

Care and Control of Community Cats

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In addition to the estimated 82 million owned pet cats in the United States,⁶ there are an estimated 30 to 60 million free-roaming stray and feral cats.^{27,40,48} In fact, these cats may represent as much as 50% of the total cat population in a given community. In addition, they are estimated to produce up to 80% of the kittens born annually in the United States.²⁷ Despite the lack of exact estimates of their numbers, there is no doubt that millions of these cats exist in communities across the United States, and millions of Americans feed them.²⁷

A continuum of lifestyles exists between socialized house cats, free-roaming, previously socialized, or “loosely owned” strays and truly unowned, unsocialized feral cats.³⁶ Feral cats are “wild” offspring of domestic cats and result from pet owners abandoning and/or failing to control their pets’ reproduction.¹⁶ Like wildlife species, when raised without human contact, feral cats remain extremely wary of humans and flee if approached. They generally do not allow handling and must be trapped in order to be presented to a veterinarian for care. In contrast, stray cats are at least somewhat socialized to people and include those cats that may have been previously owned as well as those that are “loosely owned” neighborhood or barn cats.³⁶ Free-roaming stray and feral cats form colonies surrounding a “home base,” which includes a source of food and shelter. Locations with garbage dumpsters, such as housing or shopping

complexes, or those with livestock barns, are prime locations in which cat colonies form because they offer a supply of discarded foodstuffs and rodents.¹⁶ Cats typically seek shelter in crawl spaces beneath buildings or other nearby structures (Figure 45-1). Because both stray and feral cats frequently co-exist within the same colonies, the term community cats is often used to refer to all of these outdoor-dwelling cats, regardless of socialization status.

Unlike wildlife species, cats cannot fully fend for themselves in most instances. Unattended, they survive and reproduce, yet frequently suffer from exposure, disease, and trauma. The mortality rate of kittens born outdoors is high, with fewer than 25% typically surviving beyond 4 to 6 months of age.^{39,51} However, beyond 6 months of age, the odds of survival are much greater. The life span of free-roaming cats varies depending at least in part on the colony’s location. Trauma is the most common cause of death.^{39,51} In some cases, these cats become public nuisances, and many are euthanized at animal shelters each year. Because their reproduction frequently goes unchecked, community cats represent not only a result of feline overpopulation, but also a significant source of the problem.

Substantial debate surrounds the appropriate response to the presence of community cats. Scientific reviews of their control and its impact on both the cats themselves



FIGURE 45-1 Three feral kittens observe the world from the safety of a crawl space. Such spaces under buildings are typical locations in which feral cats seek shelter and are popular sites for queens to nest and raise kittens.

as well as the environment have been published.^{27,31,40,43} Numerous stakeholders have issued policy statements regarding this issue, representing many different and often polarized opinions.^{1,3,5,52} The traditional approach to controlling free-roaming cats has been extermination by trapping and euthanasia. However, large-scale trap and kill programs, which would be necessary for even temporary population control, have not been widely implemented, and even small-scale attempts at trapping and euthanizing cats frequently result in public outcry.

There is little doubt that public sentiment is influential in policy making, and numerous examples exist whereby pressure exerted by the public and animal welfare organizations has been instrumental in stopping euthanasia of cat colonies.² In the author's opinion, trapping cats for euthanasia perpetuates the message that cats are disposable. In contrast, the provision of affordable services to neuter free-roaming cats raises awareness that cats require and deserve responsible care and enables people to "do the right thing" when cats take up residence on their property or in their neighborhood.

In addition to preventing reproduction, neutering cats also serves to promote their welfare. Studies have shown that feral cats roam less and have higher body condition scores following neutering.^{46,51} In addition, urine marking, fighting, breeding, and roaming are rapidly and dramatically reduced, making these cats less likely to be targeted as public nuisances. Finally, cats in managed colonies are no more likely than pet cats to harbor common infectious and zoonotic diseases.^{30,34,50}



FIGURE 45-2 A feral cat rests under the shade of a parked car. His cropped left ear tip identifies him as a neutered member of a managed colony. This distinctive mark is the universally recognized symbol of a sterilized free-roaming cat.

"Trap-neuter-return" (TNR) is a humane, nonlethal method of managing existing colonies of free-roaming cats and represents a legitimate response to existing colonies of cats with caregivers.^{29,38} Cats are trapped, vaccinated, neutered, and then returned to their "home" for release. The tip of the left ear is cropped to identify the cats as having been sterilized. This is the universal symbol for a sterilized free-roaming/feral cat (Figure 45-2). Caregivers take responsibility for feeding and monitoring the health of the cats in the future. TNR may not be appropriate in all circumstances; for example, colonies should not be located in wildlife refuges or where endangered wildlife species are known to reside.

TNR has become an increasingly popular method of managing existing colonies of community cats during the past 2 decades. Neutered cats display fewer "nuisance" behaviors, such as spraying and fighting, and they cannot reproduce. With time, colony size should decrease because of attrition. However, it is crucial to realize that emigration of new cats is always a possibility, and in many cases, a likelihood; thus ongoing vigilance and management are required. Therefore a dedicated caregiver is crucial for long-term cat control, as well as to ensure cat welfare.^{16,17,51} TNR has also been purported to be more cost effective than trapping and euthanizing cats.²¹ This is because most states require impoundment and holding of cats prior to euthanasia, and private volunteers are more likely to trap cats for surgery versus euthanasia.

Individuals caring for community cats frequently seek veterinary advice and services. The purpose of this chapter is to provide the veterinary clinician with current recommendations for providing care of free-roaming cats during the process of TNR. A general summary of these recommendations is found in Table 45-1.

TABLE 45-1 General Veterinary Medical Care Protocol for Trap-Neuter-Return of Community Cats

Procedure	Rationale
Short-term holding prior to surgery (e.g., 12 to 48 hours)	Provides time for acclimation; some cats that were initially reactive and feral-behaving may be determined to be tame
Balanced anesthesia administered by intramuscular injection	Essential to ensure smooth induction and proper analgesia with minimal handling to decrease stress and optimize staff safety
Physical examination, including scanning for a microchip	To identify any physical problems and to help determine if the cat might be owned
Subcutaneous fluid administration for cats that are pregnant, lactating, or dehydrated	Promotes normal hydration and prevention of complications related to dehydration
Ear tipping	Identifies cats as neutered, vaccinated members of a managed colony
Rabies vaccination (3-year product)	Affords protection against an important endemic disease of public health significance
Modified live FVRCP vaccination	Affords cats protection against common and life-threatening infections
Ivermectin 1% solution (0.3 mg/kg subcutaneously)	Treats ear mite infestations and temporarily limits round and hookworm infestations (cost effective at only pennies per dose)
Holding overnight after surgery prior to release	Ensures cat are fully alert and physically coordinated for safe release
Return to original colony site	Cats possess strong homing instincts, and release to a foreign location is not humane unless careful relocation procedures are followed

FVRCP, Feline viral rhinitis–calicivirus–panleukopenia.

SAFE AND HUMANE CAPTURE, HOLDING, AND HANDLING

Because of their lack of socialization, capture and handling is extremely stressful for feral cats. Proper education and equipment are keys to minimizing the feline stress response and keeping caregivers and cats safe. In most instances, cats should be humanely trapped using commercially available live traps ([Figure 45-3](#)). For those cats that are elusive, a drop trap is a humane alternative, but generally requires substantial time and patience ([Figure 45-4](#)).

Once captured, cats should be held securely in their covered traps. Transferring them to larger enclosures is neither necessary nor recommended for short-term holding (e.g., 2 to 3 days), because it increases the risk of human injury as well as cat escape. Indeed, if provided an opportunity, most cats will successfully escape, and serious injury can occur if individuals must recapture them. In addition, escaped cats can be destructive as they attempt to hide and resist recapture.

Another advantage of keeping cats confined in traps is that the administration of anesthetics is simple and can be done without extensive handling, minimizing stress, and enhancing safety for both cats and personnel. For all of these reasons, feral cats should not be removed from a trap until heavily sedated or anesthetized. Furthermore, at the completion of surgery and before awakening, they can be returned to their traps for recovery. With this system, cats are never handled while conscious, and there are no opportunities for escape or



FIGURE 45-3 A cat enters a commercially available humane box trap (Tomahawk Live Trap, Tomahawk, Wis.).

injury. And, importantly, they do not sustain any additional stress from unnecessary handling.

Field Capture

Before trapping, attaching two small bowls to the back corners of each trap is helpful. Plastic bowls work well and can be secured using zip ties ([Figure 45-5](#)). Having these in place before trapping makes it possible to safely feed and water cats without opening the trap once they are captured. Water can be poured into the bowl from a watering can with a long spout, and food can be dropped



FIGURE 45-4 A drop trap can be used to humanely capture cats that will not enter a box trap. Strong-smelling food is placed on the ground beneath the trap, and the caregiver waits covertly nearby until the cat takes the bait. From the remote location, the caregiver pulls a string to remove the prop stick, causing the trap to drop, capturing the cat. A transfer door is used to safely transfer the cat from the drop trap into a regular box trap for transport.



FIGURE 45-5 A trap is outfitted with small plastic bowls prior to use. The bowls are secured in place with zip ties. Canned cat food is placed in one of the bowls to bait the trap.

through the wire into the bowl from a safe distance (Figure 45-6).

Most live traps are activated by a foot plate: As the cat enters the open door of the trap to reach the food bowl at the opposite end, the footplate is depressed, which, in turn, unhooks the trap door, causing it to drop and lock in the closed position (Figure 45-7). Traps should always be covered with towels or other suitable materials: This serves to make them more inviting, increasing the likelihood of a cat entering and becoming trapped (Figure 45-8). More importantly, covering the trap serves to calm the cat, decreasing stress upon capture.



FIGURE 45-6 Proper holding procedures for feral cats. For safety and security, cats remain in their covered traps before and after surgery. Water is poured into the bowl in the trap from a safe distance using a watering can.



FIGURE 45-7 A commercially available box trap (Tomahawk Live Trap, Tomahawk, Wis.). When a cat steps on the spring-loaded footplate to reach the bait, the trap door will close and lock.

It is not uncommon for cats to initially panic once trapped. They may lunge and claw in their attempts to free themselves. Torn claws, scraped noses, and nosebleeds are common injuries that can occur in the trapping process. Although minor, these can be disturbing to caregivers, particularly if they are unaware of this possibility. Fortunately, most cats settle down physically within a few minutes of capture. However, emotionally they remain stressed, as evidenced by their tense body posture and dilated pupils. Many trapped cats tuck their feet under themselves and try to hide or back into the farthest corner of the trap. Some freeze, appearing nearly catatonic, while others strike out defensively if approached, particularly feral tomcats. Even the tamest house cats that are trapped or otherwise very stressed may exhibit the same behaviors as feral cats.¹⁵



FIGURE 45-8 Covering the trap serves to make it more inviting. In addition, it helps to decrease the stress response by providing cover and security, helping to calm the cat once it is captured.

