Every day more and more sterilization programs for feral cats are being implemented across the United States and around the world. Compassionate communities are embracing this humane, nonlethal method of managing community cats, not only because it preserves the sanctity of innocent life, but also simply because it is effective. Unlike its traditional counterpart catch-and-kill, which has been practiced for decades, Trap-Neuter-Return (TNR) programs stabilize populations, improve the overall health of outdoor cats, and reduce both shelter costs and euthanasia rates. In addition, such programs drive community involvement and encourage compassionate actions.

**TNR is Effective, Reduces Costs, and is Humane**

*Proven Effective to Reduce Feral Cat Populations and Reduce Shelter Euthanasia Rates*

Along with sterilizing community cats, all kittens are removed from the colony and placed into an adoption program, which immediately reduces the size of the colony. Friendly, stray cats are scanned for microchips and returned to their guardian or rehomed. Any cats who can be socialized are also placed into an adoption program, further reducing the number of cats in a colony.

A University of Florida study found that spaying/neutering community cats in an area of high animal-control impoundments led to a dramatic decline in the number of cats who were admitted to and euthanized by the local shelter (Levy et al., 2014). During the two-year study, the shelter staff TNR’d 2,366 community cats (an estimated 54 percent of the feral cat population in the targeted area), with most of the cats being returned to the site and some being adopted (Levy et al., 2014). After implementing TNR, the animal control intake for cats in that targeted area decreased by 66 percent and the shelter euthanasia rate for cats dropped by 95 percent (Levy et al., 2014). In addition, this TNR project reduced cat intake by animal control for the entire county by 13 percent and shelter euthanasia rate by 30 percent (Levy et al., 2014).
Another study analyzed data from a TNR program for feral cats living in Orange County, Fla. When the authors compared data from six years before the implementation of the TNR program to data collected during the program, they found both the number of calls to animal control about cats and the number of cats killed by animal control greatly decreased after the TNR program was initiated, even while the human population grew significantly. The number of sterilization surgeries and the number of cats adopted out of the shelter also increased (Hughes et al., 2002). Another study that focused on a North Carolina community found that the number of cats euthanized at the local shelter decreased significantly after a spay/neuter clinic was established nearby. The number of service and complaint calls to animal control also declined or leveled off annually (Scarlett and Johnston, 2012).

In Italy, where the national law for managing feral cats is a no-kill policy, TNR programs have been in place for more than a decade. One study examined TNR programs for feral cats living in the city of Rome and found the number of registered feral cat colonies greatly increased (Natoli et al., 2006). This allows for more detailed documentation of the program’s effectiveness, while helping to drive community involvement. Colony caretakers, who once worked under a shadow of fear and persecution for their actions, now have the freedom to carry out the necessary steps in implementing a proper TNR program. The study revealed that, with TNR, the average number of cats per colony decreased between 16 percent and 32 percent over a few years, but the researchers also concluded that further education of the larger community would be necessary to make TNR fully effective (Natoli et al., 2006).

One well-known cat sanctuary in Rome, Torre Argentina, believes this to be precisely the situation. The sanctuary, even today, must push back against the uninformed who fundamentally misunderstand TNR, and believe that all community cats will simply disappear shortly after a TNR program begins. These detractors do not consider that TNR cannot stop irresponsible people from abandoning cats, nor does it keep a cat from getting lost away from her home. Torre Argentina stresses sterilization in its outreach to the public as...
the key factor to reducing the feral cat population. It has sterilized more than 30,000 cats in the last decade, but has in fact seen a decline from the peak number in 2008. They believe that greater public education and awareness has led to more Romans sterilizing their own companion animals, which in turn has led to the decline in sterilizations at the sanctuary since 2008 (Torre Argentina, accessed 2015).

