TNVR and Public Health

WHAT IS TNVR?

Trap-neuter-vaccinate-return (TNVR) was first introduced during the 1950s in Britain, and then in Denmark during the 1970s. The practice was introduced in the U.S. around the same time but remained largely "underground" until the early 1990s [1]. The first large U.S. city to embrace TNVR as a fundamental part of its approach to animal sheltering was Jacksonville, Florida, in 2008, followed by San José, California, in 2010 [2,3]. Today, TNVR is commonplace across the U.S., in communities large and small, urban and rural.

TNVR is simple: cats are humanely trapped, evaluated by veterinary professionals, vaccinated against the rabies virus,* spayed or neutered, and returned to where they were trapped, unable to have kittens. Targeted TNVR programs offer a commonsense, effective, and economical alternative to the traditional "catch-and-kill" approach. Mark Kumpf, former president of the National Animal Care & Control Association (NACA), compared the traditional method for managing cats to "bailing the ocean with a thimble."

> *"There's no department that I'm aware of that has enough money in their budget to simply practice the old capture-and-euthanize policy, nature just keeps having more kittens." [4]*

In 2021, NACA revised its policy on Animal Control Intake of Free-Roaming Cats, highlighting the benefits of TNVR [5].

> *"indiscriminate pick up or admission of healthy, free-roaming cats, regardless of temperament, for any purpose other than [TNVR]… fails to serve commonly held goals of community animal management and protection programs and, as such, is a misuse of time and public funds and should be avoided."*
>
> — National Animal Care & Control Association

* The FVRCP (feline viral rhinotracheitis, calicivirus and panleukopenia) vaccine is also recommended.

In 2017, the American Bar Association approved a resolution "support[ing] the recognition of [TNVR] as a population management technique… [and] supports the adoption of laws and policies supportive of [TNVR] programs with the intent of decreasing community cat populations and improving public health and safety…" [6].

- Rural North Carolina: 36% average reduction in six groups of sterilized cats over the first two years; meanwhile, the population of three unsterilized groups increased by 47% [8]. Additional reductions among the sterilized groups were documented during four- and seven-year follow-up censuses [9].

THE MANY BENEFITS OF TNVR

As the following summary illustrates, TNVR offers many benefits—not only to the cats but to communities and their animal shelters.

Reducing community cat populations

A number of peer-reviewed studies have shown that targeted TNVR can reduce community cat populations. For example:

- Computer modeling suggests that population reductions are achievable if at least 40% of the unsterilized portion of a given population is sterilized every six months [7]. For a group of 10 cats, that's three cats in the first six months, two cats in the following six months, and so forth.
- Chicago, Illinois: a neighborhood TNVR program (comprised of 20 groups of cats) resulted in an average 54% decrease from initial population levels and an average 82% decrease from their peak levels [10].
- University of Central Florida: population reduction of 66% over the first six years tracking data was available, from 68 to 23 cats [11]. Over the subsequent 17 years, the program further reduced the population of free-roaming cats by 57%, from 23 to 10 cats [12].
- Key Largo, Florida: 55% reduction in community cat numbers over 14 years, from 455 to 206 cats [13].

- Newburyport, Massachusetts: TNVR reduced and, after 17 years, eliminated, an estimated 300 cats from the city's waterfront [14].

More effective than removal

For years, the standard response to community cats was removal—despite a lack of evidence that it reduced their numbers. Targeted TNVR, by contrast, has been shown to reduce community cat populations.

- Louisiana hospital: reduced the original population of free-roaming cats by 25% (from 40 cats to 30), and the overall population by 10% (due to the arrival of six new cats) over three years. No new litters of kittens were reported during this same time period. Prior to the program's implementation, several cats had been removed annually but "a noticeable reduction in overall numbers was never achieved" [15].
- Researchers have found that "low-level ad hoc culling of feral cats" is ineffective at reducing their numbers. This might actually lead to their increase due to "influxes of new [adult] individuals after dominant resident cats were removed" [16].
- More intensive culling has also proven ineffective. Removal of "an estimated 44% of the population" (based on camera trap data) failed to provide any long-term benefit. "Three months after the end of the culling campaign that eliminated 36 cats… no meaningful differences in the relative abundance and density of feral cats were observed in response to culling…" [17].

Decreased shelter intake and euthanasia

Targeted TNVR has also been shown to reduce shelter intake and euthanasia, as the following research studies demonstrate:

- Alachua County, Florida: 66% reduction in shelter intake of cats from a "target" zip code of focused TNVR efforts; intake from the remainder of the county decreased just 12% over the same two-year period [20].
- San José, California: 14% reduction in feline intake four years after implementing its shelter-based TNVR program [21].
- Best Friends' six large-scale, three-year programs integrating community- and shelter-based TNVR: median reduction of 32% (range: 1–45%) in feline intake. In addition, we observed a 40% median reduction in the number of kittens entering the shelters involved—suggesting that the programs had positive population-level impacts [22,23].
- Louisville Metro Animal Services (concurrent community- and shelter-based TNVR programs): euthanasia declined by 94% and feline admissions dropped by 43% over an eight-year period [24].
- Reduced euthanasia is likely to reduce workplace stress on government or private shelter staff [25]. Such occupational hazards can have direct—and potentially costly—consequences for the organizations: "Excessive employee turnover can create a host of strains on an organization—especially if the organization is understaffed and underfunded as are many animal shelters" [26].

