
From: Jacquie Rand
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To: Portfolio Committee 8
Cc: Teneale Houghton; Margaret Pollard
Subject: RE: Link to Pounds inquiry hearing schedule
Attachments: Standards of care in shelters-2022.pdf; Crawford 2023-Solutions based cat managt.pdf; Neal 2023 Cat is a Cat.pdf; Ma-2023-characteristics of semi-owners.pdf; Scotney 2022 Stockton cull QOL carers.pdf

Hello Margaret,

Here are the articles that I mentioned.

1. The Association Of Shelter Veterinarians' Guidelines For Standards Of Care In Animal Shelters
2. Crawford, C.; et al. *Solutions-Based Approach to Urban Cat Management—Case Studies of a One Welfare Approach to Urban Cat Management*. *Animals* 2023, 13, 3423. This is the first peer-reviewed publication based on data from the Australian Community Cat Program in Queensland. This qualitative study aimed to explore the impacts of a free sterilization, microchipping, and vaccination program on the people who care for multiple urban free-roaming cats.
3. Neal et al, *A cat is a cat: attachment to community cats transcends ownership status* 2023 *J. Shelter Med & Com An Health*. This study demonstrated that the bond cat care-givers (semi-owners) have with the cats they care for is nearly identical to the bonds pet owners have with their cats.
4. Ma et al *Characteristics of cat semi-owners* 7% of respondents are cat semi-owners, and they face multiple significant barriers, especially cost, to getting the cats they are caring for desexed and taking ownership. *J Fel Med & Surg*.2023
5. Scotney, R. et al; *The Impact of Lethal, Enforcement-Centred Cat Management on Human Wellbeing: Exploring Lived Experiences of Cat Carers Affected by Cat Culling at the Port of Newcastle*. *Animals* 2023, 13, 271. This qualitative study aimed to document the lived experience of these cat caregivers to understand their motivations for caregiving and their relationships with these cats. A secondary aim was to explore caregiver perceptions of the lethal management approach and if psychological impacts were experienced.

I would like to provide additional information on mandated desexing. In relation to **mandated desexing**, evidence shows it is ineffective because it fails to recognise the reason cats are not desexed is cost. A US study showed the strongest predictor of whether a cat in a household was desexed was household income. Secondly, published data relating to ACT's mandatory desexing showed it was ineffective in increasing desexing rates (Albertson 2016). In addition, recent research reported that the only 3 states with mandated desexing (WA, SA, Tasmania) have the highest per capita cat intakes into shelters and pounds in Australia (Chua 2023).

From APWF's submission to the 2020 Federal Government Inquiry in Feral and Domestic Cats:

"An analysis of 191,000 cats entering RSPCA shelters over 4 years in Australia found that while the ACT had mandated desexing of all dogs and cats by 6 months of age for 10 years prior to the study, the territory had the lowest proportion of desexed kittens (by 6 months of age) of all the jurisdictions in the Commonwealth (Alberthsen et al. 2016).

Legislation only works, in other words, if it is enforced. One cannot readily tell from a distance, of course, whether a free-roaming cat is desexed as required by law, or not, or who owns it. So, mandatory desexing is difficult and resource intensive to enforce, because it requires cats to be trapped and traced to an owner.

The costs to local governments of meeting these requirements mean it is just not feasible to enforce mandatory desexing. Moreover, the main barrier to desexing is not addressed by mandating it. In Australia, multiple surveys report that most owned cats are desexed, at rates typically exceeding 90%. We also know, however, that the intake of cats and kittens into shelters and pounds is correlated with socioeconomic factors, and that intakes are significantly higher in suburbs where 20% to 30% of households are classed as low income, which in Australia is often defined as 2.4 people living on less than \$650/week. In these suburbs, there are high numbers of “free/give-away” kittens and cats, because the cost of desexing cats is unaffordable.

People who take on the care of a cat or kitten often do it on a good Samaritan basis, in response to social media messages that implore people to provide a home for the animal, because otherwise it “will be killed at the pound” - which may or may not be true, depending on which local government area people are living in. We are talking, here, about people who can afford to feed a cat and provide inexpensive items, such as bedding, but the cost of desexing, microchipping and local council registration for the cat they have opted to care for is simply unaffordable. It typically runs from \$350 to \$500 for a female cat.

In the face of these realities, the effect of mandating desexing is essentially to criminalize cat ownership in the less prosperous parts of the country and to encourage semi-ownership. Public policy effectively encourages people to say that “it’s not my cat,” and disavow their best instincts for caring.

If the goal of public policy for cat management is to reduce free-roaming cat numbers, and more specifically the numbers of semi-owned, unowned and owned cats producing kittens, then the money and resources associated with mandating desexing and compliance would be more effective if it were targeted to providing support for free/affordable desexing in socioeconomically disadvantaged areas.

In the USA, to cite some comparative data, in households with annual family incomes greater than or equal to \$USD 75,000, 96% of cats were desexed. In households with annual family incomes between \$USD 35,000 and \$USD 74,999, 91% of cats were desexed (Chu 2007). When annual family income was below \$35,000, only 51% of cats were desexed. At the US federal poverty line where individual incomes range between \$16K and \$19K a year for 2 people, only 10% of pets are desexed.

Research also shows, however, that providing free or affordable desexing in socioeconomically disadvantaged areas increases the desexing rate in pets to 90% (Chadwich, Emancipet, AIAM 2019 conference). The clear implication is that low income individuals and families want to do the right thing in caring for pets, and when voluntary, free/affordable and accessible desexing programs are available, and are coupled with information on why it is important to desex, high rates of desexing can be achieved. Other assistance to overcome barriers to desexing, such as provision of a carry cage, assistance with catching the cat, and transport of the cat to and from the veterinarian may also be needed.

More specifically, in a survey of people enrolling a cat in a free desexing program in the City of Banyule (VIC), a program targeted to low SOE suburbs with high cat intake and complaints, when people were asked “What was the single most important factor why you have not already had this cat desexed?” 90% said it was because desexing was unaffordable. The targeted suburbs in this case had 20-30% of households living on \$650 a week or less.”

Happy to answer any questions.

Warm regards,

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THE ASSOCIATION OF SHELTER VETERINARIANS' GUIDELINES FOR STANDARDS OF CARE IN ANIMAL SHELTERS

Second Edition - December 2022

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Contents

Introduction	1
Purpose	1
About this document	1
Audience	1
Scope	1
Format	2
Ethical framework for animal welfare	2
Sheltering today	3
1. Management and Record Keeping	5
1.1. General	5
1.2. Management structure	5
1.3. Establishment of policies and protocols	6
1.4. Training	6
1.5. Record keeping and animal identification	6
2. Population Management	8
2.1. General	8
2.2. Determining capacity for care	8
2.3. Operating within capacity for care	9
Admission planning	9
Outcome planning	9
Length of stay	9
Pathway planning	10
Population rounds	10
2.4. Monitoring population data	10
3. Animal Handling	12
3.1. General	12
3.2. Restraint	12
3.3. Handling equipment	12
3.4. Handling feral cats	13
4. Facilities	14
4.1. General	14
4.2. Primary enclosures	14
Individual primary enclosure size	14
Primary enclosure set-up	15
Additional considerations	15
4.3. Co-housing	16

Co-housing enclosure set-up	16
Selecting animals for co-housing	17
Monitoring co-housed animals	17
4.4. Isolation housing	17
4.5. Surfaces and drainage	18
4.6. Heating, ventilation, and air quality	18
4.7. Noise control	18
4.8. Lighting	19
4.9. Enrichment spaces	19
4.10. Intake spaces.	19
4.11 Drop boxes	19
4.12. Facility design and planning	19
5. Sanitation.	23
5.1. General	23
5.2. Definitions	23
5.3. Sanitation practices	23
Sanitizing primary enclosures	24
Spot cleaning primary enclosures	24
5.4 Reducing pathogen spread	25
Personal protective equipment.	25
Hand hygiene	25
Equipment & supplies	25
5.5. Other shelter areas	26
5.6. Wildlife, rodent, & insect control	26
6. Medical Health	29
6.1. General	29
6.2. Veterinary oversight and medical recordkeeping.	29
6.3. Medical assessment	30
6.4. Essential wellness and preventive care	30
Vaccination.	30
Core vaccines in shelters	31
Noncore vaccines	32
Vaccine schedules	32
Parasites	32
Nutrition	32
Pregnant, nursing, and neonatal animals	33
6.5. Responding to health concerns	33
Pain management.	33

Emergency medical care	34
Responding to infectious disease	34
Outbreak reponse	34
6.6. Population health surveillance	34
6.7. Rehoming considerations	35
7. Shelter Surgery	38
7.1. General	38
7.2. Spay-Neuter	38
Practices and protocols	38
Identifying altered animals	38
7.3. Other surgeries	39
Dentistry	39
8. Forensics	41
8.1. General	41
8.2. Laws and regulations	41
8.3. Forensic investigation policies	41
8.4. The veterinary forensic evaluation	41
Veterinary forensic examination	42
Documentation	42
8.5. Managing evidence	42
8.6. Training	42
9. Behavior and Mental Well-being	44
9.1. General	44
9.2. Stress and welfare	44
9.3. Intake	44
9.4. Environmental management	45
Housing	45
Daily routine	45
9.5. Enrichment and socialization	45
Time out of enclosure	45
Interactions with people and other animals	45
Playgroups	46
Enrichment within enclosures	46
Socialization of puppies and kittens	46
9.6. Behavior assessment	46
9.7. Responding to behavior or welfare concerns	47
Animal training	47
Behavior modification	47

Behavior medication	47
Animals with long term stays	48
9.8. Risk assessment of animals displaying aggressive behavior	48
9.9. Rehoming considerations	49
10. Euthanasia	52
10.1. General	52
10.2. Euthanasia process	52
Euthanasia methods	52
10.3. Environment and equipment	53
10.4. Personnel considerations	53
11. Animal Transport and Relocation Programs	55
11.1. General	55
11.2. Responsibilities for relocation programs	55
11.3. Responsibilities at the source	55
11.4. Responsibilities during transport	56
Primary enclosure and occupancy	56
Special cases	56
Vehicles	57
Monitoring and care	57
Aggregation	58
11.5. Responsibilities at the destination	58
12. Disaster Response	59
12.1. General	59
12.2. Mitigation	59
12.3. Preparedness	59
12.4. Response	60
12.5. Recovery	61
13. Public Health	62
13.1. General	62
13.2. Personal protective measures	62
Hand hygiene	62
13.3. Workplace hazards	62
Chemical hazards	62
Physical hazards	62
Biological hazards	63
13.4. Human well-being	64
Appendices	67

Introduction

Purpose

The Association of Shelter Veterinarians' (ASV) Guidelines for Standards of Care in Animal Shelters [‘The Guidelines’¹] was originally published in 2010. While animal sheltering has evolved substantially in the last decade, this second edition shares the same fundamental goals. To provide:

- a set of common standards for the care and welfare of companion animals in shelters based on scientific evidence and expert consensus
- guidance that helps animal welfare organizations reduce overcrowding, stress, disease, and improve safety
- a tool for animal welfare organizations and communities to assess and improve their shelters
- references for creating regulations and statutes around sheltering, and benchmarks for organizational change
- guidance for animal housing in existing facilities and priorities for the design of new construction
- a living document that responds to developments in shelter medicine and animal care research and practice

Both documents share the guiding principle that meeting each animal's physical and emotional needs is the fundamental obligation of a shelter regardless of the mission of the organization or the challenges involved in meeting those needs.

About this document

This second edition keeps the intent and format of the original document, while incorporating important updates based on the growing body of animal sheltering science and recommendations rooted in practical experience. To undertake this revision, the Board of Directors of the ASV formed a task force of 19 shelter veterinarians from a pool of nominees and original authors. Task force members were selected from those active within the ASV community to provide diversity and breadth in their areas of expertise, geographical locations, and current or previous roles in a variety of shelter types. Task force members completed literature reviews and consulted subject matter experts to inform their contributions. Funding to support the research, development, and publication of this document was provided by the ASV. No commercial or industry funding was used.

This consensus document, which represents the collective input and agreement of all task force members, took 3 years to create. This second edition was approved unanimously by the ASV Board of Directors in December 2022.

Audience

The Guidelines for Standards of Care in Animal Shelters, Second Edition, is written for organizations of any size or type who provide temporary housing for companion animals. The term *shelter* used here includes foster-based rescues, nonprofit humane societies and SPCAs, municipal animal services facilities, and hybrid organizations. The Guidelines are also applicable to any organization that routinely cares for populations of companion animals, including companion animal sanctuaries, cat cafés, vet clinics, pet stores, dog breeding operations, research facilities (including universities), and service, military, or sporting dog organizations. This document was written for organizations working in every community, including those with significant numbers of homeless pets, those with the capacity to take in animals from other locations, and those whose pet population challenges vary by species, time of year, and other circumstances.

The term *personnel* is used in this document to include all paid and volunteer team members caring for animals in shelters and foster-based organizations. This document is intended to guide all personnel, including administrative, medical, behavior, and animal care staff; volunteers; foster caregivers; sole operators; and those filling any other role that supports animal well-being.

Scope

Although many practice recommendations and examples are included, these Guidelines are not a detailed manual for shelter operations. As with the previous document, the aim is to provide guiding standards of care to meet animals' needs, while allowing shelters to determine exactly how those standards are met in their own operating protocols, based on their mission or mandate, resources, challenges, and community needs.

In this document, we have deliberately limited our focus to the care of cats and dogs who make up the majority of animals admitted to shelters in the United States every year. When caring for other species, similar operational principles can be applied to meet the unique needs of those animals.

The ASV recognizes the importance of activities supporting pet retention and access to veterinary care, and that shelters are playing a large role in providing those services.² Informed community engagement is critical in supporting the health of animals in their communities, with impacts on shelter intake and human health.³ Although these services are addressed where they intersect with shelter admission and outcome policies and decisions, this document does not focus specifically on how shelters support owned animals or community pet welfare.

Format

These Guidelines have been divided into 13 sections; 11 have been updated from the original document and two are new. The document is intended to be read in its entirety because concepts build upon one another. A glossary is included as [Appendix A](#); a checklist of key actionable statements is available on the ASV website. Lists of helpful resources are also included in [appendices](#) for ease of access. As an evidence-based document, the many references included direct the reader to the science and research behind specific recommendations.

As with the original document, the key actionable statements use an *unacceptable*, *must*, *should*, or *ideal* format:

- **Unacceptable** indicates practices that need to be avoided or prevented without exception
- **Must** indicates practices for which adherence is necessary to ensure humane care
- **Should** indicates practices that are strongly recommended, and compliance is expected in most circumstances
- **Ideal** indicates practices that are implemented when resources allow

The ASV recognizes that each organization is uniquely situated and faces challenges that may impact their ability to implement the practices recommended. The ranked format of statements allows organizations to set priorities for improving their operations and facilities. This is not a legal document; shelters should be aware that state and local laws and regulations may supersede the recommendations made here.

Ethical framework for animal welfare

The ethical principles for animal welfare used in the original Guidelines document were the Five Freedoms: the

freedom from hunger and thirst; the freedom from discomfort; the freedom from pain, injury, or disease; the freedom to express normal behavior; and the freedom from fear and distress.^{1,4}

While these principles are valuable for defining essential elements of animal welfare, their focus is on avoiding negative experiences. Positive experiences and welfare are also essential to promote a life worth living.⁵ For example, shelters do more than ensure animals do not go hungry; they regularly provide species- and life stage-specific food that nourishes, provides interest, and satisfies without overfilling. Food can be even more enriching when provided in a context of social contact and animal training.

The Five Domains model, derived from the Five Freedoms, illustrates how better or worse nutrition, environment, physical health, and behavioral opportunities combine to inform an animal’s mental state, which, in turn, informs their overall welfare.⁶ This model does two new things. First, it gives a spectrum for each domain, for example, allowing not just the absence of pain but including the feelings of comfort and fitness (Table 1).

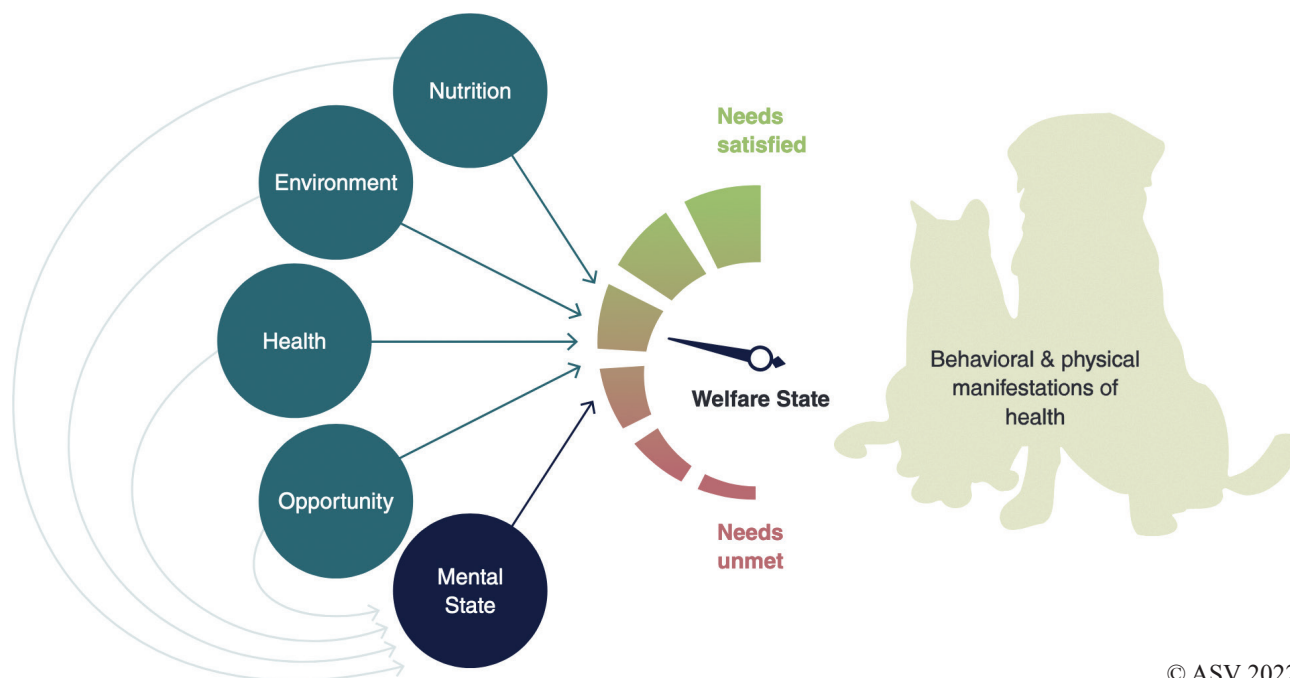
Second, this model illustrates that positive welfare states can still occur even when one or more important needs are not completely satisfied. For example, a stray cat with a healing pelvic fracture on cage rest (restricted agency, pain) may still have an overall positive welfare state when appropriately treated and housed in an enriched foster home. Negative mental states are also possible even if only one need is unmet. For example, a well-fed and physically healthy dog confined long-term to a kennel (restricted agency) may have profound mental distress and overall negative welfare.

When nutritional, environmental, physical, and emotional needs are increasingly satisfied, animals have increasingly positive mental states and demonstrate this

Table 1. The Five Domains that contribute to an animal’s welfare status

	1. Nutrition	2. Environment	3. Health	4. Opportunity	5. Mental state
Positive experiences	Enough food and water Fresh clean water Balanced, variety of food	Comfortable Temperate Routine Clean Interest/variety	Physical health Good function Good body condition Restful sleep	Choice of environment Choice of interaction Behavioral variety (play, hunt, forage, engage, rest) Novelty	Satisfied Engaged Comfortable Affectionate Playful Confident Calm Encouraged
Negative experiences	Restricted water Restricted food Poor quality Monotonous	Too cold or hot Too dark or bright Too loud or quiet Unpredictable Malodorous Soiled Monotonous Uncomfortable	Body dysfunction or impairment Disease Pain Poor fitness	Barren cage Confined space Separation from people or species Restraint Unavoidable sensory inputs	Fearful or anxious Frustrated Bored, lonely Exhausted Ill, painful Uncomfortable Hungry, thirsty

Adapted from Mellor⁶



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Figure 1. The Five Domains of animal welfare in action

through physical manifestations of good health and behavior (Figure 1).

In this document, we set out to help shelters achieve positive welfare in each of these Five Domains within the necessary constraints of animal and human safety and infectious disease control. In addition to following the Guidelines in this document, we hope that shelters will examine existing practices in light of the Five Domains framework and identify new ways to tip the balance toward positive well-being for the animals in their care.

Sheltering today

This document was created during a period of social upheaval, with a global pandemic, climate events, and racial inequity protests impacting communities around the world. Both the COVID-19 pandemic and increasingly frequent damaging weather events have accentuated the critical role that shelters play in keeping animals safe and preserving the human–animal bond. The willingness of communities to help shelters was also highlighted during the pandemic, when entire organizations pivoted to foster care and pursued creative alternatives to intake. Inviting members of the community to be a part of the safety-net has created opportunities for new programs and bigger impacts.

At the same time, the animal welfare industry has been reflecting on how sheltering and animal control practices contribute to systemic inequities in their communities, including the ways that shelters admit,

transport, and adopt out animals. This reflection has emphasized the need for accessible, non-punitive services for pet owners in our communities, the benefits of culturally sensitive community engagement, and the need to work toward representing the diversity of our communities in our personnel and profession (ASV's Commitment to Diversity, Equity and Inclusion).⁷ Staffing and work environment challenges, during the pandemic and beyond, have reiterated the need for shelters to be healthy, supportive, and inclusive places to work and volunteer (ASV's Well-being of Shelter Veterinarians and Staff).⁸

Confronting these challenges together has created a stronger, more interconnected animal welfare community. The ASV offers this document as a tool to help shelters connect to expert guidance and measure themselves against a common standard, to help personnel find compassion satisfaction, to solidify the shelter's role in supporting their community, and to elevate the welfare of animals in their care.

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I. Management and Record Keeping

1.1 General

A well-run sheltering organization of any size is built on a foundation of planning, training, and oversight. This foundation is an essential part of implementing the guidelines presented in this document. Shelters must have a clearly defined mission or mandate, adequate personnel, up-to-date policies and protocols, a system for training and supervising personnel, and management practices aligned with these guidelines.

The shelter's mission or mandate should reflect the needs of the community it serves. Tools that aid shelters in defining their purpose include community needs assessments and strategic planning. A community needs assessment reveals what services are already being provided in the community and where needs are unmet. Programs and collaborations have the biggest impact when they reflect principles of community engagement, including respect for each other's values and cultures.¹ The community's needs should be regularly reviewed, and strategies and goals updated accordingly.

Strategic planning is an organizational process used to define the shelter's essential programs and goals, and then purposefully allocate resources (e.g. shelter space, personnel, and finances) toward achieving these goals. This planning positively impacts an organization's ability to achieve its stated objectives.² Strategic plans are most effective when reviewed regularly, often quarterly, to ensure progress is being made and goals are still relevant.

Animal shelter administration requires the balance of a complex set of considerations, including a focus on collaboration and the establishment of best practices. When developing organizational level policies and protocols, administrators are encouraged to consult industry-specific professional organizations for guidance and to learn from the experience of others in the field.³⁻⁵ Because animal health and welfare is woven into every facet of shelter operations, veterinarians should be integrally involved with development and implementation of the shelter's organizational policies and protocols.

1.2 Management structure

Shelters must have a clearly defined organizational structure that outlines accountability, responsibility, and authority for management decisions. This organizational structure must be communicated to all staff and volunteers. Organizational charts are visual tools that enable all personnel to understand roles and responsibilities, supporting clear communication across departments. This blueprint of the organization can be used by

team members learning about the organization, by those in leadership planning for growth and transition, and by external partners establishing a collaborative relationship with the organization. Lines of authority, responsibility, and supervision should be in writing, reviewed periodically, and updated when roles change.

Decision-making must take into account resource allocation as well as population and individual animal health and welfare. Decisions involving the allocation of resources, whether at the organizational, population, or individual animal level, are best made by personnel aware of organizational priorities and the shelter's capacity for care.

Authority and responsibility for tasks and decision-making must be given only to those who have the appropriate knowledge, training, and when applicable, credentials. For example, resource-based decisions (e.g. to treat or to euthanize an individual animal) may be made by shelter personnel, but medical treatment decisions (e.g. which drug to treat with) need to involve a veterinarian.

The practice of veterinary medicine and surgery is restricted to those with a valid license. In the United States, veterinary practice is defined by state or territorial practice acts. These acts generally cover the diagnosis and treatment of medical conditions, prescription of pharmaceuticals, surgery, and the tasks that other personnel (e.g. technicians, assistants, veterinary students, and others) may perform under direct or indirect veterinary supervision.⁶ Several states and the AVMA Model Veterinary Practice Act have sections specific to population medicine and the provision of veterinary oversight through standard written protocols and timely visits to the premises where animals are housed.^{7,8}

Some medical procedures (e.g. microchipping and alternative therapies) may be restricted to veterinarians in some states and not in others.⁹ Shelters can maximize capacity for medical services by using veterinary technicians and other veterinary professionals to the extent of their capabilities. Providing veterinary care via telemedicine extends veterinary bandwidth and can improve animal welfare.¹⁰

A formal relationship with a veterinarian must be in place to ensure oversight of medical and surgical care in the shelter. Many shelters employ one or more veterinarians, others may use local veterinary clinics, and some use paid or unpaid contract veterinarians. A shelter's veterinarian must have knowledge about their particular population and should have training or experience in shelter medicine. The shelter's veterinarian should be consulted on all policies and protocols related to the maintenance of medical and behavioral animal health (see [Medical Health](#)).

Furthermore, veterinarians may be uniquely suited to provide training and continuing education, communicate with external stakeholders, and engage in organizational policy and protocol development in shelters.

1.3 Establishment of policies and protocols

Organizational policies are a framework of high-level decisions that ensure operations remain consistent with the shelter's mission and priorities. Shelter policies help ensure that animal needs do not overwhelm the resources available to meet those needs, since operating beyond an organization's capacity for care is unacceptable (see [Population Management](#)). Important policies for sheltering organizations include intake, treatable conditions, euthanasia, adoption, transport, and community animal services.