After researchers established a TNR program at Texas A&M University, they conducted a study where they compared the feral cat colony from the year of implementation of TNR to the year after. In the first year, they caught 123 cats, compared to 35 the second year (Hughes and Slater, 2002). Additionally, while they found 20 kittens the first year, they found only three kittens the second year, and all of them in unusual places and alone (not in litters), leading them to conclude these kittens were likely born elsewhere and abandoned. They found no litters or nursing mothers after one year of TNR. Though most cats were returned to campus, 32 were adopted. The study found that, while such programs required substantial money and time to start, they would cost less money over time as the size of the cat colonies decreased and fewer new cats migrated into the colonies. Returning the cats to their outdoor environment after trapping was deemed to be an effective method of colony management that stabilizes the population of feral cats over time (Hughes and Slater, 2002).

**Less Costly and Less Time-Intensive**

Unlike eradication programs, which are paid for using tax dollars, most TNR programs operate using private money and use volunteers to carry out the workload. A study commissioned by Best Friends Animal Society and funded by Petsmart Charities found that TNR programs for free-roaming cats can cut costs in half. The study says that with an estimated 87 million free-roaming, community cats in the United States, it would cost governmental entities about $16 billion to trap and kill these cats as opposed to about $9 billion to support TNR programs run by rescue organizations and individual volunteers (Best Friends, 2010).

As part of a population modeling project for the Alliance for Contraception in Cats and Dogs, a team of researchers conducted a more recent economic analysis of both TNR and catch-and-kill. Their results also support TNR as the more cost-effective solution to managing community cats. According to the study, the cost of catch-and-kill methods are 4.5 to 9 times greater than TNR, as projected over a seven-year period (Zawistowski, 2013).

The Orange County, Fla., study mentioned prior also supports the cost-effectiveness of TNR. Researchers calculated the estimated cost associated with neutering feral cats and compared the data to the cost of impounding and euthanizing feral cats. They found that “neutering would
be less costly as well as less labor intensive” than impounding the cats (Hughes et al., 2002).

Addresses Public Health Concerns

TNR programs provide community cats with vaccinations that prevent the transmission of diseases to humans and to other cats. A rabies vaccine is administered, which creates a buffer zone between wildlife and humans. “By keeping a critical mass (usually 80 percent) of feral cats vaccinated against rabies in managed colonies, a herd immunity effect may be produced, potentially providing a barrier between wildlife and humans and preventing one of the major public health threats caused by feral cats” (Slater, 2002). The distemper and feline leukemia (FeLV) vaccines also prevent the transmission of disease to other cats.

Providing community cats with vaccines decreases the chance of the public coming in contact with an unvaccinated cat and instills good public health policy. Ron Cash, the former business administrator of Atlantic City, who oversaw the Department of Health and Human Services, has said, “TNR is good public health policy.” Prior to implementing TNR for the cats living on the Atlantic City boardwalk, Cash said he received numerous calls from the public about the cats. However, after observing the results of TNR he said, “The [cat] population that’s here is much healthier. They’re coexisting with people very well now. Most people don’t even know the cats are there” (City of Atlantic City, accessed 2013).

Returning feral cats to their outdoor homes after sterilization also ensures rodent populations are kept in check; maintaining low rodent populations helps prevent the spread of disease. Fitzgerald and Karl, among others, studied cats and their prey for over 20 years in a mostly uninhabited forest in New Zealand, and their research clearly shows how cats keep rodent populations in check. In the beginning of the study, cats were common and the rat population was “low and stable.” However, as the study continued and cats were trapped, leaving only a few individuals in the area, rats began to increase slowly. After several years with only a few cats present, the rat population “peaked at about five times their original numbers” (Fitzgerald and Turner, 2000).

During the 14th century, the Black Plague claimed the lives of over 25 million people, because years earlier, Europe’s witch hunts had brought the country’s cat population almost to extinction. The low cat population meant a high rodent population and that made for the spread of disease. It wasn’t until the Age of Exploration, when cats began accompanying sailors on their voyages to new lands (to eat the rat stowaways) that the cat became popular again.
**TNR Improves Cats’ Health, While Helping Them Become Better Neighbors**

Along with reducing and stabilizing feral cat populations, TNR programs also improve the overall health of outdoor cats; cats are relieved from the constant stress of mating and pregnancy. In one study, veterinarians examined the effects of sterilization on feral cat health by measuring the body condition of 14 feral cats upon trapping, and then taking measurements one year following sterilization. When trapped initially, the cats were lean but not emaciated. One year after being sterilized, the cats showed significant increases in weight and improvements in body condition. In addition, caregivers reported that the cats had a decreased tendency to roam after being neutered (Scott et al., 2002, web).