Clients planning to implement TNR should be instructed to contact people around the area where they intend to trap to explain their intentions. Caregivers should discontinue feeding of cats for 24 to 48 hours prior to trapping to ensure they are hungry enough to enter baited traps. Setting traps as much as 2 days before a surgery appointment is usually the best approach to ensure successful capture. Trapping further in advance is not recommended, because it leads to prolonged holding times, increasing stress. Every attempt should be made to capture all cats in a colony at the initiation of TNR. Whenever possible, trapping should continue until all members of a colony have been captured. When only a few members of the colony are captured at the outset, the remaining members may prove very difficult to capture in subsequent attempts, prolonging the process and complicating successful management.

Clients must be cautioned about the importance of safe handling. Ideally, they should receive rabies pre-exposure vaccination for their own protection. At a minimum, they should be advised that if they are scratched or bitten, they should not release the animal and should immediately contact their physician as well as the local health department or other appropriate agency for advice. Additional client instructions for trapping and holding cats are provided in [Box 45-1](#).

In-Clinic Procedures

Most often, the veterinarians' role in TNR begins with the arrival of a trapped cat at their practice. Caregivers should be required to present cats for surgery in their

covered traps. From the time they arrive at the clinic, care should be taken not to place cats within spatial, visual, or auditory range of other species, especially dogs. Traps containing cats should be placed in quiet holding areas until the time of surgery.

Prior to surgery, injectable anesthetic agents should be administered to the cat while it remains in the trap. This is accomplished by quietly but quickly standing the trap on end and using a commercially available "trap divider" to confine the cat. This allows an intramuscular injection to be administered to the cat between the wire bars of the trap ([Figure 45-9](#)). Recommendations for injectable anesthetic agents for feral cats are discussed in Chapter 7.

Feral cats should be returned to clean traps following surgery and monitored until they are sternal. A safe heat source, such as warm air or a carefully monitored heat lamp, should be used to ensure adequate body warming during recovery ([Figure 45-10](#)). Placing shredded paper in the trap will help to insulate and protect the cats during recovery.

Cats should be hospitalized in their traps overnight. At the veterinarian's discretion, they may be discharged the same day as surgery, but caregivers should be instructed to hold them overnight to allow for a full recovery (e.g., return of normal mental status and motor coordination) prior to being returned to their environments. Additional discharge instructions for caregivers are provided in [Box 45-2](#).

Returning Cats to Their Colonies

It is imperative that caregivers understand the crucial importance of returning cats to their original home sites. Release of cats to other areas, even those that may seem protected, such as a private barn site, should only be done as a last resort and with careful consideration and planning (see [Relocation of Cats](#)). Releasing a cat in an unfamiliar area is analogous to a person being lost without a map or other method of communication to get home. Originally, the phrase "trap-neuter-release" was commonly used; however, the name quickly changed to "trap-neuter-return" to reflect the importance of returning a cat to its home colony. Emphasizing that the "R" stands for "return" remains important today, because well-meaning caregivers often consider release of cats in novel locations, not understanding the implications of their actions. In addition to creating serious welfare issues for cats, random release of cats constitutes abandonment and is illegal.

In Case of Escapes

When care is taken to adhere to the practices for handling and holding feral cats as described, escapes should not occur. However, accidents do happen and being

BOX 45-1**Trapping and Holding Instructions for Clients****Before Trapping**

- Establish a routine of feeding the cats at the same time and location each day. Cats that are accustomed to a routine will be easier to capture. If possible, placing traps in the area before trapping begins will allow the cats to acclimate to their presence and facilitate trapping. The door of each trap can be secured in an open position and food placed in the trap so that the cats learn to go inside to eat.
- Try to determine the number of cats present and make plans to trap them all. The best trapping success always occurs during the first trapping session. If only a few members of the group are captured, subsequent attempts will be more difficult because cats quickly become savvy to the process.
- Prepare a warm, sheltered area (such as a garage) for holding the cats before surgery. Prepare an area to place the traps by spreading newspapers or disposable tarps on the floor to catch urine, stool, and food that will fall from the trap. Bricks or other items can be used to elevate the traps off the ground so that the cats are not sitting in their waste.
- Prepare to transport the cats by putting a plastic liner in the vehicle that will be used. This will prevent urine damage in the vehicle while traveling to and from the trap site and veterinary clinic.
- Contact neighbors around the area in which trapping will take place. Inform them of the plans and ask them not to feed the cats during this time. In addition, ask that they keep their pet cats indoors during the planned trapping period.
- Stop feeding the cats 1 to 2 days before beginning to trap: Hungry cats are much easier to capture.

Setting the Traps

- Begin trapping at the established feeding area up to two nights before the surgery appointment.
- Weather conditions should dictate when it is safe to trap. Trapping should not be done in temperature extremes. In hot weather, trapping is best accomplished in the evening and early morning hours. In very cold climates, trapping in the daylight hours when it is warmer is generally preferred.
- Traps should be set in secure, level areas scattered around the feeding area. Cats are unlikely to enter a

trap if it is unsteady. If the traps are set in a public area, it is best to place them such that they are hidden from view to avoid attracting unnecessary attention.

- Whenever possible, set at least as many traps as there are cats to maximize the odds of trapping the entire colony at once.
- The traps should be baited with smelly food such as canned mackerel or the cat food that the cats are accustomed to eating. Most traps have a back door that must be securely latched to prevent escapes and ensure safety during transport of captured animals. Ensuring that this latch is secured is a crucial step.
- Each trap should be covered with a large towel or other suitable material when it is set. The cover helps to keep the cat calm in the trap. Cats should remain covered in the trap throughout transporting and holding procedures. For safety, wear protective gloves when carrying any animal in a trap.
- If trapping at multiple colony sites, traps should be carefully labeled in order to ensure that cats are not accidentally returned to the wrong colony site following surgery.
- Traps should be checked frequently. If a previously neutered cat or a wild animal (such as an opossum) is captured, carefully open the back door of the trap, stand back at a safe distance, and allow the animal to leave.

Holding Procedures

- Cats should be held in their traps before and after surgery. Opening the traps or transferring cats to other enclosures poses a safety risk and must be strictly avoided.
- Place the traps in the prepared area and keep them covered. If it is more than 12 hours before the surgery appointment, drop a small amount of cat food through the top of the trap into the food bowl and pour a small amount of water into the other bowl from a safe distance outside of the trap. If the surgery appointment is less than 12 hours away, only water should be given.
- Check the cats periodically and change dirty newspapers beneath the traps as needed. The cats will likely stay relatively calm and quiet as long as the traps are covered. Be sure the holding area remains at a comfortable temperature with adequate air ventilation.

prepared with appropriate equipment and knowledge is essential in order to reduce the chances of injury or damage should a cat escape and need to be contained. When working with cats, exit doors should always remain securely closed to prevent outdoor escapes. Nets are the safest and most humane tool for capture of a

loose cat indoors. Alternatively, it may be possible or even necessary to use a live trap to recapture a loose cat. However, many cats will resist entering a trap once they have been previously captured this way.

When used properly, nets minimize stress, prevent injury of the animal, and ensure staff safety. In contrast,



A



B

FIGURE 45-9 A, A commercially available “trap divider” (Animal Care and Equipment Services [ACES], Boulder, Colo.) is used to humanely restrain a cat in a box trap to facilitate intramuscular injection of an anesthetic agent. B, The trap is gently and swiftly turned on one end, and the device is inserted, confining the cat for the injection.

the use of control poles to capture cats poses significant risk of injury to the animal and exacerbates stress. For these reasons, their use is considered inhumane and must be strictly avoided.^{19,22}

Several commercially available cat nets are available. In some cases, the design allows the user to close the opening of the net using a special sliding mechanism on the handle (Figure 45-11). This type of net (often called a cage net) is designed for use when a cat is enclosed in a cage or other confined space. Other nets have a flexible rim that will allow the operator to press the opening of the net flat against the floor without placing the handle on the floor, as is required when using a net with a rigid



FIGURE 45-10 Carefully monitored heat lamps are used to provide warmth as staff members monitor feral cats during anesthetic recovery at a large-scale TNR clinic.

BOX 45-2

Discharge and Release Instructions for Clients*

- Following surgery, cats should be held in their traps overnight prior to return to their colony site. This is essential for their safety.
- Keep the cats covered in their traps in a quiet, warm area until the next morning. Check on them periodically during this time. Normal behaviors include sleeping, head bobbing, and wobbly movements.
- Some mild oozing of blood from the cropped ear tip may occur, but is not cause for concern unless it continues the day following surgery.
- There should be no bleeding from the spay or neuter surgery site.
- The morning following surgery, cats should be fed and watered. To feed or water the cats, do not open the traps. Water should be poured into the bowl and food dropped through the wire into the bowl from a safe distance.
- If the cats are fully alert the next day, they can be released at the same location from which they were trapped. To release the cat, point the back of the trap away from danger, such as a busy street. Take off the cover, unlock the back door, and lift the door away from the trap. Stand back and patiently and wait for the cat to leave—most run away immediately.

*Instructions for the provision of emergency care during the postoperative period should also be provided, as with any surgery patient.

rim. Such nets are more useful for capture in an open space. Although less sophisticated, fishing nets can also be used to humanely capture cats. In this case, the net should be placed over the cat and the rim held firmly against the floor. As the cat backs away, he will step over

the rim of the net. The net can then be lifted and the weight of the cat will effectively close the opening, securing the cat and preventing escape ([Figure 45-12](#)). Conversely, leaving the net open at the top with the cat hanging in the bottom will likely result in a second



FIGURE 45-11 A Freeman cage net (Animal Care and Equipment Services [ACES], Boulder, Colo.) is used to humanely capture a cat in an enclosure. The design of the net allows the user to close it using a special sliding mechanism on the handle.

escape and is not safe for the cat or handler ([Figure 45-13](#)).

Once a cat is securely netted, chemical restraint may be administered through the netting. Covering the cat with a thick towel or blanket will aid in safe and humane restraint while an injectable anesthetic is administered. Once the cat is immobilized, it can be removed from the net. Alternatively, the cat can be transferred in the net to an enclosure without the use of sedatives. Returning a netted cat to a trap can be very tricky. Instead, the cat can be released into a larger cage containing a commercially available cat den. Cat dens are designed as secure hiding boxes for feral or reactive cats. They can be securely closed from a safe distance ([Figure 45-14](#)) and used to transport the cat. Alternatively, they have a guillotine door on one end that allows for safe transfer to a trap or other squeeze cage as needed ([Figure 45-15](#)).