Shelter protocols are critical tools that ensure consistent daily operations in keeping with organizational policies. Protocols must be developed and documented in sufficient detail to achieve and maintain the standards described in this document and should be reviewed and updated regularly. All personnel must have access to up-to-date protocols. How shelters provide this access will vary by organization and may include digital or paper documents. Shelter management must routinely monitor and ensure compliance with protocols. [Appendix B](#) provides a comprehensive list of protocols recommended in these Guidelines.

Shelters are obligated to comply with all local, state, and national regulations, which need to be reviewed regularly. In some cases, existing regulations may represent outdated practice or lower standards of care and can restrict or even conflict with current best practices. When implementation of these Guidelines does not align with government regulations or policies, shelters are encouraged to support endeavors for legislative change.

1.4 Training

Effective training of personnel (i.e. paid and unpaid staff and volunteers) is necessary to ensure safe and humane animal care and the safety of people.¹¹ Personnel training should incorporate all relevant aspects of working in the organization. In addition to operating protocols for daily tasks, effective training programs include broader topics that help staff to perform their duties well, such as communication techniques; data management; animal husbandry; staff well-being; and diversity, equity, and inclusion ([Appendix B](#)).

Onboarding is an important part of introducing new personnel to any organization. Shelters must provide training for each shelter task, and personnel must demonstrate skills and knowledge before proficiency is assumed. For example, new animal care staff could complete virtual training materials on sanitation and work with a

senior staff member prior to being assigned to sanitize enclosures.

Documentation of training should be maintained and reviewed regularly as a part of professional development and performance reviews. Ongoing feedback about performance, both in-the-moment and through formal reviews, is an important element of professional growth for personnel at all levels. When licensing or certification is required to perform specialized duties, as in veterinary care or euthanasia, personnel performing these tasks must be credentialed.^{12,13} Continuing education must be provided for all personnel in order to improve skills and maintain credentials. Investing in training requires time and resources but is key to program success.

To ensure employee, volunteer, and public safety, shelters must provide all personnel the information and training needed to recognize and protect themselves against common zoonotic conditions (see [Public Health](#)). In addition, shelter personnel having any form of contact with animals should have proper training in basic animal handling skills, animal body language, and bite prevention strategies. This training reduces risk for staff and volunteers and provides a more humane experience for animals.

1.5 Record keeping and animal identification

Shelter animal identification and maintenance of animal records are essential for shelter operations. Shelters must adhere to the elements of record-keeping defined within regulatory requirements.

Given the wide availability of technology, digital systems should be used for record keeping, preferably software systems designed for animal shelters. With proper utilization, shelter software or spreadsheet programs allow organizations to better manage resources, schedules, and shelter processes. The software system used by a shelter should be able to generate basic population level reports as well as individual animal records. Population-level data inform management strategies (see [Population Management](#)) and allow regular assessment and reporting of organizational goals and activities.¹⁴

No matter the system used, each animal must have a unique identifier and individual record. This identifier (e.g. name and number) is established at or prior to admission and ensures consistency and accuracy in care and record keeping for that animal. Shelter software programs typically generate a 'kennel card' based on animal information entered into the system, which can be displayed on or near the animal's primary enclosure for easy reference by personnel and the public.

Because animals may move within and between areas, shelters must have an organized system by which animal identification information can be quickly and easily matched to animals in enclosures and their shelter records.

Table 1.1. Essential elements of an animal shelter record

Animal information	Unique identifier (number/name) Intake type (source) Date of intake Species Age/age category (estimate or known) Sex Spay-neuter status Physical description Weight
Identification	Photograph of the animal Microchip scan results Identifying markings (tattoos, tags, scars, etc.)
History	Medical conditions and services received Behavioral events and experiences People and animals lived with Home environment
In-shelter care activities	Medical findings, treatments, and procedures Behavioral findings, plans, and treatments Housing locations by time
Outcome information	Outcome type Date of outcome

Since identification may be challenging when animals are outside of their enclosures, co-housed with similar animals, or in foster homes, a means of identification should be physically affixed (e.g. collar and tag) or permanently inserted (microchip), when it is safe to do so.

Shelter records should capture all pertinent medical and behavioral information (Table 1.1.) Records must be maintained for animals in foster care and other off-site housing locations just as they are for shelter-housed animals.

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2. Population Management

2.1 General

Shelters must practice active population management, which is the process of intentionally and efficiently planning services for each animal in the shelter's care. Individual animals are managed in consideration of the shelter's ability to care for that animal and their entire population in a manner consistent with the guidelines outlined in this document. Population management includes pre-intake planning, protocols for care and services, ongoing daily evaluation, outcome planning, and response to changing conditions of the shelter and the animal.¹

Every organization has limits to its ability to provide care. Limits include financial and physical resources, personnel hours and skills, housing and operations space, and the opportunity for live outcomes. These limitations define the number and type of animals for which an organization can provide humane care, also known as the organization's *capacity for care*. The concept of capacity for care is not unique to animal sheltering and is recognized in veterinary hospitals, other animal care fields, human healthcare, hospitality, and other industries.^{2,3}

Operating beyond an organization's capacity for care is an unacceptable practice. When shelter populations tax the organization's ability to provide care for their animals, living conditions worsen, and population health and well-being are compromised.^{4,5} Delays in recognizing problems and providing services negatively impact animal welfare and prolong the length of stay (LOS) for animals in shelters. Alternatively, working to maintain the population within the shelter's capacity for care has been linked to decreased LOS, decreased disease and euthanasia rates, and increased live outcomes.^{6,7} Policies and protocols must be in place to ensure an organization operates within its capacity for care.

2.2 Determining capacity for care

The most visible factor in determining the shelter's capacity for care is housing capacity, or the number of available humane housing units. Housing units include in-shelter enclosures as well as foster homes and off-site housing. Housing capacity calculations must be based on the ability to promote each animal's positive welfare. Housing units that are too small or otherwise inappropriate cannot be included (see [Facilities](#)). The number of humane housing units available may exceed an organization's capacity for care, since the organization's capacity is also determined by shelter personnel, resources, and available outcomes.

The time and skills of shelter personnel is another critical component of a shelter's capacity for care. Trained personnel must be scheduled to meet daily animal care

needs and efficiently and effectively accomplish each critical task. A standard estimate such as 15 minutes per animal per day⁸ may roughly calculate the time needed for cleaning and feeding in some facilities, but it does not account for variations in housing designs and sanitation protocols, the time needed for training personnel, and the provision of enrichment and additional care.⁹ Personnel time needed for essential care tasks such as sanitation, feeding, and enrichment is best estimated using direct observation to calculate the average time per task. These estimates, when multiplied by the number of animals in care, can guide staffing levels and schedules. Direct observation is also useful for estimating the time needed for personnel to complete other critical tasks, such as intake, rounds, assessments, and outcome processes.

Animals with medical and behavioral challenges may need more care time per day and may also require services from personnel with advanced skills or credentials. When these services are provided by external partners, a shelter's capacity for care will also be affected by the capacity of these partners. Services such as surgery, veterinary visits, or transport should be scheduled in anticipation of an animal's eligibility for that service. Proactive scheduling can maximize the use of external partner capacity.

Foster programs must have sufficient personnel to provide support to caregivers and animals. Foster support includes tasks such as maintaining a foster caregiver database, communicating with foster caregivers, scheduling appointments, and facilitating outcomes. Medical, surgical, and behavioral services for foster animals must be provided in a manner that promotes animal welfare and minimizes LOS.

Shelter resources, including finances and material goods, are another critical factor in determining an organization's capacity for care. If a shelter cannot afford or otherwise procure supplies or necessary services for the animals in their facility, animal welfare will be compromised. There is no standard estimate for calculating cost of care per animal but using historical organizational information and comparing budgets with similar organizations can help shelters manage their available resources.

Shelters should engage with one another to leverage resources and maximize each organization's strengths. Thoughtful partnerships avoid redundancy and increase the community's capacity to help animals. For example, a small organization with limited medical resources can partner with a larger organization with a full-service hospital, or a brick-and-mortar organization can partner with a foster-based organization to house animals with kennel-induced stress. In addition to partnering with other animal welfare organizations, collaborating with

human service professionals, such as social workers, housing advocates, and home care providers, can support pet retention and prevent relinquishment.

2.3 Operating within capacity for care

Shelters experience a high demand for their services. Working within their capacity for care maximizes each shelter's impact through thoughtful planning and efficient decision-making. An organization's policies for admissions and outcomes should be based on their mandate, mission, and the needs of their community. When organizations find that they are frequently near or over their capacity for care, strategic planning can be a valuable process to address how a shelter's capacity for care and their community's needs can better align (see [Management and Record Keeping](#)).

2.3.1 Admission planning

When appropriate, admission policies should prioritize retention over shelter intake. Helping pets stay with their owner or caregiver preserves the human-animal bond, eliminates the stress of shelter admission, and addresses discriminatory admissions practices.¹⁰ Owners may be able to keep their pet if given access to services, supplies, or information.¹¹

Decisions about intake must consider whether admission is the best option for the animal or their situation. Gathering and providing information prior to admission can support intake diversion. For example, finders can be provided information about neonatal kitten care, so that they can rear kittens in their home until they are old enough to be adopted.

Admission must be balanced with the ability to provide appropriate outcomes, minimize LOS, and ensure the shelter remains within its capacity for care. Population management begins prior to admission: an animal must only be admitted if the shelter can provide the care they require. For welfare or safety reasons, some animals may need to be admitted so that euthanasia can be provided.

When admission is deemed the best solution for an animal, situation, and shelter, appropriate intake scheduling ensures that the shelter has the capacity to care for this animal and the animals already in care.^{12,13} Intake by appointment is recommended even for shelters with high intake demand and open admissions policies and can be used to control the flow of animals into the shelter.^{11,13,14}

Organizations that are impacted by unpredicted intakes (e.g. disasters and large-scale investigations) must have a plan to flex their operations to increase their capacity for care. Compromising the welfare of animals and personnel is not an acceptable strategy for meeting the increased care demands of unpredicted intakes. Increasing a shelter's capacity requires more than identifying additional humane housing units; all aspects of care need to flex to

match, including increased animal care personnel and hours, medical and behavioral care services and providers, resources to supply and fund the response, and a range of available outcomes.¹⁵

2.3.2 Outcome planning

Every attempt must be made to locate a lost animal's owner, including careful screening for identification and microchips, in the field and at the time of intake. Field agents and admissions personnel require ready access to lost pet data and social media in order to cross-check identifying features of animals being picked-up or brought in. Lost pets are usually found close to home and may be returned to their owner without shelter admission.^{16,17} Reunification of pets can be an opportunity to provide owners with services or information promoting identification (microchipping and ID tags), spay-neuter, training, or fence-building programs. Shelters can also support community members working to reunite animals with their owners directly.

In addition to prioritizing pet retention and reunification, shelters should remove barriers to local outcomes. Removing barriers can include:

- accessible and convenient open hours
- adoption and reclaim services in languages spoken by the community
- affordable adoption and reclaim fees
- adoption and outreach events that reach the entire community
- inclusive adoption policies

Imposing strict policies or requirements on adopters (e.g. employment status, landlord checks, home visits, and veterinary references) is discriminatory, prolongs LOS in the shelter, and prevents future adoptions.¹⁸ Strategies that support pet retention, reunification, and local adoption acknowledge the community's ability and desire to provide care for their pets.

Relocation of animals for adoption can be a valuable strategy for live outcomes while working to address population challenges and remove barriers to local outcomes (see [Animal Relocation and Transport](#)). Destination shelters need to critically consider their capacity for care before making the decision to take in transported animals. These programs are not a replacement for partnership building within the local community.

2.3.3 Length of stay

The number of animals a shelter has in its care on any given day is a product of the number of animals it admits and the length of time they stay in the shelter's care (i.e. LOS).

$$\text{Average Daily Population} = \text{Average Daily Admissions} \times \text{Average Length of Stay}$$

If two shelters take in the same number of animals each year, the shelter with the shorter average LOS will have fewer animals in care each day (Table 2.1).

Caring for fewer animals at a time allows shelters to provide better welfare and creates the capacity to provide care for animals who require longer stays.¹ Or, when it is within the shelter's capacity and mission to do so, shortening average LOS can allow the shelter to take in more animals or expand other services.

Table 2.1. Example of the relationship between length of stay and shelter population

Average admissions per day	Average length of stay (days)	Average daily population (animals)	Admissions per year (animals)
10	7	70	3,650
10	14	140	3,650
10	21	210	3,650

2.3.4 Pathway planning

LOS can be minimized through effective pathway planning. Pathway planning is a proactive process that anticipates the services and care an animal will require to achieve an appropriate outcome.¹² A pathway is selected in consideration of available housing, personnel, resources, and the likelihood of achieving the outcome while maintaining good welfare. Planning ahead prevents needless delays that add days to a shelter stay.

Policies that detail which medical and behavioral conditions a shelter can treat help personnel make swift, measured decisions when an animal's needs may be beyond their ability to provide care. Although legal holding periods and time in medical or foster care may extend the time in care, efficient planning of services can also decrease LOS for these animals.

For shelters with both an on-site and foster population, determining whether to pursue foster placement for an animal is a key part of pathway decision-making. Medical or behavioral care that can reasonably occur outside of the shelter, either in foster care or after adoption, should be identified to minimize time in the shelter environment. Regardless of whether animals are on site or in foster care, decision-making and animal movement must optimize LOS.

2.3.5 Population rounds

To ensure that each animal has a clear plan and that all needs and critical points of service are promptly met, the entire shelter population, including animals housed in foster or off-site, must be regularly assessed by knowledgeable personnel with decision-making ability and authority. The personnel involved in this assessment,

often called population or 'daily' rounds, will vary based on the shelter population and organizational structure. Population rounds work best when participants include a small group of people who represent relevant departments or teams, including intake, medical, behavior, management, daily care, and outcome personnel (individuals may represent multiple areas). Participants collectively provide and consider all aspects of each animal's pathway, needs, and next steps.

The population rounds team answers the following for each animal:

- How are you doing?
- What is your pathway?
 - Are there updates or concerns that change this pathway?
- What are your next steps?

The outcome of population rounds is a task list for each participant or team. Any needs identified during population rounds that could compromise welfare or extend the shelter stay must be addressed promptly. Although population rounds are recommended daily for most shelters, it is more important that population rounds occur frequently enough that animal care, including for those in foster, is not delayed.

Additionally, all animals physically in the shelter must be monitored daily to identify housing, care, or service needs. Monitoring these needs helps a shelter determine whether they are within or over their capacity for care. A shelter animal inventory, including all animals in foster care, should be taken and reconciled daily. This ensures that no animals are missing, data collection is accurate, and population levels are within capacity for care. This inventory can be taken during population rounds or daily monitoring.¹

2.4 Monitoring population data

Keeping track of shelter metrics and population statistics over time is a key component of successful population management. Population level statistics are available as reports from shelter software programs or can be generated manually using commonly available spreadsheet programs. At a minimum, shelters must track monthly intake and outcome type for each species by age group.¹⁹

Data collection should include information about health and behavior status at intake and outcome. Tracking this information allows shelters to understand the effects of shelter care on animal health and well-being. For example, discovering a trend where animals that are healthy at the time of intake subsequently become ill warrants investigation into the shelter's population management practices.²⁰

LOS data, broken down by age category, species, status, and location, should be regularly analyzed to identify

bottlenecks, mismatched resources, and capacity for care concerns.^{1,9} Population level data should be reviewed and analyzed regularly to ensure that operations align with the organization's goals, purpose, and policies.⁹ For example, when an organization's mandate is to admit stray, injured, or at-risk animals, redirecting healthy community cats to return-to-field services creates capacity to care for the animals that the organization is required to serve.²¹

Because local capacity to support animal welfare is maximized when organizations collaborate, population level metrics are ideally monitored as a community through transparent sharing of data. Sharing data can help communities strategically leverage resources, increase efficiency, and maximize impact for community animals and people. Organizations can share their data directly or participate in national data sharing databases such as Shelter Animals Count.²² Although useful for tracking shelter goals year over year, outcome-based metrics do not account for quality of life or animals still in the shelter's care. Live release rates or save rates must be evaluated in the context of animal welfare and cannot be used alone as a measure of success.⁹ Aversion to euthanasia is not an excuse for crowding and poor welfare.

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3. Animal Handling

3.1 General

Safe and humane handling is an essential part of supporting animal well-being. When fear and stress are minimized, animals are calmer and more willing to interact, resulting in safer and more successful interactions. Handling must be humane and appropriate for the individual animal and situation. Humane handling requires

- on-going observation and assessment of behavior with adjustments to the animal's handling plan as needed
- appropriate choice and management of environment
- sufficient number of trained personnel
- suitable equipment readily available and in good working condition

Considering how animals perceive their environment and making adjustments to minimize potential stressors can reduce or prevent negative emotional responses. These adjustments might include a slow introduction, providing a hiding option during handling (e.g. with a towel), covering a table surface to improve traction, keeping voices low, and the use of gentle but consistent touch to reduce unpredictability.^{1,2} To create a positive emotional response to human handling, shelter personnel should offer high-value treats or food when handling animals or performing procedures. Treats and toys can engage, distract, and reward animals before, during, and immediately after handling.^{3,4} When needed, medication should be used to minimize fear, anxiety, and stress and enhance safety during handling⁵⁻⁹ (see Behavior).

3.2 Restraint

Resistance to handling is almost always the result of fear or anxiety. Improper or forceful use of restraint techniques and equipment can escalate a high stress situation, increasing the likelihood of animal or human injury.¹⁰ Gentle handling with minimal restraint can improve safety and compliance during care tasks for most animals. The minimal amount of physical restraint needed to accomplish necessary animal care without injury to people or animals must be used.^{11,12}

Forceful restraint methods must not be used, except in extraordinary circumstances. Extraordinary circumstances include situations in which a human or animal is in immediate danger, and other low-stress handling options, sedation, or delays are not possible. Forceful restraint methods include scruffing cats¹² or pinning dogs to the ground. For example, a short period of forceful restraint may be required for an animal that needs to

be captured and removed from an unsafe environment. Techniques that rely on dominance theory, such as alpha rolls, are inhumane.^{5,11,13}

Alternatives to forceful restraint include distraction with food or toys, positive reinforcement, use of towels, blocking visual stimuli, sedation, and proper use of humane handling equipment (Table 3.1). Selecting a quiet environment, preparing all necessary materials in advance, and involving a person the animal has a bond with can help minimize fear, anxiety, and stress and reduce the restraint required.^{14,15} If repeated handling is required, training the animal to allow common tasks or to cooperate with handling equipment such as the use of a muzzle is a valuable strategy. Use of sedatives or behavior medications can be the most humane and effective option for frightened, fractious, or feral animals for the delivery of necessary care.¹

Handling must minimize the risk of escape. Attention to security of enclosures and carriers, building and vehicle exit points, and minimizing fearful stimuli that trigger flight behavior are important during daily care and when moving animals inside and outside the facility. Being recaptured after escape is profoundly stressful for many animals and creates additional risk of injury to the animal and personnel.⁴ Delaying handling to allow the animal to calm down can minimize stress and reduce the risk of escape.

3.3 Handling equipment

Using humane handling equipment minimizes animal stress during necessary procedures and daily care, prevents escape, and promotes animal and human safety. For example, rather than carrying a cat in their arms,

Table 3.1. Humane handling equipment by species

Equipment	Dogs	Cats
Live trap	✓	✓
Trap divider	✓	✓
Transport carrier and cat den	✓	✓
Towel/blanket	✓	✓
Rolling transport kennel	✓	○
Capture net (e.g. floor net and cat nabber)	○	○
Squeeze cage	✓	✓
Purpose designed protective gloves	✓	✓
Flexible snare	○	✗
Muzzle	✓	○
Press gate/panel/cage shield	✓	✓
Vision blocking device (e.g. calming cap and e-collar)	✓	○
Syringe pole	✓	✓
Control pole (catch or rabies pole)	○	✗

Legend: ✓=recommended; ○=situational use; ✗=inappropriate

personnel can transport cats through the shelter in carriers. A variety of humane equipment that facilitates animal handling with minimal or no hands-on contact must be available (Table 3.1). Handling equipment also has the potential to increase fear or injury if used in a forceful manner or not maintained in good working order.

Control poles (i.e. catch poles or rabies poles) are designed to keep a dog's head at a safe distance from a handler. They are not meant to lift, push, or pull a dog and are not appropriate for routine use. Control poles must only be used when alternatives for handling dogs are insufficient to protect human safety. To prevent the need for daily removal of dogs that are not deemed safe to walk on a leash, double compartment housing is recommended.

Because control poles can cause significant injury and even death, it is unacceptable to use control poles on cats or small dogs. Any restraint method, including control poles, cat tongs, or slip-leads, that causes significant compression of the neck or thorax can cause substantial or life-threatening injury and profound emotional trauma in cats.^{4,12,16}

Animals for whom handling equipment is necessary for long-term safe handling should receive positive reinforcement training to minimize fear, anxiety, and distress during its use.¹¹

Aggressive behavior between dogs can occur unexpectedly for a variety of reasons, and humans can be severely injured when trying to intervene. Animal shelters must have written protocols and readily accessible equipment for breaking up dog fights to prevent human and animal injury. Equipment may include air horns, whistles, citronella spray, blankets, break sticks, panels, and water hoses^{17,18} (see [Behavior](#)).

3.4 Handling feral cats

Specific handling procedures are necessary for feral cats, including the use of live traps, cat dens, squeeze cages, trap dividers, purposely designed cage nets, and multi-compartment enclosures.^{16,19-21} This equipment permits personnel to safely sedate or anesthetize extremely fearful cats with injectable medication, to provide food and sanitation, to transfer cats from one enclosure to another, and to release outside, all without hands-on handling.

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4. Facilities

4.1 General

The facility plays a critical role in the care provided to animals who are admitted into animal shelters. While community-centered sheltering practices and foster programs are reducing the demand for in-shelter care in some areas, providing housing for animals remains an essential part of sheltering operations. Thoughtful planning and use of the shelter building and grounds are important parts of supporting the physical and emotional health of shelter populations while meeting the organization's mission and goals.¹ The shelter facility must include sufficient space to allow for the execution of essential shelter operations and programs as required by mission or mandate.

The quality and set-up of animal housing impacts every aspect of their experience within the facility and plays a pivotal role in managing disease.² Poor housing is one of the greatest shortcomings observed in shelters and has a substantially negative impact on both health and well-being. Both the quantity and design of housing must be appropriate for the species, the number of animals receiving care, and the expected length of stay. Facility design and use must provide for proper separation of animals by species, predator/prey status, health status, and behavior. Housing in foster care should meet or exceed the guidelines for in-shelter housing.

4.2 Primary enclosures

A primary enclosure is an area of confinement such as a cage, kennel, or housing unit where an animal spends the majority of their time. Shelters must have a variety of housing units available to meet the individual needs of animals, including physical, behavioral, and medical needs. These needs will vary based on species, life stage, individual animal personality, prior socialization, and past experience.¹ Appropriate primary enclosures provide complexity and allow choice within the environment to help support positive welfare³ (see [Behavior](#)).

The primary enclosure must be structurally sound and maintained in safe, working condition to prevent injury and escape. There can be no sharp edges, gaps, or other defects that could cause injury or trap a limb or other body part. Primary enclosures with wire-mesh bottoms or slatted floors are unacceptable because they can cause pain, discomfort, and injury. Enclosure sides that are entirely wire or chain-link increase the risk of disease transmission, animal stress, and injury. Solid barriers are recommended where animal contact can occur.

The use of cages or crates intended for short-term, temporary confinement or travel is also unacceptable as primary enclosures. These include airline crates, transport carriers,

live traps, and wire crates. It is unacceptable to stack or arrange enclosures in a manner that increases animal stress and discomfort, compromises ventilation, or allows for waste material contamination between housing units.

4.2.1 Individual primary enclosure size

Animals must be able to make normal postural adjustments within their primary enclosure, including standing and walking several steps, sitting normally, laying down at full body length, and holding the tail completely erect.^{1,3-6} Primary enclosure size significantly impacts overall health and well-being. Larger enclosures generally provide animals more choice, permit additional enrichment, and make it possible to safely interact with people and other animals for socialization or cohousing. In cats, sufficiently sized housing reduces stress and respiratory disease incidence.^{7,8} Individual adult cat housing that is less than 8 ft² (0.75 m²) of floor space is unacceptable.⁸ Ideally, individual cat housing provides 11 ft² (1.0 m²) or more of floor space.⁷ For dogs, the minimum recommended kennel dimensions differ widely based on body size.⁹

The primary enclosure must allow animals to sit, sleep, and eat away from areas of their enclosures where they defecate and urinate.⁸ Housing with two or more appropriately sized compartments provides this separation and gives animals more choice and control over their environment and interactions. It also facilitates spot cleaning, reduces fomite transmission, and increases personnel safety^{3,5} (see [Sanitation](#)). Because of all these benefits, multi-compartment enclosures should be provided for the majority of animals housed in the shelter.

Multi-compartment housing is particularly important for newly admitted, fractious, quarantined, sick, and juvenile animals. Enriched room-sized primary enclosures (i.e. real-life rooms) may also benefit from separate elimination areas. Single compartment housing may be necessary for animals with specific medical conditions, which increases the importance of enhanced in-kennel enrichment and supervised out of kennel time (see [Behavior](#)).

Cats prefer spending time on raised surfaces and high structures rather than being on the floor.^{10,11} Cat housing units should be elevated off the floor. Housing cats at human eye level reduces stress, facilitates positive interactions with personnel and visitors, and improves ease of monitoring.^{5,6,12} Cat cages should face away from each other or be spaced more than 4 ft (1.2 m) apart to prevent droplet transmission of respiratory pathogens while sneezing, coughing, or vocalizing.¹³⁻¹⁵

Primary enclosures with indoor-outdoor access are ideal for most animals, especially when held long term. Some shelters in temperate climates may have primary enclosures that are fully outdoors. Enclosures that include outdoor

space must protect animals from adverse weather; provide choice for thermoregulation; protect from predators; and prevent escape, theft, or harassment. It is recommended that all enclosed outdoor spaces have double-door entry points to keep animals safe and reduce the risk of escape.

