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Effect of high-impact targeted trap-neuter-return and adoption of community cats on cat intake to a shelter

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ABSTRACT

Approximately 2–3 million cats enter animal shelters annually in the United States. A large proportion of these are unowned community cats that have no one to reclaim them and may be too unsocialized for adoption. More than half of impounded cats are euthanased due to shelter crowding, shelter-acquired disease or feral behavior. Trap-neuter-return (TNR), an alternative to shelter impoundment, improves cat welfare and reduces the size of cat colonies, but has been regarded as too impractical to reduce cat populations on a larger scale or to limit shelter cat intake. The aim of this study was to assess the effect of TNR concentrated in a region of historically high cat impoundments in a Florida community. A 2-year program was implemented to capture and neuter at least 50% of the estimated community cats in a single 11.9 km^2 zip code area, followed by return to the neighborhood or adoption. Trends in shelter cat intake from the target zip code were compared to the rest of the county.

A total of 2366 cats, representing approximately 54% of the projected community cat population in the targeted area, were captured for the TNR program over the 2-year study period. After 2 years, per capita shelter intake was 3.5-fold higher and per capita shelter euthanasia was 17.5-fold higher in the non-target area than in the target area. Shelter cat impoundment from the target area where 60 cats/1000 residents were neutered annually decreased by 66% during the 2-year study period, compared to a decrease of 12% in the non-target area, where only 12 cats/1000 residents were neutered annually. High-impact TNR combined with the adoption of socialized cats and nuisance resolution counseling for residents is an effective tool for reducing shelter cat intake.

Introduction

Approximately 2–3 million cats are impounded in animal shelters annually in the USA and over half of these are euthanased due to shelter crowding, shelter-acquired disease or feral behavior. Free-roaming, unowned stray and feral 'community cats' are estimated to number in the tens of millions throughout the USA (Levy and Crawford, 2004). Whereas >80% of owned pet cats are neutered, it is estimated that only 2% of community cats are neutered (Wallace and Levy, 2006; Chu et al., 2009). The sheer numbers and high reproductive capacity of community cats combine to make them the leading source of new kitten births and the greatest source of cats impounded in animal shelters.

In the past three decades, an alternative population control strategy known as trap-neuter-return (TNR) has been adopted by increasing numbers of non-profit humane organizations and municipal animal control shelters. In this process, cats that are thriving in the community are captured, neutered, vaccinated and returned to their original locations. Many programs combine TNR with adoption of socialized cats and kittens, which creates an immediate reduction in cat colony size, while the permanent, resident cats are gradually reduced by attrition.

Numerous studies have shown that fertility control via TNR is effective in reducing cat colony size over time. A population of 155 cats in 11 colonies on a Florida university campus was reduced to 23 over 11 years, and three colonies became extinct (Levy et al., 2003a). Cats in six colonies in rural North Carolina were reduced by 36% in 2 years and continued to decline or the colonies were extinguished over the next 5 years (Nutter, 2005). In Rome, 103 colonies experienced an average decrease of 22%, while a colony at a Rio de Janeiro zoo fell by 58% over 7 years (Mendes-de-Almeida et al., 2011). In Florida, 132 colonies containing 920 cats were reduced by 26% in the first year of a TNR program (Centonze and Levy, 2002).

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While TNR has been well documented to reduce or eliminate cat populations at the colony level, it has yet to be shown whether the strategy can be adequately scaled up to remain effective over larger areas or can reduce the number of cats impounded in shelters. Population models demonstrate that controlling community-wide cat populations via TNR is theoretically possible, but could require sterilization rates of 51–94% (Andersen et al., 2004; Foley et al., 2005; Budke and Slater, 2009; Schmidt et al., 2009; McCarthy et al., 2013). Cat feeding surveys indicate that there are likely to be at least 100 community cats for every 1000 human residents (Levy et al., 2003b; Lord, 2008; Kass et al., 2013), suggesting that even relatively small communities can have tens of thousands of cats that might overwhelm the existing local TNR capacity.

The aim of this study was to assess the effect of high-impact TNR concentrated in a region of historically high cat impoundments in a Florida community. A 2-year program was implemented to capture and neuter at least 50% of the estimated community cats in a single zip code, followed by return to the neighborhood or adoption. Trends in shelter cat intake from the target zip code were compared to the rest of the county for the 5 years prior to the intervention and the 2-year study period of intensive TNR.

Materials and methods

Study community

Alachua County is located in north-central Florida. It has a geographic land mass of 2266 km^2 and a population of 247,366 in 2010.[1] Approximately half of the human population resides in the city of Gainesville and approximately one-quarter of the county population is comprised of students at the University of Florida and Santa Fe College.

