

Feral Cats: An Overview

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CHAPTER

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Humans and cats have a long and complex history together. Since the nineteenth century, contradictory ideas about the need to protect and care for cats have moved us toward a shift in ideas, values, and behaviors to a more benign perception of cats than was generally the case in previous centuries. In some quarters, but not all, even feral cats have begun to be seen as worthy of our study and humane treatment. In many countries, the welfare of all cats has become a focus of public concern, but nowhere is the shift in values reflected more than in the focus on feral cats—defined as unowned and unsocialized cats. Feral cats likely exist everywhere humans have traveled, whether deliberately introduced to control rodents and other pests, when they accidentally escape the home, or when they have been deliberately abandoned.

Feral Cats in the United States

Scientists in biology, ecology, and wildlife conservation have been publishing work on free-roaming and feral cats since the early 1900s. These early studies in the

United States examined free-roaming cat control and licensing, predation on birds and wildlife, and cat territories. Hundreds of scientific articles have been published about the domestic cat's hunting patterns and lifestyles as well as control methods in dozens of countries around the world. Feral cats began to move into the public view in the United States about two decades ago, when the first popular book *Maverick Cats* (Berkeley 1982) was published in hardcover by Walker and Co. (it appeared in paperback from the New England Press in 1987). Cats have exceeded dogs as the most common pet in North America and in most of Europe (Slater 2005). Controlling the “cycle of stray cats” is even a topic of discussion in a popular pet supply catalog (www.drsfoster-smith.com). Yet feral cats are still viewed in many quarters as liminal beings existing on the borders of civilization. The existence of these feral cat populations tends to reinforce cats' peripheral status, reminding us of their wildness and separateness. This wildness and separateness makes it easier to see feral, and perhaps all, cats as belonging to the part of nature that humans are responsible for

controlling and dominating rather than the part with which humans coexist. If cats are viewed as belonging to nature rather than to civilization, it becomes easier to see them as health threats or nuisances rather than as individuals and companions and to recommend their elimination when they present a “problem” to human society. When problems with feral cats arise, the image of the delightful domestic companion of the hearthside is easily replaced with old stereotypes of cats as evil beings separate from humans and with no place in the civilized world. (This transition from “wild and separate” to part of a unified world is occurring slowly, if the growing use of the term, “nonhuman animal,” which deemphasizes the dichotomy between animals and humans, is any indication.)

Perhaps the most remarkable change in the status of feral cats is the fact that they are discussed as a particular population at all. Annabell Washburn of Martha's Vineyard, Massachusetts, is generally credited with bringing the concept of Trap-Neuter-Return (TNR) to feral cat management in the United States in 1980 (Berkeley 1990). Washburn founded the Pet Adoption and Wel-

fare Service (PAWS) on Martha's Vineyard, which practiced TNR on feral cats. In 1986 students and staff from Tufts University's School of Veterinary Medicine worked with PAWS to provide sterilization of feral cats on Virgin Gorda in the British Virgin Islands in one of the earliest partnerships between veterinary medicine and grass-roots organizations to improve the lot of feral cats. In 1987 Washburn spoke about her experiences and elaborated on TNR as a method of controlling feral cats at a pet overpopulation conference in New York City.

The founding of Alley Cat Allies, an organization dedicated to promoting TNR as a nonlethal population control method for feral cats, in 1990 in Washington, D.C., marked the beginning of legitimacy for feral cats and of TNR as a control technique in the United States. Alley Cat Allies provided information, networking, and other resources for individuals and organizations interested in managing feral cat populations. In 2004 its resource pages on the Web (at www.alleycat.org) included information for feral cat caregivers, veterinarians, animal care and control and humane society personnel, and government officials. It also provided information on creating new groups, organizing, and advocating on behalf of feral cats. From an initial two-person team, Alley Cat Allies had grown to almost 95,000 donors and supporters as of 2003 (B. Robinson, personal communication with M.S., October 23, 2003).

Several other grass-roots organizations were early pioneers in the TNR movement. The first was the Stanford Cat Network, founded in 1989 (Rosenblatt 1992). This was probably the earliest formal campus program in the United States to manage cats using TNR with adoption of socialized cats and young kittens. Within fifteen years, the approximately five hundred cats present initially on the Stanford University campus in Califor-

nia at the start of the program had been reduced to eighty-five (C. Miller, Stanford Cat Network, personal communication with S.S., August 17, 2004) In recent years most of the cats who joined the feral-cat colony were social, friendly cats and were therefore adopted.

In the past several years, many other campus programs have sprung up around the country. An Internet listserv designed specifically to facilitate communication among these types of programs is hosted by Alley Cat Allies.

In 1989 the San Francisco Society for the Prevention of Cruelty to Animals (SFSPCA) began a major effort to reduce euthanasia in that city. It put in place a full spectrum of programs to that effect, including subsidized or free sterilization of pets, adoption, advice on maintaining pets in the home, and, in 1993, the Feral Cat Assistance Program. This program provides free sterilization, routine medical care, education for feral cat caretakers, assistance in resolving disputes, the loan of traps and free food, and the expertise of Cat Assistance Team members. Within a seven-year period, euthanasia of feral cats dropped by 73 percent, euthanasia of neonatal kittens dropped from more than nine hundred a year to two hundred a year, and more than 47,000 cats were sterilized (Sayres 2000).