Although it is best to use a net or live trap to capture an escaped cat, in some instances this may not be feasible. It may be physically impossible, for example, to retrieve a cat that has escaped into a narrow space using a net. In this case, commercially available cat tongs can be used to grasp and retrieve the cat ([Figure 45-16](#)). However, care must be taken to prevent the use of

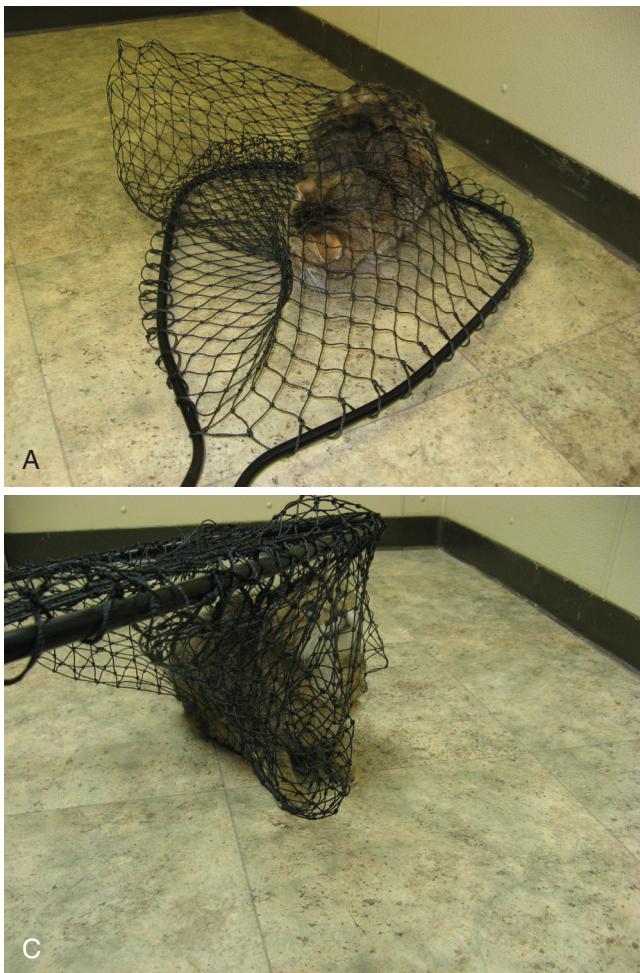


FIGURE 45-12 A rigid fishing net is used to capture a cat in an open space. **A**, The net is placed over the cat. **B**, As the handler moves closer, the cat backs away, stepping over the rim of the net. **C**, The handler lifts the net, safely entrapping the cat.



FIGURE 45-13 Improper use of a net. The top of the net is open as the cat hangs in the bottom. As he struggles to escape, there is risk of injury for both the cat and handler.



FIGURE 45-14 A commercially available feral cat den (Animal Care and Equipment Services [ACES], Boulder, Colo.) serves as a secure hiding place for a cat. The circular door can be closed from a safe and nonthreatening distance while the cage is spot cleaned as needed. The cat can also be securely transported in the den.



FIGURE 45-15 A and B, By raising and lowering the guillotine doors, a cat is safely and humanely transferred from a feral cat den to a squeeze cage for restraint.



FIGURE 45-16 Commercially available cat tongs (Animal Care and Equipment Services [ACES], Boulder, Colo.) can be used to capture a cat when a net is not feasible. The cat should be grasped and transferred into a cage or other enclosure as quickly as possible, taking care to avoid injury and unnecessary stress.

unnecessary force when using cat tongs in order to prevent injury.

DIFFERENTIATING TRULY FERAL CATS FROM REACTIVE TAME CATS

It is important to remember that cats that are trapped and feral-behaving are not necessarily feral. In reality, it can be challenging to differentiate truly feral cats from those that are tame but very frightened and reactive.¹⁵

Indeed, once highly stressed or provoked, cats frequently remain reactive for a prolonged time and may become more reactive if they are stimulated again before they have been allowed a period of time to cool down.⁷ For this reason, special care should be taken to provide a calm and quiet environment during the time in which cats are being held awaiting surgery. Certainly, it is prudent to determine the cat's true level of sociability and tractability whenever possible. This information can help caregivers provide the best possible care for cats. Tame cats may be lost, and efforts to reunify them with owners may be warranted. Careful scanning for a microchip should be performed and other measures, such as posting signs in the area where the cat was trapped, should be taken to locate an owner. If an owner is not located, tame cats may be placed in homes rather than returned to their colony. If reunification and adoption efforts are not successful, the best option may be to return the cat to the colony as long as ongoing care will be provided by a caregiver. Relinquishment to an animal shelter may not be in the cat's best interests because approximately 70% of cats entering shelters in the United States are euthanized.⁴ If the cat appears to be well adapted to its outdoor life and will receive ongoing care, return is appropriate regardless of socialization status.

In order to increase the odds of determining their true socialization status, trapped cats should be allowed "chill out time" to acclimate—preferably at least overnight. Fearful cats, whether feral or tame, may resort to overt aggressive behavior or may "teeter on the edge" of defensive aggression when stressed. Given time, some tame cats will relax. Caregivers can readily recognize these cats, because they will usually stand in the trap, rubbing, mewing, pawing, and chirping as they attempt to solicit attention. However, not all tame cats will relax in a short period of time; some remain reactive and fractious for prolonged periods. Caregivers should be cautioned that even when cats do not exhibit outward aggression in the trap and appear merely "shy" or "nervous," it is not safe to open the trap or to attempt to touch the cat. These are common behaviors for both fractious and feral cats, and opening the trap will likely result in escape or alternatively, defensive aggression.

In addition to behavior, certain physical characteristics may be helpful to distinguish feral cats from those that are tame but behaviorally reactive. When cats are not suspected to be feral, based on their physical characteristics, it may be desirable to allow a longer period for acclimation to see if they become less reactive and "show their true colors." Although it is not often possible to determine a cat's true status based on physical features alone, careful visual inspection of the cat in the trap may prove helpful. The following features should be noted:

- *Ear tip:* Removal of the tip of one of the ears is the universal symbol for a sterilized free-roaming cat. The presence of an ear tip alone should not be used as a singular designation for feral; the ear tip only truly means that the cat has been spayed or neutered. It likely signifies that the cat is a part of a managed colony. Caution must be taken not to mistake frostbite of the ear for a tipped ear.
- *Reproductive status:* Unless they are ear tipped, feral cats should be assumed to be reproductively intact. Females may be pregnant or lactating, especially between April and October (in the northern hemisphere). A large abdomen on a female may indicate pregnancy. If mature, males will have "tomcat urine odor," a wide neck, and well-developed jowls. In addition, they often have scars on their face and ears or torn ear flaps. In contrast, reactive tame cats may be spayed or neutered. Neutered adult toms will lack the typical secondary sex characteristics.
- *General body condition:* Prior to spaying or neutering, feral cats are usually in lean, wiry body condition. In contrast, reactive tame cats may be overweight, particularly if they have been spayed or neutered.
- *Age:* Feral cats are usually young (frequently less than 3 years of age), unless they are part of a managed colony. In contrast, reactive tame cats may be middle-aged or even geriatric. In fact, pampered adult house cats, including those that are geriatric can become very reactive in stressful situations.^{12,41} An experienced practitioner may recognize the subtle aging changes that are suggestive of an older cat, especially in the eyes and face.

SPECIAL MEDICAL AND SURGICAL CONSIDERATIONS FOR FREE-ROAMING CATS

Patient Selection and Perioperative Care

Detailed veterinary medical guidelines for spay-neuter programs have been published.³² Cats undergoing elective surgery should appear to be in reasonably good

health and body condition. However, veterinarians must weigh the risks and benefits of spaying and neutering patients with apparent physical abnormalities (e.g., evidence of mild infectious disease or decreased body condition). In the context of feral cats, future opportunities for that animal to receive care may not be available, and the alternative outcome may be release without surgical sterilization or euthanasia. Although some conditions may increase the risk of complications, the benefits of neutering likely outweigh these risks in feral cats. Cats that are pregnant, in estrus, or have pyometra, as well as those that are thin or have mild upper respiratory infection, can be safely spayed or neutered.³²

Injectable anesthetic protocols with a wide safety margin are preferred, because body weight must be estimated or determined based on an in-trap measurement and because physical examination must be performed following anesthetic induction for feral cats. It is imperative that balanced anesthesia, including proper analgesia, be used. Cats that are pregnant or lactating and those that are dehydrated should receive fluid supplementation. Warmed fluids can be administered subcutaneously postoperatively prior to recovery. Chapter 7 discusses anesthetic recommendations for feral cats.

Surgical Sterilization

Aseptic surgical technique is required, and separate sterile instruments must be used for each patient. Surgeries should be performed by experienced veterinarians, because free-roaming cats are returned to their environments the day following surgery and close follow-up is not generally possible. For this reason, most surgeons prefer to make small incisions and ensure that they are securely closed without the use of skin sutures.

For spaying female patients, some surgeons prefer a flank approach rather than the traditional ventral midline incision (Figure 45-17).^{11,24,26,35,53} The flank approach allows caregivers to monitor a cat's incision from a distance and may help to prevent evisceration should dehiscence of the surgical wound occur. The flank approach has also been recommended for lactating queens, to prevent the possibility of incising mammary tissue and causing leakage of milk into the surgical wound. However, it is not recommended for pregnant cats because of the attendant morbidity associated with a large incision in the lateral abdominal wall. If pregnancy or pyometra is discovered upon entering the abdominal cavity, closing the flank incision and using a ventral midline approach is generally advisable.

