

# Time and financial costs of programs for live trapping feral cats

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**Objective**—To determine the time and financial costs of programs for live trapping feral cats and determine whether allowing cats to become acclimated to the traps improved trapping effectiveness.

**Design**—Prospective cohort study.

**Animals**—107 feral cats in 9 colonies.

**Procedure**—15 traps were set at each colony for 5 consecutive nights, and 5 traps were then set per night until trapping was complete. In 4 colonies, traps were immediately baited and set; in the remaining 5 colonies, traps were left open and cats were fed in the traps for 3 days prior to the initiation of trapping. Costs for bait and labor were calculated, and trapping effort and efficiency were assessed.

**Results**—Mean  $\pm$  SD overall trapping effort (ie, number of trap-nights until at least 90% of the cats in the colony had been captured or until no more than 1 cat remained untrapped) was  $8.9 \pm 3.9$  trap-nights per cat captured. Mean overall trapping efficiency (ie, percentage of cats captured per colony) was  $98.0 \pm 4.0\%$ . There were no significant differences in trapping effort or efficiency between colonies that were provided an acclimation period and colonies that were not. Overall trapping costs were significantly higher for colonies provided an acclimation period.

**Conclusions and Clinical Relevance**—Results suggest that these live-trapping protocols were effective. Feeding cats their regular diets in the traps for 3 days prior to the initiation of trapping did not have a significant effect on trapping effort or efficiency in the present study but was associated with significant increases in trapping costs. (*J Am Vet Med Assoc* 2004;225:1403–1405)

**T**rap-neuter-return (TNR) programs have been used to manage colonies of feral cats in Europe and the United Kingdom since the early 1970s and are becoming increasingly popular in the United States.<sup>1-5</sup> However, techniques for live trapping of feral cats have not been well described in the literature,<sup>3,6-8</sup> and although baits and olfactory attractants have been developed, they have not been combined with live-trapping attempts.<sup>9-11</sup>

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Feral cats are naturally wary of unusual conditions in their environment, meaning that some feral cats may be reluctant to approach and enter traps, regardless of whether they contain bait or olfactory attractants. In an attempt to overcome this problem, some groups have suggested that baited traps that have been rigged so their doors will not close be placed in the cats' environment for several days prior to the initiation of any trapping program,<sup>12-14</sup> as it is thought that this will help to accustom the cats to the traps and increase the likelihood that they will be captured. However, whether this has any effect on trapping efficiency is not known. Furthermore, the costs of programs for trapping feral cats, beyond the initial costs of the traps themselves, have not been evaluated.<sup>15</sup> The study reported here compares the time and financial costs of 2 alternative approaches to live trapping feral cats: initiating trapping immediately versus acclimating cats to the traps prior to trapping.

## Materials and Methods

**Feral cat colonies**—The study involved 9 feral cat colonies in Randolph County, NC. Cats in the 9 colonies were live trapped between May and August 1998 as part of a prospective study evaluating the effects of TNR programs on feral cat colonies. Colonies were identified and referred to the investigators by the Randolph County Humane Society. After initial contact was made with the caretakers, all colonies were visited at least twice and assessed for suitability for inclusion in the study. Colonies were included in the study only if they had an established caretaker who provided food and water on a regular basis; cats in the colony had access to adequate shelter, such as a barn, storage shed, carport, basement, or crawl space; the colony consisted of at least 10 adult cats (ie, cats > 6 months old), with at least 3 adult male cats; and the colony was located in a rural or suburban residential area at least 1 km from the nearest 4-lane road.

**Trapping protocols**—Live traps<sup>a</sup> lined with clean newspaper and baited with canned mackerel (approx 0.8 oz/trap) were used to trap cats in the 9 colonies. Cats were not fed their regular diet for 24 hours prior to the initiation of trapping efforts. For each colony, 15 traps were set in a radial pattern around the colony's normal feeding site with the trap doors opening towards the center and at least 2 feet between traps. Traps were covered with a light-colored towel for camouflage and to darken the interior of the trap in the hopes that this would help calm cats after capture. No special efforts were made to descent traps because the colonies were all well acclimated to humans providing food. No trapping was conducted during inclement weather (ie, if precipitation was forecasted or if the temperature was expected to be < 0°C [32°F]).

Traps were set at dusk and checked the following morning within 1 hour of sunrise. Newspapers and leftover bait were removed from the traps, and the traps were closed. At dusk, traps were again baited and set. Trapping was continued in this manner for 5 consecutive nights. After this time,

the number of traps was reduced to 5, and trapping was continued until at least 90% of the cats in the colony had been captured or until no more than 1 cat remained untrapped.

To determine whether allowing cats time to acclimate to the traps had an effect on trapping effort or efficiency, 5 colonies were randomly selected to have traps set out for 3 days prior to initiation of trapping. Doors of the traps were tied open during these 3 days so that cats could not be captured, and the regular diet provided by the caretakers was placed in the traps. The traps were checked and newspapers and food were replaced daily.

**Statistical analyses**—Trapping effort was defined as the mean number of trap-nights per cat captured, and trapping efficiency was defined as the percentage of cats captured per colony. The Wilcoxon rank sum test<sup>16</sup> was used to compare trapping effort and efficiency between colonies in which cats were allowed to acclimate to the traps before initiation of trapping and colonies that were not allowed an acclimation period. The Wilcoxon rank sum test was also used to compare trapping costs between colonies that were allowed an acclimation period and those that were not. For all analyses, values of  $P \leq 0.05$  were considered significant.