On average, spayed females live 39 percent longer than unspayed females, and neutered males live a full 62 percent longer than those unneutered (Banfield Pet Hospital, 2013). Sterilization greatly decreases the risk of certain cancers (uterine, mammary, testicular, prostate), while providing vaccines will prevent the spread of disease. Neutering male cats also decreases fighting (for mates and territory), which leads to the reduced risk of disease transmission, FIV in particular (Banfield Pet Hospital, 2013).

In addition, sterilizing both female and male cats decreases their need to roam in search of mates, which decreases the risk of injury. Unneutered cats are at four times the risk of being hit by a car than neutered cats, and three times more likely to need treatment for an animal bite (Banfield Pet Hospital, 2013). And most
TNR programs treat cats for internal and external parasites to address disease and potential malnutrition. Lastly, caretakers provide daily food and fresh water; a proper diet leads to improved health and reduces the need to roam in search of food. Any cats showing signs of illness or injury are promptly trapped and treated accordingly.

Once reproduction stops, so do the mating behaviors, which helps improve their relationship with local residents. Sterilization greatly reduces yowling, fighting, and spraying, so complaint calls to animal agencies are decreased. Helping feral cats become better neighbors improves community morale (Hughes et al., 2002).

**Drives Community Involvement and Promotes Compassion**

Implementing local TNR programs helps drive community involvement and encourages compassionate action. TNR also creates opportunities for outreach, education, and cooperation. Today, three times as many individuals in this country are sharing their homes with companion animals as compared to 40 years ago (The HSUS, 2014). Cats and dogs play a large role in the lives of most Americans and these animals are treated like family members. Today’s society also has a heightened awareness of the staggering euthanasia rates occurring in animal shelters, and there is more determination than ever to reduce the killing of healthy animals. Rather than a simple problem of too many animals, many view the situation “as a people problem — the result of the human-animal bond failure,” which makes “the killing of animals an unacceptable response” (Hughes et al., 2002).

This shift in attitude has brought a change in the role humans play when managing these animals. The traditional catch-and-kill method is no longer viewed as morally acceptable; many individuals would rather see a cat sterilized and returned to the site over having the cat trapped and killed. A case study conducted by The Humane Society of the United States found that 85 percent of cat owners who were surveyed would rather have a cat TNR’d than trapped and killed (Gibson, 2012). And in the Orange County, Fla., study, it was noted that prior to implementing a TNR program, citizens “had requested help from the county to keep their colonies rather than having them euthanized” (Hughes et al., 2002).

Surveys have shown that most individuals acquire cats by rescuing strays in their neighborhoods. Compassionate people feed and care for homeless cats. They use their own time and money to provide the basic needs for these animals. When they are given the proper tools (access to low-cost TNR services) and they are permitted to conduct TNR without penalty (fines, jail time), they are able to help more cats. This is illustrated by the study of Rome’s no-kill policy that showed an increase in the number of registered feral cat colonies (Natoli et al., 2006). TNR programs encourage individuals to get involved and make a difference in their
TNR also establishes a point of contact for concerns about the cats and for resolving any community concerns.

**Eradication is Ineffective, Costly, and Cruel**

Once an eradication program has started, it must continue until all targeted individuals have been killed in order to be successful. A primary weakness of eradication programs is that it is close to impossible to determine if all targeted subjects have been killed, let alone identified, and when they are not, the breeding cycle will repopulate the area. Since individuals become trap-shy or immune to introduced disease, it becomes more difficult to kill the last few individuals. However, the killing cannot continue indefinitely and the program must cease at some point.