Another limitation of this approach is that the small size and dorsal location of the incision render thorough abdominal exploration impossible; therefore, if it becomes necessary to locate a dropped pedicle, a ventral midline incision may also be necessary. Increased postoperative pain has also been reported in queens spayed

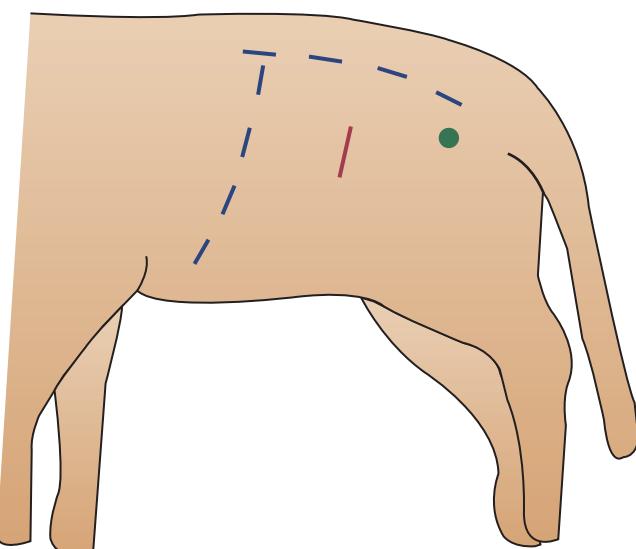


FIGURE 45-17 Location and landmarks of the flank spay incision. The incision should be located midway between the dorsal and ventral midline and approximately 3 cm cranial to the greater trochanter, or 3 to 4 cm caudal to the last rib.

by a flank approach compared with those spayed using a ventral midline approach.^{8,20} Depending on the surgeon's preference, the flank approach can be performed with the patient in either right or left lateral recumbency. Box 45-3 describes the procedure.

Ear Tipping for Identification

As previously discussed, removal of the tip of one of the ears (or pinna) is the accepted global standard for marking or identifying a neutered free-roaming community cat. Alley Cat Allies (a national humane organization that serves as a resource on feral cats) recommends removal of the left ear tip, and this standard is widely used. However, some organizations identify cats by removing the right ear tip or by removing the tip on one side or the other, depending on the sex of the cat. Whichever ear is selected for tipping, it is best to be consistent with the standard in your community.¹⁸

Ear tipping is performed to clearly and permanently visually identify neutered, vaccinated cats that are being humanely managed by TNR. It is often impossible to get close enough to a feral cat to see a subtle mark or tattoo; thus such methods of identification are not useful because they are frequently ineffective. Similarly, other visual means of identifying cats have not been effective. Collars are impractical, because young cats will continue to grow, and collars are frequently lost with time. Ear tags and bands are also not useful, because they may become infected or be torn out. Microchips are not visible and even if a cat is trapped, proper scanning cannot be performed without removing the cat from the trap because of interference from the metal bars.

BOX 45-3**Lateral Flank Spay Technique**

- Patient preparation: Shave and prepare the skin beginning at the last rib and extending caudally to the greater trochanter, dorsally to the vertebral transverse processes, and ventrally to the midline.
- Positioning: Place the cat in right or left lateral recumbency, according to the surgeon's preference. A small rolled-up towel may be placed under the lateral lumbar area to remove the concavity of the flank, improving visualization.
- Incision location: Midway between the dorsal and the ventral midline and approximately 3 cm cranial to the greater trochanter, or 3 to 4 cm caudal to the last rib (see [Figure 45-17](#)).
- Incision length and orientation: Approximately 1.5 to 2 cm in length—vertical, horizontal, or oblique.
- Entering the abdomen: After making the skin incision, grasp the body wall with thumb forceps and bluntly separate the fibers of the external abdominal oblique, internal abdominal oblique, and transversus abdominus muscles to enter the abdomen. If the left lateral approach is used, special care should be taken to elevate the body wall while separating the muscle layers to avoid trauma to the spleen beneath the incision. Tagging the body wall with a suture will ensure that it can be readily located for closure.
- Locating the uterine horn and ovary: The uterine horn should be readily visible and can be gently withdrawn from the abdomen and retracted to identify the ovary. The remainder of the procedure is performed as in the standard ventral midline approach.
- Closure: The body wall is closed with one or two cruciate mattress sutures passed through all three muscle layers; the subcutaneous and intradermal layers are closed according to the surgeon's preference.

When cats are ear tipped, animal control officers, shelter workers, and caregivers can easily and reliably identify cats that are graduates of a TNR program.¹⁸ This is important to ensure that all cats in a colony are humanely managed and to prevent shelter euthanasia of feral cats that are part of managed colonies. Ear tipping should be performed even in colonies of cats with dedicated caregivers who believe they "know" all of the cats in their colony by sight, because it is very common for several cats in a colony to possess similar coat colors and patterns, making it difficult, if not impossible, to distinguish which cats have already been trapped and neutered. It is very important that ears be tipped rather than notched, because notching may occur as the result of fighting, especially in tomcats, and may be mistaken as a sign of previous TNR ([Figure 45-18, A to C](#)).

Ear tipping is an antiseptic procedure rather than an aseptic one. It should be performed under clean surgical conditions. Separate sterile scissors and hemostats should be used for each cat. Clean exam gloves or sterile surgical gloves should be worn. Hair removal or shaving of the pinna is unnecessary and is not recommended to avoid abrasion of the tender skin of the earflap. Antiseptic solution, such as chlorhexidine or Betadine, may be used to gently swab both sides of the pinna. Care should be taken to avoid introducing moisture into the ear canal, which could predispose the cat to otitis externa. The distal tip of the pinna may be removed using sharp dissection or, if available, electrocautery or laser, taking precautions not to induce thermal damage. Most veterinarians perform the procedure using a pair of hemostatic forceps and scissors ([Figure 45-19](#)). Scissors are preferred rather than a scalpel blade, because their crushing action aids in hemostasis. Straight scissors and straight hemostats should be used to crop the ear in a straight line. This is very important to ensure the desired visual effect: The ear should have a distinct straight edge that is easy to recognize from a distance. [Box 45-4](#) describes the procedure for ear tipping using straight hemostat and straight scissors. Healing is rapid and complications are rare. This procedure is humane and represents a potentially life-saving permanent form of identification for community cats.¹⁸

Vaccination

Rabies is a core vaccination for all cats and is an absolute necessity for community cats. Rabies is endemic throughout the mainland United States, and vaccination is the most effective method of control. For this reason, all cats should be vaccinated against rabies virus using an approved 3-year vaccine at the time of surgery.⁴⁴ In addition, the administration of a modified live feline viral rhinitis–calicivirus–parvovirus (FVRCP) vaccine is also recommended. In particular, immunity against panleukopenia is especially important for cats, because of the widespread nature and severity of this disease.

Historically, scientists have debated both the effectiveness of vaccines given at the time of surgery and whether or not a single vaccination alone can confer clinically significant immunity. Recent studies have investigated these concerns. In one study of 61 cats undergoing TNR, cats were vaccinated against feline panleukopenia virus, feline herpes virus, feline calicivirus, and rabies virus at the time of surgery.¹³ Antiviral antibody titers were measured at the time of surgery and again approximately 10 weeks later. The results of this study demonstrated that feral cats had a robust serologic response following vaccination at the time of neutering. The authors concluded that incorporation of vaccination into TNR programs is likely to protect the health of individual cats and possibly reduce the disease burden

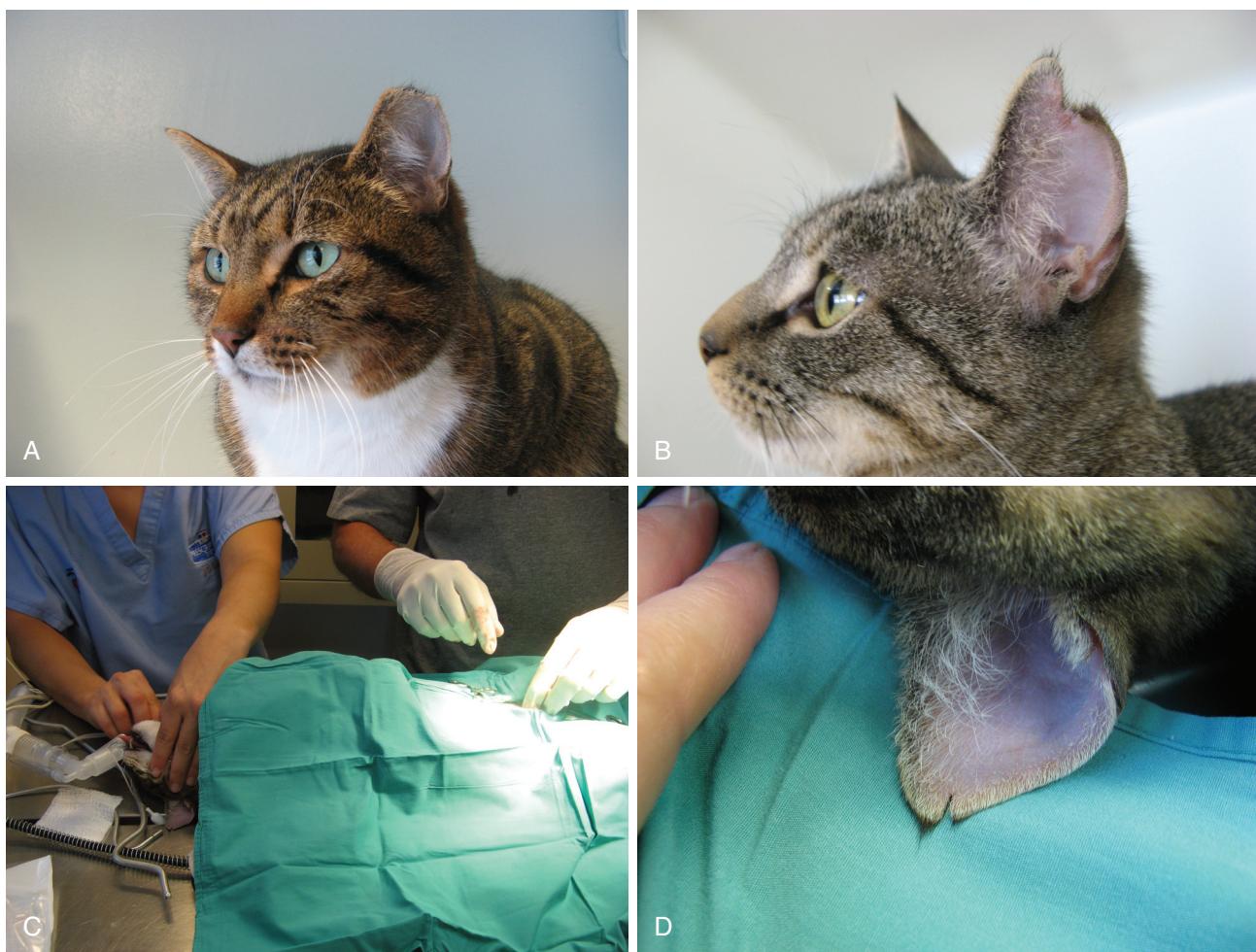


FIGURE 45-18 **A**, Correct appearance of a tipped ear. **B**, It is very important that ears be tipped rather than notched. This is because notching commonly occurs as the result of fighting or other injury, and may be mistaken as a sign of previous neutering. **C**, A female cat is anesthetized for ovariohysterectomy, but exploratory surgery revealed she is already spayed. **D**, Note the small ear notch, which unfortunately was not recognized as an identifying mark of a neutered cat, because it does not adhere to the universal standard.

in the community. Several other independent studies support these findings.^{23,37,42}

Although the exact duration is unknown, immunity against rabies and panleukopenia following a single vaccination may persist for years.^{14,44,49} Considering the relatively low medical risk and financial cost of vaccination compared with the potential benefits for feline health, community cats undergoing TNR should always be vaccinated against these important feline diseases. Periodically retrapping cats for revaccination is ideal, although it may prove challenging to recapture cats.