Another model grass-roots organizations use in working with feral cats is the high-volume feral cat sterilization program originally developed in 1992 in San Diego by the Feral Cat Coalition (Berkeley 2004). This program was designed to sterilize fifty to two hundred cats in a single day and used a large core of volunteers, including local veterinarians. Since then many similar programs have arisen throughout the country. They have provided manuals and videotapes on how to orchestrate this high-volume approach to sterilization smoothly. Operation Catnip in

North Carolina (founded in 1994) and Florida (founded in 1998) are other good examples of this approach; they also have served as resources for research on feral cat health. A variation on high-volume spay neuter is the mobile clinic approach. A good example is a unit purchased by the Feral Cat Coalition of Oregon (FCCO) in 1998 (Berkeley 2004). In August 2004 the FCCO neutered its twenty thousandth cat (K. Kraus, personal communication with M.S., August 9, 2004).

A more comprehensive approach is a grass-roots program for cats in the community that began as a TNR-only effort. Merrimack River Feline Rescue Society, in Newburyport, Massachusetts, was founded in the early 1990s to manage feral cats on the waterfront in this tourist town. It soon discovered that many of the cats were socialized pets who had been lost or abandoned. This led to the development of a cats-only animal shelter, an extensive education program, and many other cat-related community activities. It has been extremely successful in decreasing the numbers of feral cats in Newburyport because of the broad range of approaches and the widespread geographic application of its work. In ten years, the original two hundred or so cats in the town had decreased to twenty, many of whom were elderly, and, in a few places, there were no feral cats at all (S. LeBaron, personal communication with M.S., July 2, 2002). Neighborhood Cats, founded in 1999, practices TNR in New York City, which few thought was suitable for TNR until this organization demonstrated otherwise (www.neighborhoodcats.org/about/about_history.htm). It also is an active advocacy group that networks with other agencies and promotes TNR throughout the area.

Most public or official discussion of feral cats in the field of animal protection in the United States

seems to have begun around 1990. The National Animal Control Association began addressing feral-cat issues at its conferences in the early 1990s. Other animal protection agencies, local and national, began considering feral cats seriously in the mid-1990s. Perhaps the most significant turning point was a joint conference, "A Critical Evaluation of Free-roaming/Unowned/Feral Cats in the United States," sponsored by the American Humane Association and the Cat Fanciers' Association in 1996. The convoluted title accurately reflected the confusion about and complexity of the free-roaming cat world. In 1998 The Humane Society of the United States (HSUS) devoted an entire issue (September–October) of its magazine *Animal Sheltering* to free-roaming cats. It laid out a radically new policy statement on free-roaming cats, including a section on managing colonies of feral cats. This section outlined guidelines under which such management might be appropriate and codified the need for ongoing management and care of a colony of cats. Presentations about feral cats and how best to deal with them became a regular part of regional and national humane organization meetings by late in the decade.

In veterinary medical continuing education, feral cats began to appear as a topic in the early and mid-1990s. In 1992 Tufts University's School of Veterinary Medicine sponsored a feral-cat workshop where TNR as a method for control was presented. The American Veterinary Medical Association (AVMA) Animal Welfare Forum in 1995 focused on the welfare of cats and included discussions about feral cats and their management. In 2002 the AVMA annual meeting included a full day on feral cat issues. In 2003 the AVMA Animal Welfare Forum focused solely on feral cat issues and control methods. During 2003 and 2004, the AVMA (<http://www.avma.org/>

[policies/animalwelfare.asp#companion](http://www.avma.org/policies/animalwelfare.asp#companion)) and the American Association of Feline Practitioners (AAFP) worked to update and create, respectively, position statements on free-roaming and feral cats. The balanced AAFP position statement released in mid-2004 provided a brief discussion of the problems associated with free-roaming cats as well as the need to prevent and control free-roaming cats by education, veterinary practice, public policy, and the application of TNR (www.aafponline.org/positiostate.htm). A model program was described for TNR recognizing that reducing cat populations was the primary objective.

Only recently has control of cat numbers become the focus of wildlife biologists and conservationists in the United States. In 2003 the Florida Fish and Wildlife Conservation Commission proposed a policy to "protect native wildlife from predation, disease, and other impacts presented by feral and free ranging cats." After much publicity, debate, and a lawsuit, the final policy was modified substantially, and study groups were established to look into the problem. Later that same year, the Pennsylvania Game Commission proposed an amendment to the state game and wildlife code to "make the release of captive held wildlife without a permit or domestic dogs or cats into the wild unlawful." This amendment was removed after public debate with the support of several members of the panel who felt that domestic dogs and cats were outside the scope of their mandate.

Feral Cats in the United Kingdom

Although concern for the control and welfare of feral cats is a very recent phenomenon in the United States, animal welfare organizations in the United Kingdom were

discussing, studying, and publishing scientific work about feral cats as early as the 1960s, '70s and '80s (Universities Federation for Animal Welfare 1981; Neville and Remfry 1984; Berkeley 2004). The first scientific conference on "the ecology and control of feral cats" was held in London in 1980 and its proceedings published by the Universities Federation for Animal Welfare (UFAW). Subsequent UFAW publications in 1982, 1990, and 1995 were the primary scientific references for feral-cat control for many years. Tabor's book (1983) was both scientific and appropriate for the cat-loving public. It included information on predation, cat territories, and feral-cat management, and it set the stage for much of what is known about free-roaming cats in urban areas based on the author's extensive observations on a colony of cats living in London. *Understanding Cats* (Tabor 1997) was a *Reader's Digest* coffee-table book clearly aimed at the general public. It included a chapter on feral cats as well as a discussion on feral-cat colony control that cited work done on TNR in Great Britain in the 1970s.

Feral Cat Populations: What Are the Sources?

