level; *Ancylostoma* spp.
- *Dipylidium caninum*
- *Taenia taeniaeformis*



Ectoparasites

- Cat flea is the most important
 - Typically not associated with skin lesions in surveys
- *Otodectes cynotis* is the only mite of importance
 - Typically not associated with clinical otitis in surveys
- Ticks and TBD uncommon



Zoonotic disease risks

Feline diseases with zoonotic potential

- **Important and/or relatively common:** Rabies, toxoplasmosis, toxocariasis, hookworm, cat scratch fever (*Bartonella henselae*), bite wound infections
- **Unlikely and/or extremely rare:** Tularemia (*Francisella tularensis*), plague (*Yersinia pestis*), rickettsial infections, giardiasis, *Cryptosporidium* infection, influenza, leptospirosis



Zoonotic Diseases Associated with Free-Roaming Cats

Gerhold & Jessup 2013, Zoonoses & Pub Hlth 60:189;

Wolf: *"Just how much of a threat do these cats pose?"*

"Just how much of a threat do these cats pose?"

"in reviewing the literature there is little information on the actual frequency of zoonotic diseases in which cats can be implicated."

Robertson 2008

Robertson 2008, Jnl Fe Med Surg 10:366



<https://alleycatadvocates.org/about-aca/>

Rabies

Rabies risk to humans

Human rabies deaths annually: **59,000**

% in Africa and Asia: **95%**

% exposure from dogs: **90%**

Rabies-positive animals in Canada 2016: **392**

% in wildlife 2014-2016: **93%**

Human rabies deaths in Canada since 1924: **25**

Rabies risk from cats

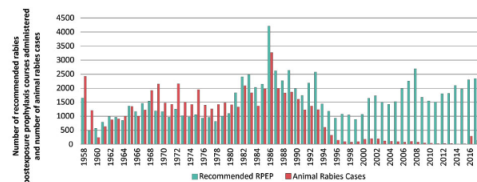
Cases in cats in Canada 2016-2018: **9**
 Cat-human transmission since 1960 (USA): **3**
 Cat-human transmission since 1925 (CA): **1**
 Cat-human exposure since 1967 (CA) (?): **1**

Calgary

Cat tests positive for rabies in southern Alberta after biting owner, owner's son

November 2018. **Pet** cat on a farm, suspected to have been infected by a bat.

<https://www.cbc.ca/news/canada/calgary/cat-rabies-alberta-1.4915853>



"One study...calculated that the risk of mortality from an automobile accident en route to receiving PEP was greater than the risk of mortality from rabies."

<https://www.canada.ca/en/public-health/services/reports-publications/canada-communicable-disease-report-cdr/monthly-issue/2019-45/issue-7-8-july-4-2019/article-2-rabies-postexposure-prophylaxis-rabid-terrestrial-animal.html>

Cat bites

Typical dog bite history	Typical cat bite history
Pet dogs	Community cats
On the owner's property	Off the owner's property
~50% unprovoked	~ 90% provoked
65% not vaccinated (RV)	92% not vaccinated (RV)
Dogs quarantined	Cats euthanized for testing

Patrick, 1998, Public Health Reports 113: 252



Hanna Booth, Toronto Street Cats



wildlife-removal.com

Management of cat bites

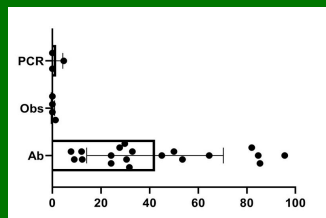
- Prophylactic antibiotics routinely prescribed:
 - Hands often affected
 - Infection is common - deep puncture wounds, *Pasteurella*
- Rabies assessment +/- PEP



catster.com

Toxoplasmosis

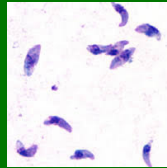
Effect of diagnostic method in *Toxoplasma* surveys of community cats



Jacobson, Greene's Infectious Diseases of the Dog and Cat, in press

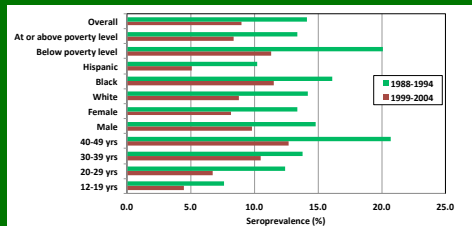
Transmission to humans

- Most human infection is from infected meat and contaminated water or soil
- Transplacental uncommon but serious
- Rarely through direct contact with cats



wikipedia.org

Toxoplasmosis seroprevalence in the US declined across all categories



Adapted from Jones 2007, Am J Trop Med Hyg 77:405

Zoonotic helminth infections

Ontario couple contract parasitic foot infection after Caribbean vacation



BY ARTI PATEL · GLOBAL NEWS

Posted January 30, 2018 3:50 pm

Updated February 1, 2018 3:49 pm

<https://globalnews.ca/news/3992746/couple-hookworm-punta-cana/>

Serious toxocariasis in Canada

- Ocular larval migrans, visceral larval migrans
- Canadian data 2002-2011
 - 0.010 per 100,000 (0.00001%)
 - No attempt to link infection to source