Feline Leukemia Virus and Feline Immunodeficiency Virus Testing

A common question regarding care of free-roaming cats is whether or not they should be routinely tested for feline leukemia virus (FeLV) and feline immunodeficiency virus (FIV). The American Association of Feline Practitioners recommends testing all cats for FeLV and

FIV and confirming positive test results.²⁸ It is difficult, if not impossible, however, to apply these guidelines intended for pet cats to feral cats. When deciding whether or not to test feral cats, one must consider that based on surveys of thousands of free-roaming and feral cats, the incidence of these diseases is very low (e.g., less than 2% in healthy cats) based on screening tests.³⁰ In addition, community cats are no more likely to test positive than owned pet cats. When cats test positive on screening tests, confirmatory testing requires substantial time and monetary investment and is not generally feasible when cats need to be returned to their colony sites. Furthermore, one should keep in mind that neutering greatly reduces transmission of these viruses by decreasing fighting and preventing kitten births. Finally, one should consider that testing is generally expensive and that for successful cat control, the bulk of financial resources must be used to sterilize as many cats as possible. Although testing all cats for FeLV and FIV may be ideal, considering the cost of testing, the disease incidence, and

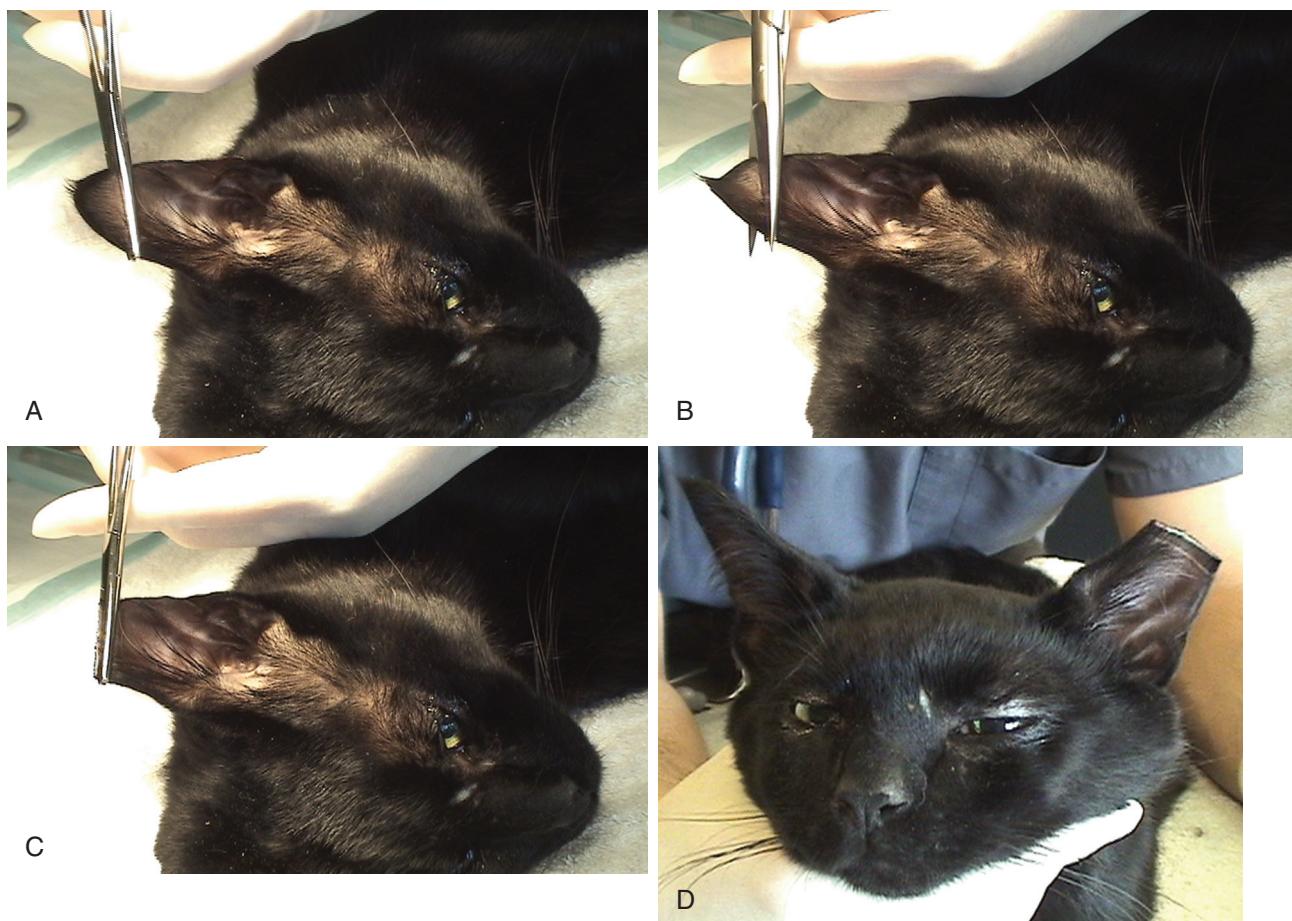


FIGURE 45-19 Ear tipping procedure. **A**, A straight hemostat is placed across the left pinna perpendicular to its long axis, exposing approximately 1.3 cm (0.5 inches) of the ear tip. **B**, Scissors are used to remove the ear tip by cutting over the top of the hemostat in a straight line. **C**, The hemostat is left in place until after surgical neutering to allow adequate time for hemostasis of the pinna to occur. **D**, Proper appearance of the ear following removal of the hemostat. Note the distinctive straight edge that is easily recognizable. (Courtesy Brenda Griffin.)

the effects of neutering on transmission, this approach is often not a feasible practice when working with community cats.^{25,28}

Testing is recommended, however, when cats appear unthrifty at the time of presentation for TNR. Sick cats are more likely to test positive than apparently healthy cats. In addition, studies indicate that risk factors for infection include contact with other cats and living outdoors. In particular, intact adult tomcats are often at highest risk.³⁰ For these reasons, positive test results have a higher predictive value in community cats that appear to be in poor health and can be used to help guide decisions for return or euthanasia in the context of TNR programs. Tame cats that are identified as candidates for adoption should also be tested, preferably prior to making substantial investments in their care, because it is often very difficult to place cats in homes. If testing is not performed prior to adoption, adopters should be advised to have their new pet tested and kept separate from other cats prior to doing so.

Parasite Control

Both endoparasite and ectoparasite infestations occur frequently in community cats—fleas, ear mites, and roundworms are particularly common culprits.¹⁷ To be successful for long-term control, repeated antiparasitical treatments are generally required, especially in the context of outdoor multicat environments where the risk of re-infestation is high. For these reasons, a single antiparasitical treatment at the time of TNR may be of limited or even questionable benefit in most cases. However, in the author's opinion, treatment may be of particular benefit to some cats, especially unthrifty juveniles, because even temporary reduction in parasite burdens may provide significant support in these maturing cats.

When considering products for use in unsocialized cats, selection should be limited to injectable and topical products to ensure safe and reliable administration. Imidacloprid/moxidectin (Advantage Multi, Bayer Animal Health, Shawnee Mission, Kans.) is an excellent

BOX 45-4**Procedure for Ear Tipping Using a Straight Hemostat and Straight Scissors (See Figure 45-19)**

- Ear tipping is a quick and simple procedure. It should be performed after the cat has been anesthetized and reached a surgical plane of general anesthesia and prior to surgical sterilization. This will ensure adequate time for hemostasis to occur prior to recovery.
- The procedure is performed by placing a sterile straight hemostat across the designated pinna, exposing approximately 1.3 cm (0.5 inches) of the ear tip. The amount of the ear tip removed may be more or less depending on the size of the cat. Proportionately, approximately one third of the distal pinna is removed.
- Care must be taken to place the clamp perpendicular to the long axis of the pinna. This is necessary to ensure the desired visual effect—an easily recognizable, straight, cropped ear tip.
- Sterile scissors are used to cut the tip off, leaving the hemostat on the ear. The hemostat should remain in place until the cat is in recovery and is removed just prior to returning the cat to the trap.
- Some oozing of blood from the ear tip site may occur during recovery especially if the cat rubs or bumps the freshly clotted tissue against the trap.
- Gluing or suturing the ear is neither necessary nor recommended.
- Profuse, excessive, or prolonged bleeding is abnormal.
- Proper placement of the hemostat on the ear tip is critical for proper healing and appearance of the ear.
 - If the clamp is placed too high, the ear tip will be difficult to recognize from a distance.
 - If the clamp is placed too low, the skin may retract, exposing the ear cartilage, which may prolong healing and predispose to an incision site infection.
 - If the clamp is placed at an angle, the pinna will appear pointed from a distance and may be difficult to recognize as a tipped ear.
 - The use of curved hemostats and/or curved scissors should be avoided. If the ear tip remains curved, it may be difficult to recognize as a tipped ear from a distance.
- In very cold climates, mild frostbite of the ear tips is common and may be unilateral or bilateral. Frostbitten ear tips may appear to be cropped but often have a thickened, irregular border. However, it is often difficult to distinguish a frostbitten pinna from a tipped pinna, especially from a distance. In these climates, some programs apply green tattoo ink to the skin margins at the ear tip site to aid in identification.

choice for an effective single broad-spectrum treatment, because it can be administered topically, and a single dose is effective against fleas, roundworms, hookworms, and ear mites. Because of the cost associated with this and similar topical products, it may not be feasible to treat all cats. If flea treatment is desired, the author recommends topical treatment with fipronil (Frontline, Merial, Duluth, Ga.) as a spray or top spot. In particular, the spray is very cost effective. It is safe for use in cats of all ages, including pregnant and nursing mothers. In addition, fipronil also has activity against ear mites, *Cheyletiella* spp., chewing lice, and ticks.^{9,45} Because it costs only pennies per dose, the author routinely administers injectable ivermectin to all cats at the time of TNR. A single subcutaneous injection of 1% ivermectin solution at a dosage of 0.3 mg/kg is highly effective against ear mites and also temporarily reduces roundworm and hookworm burdens.

