Honors Thesis: Guidelines and Recommendations for Record Keeping and Data Use for Feline Trap-Neuter-Return Programs

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Feral and free roaming domestic cat (*Felis catus*) populations are a growing concern for animal welfare, wildlife mortality, and human and domestic animal health [1,2]. This means that the issue is also a growing topic of discussion for animal welfare proponents as well as wildlife and environmental scientists and managers, and that there are varying opinions on how to manage feral cat populations [3]. Trap-neuter-return (TNR) programs are increasingly being used and portrayed as an effective way to limit and even reduce populations of feral cats. However, there is criticism from much of the scientific community about whether this method is actually reducing feral cat populations, and because even sterilized free-ranging cats kill wildlife [4]. There have been very few quantitative studies of feral cat colonies managed using TNR [5]. This means that claims about the success of TNR programs are based on anecdotal evidence and not scientifically collected data.

Operation Catnip Stillwater is a TNR program that has been ongoing since 2012 in Stillwater, Oklahoma. It is a "non-profit organization providing high volume, no-cost spay/neuter and vaccination services to the free-roaming community cats of Stillwater, Oklahoma through TNR," and the purpose is to "humanely reduce the feral and free roaming cat population in Stillwater and the surrounding areas, reduce the number of non-adoptable cats presented to local shelters each year, and [participate in] community outreach and education addressing the values of spay and neuter." [6] This program holds seven clinics a year to sterilize and vaccinate feral cats caught in traps by volunteers [6]. Volunteers include staff and students in the Oklahoma State University Center for Veterinary Health Services (OSU CVHS), as well as undergraduate students of Oklahoma State University and members of the community.

Like most TNR programs, Operation Catnip has not rigorously documented whether they have successfully reduced the abundance of Stillwater's cat populations. Thus, the main objective of my project was to examine the effects of Operation Catnip on the feral cat population in Stillwater, Oklahoma. Specifically, I sought to determine whether there has been a statistically significant change in cat colony size since the initiation of Operation Catnip efforts, as determined by using sterilization, release, and intake rates from several sources. These data sources were to include Operation Catnip itself, Stillwater Animal Welfare, and Tiny Paws Kitten Rescue. Unfortunately, soon after initiating data collection, it became clear that addressing my research objective would not be possible, due to limited data availability. Thus, I revised the objective of my project, and in the remainder of this paper, I summarize and discuss

these data limitations and highlight suggested data collection procedures that will be necessary for future efforts to rigorously evaluate the success of TNR programs, both in Stillwater and anywhere TNR is conducted.

The first issue with the data, which was not entirely unexpected, was that Operation Catnip Stillwater had only been active since 2012, and thus only had three and a half years of data available. This limited time in operation meant there were not have enough data points to assess trends in cat sterilizations over time. I encountered this same problem with the Tiny Paws Kitten Rescue data, as they have only been in operation since 2013. This data limitation can only be remediated by continued operations of each program.

An even broader issue was that the data that were collected were recorded inconsistently within each program, and this prevented me from parsing apart the effect of different methods of recording data versus actual variation in cat population abundance since the TNR program had started. For Operation Catnip, the only information recorded for every cat was its sex and whether the animal was spayed or neutered. Information available and legible for some cats but not others included: age, location of trapping, and whether the cat had an illness or wound that was treated. This lack of consistency was exacerbated by the fact that there were multiple data recording sheets for each cat; therefore obtaining a complete picture for each individual required sorting through multiple stacks of handwritten papers. Additionally, I had to exclude the entire first year of Operation Catnip data (2012) because the data were recorded differently than in the subsequent 3 years. Most importantly, I could not confirm whether any of the 2012 cats were trapped within Stillwater city limits, as trapping location was not explicitly stated on intake forms. This same problem occurred with a subset of the cat data for 2013-2016.

In addition to data limitations within Operation Catnip, the other organizations with the potential to track cat populations through intake data – Tiny Paws Kitten Rescue and Stillwater Animal Welfare – also had substantial data limitations. Surprisingly, the city of Stillwater does not require Animal Welfare to keep records of the animals they admit and care for each year [7]. The only data records kept are retained by officers out of curiosity and when time permits. This means that records are erratic from month to month and year to year. Tiny Paws is a non-profit organization, and their main mission is to take care of orphaned, neonatal kittens. Due to staffing and funding limitations, Tiny Paws generally focuses on caring for kittens rather than keeping consistent records. Thus, the only data available to me from this organization was the total

number of cat intakes per year, and the number of those intakes from within Stillwater city limits.