4.2.2 Primary enclosure set-up

In addition to the size and structural layout, the set-up of the enclosure and care items provided are important in meeting the welfare needs of shelter animals (Figures 4.1 & 4.2).¹ The enclosure needs to be large enough to accommodate the necessary set-up without impeding the animal's ability to move or stretch.

All dogs should be given the opportunity to hide within their enclosure, especially young, small, fearful, and anxious animals. Options for canine hiding areas include a covered crate within the enclosure or a visual barrier over part of the kennel front.

A soft resting place that elevates animals off of the floor should be made available for all animals to ensure comfort, keep animals dry, and support thermoregulation.

All cats must be given the opportunity to hide within their enclosure. A hiding place provides the choice to be seen or not seen and a place to feel safe and protected.^{11,16} Options for feline hiding places include feral cat dens, perches covered with towels, cardboard boxes, and partial

coverings over enclosure doors. Cats with hiding places spend less time trying to hide and are more likely to approach adopters.^{17,18}

To ensure that cats can display natural behaviors, feline primary enclosures must allow scratching, climbing, and perching. Cats must have a litter box large enough to comfortably accommodate their entire body and allow for proper posturing.^{19,20} Litter boxes that are too small impact welfare and potentially lead to house soiling behavior.²⁰

4.2.3 Additional considerations

Appropriately sized, enriched primary enclosures are critical for all animals regardless of their length of stay in the shelter. Housing that provides animals with additional space, enrichment, and choice within their enclosure must be provided for animals remaining in the shelter long-term (i.e. more than 2 weeks). Foster care, while beneficial for many animals, can be particularly valuable when animals require a longer length of stay, such as protracted legal holds or long-term medical care.

Animals for whom handling poses an acute welfare or safety risk need to be housed in enclosures that allow humane, touch-free daily care (i.e. multi-compartment). It is unacceptable to house animals in an enclosure that would require the use of forceful animal handling equipment for daily cleaning and care (see *Animal Handling*).

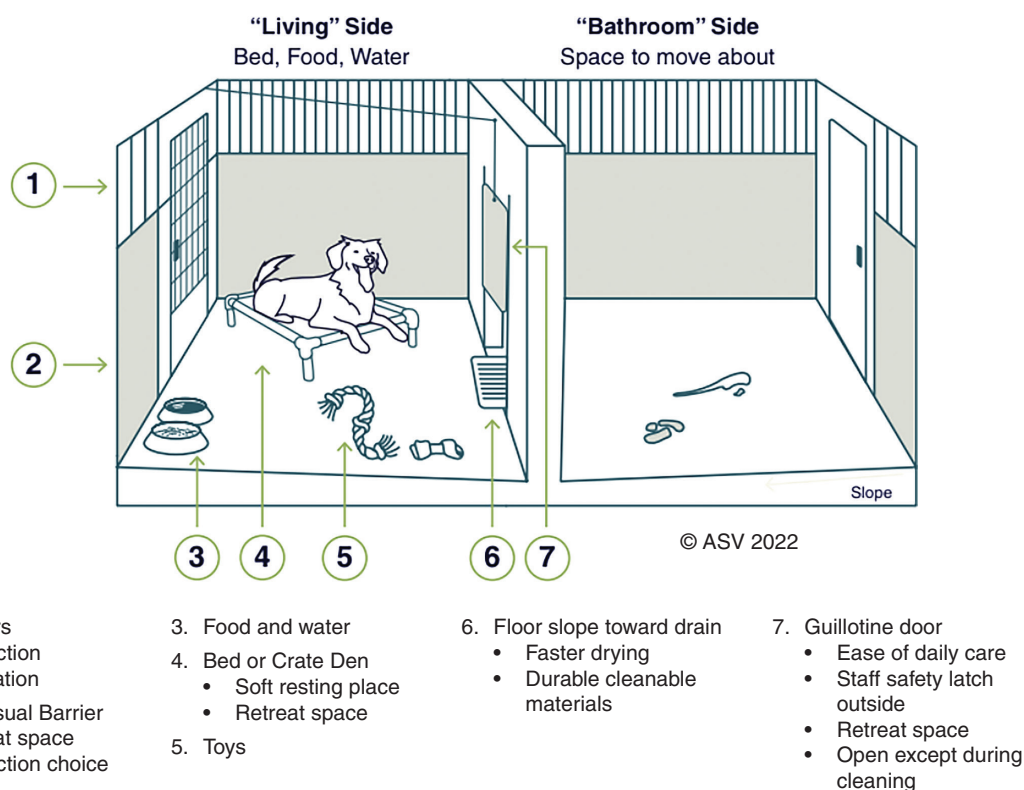


Figure 4.1. Canine primary enclosure set-up

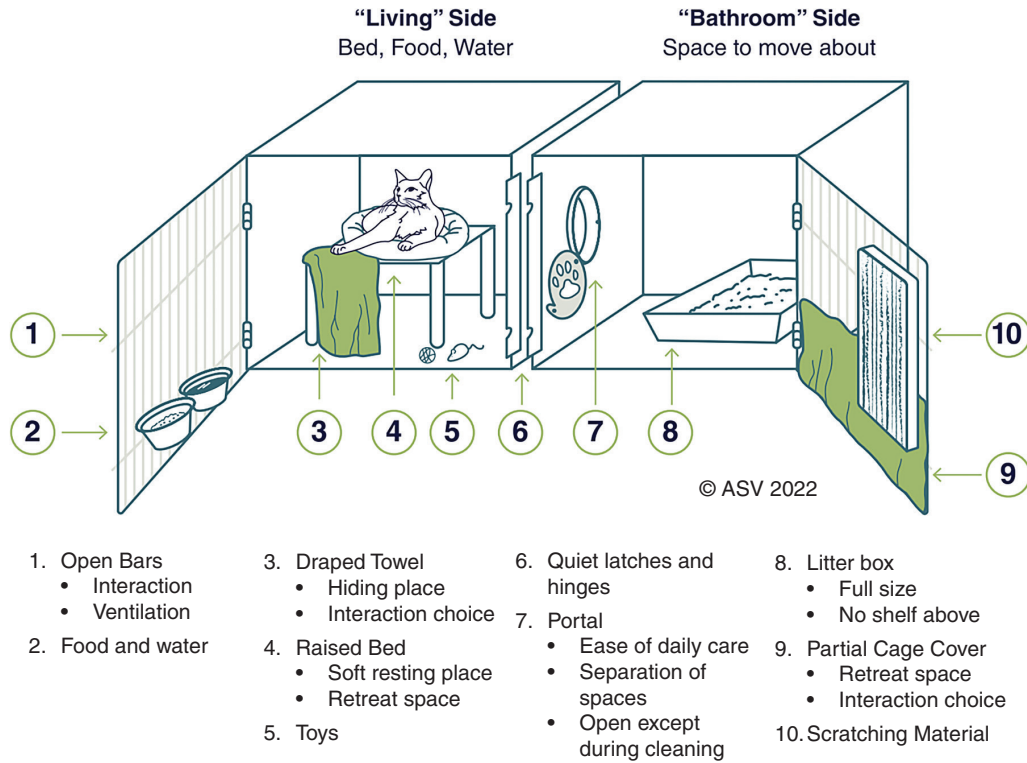


Figure 4.2. Feline primary enclosure set-up

Except for a brief, emergency situation, it is unacceptable to house animals in facility spaces not intended for animal housing (e.g. bathrooms and hallways). Shelters may have multiuse spaces such as offices set up for animal housing; these planned spaces differ from unplanned practices such as placing temporary kennels in areas unequipped for sanitation or delivery of care.

Tethering is an unacceptable method of confinement for any animal.²¹ Tethering can cause significant stress and frustration and is best avoided even when used briefly during the cleaning of primary enclosures. Multi-compartment enclosures, thoughtful timing of walks and playgroups, or the use of securely enclosed exercise areas are good alternatives to tethering.

4.3 Cohousing

Cohousing, or keeping more than one animal in an enclosure, can improve animal welfare in some circumstances by facilitating social contact with other animals of the same species.^{22–29} However, cohousing also known as group housing, is not suitable for every situation. Mental and physical benefits of cohousing need to be carefully weighed against risks to health and safety. If shelters are cohousing animals, they need to prioritize animal well-being and keep population levels within their capacity for care.

4.3.1 Cohousing enclosure set-up

The size and set-up of enclosures used for cohousing require special considerations. The size of a primary enclosure for cohousing must allow each animal to express a variety of normal behaviors and maintain distance from roommates when they choose to do so. Meeting these needs often requires more space per animal than required for individual enclosures, particularly when unfamiliar animals are cohoused. The optimal space requirements for cohousing vary based on species, as well as size, activity level, and behavior.²⁷ A minimum of 18 ft² (1.7 m²) of floor space per adult cat should be provided for cohousing.⁴

Quality and complexity of cohousing environments is essential to support the welfare of all animals living in the enclosure.^{26,30,31} Appropriate resources (e.g. food, water, bedding, litter boxes, and toys) must be provided to minimize competition or resource guarding and ensure access by all cohoused animals. Functional space can be maximized by spacing resources out throughout the enclosure. For cohoused cats, a variety of elevated resting perches and hiding places must be provided to increase complexity and choice within the living space.^{22,32–36} The ability to choose resting places, social interactions, elimination spaces, and toys contributes to behavioral stability within groups.

Cohousing areas may require enhanced measures to prevent escape. Double door entry at the enclosure's

entrance can provide additional protection when entering or exiting. When housed in a retrofitted area, cats may be able to dislodge ceiling panels or duct covers unless care is taken to secure them.³⁷

4.3.2 Selecting animals for cohousing

Random cohousing of animals in shelters is an unacceptable practice.²⁵ Cohousing requires careful selection of animals by trained personnel to balance the benefits and risks for individual animals and the group. Unrelated or unfamiliar animals must not be cohoused until health and behavior are assessed.²⁷

When cohoused, animals need to be intentionally matched for age, sex, health, and behavioral compatibility. Monitoring after introduction is essential to recognize signs of stress or negative interactions (e.g. guarding food or other resources) that may necessitate separation. Given their increased welfare needs, animals predicted to have longer lengths of stay may benefit most from cohousing, particularly when foster care is not available.

Regardless of the size of the enclosure, no more than six adult cats should be cohoused in a primary enclosure.⁵ When cohousing is indicated, pairs are preferred for dogs to maximize safety and biosecurity, and no more than two to four adult dogs should be cohoused in a primary enclosure.³ Larger groups of any species are challenging to monitor and increase the risk of conflict and infectious disease transmission. It is preferable to cohause the minimum number of adult animals together needed to achieve a social benefit.

Housing young puppies and kittens with their mother and littermates is important for physical and emotional development, as well as the establishment of species-specific behaviors. Because of their susceptibility to infectious disease, puppies and kittens under 20 weeks of age must not be cohoused with unfamiliar animals except when the benefits outweigh the risks for all animals involved.³⁸ For example, after a careful medical and behavioral assessment, a single orphaned kitten or puppy may be paired with another orphan or a surrogate mother (see [Behavior](#)).

Introducing new animals can result in stress for individuals and the group. Dogs should be introduced outside of their primary enclosures in pairs or groups to determine compatibility prior to cohousing.^{3,27} In addition, turnover within groups must be minimized to reduce stress and social conflicts as well as the risk of infectious disease exposure and transmission.^{22,39,40}

The use of smaller enclosures with fewer animals, rather than large rooms with large groups of animals, minimizes the need for frequent introductions, group reorganization, and allows for more effective monitoring.^{41,42} Smaller cohousing spaces facilitate an ‘all-in/all-out’ approach,

where all animals leave before more are added. This strategy allows enclosures to be completely sanitized before a new group of animals moves in and eliminates the risks associated with new introductions.

4.3.3 Monitoring cohoused animals

Individual animals and group dynamics must be monitored to recognize signs of stress and social conflicts in cohousing enclosures.^{24,43} Monitoring, especially after a new animal is introduced into a group and during feeding time, is critical to ensure that all animals are benefitting. In addition to daily monitoring for resource guarding and other signs of social conflict, regular physical examinations including measurement of body weight can ensure that cohoused animals are not suffering due to unrecognized social conflicts.

Not all animals are well suited to cohousing. Individual enriched housing must be provided for animals who are fearful or behave aggressively toward other animals, are stressed by the presence of other animals, require individual monitoring, or are ill and require treatment that cannot be provided in cohousing.^{22,41} Cohousing animals who fight with one another is unacceptable.

4.4 Isolation housing

Shelters must have a means of isolating infectious animals from the general population to prevent the spread of infectious disease. Isolation housing must meet the medical and behavioral needs of ill animals, including being of sufficient size with appropriate set-up. Different species must not be housed within the same isolation room.¹

Separate isolation areas must be provided for animals with different highly contagious diseases to prevent coinfections with multiple pathogens. For example, dogs with parvovirus infection need to be separated from those with infectious respiratory disease. This separation is more readily accomplished in flexible-use rooms with a smaller number of enclosures. Animals that already have coinfections (e.g. ringworm and upper respiratory infection) will need veterinary input to determine the most appropriate isolation housing.

To avoid exposure of healthy animals to sick animals, isolation rooms must be designed so that they do not open directly into another animal housing area. A corridor or vestibule can be used to access isolation rooms and also serve as a space to put on and remove personal protective equipment (PPE). Isolation rooms should have access to a sink for handwashing and be set up with space for treatments, examinations, and storage for dedicated supplies.

Isolation rooms must be clearly labeled to indicate current use and necessary precautions. Human and animal traffic through isolation spaces should be limited¹ (see [Medical Health](#)). Limiting foot traffic reduces the risk

of spreading infection to others outside of isolation and reduces stress for ill animals during recovery. Ideally, isolation rooms are designed with windows to allow observation of animals from a corridor without needing to repeatedly enter the room.¹

When no isolation options exist, makeshift separation can be accomplished by housing contagious dogs at least 25 ft (7.6 m) from unaffected dog enclosures and covering enclosure doors.⁴⁴ Contagious ill cats may be separated from others in their individual enclosures in a general ward if they can be cared for without fomite transmission to other cats. These options will not be as effective at reducing transmission as isolation.

4.5 Surfaces and drainage

Primary enclosures and all animal areas must be able to be fully sanitized and withstand repeated cleanings. Nonporous surfaces are important in cages and kennels, as well as high traffic areas such as walkways or play rooms. A sealed, impermeable surface, such as resinous epoxy or resinous urethane, is recommended for shelter flooring and should be considered for new facilities. Linoleum or tiles may be acceptable flooring in low-risk areas. However, these materials are less durable, more challenging to sanitize due to seams and grout lines, and may harbor infectious pathogens in areas that are damaged or worn. Regardless of flooring type, points where walls meet floors should be sealed to prevent water intrusion and the accumulation of organic matter and pathogens.

Drainage systems must be designed to prevent standing water and cross-contamination of waste between housing units. Many design options exist. To aid in this effort, floors should be gently sloped to enable waste and water to run into the drains, particularly in animal housing areas. Drain covers must be designed to prevent injury or escape and should be easily removable for routine cleaning. Similarly, outdoor primary enclosures or portions of primary enclosures that are outdoors must have nonporous, durable floors that allow for sanitation and proper drainage.

4.6 Heating, ventilation, and air quality

It is essential that housing areas allow each animal to comfortably maintain normal body temperature.^{9,45} To ensure humane and comfortable conditions, environmental temperature must be maintained between 64°F (18°C) and 80°F (26.6°C).^{38,45} Breed, body condition, medical health, haircoat, facial conformation, and age impact an animal's ability to regulate their body temperature.

Animals must be monitored individually to ensure the environmental temperature is comfortable, and necessary measures must be taken if an animal appears too cold or too hot. If an animal cannot be kept comfortable with adjustments to the thermostat and airflow, additional

measures need to be taken. These might include provision of additional bedding if too cold, providing frozen treats or ice if too hot, or relocating the animal. The relative humidity should be maintained between 30 and 70%.⁴⁷⁻⁴⁹

Proper ventilation removes heat, dampness, odor, airborne microbes, and pollutant gasses such as ammonia and carbon dioxide while allowing for the introduction of fresh, oxygenated air. Fresh air is essential for the well-being of shelter animals and personnel, as well as for limiting the spread of infectious disease.⁵⁰ Ventilation must be maintained at a high enough rate to ensure adequate air quality in all areas of the shelter including in the primary enclosure. Ventilation rates may need to be adjusted seasonally, especially if air movement occurs primarily through active heating or cooling.

Ventilation must not compromise recommended ambient temperatures.³⁸ The standard recommendation for ventilation of animal facilities is between 10 and 20 room air exchanges per hour with fresh air.^{38,51-53} Ventilation requirements vary depending on population density and presence of pollutants in the air. A facility may require a higher ventilation rate when it is at full capacity compared to when it is relatively empty, as animals themselves are a major source of heat, humidity, and carbon dioxide. All ventilation systems must be regularly maintained based on manufacturer recommendations. Carbon dioxide monitors may be useful in monitoring the success of ventilation equipment and use.

To improve ventilation, barred enclosure doors are recommended over plexiglass doors or fully enclosed units. When housing units are fully enclosed, they require individual-unit mechanical ventilation. Barred doors improve air flow and also allow for adopter interaction and behavior training.

Because canine respiratory pathogens can be easily transmitted through the air, air from isolation areas should be exhausted outside and not recirculated. Separate air exchanges for feline isolation areas are a lower priority since cats do not readily transmit pathogens through the air.^{14,15}

Air purification technologies, such as ultraviolet germicidal irradiation (UVGI), may act as an adjunct to a traditional HVAC system to improve indoor air quality. However, ultraviolet irradiation must not be relied on as the sole method for ensuring good air quality or infectious disease prevention.⁵⁴⁻⁶² Although attention to ventilation and air quality is important, it will not overcome the harmful effects of inadequate housing, poor sanitation, or lax population management.

4.7 Noise control

Noise must be minimized in animal housing areas. Cat and dog hearing is sensitive, and noise levels that are

uncomfortable for humans are likely to be very uncomfortable for animals (see *Behavior*). Noise and vibration-producing equipment and mechanical systems should be located as far away from animal housing as possible.⁶³

Even reasonable volumes may be stressful for shelter animals, particularly if sounds are sudden or unpredictable such as the slamming of cage doors or tossing of metal bowls.^{64,65} Prevention and mitigation strategies to minimize the impact of noise should be implemented in facility design, added to existing facilities, and incorporated into shelter operations. These strategies can include arrangement of cages; material selection for cages, doors, and latches; and decisions about where to house individual animals.

Barking can be a significant source of shelter noise. Appropriate facility design, environmental management, enrichment strategies, and behavior modification can dramatically reduce noise levels related to barking.^{66–68} Because the causes and solutions to barking are multifactorial, preventing visual contact between dogs should not be used as a sole strategy to reduce barking.^{69,70}

4.8 Lighting

Lighting should promote a safe working environment and effective observation of animals and the enclosure. Facilities should be designed to offer as much natural light as possible. Exposure to sunlight in a manner that maintains daily circadian rhythms improves health and well-being for animals and for shelter personnel.⁷¹ When natural lighting is not available and artificial light is used, it should approximate natural light in duration and intensity to support circadian rhythms.⁷² If it is necessary to keep lights on after dark for safety or by regulation, a fixture that emits red-orange light is preferred. Because of the way dog and cat eyes function, a red light creates a darker space for animals at night, allowing them to sleep more normally.⁷¹

4.9 Enrichment spaces

Dedicated indoor or outdoor enrichment, exercise, and training spaces allow shelters to safely provide opportunities that improve welfare for animals. These spaces need to be clearly marked, prevent escape, provide protection from the elements, and limit exposure to disease and parasites. All enclosed outdoor spaces should have double door entry points to keep animals safe and reduce the risk of escape.

4.10 Intake spaces

Designed appropriately, shelter lobbies provide a welcoming environment for clients and help reduce animal stress. Shelter admission areas should be separated from adoptions and other client-facing areas.⁵¹ If a different space is not available, placing a divider within the lobby

or scheduling intake appointments outside of adoption hours can functionally separate admissions from adoptions.

Animal well-being during the admission process is supported by creating separate species areas within the lobby and intake examination space.^{6,8,51,71} To allow for safe and efficient processes, animal intake should occur in a designated quiet space away from the main pattern of foot traffic.⁷³ Cages and kennels in intake areas should only hold animals until their initial intake assessment has been completed.^{6,8} Intake rooms should have elevated surfaces to place animals in carriers off of floor level.^{8,10,74}

4.11 Drop boxes

The use of ‘drop boxes’ where live animals are placed in unmonitored receptacles for later intake is unacceptable. This practice can result in safety risks for humans and animals, animal suffering, infectious disease exposure, or death. Alternatives for community animals requiring after hours emergency care include posting on-call phone numbers for animal services, creating drop-off arrangements with police departments, or creating care agreements with local veterinary emergency clinics.

4.12 Facility design and planning

Well-designed shelter facilities support the well-being of animals and personnel and allow smooth and efficient operations. In order to meet the changing needs of the community and services offered by the shelter, flexibility in operational and spatial use should be incorporated into designs for remodeling and new facilities. Areas that can be readily adapted for multiple purposes over time can reduce the need for future renovations. When designing a new facility or undertaking a significant renovation, shelters should consult with a shelter veterinarian and an architect experienced in shelter design.

Shelters must avoid large warehouse type rooms when designing housing. Instead, multiple smaller rooms with fewer primary enclosures per area are strongly preferred.⁷⁵ Small wards reduce noise, limit disease exposure and transmission, provide flexibility in meeting individual animal needs, and permit close monitoring of individual animals.

When remodeling or planning a new facility, the movement of animals, people, and supplies should be incorporated into the design. For example, placing housing for difficult to handle dogs close to the facility entry point will improve personnel and animal safety. Animal shelter design should provide an environment that also serves the needs of personnel and clients. Areas for training, work breaks, meetings, and private discussions support personnel well-being, client–staff interactions, and client–animal interactions.

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5. Sanitation

5.1 General

Maintaining a sanitary environment is an integral part of supporting health and welfare and minimizing the risk of infectious disease. Whether or not infectious disease occurs is dependent on the interaction of several factors: the animal (e.g. species, age, and immunity), the pathogen (e.g. infectious dose and ability to survive outside of the body), and the environment (e.g. temperature, housing, and amount of pathogens present), and how each of these factors are managed¹ (Fig. 5.1).

Through cleaning and the proper use of disinfectants, the number of pathogens in the environment is reduced, decreasing the likelihood of spread.² A clean shelter increases the comfort level of the animals and personnel, and presents a positive image of the shelter to the public.^{3,4} Protocols for proper sanitation are essential for any sheltering program.

5.2 Definitions

Cleaning is defined as the manual removal of urine, fecal matter, food waste, hair, bodily fluids, and other debris from the environment.^{2,4,5} Oils and grime found on surfaces, especially soiled, porous, or rough surfaces, can interfere with the ability to kill pathogens⁶ (see Appendix E). Detergents and degreasers break down oil and grime with soap-like action and can remove up to 90% of environmental pathogens.^{3,7-9}

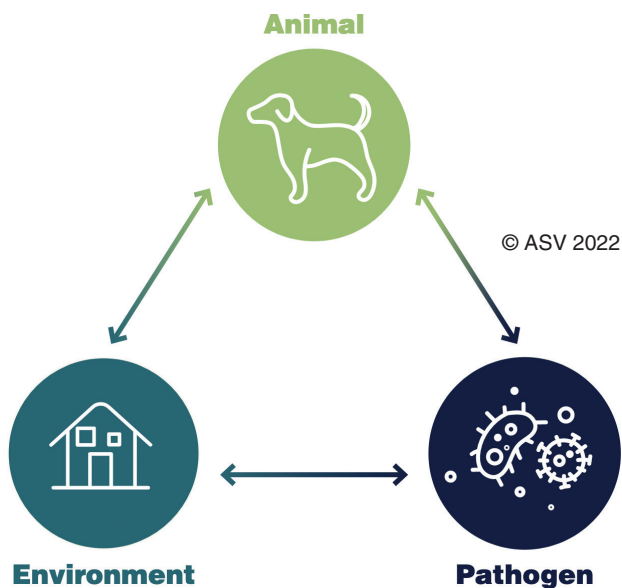


Figure 5.1. Factors impacting disease transmission in the shelter.

Disinfection, typically by the application of a chemical product to a clean surface for a specific time period, is the process of killing most of the remaining pathogens.⁹ Sanitation refers to the combination of cleaning and disinfection. Cleaning and disinfection are separate steps, even when using a detergent-disinfectant combination product that is labeled for both purposes.²

Sterilization is the destruction of all pathogens (e.g. viruses, bacteria, and fungi), including spores, and is generally reserved for surgical instruments and other equipment necessary for sterile procedures.⁹ True sterilization of cage and kennel surfaces does not occur.

5.3 Sanitation practices

Shelters must have a sanitation plan for all locations in which animals are present, including enclosures, common-use areas, foster homes, and outdoor spaces. Sanitation protocols are used to describe which areas to sanitize, which products to use, and how to use them.⁴

Sanitation protocols should be based on pathogens, routes, and risk of transmission. Sanitation protocols must include steps for removal of organic matter, cleaning, and disinfection.⁴ Ideally, sanitation protocols will be developed in consultation with a veterinarian experienced in shelter medicine.⁴ Those making decisions about sanitation protocols need to be familiar with the active ingredients of common disinfectants, target pathogens, and potential routes of transmission. An increasing number of resources provide guidelines tailored to the shelter environment.^{6,10,11}

Sanitation products must be diluted and used according to label instructions or published recommendations. Solutions that are too weak may be ineffective, and those that are too strong may be harmful to animals and people.^{4,9} Some disinfectants such as quaternary ammonium products and bleach can be harmful when animals contact or ingest them, even at recommended dilutions, so removing the residue is an essential step.^{3,4}

Disinfectants used in animal areas must be effective against non-enveloped viruses, such as parvovirus, panleukopenia, and calicivirus. Several studies have found that quaternary ammonium-based products, which are commonly used in shelters and veterinary clinics, do not eliminate non-enveloped viruses in spite of label claims.¹²⁻¹⁵ Other products, such as accelerated hydrogen peroxide, potassium peroxydisulfate, and bleach products, are effective against non-enveloped pathogens and dermatophytes at the appropriate concentration and contact time.^{2,12-15}

Adequate sanitation cannot be accomplished by using water alone, by spraying and quickly wiping off a

disinfectant, or by using a disinfectant with no detergent properties (i.e. bleach) without cleaning first.^{2,4} Alternative methods of disinfection such as ultraviolet light, steam, freezing, and air filtration systems must not be relied on as the sole means of sanitation in shelters.^{9,16-24}

Sufficient personnel must be assigned to complete sanitation tasks promptly each day so that animals spend most of their time in sanitary conditions. Industry guidelines recommend a minimum of 9 min per animal per day for routine cleaning of enclosures.²⁵ The actual time needed to accomplish daily sanitation will vary based on population, housing size and type, specific products and protocols, and facility use. Calculating how long proper sanitation typically takes per housing unit can provide better estimates of sanitation staffing needs in individual shelters (see [Population Management](#)).