PREGNANT AND LACTATING CATS

It is common to capture pregnant and lactating cats, particularly in the springtime. Veterinarians should discuss recommendations for these cats with caregivers before they begin trapping. In the author's experience, pregnant cats that are captured should be spayed, because it is the most humane course of action. This is for several reasons. First, delivering and raising kittens outdoors is stressful for both the mother and kittens. The mortality rate of kittens is high; often, more than 75% die within the first several weeks of life.^{39,51} Secondly, pregnant queens frequently migrate prior to queening in order to find a secure nesting site. This is a familiar scenario to anyone who has discovered a mother and her litter on their property. Even if the queen chooses to deliver her litter nearby, it can be very difficult to locate her nest. Furthermore, if she perceives any threat from observation or other disturbance, she will likely attempt to move her kittens. This can make it extremely difficult to locate and capture the litter once they are born outdoors.

Some caregivers consider confining pregnant feral cats through delivery of their kittens; however, this is extremely stressful for them and cannot be recommended. Others choose to release pregnant cats that they capture, believing it will be in her best interest to allow her to deliver her kittens. Unfortunately, even if the cat remains in the area, she will likely prove to be difficult to retrap in the future and therefore will continue to reproduce for as long as she survives. Indeed, it is common for cats that have been previously trapped to quickly become "trap savvy" such that they will not enter traps on subsequent occasions.

For all of these reasons, caregivers should be advised that pregnant queens should be spayed. This will prevent

unnecessary stress and suffering for the queen and her kittens and will prevent the possibility that she will relocate prior to giving birth. Even for those queens that are in an advanced state of gestation, spaying can be safely and humanely performed. In the author's experience, cats do not commonly experience signs of maternal loss following late-term spaying and quickly adjust to the less stressful lifestyle of a spayed cat.

When a lactating queen is trapped, caregivers should be advised to search for kittens. Even though they may look cute and innocent to caregivers, even small feral kittens can inflict serious injury if proper caution is not taken in their handling and capture. Kittens less than 3 to 4 weeks of age can sometimes be caught without a trap, although they may still be too wild to be easily handled. A thick towel can be used to pick them up, protecting the handler from scratching and biting, until they can be contained in a trap or carrier. Once kittens are coordinated enough to leave the nest (e.g., more than 3 to 4 weeks of age), it is safer and may be easier to trap them. Placing the trapped mother cat next to a baited trap will often facilitate capture of her kittens, because they will be attracted by her presence. Similarly, if small kittens are captured in an area, the mother cat will be attracted by their sound if they are placed near the trap. Obviously, frequent monitoring and common sense must be used to determine how long it is safe to leave trapped cats in an area, depending on such factors as the weather or other threats to their safety. Regardless of whether or not kittens are located, lactating queens should be spayed. Spaying will not interfere with the queen's ability to produce milk and nurse kittens. Efforts should be made to release mother cats as soon as it is deemed safe for her so that she can return to care for her kittens.

SMALL KITTENS

Because of their high mortality rate, if small kittens are captured, the author recommends that they be tamed and placed in homes as pets rather than being returned to their colony sites. If this is not possible, euthanasia may be a more humane option than return considering their poor odds of survival. A study of 70 feral kittens demonstrated that they can become good pets with friendly temperaments and that handling prior to 7 to 8 weeks of age improved socialization success.³³ In many cases, it is still possible to tame kittens up to 3 to 4 months of age; however, beyond this age range, taming is often not possible.

The process of taming involves confinement with daily handling sessions and requires patient and committed caregivers. Feral kittens can be absolute "spitfires," and clients should be counseled to wear gloves and use thick towels during handling sessions. In

addition, they should be advised to contact their local health department and to seek medical care in the event of any bite. Despite the risks and time commitment required, many individuals are eager and willing to provide the care necessary to successfully tame these animals.

The taming process may take anywhere from a few days to several weeks to accomplish. In the author's experience, individual kittens, even within the same litter, may vary tremendously in their acceptance of human handling and their rate of progression in the process. **Box 45-5** contains the recommended steps for taming feral kittens.

SICK AND INJURED CATS AND THE ROLE OF THE CAREGIVER

Minor physical problems are sometimes discovered once a cat has been anesthetized and a physical examination is performed. In the author's experience, common ailments include abscesses, wounds, tail tip injuries, dental disease, and *Cuterebra* infestation.¹⁷ These can all be successfully treated at the time of surgical sterilization. In contrast, when cats present with signs of serious illness or injury, humane euthanasia should be considered. Although there are exceptions, ongoing treatment cannot typically be safely, reliably, and humanely administered to a feral cat. However, if treatment is attempted, it is imperative to have proper equipment for safe and humane handling and housing. Feral cat dens and squeeze cages are essential for this purpose (**Figure 45-20**).

In instances where the caregiver has had a long-term relationship with the cat (e.g., the cat has been part of a managed colony for years), the author has witnessed situations where cats accepted care when they were gravely ill despite the fact that they had never before allowed handling of any kind. In these instances, the caregivers found "their" cat in a state of shock (because of trauma or severe infection) and presented them for care. Therapy was initiated, and when the cats regained consciousness they readily accepted handling. Anecdotally, there are numerous stories of this kind because of the fluid nature of cat lifestyles. In the author's experience, cats that have been neutered and returned and are fed on a regular basis, may increasingly affiliate with their caregivers with time. Although they may not allow handling, they will interact from a closer and closer distance with time.

That being said, when cats do not accept handling, the provision of medical care can prove extremely stressful—and is not always in their best interest. In the context of population control efforts, financial resources are best spent by maximizing the number of cats that

BOX 45-5**Taming Feral Kittens****Step 1: Seclusion and Confinement**

- Select a quiet room and set up a large pet carrier with a litter box, food, and water bowls and comfortable bedding in which to confine the kittens. Arrange the litter box and bowls so that they are within easy reach for cleaning and refilling.
- Allow the kittens strict “chill out” time to acclimate to their new surroundings without intrusion or disturbance. Check to be sure they are eating and using their litter box but otherwise do not disturb them for 1 to 2 days.

Step 2: Handling and Hand Feeding

- On the second or third day of confinement, begin handling sessions 3 to 4 times daily, or more often if possible. Wear protective gloves and use a towel to pick up each kitten. Start with the one that seems the least reactive and the most likely to accept handling. When one kitten exhibits a stressful response, its behavior may have a negative impact on the responses of the others. Likewise, some kittens may become less reactive as they observe calm and soothing handling of their littermates.
- Be sure to approach the kittens slowly; they will be less likely to react when movements are slow and deliberate. Securely wrap and fold the towel around the kitten’s body and limbs, leaving only the head exposed. Holding the kitten so that the head is facing away from the handler will enable it to feel less threatened, making it less likely to struggle or fight to escape. Approaching from the back, carefully attempt to gently touch and rub the top of the kitten’s head. Talk in a soothing tone. Put baby food* on a small spatula and hand feed it to the kitten.
- In general, the more often the kittens are handled, the more quickly they will be tamed. Eventually, progress to stroking the kitten’s body during handling sessions.

Step 3: Ensuring and Continuing Progress

- Expect to see progress over the next several days. Kittens should begin to relax upon handling and may even begin to greet the caregiver at the front of the carrier. When the kittens are readily accepting handling and greeting caregivers, they can be released in a small

room, such as a bathroom. Prior to their release, the room should be “kitten proofed.” This should include putting away anything that could be broken or damaged or otherwise be harmful to the kittens, securely blocking off any places into which the kittens could crawl and, in the case of a bathroom, closing the toilet lid. Regular handling and feeding sessions should continue, and the kittens should be encouraged to interact with the handler by using toys such as feathers or wands. Play is a very important part of ensuring social bonding.

- It is not uncommon for one or more kittens in a litter to progress more slowly than the others. They may resist handling and remain frightened, reactive, or aggressive. In this case, solitary confinement can be extremely helpful. Without littermates for social companionship, the kitten will be more willing to interact with a human caregiver. This will greatly facilitate the taming process and can produce dramatic results.

Step 4: Continuing Socialization

- Ensure that the kitten’s world does not “get too big, too fast.” This is crucial to prevent the development of fear, which could hamper the taming process. If allowed too much room in which to explore too quickly, kittens may become stressed and overwhelmed, ultimately seeking a hiding place. They may be difficult to find and even more difficult to catch or retrieve, which, in turn, further induces stress and can compromise the progress they have made.
- As kittens progress, it is important to introduce different handlers: They need a healthy daily dose of positive attention from different human caregivers and reasonable amounts of exposure to the sights and sounds of household activities to become properly socialized pets.
- If adopted to a new home, new owners must take special care to introduce their new kitten very slowly into the new household. Confinement should be used to ensure the kitten continues to feel secure. Once the kitten is actively seeking to be let out of the carrier or small room, it is usually ready to venture forth.

*Baby food that contains onion powder should not be used because of the potential for toxicity from this ingredient.

can be sterilized rather than providing heroic care for individual cats. Nonetheless, in some cases, the human-animal bond will call for additional measures. Many caregivers are deeply bonded to the cats they care for despite their lack of direct physical contact with them.