Despite the multitude and variety of locations in which feral cats are found, the potential sources of the cats themselves are shared by all. Owned companion cats may become lost or may be abandoned deliberately by their owners. Such animals will become the nucleus of new feral cat colonies, particularly if the cats are intact. Intact cats still in the home may also contribute to the problem, since their unplanned litters may be too wild to be adopted or may be abandoned as well. The relative propor-

tion of each of the sources varies widely among different locations. Relatively little research has been done to document the origins of feral cats in most locations. It is known that stray cats who become pets (the reverse of the owned-cat-becoming-feral phenomenon) account for 21 percent to 33 percent of the owned cat population (Johnson, Lewellen, and Lewellen 1993; Johnson and Lewellen 1995; Patronek, Beck, and Glickman 1997; New et al. 2000).

Feral Cat Issues in the Community

Conflict and confusion surrounding feral cats generally spring from five sources. The first is the variability in human perception about cats in general and feral cats in particular. The public views cats in a wide variety of roles, ranging from surrogate child to vermin. For example, some people find cat footprints on their cars amusing, while others believe cats who leave footprints on their cars should be euthanized. Such a disparity in perception leads to conflict about appropriate ways to treat cats, even among neighbors.

Public health and safety concerns often arise in discussions about feral cats. It is important to remember that these concerns are equally applicable to owned cats in the community who are allowed outdoors.

Public health officials have as their mandate the prevention of the *possibility* of disease in the general human population; therefore, they are interested in zoonotic diseases (Patronek 1998; Slater 2002). The actual magnitude of the risk to the public varies tremendously by disease and specific situation.

Rabies may be the foremost concern among such transmittable diseases. Current recommendations for controlling rabies include understanding the relationships between the residents and animals

and developing culturally appropriate approaches (Beran and Frith 1988). Removal of free-roaming animals is no longer recommended by the World Health Organization (WHO), although it was at one time (WHO Expert Committee 1988, 1994; Meslin, Fishbein, and Matter 1994). Instead, vaccination programs are the cornerstone of prevention. Fortunately, a very effective vaccine for cats exists to protect against rabies. Research in the 1980s indicated that a single early rabies vaccination provides protection for more than three years to cats in a research setting (Soulebot et al. 1981). This supports the idea that rabies vaccines are very effective, and that even one vaccination is likely to be much better than no vaccination at all. TNR programs that include rabies vaccinations can potentially provide a herd immunity against this disease: once a high enough proportion of the population is immune, it is very difficult for the disease to gain entry and establish itself in that population. In addition, vaccinated cats form a barrier between wildlife and humans. If cats are simply rounded up and removed from an area, a few unvaccinated cats will always escape and remain in the colony. New cats, also likely to be unvaccinated, will move in. In a short time the population will have rebounded and none of the cats will be vaccinated. If TNR is practiced, cats are trapped, neutered, and vaccinated for rabies before being returned to the colony, creating a substantial barrier of vaccinated individuals against the disease. When humane caretakers are very diligent, all cats in the colony will have been vaccinated at least once and possibly more frequently.

Another concern, the effects of predation by feral cats on wildlife, may be coupled with concerns about feral cats' competition with native predators and disease transmission. The debate is a collision of three main viewpoints (Slater 2004).

One is philosophical, based on the relative value of cats and wildlife. This view maintains that cats are a domestic species and as such are humans' responsibility. It is, therefore, irresponsible to allow cats to roam freely outdoors and hunt native wildlife, a particular problem since cats often are not regulated in the wild by food supply in the same way other predators are. This argument is not based on numbers of animals killed, but rather on appropriate stewardship of the domestic species. It applies to owned cats allowed to roam, not just to feral cats.

A second view is that cats are an introduced, non-native species that should be removed or prevented from entering native habitats. This view is based on the idea that introduced species have a negative impact on native species and that native species should be valued over introduced ones. In fact, native predators are often killed to protect livestock, and native species are often managed to protect other native species (Cohen 1992). This view assumes that removal of introduced species results in a return to a normal, or pre-introduction, state of the ecosystem. In reality, ecosystems are very complex and are changed in many ways, in addition to the introduction of cats, as a result of human habitation (Terborgh 1992). Cats may integrate into ecosystems such that their predation of other non-native animals like rats and mice can be very beneficial in protecting native species from these predators and competitors (Courchamp, Langlais, and Sugihara 1999; Fitzgerald and Gibb 2001).

The third view is based on the numbers of birds and other wildlife killed by cats, owned as well as unowned ferals. There are many widely cited figures about the extent of cat predation on birds in the United States. Most are based on extrapolation from three to fifteen cats or on estimates made by

wildlife biologists that have been taken out of context. Effectiveness of cat predation appears to vary quite a lot, with some cats catching no prey and others catching quite a bit. It is important to remember that cats are opportunistic hunters: they will eat and catch whatever is most readily available. This includes carrion, garbage, and cat food, as well as prey species. Overall, cats are rodent specialists. More than half their diet is composed of rodents, with other species and other sources of food making up a small percentage of the remainder (Fitzgerald and Turner 2000).

Holders of these viewpoints disagree about what to do with feral cats. In some cases, local ordinances about licensing, the numbers of pets allowed per residence, and cat leash laws have been put into place to try to control feral and owned free-roaming cats. Cat licensing is extremely controversial and is sometimes, according to some, used to punish or fine caretakers of feral cats (www.sfspca.org/figs/pdf_feralcats/licenses.pdf). The public often views cat licensing as a moneymaking scheme for the benefit of local government, although, in fact, revenues from licensing may support animal-care and -control programs in the community. Licensing efforts for cats are attempts to provide cats with protection similar to that enjoyed by dogs, including mandated holding periods in shelters, intervention by animal-control officers on a cat's behalf, and return to owners. Unfortunately, licensing often is not a constructive approach to controlling feral cat numbers (Slater 2002). Ordinances that require identification rather than licensing are usually more palatable to community residents, and ear tipping of feral cats can be considered a form of identification. A cat identification law in Hawaii took this approach as a way of providing a bigger carrot rather than a stick in trying to convince resi-

dents to put identification on their cats (<http://www.co.honolulu.hi.us/refs/roh/7.htm>; Slater 2002). Identified cats benefit from longer holding periods at the shelter and are much more likely to be returned to their owners.