Sanitation should proceed in an order that minimizes both the risk of pathogen transmission from infected animals and the exposure of vulnerable animals. In general, the recommended order of cleaning and care, from first to last, is:

- healthy puppies and kittens
- healthy adult animals
- unhealthy animals³

This order of cleaning may be customized to include specific animals or subpopulations (e.g. different infectious diseases and immune-compromised animals) based on the specific needs of the shelter, population, and protocols.^{5,26}

Sanitation practices should be observed regularly to ensure consistency with written protocols. Observation of sanitation practices provides an opportunity to identify and correct deviations from the protocols.³ It is important to ensure that contact times are observed, supplies are readily available, and equipment is adequate for the job.

Pathogen risks in a shelter can change over time, and shelters may need to alter sanitation protocols when disease rates increase or a more difficult to kill pathogen is identified. During an outbreak, protocols should be reviewed and practices observed to ensure efficacy against suspected pathogens.^{11,27} Pathogens can be spread inadvertently when protocols are improper or practices are not in line with protocols. Common mistakes include incorrect choice of disinfectant, under or over-dilution, not observing contact times, etc.^{28,29}

5.3.1 Sanitizing primary enclosures

Sanitizing primary enclosures is critical to ensure health and comfort. Enclosures must be completely sanitized before being occupied by a different animal.⁴ This process, also known as deep cleaning, is important even if an animal has only occupied a primary enclosure for a short period of time, the enclosure is not visibly soiled, or the

animal appears healthy. Animals are capable of shedding pathogens without showing signs of illness.³⁰ Sanitation is indicated when enclosures are heavily soiled, an infectious disease is diagnosed and on a regular schedule based on use. Table 5.1 shows basic steps and indications for sanitation of primary enclosures.

Sanitation methods significantly impact animal health and welfare. Splattering or soaking animals when spraying water, cleaning, or disinfection products can cause significant distress. It is unacceptable to spray primary enclosures while animals are inside them.^{3,4,31} Animals need to be removed from nearby housing compartments when overspray is likely.

Adequate drainage is essential for animal housing areas regularly hosed or sprayed with cleaning fluids.^{32,33} Drainage systems or operational practices (e.g. squeegee and towel drying) must prevent the accumulation of standing water. Dry surfaces are required before animal use because they promote animal comfort and drying aids in the inactivation of pathogens.

Ideally, mopping is avoided in animal housing areas. Mops may harbor pathogens, allowing them to be deposited in other locations.⁴ However, mopping may be necessary when sanitizing animal enclosures and ward hallways that do not have drains. When mopping cannot be avoided, personnel must ensure that both cleaning and disinfection of the floor surface occur. Mop heads require disposal or sanitation and drying between uses, including between cleaning and disinfection products and between housing areas.

5.3.2 Spot cleaning primary enclosures

When an animal will remain in their enclosure and it has not been heavily soiled, complete sanitation of the enclosure may not be necessary or supportive of animal health.^{3,4,34,35} Daily cleaning is essential, even in cage-free or home environments, but can often be accomplished using a spot cleaning method.

During spot cleaning, an animal may remain in their enclosure or be given out-of-kennel enrichment. Multi-compartment enclosures facilitate spot-cleaning by allowing personnel to clean in the other compartment to avoid animal contact. Spot cleaning should be conducted at least daily when an animal will remain in the same enclosure. Soiled bedding, old food, urine, and feces are removed, the area tidied, and food and water resupplied (Table 5.1).

Spot cleaning is typically less stressful for animals as it requires less animal handling and does not remove familiar scents.³⁶ Spot cleaning is particularly important for shy or under-socialized animals, and animals with mild diseases worsened by stress (e.g. feline infectious respiratory disease).

Table 5.1. Basic steps for cleaning primary enclosures

Sanitizing	Spot cleaning
Remove animal (or move to different compartment)	Keep animal in enclosure (or give out of kennel enrichment)
Remove all items	Remove bowls, wet or soiled items
Remove all organic material	Remove all organic material
Apply detergent solution and physically scrub all surfaces	Clean soiled areas with detergent and single-use towel as needed
Rinse all surfaces and then remove standing water	Wipe surfaces to remove detergent
Apply disinfectant solution for appropriate contact time	Replace care items
Rinse all surfaces as indicated and then remove standing water	
Reset enclosure	

5.4 Reducing pathogen spread

Fomites are objects that may be contaminated with pathogens and contribute to transmission of disease. Hands, work clothing, medical equipment, food bowls, litter boxes, toys, and cleaning and handling equipment may serve as fomites.⁴ Care to avoid the spread of disease through fomites is important during sanitation and when interacting with animals in the shelter.

5.4.1 Personal protective equipment

Personal protective equipment (PPE) is a physical barrier that reduces the spread of disease when used properly. PPE should be selected based on specific pathogens and exposure risks within each population (see [Public Health](#)). As the health of the population varies, the type of protective equipment needed may also vary. Appropriate PPE should be used in each area and disposed of or sanitized before proceeding to care for other animals³⁷ ([Appendix C](#)).

PPE may need to be changed between individual enclosures or areas based on disease risk because contaminated PPE can contribute to pathogen spread. Protective garments must be changed between handling each animal when there is a high risk for disease transmission.³⁸ Staff training, adequate supplies, and facility set-up (e.g. location of trash receptacles) allow for proper use and removal of PPE. Personnel should wash hands after removing PPE.

5.4.2 Hand hygiene

Hand sanitation is a key part of preventing disease transmission.^{37,39} Hand hygiene stations should be available in or near every area where contact with animals occurs.⁴⁰ Ideally, hand hygiene stations are sinks that allow washing with soap and water, and drying with single use towels. At a minimum, hand hygiene stations provide hand sanitizer with at least 60% alcohol.⁴¹ Because hand sanitizers are ineffective against some of the most concerning pathogens in shelters (e.g. parvovirus, calicivirus, and ringworm), hand sanitizers should not be relied on as the sole means of hand hygiene.^{41,42}

Proper handwashing technique includes wetting hands with clean, running water; applying and scrubbing with soap for at least 20 seconds; rinsing with clean water; and drying thoroughly with a fresh towel or forced air.⁴³ Proper hand sanitizer techniques include applying 1–2 pumps of gel product to one hand and then rubbing hands together until all surfaces are covered and dry (approximately 20 seconds). Hand sanitizer should only be used on hands that are visibly clean.⁴¹

Sanitation protocols must address hand hygiene for shelter staff, volunteers, and visitors.^{3,4,37} Although all people can move pathogens around, shelter personnel are significantly more likely to do this while they complete daily care tasks compared to shelter visitors.⁴⁴

5.4.3 Equipment and supplies

All items that come into contact with animals should be sanitized on a regular basis, whenever visibly soiled, and when in direct contact with bodily fluids. In the case of disease outbreaks or when proper sanitation of supplies is not possible between animals, the use of disposable items may be warranted. It is essential to note that gloves, clothes, and shoes can serve as fomites, underscoring the importance of the proper use and replacement of PPE.

Separate cleaning supplies must be designated for each shelter area or be sanitized prior to use in each area. Some supplies need to be changed or sanitized between enclosures, such as rags or towels. Other supplies, such as mop heads and squeegees, can be changed between areas, unless there is a high risk of disease transmission.

Transport cages and traps, as well as vehicle compartments used for animal transport, must be sanitized before being occupied by a different animal.⁴⁵ Mobile equipment such as rolling trash cans, shopping carts, and food or treatment carts should be assigned to one area or be sanitized between areas.^{45,46} Sanitation of these items includes wheels and outside contact surfaces. Objects with scratched, damaged, and porous surfaces are difficult or impossible to completely disinfect and should be used with caution or discarded between animals.⁴⁷ These

objects include plastic litter pans, airline carriers, and plastic or unglazed ceramic water bowls.

All bedding and other textiles used at the shelter must be discarded or laundered and thoroughly dried when visibly soiled and before reuse with a different animal.⁴⁵ Items that are heavily soiled may need to be laundered separately from other textiles.^{29,48,49} Organic debris (e.g. feces) should be removed from items before laundering.³⁷ Items that cannot be readily disinfected, such as leather gloves and muzzles, may contribute to disease spread when used with animals who appear ill and/or during a disease outbreak.⁴⁵ Routine cleaning or laundering of bedding could fail to remove non-enveloped viruses and dermatophytes; in these situations, discarding the items in question or using pathogen-specific laundry protocols is recommended.^{29,49}

Automatic watering devices and water bottles should not be used if the watering valve cannot be sanitized before being used by another animal.^{50,51} Food and water bowls must be sanitized in a different location or at a different time than litter pans or items soiled by feces, to prevent cross contamination.^{4,52} Dishwashers have excellent mechanical washing action and attain high temperatures which destroy the majority of pathogens but may not destroy non-enveloped viruses such as parvoviruses.^{26,53} The best way to inactivate these viruses is through the application of a disinfectant to the dishes following the dishwasher cycle. When a dishwasher is not available, disinfectant can be applied following thorough washing and rinsing by hand.⁵² Basins used to sanitize food and water bowls and litter pans should be thoroughly sanitized between uses.³

5.5 Other shelter areas

Foot traffic plays a role in fomite transmission throughout the shelter and grounds; dedicated boots that can be sanitized or disposable shoe covers should be used in potentially contaminated or protected areas, such as isolation and surgery.^{4,54,55} Footbaths must not be relied on for infectious disease control in the shelter.^{4,56,57} This is because achieving adequate contact time is impractical, and the accumulation of organic debris within the bath inactivates many disinfectants. Poorly maintained footbaths create environments that encourage pathogen growth and contribute to disease spread. It is unacceptable for animals to walk through footbaths.³

Animal waste and bodily fluids must be removed from indoor common spaces as soon as possible.^{5,58} After removal, the area needs to be sanitized properly. Feces must be removed from outdoor areas between animals or groups.⁵⁹ To reduce parasite egg accumulation in the environment, daily removal of feces is acceptable, although immediate removal is preferred.

Outdoor areas around the shelter must be kept clean, recognizing it is impossible to disinfect gravel, dirt, and grass surfaces.²⁹ Surface covers (e.g. pea gravel, mulch,

and rubber chips) can be replaced or recovered regularly to reduce contaminant load. To manage this risk, many shelters designate certain outdoor areas for use by specific animals. This allows closure of an area when needed while still preserving other areas for continued use. Access to areas that cannot be sanitized should be restricted to adult animals who have been vaccinated, dewormed, and appear healthy, or animals for whom the benefits of such access outweigh the risks of disease exposure or transmission.^{60,61}

Standing water should not be allowed to accumulate in or around the shelter because mosquitos breed and many pathogens thrive in wet environments.^{62,63} Well drained substrates and exposure to sunlight aid in the destruction of pathogens; however, some pathogens survive even in environmental extremes.

5.6 Wildlife, rodent, and insect control

Rodents and insects may harbor pathogens that can spread to shelter animals through direct ingestion, contamination of pet food, or contamination of the environment. Areas of food storage are particularly vulnerable to infestation. All food must be protected from wildlife, rodents, and insects.^{64,65} Properly storing food bags in sealed bins, promptly cleaning spills or waste, and resealing and refrigerating opened food containers (animal or human) can help mitigate infestations. Rodent and insect control solutions must be safe, humane, and effective.⁶⁶ Integrated pest management plans are recommended and utilize a variety of environmental measures to reduce the need for pesticides, rodenticides, and insecticides.⁶⁷

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6. Medical Health

6.1 General

Comprehensive shelter medical programs are the foundation of humane sheltering. The World Health Organization describes *health* as a state of complete physical, mental, and social well-being and not merely the absence of disease or infirmity.¹ Health care for animals in shelters is a necessity and must include attention to overall well-being.^{2,3}

Shelter medical care must begin at or before intake and continue throughout the shelter stay.⁴⁻⁶ Animals may arrive at shelters already experiencing health challenges, while others may develop issues during their stay. When a shelter admits an animal, they become responsible for providing all of the medical and wellness care that the animal needs, or promptly finding an outcome that meets those needs. When medical treatment is necessary, it must be provided in a timely fashion.

Shelters must provide species-appropriate preventive health care; this includes implementing protocols that strengthen resistance to disease and minimize exposure to pathogens, such as vaccination, parasite control, good nutrition, and appropriate handling and housing location.⁷ Shelters can experience severe disease outbreaks without proactive management, monitoring, and communication.

Individual animal health must be addressed within the balance of decisions and practices that support overall population health. Population health is impacted when spread of disease is likely, when long lengths of stay place the shelter over its capacity for care, and when treatment costs reduce the shelter's resources to provide care for other animals (see [Population Management](#)).

A shelter's capacity to provide medical care for individual animals is impacted by:

- the availability of resources to safely and humanely provide treatment and maintain welfare during the treatment period
- the duration of care
- the number of animals needing treatment
- likelihood and consequences of disease transmission
- the likelihood of recovery
- and the animal's potential for a live outcome

Prompt identification and communication of health conditions, and the development of protocols for conditions that are routinely treated or managed by the shelter provide transparency and support timely decision-making. Shelters should have a protocol for making decisions about which animals and conditions to treat, and which animals and conditions they cannot treat.

Tracking disease rates and outcomes for medical cases provides important measures of shelter population health.⁸ Key indicators of healthcare program deficiencies include the decline of animal health and welfare after intake, sick or injured animals held without prompt treatment, wide-scale disease outbreaks, animals dying or being euthanized as a result of shelter-acquired disease or injury, and chronically high rates of disease. Prevention of disease in shelters through proactive planning of animal pathways (see [Population Management](#)) and preventive healthcare supports better animal health and welfare, saves resources, and improves the well-being of shelter personnel.⁹

6.2 Veterinary oversight and medical recordkeeping

A formal relationship with a veterinarian must be in place to ensure oversight of medical and surgical care in the shelter. Personnel providing medical care must have the skills and equipment to administer prescribed treatments safely and effectively.

Evidence-based protocols are essential for providing a consistent approach to addressing the health of individual animals and populations entering shelters.¹⁰ All medical practices and protocols must be developed in consultation with the shelter's veterinarian (see [Management and Record Keeping](#)). Ensuring compliance with healthcare plans and protocols, on a population or individual level, is part of veterinary oversight. In addition to providing details of diagnosis and treatment, shelter medical protocols include instructions for animal housing, sanitation, decision-making, and communication.¹¹ When a medical concern falls outside of standard protocols or does not respond to treatment as expected, a veterinarian must be consulted.

Medications and treatments must only be administered by prescription or in accordance with written protocols provided by a veterinarian.¹² Medication should only be prescribed when there exists a reasonable presumptive diagnosis, the ability to administer as directed, and a plan to monitor the course of disease, so that success or failure can be determined.¹³ Giving medications when not needed, such as prescribing antibiotics to prevent viral infections, can cause harmful side-effects and promote antibiotic resistance.

When drugs are used or dispensed, it must be done in accordance with federal and state regulations.¹⁴ These regulations may limit use or dispensing of off-label and compounded drugs. When dispensed or when required by state regulations for in-shelter use, prescription drug labels include:

- name of the prescribing veterinarian
- clinic or shelter name, phone number, and address

- patient identification and species
- date dispensed and expiration date
- drug name, form, and amount
- directions for use
- cautionary statements¹⁵

Accurate medical records are an essential part of an animal's shelter record. A medical history must be requested for all animals presented to the shelter and added to the medical record. Shelters must document all medical care rendered to each animal in the medical record.¹⁶ Medical records include accurate identifying information; signalment (age, sex, species, and reproductive status); and a dated list of physical exam findings, vaccinations, diagnostic test results, procedures, and treatments (including medications with dose and route of administration). A record of the animal's medical care must be provided in hardcopy or electronic form when the animal leaves the shelter's care.

6.3 Medical assessment

Collecting information about animal health before admission allows the shelter to offer medical services that can prevent intake, such as spay-neuter, outpatient care, or referral to other accessible programs.¹⁷ When intake to the shelter is necessary, each animal's individual health status must be evaluated, documented, and monitored beginning at intake.

Each animal must receive at least a cursory health assessment by trained personnel at intake to check for signs of infectious disease or problems that require emergency medical care.^{5,18} The intake assessment must include confirmation of the animal's estimated age, sex, physical description, and the presence of any identification and microchips. Administration of core vaccinations (Table 6.1) and parasite prevention is typically paired with this intake assessment.

A comprehensive physical examination by a veterinarian or trained personnel should also be performed. Ideally, this physical exam is performed within 24 hours of intake. Timely initial assessment and examination allow prompt treatment of medical conditions, establish a health baseline for each animal, and allow recognition of changes in health during the animal's time in care. Screening tests can be a part of this assessment, including FeLV and FIV testing and management in animal shelter's policy¹⁹ (see [ASV Position Statement](#)).²⁰ Findings from any assessments and examinations are documented in the individual animal's medical record and used to inform housing and flow-through planning.

Animals with signs of infectious disease at intake should be isolated until determined to be low-risk to the population. Separating potentially infectious sick animals reduces the risk of fomite transmission by personnel and prevents spread through shared environments.

Quarantining healthy animals at intake is not generally recommended. Quarantines are appropriate only for animals with a history of direct, high-risk infectious disease exposure. Unnecessary holds increase length of stay and are detrimental to animal health and organizational goals (see [Population Management](#)).

Some animals are more susceptible and require greater protection from possible disease exposure. Heightened precautions to prevent disease transmission should be taken when handling more susceptible animals, such as juveniles, older animals, and those with underlying conditions. Precautions typically include placement in foster care, limiting the number of people in contact, using personal protective equipment (PPE), and providing care for the most vulnerable first ([Appendix C](#)).

Trained personnel must visually observe the health and well-being of every animal at least once every 24 hours.¹⁶ Ideally, daily monitoring observations take place before cleaning, so that food intake and condition of the enclosure, including feces, urine, or vomit, can be noted. Medical staff are essential members of the shelter's comprehensive care team; a medical staff member should attend population rounds with representatives from other departments (see [Population Management](#)).

Animals staying in the shelter long-term require regular medical assessment. At minimum, an examination by trained personnel, including weighing and body condition score, should be repeated on a monthly basis. A comprehensive exam should be performed at least every 6 months while in shelter care, including animals in foster. More frequent examinations are necessary for animals with chronic conditions and when new concerns are observed.

6.4 Essential wellness and preventive care

Prevention and early detection of health concerns in the shelter is critical to supporting physical and emotional well-being. Vaccination, parasite control, proper nutrition, and addressing specific care needs for individual animals improves the health of individuals and populations, while saving the shelter time and resources. For example, grooming and bathing are essential components of animal care and must be provided when necessary for animal health or comfort.¹¹

6.4.1 Vaccination

A timely vaccination program is fundamental to preventing severe disease outbreaks in animal shelters.^{21,22} Shelters must have a written vaccination protocol developed under the supervision of the shelter's veterinarian (see [Management and Record Keeping](#)). Shelter vaccine protocols differ from protocols used in private practice because shelter animals are subject to an increased risk of infectious disease.^{11,23} Risk factors include stressors, exposure to other animals, age, previous preventive care, and pathogen levels

Table 6.1. Vaccination schedule for animals housed in shelter facilities

Core vaccines	Route	Species	Starting age	Frequency <20 weeks	Frequency adults
MLV DAPP	SQ	Dog	4 weeks	Intake, every 2 weeks	Intake, suggested booster in 2–4 weeks
MLV FVRCP	SQ	Cat	4 weeks	Intake, every 2 weeks	Intake, suggested booster in 2–4 weeks
MLV Bord/PI	IN	Dog	3 weeks	Once at intake	Once at intake
Rabies	SQ	Dog and cat	12 weeks	Once	Once

MLV, modified live virus; DAPP, distemper-, adeno-, parvo-, and parainfluenza; FVRCP, feline viral rhinotracheitis, calicivirus, and panleukopenia; Bord/PI, *Bordetella* and parainfluenza virus; SQ, subcutaneous; IN, intranasal.

in the environment.^{11,24–27} Key differences in protocols compared to those recommended in private practice include an earlier and longer age range for juveniles, a shorter time span between vaccines, and different core and noncore products.^{11,23}

Shelters must properly handle and store vaccines according to manufacturer guidelines. Proper handling includes refrigeration along the supply chain and within the shelter, preventing freezing, reconstitution according to manufacturer instructions, and discarding modified live vaccines reconstituted more than 1 hour prior to use.^{4,25,27–29} Proper technique for vaccine administration is important for efficacy and safety. This includes use of the dose and route indicated by the manufacturer, a sterile syringe and a fresh needle, and gentle handling.^{4,28–30} The location for specific vaccine injections should follow administration site guidelines.^{28,30} Recording the serial and batch number information in the medical record is required for rabies vaccines and is recommended for all vaccines in case of adverse reactions, recalls, or vaccine failures.

Shelters must have protocols for recognizing, managing, and reporting adverse vaccine reactions, and required treatments must be accessible.^{25,31} This includes protocols for accidental subcutaneous administration of intranasal vaccines, which can lead to significant infection or allergic reactions.⁴ Management of vaccine reactions might include alerting the veterinarian, close monitoring, administration of medications, or referral to an emergency clinic, depending on the situation and severity of the reaction.²⁷ Vaccine reactions need to be reported to the manufacturer.³²

6.4.2 Core vaccines in shelters

A core vaccine is one given to all eligible animals and is withheld only in extraordinary circumstances.²⁷ For all core vaccines except rabies, shelters should use modified live virus or recombinant vaccines (MLV) rather than killed products because they provide a faster immune response.^{33–35} This includes vaccines for puppies, kittens, animals with FeLV or FIV, and pregnant and nursing animals.^{30,36} Cerebellar hypoplasia is a theoretical complication of MLV panleukopenia vaccination of pregnant cats; however, the risk of abortion, maternal, and kitten death due to panleukopenia generally outweighs this concern in shelters.^{37,38}

MLV vaccines create effective, long-lasting immunity to distemper-, parvo-, adeno-, and panleukopenia viruses in dogs and cats with competent immune systems within days of initial vaccination and may provide partial protection sooner.^{33,39,40} MLV vaccines also decrease symptoms and duration of herpes-, calici-, and parainfluenza virus and *Bordetella* infections.^{25,34,35,41,42}

Dogs

A subcutaneous MLV vaccine for canine distemper-, adeno-, parvo-, and parainfluenza viruses (DAPP) is core for shelter puppies and dogs.²¹ An intranasal vaccine containing both *Bordetella* and parainfluenza virus (Bord/PI), with or without adenovirus, is also core for shelter puppies and dogs.²¹ The intranasal route is important to maximize efficacy and activate respiratory immune cells, which can provide additional protection against other infectious respiratory diseases.^{43,44}

Cats

A subcutaneous MLV vaccine for feline viral rhinotracheitis, calicivirus, and panleukopenia viruses (FVRCP) is core for shelter cats and kittens. Feline intranasal vaccination for herpes and calicivirus has a similar efficacy to the injectable, but there is questionable reliability of intranasal vaccination against panleukopenia virus.^{23,39} Using both subcutaneous and intranasal vaccines together is safe but has not been shown to increase immunity over either product alone. The intranasal vaccine may provide protection against herpes and calicivirus to young kittens through reduced maternal antibody interference.²³

Rabies

Eligible dogs and cats should be vaccinated against rabies before leaving shelter care.¹¹ Rabies vaccines must be administered following state and local guidelines and the most recent Compendium for Animal Rabies Prevention and Control.^{45–48} Specific regulations for how rabies vaccination is to be documented and who can administer the vaccine vary by state. Puppies and kittens that are too young for rabies vaccination may be adopted or transported with the recommendation that new caretakers provide vaccination when old enough. Rabies vaccination of animals under

12 weeks of age, although considered off-label, appears safe and may be of value in some situations (e.g. return-to-field).⁴⁹ Feral cats should receive all core vaccines at the time of spay-neuter, regardless of age.⁵⁰

After the initial series (see Table 6.1), vaccination protocols for animals housed long-term in shelters are best guided by the shelter's veterinarian.

6.4.3 Noncore vaccines

Noncore vaccines (e.g. Canine influenza, *Leptospira*, Lyme; Feline Bordetella, Chlamydia, leukemia virus, etc.) may be useful when prescribed by a veterinarian for specific animals, subpopulations, or in the face of diagnosed outbreaks. When deciding whether to use noncore vaccines, it is important to consider the onset of immunity and the number of boosters, as many of these vaccinations may not be fully effective for 10–14 days after the final dose.²³

6.4.4 Vaccine schedules

Adult animals must be vaccinated with core vaccines at or before intake (Table 6.1). Revaccination 2–4 weeks later is suggested for those still in shelter care, especially when disease risk is high. Animals housed in shelters should be vaccinated with core vaccines even if ill or pregnant, as the individual and population risks of not vaccinating outweigh the small risk of vaccination.^{25,30,38} Vaccinating an animal with all core products on the same day or during a surgical procedure does not decrease immune responsiveness to those vaccines or significantly increase the chance of adverse reactions.^{29,36,51–53}

Puppies and kittens housed in shelter facilities must begin core vaccinations at or before intake starting at 4 weeks old and must be revaccinated every 2 weeks until 20 weeks old.^{4,25,28} Shelter personnel and veterinarians can use dentition, behavior, body weight, and available history to estimate age when date of birth is unknown.⁵⁴ In juvenile shelter-housed animals, frequent vaccination is critical to ensure that animals develop their own protective antibodies as soon as possible after antibodies provided by their mother wane.^{28,55} When no longer housed in the shelter facility (i.e. in foster or adopted), juvenile vaccine schedules may be adjusted.