> *"TNR can be an effective method for both reducing feral cat populations and reducing the number of cats and kittens entering local animal shelters."*
>
> — National Feline Research Council

- Population reductions benefit wildlife, too. Since at least 2005, a TNVR program has been in place on the campus of the University of KwaZulu-Natal's Howard College (in Durban, South Africa), which is recognized as an "urban conservancy… interspersed with conservation-sensitive natural bush habitat and a nature reserve on the northern border" [18]. Sterilization efforts led to a 38% reduction in the number of cats on campus (from 55 to 34) after four years [18,19].

Improved public health

- Rabies in domestic animals was once relatively common; however, data compiled by the CDC show that nearly 93% of rabies cases in the U.S. occur in wildlife [27].
- TNVR programs protect public health by creating a powerful barrier between wildlife and humans—and not every cat needs to be vaccinated to achieve "herd immunity" [28].

- Between 1975 and 2018 (the latest year for which data are available), the CDC has documented 115 cases of human rabies in the U.S.—most of which were attributed to contact with wildlife. Of the 26 cases attributed to domestic animals, 25 were attributed to dogs (nearly all exposures occurred outside the U.S.) Just one case was attributed to contact with a cat [29].
- A study of patients seeking post-exposure treatment at 11 emergency departments found that 81% of 2,030 exposures were attributed to dogs while just 13% were attributed to cats [30]. Moreover, 499 of 1,499 dog exposures (33%) occurred in the public street or park, compared to 29 of 248 cat exposures (12%); by contrast, 358 of 1,499 dog exposures (24%) occurred in the home, compared to 132 of 248 cat exposures (53%) [31].

number of complaints… [cats] who remain are less of a nuisance than previously they were" [33].

- Gillis W. Long Hansen's Disease Center (Carville, Louisiana): "unwanted noise from cats fighting and from mating calls was commonly heard during nocturnal visits to the cats' living areas before the study. Three years later, nocturnal vocalizing had been greatly reduced and was not detected by the authors at any time during the three-year census" [15].
- Orange County, Florida: "Complaints have decreased gradually, and only rarely has it been necessary to move colonies… despite the change broadening the definition of a nuisance complaint in the last two years, complaints decreased in FY 2000/2001. There were no changes in procedure or code to account for this decrease" [34].

Reductions in nuisance complaints

Published research studies indicate that targeted TNVR efforts can reduce nuisance complaints, as these programs "not only address the overpopulation issue by preventing new litters, but also serve to reduce roaming, spraying of urine, and fighting among the cats" [32].

- Texas A&M campus: researchers documented the removal of more than one-third of the free-roaming cats for adoption following the implementation of a TNVR program "based on the decrease in the
- Alachua County, Florida: fewer nuisance complaints likely contributed to a 66% reduction in shelter admissions from the target zip code [20].

Cost-effectiveness

Recent computer modeling from the Alliance for Contraception in Cats & Dogs shows that sterilizing 75% of cats in a particular population every six months is more cost-effective than many lower-intensity lethal removal scenarios. The researchers acknowledge that

this requires a “disproportionate investment of time and resources during the early management period,” but point out that “these expenditures are compensated for by cost savings at later time periods and by lower final abundances for a given overall investment” [35]. Empirical evidence, too, has demonstrated the cost-effectiveness of targeted TNVR:

- Orange County, Florida: Data compiled over 12 years (six prior to the program’s implementation and six afterward) were used to estimate and compare costs associated with impoundment/killing and TNVR. The average cost of sterilization and vaccination was estimated to be $56 while “the average total cost per impounded animal for impounding, sheltering, and processing the [nuisance] complaint was $139.” As a result, the TNVR program saved taxpayers an estimated $656,000 over the course of 12 years [34].
- Cook County, Illinois (six years after implementation): TNVR program had “saved the county over $1.5 million, primarily resulting from having fewer feral cats to euthanize” based on an estimated $135 for trapping, impounding, and killing each cat [36].
- Hillsborough County, Florida: cost to sterilize and vaccinate cats to be $65 per cat “as opposed to $168 for [HCAS] picking-up, handling, and disposing of an animal” [37].
- San José, California: approximately $72 per cat” for “vaccinations against rabies and other common cat disease, flea treatment, ear treatment, microchip, and ear-tipping” [2].

SUMMARY

Targeted TNVR offers several benefits, including reduced community cat populations, reduced shelter intake and euthanasia, improved public health, reduced nuisance complaints, and cost-effectiveness. No wonder TNVR has become commonplace across the country, in communities large and small, urban and rural.

ABOUT BEST FRIENDS

Founded in 1984, Best Friends Animal Society is a leading national animal welfare organization dedicated to saving the lives of dogs and cats in America’s shelters. Best Friends operates one of the nation’s largest sanctuaries for companion animals and has helped reduce the number of lives unnecessarily lost in shelters nationwide from an estimated 17 million per year to around 733,000. Sadly, around 114,000 of those pets were right here in Texas. But that’s about to change: Best Friends has a long history of working in the Greater Houston area. We have invested more than $8 million through 2019—about $3.8 million alone following Hurricane Harvey alone. We’ve helped increase the save rate for Houston area pets from 67% in 2016 to 94% in 2021. With Greater Houston leading the way, Texas can become a model state when it comes to saving lives.

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