Schurer 2016, Am J Trop Med Hyg 1:168

Toxocara infection and cats

- Risk from cats frequently assumed but virtually no hard data
- Iceland – dogs banned 1924-1984, people exposed to cats remained seronegative

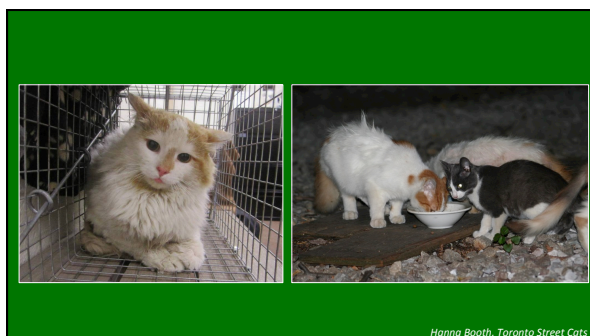


followmeaway.com

(Woodruff 1981, Brit Med Jnl 1:309)

Management and control of infectious diseases in community cats

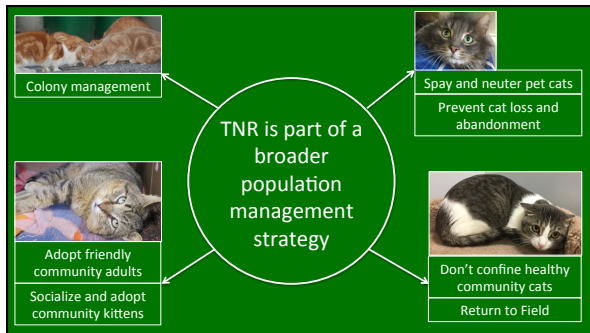




Population control

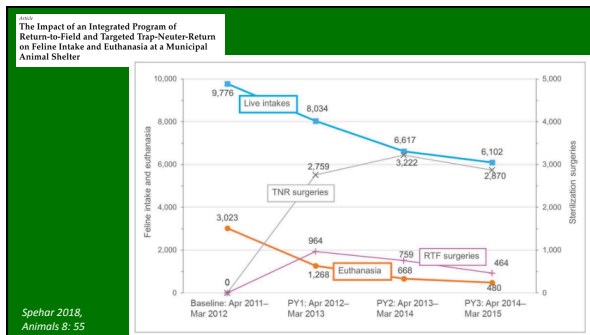
- Sizeable and growing body of evidence showing success of TNR
- **NO** body of evidence suggesting that lethal control and relocation are feasible or effective

operationcatnip.org



Benefits of population control

- 1) **Decreases** predation on wildlife, extinction of native species, disruption of ecosystems
- 2) **Improves** welfare of the cats themselves
- 3) **Decreases** risk to public and risk of zoonotic disease
- 4) **Decreases** risk of spread of disease to pet cats
- 5) **Decreases** risk of spread of disease to other species
- 6) **Decreases** public nuisance



Health benefits of TNR for the cats

- Improved health and longer lifespan
- Wellness care at clinic
- Less roaming and fighting – less injury and disease transmission
- Care from colony caregivers

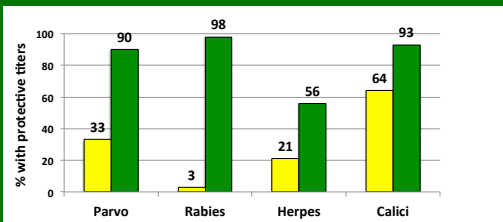


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Vaccination



Titres 60 days after a single RV, live FVRCP or killed FVRCP vaccine at TNR



Adapted from Fischer 2007, JAVMA 230: 52

Parasite control

- Likely to be of most benefit to juveniles
- Topical and injectable products at TNR
- Medication in food in colonies?



aspc.org

Effect of sporadic deworming

- Cat shelter in Brazil, communal housing with open-air access, no litterboxes
- Sporadic deworming was provided
- 49.5% prevalence of intestinal parasites vs. 77.3% in untreated community cats



pictures-of-cats.org

Pereira 2017, Revista Brasileira de Para Vet 3:383

Retrovirus testing and control

- Routine testing at TNR not recommended
- Focus resources on maximizing number of surgeries
- Sterilization reduces transmission by reducing fighting and preventing breeding



neighborhoodcats.org

Little 2020, Jnl Fe Med Surg 22:5

Education and safety

- Avoid handling unknown animals where possible
- Safe handling methods
- Appropriate PPE and hand hygiene



Working with managed colonies

- Caregivers develop close bonds with the cats
- Medical considerations:
 - Ability to deliver care
 - Peri-operative care
 - Welfare when confined
 - Ability to survive outdoors after treatment



“Don’t Kitnap the Kittens”

- Kitten season
- “Orphan” kittens frequently have a mother
- Too-early removal
 - Behavioural and medical problems
 - Avoidable euthanasia in shelters



“Don’t Kitnap the Kittens”

- Educate the public to care for queen and kittens until 4-5 weeks old
- Kittens can then be socialized for rehoming and queen trapped for TNR



Thank you! Questions?



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