The risk of puppies and kittens contracting and spreading infections such as parvo, distemper, and panleukopenia can be greatly reduced by housing litters in individual foster homes until they are old enough for spay-neuter and adoption. Puppies and kittens housed in foster care must begin core vaccinations at or before intake starting at 4 weeks old and must be revaccinated at the veterinarian's discretion every 2–4 weeks until 20 weeks old.^{4,25,28} Assessment of infectious disease risk in the foster home will determine whether a shorter or longer interval is appropriate.

It is not recommended to delay placement outcomes (e.g. adoption and transport) to allow response to vaccination or to receive a booster. The safer alternative is to secure an outcome with the recommendation that new caretakers continue a veterinary-directed vaccination protocol that reflects the animal's new lifestyle and disease risks.

6.4.5 Parasites

Parasites, both internal and external, are one of the most common health concerns seen in shelter dogs and cats.⁵⁶ Some animal parasites can also impact human health (e.g. roundworms, hookworms, mites, ticks, and fleas). Animals should receive anti-parasite treatments at or before intake and throughout their shelter stay.

An effective parasite control program, including medications and environmental control, should be designed with the supervision of a veterinarian. Considerations include the impact of the parasite on individual animals, the shelter population, and human health. Because risks vary geographically, it is important to identify the parasites of concern in the shelter and in the community the animal comes from, including those received through relocation programs. Effective protocols tailor treatments to the species and life stage of their animals, including age, pregnancy, and lactation.^{57–61} For example, treatment for coccidia may be considered for juvenile animals at intake to reduce disease severity and environmental contamination.

All dogs and cats must be treated for roundworms and hookworms at intake, starting at 2 weeks of age, because these organisms can cause harm to people, especially children.⁶² Parasite treatment also reduces contamination of the shelter environment where animals and humans may be exposed. Since most parasite eggs or cysts are shed in high numbers through feces and are difficult or impossible to kill, feces should be promptly removed from animal housing and exercise areas.^{63,64} Good sanitation practices, especially mechanical cleaning of soiled areas, reduce the potential for spread.⁵⁶

Regardless of geographic location, all shelters should have policies regarding testing, prevention, and management of heartworm disease.^{65–69} This policy may specify in-shelter prevention, treatment and management protocols, or may describe a plan for referral of adopters to local veterinarians for testing or care.

6.4.6 Nutrition

Shelters should seek veterinary input when developing a feeding protocol for their animal population. Food that is consistent with the nutritional needs, health status, and species of the individual animal must be provided at least daily. Food must be fresh, palatable, free from contamination, and not shared between enclosures. Feeding a consistent diet can support animal health and streamline feeding protocols. Fresh, clean water must be available to

animals unless there is a medical reason for water to be withheld for a prescribed period of time.

The amount and frequency of feeding vary depending on life stage, species, size, activity level, health status of the animal, and the particular diet chosen. Ideally, healthy adult dogs are fed twice daily, and cats are fed multiple small meals or allowed to forage throughout the day. When managing starved animals or those with unique nutritional needs, veterinary input must be sought. Healthy puppies and kittens as well as lactating and pregnant animals must be fed small amounts frequently or have food available through the day (i.e. free-choice).

Food intake must be monitored daily. Loss of appetite or inability to eat are health concerns that require medical attention. Since animals have highly variable metabolic requirements, each animal should be fed to meet individual needs and prevent excessive gain or loss of body weight.^{54,70} Body condition and hydration status of animals must be monitored. When animals are cohoused, matching animals with similar nutritional needs or having a process for feeding separately is important. Cohoused animals should be monitored during feeding times, so that appetite and conflicts around food may be addressed.

Food and water dishes must be safe, sufficient in number, and of adequate size. For litters and cohoused adults, providing at least one food dish per animal is recommended. Distributing dishes throughout the enclosure can help prevent guarding behavior (see [Facilities](#)).

Supplies of food must be stored in a manner to prevent spoilage or contamination, including refrigeration for perishable foods. Food waste creates a health hazard through spoilage and attraction of pests.

6.4.7 Pregnant, nursing, and neonatal animals

Shelters should have a protocol for the care of pregnant, nursing, and neonatal animals.⁷¹ This includes whether or not an animal will be spayed or allowed to go to term (see [Surgery](#)). Shelters housing pregnant, nursing, or neonatal animals must ensure that additional disease prevention, nutrition, and stress reduction measures are taken, to protect these vulnerable populations. Housing pregnant and nursing animals in foster care provides significant medical and behavioral benefits, including minimizing risk of infectious disease transmission and facilitating more consistent monitoring. Pregnant and neonatal animals may require urgent interventions, so protocols for accessing emergency care, additional training, and resources are needed to support these populations.

6.5 Responding to health concerns

Any animal observed to be experiencing pain, suffering, or distress; rapidly deteriorating health; life-threatening problems; or suspected zoonotic medical conditions must

be promptly assessed and managed.¹⁶ Communication is a key part of facilitating care. Protocols for documenting and reporting health concerns are essential.

Protocols for common diseases and health conditions, which specify diagnostics, medical care, and management (e.g. housing, PPE, and outcomes) are an integral part of any shelter health program. Infectious disease protocols must include measures both to minimize transmission and to ensure appropriate care of the infected animals. The response to each disease will look different for every organization, due to the variety of pathogens encountered, modes of transmission, and types of facilities. The shelter veterinarian should be consulted on all policies and protocols related to the maintenance of medical and behavioral animal health (see [Management and Record Keeping](#)).

6.5.1 Pain management

Animals with acute or chronically painful medical conditions are often cared for by shelters. Pain must be recognized and treated to alleviate suffering. Treatment of pain can include providing euthanasia. Unrelieved pain is a significant welfare concern and can result in chronic physical manifestations, such as weight loss, muscle breakdown, increased blood pressure, and prolonged recovery from illness or injury, as well as mental and emotional distress.⁷² Failure to provide treatment for pain is unacceptable.

Recognizing and alleviating pain in a wide variety of species can be complex and difficult.⁷³ Individual animals react differently to painful stimuli and may show a variety of clinical and behavioral signs.² Observation of behavior and knowledge of the causes of pain are the most accurate ways of assessing pain in animals; if a procedure, injury, or condition is known to be painful in humans, it can be assumed to be painful in animals. Several published scales are available to assess pain in animals.⁷⁴ When an animal is suspected to be painful, it is the responsibility of shelter staff to follow veterinary protocols and request veterinary assessment.

Protocols for the treatment of painful conditions should be created by a veterinarian. Pain control provided must be of an appropriate strength and duration to preempt or relieve pain. When pain can be anticipated, as with surgical procedures, pain control should be provided before the painful event. The use of controlled drugs must be supervised by a veterinarian as required by regulatory statutes.

Non-pharmacological approaches to pain (e.g. the presence of littermates, a quiet environment, massage, physical therapy, heat, and deep bedding) can supplement pharmacologic interventions to help increase comfort and alleviate anxiety.

Animals must be reassessed frequently to determine the efficacy of pain relief provided. When the pain relief

provided is inadequate, emergency medical care must be provided.

6.5.2 Emergency medical care

An emergency medical plan must be in place to provide appropriate and timely veterinary care for any animal who is injured, in distress, or showing signs of significant illness.¹⁶ The emergency medical plan must indicate how staff will recognize and report medical conditions requiring emergency care. The emergency medical plan should specify whether emergency services are provided on site or through an outside veterinary clinic. Animals housed outside the shelter facility (e.g. in foster or off-site adoption centers) are subject to the same guidance. Foster care providers should be given clear instructions about how and when to access emergency and after-hours care.

If the emergency medical plan cannot be implemented or fails to relieve suffering, the animal should be euthanized.¹⁶ Many shelters care for animals they do not legally own, such as those impounded as strays, held as evidence in legal cases, or boarded for owners requiring temporary assistance. Agreements between the shelter and relevant parties can clarify emergency medical care expectations. The comfort and welfare of the animal is the shelter's highest concern. The legal status of the animal must not prevent treatment to relieve suffering. This includes providing euthanasia if suffering cannot be alleviated.

6.5.3 Responding to infectious disease

Shelters must have a means of isolating contagious animals. Animals with a suspected infectious disease must be isolated until diagnosis by a veterinarian or treatment determines them to be a low risk to the general population. Isolation may be accomplished onsite or through placement in an appropriate facility, such as a veterinary clinic or foster home, after considering risk to animals already in those facilities. When isolation efforts are inadequate to prevent disease transmission to the population, informed adoption, transfer to a partner, or euthanasia of the infected animal needs to be considered. Allowing animals with severe infectious disease to remain in the general population is unacceptable.

The treatment and response plan for animals with mild to moderate or uncomplicated infections is based on circumstance and clinical signs and often follows a standard protocol. When the number of cases increases above typical for the shelter, when signs are severe or not responding to treatment as expected, and when a zoonotic condition is suspected, diagnosis or identification of specific pathogens should be sought. Individual animals, or a representative sample in an outbreak, can be tested to achieve a likely diagnosis. When an animal dies from unexplained causes, a necropsy should be performed.²¹ If gross necropsy is inconclusive, additional testing may be indicated.

6.5.4 Outbreak response

An outbreak is the occurrence of more than the usual number of animals affected by a disease or syndrome, or an increase in the severity of cases. Outbreaks can involve one animal or many animals; high levels of disease may represent an ongoing outbreak or gaps in management and preventive care practices.

During an outbreak, a risk assessment to identify potentially exposed animals must be performed based on the confirmed or suspected pathogen. Physical separation must be established between sick, exposed, at-risk, and unexposed animals or groups of animals. Implementation of this separation will vary depending on the disease of concern and type of facility. In some circumstances, isolation or limited handling of an animal or group of animals may be enough to protect the population. In other circumstances, it may be necessary to stop animal movement, including halting intake. In order to prevent tracking of pathogens from contaminated to uncontaminated areas, animal handling and foot traffic should be limited during disease outbreaks.

During an outbreak, all at-risk animals should be monitored for signs of disease at least once a day. Animal care staff should be educated on the clinical signs of the disease of concern and on the process for alerting medical staff. Shelters should avoid returning recovered or exposed animals to the general population, while there is significant risk that they may transmit disease to other animals. Shelters must also ensure federal, state, and local laws are followed concerning reportable diseases.

As part of the outbreak response, relevant protocols should be reviewed to ensure control measures are effective against the suspected pathogen. Effective measures, such as sanitation and animal handling protocols, help to ensure animal care and treatment activities do not contribute to the spread of disease. For example, footbaths often become contaminated and aid in disease transmission rather than control⁷⁵ (see [Sanitation](#)).

Depopulation is defined as euthanasia of an entire population or subpopulation, including healthy and unhealthy animals. It is not an appropriate initial response to disease outbreaks and typically does not resolve the underlying causes. Depopulation is a technique of last resort reserved for extraordinary circumstances when morbidity, mortality, infectivity, injury, or risk of zoonotic disease is uncommonly severe. In the rare instance that depopulation is considered, an experienced shelter veterinarian must be consulted beforehand.⁷⁶

6.6 Population health surveillance

Regular monitoring of population health is as important as monitoring individual animal health; one cannot exist without the other in the shelter environment. Shelters should track animal population health trends (e.g. morbidity and mortality) and develop targeted strategies to

address concerns. Population health surveillance will facilitate early recognition of problems, accurate diagnoses, and effective intervention and prevention strategies.

One or more shelter animals dying in care can be a signal to assess management practices. Increases in deaths or infections over time may indicate deficiencies in population management practices, such as operating beyond a shelter's capacity for care, lapses in preventive care protocols, or the need for targeted interventions. Shelters can learn from examples where conditions created by poor management caused severe suffering and unnecessary death.^{77,78}

6.7 Rehousing considerations

It is increasingly common for shelters to find live outcomes for animals with medical conditions. Adopters or others receiving animals from shelters should be informed about any disease or condition known to be present at the time of outcome. Many shelters employ standard written disclosures for common conditions, modifying as needed for a particular animal.

Ongoing care for known medical conditions typically becomes the responsibility of the adopter, transport partner, or other caretaker of the animal, but may be provided by the shelter when regulations and policies allow. Shelters should have and disclose policies that specify whether or not they provide care for medical conditions that are ongoing or occur after adoption.

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7. Shelter Surgery

7.1 General

In order to decrease the local population of animals needing shelter services and improve individual animal health and welfare, shelters routinely sterilize (i.e. spay or neuter) shelter animals, owned pets, and community cats. Robust community spay-neuter programs target pets and free-roaming cats who might not otherwise have been sterilized. This, in turn, supports community animal health, prevents shelter intake, and reduces euthanasia of both adults and unplanned offspring.^{1–6} Spay-neuter is associated with a reduction in many nuisance and unwanted behaviors^{7–9} and is associated with increased life expectancy.^{10,11} In some jurisdictions, pre-adoption sterilization of dogs and cats is required by law.

Many areas of the country continue to deal with pet overpopulation, and it is important for shelters not to exacerbate this problem.¹² The severity of overpopulation varies on local, regional, and national levels as well as by species. It is unacceptable for organizations to allow shelter animals to breed. When spay-neuter is not immediately available, housing intact animals of breeding age separately or in sex-matched pairs and thoughtfully planning and monitoring off-leash activities such as playgroups can prevent mating behaviors.

When animals that are already pregnant are admitted, shelters should prevent birth from occurring in the facility, instead seeking alternatives such as spay or foster care. In almost all cases, it is safe and humane to spay dogs and cats at any stage of pregnancy. Keeping the uterus closed during and following the spay procedure allows the anesthetized fetuses to die humanely without the need for additional barbiturate injections.¹³ If a shelter is considering allowing animals to give birth, it is important to assess the availability of routine and after-hours emergency medical care, behavioral care, foster home capacity, live outcome options, and regional population implications.

7.2 Spay-Neuter

Shelters should sterilize all animals before adoption or ensure that they will be sterilized after their outcome. Performing spay-neuter prior to adoption ensures completion and reduces the risk of additional litters prior to surgery. Spay-neuter can be safely performed in healthy animals as young as 6 weeks old and as small as 1.5–2 pounds (0.7–1 kg) body weight.^{14–17} If a shelter does not have the capacity to sterilize all animals prior to adoption without increasing length of stay, an acceptable alternative is to arrange post-adoption spay-neuter. Shelters performing post-adoption sterilization must have a system

for keeping track of unaltered animals and ensuring that surgery is completed in a timely manner. As adopters may be unfamiliar with the needs and care of sexually intact animals, providing information about the reproductive cycle, potential medical and behavior issues, and preventing breeding is recommended.

In some situations, spay-neuter surgery or the anesthesia it requires puts an animal's health at risk.¹⁸ The final decision regarding acceptance of any patient for surgery must be made by a veterinarian based on a physical examination, available medical history, and capacity of the surgical team. Granting an exemption from a spay-neuter requirement should only occur when performing the procedure puts the patient at significant risk. It is generally safe to sterilize patients in estrus or suffering from mild infections or other medical conditions, such as infectious respiratory disease or heartworm disease.^{19,20} When considering sterilizing patients with medical conditions, veterinarians must weigh the benefits and risks to that animal, others receiving surgery that day, the shelter population, and the community population. Shelter spay-neuter policies need to follow all state and local ordinances regarding the timing of spay-neuter with respect to legal holding periods.

7.2.1 Practices and protocols

Shelters that perform their own sterilization surgeries must follow the current ASV Veterinary Medical Care Guidelines for Spay-Neuter Programs, which includes establishing policies and protocols for managing related complications and emergencies.¹⁹ This document provides guidance on presurgical care, transport, anesthesia, pain management, surgery, and postsurgical care. It is also recommended that outside veterinary partners who work with shelters be familiar with the ASV Spay-Neuter Guidelines. Shelters can refer to this document when discussing expectations for surgical care, pain control, and the management of postoperative complications with new surgeons and partners.

7.2.2 Identifying altered animals

Sterilization status should be documented for each animal. Spay scars can be difficult to see, and other surgeries or injuries can leave similar scars. The placement of a permanent tattoo on the abdomen at the time of spay-neuter is an accepted standard for indicating sterilization and strongly recommended for all animals.^{19,21} If an animal is lost or transferred to another owner without records, the tattoo can prevent unnecessary anesthesia or surgery. For community cats, removal of the tip of one ear is the accepted standard for indicating an animal is

sterilized.^{19,21,22} The ears are visible from a distance without the need for handling, which helps with colony monitoring and prevents unnecessary transport of already sterilized cats.

7.3 Other surgeries

Some animals presenting to shelters have medical concerns that require surgical treatment. In shelters that regularly perform spay-neuter surgery, these non-sterilization surgical procedures may also be performed onsite. To promote quality care for surgical patients, all surgical practices and protocols must be developed in consultation with a veterinarian familiar with the sheltering organization, its population, and facilities.

Non-sterilization surgeries performed in the shelter setting, including dentistry, must adhere to the ASV Spay-Neuter Guidelines regarding surgical suite, anesthesia, analgesia, and principles of sterility related to instrumentation and surgical practice.¹⁹ Ideally, shelters without the capacity to perform these surgeries partner with outside organizations, specialists, or transport partners to obtain necessary care.

Regardless of where surgery is performed, it is critical that shelters pursue surgical treatment only when the appropriate pre- and postsurgical care can be provided. In particular, following orthopedic procedures, patients must receive appropriate rehabilitation and pain management in order to minimize discomfort and ensure success of the procedure.²³ Due to often-prolonged recovery times for orthopedic patients and their special mobility and care needs, appropriate postoperative plans may require alternative housing plans such as foster care or adoption with in-depth counseling. Ideally, orthopedic patients requiring extended care are not housed long term at the shelter.

7.3.1 Dentistry

Providing surgical dental services is an increasingly common part of shelter animal care, particularly for geriatric animals.^{24–26} Appropriate dental care considers individual patient health, surgical safety, and postoperative recovery needs including pain control, in the context of the shelter population.²⁷ Medical records should document the dental exam, diagnostics, and treatments performed.

Non-anesthetic dental probing, scaling, and polishing is unacceptable.^{28,29} Without sedation, significant dental concerns can be missed or inadequately addressed. The restraint required can cause significant animal and technician stress, and veterinary staff and the animal are put at risk of serious injury from sharp instruments or bites.^{28,29}

Ideally, intraoral radiographs are taken in patients undergoing dental surgery. Radiographs allow veterinarians to detect important concerns of the tooth and jaw not visible during oral examination.^{28,29} Dental disease can have serious welfare implications, and treatment for a painful mouth is strongly recommended even when radiology is

not available. Dental procedures, including radiology, must be performed by appropriately trained and credentialed individuals based on state and local regulations.²⁸ Shelters without the capacity to perform dentistry can partner with adopters, outside organizations, specialists, or transport partners to ensure animals receive needed care.

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8. Forensics

8.1 General

All animal shelters play an important role in the prevention of animal suffering. Socioeconomic factors often place owners in situations with limited access to veterinary care or difficulty meeting their pet's basic care needs.¹ This can lead owners to surrender their pets or result in seizure if a complaint is filed. In many cases, shelters can help owners and their pets by providing necessary services (e.g. food, medical care, shelter, and grooming) and information, or connecting owners with others in the community who can assist them.

While community interventions are an important strategy to improve animal welfare, any shelter may receive animals who have experienced abuse or neglect (i.e. maltreatment). Shelters have an obligation to recognize and report suspected cases. Many shelters are engaged in the active investigation of suspected crimes against animals, or *forensics*, which can be part of a their mission or mandate.² Caring for animals who have been abused or neglected may place significant demands on shelter resources due to their medical or behavioral needs, the number of animals involved, and potentially lengthy stays while a legal outcome is determined.

8.2 Laws and regulations

The definitions of animal abuse and neglect vary across states and jurisdictions, as do relevant laws.^{3,4} These crimes range from inflicting physical or emotional harm (i.e. abuse) to failing to provide adequate and necessary care (i.e. neglect).⁵⁻⁷ Shelters, veterinarians, and humane investigators must be familiar with animal abuse and neglect laws in their jurisdiction and know how to report suspected cases. In recent years, the Five Domains model of animal welfare assessment has been used as a framework for assessment in animal legal cases.^{8,9}

In several states, veterinarians have been designated as mandated reporters of animal abuse and neglect. Most of these states provide protection from liability (i.e. law suits) for those who report suspected crimes in good faith; however, reporting is important regardless.^{2,4,10} Veterinarians must be aware of their state's animal cruelty reporting requirements and liability protection statutes. In some states, veterinarians and other shelter personnel may also be required to report suspected abuse and neglect of people.

8.3 Forensic investigation policies

Shelters should have a policy that outlines the scope of forensic services provided. Services may be limited to animal care or may involve active investigation. For shelters

that regularly perform investigations or provide investigative support to other agencies, the forensic investigation policy needs to define:

- which geographic areas are covered
- which species can be investigated
- where forensic exams are performed
- who performs forensic exams
- how animals and other evidence are held^{10,11}

Consultation with an attorney is suggested during the development of a forensic investigation policy.²

Sharing the shelter's forensic investigations policy helps partner agencies understand how and when the shelter may be able to assist. A memorandum of understanding (MOU) with collaborating agencies defines roles and financial responsibilities for crime scene documentation, the care and treatment of animals, and allows an orderly investigation response. When law enforcement agencies are leading an investigation, a release permitting the shelter to examine and care for the animals is recommended.^{5,6,11,12}

Those investigating a suspected case of animal abuse or neglect must first ensure that they have the legal right (e.g. seizure, warrant, or owner consent) to examine, treat, and document the condition of the animal or scene.¹⁰ It is essential that all involved in the investigation of animal abuse and neglect understand the legal procedures involved in criminal investigation, including the defendant's right to protection from unreasonable search and seizure. Mishandling evidence can cause it to be withheld from court proceedings.^{3,5,7,12-14}

8.4 The veterinary forensic evaluation

Veterinary forensic evaluations are holistic assessments of all aspects of an animal abuse or neglect case. The veterinarian should have access to information about the scene, evidence collected, allegations, and known or reported history.^{15,16} The veterinary forensic evaluation includes all of this information, as well as findings from forensic examination or necropsy, diagnostic results, and evidence collected from the animal.^{5,11,14} Evaluation and opinion formation for forensic purposes must be conducted by a veterinarian.

Veterinarians involved in forensic cases may be expected to provide evidence through written statements or by providing testimony in court.^{17,18} The lead investigator or district attorney is a good resource for understanding legal expectations and requirements.^{5,14,17} The goal of the veterinarian's report and testimony is to present and interpret the facts of the case. It is up to the prosecution to prove the case, and the jury or judge to decide.^{7,18}

8.4.1 Veterinary forensic examination

A key part of forensic evaluation is a forensic physical exam or necropsy with documentation, for which shelters should have standard protocols.^{19–21} These protocols ensure that each forensic examination is approached consistently and methodically. Further diagnostics, treatments, or assessments can be performed based on presentation and initial findings.^{22–25}

When animals have urgent medical needs, the priority is providing stabilization and medical care. In most cases, this can be accomplished while simultaneously trying to identify, document, collect, and preserve key evidence. Even when cases are not medically urgent, forensic physical examinations and diagnostics must be conducted in a timely manner to preserve evidence. Case evidence may disappear quickly or change over time with appropriate care. For example, blood chemistry values may normalize after feeding and hydration, and trace evidence visible on the body under normal or alternate light sources may be lost during movement and grooming.^{22,26–32}

8.4.2 Documentation

Photographs are essential when documenting evidence of suspected abuse and neglect. Standard views include the front, back, left, right, and top of the animal, as well as photos of abnormalities. At least one photo should include identifying information. Photographs should be of sufficient quality to serve as evidence, and they should be managed to ensure proof of origin and integrity.^{2,22,26,34} Videos can help document dynamic processes such as limping or behavior.¹⁹

8.5 Managing evidence

Humane investigators and veterinarians involved in investigating animal abuse and neglect must be prepared to maintain chain of custody protocols. To ensure proper packaging, storage, and transfer of evidence between agencies, it is recommended that shelters consult local law enforcement, the forensic laboratory, or forensics reference materials.^{12,13,29}

Monitoring and response to ongoing treatment should be documented as evidence throughout recovery. Demonstrating improvement as a response to appropriate care provides evidence and may refute narratives presented by the defense.^{11,22,34} For example, a log of increasing weights accompanied by photographs of an animal recovering from emaciation contradicts an assertion that the animal was losing weight despite being given an adequate diet.

8.6 Training

Specific training regarding forensic evaluations, evidence identification and collection, testifying in court, and other aspects of forensic investigations has become widely

accessible (Appendix D). Veterinarians routinely involved in the investigation of animal cruelty should complete additional training in veterinary forensics or criminal justice. Attending trainings for law enforcement or human medical professionals, including forensic nursing and medical examiners, can also be helpful.¹⁴

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9. Behavior and Mental Well-Being

9.1 General

To promote animal health and well-being, it is essential for shelters to address emotional needs as well as physical needs.¹⁻⁴ Emotional and behavioral needs are determined by environment, species, genetics, personality, prior socialization, and life experiences. Emotional and behavioral health have impacts on physical health, and vice versa. Shelters must provide behavioral care that considers the needs of individual animals as well as conditions experienced by the entire population.^{1,5}

All shelter personnel should receive training about common behavior concerns at a level of detail appropriate to their position and job tasks. All relevant personnel must be trained in animal body language, objectively describing behavior, and how to interpret and respond to animal body language and behavior.⁶ Animals experiencing fear, anxiety, stress, and frustration are more likely to exhibit dangerous behaviors. Interactions that minimize negative mental states in animals improve handler safety, animal safety, and animal welfare.⁷ When interactions are positive, animals are more likely to accept and respond positively to additional interactions over time.⁸ Training in animal behavior allows personnel to recognize concerns and work to improve animal welfare.

9.2 Stress and welfare

Admission to a shelter is stressful for the vast majority of dogs and cats.^{9,10,11} Separation from caregivers, decreased and unfamiliar social interactions, confinement, loud noises, other stressed animals, and unpredictability all result in impaired welfare.¹² Lack of control over one's environment and separation from people are among the most profound stressors for companion animals.¹³ Shelters must have comprehensive protocols in place for recognizing and mitigating stress and associated negative emotions including fear, anxiety, and frustration.