Another option for communities is differential licensing, in which owners of neutered animals pay a reduced fee—or no fee at all—for licensing as compared to owners of intact animals. This can be made to work for managed feral cat colonies since colony cats are neutered. Some have proposed registration for the colonies themselves as an alternative, but this may be viewed as punitive or as putting cats at risk to be rounded up by animal control.

Defining by law the number of cats that can be owned by a resident or live in a single household (so-called limit laws) can be used against feral cat caretakers since they are usually considered owners of the cats. Many colonies exceed the usual three- to four-cat limit that is common with this type of ordinance. Therefore, caretakers may be in violation and fined. These laws generally are designed to prevent hoarding and to provide leverage or oversight of households that may end up with too many animals. However, they generally do not allow TNR to be practiced legally if the local enforcement agency chooses to include feral cats. Such problems can be avoided with exemptions for managed or managed and registered feral colonies.

Leash laws generally require that animals be kept under the direct control of a person or confined to the owner's property. Leash laws, like the previously described ordinances, are nearly always enforced on complaint: someone has to see free-roaming cats and call the authorities. They will trap cats, who then will be transported to a local shelter or veterinarian. There, feral cats often will be euthanized. Depending on neighbors' tolerance of free-roaming cats, in

some locations trapping may never become necessary because the neighbors never call the authorities. But, in other locations, battles over free-roaming cats can be quite vicious and unrelenting.

An exemption for managed colonies (which may be defined clearly in the ordinance) from any of these laws is a possible option. It allows the law to provide for enforcement where appropriate and gives individuals the option to manage feral colonies. Alternatively, a well-written nuisance law will allow enforcement on complaint if specific feral cats are causing particular problems in an area.

These kinds of punitive laws were designed to protect the people and the animals in the community. Yet, positive rewards for doing the right thing, once people understand what the right thing is, generally will result in a faster and more wholehearted acceptance of the appropriate behavior. There will always be a few people who will not comply even with laws that punish. But is important not to punish those people who are trying to take responsibility for cats no one else wants.

Options

Most individuals and organizations involved in the feral cat debate agree that the ultimate goal is fewer cats. However, the best and most practical method to achieve this is hotly contested and often obscured by fruitless discussions about the number of birds killed, the numbers of cats in a neighborhood, or the exact costs of a particular option. No single approach will work in every location. Each location has a distinct set of problems and available resources as well as a unique public perception. It is critical to remain focused on the idea that there should be fewer feral cats and that practical approaches must be considered. The options for feral cat control have included doing nothing; killing

cats on location; or removing cats for euthanasia elsewhere. More recently, TNR with adoption has been advocated as an option (Slater 2004). Trapping and removal, followed by relocation or placement in sanctuaries, has been used as well on a more limited basis (Levy and Crawford 2004).

“Doing Nothing”

The options for feral cat control have historically included doing nothing—or, “letting nature take its course.” While still fairly common, this is not a responsible or constructive choice.

Killing Cats on Site

Killing cats on location has been used most commonly on islands and in countries outside the United States, including Australia and New Zealand. Cats are commonly killed by poisoning, shooting, introduction of infectious diseases, hunting by dogs, and trapping (Bester et al. 2002). These are typically components of a complete eradication program in an area with few humans and few other species to worry about. These eradication programs often require years to accomplish and hundreds of hours of work and are only successful in closed populations where no new cats can arrive. Trapping and removal of cats for euthanasia has been used in many communities as a method of handling animal issues. At times, this was justified as a way of providing a humane death for an animal who could not otherwise enjoy a good quality of life. At other times, concerns about cat predation, nuisance problems, or public health were motivating factors. It is appealing to think that removing cats will result in a permanent decrease in the cat population; however, that is almost never the case. It is extremely difficult to remove every cat in a particular location, and most locations are not sufficiently

isolated to prevent migration of new cats into the ecological vacuum created by cat removal. If there is sufficient food and shelter, new cats will move in from nearby areas, and survivors of the removal program will continue to reproduce until the maximum carrying capacity is reached again (Tabor 1983). Local residents may sabotage attempts to remove cats for euthanasia. The result is that, even if half the cats are removed, six months or a year later, the numbers of cats will be increasing quickly, climbing to the same number present before removal.

Relocation

A number of feral cat programs have incorporated a relocation component as part of their efforts. Neutered, vaccinated cats are transported and held for two to four weeks (to acclimate) before being released at their new owners' selected rural properties or farms. This is a time-consuming process complicated by the need to locate suitable release sites, and there are relatively limited data on success of relocation.

Increasingly, wildlife advocates have suggested removal of feral cats with placement in long-term sanctuaries. On the surface, this seems appealing because cats are confined in a selected location where they may receive care for the rest of their lives. While a number of sanctuaries around the country accept feral cats, they fill up rapidly and the quality of care can vary greatly (Levy and Crawford 2004). Overcrowding can be a serious health risk for cats, and feral cats do not always adapt well to confinement in a sanctuary. Unlike socialized cats, the very presence of humans causes feral cats stress. Thus, they need to be housed as essentially “wild” animals. In addition, oversight of this type of facility is highly variable and the quality of care provided is not always adequate or humane. Young cats may

face living ten or twelve years in a sanctuary, and the cost of high-quality care and housing for such animals is often prohibitive, eliminating the ability to expand sanctuary housing for the large numbers of feral cats in the United States.