Although there were major data limitations with all the organizations I looked at, my observations provide valuable information and insight that can be used to make a series of recommendations to any organizations seeking to track cat population abundance trends in response to of TNR efforts. Based on the data limitations I observed, I propose a minimum baseline of standards for data and record keeping for TNR proponents and officials serious about determining the effectiveness of TNR programs under their care or in their jurisdiction. The following information is the bare minimum that TNR organizations should be obtaining and recording for each cat (the rationale for collecting each piece of information is highlighted in italics):

1. Identification number and defining appearance.
    a. *This helps keep track of individuals, which facilitates more reliable abundance counts in different time periods.*
2. The date of sterilization.
    a. *This allows calculation of sterilization numbers and rates for different time periods.*
3. The location of trapping/release.

    a. *Note: this information should be as specific as possible, perhaps including a map (preferably digital) where locations can be pinpointed and recorded with each trap and cat ID number. This way, individual colonies can be recorded and monitored for population changes. This also allows for calculation of cat sterilization numbers and rates for different geographical areas.*
4. Name and contact information of the person who conducted trapping.
    a. *In case information is missing when the cat is submitted for sterilization, someone can be reached to provide it, as well as are available to contact about future trapping opportunities.*
5. Sex.
    a. *This clarifies whether the animal was spayed or neutered. Also, this information can be used to determine sex ratio and structure of the population, which can be*

used when examining fecundity and other population parameters that can influence abundance.

6. Age. Note: Determining the exact age is often impossible and using broad categories may be preferable. (e.g., <3 months, 3-5 months, 6-12 months, and >12 months.)
   a. *Age can be used to determine the age structure of the population, which can show if the population is growing, and if it is growing due to births (younger cats) or by immigration from other areas (older cats).*
7. If the cat is diseased or wounded, and whether the animal was treated.
   a. *This is for information about disease spread, which can affect the feral cats, as well as wildlife, domesticated animals, and humans.*
8. If the cat was vaccinated and for what disease.
   a. *Again, this provides information about disease spread.*
9. If the cat was euthanized and reason for euthanasia.
   a. *This clarifies reasons for disease/death of feral cats, as well as to record that the animal has permanently been removed from the population.*
10. If the cat was already spayed/neutered, and/or ear-tipped.
    a. This provides evidence of participation in a previous TNR clinic.
11. Records be kept electronically (ideally grouped by date of sterilization clinic).
    a. *This makes information easier to access and analyze and avoids issues related to legibility of handwriting or lost/damaged papers.*

In addition to the above recommendations for TNR programs, I recommend minimum data recording standards for any associated organizations that take in cats, including numbers 5-11 from the above list, and additionally (ideally, recorded monthly and yearly):

1. Date of intake/capture.
2. Location the cat came from/was captured.
   a. Note: this information should be as specific as possible, so as to know where animals are coming from and that area can be monitored.
3. Details of cat capture/provenance that help establish whether it is a feral, semi-feral, free-ranging pet, or indoor pet.

   a. *This clarifies how the cat came to end up with the organization, information that can help determine whether cats were not feral or owned pets.*
4. If adopted or moved to another organization and when.
   a. *This facilitates tracking of the animal through the community, and helps determine if it permanently leaves the community.*

There are understandable reasons that data recording and consistency may be lacking for different organizations and areas. Some of these may be constraints of funding and time for members or employees to compile records. In these cases, if individuals implementing a TNR program desire to assess the program's success, it would be in their best interest to assist these other organizations and in data collection. This will foster a cooperative attitude that will ensure that data is useful and consistent, which is crucial to judging the success of the TNR program.

It is critical for TNR programs that strive to be successful in their mission of decreasing feral cat populations to keep concise, detailed, and consistent records so they and others can use the information to analyze how well the program is working and to determine what future actions may need to be adjusted or initiated to reach that goal. It is also critical for associated organizations that work with cats to keep records that are just as consistent and clear so that overall conclusions on the cat intake and population levels are discernable for the targeted area. In addition, it may be beneficial to TNR programs to collaborate with scientists to evaluate the effectiveness of TNR. Citizen scientists are a valuable research tool utilized by many other scientific fields, and would be an excellent addition to the study of TNR. With this addition to their team of veterinarians and animal welfare proponents, TNR organizations could ensure they are working to find the best solution possible for feral cat overpopulation, as well as the most humane treatment of the feral cats in their care.

References

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