Because confinement has negative impacts on animal behavior, reducing the duration of time spent in cages or kennels is critical. Foster care is generally the preferred method of housing for dogs and cats because it allows for regular social interaction and for animals to choose where and how they spend their time.¹⁴ When animals require care in a shelter facility (e.g. safety, legal, medical or behavioral reasons, or to facilitate adoptions), extra attention to well-being is necessary.

Animals must be monitored daily in order to detect trends or changes in well-being and respond to their behavioral needs. Actions must be taken to respond promptly to behavioral needs that impact welfare. When

welfare is impaired, a health and behavior assessment is necessary to determine the severity of impairment and implement a plan to improve welfare. Any animal experiencing mental suffering, distress, or behavioral deterioration must be urgently assessed and treated.

Alternative housing and placement options must be urgently pursued for distressed animals not responding to behavioral care. Options include foster care, office foster, group housing, a different housing location, return to owner, or transfer to another shelter.^{15,16} However, for animals profoundly stressed by interactions with people, better options include return-to-field or placement in an appropriate environment (e.g. barn or warehouse). Distressed animals not responding to behavioral care should be humanely euthanized when other options are not feasible or available. When an animal is suffering and treatment efforts have failed, it is not appropriate or humane to postpone euthanasia in the hope that they will improve or another option will materialize.

9.3 Intake

Collecting information before admission allows the shelter to offer services that prevent intake, such as outpatient behavioral care, other rehoming resources, spay-neuter, or return-to-field. If intake to the shelter is necessary, personnel must collect a thorough behavioral history at or near the time of intake, including the reasons the animal was brought to the shelter and previously observed behavior. It is essential that personnel request information for every animal coming to the shelter, regardless of source.

A complete behavioral history is gathered by following a consistent process that collects key pieces of information, and additional details based on responses provided. Training in communication techniques assists intake personnel in completing this task, including asking open-ended questions, using objective language, and active listening. Available information about aggressive behavior must be recorded and include an objective description of the animal's actions and the circumstances. Information about positive behaviors and preferences is also important. Personnel must use the available history to tailor animal care, meet the needs of individuals, and protect the safety and welfare of people and animals.

Shelters must work to minimize stress at the point of initial contact and throughout an animal's stay. Functional separation of waiting areas, managed through scheduling or the use of partitions, placing carriers on elevated surfaces, and covering carriers with towels or blankets can reduce stress for incoming animals. Assessment of an animal's behavior must begin at the time of first contact or

intake and continue throughout their stay. The assessment process includes reviewing the history, observing behavior while in the shelter's care, recording observations in the animal's record, and communicating this information as needed.

9.4 Environmental management

The key to ensuring the best possible experience for animals living in the shelter is by creating an environment that minimizes stimuli that induce fear, stress, and frustration.^{5,17,18} Shelters must have policies and protocols for managing the environment in a manner that supports animal mental health and well-being. Understanding how dog and cat senses and cognition contribute to perception of the environment is an important part of environmental management (see [Appendix E](#)). Shelter housing and areas frequented by animals can be set up so that unwanted behaviors (e.g. barking and lunging) are less likely to occur than desired behaviors.^{19–21}

9.4.1 Housing

Shelter housing has a tremendous impact on animal health and welfare (see [Facilities](#)). Novel environments are especially stressful for shy, under-socialized, or geriatric cats and dogs.^{1,10,22–24} Many animals benefit from foster care placement or housing in separate, calm, quiet areas beginning at intake. Feral animals must not be housed in the shelter except for a brief period of time related to the delivery of veterinary care.

Prey species must be housed away from predatory species at all times. Prey species (e.g. cats, birds, guinea pigs, hamsters, gerbils, and rabbits) become fearful and stressed when housed in olfactory, auditory, or visual contact with predatory species (e.g. ferrets, cats, and dogs). Cats not only are predators but may also be prey for dogs. Cats should not be handled or housed within spatial, visual, or auditory range of dogs.

9.4.2 Daily routine

Animals should be provided with a consistent and structured environment that minimizes reassignment of enclosures, caregivers, and schedules. An unpredictable environment can result in chronic fear and anxiety.^{13,25} Unpredictability includes a lack of routine in daily care, frequent disruption of enclosure set-up, as well as irregular patterns or continuous light or darkness.²⁶ When events perceived as stressful are predictable, animals may experience periods of calm and relaxation between them because they learn what to expect.³ Animals also learn to look forward to positive experiences in their daily routines such as feeding and enrichment.

9.5 Enrichment and socialization

Enrichment refers to the process of improving the care of confined animals by providing them with:

- social interaction
- physical and mental stimulation
- opportunities to perform species-typical behaviors
- choice and control over their environment

Successful enrichment programs promote emotional well-being and minimize undesirable behaviors. Enrichment must be given the same significance as other components of animal care, such as nutrition and medical care, and is never considered optional. This is true whether animals are in a shelter facility or in a foster home. Positive social interaction, mental stimulation, and physical activity that meets each animal's needs must be provided daily, outside of the activities of feeding and cleaning.

9.5.1 Time out of enclosure

Daily time out of the primary enclosure is one of the most effective means of reducing stress and frustration in kennelled dogs.^{27–29} Dogs must be provided with daily opportunities for activity outside of their kennels, unless doing so creates an unmanageable risk to the health or safety of people or other animals.

Cats must be offered regular opportunities to express natural behaviors, including physical activity and exploration. This can include time outside of their primary enclosure to exercise and explore in a secure, enriched setting. However, removal to a new location may not always be preferred or necessary for cats living in spacious, enriched rooms (especially with indoor-outdoor access).

For both dogs and cats, physical and mental activities outside of their enclosures need to be tailored to meet individual animal needs.

9.5.2 Interactions with people and other animals

Shelters should provide all animals with opportunities to engage in healthy social contact with people and other animals of the same species.^{13,30} Social isolation has a profoundly negative impact, and enrichment that meets the social needs of the animals is of the utmost importance in the shelter environment. Social interactions with people and other animals need to be monitored and individually tailored. For example, poorly socialized animals may not benefit from contact with people (with the exception of young puppies and kittens) but may find comfort in social interactions with their own species. Other animals, whether feral or socialized, may not enjoy interacting with members of their own species.

Regular positive daily social interaction with people is essential for all socialized dogs and cats, beginning at the time of admission. Providing appropriate daily social contact improves behavior, reduces defensive aggression, and supports physical health, particularly for fearful animals.^{8,31–33} Social contact with humans is essential

even for animals with an unknown history or with an infectious disease concern. Positive social interactions with people, including calm, quiet interactions (e.g. sitting with or reading to) or more energetic play-centered interactions (e.g. wand, fetch, and tug) can be provided without removing the animal from the enclosure, if confinement is necessary for medical or behavioral reasons (Appendix F). Animals benefit greatly from having the opportunity to play, and play behavior is a strong indicator of positive welfare.^{5,34,35}

9.5.3 Playgroups

Well-managed playgroup programs provide opportunities for healthy social contact with dogs and people. Playgroups require a safe and well-maintained space and the participation of sufficient personnel trained in canine behavior and humane handling.³⁶ Selection and grouping of dogs based on health and behavior is necessary for safe, positive experiences.

Shelters should optimize human and animal safety by limiting the number of dogs in playgroups based on competency of personnel, play yard size, individual dog behavior, and shelter resources.³⁶ Careful and consistent monitoring during playgroups and the use of humane techniques ensures participating dogs benefit from and enjoy the experience. Forcing dogs to interact when they have shown significant or consistent signs of fear, anxiety, or aggression increases the likelihood of defensive aggression, worsening fear, and injuries to dogs or personnel.

9.5.4 Enrichment within enclosures

Providing animals with an enriched primary enclosure is a critical aspect of sheltering. All cats need the opportunity to rest comfortably, hide, perch, scratch, play, and exercise choice within their environment. All dogs need the opportunity to rest comfortably, retreat from view, chew, play, and exercise choice within their environment. Shelters meet these needs by providing all animals with suitable housing, comfortable bedding, and toys. Scratching posts, elevated perches, and hiding boxes are also important for cats, while items to chew are also important for dogs.^{37,38} Feeding enrichment and olfactory, visual, auditory, and tactile stimulation can all be used as forms of sensory enrichment. It is important to provide animals with a rotation of novel enrichment items and activities to maintain interest (Appendix G).

9.5.5 Socialization of puppies and kittens

For young puppies and kittens, proper socialization with people and other animals of the same species is essential for normal behavioral development. Without daily gentle handling and positive exposure to a variety of novel stimuli, animals may develop chronic fear and anxiety, display aggressive behavior, or be unable to adjust normally to

their environment. A broad range of positive socialization experiences must be provided to puppies and kittens and is best accomplished in a foster or adoptive home.

While in the shelter's care, young puppies and kittens should be housed with their littermates and their mother. This interaction is important for normal behavioral and emotional development, as well as the establishment of species-specific behaviors. Single, unrelated puppies or kittens can greatly benefit from being housed with one or more age-matched individuals once health status for each is determined. Separation of puppies and kittens into pairs or smaller groups may be necessary to allow monitoring, completion of care tasks, foster placement, or to address medical or behavioral concerns.

9.6 Behavior assessment

In the shelter setting, the process of collecting information about an individual animal's behavior is commonly referred to as 'behavior assessment'. The goals of this process are to learn and interpret as much as possible about an individual animal's behavior and use that information to:

- better understand the animal's needs in the shelter and new home
- address behavior and welfare concerns
- match the animal with the appropriate outcome.³⁹

Historically, a variety of methods have been used by shelters to assess behavior and prevent rehoming animals, especially dogs, who pose a public safety risk. This has included conducting behavior evaluation tests (i.e. temperament tests) where behavior is observed and interpreted in a structured format using a formal series of sub-tests performed one after the next (e.g. SAFER, Assess-a-Pet, and Match-up II).

Over the past two decades, studies have shown that behavior evaluation tests fail to reliably predict future behavior, particularly aggression, in a new home.⁴⁰⁻⁴³ Performing one stressful subtest after the next can negatively impact test results and the animal's emotional well-being.⁸ For example, It is unacceptable to expose cats to dogs in the shelter as a test to determine if the dog can safely live with cats because this poses a significant risk of emotional and physical harm to cats. Formal testing requires considerable time and resources and can increase individual and population length of stay (LOS). For these reasons, requiring all shelter animals to go through a formal behavior evaluation test is no longer recommended.

Current recommendations for behavior assessment are to combine objective information collected via behavioral history with objective behavior observations noted during a variety of interactions.^{1,44,45} An overall behavior assessment must collect and consider all the information about

the animal, including history and behaviors observed during all shelter and foster interactions. These interactions, with an emphasis placed on those likely to occur in a home setting, include intake procedures, daily care, medical handling and treatment, enrichment, play, and training activities, as well as interactions with personnel, visitors, adopters, and animals of the same species.

Through the process of behavior assessment, shelter personnel must strive to learn as much as possible about each animal to aid in optimizing their care, pathway planning, outcome decisions, and adoption matching and counseling. Training in current animal behavior science is necessary for personnel assessing shelter animal behavior, to give them the skills needed to reliably observe, document, assess, and act on findings or concerns. Documenting relevant behavior observations daily can track positive and negative trends in behavior and welfare. Behavior that requires intervention or affects how an animal can be safely handled must be entered into the animal's record and communicated with shelter personnel promptly.

Behavior is highly influenced by stress, fear, and other negative emotional states as well as by the animal's environment, previous experiences, and relationships with individual people and animals. When animals are experiencing high levels of stress or fear when interacting with people or other animals, they must not be forced to interact. In all cases, interactions with animals must not intentionally or carelessly provoke negative emotional states or undesirable behavior.

9.7 Responding to behavior or welfare concerns

When behavior or welfare concerns are present, it is important for shelters to develop an individualized plan, provide behavioral support, and make timely outcome decisions.

Environment modification and management to reduce undesirable behavior, as well as training, behavior modification, and behavior medications, can improve welfare and aid outcome and placement decisions.²¹ When deciding how to provide behavior support in the shelter, the impact on the animal, other animals in the shelter, shelter personnel, and future adopters require consideration. Behavior care and outcome decisions must be based on current animal behavior science. Approaches that increase length of stay in the shelter may result in unintended emotional deterioration or the development of new behavior problems. When behavior cannot be humanely managed in the shelter environment, seeking foster care and making timely outcome decisions are essential components of providing behavioral care.

9.7.1 Animal training

Animal training must be based on Least Intrusive Minimally Aversive principles and the Humane Hierarchy

of Behavior Change in accordance with current professional guidelines.^{46,47} Positive reinforcement training programs for dogs and cats improve health, welfare, and likelihood of adoption.⁴⁸⁻⁵² Training methods that incorporate punishment can increase fear, anxiety, and aggression toward people.^{21,53,54} These methods compromise both safety and welfare.^{55,56} Except when safety is an imminent concern, personnel should not use anything other than mildly aversive training methods. Ideally, animal trainers and behavior consultants are certified or have graduated from a program that assesses knowledge and skills.⁵⁷

9.7.2 Behavior modification

Behavior modification applies techniques which change an animal's behavior and underlying emotions. Behavior modification protocols must incorporate scientific principles of animal behavior and learning, such as classical conditioning, operant conditioning, and systematic desensitization and counterconditioning.²¹ It is unacceptable to use physical force as punishment to modify animal behavior.

Before implementing behavior modification, shelters must ensure they have the necessary resources to support such plans. Behavior modification is labor-intensive, time consuming, and must be applied consistently over a period of time in order to be successful. Behavior modification in the shelter environment may have a limited effect due to the significant impact of stress on animal behavior and learning. Placement in foster or an adopter's home may facilitate response to the behavior modification plan.

9.7.3 Behavior medication

Behavior medications must be strongly considered to address welfare concerns related to emotional health. These medications may address immediate welfare concerns associated with shelter intake or housing, or long-term problems that impair welfare (e.g. separation anxiety, fear of people, and chronic stress associated with shelter housing). Behavioral health concerns must be objectively assessed and diagnosed to ensure that medications are prescribed when indicated, with clear goals for treatment and outcome.

Treatment goals include improving welfare, reducing stress and anxiety, and facilitating response to the behavioral treatment plan.²¹ Behavior medications must only be administered under the advice of or in accordance with written protocols provided by a veterinarian, and all drugs must be dispensed in accordance with federal and state regulations.

There are many alternative or complementary products also used to support animal behavior. In general, studies have been inconclusive or suggest minimal efficacy in

shelter environments. It is the veterinarian's duty to evaluate and consider the level of evidence for their use, and to weigh potential benefits against the shelter resources required.

When behavior medication is prescribed, it must be part of a comprehensive plan to help address the animal's condition. This individually tailored comprehensive plan might include:

- continuing assessment (e.g. physical exam, diagnostic tests, and additional behavior assessment)
- environmental management
- daily routine adjustments
- foster care
- enrichment (additions or modifications)
- training or behavior modification
- complementary products and therapies
- monitoring response to treatment (e.g. medication and behavior modification)

9.7.4 Animals with long-term stays

Keeping length of stay as short as possible for each individual animal is a critical factor in maintaining animal welfare in shelters (see [Population Management](#)). For all animals staying in the shelter more than a few days, appropriate levels of additional enrichment must be provided on a daily basis. Chronic stress from prolonged stays in the shelter (i.e. more than 2 weeks) can reduce an animal's ability to cope, increase fear, anxiety, and frustration, and underlie related behaviors such as social withdrawal, repetitive behaviors, and aggression. These behaviors can negatively impact other animals and personnel, and jeopardize placement options.^{9,13,58–64}

In addition to more time and enrichment activities outside of their enclosures, housing that provides animals with additional space, enrichment, and choice

within their enclosure must be provided for animals remaining in the shelter long-term. When an outcome is not quickly available (e.g. animals seized as legal evidence), foster care is a better choice than confinement in the shelter.^{15,65,66}

Reproductive stress from estrous cycling and sex drive can decrease appetite, increase urine spraying, marking, and fighting, and profoundly increase social and emotional stress.⁶⁷ Therefore, animals who are housed long-term should be spayed and neutered.

Long-term confinement of any animal who cannot be provided with basic care without inducing stress or compromising safety is unacceptable. Basic care includes daily enrichment and exercise. Feral animals, as well as those with persistent fear or aggressive behavior toward people, cannot be safely handled on a routine basis without inducing significant distress. These animals are unable to express natural and rewarding behavior, engage in play, or form social bonds in the shelter. Euthanasia is the humane option when live outcome (e.g. return-to-field) is not possible in a timely manner.

9.8 Risk assessment of animals displaying aggressive behavior

Shelters must promptly respond to behavior that poses a significant safety risk. When a dog or cat's behavior might result in harm to people, other animals, or themselves, assessing the magnitude and likelihood of that harm is crucial.^{68,69} Risk assessment protocols provide a structured format, using all historical and current information gathered during behavior assessment, to make an educated estimate of an individual animal's risk to the community and to determine whether that risk can be appropriately managed (see [Table 9.1](#)). The result of risk assessment is a comprehensive plan for reducing risk, including environmental and behavior management (which is often life-long) or euthanasia.

Table 9.1. Aggressive behavior: Considerations for risk assessment

Factor	Considerations
Animal	Age, sex, neuter status, and size history (including previous bites) physical and emotional health ability to treat or manage conditions that impact behavior other behaviors (e.g. impulsivity and escape behavior) that might increase risk behavior diagnoses (single/multiple)
Behavior details	Context for the behavior *severity (e.g. damage to person or animal, number of bites per incident, sustained vs brief) *effort made to engage *consistency (e.g. frequency, predictability) *number of incidents
Behavioral triggers	Complexity Ability to manage or prevent exposure to triggers
Environment	Behavior occurs only in one vs. multiple environments Ability to manage the environment to reduce risk
Response to intervention	Animal's response to previous treatment or management efforts

Shelters must have protocols and criteria in place that attempt to identify and manage animals at high risk of causing harm to shelter personnel, the public, or other domesticated animals. Decisions about rehoming require careful consideration of public safety, potential risks, and whether mitigation of these risks is feasible. Euthanasia is the appropriate outcome for animals at high risk of causing serious harm to people.

It is important for shelters to recognize that robust management efforts will not be suitable or sufficient to prevent aggressive incidents in every case or scenario, even when implemented thoroughly and consistently. Monitoring post-placement outcomes can help improve risk assessment processes. Consultation with legal professionals may be helpful when creating risk assessment and placement protocols for animals with a history of aggressive behavior.

9.9 Rehoming considerations

An important aspect of risk mitigation and supporting the quality of life for animals and people is providing resources and guidance to those who foster or adopt a shelter animal.³⁹ Adopters and foster caregivers must be counseled on providing safe, gradual, and controlled introductions of shelter animals to children and resident pets.⁷⁰ This helps create successful transitions and relationships. Foster caregivers and prospective adopters should be allowed to adopt or foster without bringing their own animals to the shelter.⁷¹ Information and counseling on strategies for safe and low-stress introductions can be tailored to the individual shelter or resident animal's behavior and history.

A record of the animal's behavior should be provided in hardcopy or electronic form with the animal at the time of transfer, foster, or adoption. When behavior concerns have been noted, communication about humane and appropriate management and modification of concerning behaviors reduces the risk of placing animals into a home environment and reduces shelter returns. Collecting post-adoption data regarding the success of behavior interventions helps shelters make needed adjustments and improves consensus within communities.

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10. Euthanasia

10.1 General

Maintaining positive welfare for animals in shelter care includes ensuring a humane death when euthanasia is appropriate. All animals and people must be treated with respect during the euthanasia process. Respect includes compassionate handling of the animal and its remains, consideration for the well-being of personnel involved, and compassionate interactions with those requesting euthanasia services. These recommendations apply whether euthanasia is performed in the shelter, the field, or a home setting.

The euthanasia process must be as free from pain, fear, anxiety, and distress as possible. Ensuring a humane death requires proper technique and expertise. To ensure euthanasia practices are suitable for each organization and the animals they serve, a veterinarian with appropriate training and expertise for the species involved should be consulted when establishing euthanasia protocols. Agents and methods deemed unacceptable in the AVMA Guidelines for the Euthanasia of Animals are unacceptable to use in shelters.¹

Euthanasia decisions are based on the shelter's ability to support the welfare of the individual animal in the context of the population, available resources, and the community. Rarely, there may be severe circumstances in which euthanasia of an entire population (i.e. depopulation) may be considered, such as in the event of a disease outbreak, disaster, or other population level crisis (see [Medical Health](#)). Depopulation must only be used as a last resort when all other methods to address the situation have been exhausted.²

10.2 Euthanasia process

Euthanasia protocols must be created and followed to support consistent euthanasia practices. Protocols include euthanasia drugs, delivery methods, handling plans, and environmental conditions. Protocols should have options to accommodate individual animal's behavioral and physical needs and ensure human safety. Prompt intervention must occur if complications are noted during the euthanasia process. Complications could include delayed onset of sedation or death, excessive excitement, seizures, or vomiting. Adjustments to the euthanasia protocol may be needed if complications occur frequently.

It is unacceptable to euthanize an animal without confirming that the animal is the individual the shelter intends to euthanize. Using multiple methods to confirm an animal's identity prior to euthanasia is important regardless of intake type. Shelter records, enclosure labels, collars, tags, physical descriptions, and people familiar with the

animal may be consulted to ensure identification is correct. For stray animals, a final check of local missing animal listings should be performed to confirm that there are no matches before performing euthanasia.

Immediately prior to euthanasia, animals must be scanned for a microchip, either to confirm known microchip identity or in case previous scanning was incomplete. Multiple scans of the entire body using proper technique and a universal scanner maximize the chance of identifying a microchip.³ If a microchip is identified, ownership status requires follow-up before proceeding.

It is unacceptable to euthanize an animal without verifying legal eligibility. Legal eligibility includes verification that the organization owns or has legal responsibility for the animal (e.g. the animal is not on a court ordered or mandated stray hold), or the organization has consent from the animal's owner, or the animal has a documented need for immediate euthanasia to alleviate suffering.

Performing euthanasia in the presence of other unfamiliar animals is not recommended because it may be stressful for animals in close proximity. However, when euthanasia is necessary for a litter of very young kittens or puppies, keeping them together during the euthanasia process may reduce the stress of separation. When the mother will also be euthanized, it is preferable to euthanize her first.

After the euthanasia procedure, death must be verified by trained staff before disposing of the animal's body. The use of multiple verification methods is recommended. Lack of consciousness can be verified by the lack of blink reflex when the eye is touched, or the lack of response to a deep toe pinch. When breathing has stopped, cardiac standstill can be confirmed by the lack of movement of a needle inserted in the heart, or the lack of heartbeat using a stethoscope. Proper verification of death always includes confirmation of cardiac standstill or rigor mortis.¹

10.2.1 Euthanasia methods

Euthanasia methods must be reliable, irreversible, compatible with the species, age, health and behavior of the animal, and ensure a smooth loss of consciousness followed by death. The use of pre-euthanasia sedation is generally recommended because it improves the experience for animals and personnel. Pre-euthanasia drugs must be administered when their use is necessary for a smooth euthanasia process. Their use is particularly important for animals who are in pain or are showing signs of fear, anxiety, or distress.

Each animal's weight (actual or assessed) must be used to calculate adequate drug doses. The drugs and dosage

used vary by drug availability⁴ and the chosen route of injection, whether intravenous (IV), intraperitoneal (IP), or intra-organ (including intrarenal or intracardiac). Each route of administration has benefits and drawbacks depending on the individual animal and circumstance. For example, IP injection is often the most humane strategy for very young or debilitated animals, while IV injection is preferred for pregnant animals. Unless an animal has been verified as unconscious, intra-organ injections are unacceptable.

While necessary in rare occasions in the field, gunshot is unacceptable as a routine method for euthanasia of dogs, cats, or other small companion animals.¹ Inhalation of carbon monoxide is an unacceptable method of euthanasia for companion animals in shelters.⁵

10.3 Environment and equipment

A separate room should be designated for euthanasia in a quiet area away from the main pattern of foot traffic. The room used for euthanasia should be well lit and large enough to accommodate the necessary people and equipment. Only people with defined roles in the euthanasia process should be in the room when the procedure is being performed. These roles include technicians or veterinarians performing the euthanasia procedure and handling assistants, owners, familiar personnel, or trainees.

The euthanasia environment must be set up to minimize discomfort and distress and accommodate the individual animal's behavioral and physical needs. Incorporating soft bedding, calm music, and comforting experiences (e.g. talking to the animal, gentle petting, toys, and food) is often beneficial for socialized animals. Other animals, such as wildlife and feral cats, are better served by minimal interaction and opportunities to hide.

All equipment used during the euthanasia process must be easily accessible and in good working order to ensure a safe and humane euthanasia process. A new needle must be used to administer euthanasia drugs to each animal because previously used needles may be dull or burred and cause unnecessary pain. Appropriate personal protective equipment must be utilized during the euthanasia process to avoid injury to personnel or transmission of disease. Euthanasia equipment and surfaces should be cleaned after each use, and the entire euthanasia room should be sanitized regularly.

All drugs used during the euthanasia process must be stored, administered, and documented in accordance with federal and state regulations. This includes keeping a record log documenting each animal's identification, the amount of euthanasia solution and pre-euthanasia drugs used, the amounts remaining in the vial, and the identity of the person performing the euthanasia.⁶

Storage and final disposal of animal remains must be in compliance with all applicable laws and regulations.

Proper storage is important to prevent disease transmission and unpleasant odors, and because medications, including those associated with euthanasia, may create a risk to scavenging animals. It is unacceptable for shelters to euthanize an animal solely for research or educational purposes. However, when shelter animals have already been euthanized for other reasons, and there is a clear benefit to other animals and society, their body may be used for science or teaching.⁷

10.4 Personnel considerations

Many states set training requirements and authorize who can perform euthanasia in shelters and under which circumstances. Veterinarians, veterinary technicians, animal control officers, and designated lay staff may be tasked with performing euthanasia in shelters.¹ Personnel performing euthanasia must be appropriately trained and maintain all necessary certification as required by state or local regulations.