HELPING CLIENTS SOLVE CONCERNS RELATED TO COMMUNITY CATS

When concerns arise regarding the presence of cats in managed colonies, clients sometimes reach out to their veterinarian for advice. In the author’s experience, one

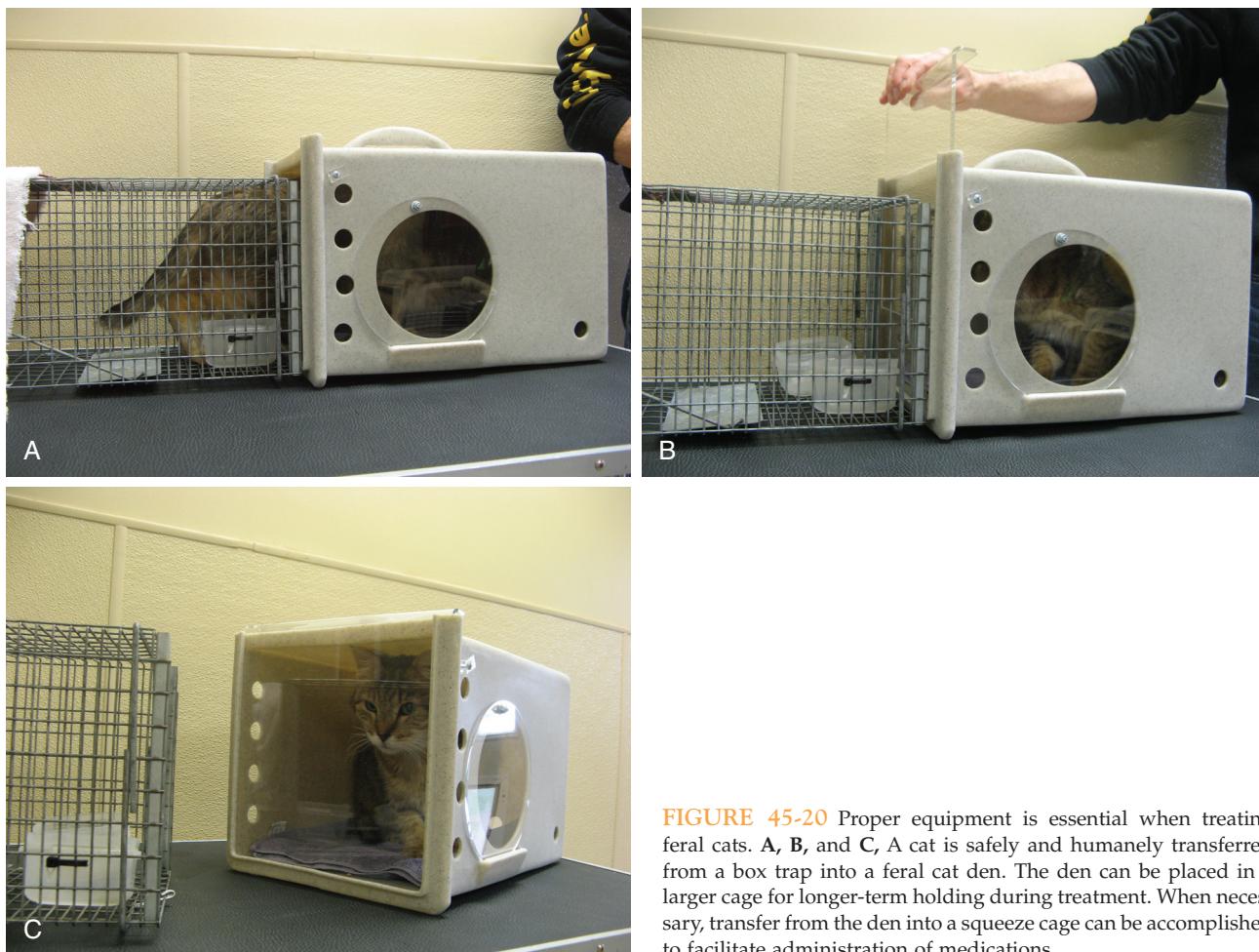


FIGURE 45-20 Proper equipment is essential when treating feral cats. A, B, and C, A cat is safely and humanely transferred from a box trap into a feral cat den. The den can be placed in a larger cage for longer-term holding during treatment. When necessary, transfer from the den into a squeeze cage can be accomplished to facilitate administration of medications.

of the most common concerns that arise occurs when cats take up residence in a crawl space beneath a home where they are not welcome. Whereas it is important for cats to have shelter available to them, it is sometimes necessary to prevent them from residing in certain locations. This is easy to do by simply eliminating access to this area. However, sealing off access without proper planning can result in accidental trapping of cats without a route for escape, creating serious welfare concerns for the animals. Such situations however can easily and humanely be avoided by using a one-way door: this will allow cats to leave the area, but makes it impossible for them to return to it (**Box 45-6**).

Another common concern arises when cats frequent gardens and/or sand boxes. Efforts to exclude cats from such areas are important for public health, especially because of the zoonotic risk posed from roundworms, hookworms, and toxoplasmosis as a result of contact with contaminated soil. In addition to community cats, pet cats also contribute to this potential risk.¹⁰ Covers should be used for children's sand boxes, and gloves should be worn when gardening. Commercially available motion-activated sprinklers can be helpful in some instances. Spreading prickly textures around the

BOX 45-6

Using a One-Way Door

To safely exclude cats from a crawl space where their presence is problematic, use a one-way door. To make a one-way door, simply cut a piece of plywood to fit over the crawl space where cats are entering. Cut a cat-sized door in the board and attach it with a hinge that will only allow the door to open in one direction. Alternatively, attach a thin strip of wood along the bottom of the back of the board to prevent the door from opening inward. Secure the door over the entrance to the crawl space. This allows any cats to exit, yet prevents them from re-entering. After several days, any cats should have departed, and the one-way door can be replaced with a permanent covering. To safeguard the welfare of the cats, it is best to ensure than some alternate shelter is available in the area.

garden, such as pinecones, holly leaves, chicken wire, or purpose-designed prickly mats, especially where there is newly turned dirt, can also be effective. To minimize risks, vegetables should always be washed thoroughly, and excellent hand hygiene should be

practiced. Additional resources for clients concerning all aspects of community cat care are included at the end of this chapter.

RELOCATION OF CATS

On occasion, individuals may wish to relocate feral cats to new sites, or major construction or some other event may necessitate relocation of a colony. However, the process of relocation is difficult and poses significant danger to cats, because they possess strong homing instincts and typically flee when released at a location other than their original colony site. In the author's experience, when caregivers have released cats at foreign sites, they have either readily disappeared or their remains have been discovered on a nearby roadside. In a few instances, cats have managed to return to their original home sites days or even weeks later. One investigator attempted to establish colonies of feral cats at a farm site in order to study them.⁴⁷ Following their release, all of the cats disappeared. For this reason, relocation of feral cat colonies must be viewed as a last resort.

If relocation cannot be avoided, cats must be confined for several weeks at their new "home" location prior to release. Cats should be confined in enclosures that are large enough to accommodate separate feeding and litter areas as well as a cat den or other suitable purpose-designed box. The enclosure should be situated in a secure location, such as inside a shed, barn, or other protected area. Caregivers should feed and care for the cats daily for a minimum of 3 weeks prior to release. This practice allows cats to acclimate to the new site and become entrained to a routine of feeding at this location. Following release, the cat should continue to be fed at the same location on a regular schedule. It is not unusual for a cat to "disappear" for days or more following release. However, most will come around in time and will ultimately be sighted, usually around the food bowl, as they anticipate feeding times. When more than one cat from a colony is relocated, the presence of familiar cats at the new location facilitates adaptation of others.

LARGE-SCALE TRAP-NEUTER-RETURN PROGRAMS

Large-scale programs to sterilize community cats in the United States have become increasingly commonplace during the past decade. Caregivers trap community cats for participation in large surgery clinics. In these clinics, cats are sterilized in an assembly line fashion that provides high-quality care to a high volume of patients.



FIGURE 45-21 Veterinarians and volunteers care for cats at a large-scale TNR clinic. By using an assembly-line approach, high-quality care is efficiently delivered to a high volume of cats at various dedicated stations throughout the clinic.

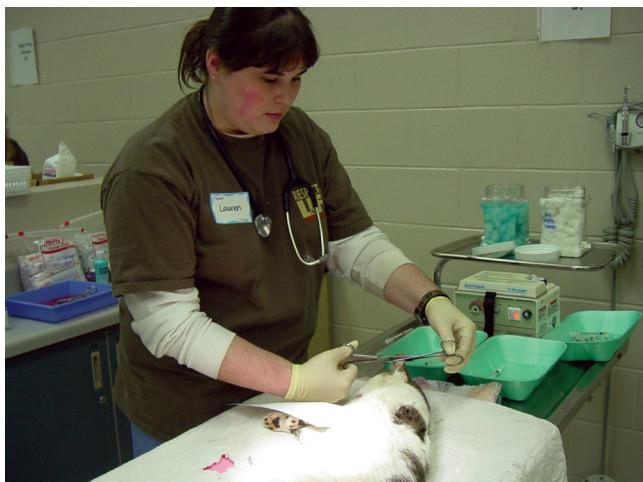


FIGURE 45-22 Ear tipping is antiseptically performed at a dedicated ear tipping station at a large-scale TNR clinic.

Most programs use trained volunteers to facilitate patient care and ensure constant monitoring of cats during the process. Following induction of anesthesia, cats are removed from their traps and identified by physically affixing a tag to their body, ensuring they are returned to the correct trap and caregiver at the end of the clinic. Cats are examined, ear-tipped, surgically sterilized, vaccinated, and then returned to their clean traps, where they are monitored until adequately recovered (see [Figure 45-10](#)). To maximize efficiency, these programs often establish "stations" that perform each task, using trained volunteers to transport and monitor cats between stations ([Figures 45-21 and 45-22](#)). Detailed protocols for establishing large-scale TNR clinics are available online ([Box 45-7](#)).

BOX 45-7**Resources for Care of Community Cats**

Alley Cat Allies: <http://www.alleycat.org>

Neighborhood Cats:

<http://www.neighborhoodcats.org>

Operation Catnip: <http://www.operationcatnip.org>

Feral Cat Spay/Neuter Project:

<http://www.feralcatproject.org>

Feral Cat Coalition: <http://www.feralcat.com>

LIABILITY

As professionals, veterinarians should always be concerned about liability protection. It is always important to make clients aware of risks associated with any practices or procedures that are recommended and to obtain written consent prior to initiating them. **Box 45-8** contains suggested statements for liability forms involving TNR programs, including the loan of traps. Some veterinary practitioners allow clients to “check out” traps as part of the service they provide, to facilitate spaying and neutering of community cats. It is important to discuss these services with your insurance provider to ensure coverage in the event of a claim. Despite the need to be aware of the potential liability concerns, such concerns should not prevent veterinarians from facilitating TNR. In fact, many veterinarians in communities throughout the United States work with individual clients performing TNR as well as with organized TNR programs on a regular basis.

CONCLUSION

As a sole measure, TNR programs cannot be expected to solve the problem of free-roaming cats in communities. However, they do hold great merit as a legitimate response to existing colonies of cats with caregivers and raise public awareness of the welfare issues surrounding cats. TNR programs emphasize to communities that cats require and deserve responsible care; including sterilization, vaccination, identification, and regular feeding, watering and shelter. The provision of accessible, affordable spay-neuter services for community cats helps individual cats and people, while promoting veterinary medical care for all cats and providing humane alternatives to sheltering and euthanasia.