But an eradication program cannot just stop at any given time. A mistaken assumption that eradication is complete when it really isn’t can have disastrous consequences: “the species can bounce back and even expand its range, causing environmental and economic damage, and rendering the initial eradication campaign redundant” (Rout et al., 2013). And although scientists try to predict the appropriate time to stop eradication programs, “imperfect detection methods make it difficult to tell whether an invasive species has been successfully eradicated” (Rout et al., 2013).

**The “Vacuum Effect”**

History has shown that the catch-and-kill method does not effectively reduce feral cat populations. Killing is a temporary, “quick fix” that may appeal to authorities but it does not stop the breeding cycle. When cats are trapped and removed from an area, new cats quickly move in to fill the vacated territory and start the breeding process all over again. This phenomenon was discovered by British biologist Roger Tabor and is referred to as the “vacuum effect” (Tabor, 1983). However, if a colony of cats is “neutered and returned to its area it will continue to hold the location and keep other cats out by its presence” (Tabor, 1995). If new unsterilized cats are permitted to join the colony, they will be sterilized and returned.

A perfect example of the vacuum effect is illustrated by a recent study conducted by Lazenby et al. (2015) in the forests of Tasmania, Australia, where “low-level culling of feral cats” actually caused an increase in the number of cats in the area, despite the initial illusion that there was a decrease in population. Over the course of 13 months, researchers attempted to “simulate the resource-effort that typically might be available to and expended by natural resource managers,” which entailed trapping cats and shooting them in the head (Lazenby et al., 2015). At the end of the study, researchers noted a significant increase in feral cat numbers with an average of 75 percent at one site and 211 percent at the other site. It was also noted that “cat numbers fell,
and were comparable with those in the pre-culling period, when culling ceased” (Lazenby et al., 2015). More importantly, the researchers acknowledge their efforts “did not constitute a sustained, multifaceted, long-term downward pressure on [their] study populations, which may be required if culling is to be used in programs of feral-cat control” (Lazenby et al., 2015). Subsequently, the catch-and-kill method of managing feral cats continues to prove ineffective and also counterproductive.

**Counterproductive**

Eradication programs for feral cats can be highly counterproductive with potentially catastrophic consequences on local ecosystems. After cats were eradicated from Macquarie Island, near Antarctica, the rat population exploded, decimating the ground-nesting bird populations (rats feed on eggs and baby birds)(Strickland, 2009). Rabbits, too, increased in population, which destroyed the island’s vegetation; this resulted in decreased materials for birds to build nests and left the native penguin population more susceptible to predators. Scientists spent seven years eradicating the rats, mice, and rabbits to combat their increased predation on birds (Strickland, 2009; Australian Department of the Environment, 2009). And on Wake Atoll, part of the Pacific Islands, a U.S. military base eradicated the cat population (though a few cats have since been sighted), which allowed for the rat population to dramatically increase. The base continues to implement rat control measures (Rauzon et al., 2008).

“Other counterproductive eradication attempts include: the explosion of the local rat population in Albany, Ore., after “aggressive city efforts in recent years to control the feral cat population” (Harlan, 2013), and an increase in the local skunk population in Cape May, N.J., following the removal of a colony of feral cats (Cox, 2008).” An eradication effort on Little Barrier Island near New Zealand resulted in a proliferation of rats, who then preyed on the petrels meant to be protected from cats (Rayner et al., 2007).

In a letter to *Nature*, biologists Kevin R. Crooks and Michael E. Soulé explain that when large mammalian carnivores disappear (or in the case of eradication programs, they are lethally removed), this causes small carnivores, or mesopredators, to increase (Crooks and Soulé, 1999). In other words, when a top predator, such as the cat, is removed from the food chain, smaller predators like rats — along with prey animals like rabbits — increase in abundance, which is often bad news for an ecosystem. As seen on Macquarie Island, removal of the top predator (cat) left prey populations (rats and rabbits) unchecked and vegetation was decimated, causing the entire ecosystem to collapse.