TNR

The limitations of these options have made TNR increasingly viable as an option for decreasing the numbers of existing feral cats. This approach, at its most basic, includes humane trapping of feral cats, transportation to a veterinarian, surgical sterilization, vaccination for rabies, and ear-tipping or notching. Vaccination for rabies is included in the basic option because, in most parts of the United States, it is a crucial component of addressing public and animal health concerns. Ear tipping is included in the basic package since some form of visual identification of cats who have already been sterilized is critical in preventing re-trapping, re-anesthetizing, and re-operating on already neutered cats.

A variation, explicitly includes testing, managing, and monitoring as part of the TNR program (trap, test, vaccinate, alter, return, manage, and monitor, or TTVARM-M). It is preferred by groups such as The HSUS. The “test” component includes testing for feline leukemia (FeLV) and feline immunodeficiency viruses (FIV). “Managing and monitoring” includes ongoing feeding, housing, and oversight of cats in managed colonies. Ongoing monitoring provides the most effective population control because new, probably unneutered cats, will be identified quickly and trapped before they can reproduce. The cats are looked after so that any illness or injuries can be handled in humane fashion. Very commonly, the shorthand TNR is used to describe these very extensive programs as well as simpler ones.

The advantages of TNR are its ability to (1) stabilize the popula-

tion through sterilization; (2) increase the proportion of vaccinated cats in a community; (3) decrease nuisance problems, since sterilized cats roam less, fight less, make less noise, and are generally less obtrusive; (4) decrease cat welfare concerns because the cats tend to be healthier when they are not breeding and fighting and no kittens are born; and (5) garner stronger public support than do programs that result in killing cats (Slater 2002; Levy and Crawford 2004).

TNR programs that include aggressive adoption components are the most successful in decreasing the numbers of cats short term. The numbers of young kittens and socialized adults varies but can be upwards of 50–70 percent in some colonies (Levy and Crawford 2004). Removing these animals for adoption results in an immediate and substantial decrease in the numbers of cats at that site.¹

The Controversy over Testing

Testing for FeLV and FIV is controversial. On the one hand, there is concern about leaving “positive” cats in the environment, because their own health and well-being may be in jeopardy, and they have the potential to transmit disease. When funds are limited, there are cost-benefit considerations since testing costs close to what spay or neuter surgery costs. Testing decreases the number of cats that can be sterilized for the same money. On the other hand, sterilization decreases transmission of these diseases between cats.

The frequency of these and other infectious diseases in feral cat populations is similar to or lower than that of owned-cat populations (Levy and Crawford 2004; Nutter et al. 2004a). Because the frequency of these diseases is so low and the diseases are not spread uniformly throughout the feral cat population, testing a few cats or a

small randomly selected number of cats is unlikely to provide accurate information about the general cat population in the community. Limited testing may prove helpful in specific colonies where there is a high suspicion of disease, particularly of feline leukemia. Animals who test positive for FeLV present another set of problems: for some, euthanasia of positive animals is not acceptable unless the cat is very ill; for others who know that FeLV generally causes a slow death within a few years, euthanasia is a humane option.

FIV is spread through the bite of an infected cat. This disease is much more common in male cats than in females because intact males do most of the fighting. Neutering males decreases their aggression and fighting for mates and disease transmission is nearly eliminated. Many FIV-positive cats will live for many years without any clinical problems, and it is less clear that euthanasia will prevent obvious suffering in the near future.

FeLV is spread from mother to kittens and by prolonged close contact between cats. By spaying the mother cats, disease transmission to kittens is eliminated. FeLV is not a highly contagious disease, and many cats who are exposed will never contract it. By putting the money saved by not testing into spaying more female cats, organizations may prevent many more cases of FeLV.

Ultimately the caregivers and veterinarians involved will have to make a decision about testing and about what to do with positive cats. Some cats who are positive for either of these diseases may be removed for placement into sanctuaries or homes with other disease-positive cats.

There are many different approaches to promoting or offering TNR in a community. Often, it will start with one or two individuals who are feeding cats and realize that they can't continue to feed all

of the cats in the colony if the current population continues to multiply. The feeders discover TNR, often through friends, neighbors, or the internet. Sometimes these individuals will form networks with others who are feeding cats in the same community. This loose network may continue as is or may become an incorporated, nonprofit organization. In other situations, once it realizes there is a problem with feral cats, a group of people may immediately pull together an organization dedicated to helping those animals. Animal-care and -control agencies, humane societies, or veterinary wellness/sterilization clinics also may begin to offer services or programs specifically related to feral cats. These can include trap rental, subsidized or free sterilization and vaccination, provision of education or meeting areas, referral networks, and assistance with adoptions. Sometimes these organizations will partner with existing grass-roots TNR programs. While it may take months (or years) to build the level of trust needed among the parties, these alliances can be extremely productive. Optimally, all interested parties will map out a strategy to work together to decrease the feral cat population and prevent new stray/abandoned cats. The Orange County, Florida, animal-control agency, for example, partnered with a TNR group for an extremely successful program (Hughes, Slater, and Haller 2002).

There is no one best template for introducing TNR in a community. Instead, existing veterinary and sheltering resources should be evaluated and any missing pieces put into place. For example, in a community that already has subsidized or free sterilization for feral cats, a feral cat group might focus on trapping, adoption, and education. In a community without subsidized or free sterilization, a high-volume, feral-cat-only monthly surgery session might be the best use of an organization's resources, since ster-

ilization is a key element in TNR.