Where emotions and controversies surround methods of community cat management, the goals of cat control and welfare should not be forgotten. Consideration should always be given to the messages we send with the methods we elect to use. Perhaps the greatest value of TNR is that it promotes both humane care and control

BOX 45-8**Suggested Statements for Liability Forms Involving Trap-Loan and TNR Services**

- I understand that this spay/neuter service is for free-roaming community cats, and I certify that to the best of my knowledge these cats are unowned. I accept any liability that may occur secondary to the trapping and treatment of an owned cat.
- I understand that all cats will be “ear-tipped” by the surgical removal of the tip of the left ear under anesthesia so that they can be easily identified as having been sterilized and vaccinated.
- I recognize the risks feral cats face during handling, anesthesia, and surgery and hold _____ harmless should a cat experience complications, injury, escape, or death.
- I understand that trapped animals may be dangerous, and I agree not to open any trap or handle any trapped animal unless specifically instructed. I release _____ from any liability for any injuries or damages that I may incur or cause while trapping, confining, transporting, or releasing these cats.
- I promise to see that, following surgery, spayed/neutered cats will receive food, water, and necessary care on a regular basis when they are returned to the location from which they were taken. I commit to caring for these cats indefinitely and will secure a substitute caregiver if I am unable to provide adequate care. I acknowledge the possibility that once released, some cats may not return.
- I will not use the trap to capture any owned cat, or for any other unlawful act, and will only use it for the purpose of spay/neuter procedures or other necessary medical treatment. Under no circumstances shall this trap be used to capture a healthy animal for destruction or surrender to animal control agencies. I indemnify _____ from any liability based on my use of the trap.
- The value of each trap is \$_____. I will be responsible for said sum to secure its return or replacement. I agree that the traps I am receiving today are in good working order. I understand that if the traps are not returned in similar condition, I will forfeit my deposit for each trap not in good working order.

of cats, setting an important example for responsible stewardship to all animals.

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References

1. American Association of Feline Practitioners (AAFP) position statement on feral cats. Available at <http://www.catvets.com/professionals/guidelines/position/?Id=292>, published 2007. Accessed April 17, 2010.
2. Alley Cat Allies: Feral cat activist archives. Available at <http://www.alleycat.org/NetCommunity/Page.aspx?pid=439>. Accessed April 8, 2010.
3. American Bird Conservancy: Resolution on free-roaming cats. Available at <http://www.abcbirds.org/abcpolicies/policy/cats/Resolution.PDF>, published 1997. Accessed April 17, 2010.
4. American Society for the Prevention of Cruelty to Animals: Pet statistics. Available at <http://www.aspca.org/about-us/faq/pet-statistics.html>. Accessed January 12, 2010.
5. American Veterinary Medical Association (AVMA): Policy statement on free-roaming abandoned and feral cats. Available at http://www.avma.org/issues/policy/animal_welfare/feral_cats.asp, published 2009. Accessed April 17, 2010.
6. American Veterinary Medical Association (AVMA): *Center for information management: U.S. pet ownership and demographics source book*, 2007 ed, Schaumburg, Ill, 2007, AVMA.
7. Beaver BV: Fractious cats and feline aggression, *J Feline Med Surg* 6:13, 2004.
8. Burrow R, Wawra E, Pinchbeck G et al: Prospective evaluation of postoperative pain in cats undergoing ovariohysterectomy by a midline or flank approach, *Vet Record* 158:657, 2006.
9. Coleman GT, Atwell RB: Use of fipronil to treat ear mites in cats, *Aust Vet Pract* 29:168, 1999.
10. Dabritz HA, Atwill ER, Gardner IA et al: Outdoor fecal deposition by free-roaming cats and attitudes of cat owners and nonowners towards stray pets, wildlife and water pollution, *J Am Vet Med Assoc* 229:74, 2006.
11. Dorn AS: Ovariohysterectomy by the flank approach, *Vet Med Small Anim Clin* 70:569, 1975.
12. Dybdall K, Strasser R, Katz T: Behavioral differences between owner surrender and stray domestic cats after entering an animal shelter, *Appl Anim Behav Sci* 104:85, 2007.
13. Fischer SM, Quest CM, Dubovi EJ et al: Response of feral cats to vaccination at the time of neutering, *J Am Vet Med Assoc* 230:52, 2007.
14. Greene CE, Addie DD: Feline parvovirus infection. In Greene CE, editors: *Infectious diseases of the dog and cat*, ed 3, Philadelphia, 2006, Saunders, p 78.
15. Griffin B: Scaredy cat or feral cat? *Animal Sheltering* Nov/Dec:57, 2009.
16. Griffin B: Prolific cats: the impact of their fertility on the welfare of the species, *Compend Contin Edu Pract Vet* 23:1058, 2001.
17. Griffin B: *unpublished data*. Scott-Ritchey Research Center, Auburn University, Auburn, Ala, 2004.
18. Griffin B, DiGangi B, Bohling M: A review of neutering cats. In August JR, editor: *Consultations in feline internal medicine*, ed 6, St Louis, 2009, Saunders Elsevier, p 776.
19. Griffin B, Hume KR: Recognition and management of stress in housed cats. In August JR, editor: *Consultations in feline internal medicine*, ed 6, St Louis, 2009, Saunders Elsevier, p 717.
20. Grint NJ, Murison PJ, Coe R et al: Assessment of the influence of surgical technique on postoperative pain and wound tenderness in cats following ovariohysterectomy, *J Feline Med Surg* 8:15, 2006.
21. Hughes KL, Slater MR, Haller L: The effects of implementing a feral cat spay/neuter program in a Florida county animal control service, *J Appl Anim Welf Sci* 5:285, 2002.
22. Humane Society of the United States: How-to series: how to use a control pole. Available at http://www.animalsheltering.org/resource_library/magazine_articles/sep_oct_1996/asmSO96_howto.pdf, published 2006. Accessed April 17, 2010.
23. Kelly GE: The effect of surgery in dogs on the response to concomitant distemper vaccination, *Aust Vet J* 56:556, 1980.
24. Krzaczynski J: The flank approach to feline ovariohysterectomy (an alternate technique), *Vet Med Small Anim Clin* 69:572, 1974.
25. Levy JK: Feline leukemia virus and feline immunodeficiency virus. In Miller L, Hurley KF, editors: *Infectious disease management in animal shelters*, Ames, Iowa, 2009, Blackwell, p 307.
26. Levy J: Feral cat management. In Miller L, Zawistowski S, editors: *Shelter medicine for veterinarians and staff*, Ames, Iowa, 2004, Blackwell, p 377.
27. Levy JK, Crawford, PC: Humane strategies for controlling feral cat populations, *J Am Vet Med Assoc* 225:1354, 2004.
28. Levy JK, Crawford C, Hartmann K et al: 2008 American Association of Feline Practitioners' feline retrovirus management guidelines, *J Feline Med Surg* 10:300, 2008.
29. Levy JK, Gale DW, Gale LA: Evaluation of the effect of a long-term trap-neuter-return and adoption program on a free-roaming cat population, *J Am Vet Med Assoc* 222:42, 2003.
30. Levy JK, Scott HM, Lachatra JL, et al: Seroprevalence of feline leukemia virus and feline immunodeficiency virus infection in cats in North America and risk factors for seropositivity, *J Am Vet Med Assoc* 228:371, 2006.
31. Longcore T, Rich C, Sullivan LM: Critical assessment of claims regarding management of feral cats by trap-neuter-return, *Conserv Biol* 23:887, 2009.
32. Looney AL, Bohling MW, Bushby PA et al: The Association of Shelter Veterinarians veterinary medical care guidelines for spay-neuter programs, *J Am Vet Med Assoc* 233:74, 2008.
33. Lowe SE, Bradshaw JWS: *Effects of socialisation on the behaviour of feral kittens*, Proc Third Int Congress Vet Behav Med, Vancouver, British Columbia, 2001, p 68.
34. Luria BJ, Levy JK, Lappin MR et al: Prevalence of infectious diseases in feral cats in Northern Florida, *J Feline Med Surg* 6:287, 2004.
35. McGrath H, Hardie RJ, Davis E: Lateral flank approach for ovariohysterectomy in small animals, *Compend Contin Educ Pract Vet* 26:922, 2004.
36. Miller J: The domestic cat: perspectives on the nature and diversity of cats, *J Am Vet Med Assoc* 208:498, 1996.
37. Miyamoto T, Taura Y, Une S et al: Immunological responses after vaccination pre- and post-surgery in dogs, *J Vet Med Sci* 57:29, 1995.
38. Neville PF, Remfry J: Effect of neutering on two groups of feral cats, *Vet Record* 144:447, 1984.
39. Nutter FB, Levine JF, Stoskopf MK: Reproductive capacity of free-roaming domestic cats and kitten survival rate, *J Am Vet Med Assoc* 225:1399, 2004.
40. Patronek G: Free-roaming and feral cats: their impact on wildlife and human beings, *J Am Vet Med Assoc* 212:218, 1998.
41. Patronek GJ, Sperry E: Quality of life in long term confinement. In August JR, editor: *Consultations in feline internal medicine*, ed 4, Philadelphia, 2001, WB Saunders, p 621.
42. Reese MJ, Patterson EV, Tucker SJ et al: Effects of anesthesia and surgery on serological responses to vaccination in kittens, *J Am Vet Med Assoc* 233:116, 2008.
43. Robertson S: A review of feral cat control, *J Fel Med Surg* 10:366, 2008.
44. Richards JR, Elston TH, Ford RB et al: The 2006 American Association of Feline Practitioners Feline Vaccine Advisory Panel report, *J Am Vet Med Assoc* 229:1405, 2006.
45. Scaramella F, Pollmeier M, Visser M et al: Efficacy of fipronil in the treatment of feline cheyletiellosis, *Vet Parasit* 129:333, 2005.
46. Scott KC, Levy JK, Gorman SP et al: Body condition of feral cats and the effect of neutering, *J Appl Anim Welf Sci* 5:203, 2002.
47. Smith RE, Shane SM: The potential for the control of feral cat populations by neutering, *Feline Pract* 16:21, 1986.

48. Slater MR: *Community approaches to feral cats: problems, alternatives, and recommendations*, Washington, DC, 2002, Humane Society Press.
49. Soulebot JP, Brun A: Experimental rabies in cats: immune response and persistence of immunity, *Cornell Vet* 71:311, 1981.
50. Stoskopf MK, Nutter FB: Analyzing approaches to feral cat management—one size does not fit all, *J Am Vet Med Assoc* 225:1361, 2004.
51. Subacz KB: Impact assessment of a trap-neuter-return program on selected features of Auburn, Alabama feral cat colonies. Unpublished graduate thesis: Auburn University, Ala. Available at <http://etd.auburn.edu/etd/handle/10415/1101>, 2008. Accessed June 4, 2011.
52. Wildlife Society: Position statement on feral and free-ranging domestic cats. Available at <http://joomla.wildlife.org/documents/positionstatements/28-Feral%20&%20Free%20Ranging%20Cats.pdf>, published 2006. Accessed April 17, 2010.
53. Wilson FD, Balasubramanian NN: The lateral approach for the spaying of canines and felines, *Indian Vet J* 44:1052, 1967.