**Costly and Very Time-Intensive**

Eradicating feral cats is a futile endeavor that comes with a hefty price tag — at the expense of the taxpayer — and requires decades of continual killing. It took over 15 years and cost AU$3.5 million (about
$2.5 million USD) to eradicate the 2,500 cats on Macquarie Island (which is only 21 miles long and 3 miles wide), with another AU$24.7 million (about $20.2 million USD) allocated to eradicating the rats and rabbits over seven years (Veitch et al., 2011). Marion Island near South Africa is only 15 miles long and 10 miles wide, yet it took 19 years to kill 3,400 cats (Bester et al., 2002). Additionally, it cost $1.3 million to eradicate the cats living on Ascension Island (located in the South Atlantic Ocean), which is only 34 square miles (Veitch et al., 2011). These eradication programs that are deemed “successful” within the scientific community have been carried out on small, isolated islands with little to no human habitation. Attempting to eradicate an entire population of feral cats on a continent, with far more variables and unpredictable outcomes, would be futile.

**Cruel and Inhumane**

Along with being ineffective and costly, eradication programs are also cruel and inhumane to the animals being culled. In most cases, the animals die slow, painful deaths due to asphyxiation, starvation, dehydration, dismemberment, or over-exposure to weather elements. Attempting to eradicate an entire population of feral cats on a continent, with far more variables and unpredictable outcomes, would be futile.

In Australia, cats are lured into tunnels where they are sprayed with a toxic substance (Murphy et al., 2011). The country’s government is currently working to create a deadly virus to be released nationwide to control the feral cat population, along with producing a toxic bait known as “Curiosity” (Owens, 2014; Arup and Phillips, 2014).

In the above island examples, every eradication program required more than one method of killing to eliminate most or all of the feral cats. On Marion Island, nearly 100 cats were intentionally infected with the feline panleukopenia virus (feline distemper), which ultimately killed around 2,800 cats. Some cats, however, built up an immunity to the disease, so the remaining individuals were shot at night (Bester et al., 2002). On Ascension Island, the cats were killed by live trapping and shooting, poisoned bait, and leghold traps (Ratcliffe et al., 2010). And one study of 87 island eradication programs, including Macquarie Island, revealed that “on average, each campaign employed 2.7 eradication methods including leg-hold traps (68%), hunting (59%), primary poisoning (31%), cage traps (29%), and dogs (24%)” (Ratcliffe et al., 2010).

**Collateral Damage**

Eradication programs rarely kill only the one intended species; more often, many non-target animals are killed as well. Poisoned bait does not discriminate between a cat and another meat-eating animal, and intentionally unleashed viruses like, feline distemper, infect feral cats and domestic cats alike. In these programs, when live-trapped cats show
no sign of ownership (i.e., a collar or microchip) they will be killed even if they are someone’s pet.

Non-target animals and species sometimes pay quite a high price when people try to eradicate cats. On Ascension Island, 38 percent of domestic house cats were killed, causing “public consternation” (Ratcliffe et al., 2010). Over 6,000 land crabs were also killed by ingesting poisoned bait, and “a moratorium on crab claw consumption” was implemented to prevent secondary poisoning of humans (Ratcliffe et al., 2010). In some cases, eradication of feral cats is done through secondary poisoning, meaning prey animals are intentionally poisoned in order to kill cats who eat the tainted prey. On the New Zealand island of Tuhua, cats were removed through secondary poisoning by attempting to eradicate two types of rats living on the island (Ratcliffe et al., 2010).

Even on Marion Island, where “acceptable” numbers of non-target animals were killed, hundreds of birds died in traps set for cats, including some of the petrels that the eradication of cats was meant to protect (Bester et al., 2000). After most or all of the cats had already been killed, researchers set out across the island 30 thousand slaughtered chicken carcasses that had been laced with poison. There is no record of how many cats or other animals died from consuming these tainted birds (Bester et al., 2000).

**Perpetuates Animal Abuse**

Implementing catch-and-kill to manage any animal population, not just cats, perpetuates the idea that animal cruelty is tolerable. When policy supports lethal methods of control, it sends a message to the public that it is morally acceptable to kill sentient beings. Humans created the situation that feral cats are currently
in: we domesticated them, we relocated them to every corner of the Earth, and we allowed them to reproduce. Therefore, it is our responsibility to manage them humanely. Killing is the highest form of abuse; it is certainly not humane.