The safety and well-being of personnel must be incorporated into euthanasia protocols and policy. Because euthanasia is an important factor in the compassion fatigue, moral distress, and work-related strain reported by veterinarians and shelter staff,^{8,9} systems must be in place to prevent, recognize, and address fatigue and distress related to euthanasia in shelter personnel. This includes personnel involved in euthanasia decision-making, those performing the euthanasia procedure, and any who may be emotionally affected.^{8,10,11}

Euthanasia decision-making must occur through a transparent process that lessens the decision-making burden on any one individual. Shelters can mitigate the stress of euthanasia on personnel by having clear and consistent decision-making protocols, sharing the decision-making burden, providing mentorship and training to those expected to perform euthanasia, rotating euthanasia performance duties, communicating transparently and sensitively about euthanasia, and holding debriefing sessions.^{12,13}

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11. Animal Transport and Relocation Programs

11.1 General

Animal relocation programs involve the transfer and transport of animals from one sheltering organization (the source) to another (the destination). Transport can be local, regional, or international. The purpose is typically to move companion animals from communities with an excess pet population to communities with unmet adopter demand. Shelter animals are also relocated when they require services not available at the source shelter.

For many communities, relocation programs are a critical strategy to support live outcomes. However, relocation carries risks to health, behavior, and safety which can be particularly concerning for some animals.¹⁻³ Intentionally designed relocation programs consider the risks and benefits for all affected animals and minimize negative impacts through careful selection and planning.

Decision-making in relocation programs must prioritize decreasing length of stay. Holding animals for relocation when live outcomes are available locally can lead shelters to operate beyond their capacity for care and compromise their relationship with their community⁴ (see [Population Management](#)). Likewise, when destination shelters accept more animals than they have the capacity to care for, the welfare of both relocated and destination animals may be compromised, and lengths of stay increased.

Shelters transport animals for a variety of reasons, such as local transfer, external medical services, enrichment activities, or relocation. It is unacceptable to transport animals when the transport itself is likely to be harmful to their immediate or long-term health or welfare. Careful management and planning are required to ensure that transporting an animal improves their welfare, and that priority is given to animal comfort and safety.

11.2 Responsibilities for relocation programs

All participants in the relocation process must follow federal regulations for animal transportation as well as local or state regulations for both source and destination locations. Departments of Agriculture and Departments of Health commonly have requirements for animals being imported into their jurisdiction. These often include health certificates (i.e. Certificates of Veterinary Inspection [CVI]) and certain vaccinations; there may also be restrictions for age and health conditions. For commercial air transport, organizations must consult with the airline for specific requirements.

Emergency plans must be made prior to transport. These plans include emergency contact information, safe

locations to stop if necessary, protocols to address vehicle problems, and a plan for animal and human medical emergencies. Those transporting animals also need to have contact information for both the source and destination.

Clear direct communication is essential for successful relocation programs. Written agreements between all parties involved in the relocation program should be developed and reviewed regularly. Animal health and behavior must be accurately described and communicated between relocation partners. At minimum, such agreements address medical and behavioral selection criteria as well as transportation and destination requirements.⁵

A contact person must be identified at each transfer point, and a record of each animal's travel from source to destination must be kept. Appropriate, accessible travel records allow tracing of an animal's source and contacts along the route.

Public health and safety must be considered in the design of relocation programs and protocols. Zoonotic diseases with a regional distribution (e.g. plague, rabies, and *Leptospirosis*)⁶ and aggressive behaviors require special consideration (see [Behavior, Public Health](#)).

Organizations engaging in relocation should track standard metrics for transported animals. This includes animal demographics, behavioral and medical conditions, and outcomes.⁷ Unless there are extenuating circumstances, animals should not be returned to the source even in the event of unexpected medical or behavioral concerns. Transport is a significant stressor for the animal as well as a significant resource investment. If destination shelters regularly find that transported animals are not eligible for adoption, it is important for all parties to revisit selection criteria and program goals.

11.3 Responsibilities at the source

As with all shelters, all eligible animals within a source population must be vaccinated at or before intake^{8,9} (see [Medical Health](#)). It is insufficient to vaccinate only animals selected for relocation because it leaves the majority of animals unprotected. It is not recommended to hold animals back from transport just to allow response to vaccination or to receive a booster.¹⁰ To prevent the spread of internal and external parasites, treatment for fleas, ticks, and internal parasites is strongly recommended. Ideally, all dogs 6 months of age and older are tested for heartworm disease prior to relocation.¹¹

The animal's health and behavior records must be shared with the destination. When required, a valid health certificate (CVI) and proof of rabies vaccination must accompany each animal. Requirements may vary from state to state.

Animals must be examined by trained staff within 24 h prior to travel and deemed fit for transport. The purpose of the pre-transport examination is to look for evidence of infectious disease, and to evaluate the animal's ability to tolerate the impact of the physical and emotional experiences encountered during travel (e.g. prolonged confinement, handling by multiple novel people, and direct exposure to other animals). A veterinarian must confirm that animals with medical concerns or recovering from surgery are fit for transport.

Animals being transported must be provided with visual identification. Collars or tags are routinely used, though in some cases, other techniques may be needed (e.g. marking the inner ear or painting a claw on a neonate). Ideally, animals are microchipped before transport, as this provides permanent identification. To aid in identification of individual animals, each primary transport enclosure must be marked with each animal's unique identifier.

A copy of the manifest for each transport, identifying each animal on board, must be maintained in an accessible location separate from the vehicle itself, in case an accident leads to loss or destruction of the manifest accompanying the animals. For example, a cloud-based digital manifest can be made available to source, transporter, and destination in real time.

11.4 Responsibilities during transport

11.4.1 Primary enclosure and occupancy

For the safety and comfort of the animals, primary transport enclosures must be large enough for animals to stand and sit erect, turn around normally while standing, and lie in a natural position without lying on another animal. Unfamiliar animals must not be transported together in the same primary enclosure. Ideally, animals are introduced and acclimated to the transport carrier prior to transport in order to reduce associated stress.

The primary enclosure must not have sharp edges, and the flooring must prevent injury, discomfort, and leakage of fluids into other enclosures.¹² To improve comfort and hygiene, absorbent bedding must be provided during transport unless it poses a risk to an individual animal's health.

In a transport vehicle, kennels must be positioned in a manner that ensures adequate airflow and temperature regulation within each primary enclosure. Airflow is facilitated by choosing enclosures with vent openings on at least three sides, and maintaining at least 1 inch (2 cm) of unobstructed space between vent openings and adjacent structures. When primary enclosures are permanently fixed to the vehicle so that only a single door provides ventilation, the door needs to face an unobstructed aisle.¹²

Primary enclosures must be loaded in a manner that minimizes animal stress or discomfort while allowing

direct visual observation. Primary enclosures must be secured to prevent movement within the vehicle, and doors secured to prevent accidental opening. In an emergency, operators must be able to swiftly remove animals.

11.4.2 Special cases

Cats

During transport, cats should be provided with a hiding space or visual barrier that allows ventilation and monitoring. For example, the kennel door can be partially covered with a towel, or a small hiding box can be provided within the primary enclosure. Stress can be further reduced if cats are acclimated to their carrier prior to transport and provided familiar objects with their own scent.^{13,14} Ideally, all cats are provided with access to a litter box during long-distance transport.

Cats and dogs are ideally transported in separate vehicles. If cats are transported in a vehicle with dogs, they must be housed in a physically separate space with special consideration given to visual and noise barriers.

Vulnerable populations

Puppies and kittens, geriatric animals, or animals with chronic medical or behavioral conditions require special care during transport. This care includes avoiding temperature extremes, more frequent feedings, and enhanced protection from infectious disease exposure during the transport process. Pediatric and brachycephalic animals are more susceptible to temperature extremes and may require different environmental parameters or alternative modes of transport.^{15,16} Kittens or puppies less than 8 weeks old should be transported with their mother when possible and should be transported in a single enclosure large enough for her to lie down with legs extended for comfort and to facilitate nursing. Importing animals under 8 weeks old may be prohibited in some states.

Sedation and behavior medication

Behavior medications should be considered when an animal is likely to have emotional welfare concerns during transport (see *Behavior*). Assessment of transport suitability is especially important for these animals. Clear communication between partners is essential when behavior medications are used. Safe and humane relocation programs do not use sedatives or behavior medications to compensate for poor transportation practices.

It is unacceptable for a relocation program to transport animals that are sedated or anesthetized to the point that they are unable to swallow, walk, or thermoregulate. Animals in this condition are at risk of choking, pneumonia, hypothermia, and cardiac and respiratory arrest without continuous monitoring by trained medical personnel.

11.4.3 Vehicles

Federal and local statutes for animal transport vehicles and their operation may not be sufficient to ensure humane care or the safety of animals and operators. Department of Transportation (DOT) regulations promote the safety of drivers and those around them and should be followed even when transporters are not licensed or subject to them. Vehicle operators must be licensed and trained in use of the specific vehicle they will be operating. Additional training in accident prevention and techniques to minimize animal discomfort during vehicle operation are recommended. For example, avoiding excessive lateral movement and sudden acceleration or deceleration are important skills to minimize animal stress and injury.

To ensure safe and humane conditions, control over heating and cooling in the animal compartment is essential in any vehicle used to transport animals.¹² Interior temperatures of vehicles in direct sunlight can rapidly exceed safe levels, even when comfortable outside. The temperature of the animal compartment in the vehicle must be monitored, and action taken if low or high temperatures occur. Alarms can facilitate monitoring when drivers and animals are in separate compartments; placing the thermometer at the level of the animals allows for more accurate monitoring.

For animal safety, ambient temperature must be maintained above 45°F (7.2°C) and below 85°F (29.5°C), and humidity maintained between 30 and 70%.^{12,17} To ensure comfortable conditions, ambient temperature should be maintained between 64°F (18°C) and 80°F (26.6°C).^{17,18} Operators must ensure that air in the animal compartment is fresh and free of vehicle exhaust fumes.¹² To detect poor air quality, carbon monoxide detectors should be placed in the animal compartment.

11.4.4 Monitoring and care

Vehicle drivers or animal attendants must have sufficient training in animal health, welfare, and safety to recognize and respond to animal needs during transport. For transports longer than 4 hours, two drivers should be present to monitor and reload animals. Having a second driver

for longer trips allows one driver to rest while the other drives, or to assist in the case of an emergency. At minimum, every 4 hours, the vehicle must be stopped, and a visual observation of each animal must be performed.¹²

If it becomes necessary to remove animals from their enclosures for any reason, safeguards are needed to ensure animal safety and to prevent escape. For example, operators may have a supply of leashes, vehicles may be fitted with a secondary barrier around the exterior door, or protocols may specify closing exterior vehicle doors before opening primary enclosures.

Caregivers are charged with meeting the nutritional needs of transported animals. For juvenile animals, a small meal should be given no more than 4 hours before departure, and small amounts of food should be provided every 4 hours throughout transport. For both adults and juveniles, water must be provided at least every 4 hours during observation stops. Food must be provided at least every 24 hours for adult animals.¹²

Although federal regulations do not address travel distance for companion animals, risks to animal health and welfare generally increase with duration of transport.² During transport, driving time to an intermediate or final destination should not exceed 12 hours per day, and loading and unloading of animals should not exceed 1 hour each (see Figure 11.1).^{15,19} Confinement for these lengths of time can still present welfare concerns, so efforts to reduce the overall transport duration, including stopping only when necessary and coordinating stops to manage both human and animal needs, are strongly recommended.

Transport that exceeds 12 hours of travel must be broken up with an overnight rest stop at an intermediary location. According to the DOT regulations for vehicle operators, overnight rest stops are at least 10 hours long. Total transport time from the source to a final destination should include no more than 28 hours confined to a transport vehicle, including loading and unloading time and excluding an overnight rest stop.¹²

Dogs must be walked or exercised on trips that require an overnight stay. Animals should never be left unattended in a

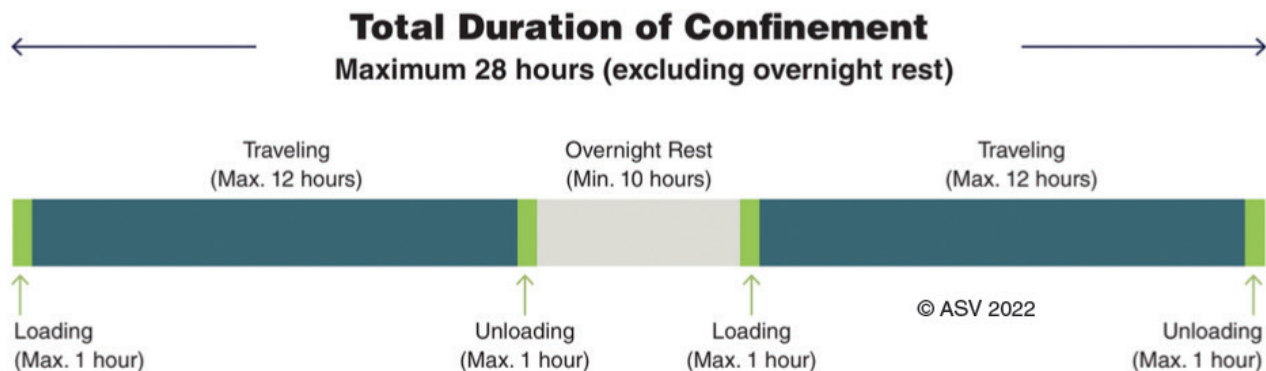


Figure 11.1. Maximum cumulative transport time to a final destination.

transport vehicle unless sufficient monitoring capabilities are in place, and attendants are able to immediately respond to animal care needs. When feasible, an overnight facility that can accommodate the housing of cats and dogs off of the vehicle is preferred. Cats may benefit from remaining in their transport carriers, if large enough. Cats must have access to a litter box if being housed overnight. Overnight facilities can include foster homes, shelters, hotels, or transport hubs.

11.4.5 Aggregation

Safe and sustainable transport programs carefully manage different animal populations throughout the transport process. If transporting animals from different sources on separate vehicles is not possible, animals from each source are ideally housed in separate compartments. Whenever animals from different sources are held in the same vehicle or facility, protocols that minimize exposure and cross-contamination between populations must be in place.

11.5 Responsibilities at the destination

The destination shelter must have sufficient trained personnel ready to receive and evaluate animals upon arrival. Communication with transporters is important to ensure that the shelter has enough time to assemble their personnel. Each animal admitted through a relocation program must receive a brief health assessment at intake. This assessment identifies signs of infectious disease and problems that require emergency or follow-up medical care. Veterinary services must be accessible upon arrival. Access might include having a veterinarian on-site, on-call, or available at a local clinic.

The destination facility must have adequate housing prepared for the arriving animals without displacing the existing population. The need for isolation or quarantine of arriving animals is informed by regulatory requirements, animal health status, source organization practices, and infectious disease risk. Quarantines are only appropriate for high-risk animals with direct infectious disease exposure; unnecessary holds increase length of stay and are detrimental to animal health and organizational goals.

Destination shelters should maintain an active working knowledge of the source organization, which includes familiarity with the common diseases, preventive health-care, and biosecurity practices at each source organization. Establishing procedures for continuing assessment, care, and communication after arrival promotes a healthy and successful partnership.

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12. Disaster response

12.1 General

All shelters should be prepared to respond when directly affected by a disaster. Disasters include natural events such as hurricanes, tornadoes, floods, and fires, or human-made events such as large-scale cruelty cases, workplace violence, and toxic chemical spills. Advance planning is critical to safeguard animal welfare, and to protect human health and safety.¹

Animal welfare needs described in this document are still present even when a shelter is experiencing a disaster. Deviations from these Guidelines as the result of a disaster should be as brief and as minimal as possible. Good planning helps ensure that these standards can be met under any circumstances. Additional published operational guidelines for animal evacuation & transport, animal decontamination, and emergency animal sheltering may be helpful in planning for and responding to disasters (Appendix H).

A disaster and its impacts may be localized to the shelter, the community it serves, or an entire region or country. Shelters outside of the impacted area may decide to offer aid to affected communities, including accepting and facilitating relocation of animals, sending personnel or resources, or providing advice and expertise. Whether impacted or offering aid, familiarity with disaster response principles is essential.

Disaster response is divided into four phases:

- *Mitigation*: on-going, preemptive activities that reduce the impacts of future disasters on animals, people, shelters, and communities
- *Preparedness*: creating plans to handle specific disasters, training and conducting exercises or drills, and acquiring the resources needed to respond
- *Response*: implementing the disaster plan and adapting as necessary during an event
- *Recovery*: returning to some degree of normalcy in the period following a disaster, this period can last from days to years

12.2 Mitigation

Shelters should take steps to anticipate, detect, and mitigate the impacts of disasters. In order for shelters to reduce the impact of a disaster, they must first identify the events most likely to affect them and their communities. Shelters must identify and plan for reasonably anticipated disasters, including those most likely to occur in their geographic area. Once disaster risks are identified, mitigation strategies can be developed and implemented to

reduce the impact of a future disaster. Mitigation might include holding community pet identification and rabies vaccination clinics, reinforcing existing structures to better withstand common weather events, designing shelters according to building codes, and maintaining insurance and liability policies.

12.3 Preparedness

Every sheltering organization must have a written plan that outlines the actions the shelter will take in response to likely emergency scenarios. These actions may include services that the shelter does not typically provide, including admission of displaced animals, provision of resources, or relocation of animals to other facilities. The written disaster response plan should be accessible by all personnel, used to train staff during disaster drills, and regularly reviewed and updated.

Disaster response plans must detail how shelters will provide essential services to all animals currently in care, including those in foster homes. Essential services include sanitation, housing, food, and water as well as medical and behavioral care. Plans should detail how necessary supplies will be acquired, and include evacuation strategies in the event that supply chains or utilities (e.g. water, food, and heating or cooling) are disrupted.

Emergency plans should include a process for preemptively relocating the shelter's population in advance of the event when appropriate. Evacuation ensures the safety of relocated animals and creates capacity to house and care for displaced community animals. Even if minimal animal intake from the community is expected, preemptive transport can reduce staffing challenges during a disaster and lessen the impact of facility damage on housed animals.

Since the risk of zoonotic disease spread may increase during disasters, plans must include steps to control transmission.²⁻⁴ These steps include providing wellness care, appropriate disease surveillance, and isolation and treatment of infected animals. Especially important during all disaster events is the consideration and control of rabies.³ Animal stress and anxiety leads to an increased likelihood of dog bites during disasters.^{2,4}

Shelter disaster plans should indicate the personnel structure necessary to provide essential animal care services during a disaster. This structure identifies the critical personnel required and how the shelter plans to fill these roles. The staffing structure needs to be flexible, as animal care needs or personnel availability may be different than were anticipated. Critical personnel may be expected to perform new or additional roles or be recruited from outside organizations.

Training is an essential part of preparedness, as it is important for personnel to know what to do and when. Training specific to the roles personnel will fill during a disaster, including safety considerations, should be provided before starting the work. This training is best provided well in advance for personnel who are expected to respond to disasters but may be provided just prior to involvement. Even experienced personnel may need ‘just in time training’ in order to assume a new role.⁵ Exercises and drills are an excellent training tool and allow shelters to evaluate how well the current plan fits the organization’s needs.

Individuals participating in multi-agency disaster responses should complete National Response Framework (NRF) and National Incident Management System (NIMS) training, including Incident Command System (ICS) modules.^{5,6} These widely used systems provide a clear chain of command and communication structure, which can be scaled to meet the size and demands of any disaster.⁷ Partnerships are most successful when stakeholders are familiar with the shared vocabulary, operations, and processes guiding the response.⁸

Disasters are times of extreme stress for animals and people. Disaster planning should include provisions to address the physical and mental stress experienced by personnel, community members, and responders. Human safety must be the first priority of any disaster response plan.

Shelters can be key team members in coordinated community, state, or national disaster preparedness and response. If a shelter is part of an established disaster response team, a written plan should specify its particular role and the other organizations the shelter will be working with. Shelters responding to disasters as part of a coordinated response should draft memoranda of understanding (MOUs) with their governmental and nongovernmental response partners. MOUs enhance efficiency and secure resources by specifying which personnel, equipment, or facilities will be provided by each organization and clarifying roles and expectations.

12.4 Response

Response plans should be followed as soon as a disaster is anticipated or has occurred. Prompt response ensures critical shelter and community needs are addressed as quickly as possible. The most common challenge faced during a response is communication, both internally and externally.^{9,10} When indicated, an ICS should be initiated rapidly to designate and maintain a clear chain of command and communication infrastructure (see [Appendix I](#)).

Each animal admitted during a disaster must receive at least a cursory assessment at intake to check for signs of infectious disease, any conditions that require emergency medical care, and exposure to hazards. This allows staff

to prioritize care where it is needed most and to separate animals to reduce the transmission of disease. Animals admitted during a disaster should be given core vaccines, including rabies and parasite control (see [Medical Health](#)).

Animals must be decontaminated when applicable (e.g. exposure to flood waters, fire retardants, or drug labs).¹¹ Decontamination typically involves bathing and rinsing, with specific methods and products used depending on the potential contaminants.^{5,12–14} Because hazards on the animal may be a danger to animals and personnel, personal protective equipment (PPE) is recommended until decontamination is complete.

As soon as it is safe, shelters must make concerted efforts to reunify pets displaced by a disaster. Animal holding times (i.e. stray periods) and communication with owners may need to be broadened to reflect the challenges of the particular disaster. Using multiple methods to reach owners, including social media, flyers, electronic billboards, or neighborhood ambassadors, may be helpful in facilitating reunification. If an animal is transported out of the impacted area, clear communication between partner shelters regarding roles, processes, and timelines for reunification efforts is important.¹⁵

Shelters outside of the disaster area accepting impacted animals must be able to provide appropriate care and outcomes for their existing population before volunteering to accept displaced animals. Shelters are required to follow all relevant regulations and legal requirements related to animals even during disasters.

Shelters should have a system for managing physical and monetary donations during disaster response and recovery. Without a system, physical donations can become overwhelming and require valuable time and facilities to manage. Shelters should track resources used during disaster response and recovery. Detailed information, including staff time dedicated to response, may be requested for reimbursement grants from local, state, or federal agencies or private organizations.

Shelters must anticipate the arrival of self-deployed volunteers during a disaster and must address how these individuals will or will not be used.¹⁶ Volunteers may be unfamiliar with response plans and staffing structure, which can inadvertently place themselves and others at risk. However, preemptive planning for volunteer roles, training, and oversight can effectively mobilize this resource.

Responders may include volunteer veterinarians or veterinary technicians; veterinary professionals must only provide medical treatment or services when they hold a license to practice in that jurisdiction or are exempt from this requirement. Even during a disaster, oversight of use and storage of controlled substances must remain with the individual identified as the responsible party on the DEA license for that premise.

12.5 Recovery

The recovery period following a disaster lasts until the individual shelter and affected communities return to normal. Even if undamaged, shelters may be challenged by continuing impacts on their community or personnel. If damage to the shelter building, grounds, or local infrastructure is a concern, a full safety assessment must be made prior to resuming normal activities in that area or facility.

Shelters must tailor placement efforts when their community is impacted by a disaster. When local residents are struggling with rebuilding or finding shelter, fostering and adoption are unlikely to be a priority. Adoption events outside of the impacted community, increased shelter partner transfer, shelter-neuter-return, or other creative programs may help address longer lengths of stay.

Ongoing challenges during recovery may disproportionately impact some community members. Shelters should provide additional services that support keeping pets with their owners in the time frame immediately following the disaster. Sustained housing instability is a particular concern; shelters may be asked to assist an increased number of people facing eviction or displacement.¹⁷

Following a disaster, shelters should debrief and evaluate their planning, response, and recovery processes, so that adjustments to their plans can be made. The period of recovery from a disaster or major event is a natural time to broadly evaluate the effectiveness of programs, services, and procedures within the organization. Furthermore, shelters may decide to maintain changes implemented during the response that were valuable to the organization and community.

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13. Public Health

13.1 General

Public health promotes and protects people and the communities where they live, largely through One Health, which studies the connections among the well-being of animals, people, and the environment.¹ The care that shelters provide to animals also impacts humans and the environment. Both within their facilities and in the larger community they serve, shelters must take precautions to protect the health and safety of animals, people, and the environment.

13.2 Personal protective measures

Shelter personnel encounter unavoidable risks to their health on a daily basis through normal work activities. Giving personnel the knowledge and equipment needed to mitigate risks is a critical component of workplace safety. Personal protective equipment (PPE) is worn to help prevent the spread of disease and to protect personnel from potentially harmful substances. In order to protect personnel from exposure to workplace hazards, shelters must provide PPE such as gloves, smocks, goggles, face masks, face shields, shoe covers, and ear plugs.² PPE must be available in types and sizes to accommodate all personnel, including those with special concerns such as latex allergies.

13.2.1 Hand hygiene

Proper hand hygiene is essential to protecting human health in animal care environments. Personnel should wear gloves when handling animal waste or fluids and should wash hands frequently, especially after handling animals, and after removing PPE.^{3,4}

Whether or not a person has had contact with animals, personnel should wash their hands before eating, smoking, or touching their face.⁵ As a precaution, personnel and visitors should be discouraged from eating, drinking, or bringing pacifiers, teething toys, or baby bottles into animal housing areas.^{3,6} To prevent the spread of zoonotic diseases, animals should not be present in areas designated for human food preparation or consumption.⁷

13.3 Workplace hazards

People working with and caring for animals are exposed to a diverse set of hazards. Shelters must comply with local, state, and federal health and safety regulations regarding chemical, biological, and physical hazards in the workplace.

13.3.1 Chemical hazards

Hazardous compounds, including disinfectants, medications, and pesticides, are routinely encountered in animal

shelters.⁸ When working with hazardous chemicals, PPE such as eye protection or respirator face masks must be worn as indicated by the product label.⁹ A well-ventilated area or fume hood may also be required when working with certain products. Because mixing compounds such as bleach and ammonia can produce lethal toxic gas, Occupational Safety and Health Administration (OSHA) requires organizations to correctly label and store chemicals to prevent spills or accidental mixing.^{10–12}

When allowed to accumulate or when improperly stored, animal urine and feces can become a significant source of toxic compounds such as ammonia and hydrogen sulfide.^{13–15} Shelters must promptly dispose of biological waste (animal waste, animal tissues, and carcasses) in a manner that follows state and local regulations.^{16,17}

Shelters must follow regulatory guidelines for the disposal of unused medications.^{18,19} Controlled medications must be disposed of or wasted in a manner that follows regulations, prevents environmental contamination, and prevents human diversion.²⁰ Guidance to reduce waste gas exposure associated with anesthesia may be found in the ASV's Veterinary Medical Care Guidelines for Spay-Neuter Programs and from OSHA.^{21,22}

Smoking must not be allowed in animal shelters. In addition to creating a risk of fire, second-hand smoke is harmful for pets and people.^{23–26}

13.3.2 Physical hazards

Shelter personnel are also commonly exposed to physical hazards. These include slippery surfaces, loud noises such as barking or clanging metal, animal scratches and bites, job requirements to lift heavy objects and animals, and exposures to needles or other sharp objects.²⁷ Shelters must follow industry guidelines for the proper disposal of sharps.^{28,29} Since the seriousness of physical injuries may initially be difficult to recognize, supervisors must advise persons injured at the shelter or by a shelter animal to seek medical care.

