



BIOLOGY AND BEHAVIOR OF THE CAT

Cats have lived outdoors for thousands of years. They are part of the natural landscape, and there are many biological and behavioral reasons why they are not a threat to other species. But opponents of Trap-Neuter-Return (TNR) still accuse outdoor cats of being responsible for the decline of birds and wildlife. Science clears cats of blame—studies prove that cats are not a significant threat (especially when compared to the very real dangers from human activities) and that they actually play important roles in balancing the local ecosystem. For example, they often step in to fill the place of now extinct or greatly diminished small predators.



Dietary Biology: What Cats Really Eat

Studying cats' diet and behaviors exonerates them as a culprit behind wildlife decline.

CATS ARE SCAVENGERS

Feral cats are opportunistic feeders—they will eat whatever food is easiest to find. For many feral cats, people's garbage is a main source of food. Just as cats 10,000 years ago were attracted to the easy, consistent food source that the first human settlements provided (see www.alleycat.org/CatHistory), feral cats today scavenge on the scraps that all human habitats inevitably produce.¹ A study of a feral cat colony in Brooklyn found that the cats depended more on local garbage for food than on either prey or food provided by caregivers, and that the neighborhood produced enough garbage to feed three times more cats than actually lived in that area.²

IF THEY HUNT, CATS PREFER RODENTS

The staunchest opponents of TNR would prefer having all outside cats be rounded up and killed instead of allowed to continue their lives outdoors. They mislead the public into believing that cats are decimating countless songbird populations. However, decades of studies prove that when cats do hunt—which isn't nearly as often as people think—rodents and insects are the prey they hunt and consume most often. Studies have shown cats to be far more efficient hunters when they sit and wait for prey—outside a rodent burrow, for example—than when they stalk and pounce, the way they approach birds.³ As opportunistic feeders, cats are more likely to go for your garbage, eat bugs, or sit and wait to catch rodents than take their chances chasing birds who can easily spot them and fly away.

In fact, studies of samples from the diets of outdoor cats confirm that mammals appear three times more often than birds. Birds are consumed only incidentally and not according to a regular feeding pattern.

SO WHAT DO CATS EAT?

As noted above, cats primarily scavenge for food and eat scraps and refuse—whatever food is easiest and most abundant to find—and typically hunt only when other, easier food sources are scarce. When they do hunt, cat diet studies show that instead of catching a large number of a specific species of bird, they catch individual birds of several different species—usually the most common species in the area.⁴ A study of cat predation on rabbits similarly observed that cats' prey is the most numerous prey species in that area for that time of year. Endangered species were rarely on the menu, and even then not as the primary prey.⁵

Understanding Ecosystems: Why Removing Cats is Worse for Everyone

Opponents of TNR often call for cats to be trapped and killed or relocated to protect wildlife. Since there is no evidence that cats are a species-endangering threat to any of our bird species, there's no foundation for calls to remove and/or kill outdoor cats from the American landscape. Cats play a complex role in local ecosystems and cannot simply be removed from any environment without consequences. The scientific phenomena discussed in this section—compensatory predation, the mesopredator release effect, and the vacuum effect—illustrate why removing cats is harmful to the entire habitat and why Trap-Neuter-Return is truly the best approach.

COMPENSATORY PREDATION

Although cats do occasionally prey on other animals, taking a bird here or there doesn't necessarily impact the survival of the species. Evidence suggests that cat predation is often "compensatory predation"—preying on animals that would likely have died anyway from disease or hunger. Studies show that the animals caught by predators are generally weaker and more diseased than those killed by manmade sources.^{6,7} One study found that "birds killed by cats had significantly lower mass, fat scores, and pectoral muscle mass scores" than birds of the same species killed by cars or windows.⁸ These studies indicate that cats are catching what some biologists refer to as the "doomed surplus"⁹—animals who would not have lived and so whose death does not affect overall population levels.

COMPLEX ECOSYSTEMS

Maintaining ecological balance is far more complicated than cats versus birds, predator versus prey. While cats sometimes might be the top predators in their environments, some of the animals they prey on are also predators, like rats. The predators who fall lower on the food chain are called *mesopredators*. They prey on certain species—in the case of rats, small or fledgling birds and bird eggs—while being prey to larger predators themselves.

Removing cats from the ecosystem can destabilize the relationships between the different predator and prey species, with dire consequences.¹⁰ On Amsterdam Island in the Indian Ocean, an attempt to eradicate feral cats to protect endangered birds caused a spike in the rat and mouse population. The rats and mice then preyed on the birds—making the cat eradication ineffective at conserving bird populations.¹¹

Mathematical models in scientific studies project that cats, rats, and birds can find a balance where all three species co-exist. But when the cats are removed in these simulations, the rat population surges out of control, wiping out the birds completely. Although the cats in this scenario may occasionally prey on a bird, removing the top predator completely is far worse for the prey species' survival.^{12, 13}

ENVIRONMENTAL IMPACT

When people misguidedly remove cats to protect wildlife, they risk seriously harming both the environment and the species they aim to protect. A real-life study of a coordinated cat eradication effort on an island—intended to protect endangered species from predation—saw the rabbit population on the island spike wildly. Without the cats to keep prey species in check, the rabbits devastated local vegetation, which harmed other animal species, and a wave of more than 130,000 rodents entered the ecosystem. In their report of the eradication effort, the researchers directly linked this damage to the removal of the cats, concluding: “the unintended consequences have been dire.”¹⁴

THE VACUUM EFFECT

Cats choose to live in an area for two reasons: because there is a food and water source—and because there is shelter. The availability of these resources determines the number of cats who can live off of these resources. If the cats are removed, other cats will take advantage of these same resources, whether they move in from neighboring territories or are born from survivors. This phenomenon is known as the vacuum effect and is scientifically documented across a variety of species—and corroborated by decades of failed animal control policy. Learn more about the vacuum effect at www.alleycat.org/VacuumEffectScience.