**Feeding Bans**

Some authorities blame caregivers for perpetuating and even starting the problem by feeding stray and feral cats. They think the cats can be “starved out,” so they implement feeding bans and threaten anyone caught feeding outside cats with fines and jail time. These plans never work because cats are territorial animals, who won’t quickly abandon an area, and they are also very resourceful scavengers, finding new food sources even when supplies are scarce. In addition, compassionate people continue to feed outdoor cats regardless of potential fines and other repercussions; it seems to be a natural act for humans to feed an animal to keep her from starving. One recent study concluded that as much as 25 percent of U.S. households, approximately 30 million, are feeding at least one community cat (Lord, 2008). Instead of blaming feeders/caretakers and criminalizing their actions, we should encourage their acts of compassion by assisting them with the resources and information to help sterilize the animals.

**Conclusion**

As demonstrated by the above studies, TNR programs are highly effective in stabilizing feral cat populations, reducing shelter costs and euthanasia rates, and improving overall health of outdoor cats. All kittens and adoptable adult cats are immediately removed and placed into adoption programs, which decreases a colony’s size instantly. All remaining cats are sterilized to stop the breeding cycle. Euthanizing cats who are too sick or injured also decreases the number of cats in a colony, and, over time, natural attrition will further reduce the size of a colony.

When feral cats enter a traditional shelter they are usually euthanized immediately. Most agencies do not have the time nor the resources to house feral cats. However, by working with local rescue organizations to implement TNR programs, fewer cats end up in shelters, fewer cats are killed, and the feral cats who do come in can be returned to their appropriate colony.

The traditional method of controlling feral cats by catching and killing them is not only outdated but it has been proven ineffective, counterproductive, and costly. The few examples scientists like to provide of “successful” cat eradication programs took several years, millions of taxpayer dollars, and were carried out on tiny islands, most uninhabited by humans. Removing the cats in these examples also released prey populations of rats and rabbits, so eradication programs were implemented to remove those animals from the ecosystem as well — because rats prey on ground-nesting birds and rabbits destroy vegetation. Even removing one species from an ecosystem can have catastrophic conse-
The Effectiveness of TNR Programs

Like setting off a chain reaction that could result in the total collapse of that ecosystem. Once you start killing, you have to continue to kill until all targeted animals are removed or the breeding cycle will re-populate the area.

Unlike killing, which has a dramatic effect on the environment with uncertain results, TNR provides a practical solution with a more subtle way of interacting with the environment. TNR stops the breeding cycle without removing the animals from the ecosystem. This does not create any open niches and keeps nature in balance. Professor Andrew Linzey of the University of Oxford, England, once said:

In the name of biodiversity, these ‘managers’ regularly kill one form of life in order to ‘allow’ another to survive ... perhaps populations rise and crash as a matter of course ... we seem to have forgotten ... that it is a self-regulating system. In the end, everything depends upon our own moral vision of ourselves in the world of nature. I believe that we should be not the master species, but the servant species. That means as little interference as possible, and only then with genuinely benign intentions. Biodiversity is a classic tale of how an idealized view of the world can result in individual harm. (Linzey, 2001)

With more individuals sharing their homes with companion animals, the bond between humans and animals is strengthening. People are making more compassionate decisions and becoming more vocal regarding animal concerns. And they are awakening to their place within the environment and moving away from the view that humans are separate from the environment. The public no longer finds it morally acceptable to use lethal animal management practices, such as catch-and-kill. Today’s society supports programs, like TNR, that preserve and respect life.

In the Name of Mercy

In his 1989 essay entitled, “In the Name of Mercy,” Edward Duvin had this to say about traditional animal sheltering operations:

“Shelters cannot continue to be slaughterhouses and friends of animals cannot continue killing healthy beings in the name of mercy. A new and larger vision is needed, a vision in which shelters hold themselves accountable for meeting demanding performance standards that preserve life — not destroy it.”