## Results

**Trapping effort and efficiency**—Mean  $\pm$  SD number of adult (ie,  $> 6$  months old) cats per colony was  $12.8 \pm 5.5$  cats (range, 10 to 27 cats; mean number of cats for colonies given an acclimation period,  $13.4 \pm 7.6$  cats; mean number of cats for colonies not given an acclimation period,  $12.0 \pm 0.8$  cats). Overall trapping effort during the initial 5 days of trapping was  $6.0 \pm 3.1$  trap-nights per cat captured, but trapping effort during the initial 5 days of trapping was not significantly different between colonies given an acclimation period ( $6.1 \pm 3.3$  trap-nights per cat captured) and colonies not given an acclimation period ( $6.0 \pm 3.3$  trap-nights per cat captured). Mean overall trapping effort (ie, number of trap-nights until at least 90% of the cats in the colony had been captured or until no more than 1 cat remained untrapped) for the 9 colonies was  $8.9 \pm 3.9$  trap-nights per cat captured. Overall trapping effort was not significantly different between colonies given an acclimation period ( $10.1 \pm 3.8$  trap-nights per cat captured) and colonies not given an acclimation period ( $7.4 \pm 4.1$  trap-nights per cat captured). For all 9 colonies, mean trapping efficiency during the initial 5 days of trapping was  $87.2 \pm 10.6\%$ , and overall trapping efficiency was  $98.0 \pm 4.0\%$ . Trapping efficiency during the initial 5 days of trapping ( $87.0 \pm 8.4\%$  and  $87.5 \pm 14.4\%$ , respectively) and overall trapping efficiency ( $95.8 \pm 5.8\%$  and  $96.8 \pm 4.9\%$ , respectively) were not significantly different between colonies that were provided an acclimation period and colonies that were not.

**Trapping costs**—Newspapers used to line the traps were obtained at no cost from a recycling center. A single 16-oz can of mackerel was found to be sufficient to bait 20 traps; therefore, bait cost was calculated to be \$0.06/trap-night. One person working alone was able to set the 15 traps at each colony in approximately 1 hour and 15 minutes, including time spent loading and unloading the traps from a transport vehicle, for a time of 5 min/trap. On the basis of the 1998 salary of \$7.30/h earned by trap-setters for Randolph

County Animal Control, labor cost was calculated to be \$9.16, or \$0.61/trap, for the initial trap setting. Thereafter, checking the traps each morning, removing newspapers and leftover bait, and closing the traps and returning in the evening to bait and set traps required 45 minutes. Thus, the labor cost to monitor traps was calculated to be \$5.50/night, or \$0.37/trap/night. After the initial 5 nights, when the number of traps set was reduced to 5/night, the labor cost to monitor traps was calculated to be \$1.83/night (\$0.37/trap/night). The labor cost for the 3-day acclimation period was calculated to be \$15.50/colony; no additional cost for bait was incurred, as cats were fed the regular diet provided by the caretakers.

Mean  $\pm$  SD total trapping cost (bait cost plus labor cost) per cat for colonies given an acclimation period ( $\$6.57 \pm \$1.00$ ) was significantly higher than mean total trapping cost per cat for colonies not given an acclimation period ( $\$3.43 \pm \$1.74$ ). Similarly, mean total trapping cost per colony for colonies given an acclimation period ( $\$70.77 \pm \$11.75$ ) was significantly higher than mean total trapping cost per colony for colonies not given an acclimation period ( $\$37.79 \pm \$19.66$ ).

## Discussion

Results of the present study suggest that the live-trapping protocols that were used were effective, in that in the present study, mean overall trapping efficiency was 98% with mean overall trapping effort being 8.9 trap-nights/cat. The success of trapping in these colonies could in part be attributable to the regular feeding schedules and locations maintained by the colony caretakers. During preliminary visits to the colonies prior to the study, we observed that cats gathered at the feeding sites in anticipation of food delivery. It was possible to see most, if not all, resident cats at these times.

Feeding cats their regular diets in the traps for 3 days prior to the initiation of trapping did not have a significant effect on trapping effort or efficiency in the present study but was associated with significant increases in trapping costs. However, cats in the present study were used to being visited regularly by their caretakers. Thus, whether providing an acclimation period would be beneficial for colonies not used to regular human contact or for particularly trap-shy cats could not be determined in the present study.

Although the capture of all cats in any given colony is the goal of a TNR program, some cats can be expected to evade capture and their effect on the success of such programs must be evaluated. In the present study, trapping was continued until at least 90% of the adult (ie,  $> 6$  months old) cats in a colony were captured or no more than 1 adult cat remained untrapped. Additional methods can be used to catch stragglers but require experience (eg, net capture) or the participation of a veterinarian (eg, use of sedative-laced food). Setting the traps used in the present study was straightforward and could have been accomplished by lay volunteers and colony caretakers following minimal instruction.

The purchase of traps represents one of the major start-up costs for TNR programs. Traps used in the pre-

sent study cost \$58.54 or \$69.75 each, with volume discounts available from the company. They performed reliably, did not cause injury to the cats, and were easy to clean. Also, they are expected to have a long functional lifespan ( $\geq 10$  years) if properly maintained.

Trapping costs in the present study were specific to these colonies, and costs for trapping other feral cat colonies will vary depending on the traps and bait used and the particular trapping protocol. Nevertheless, results of the present study can be used as general guidelines when calculating the costs of a TNR program.

<sup>a</sup>Tomahawk live traps #207 and #608, Tomahawk Live Traps, Tomahawk, Wis.

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