In discussing what to do with existing feral cats, communities often do not address the sources of these cats adequately. Generally, irresponsible or ignorant owners are the core problem. Often, there are many different reasons why people choose to allow their cats to roam freely without identification or sterilization or abandon cats altogether. More research needs to be performed to better understand how to identify the problems in each community and how best to intervene. A “safety net” of services for cats and owners could include (1) information on maintaining cats in the home, such as selection of an appropriate kitten or advice on behavior modification; (2) subsidized veterinary care and mechanisms to improve access to care, such as transportation or language translation services; (3) cat identification and sterilization information as well as information on keeping cats safely at home disseminated by local veterinarians, through public schools and community education, and by the animal shelter; (4) programs that assist people in finding new homes for cats they genuinely cannot keep; and (5) better dissemination of information about cats available for adoption at the local shelter. Some central location or referral system to help residents find these existing resources is crucial as well. Local laws or ordinances can have a role in encouraging compliance but should be primarily a mechanism to deal with individuals who do not wish to comply rather than with those who are unable to comply. “Fix-it” tickets can give enforcement officers a means of accomplishing the ultimate goal of the ordinance, for example, having a cat sterilized rather than receiving a fine.

Each community has an existing set of resources that should be evaluated critically so that the missing components of the safety net can be developed and added. All of the

diverse constituents who are involved in dealing with cat-related problems should be brought to the table and be involved in creating the solutions.

Guiding Principles

While the specifics on approaches to dealing with feral cat issues in a community will vary, some core principles should be followed in all cases to ensure success.

1. All reputable parties involved with feral cats have as a goal fewer feral cats. The problem is how best to accomplish that goal and to get past other arguments and issues.
2. Each location has a specific set of problems and available resources. While data from other locations can certainly be helpful in guiding decisions, each solution must be tailored to the individual location.
3. Controlling feral cat numbers is really a “herd”-level problem. While each individual cat may (or may not) be seen as having value, it is the population as a whole in a neighborhood, community, or county that must be addressed. Therefore, solutions must work for populations of cats and must be able to be scaled up for the numbers of cats in a given situation.
4. Everyone involved must be guided by concern for the welfare and well-being of the cats, as well as for other species, including humans, but also by what is practical and possible in a specific situation.
5. To reach the goal of fewer cats will require a broad spectrum of programs. No single approach will accomplish this goal. The more diverse the location, the more creative the set of programs must be to result in fewer feral cats.

Example Programs

A published study of feral cats managed on the University of Central Florida campus demonstrates the efficacy of TNR coupled with aggressive adoption in decreasing the numbers of free-roaming cats (Levy, Gale, and Gale 2003). During the eleven years reported in the article, a total of 155 cats were trapped. After five years, only 68 of the original cats remained. At the end of the study, only 23 cats (15 percent) were left, with a median residency duration of seven years. Nearly half the cats were initially or eventually adopted. Eleven percent were euthanized, 15 percent disappeared, 6 percent died, and 6 percent moved to nearby woods. This demonstrates that it is possible to decrease their numbers with time and ongoing monitoring and that adoption is important to ensure this decrease.

Another campus program, at Texas A&M University, had existed for six years as of 2004. The initial two-year startup was published to demonstrate the initial drop in feral cat numbers (Hughes and Slater 2002). In the first six years, 264 cats were trapped, with about half returning to campus and a third being adopted. Cats positive for FeLV (5 percent) or FIV (6 percent) were euthanized. Well over half the cats were trapped and neutered in the first two years of program.

Several animal-control agencies around the country have embraced TNR. Maricopa County (Arizona) Animal Care and Control is the largest animal-control agency in the United States, based on 61,984 animals handled and more than three million people (Anonymous 2002). Its feral cat programs, Operation FELIX and a partnership with AzCats, which began in the fall of 2001, provide high-volume spay/neuter for feral cats as well as mobile spay/neuter programs. These programs are in addition to comprehensive spay/neuter and

adoption efforts and have contributed to a drop in euthanasia rate from twenty-five cats per thousand county residents to nine cats per thousand. This agency actively promotes TNR in the community. Recently, county officials proclaimed that TNR was the official management policy for feral cats in Maricopa County. The city of Phoenix, Arizona, planned to allocate \$200,000, and Animal Care and Control was to begin to charge \$61 per feral cat brought in unless the community it came from actively sponsored a TNR program (Anonymous 2002).

Orange County Animal Care and Control partnered with a nonprofit feral cat organization to facilitate TNR in Orlando, Florida, and the surrounding area (Hughes, Slater, and Haller 2002). As of 1995 the animal-control shelter provided surgeries, rabies vaccination, and ear tipping, while the community feral-cat organization handled complaints and trapping. Despite a growing human population and an expected increase in pet population and related problems, after implementing the program, cat impounds and complaints remained stable, cat euthanasia decreased slightly, and the numbers of spay/neuter cat surgeries exceeded euthanasias for the first time. One six-block residential area had a greater than 50 percent decrease in complaints following implementation of TNR. An additional benefit was a significant improvement in the relationship between animal-control officers and the community and higher morale among the officers.

Creativity is imperative when trying to solve the feral cat problem. The World Society for the Protection of Animals (WSPA) as of 2005 had a program at the Sheraton Rio Hotel in Rio de Janeiro, Brazil. Because many cats are attracted to the resort area and many visitors wish to feed them, the cats could have become a problem. The solution was to set up the

Cat's Café, an area where cats can be fed and stroked but that is not near restaurants, bars, or swimming pools. Signs assure visitors that cats are vaccinated and provided with veterinary care (E. MacGregor, WSPA, personal communication with S.S., July 1, 2004). This solution provides a humane alternative to trapping and euthanasia while addressing sanitation and health concerns.