The county is served by a single open-admission municipal animal shelter (Alachua County Animal Services) that receives stray and owner-relinquished pets. The shelter adopts out some animals and transfers others to a humane society and several pet rescue groups for adoption. Animals are also euthanased for behavioral reasons, poor health and to relieve crowding. In the baseline year of this study, the shelter impounded 3996 cats (71% as strays) and 4389 dogs (62% as strays). The shelter euthanased 2520 cats (63%) and 1936 dogs (44%). Intake and euthanasia of cats and dogs at the municipal shelter have been decreasing steadily for more than a decade.

Target area

The target area was selected to represent a discrete geographical urban area in which shelter cat intake was higher than in other areas of the county. The non-target area was the remainder of the county. The target area selected was zip code 32601, which included 0.5% of the county's land mass (11.9 km^2), 8% of the human residents and 6% of the baseline year cat intake by the county shelter (Table 1). Shelter cat intake in the baseline year was 247 (21 cats/km^2) compared to 3749 cats in the non-targeted remainder of the county (1.5 cats/km^2; Table 2). Cat intake per capita was similar in the target area (13/1000 residents) and the non-target area (15/1000 residents). In the previous 5 years, the countywide TNR program performed an average of 124 cat surgeries annually in the target area.

The target area was adjacent to the University of Florida campus and included the downtown Gainesville dining and business district, several residential neighborhoods, a mobile home park, two homeless shelters, industrial parks and one veterinary clinic. The target area was classified as lower middle class compared to other Florida zip codes. Compared to the county as a whole, the target area had higher unemployment, higher poverty, lower household income and lower homeownership (Table 1). The racial and educational trends were similar in both areas. The center of the target area was 8.9 km from the shelter.

Household survey

At the beginning of study year 1, a randomized telephone survey of households in the target area was conducted by a commercial polling service (Bureau of Economic and Business Research, University of Florida) regarding pet ownership and activities involving community cats. This information was used to estimate the number of community cats fed by residents of the target area. For each telephone number, up to 10 calls were attempted at various times, including week days, evenings, and weekends, to contact potential respondents. Interviewers read from a prepared script and surveyed any adult at least 18 years old in the household who agreed to participate. The survey was approved by the University of Florida Institutional Review Board.

[1] See: http://www.census.gov (accessed 26 April 2014).

Table 1
Geographic and human demographic characteristics of Alachua County, Florida, USA, and target area zip code (32601).

	Alachua county	Target area
Geography		
Land mass (km^2)	2,266	11.9
Population of human beings		
Total population	247,366	18,585
Average household size	2.3	2.3
Average family size	2.9	3.1
Housing		
Total housing units	112,766	9,277
Owner occupied	54,768 (49%)	1,920 (21%)
Renter occupied	45,748 (41%)	5,813 (63%)
Vacant	12,250 (11%)	1,544 (17%)
Median home value (US$)[a]	$176,300	$147,000
Median monthly rent (US$)[a]	$895	$791
Racial background		
Caucasian	172,156 (70%)	12,808 (69%)
African-American	50,282 (20%)	3,728 (20%)
Other	24,928 (10%)	2,049 (11%)
Employment and income		
Per capita income (US$)[a]	$25,287	$15,238
Median household income (US$)[a]	$42,818	$22,103
Unemployment rate	7.9%	9.4%
Individuals below poverty level	24%	43%
Highest educational achievement (>25 years old)		
No high school diploma (or equivalent)	13,479 (9%)	790 (9%)
High school	56,406 (39%)	3,253 (38%)
Associate's degree	15,724 (11%)	673 (8%)
Bachelor's degree or higher	60,012 (41%)	3,781 (44%)

[a] US$1.00 = GBR£0.59 = €0.72 as at 30 April 2014.

Community outreach and assistance

Informational postcards explaining the free TNR program were mailed to every residential and business address in the target area five times during the 2-year program. Flyers and brochures were distributed to business locations and churches. Study staff members and volunteers went door to door to speak with residents about the neutering program. Residents were encouraged to contact program staff if they were aware of unowned community cats that had not been sterilized. Humane traps

Table 2
Baseline animal control shelter cat and dog intake and disposition in non-target and target areas.

	Non-target area	Target area
Cats		
Cat intake		
Total cats	3749	247
Cats/square mile	4	54
Cats/1000 human residents	15	13
Location of intake		
Cat intake from field	1181 (32%)	116 (47%)
Cat intake at shelter	2568 (68%)	131 (53%)
Type of intake		
Stray cats	2660 (71%)	190 (77%)
Owned cats	1089 (29%)	57 (23%)
Euthanasia	2363 (63%)	157 (64%)
Dogs		
Dog intake		
Total dogs	4123	266
Dogs/square mile	5	58
Dogs/1000 residents	17	14
Intake location		
Dog intake from field	1882 (46%)	148 (56%)
Dog intake at shelter	2241 (54%)	118 (44%)
Type of intake		
Stray dogs	2541 (62%)	161 (61%)
Owned dogs	1582 (38%)	105 (39%)
Euthanasia	1816 (44%)	120 (45%)