

# Counting Cats:

## What population ecology models can tell us about TNR programs

Getting people to agree on strategies for helping feral colonies can seem as difficult as herding cats. And although animal advocates have developed strong arguments to promote trap-neuter-return (TNR) programs, success has typically been expressed through reports of the numbers of cats sterilized rather than through long-term population measurements. But a recent study using a population ecology model—which examines the structure and dynamics of populations and how those populations interact with their environments—points to the need for greater refinement of current TNR programs.

According to the study, published in the *Journal of the American Veterinary Medical Association* (Vol. 227, No. 11), feral cats are territorial and are likely to reproduce most quickly when their population is low. Feral colonies tend to expand their numbers until the “carrying capacity”—the maximum sustainable population—is reached, a measurement that depends primarily on the availability of food and territory. Previous feral cat control programs have shown that reducing the population below the carrying capacity produces no long-term reduction; the remaining population of unsterilized cats will simply increase back to its original carrying capacity. The authors cited a 1979 case in which virulent panleukopenia was released on Marion Island in South Africa to control the feral cat population. “Within 5 years, intrinsic population growth rates were reported to have increased 4 times,” wrote researchers Patrick Foley, Ph.D.;

Janet Foley, D.V.M., Ph.D.; Julie Levy, D.V.M., Ph.D.; and Terry Paik, D.V.M. In essence, the cats who remained increased their birth rates to compensate for the reduction in their numbers.

By contrast, the researchers wrote, “TNR has the potential advantage of allowing niches to become saturated with neutered individual cats,” which over time seems to produce a gradual, humane reduction in population.

Researchers collected data from the Feral Cat Coalition in San Diego County, California, and Operation Catnip in



Alachua County, Florida. In both programs, feral cats were live-trapped and transferred about once a month to participating veterinary clinics, where they were neutered, vaccinated, and returned to their colonies. From 1992 to 2003, the Feral Cat Coalition in California trapped 14,452 cats, of whom 4 percent had already been neutered and 17.2 percent were pregnant. Operation Catnip trapped 11,822 cats between 1998 and 2004, of

whom 2 percent had already been neutered and 16 percent were pregnant. In both cases, the presence of pregnant cats was strongly seasonal, with numbers increasing in the spring for San Diego County and peaking in both March and August for Alachua County.

To achieve a long-term reduction in cat population, it's necessary to reach a “critical neutering rate” that varies by population, according to the researchers. Critical neutering rates depend on two factors: how quickly the population multiplies and how long cats survive. Researchers determined that the critical neutering rate for feral cats was 71 percent in San Diego County and 94 percent in Alachua County. At these levels, the maximum per capita rate of increase—the maximum mean number of female cats produced annually from each female cat—would drop to less than zero, and the size of the colonies would gradually decrease. However, the actual annual neutering rate was only 14 percent in San Diego County and 19 percent in Alachua County, meaning that an overall reduction in either of the counties was not detected.

Although the study's results are disappointing from the standpoint of demonstrating long-term success of two large TNR programs, this population ecology model offers a more sophisticated method for evaluating TNR and the opportunity to refine current programs. An impressive number of cats were neutered in both San Diego and Alachua counties, but this number still constituted only a small overall proportion of the total number of cats, especially since both counties most likely had multiple distinct populations of feral cats. The bottom line? TNR programs are most effective when they are conducted on smaller, well-defined, geographically restricted cat populations.

—Hillary Twining