An example of an early program to manage feral cats in a prison setting took place in San Quentin State Prison in San Quentin, California, in 1992. Historically, 100 to 250 cats were being euthanized each year (K. White, The HSUS, personal communication with P. Miller, Marin Humane Society, March 13, 1994).

A TNR program was implemented, and approximately 250 cats were trapped. More than 200 were adopted, and approximately 50 neutered and vaccinated feral cats were returned to the prison over an eighteen-month period. Internal prison correspondence indicated benefits to the inmates and staff, such as less violence and tension as well as being able to "model relatedness" to other species and individuals (B. Smythe, R.N., prison employee, personal communication with Warden A. Calderon, n.d.).

What Has Been Achieved with TNR

Many resources are now available around the country to implement TNR programs. Many websites have written materials that can be downloaded and shared. Others have videotapes, links to other useful websites, and advice on starting new grass-roots groups. Many organizations are beginning to assemble comprehensive educational materials to make teaching and learning about TNR easier. For example, the Neighborhood Cats TNR kit provides all necessary edu-

cational materials needed to launch a TNR program in one easily accessible package (www.NeighborhoodCats.org). TNR organizations are learning to be cohesive and focused and to define their mission and scope of work clearly. This aids them in being as effective as possible and improves their visibility and respectability.

While the level of technical knowledge about conducting TNR programs has certainly increased over time, the philosophical implications of TNR programs have even wider-ranging effects. Feral cat management is clearly interrelated with all other animal-related efforts in a community. This means that, to be effective, TNR groups have to develop a working relationship with municipal animal-control agencies and other animal-related programs. Feral caregivers also need each other and can accomplish more as part of a whole group or network than they can individually. Citywide efforts can work if they are truly comprehensive and wide reaching, as they are in San Francisco, California, and Newburyport, Massachusetts.

Feral cat problems have a direct impact on the intake and disposition of cats in shelters around the country. Feral cats themselves may be brought into shelters, where they are often euthanized, sometimes after being held for several days. The offspring of feral cats may be brought to shelters as well. Some of these offspring may be adoptable, adding to the numbers of cats needing homes. However, some will be euthanized due to disease or lack of socialization or because they are too young to be adopted and no foster home is available. Adoptions of colony kittens can contribute to problems in the community if the new owners do not sterilize their pets. It is also clear that discussions surrounding TNR and its implementation help shape society's views of and reactions to unowned cats. The discussion opens

the door to new ideas beyond euthanasia of cats or other animals to control their population or deal with homeless animals. We are beginning to ask not why we should care about feral cats but rather how we can make a difference.

The Future

There is an ever-increasing body of knowledge being produced and published about feral cats. Researchers' long-term, detailed, follow-up study of feral cat colonies using several different control methods conducted in North Carolina was published in the *Journal of the American Veterinary Medical Association* in 2004. Three articles report on disease frequency in pet and feral cats (Nutter et al. 2004); reproduction and survival of kittens in feral colonies (Nutter, Levine, and Stoskopf 2004a); and live trapping efficiency of feral cats (Nutter, Levine, and Stoskopf 2004b). A scientific chapter on feral cats, with emphasis on the international perspective, is included in *The Welfare of Cats* (Rochlitz 2005). An in-depth and carefully crafted research project in Auburn, Alabama, comparing feline activities and territories before and after TNR will be completed and published in the near future. And a project to study the population dynamics of free-roaming owned and feral cats as of 2004 had just begun in a community in Texas.

Impressive strides have been made in bringing the plight of feral cats to public view and into the scientific and animal protection arenas. TNR can now be considered as an alternative to doing nothing or to euthanasia for feral cats currently in communities. Yet communities must grapple with the chain of events that results in establishment of feral cat colonies, particularly the initiating event, the deliberate abandonment or accidental loss of companion cats. They must find ways to increase the value of

cats in the minds of the public, to change people's behaviors so that it is no longer acceptable to leave cats behind or allow them outside without identification or sterilization, and to provide the public with the knowledge and impetus to help cats who appear to be homeless. Finally, those in the animal-care field must provide communities with the knowledge and resources to help cat owners trying to do right by their own cats and by homeless or feral cats in their neighborhoods.

Note

¹Kittens younger than about eight weeks are generally the easiest to socialize. Kittens older than this may or may not socialize well within a few days to weeks. Adult cats may need a few days' "cooling off" before they can be definitively assessed as feral. Many previously owned cats when trapped and transported may seem unsocialized, but with time they return to their former socialized status. Adult feral cats can be socialized on occasion, but the process requires great care and commitment since these cats are often terrified and/or aggressive and generally require months to years of effort before they become socialized, if ever. They may also only be friendly with one or two people they know well. Adult feral cats in managed colonies may become more social with time, sometimes to the point where they are adoptable. This is another means by which colony size may be decreased over time.

Literature Cited

Anonymous. 2002. *Alley Cat Action*, Spring, 1.

Beran, G.W., and M. Frith. 1988. Domestic animal rabies control: An overview. *Reviews of Infectious Diseases* 10: S672-S677.

Berkeley, E.P. 1990. Feral cats. *Cat Fancy*, July, 20-27.

———. 2004. *TNR past, present, and future*. Washington D.C.: Alley Cat Allies.