TRAP-NEUTER-RETURN BENEFITS CATS AND WILDLIFE

Trap-Neuter-Return is the only approach that stabilizes cat populations. With TNR, there are no more kittens, and sterile adult cats are left in their territory to prevent new, intact cats from coming into the space—while allowing these top predators to remain in the habitat, preempting problems like the destabilization of the ecosystem or attracting new, intact cats. Choosing the survival of either cats or wildlife over the other is wrong and unnecessary. The best approach for all animals is the same: TNR.

Seeing the Whole Picture

Predation and conservation are not about one cat and one bird. These complex issues affect entire species, whole ecosystems, and millions of animals. As animal advocates, we want what's best for all of them. A cat will eat whatever is easiest to obtain—be it garbage, cat food, or sometimes prey. But when we look at the big picture, scientific evidence consistently exonerates the domestic cat species of threatening wildlife. For this reason, the Royal Society for the Protection of Birds has said that “we have no scientific evidence of the impact of cat predation on bird populations that is strong enough to support such a call” to legislate against free roaming cats.

- ¹ Yamane, A., J. Emoto and N. Ota. Factors affecting feeding order and social tolerance to kittens in the group-living feral cat (*Felis catus*). *Applied Animal Behaviour Science* 52 (1997): 119-127.
- ² Calhoun, Robert E. and Carol Haspel. Urban cat populations compared by season, subhabitat and supplemental feeding. *Journal of Animal Ecology* 58 (1989): 321-328.
- ³ Fitzgerald, B. Mike and Dennis Turner. Hunting behaviour of domestic cats and their impact on prey populations. In *The Domestic Cat: The Biology of Its Behavior, 2nd Ed.*, Turner, Dennis C. and Patrick Bateson eds. (Cambridge University Press: New York, 2000) 153-154.
- ⁴ *Ibid.*, 164.
- ⁵ *Ibid.*, 160.
- ⁶ Møller, Anders P., Johannes Erritzøe and Jan T. Nielsen. Frequency of fault bars in feathers of birds and susceptibility to predation. *Biological Journal of the Linnean Society* 97 (2009): 334-345.
- ⁷ Leyhausen, Paul. *Cat Behavior: The Predatory and Social Behavior of Domestic and Wild Cats*, (New York: Garland STPM Press, 1979), 78.
- ⁸ Baker, Philip J., et. al. Cats about town: is predation by free-ranging pet cats *Felis catus* likely to affect urban bird populations?. *Ibis* 150 (Suppl. 1) (2008): 86-99.
- ⁹ Lilith, Maggie. Do pet cats (*Felis catus*) have an impact on species richness and abundance of native mammals in low-density Western Australian Suburbia? Ph.D. thesis for Murdoch University, Western Australia. 2007.
- ¹⁰ Soulé, M. E., D. T. Bolger, A. C. Alberts, J. Wright, M. Sorice, and S. Hill. 1988. Reconstructed dynamics of rapid extinctions of chaparral-requiring birds in urban habitat islands. *Conservation Biology* 2:75-92.
- ¹¹ Isabelle M. Cote and William J. Sutherland, "The Effectiveness of Removing Predators to Protect Bird Population," *Conservation Biology* 11 (1997): 402.
- ¹² Fan, Meng, Yang Kuang, and Zhilan Feng. Cats Protecting Birds Revisited. *Bulletin of Mathematical Biology* 67 (2005): 1081-1106.
- ¹³ Courchamp, Frank, Michel Langlais, and George Sugihara. Cats Protecting Birds: Modeling the Mesopredator Release Effect. *Journal of Animal Ecology* 68 (1999): 262-292.
- ¹⁴ Bergstrom, Dana M., A. Lucieer, K. Kiefer, J. Wasley, L. Belbin, T.K. Pedersen and S.L. Chown. Indirect effects of invasive species removal devastate World Heritage Island. *Journal of Applied Ecology* 46 (2009): 73-81.

ABOUT ALLEY CAT ALLIES

Alley Cat Allies is the only national nonprofit dedicated exclusively to the protection and humane treatment of all cats.

For over 25 years, Alley Cat Allies has led the movement to save cats' lives. With advocacy, education, and grassroots organizing, we champion innovative programs and policies that serve communities and save cats. Since our founding in 1990, we have popularized Trap-Neuter-Return (TNR) as the only humane and effective approach to community cats. Before Alley Cat Allies, TNR was virtually unknown in America, and no local governments supported it. Today, more than 600 municipalities have officially embraced TNR.

Alley Cat Allies has changed how all cats are treated—pet, stray, feral, and each cat in between. We advocate for a variety of progressive policies to protect cats, including the transformation of the American animal shelter system, which still routinely kills 70 percent of all cats who enter.

Thanks to our more than half a million supporters and countless advocates, Alley Cat Allies works in hundreds of communities each year. To learn more about how we save cats' lives, visit www.alleycat.org.