Bester, M.N., J.P. Bloomer, R.J. van Aarde, B.H. Erasmus, P.J.J. van Rensburg, J.D. Skinner, P.G. Howell, and T.W. Naude. 2002. A review of the successful eradication of feral cats from sub-Antarctic Marion Island, Southern Indian Ocean. *South African Journal of Wildlife Research* 32:

65-73.

Cohen, A. 1992. Weeding the garden. *The Atlantic Monthly*, November, 76-86.

Courchamp, F., M. Langlais, and G. Sugihara. 1999. Control of rabbits to protect island birds from cat predation. *Biological Conservation* 89:(2) 219-225.

Fitzgerald, B.M., and D.C. Turner. 2000. Hunting behaviour of domestic cats and their impact on prey populations. In *The Domestic cat: The biology of its behaviour*, ed. D.C. Turner and P. Bateson, 151-175. New York: Cambridge University Press.

Fitzgerald, B.M., and J.A. Gibb. 2001. Introduced mammals in a New Zealand forest: Long-term research in the Orongorongo Valley. *Biological Conservation* 99: 97-108.

Hughes, K.L., and M.R. Slater. 2002. Implementation of a feral cat management program on a university campus. *Journal of Applied Animal Welfare Science* 5: 15-27.

Hughes, K.L., M.R. Slater, and L. Haller. 2002. The effects of implementing a feral cat spay/neuter program in a Florida county animal control service. *Journal of Applied Animal Welfare Science* 5: 285-298.

Johnson, K., and L. Lewellen. 1995. *San Diego County: Survey and analysis of the pet population*. San Diego: San Diego Cat Fanciers, Inc.

Johnson, K., L. Lewellen, and J. Lewellen. 1993. *Santa Clara county's pet population*. San Jose, Calif.: National Pet Alliance.

Levy, J.K., and P.C. Crawford. 2004. Humane strategies for controlling feral cat populations. *Journal of the American Veterinary Medical Association* 225 (9): 1354-60.

Levy, J.K., D.W. Gale, and L.A. Gale. 2003. Evaluation of the effect of a long-term trap-neuter-return and adoption program on a free-roaming cat population.

- Journal of the American Veterinary Medical Association* 222: 42–46.
- Meslin, F.X., D.B. Fishbein, and H.C. Matter. 1994. Rationale and prospects for rabies elimination in developing countries. *Current Topics in Microbiology and Immunology* 187: 1–26.
- Neville, P.F., and J. Remfry. 1984. Effect of neutering on two groups of feral cats. *The Veterinary Record* 114: 447–450.
- New, J.C., Jr., M.D. Salman, M. King, J.M. Scarlett, P.H. Kass, and J.M. Hutchinson. 2000. Characteristics of shelter-relinquished animals and their owners compared with animals and their owners in the U.S. pet-owning households. *Journal of Applied Animal Welfare Science* 3: 179–201.
- Nutter, F.B., J.P. Dubey, J.F. Levine, E.B. Breitschwerdt, R.B. Ford, and M.K. Stoskopf. 2004. Seroprevalence of antibodies against *Bartonella henselae* and *Toxoplasma gondii* and fecal shedding of *Cryptosporidium* spp., *Giardia* spp., and *Toxocara cati* in feral and pet domestic cats. *Journal of the American Veterinary Medical Association* 225: 1394–1398.
- Nutter, J.P., J.F. Levine, and M.K. Stoskopf. 2004a. Reproductive capacity of free-roaming domestic cats and kitten survival rate. *Journal of the American Veterinary Medical Association*. 225: 1399–1402.
- . 2004b. Time and financial costs of programs for live trapping feral cats. *Journal of the American Veterinary Medical Association* 225: 1403–1405.
- Patronek, G.J. 1998. Free-roaming and feral cats—Their impact on wildlife and human beings. *Journal of the American Veterinary Medical Association* 212: 218–226.
- Patronek, G.J., A.M. Beck, and L.T. Glickman. 1997. Dynamics of dog and cat populations in a community. *Journal of the American Veterinary Medical Association* 201: 637–642.
- Rosenblatt, B. 1992. Cats on campus. *The Animal's Agenda*, April, 20–21.
- Sayres, E. 2000. Expanding the safety net: Creating a humane feral cat program in your community. Handout. No-Kill Conference. Tucson, Ariz. September 14–17.
- Slater, M.R. 2002. *Community approaches to feral cats: Problems, alternatives and recommendations*. Washington, D.C.: Humane Society Press.
- . 2004. Understanding issues and solutions for unowned, free-roaming cat populations. *Journal of the American Veterinary Medical Association* 225: 1350–1354.
- . 2005. The welfare of feral cats. In *The welfare of cats*, ed. I. Rochlitz, 141–176. Dordrecht, The Netherlands: Springer.
- Soulebot, J.P., A. Brun, G. Chapuis, F. Guillemin, H.G. Petermann, P. Precausta, and J. Terre. 1981. Experimental rabies in cats: Immune response and persistence of immunity. *Cornell Veterinarian* 71: 311–325.
- Tabor, R. 1983. *The wild life of the domestic cat*. London: Arrow Books Limited.
- . 1997. *Understanding cats: Their history, nature and behavior*. Pleasantville, N.Y.: Reader's Digest.
- Terborgh, J. 1992. Why American songbirds are vanishing. *Scientific American* May: 98–104.
- Universities Federation for Animal Welfare. 1981. Feral cats: Notes for veterinary surgeons. *Veterinary Record* 108: 301–303.
- WHO Expert Committee. 1988. Report of WHO consultation on dog ecology studies related to rabies control. *World Health Organization* 88.25: 1–35.
- . 1994. *Report of the fifth consultation on oral immunization of dogs against rabies*. World Health Organization 94.45, 1–24.