Noise exposure

Prolonged exposure to loud noise can damage the hearing of animals and people.^{30,31} Both environmental and behavioral noise abatement strategies should be used in animal housing and holding areas (see *Facilities, Behavior*). Hearing protection must be worn by employees working in environments where volume is at or above 100 dB cumulatively for 15 min. When volumes exceed 85 dB at any point in time, hearing protection should be worn.^{30,32} Several sound level meters are commercially available, including phone apps that measure decibel levels.³³ Hearing conservation programs that include training and regular hearing

testing may be required by OSHA depending on the average noise exposure.³⁴ Hearing protection is recommended whenever personnel have to raise their voice in order to be heard three feet away.

13.3.3 Biological hazards

Animal bites

Animal bites are both a physical and biological hazard of significant concern in shelters. Training in animal body language, safe handling techniques, and the use of sedation can reduce but not eliminate the risk of bites (see [Animal Handling](#)). While many animal bites are minor, some are extremely serious with extensive tissue damage. All bites that break the skin carry a risk for infection, which can be reduced by immediately washing the wound.³⁵ Deep penetrating punctures that close quickly, like those caused by cat bites, are at higher risk of developing a serious bacterial infection.³⁶

The public must be prevented from having contact with animals who pose a high risk of biting by clearly marking and restricting access to areas where these animals are held. Shelters must consider public safety when making outcome decisions regarding animals who pose a risk of serious harm. If, after a careful, in-depth risk assessment, the shelter decides that an animal with a history of mild to moderate aggressive behavior is eligible for a live outcome (see [Behavior](#)), a record of all known bite incidents must be provided in hardcopy or electronic form to adopters, fosters, or transfer partners.

Human rabies exposure

Animal bites can transmit rabies virus. To allow for appropriate follow-up by public health authorities, shelters must follow regulations for reporting animal bites to humans.³⁷ At intake, shelter personnel must ask owners or finders if the animal being admitted has bitten anyone within the past 10 days. Because aggression may be a symptom of rabies, animals who have bitten a human must be managed according to state and local regulations, including quarantine of the animal or euthanasia for rabies testing when required.^{38,39} Because animals who are symptomatic for rabies succumb to their illness within a week, the rabies quarantine period is typically 10 days.^{38,40} In some cases, euthanasia and testing may be preferred over quarantine, especially if the animal is suffering physically or emotionally, or presents a danger to others. If a dog, cat, or ferret dies for any reason within 10 days of a bite, testing for rabies is mandated. Local public health authorities can be contacted with questions about the management of other biting animals.

Because the consequences of rabies exposure are deadly, personnel who routinely work with animals should receive pre-exposure vaccinations against rabies

in accordance with the current recommendations of the Advisory Committee on Immunization Practices.⁴¹

Animal rabies exposures

Shelters frequently admit animals with injuries or neurological symptoms of unknown cause. Though rare, these injuries or symptoms could be associated with rabies virus infection.^{42,43} At intake, shelter personnel must ask owners and finders of incoming animals about recent wildlife bites or exposures. During intake health assessments and physical examination, shelter personnel should look for and document evidence of wounds that could indicate a potential rabies exposure. Determining the appropriate quarantine period for an animal potentially exposed to rabies depends on species, previous rabies vaccination, and local regulations. Animals who have potentially been exposed to rabies must be managed with guidance from the NASPHV Rabies Compendium, and in accordance with state and local health regulations.³⁸

Shelters should vaccinate all animals eligible for rabies vaccine prior to leaving the shelter^{44,45} (see [Medical Health](#)). Community cat vaccination is especially important because cats are the domestic animal most likely to acquire and transmit rabies in the United States and Canada.^{46–48}

Other zoonotic diseases

Zoonotic diseases are transmitted from animals to people. Although all people are at risk of zoonotic disease, those with exposure to animals, and those with delayed or weakened immune responses due to young or old age, disease, pregnancy, or medical treatments have an increased risk.^{49,50} Not everyone is aware of their immune status or chooses to share this information. It is important that shelters implement policies that prevent, recognize, and manage zoonotic diseases.

Many common pathogens in the shelter can pass from animals to humans, including internal parasites (roundworms, hookworms, and toxoplasma), external parasites (mites), fungal diseases (ringworm), and bacterial diseases (*Bordetella*, *Chlamydia*, and *Leptospira*); viral diseases (rabies, influenza, and COVID-19) are less commonly transmitted to people. Even when the animal's health is not significantly affected, timely treatment and management of animals with zoonotic pathogens help prevent spread to people and other animals.⁵¹

Training personnel to recognize zoonotic diseases is a key step in prevention.⁵² In addition to the general infectious disease control measures described in this document (see [Medical Health](#)), shelters should have a protocol for responding to zoonotic diseases, including communication regarding potential exposures. Reporting of some zoonotic diseases is mandated by local, state, and national regulations.

Access to animals with known zoonotic conditions should be limited to those necessary to provide appropriate care. Enclosures of animals with suspected zoonotic disease must be clearly marked to indicate the condition and necessary precautions, such as recommended PPE, handling, and sanitation practices. Shelters must disclose the risk of known zoonotic disease to personnel, transport partners, foster care providers, and adopters. Some states prohibit relocation of animals with zoonotic disease (see [Animal Transport and Relocation Programs](#)).

Antimicrobial resistance and emerging pathogens

Bacteria are continually evolving resistance to antibiotics. A key factor in slowing the development of resistance is to use antimicrobials only when truly needed.⁵³ Routinely using antimicrobials to prevent infection in healthy animals is unacceptable.

Antimicrobial use must be tailored to appropriate clinical conditions, used judiciously, and evaluated for therapeutic effect.^{54–56} It is vital that antibiotics are only prescribed when they are effective against the pathogen of concern. To do this in a shelter, treatment protocols for common conditions need to be evidence-based and include specific criteria for diagnosis; which antibiotic, dosage, and duration to use; any follow-up considerations; and when to consult the veterinarian.^{57–60} Performing diagnostic testing is strongly recommended when animals do not respond to treatment or display unusual or severe signs of infection.⁶¹ When animals in shelters are managed in a manner that supports their physical and emotional health, the need for antimicrobial drugs is reduced.^{62,63}

Some emerging diseases with the potential to infect people, such as influenza, were first identified in animal shelter populations.^{64,65} Because shelter populations can be sentinels for emerging diseases, animal shelters should monitor their populations for signs of unusual or severe disease. Poor sanitation practices, close housing of multiple species, housing diseased animals in the general population, and operating over capacity for care can facilitate the spread of disease.⁶⁶ Animal population management should be used to reduce the risk of developing novel or emerging pathogens.

13.4 Human well-being

The well-being of shelter personnel is an important One Health concern. Both veterinarians and shelter employees have been shown to have high levels of compassion fatigue, secondary traumatic stress, moral injury, suicidal ideation, and burn-out as a result of their daily work.^{67–70} Shelters should strive to become workplaces that emphasize staff wellness through a positive organizational culture, fair pay, hours and expectations, provisions for self-care, and ready access to mental health support systems without repercussions. When mental health concerns

are communicated or observed, personnel should be encouraged to seek professional help.⁷¹

Being able to provide appropriate care to shelter animals, and seeing their quality of life improve as a result of that care, can also reduce work-related stress for shelter personnel.^{72,73} In turn, personnel who are satisfied with their work are more likely to provide high-quality care for animals and stay in the workforce.^{73,74} Providing personnel with the skills, resources, and authority to excel at their jobs creates a beneficial cycle, improving human, animal, and population health.

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Appendix A: Glossary

Glossary terms

Age Category, Adult – cats and dogs 5 months of age or older

Age Category, Juvenile – cats and dogs under 5 months of age

Age Category, Neonate – cats and dogs 4 weeks of age or younger

Aggregation – gathering animals from different source shelters in one vehicle or location

Analgesia – pain control, usually medication or other therapeutics

Anesthesia – medications that induce unconsciousness and prevent pain

Animals in Care – the number of animals currently housed in the shelter including those housed off-site and in foster homes

Antimicrobial – products such as medications and disinfectants which kill or decrease reproduction of pathogens

Aversive – equipment or practice intended to cause an animal to stop an undesirable behavior by associating it with an unpleasant event

Behavior Assessment – a process of observing and interpreting an individual animal’s behavior throughout their shelter stay, in order to better understand their needs, address welfare concerns, and make appropriate handling, outcome and placement decisions

Behavior Evaluation – a structured procedure or test in which an animal’s responses to a series of sub-tests performed one after the other are observed and interpreted

Capacity for Care – the total resources (e.g. humane housing, trained personnel, medical care, appropriate outcomes) required to promote positive welfare as described by the Five Domains for all the animals in (or coming into) the shelter’s care

Certificate of Veterinary Inspection (CVI) – official document issued by an accredited veterinarian certifying that the animals identified on the document have been inspected and meet the importation criteria of the destination state; also known as a “health certificate”

Circadian Rhythm – internal biological process that regulates the sleep–wake cycle and repeats approximately every 24 hours

Cleaning – removal of dirt, oils, grime, and organic materials; includes both physical cleaning (i.e. scooping feces, scrubbing dirt) and chemical cleaning (i.e. application of a detergent or degreaser)

Co-Housing (Group Housing) – housing more than one animal in the same primary enclosure

Community Cat – all outdoor dwelling cats regardless of socialization status; community cats may be owned, unowned, free-roaming, or feral

Control Pole (i.e. Rabies Pole or Catch Pole) – rigid metal pole with an internal cable that forms an adjustable noose at one end

Deep Cleaning (Full Cleaning) – cleaning followed by sanitation (i.e. application of a disinfectant); used when a cage is heavily soiled, contaminated with infectious pathogens, or a different animal will be occupying the enclosure

Degreasers – strong detergents

Dental Probing – procedure in which a dental instrument called a “probe” is used to identify and measure periodontal pockets around the teeth

Dermatophytosis (Ringworm) – skin disease caused by pathogenic fungal organisms, most commonly *Microsporum* or *Trichophyton* species

Destination Shelter – organization that receives relocated animals from a source shelter

Detergent – chemical used during the cleaning process designed to break down oils and suspend particles so they can be removed by wiping or rinsing

Disinfection – inactivation of pathogens, usually through application of a properly diluted chemical product for a specified period of time

Efficacy – capacity for producing the desired outcome; how well something works

Feral Cat – unsocialized “wild” domestic cats living outside without human contact; fearful and avoidant of human interaction much like other wildlife species

Fomite – any object that may become contaminated and contribute to the spread of pathogens (e.g. clothing, equipment, hands)

Footbath – a floor container filled with disinfectant intended to be stepped in to reduce pathogen load on footwear

Forensic Evaluation – gathering and reviewing all crime-related evidence including the forensic physical examination or necropsy, diagnostic test results, reports from others involved in the investigation, documentation such as photographs or videos, and evidence collected from the animal and scene, in order to render an expert opinion about the case

Forensic Physical Examination – comprehensive physical examination, including normal and abnormal findings, that carefully documents health status, identifies abnormalities, and collects evidence

Foster Care – temporary housing in the home of a community member where a shelter-owned animal receives individualized care and monitoring, regular positive social interaction with people, and physical, sensory and mental enrichment

High Consequence Pathogen – contagious disease with the potential to cause significant harm or death, spread rapidly, or infect humans

Humane Investigator – person who investigates animal abuse and neglect, may work for a shelter or a law enforcement agency

Importation – movement of animals into a state or country intended to be their final destination

Incident Command Structure (ICS) – standardized approach to the control and coordination of emergency response providing a common hierarchy within which responders from multiple agencies can be effective

Infectious Dose – number of pathogens required to cause infection

Infrastructure – organizational structures and facilities (e.g. buildings, roads, power, supplies, personnel) needed for the operation of an organization, community, or society

Intact (Entire, Unsterilized) – animal with a complete reproductive tract

Isolation – housing for clinically ill (symptomatic) animals infected with a contagious disease that physically separates them from those who are not infected

Just in Time Training – educational process that provides knowledge and skills at the time they are needed

Length of stay (LOS) – period of time (usually in days) that an animal is in the shelter's care; calculated as the difference between the date of intake and the date of final outcome; often used as an average or median for species and life stage

Liability – action or omission for which a person or organization can be held legally responsible

Maltreatment – behavior towards a person or animal that involves physical abuse, sexual abuse, emotional abuse, or neglect

Memorandum of Understanding (MOU) – a document describing the broad outlines of an agreement that two or more parties (usually organizations) have reached

Metrics – numerical measures of shelter performance including intakes, returns, euthanasia rates, live outcome rates, lengths of stay (LOS), community services, etc.

Morbidity – number of animals infected by a specific disease in a population

Mortality – number of animals who die due to a specific disease or condition in a population

Multi-Compartment Enclosures – housing with at least two separate areas connected by a door, pass-through, or portal, and allows open access to both sides of the housing except during cleaning or handling

National Incident Management System (NIMS) – guidelines that define operational systems for personnel working together during emergencies; provides communities and organizations with shared vocabulary, goals and processes needed to successfully respond to a disaster or incident

Necropsy – an animal post-mortem examination (autopsy)

Neuter – surgical procedure in which the male reproductive organs (testicles) are removed; occasionally used to indicate surgical sterilization in females

Orthopedic – surgical procedure focused on repair of bones and the skeletal system

Outbreak – increase in the number or severity of cases of a disease in a population; can include but not limited to disease spread inside the shelter

Partner Shelter – in disaster response, a shelter not directly impacted by the emergency but providing any kind of assistance to the impacted shelter or community

Pathogen – biological agent that can cause disease, including bacteria, viruses, protozoa, fungi, and parasites

Pathway Planning – proactive process of determining the most appropriate outcome for each animal, which steps are necessary to achieve that outcome, and reassessment of the pathway as needed

Personal Protective Equipment (PPE) – equipment worn to minimize exposure to hazards that cause workplace injuries and illnesses; also used to minimize transmission

of pathogens between animals (e.g. gloves, gowns, goggles, shoe covers)

Personnel – all administration, management, staff and volunteers working at or for an organization, both paid and unpaid

Physical Description – includes species, weight, coat color, markings, sex, neuter status, age, and breed when appropriate

Polishing – procedure in which paste is used to buff and smooth surface defects in teeth caused by scaling or wear

Population Rounds – regular holistic assessment of the shelter population (usually daily) to ensure that each animal has a plan and that all needs and critical points of service are promptly met

Positive Reinforcement – rewarding a desired behavior with a pleasant reward

Practice of Veterinary Medicine – defined by state practice acts and limited to licensed individuals; diagnosis, prognosis, treatment, and prevention of animal disease, illness, pain, deformity, defect, injury, or other physical, dental, or mental conditions by any medical or surgical method

Prophylactic – preventive or presumptive treatment or management of disease before it becomes clinically apparent

Quarantine – housing for healthy animals exposed to and potentially incubating a contagious disease that physically separates them from clinically ill or unexposed animals

Relocation – program or organized effort to transport animals from one sheltering organization (source) to another (destination) locally, regionally, or internationally

Return to Field (Shelter Neuter Return) – outcome process of sterilizing unowned cats and returning them to their home situation after shelter intake

Risk Assessment – a process to identify possible incidents or problems, their likelihood of occurring, and steps that can be taken to control or reduce frequency and/or severity of harm

Sanitation – process of both cleaning and disinfection

Scaling – dental procedure in which tartar or calculus is physically removed from the surfaces of the teeth (manual or ultrasonic)

Shelter – organization of any type or size that provides temporary housing for companion animals; includes foster-based rescues, non-profit humane societies and

SPCAs, municipal animal control facilities, and hybrid organizations

Source Shelter – organization that prepares and sends animals for relocation to a destination shelter

Spay – surgical procedure where the female reproductive tract (ovaries and/or uterus) is removed

Spot Cleaning – cleaning process that includes tidying and removal of soiled objects and stains; used when a cage is lightly soiled AND the animal is remaining in the same enclosure; less disruptive than deep cleaning

Sterilization – collective term for surgeries that remove the reproductive organs from dogs and cats with the intent of permanently preventing offspring; also known as spay-neuter, neutering, and de-sexing

Surgical Suite – separate room of the medical department where surgeries are performed

Test, Diagnostic – medical test administered to animals with clinical signs of disease or injury to determine the cause

Test, Screening – medical test administered to determine whether a sub-clinical or inapparent disease, condition or exposure is present

Tethering – using a chain, rope, leash or cord to attach a dog to a stationary object with the intention of restraining them while unattended

Transfer (of Ownership or Custody) – formally handing over possession of an animal to another shelter or individual, typically as a transfer of ownership

Transport – movement of animals from one location to another, including intrastate, interstate, and international transportation

Veterinary Client Patient Relationship (VCPR) – situation in which a veterinarian has assumed case responsibility, has become familiar with the individual animal, population and/or premises, and has consent from the owner or current caretaker to provide treatment and management of diseases or conditions; defined by state practice acts, often required to perform veterinary services

Veterinarian, Licensed – person who holds a current license to practice veterinary medicine in the state in which services are provided

Veterinarian, Shelter – veterinarian with experience and training in the practice of veterinary medicine in animal shelters, may be employed or contracted by a shelter, or consulting

Veterinary Supervision, Direct – licensed veterinarian is readily available on the premises

Veterinary Supervision, Indirect – licensed veterinarian has given either written or oral instructions for management of the patient and is readily available by telephone or other forms of immediate communication, but is not necessarily on the premises

Zoonotic Disease (Zoonoses) – infectious disease spread between animals and people

Abbreviations

DAPP (DHPP/DA2PP): Canine Distemper, Adenovirus type 2 (Hepatitis virus), Parainfluenza Virus, Parvovirus
FVRCP (HCP): Feline Viral Rhinotracheitis (Herpesvirus), Calicivirus, Panleukopenia Virus

ICS: Incident Command System

IN: Intranasal; into the nose

LOS: Length of Stay

MLV: Modified Live Virus; a type of vaccine

MOU: Memorandum of Understanding

NIMS: National Incident Management System

PPE: Personal Protective Equipment

RTF: Return to Field

SPCA: Society for the Prevention of Cruelty to Animals

SQ: Subcutaneous; under the skin

TNR (TNVR): Trap-Neuter-(Vaccinate)-Release

CVI: Certificate of Veterinary Inspection

VCPR: Veterinary Client Patient Relationship

Appendix B. Examples of Core Shelter Protocols

Management and Record Keeping	<ul style="list-style-type: none"> • Organizational charts and lines of communication • Documentation of training and proficiency in tasks • Expectations for continuing education by position • How to document and report injuries and incidents
Population management	<ul style="list-style-type: none"> • Daily monitoring • Population rounds • Pathway planning • Monitoring of population level reports • Housing decision-making and flow • Foster care decision-making and flow
Animal Handling	<ul style="list-style-type: none"> • Low-stress handling for a spectrum of situations
Facility Design and Animal Housing	<ul style="list-style-type: none"> • Individual housing selection and set-up • Co-housing selection and set-up • Safe use of enrichment areas and other shared spaces • Environmental control and modification: sound, lighting, heating, cooling, ventilation and air quality
Sanitation	<ul style="list-style-type: none"> • Specific procedures for sanitizing various types of primary enclosures (e.g. cage, kennel, rooms) and shared enclosures (e.g. play yards, meet and greet rooms) • Deep cleaning vs spot cleaning techniques • Sanitizing equipment (e.g. dishes, litterboxes, toys, laundry, carriers, cleaning equipment, handling equipment) • Use of personal protective equipment during sanitation
Medical Health	<ul style="list-style-type: none"> • Standard preventive care (e.g. intake evaluation, vaccinations, treatments, and testing) • Treatment for common medical conditions by condition and species • Recognition, management and reporting of adverse vaccine-associated events • Anesthesia • Surgical procedures and care • Pain recognition and management • Nutrition and feeding • Emergency care • Care of pregnant, nursing, and neonatal animals • Lines of medical decision-making and communication • Outbreak recognition and management • Isolation of infectious animals • Pharmaceutical management, including controlled substance handling and security • Provision of post-adoption care
Shelter Surgery	<ul style="list-style-type: none"> • State/local ordinances regarding sterilization (compliance) • Anesthesia • Surgical procedures and care • Preemptive pain management • Management of postoperative complications
Forensics	<ul style="list-style-type: none"> • Scope of investigative services: species, geographic area • Forensic evaluation of animals (alive/deceased) • Collection, documentation, and management of evidence • Expectations for continuing education and training

Appendix B continues on next page

Behavioral Health and Mental Well-being	<ul style="list-style-type: none"> • Monitoring, recognition, and mitigation of stress • Behavioral enrichment by species and enclosure type • Documentation of behavioral observations • Environmental management in consideration of the five senses • Playgroup design and use • Behavioral treatment for common conditions by condition and species • Use of behavioral medications • Housing and enrichment of pediatrics • Risk assessment and mitigation for animals at high risk of causing harm
Euthanasia	<ul style="list-style-type: none"> • Outcome decision-making process and documentation • Euthanasia procedures and documentation
Animal Transport and Relocation Programs	<ul style="list-style-type: none"> • Written agreements detailing roles and responsibilities • Relocation process • Monitoring and care during all stages of transport, including overnight stops if applicable • Transportation equipment use and maintenance (eg., vehicles, enclosures, environmental controls and management) • Emergency plans for incidents during transport • Tracking of important metrics
Disaster Response	<ul style="list-style-type: none"> • Basic organizational Incident Command System and lines of communication • Detailed actions and procedures that anticipate, detect, and mitigate the impacts of potential disasters by type • Plan outlining care of shelter and community animals throughout response and recovery • Plan for preemptively relocating the shelter's population in advance of impending disasters • Zoonotic disease recognition, management, and mitigation
Public Health	<ul style="list-style-type: none"> • Identification and mitigation of workplace hazards: physical (eg., bites, injury, noise), chemical, biological (eg., rabies, zoonotic diseases) • Hand hygiene and infectious disease control • Promotion of well-being in the workplace for personnel

Appendix C. Personal Protective Equipment During Sanitation

Protective layer	Gloves	Outer clothing layer (gown, scrubs)	Shoe covers or Dedicated boots
Animal population			
Healthy animals	Gloves OR hand hygiene before and after care	Optional	Recommended when entering soiled enclosure
Non-contagious medical conditions	Gloves OR hand hygiene before and after care	Optional	Recommended when entering soiled enclosure
Mild contagious disease (e.g. typical URI, CIRI) or vulnerable animals	Gloves AND hand hygiene before and after care required	Recommended (change after handling)	Recommended when entering soiled enclosures
High consequence contagious disease - diagnosis or known exposure	Gloves AND hand hygiene before and after care required	Required -Disposable gown recommended	Required when entering isolation area
(e.g. Parvo-, Distemper-, or Panleukopenia viruses)			

*Adjustments based on individual and population disease risk may be indicated. Change PPE between individual enclosures or wards/areas based on disease risk.

Appendix D. Forensics Resources for Shelters

- Standards and Best Practices
 - Touroo, R., Baucomb, K., Kessler, M, Smith-Blackmore, M. “Minimum standards and best practices for the clinical veterinary forensic examination of the suspected abused animal” in Forensic Science International: Reports, Volume 2, December, 2020.
 - Brownlie, HW Brooks, and R. Munro. “The veterinary forensic necropsy: a review of procedures and protocols.” Veterinary pathology 53.5 (2016): 919-928.
- Books
 - Veterinary Forensic Medicine and Forensic Sciences Eds. Byrd JH, Norris P, Bradley-Siemens, N. CRC Press, 2020.
 - Veterinary Forensic Pathology, Volumes 1&2. Ed. Brooks J, Springer, 2018.
 - Veterinary Forensics: Investigations, Evidence Collecting and Expert Testimony. Eds. Rogers ER, Stern A., CRC Press. 2018.
- Organizations
 - International Veterinary Forensic Science Association (IVFSA). <https://www.ivfisa.org>
 - American Academy of Forensic Science (AAFS). <https://www.aafs.org>
 - American College of Veterinary Pathologists (ACVP). <https://www.acvp.org>

Appendix E: Environmental Management Considering an Animal's Five Senses

Sense	Description/Perception	Management
Hearing	<ul style="list-style-type: none"> • Keen sense of hearing: highly sensitive to sounds • Loud and novel noises including the sounds of other animals, such as barking, increase stress and fear 	<ul style="list-style-type: none"> • Minimize loud and sudden noises, including barking • Separate cats from dogs • Separate stressed animals from loud animals • Use white noise to muffle disturbing noises
Smell	<ul style="list-style-type: none"> • Keen sense of smell: highly sensitive to odors • Strong and noxious odors increase stress and fear • Animal odors and pheromones may increase stress and fear • Pleasant and familiar smells support positive emotions 	<ul style="list-style-type: none"> • Use odor eliminators and enzymatic cleaners • Avoid strong and noxious odors • Provide pleasant odors such as scent enrichment • Spot clean cat enclosures so familiar scent is retained
Taste	<ul style="list-style-type: none"> • Attracted to high protein foods: both taste and smell are pleasant and rewarding 	<ul style="list-style-type: none"> • Offer delicious foods to entice, engage, and create positive associations • Add extra to meals when animals are not eating due to stress
Sight	<ul style="list-style-type: none"> • Highly sensitive to motion: rapid movements increase stress and fear or frustration-Greater peripheral vision 	<ul style="list-style-type: none"> • Move slowly, calmly and deliberately; avoid threatening postures (such as direct eye contact) • Block visual stimuli that cause stress (e.g. close doors to block outside activity or place a towel over an enclosure as a visual shield) • Avoid bright lights • Provide visual access to observe natural environments/outdoors
Touch	<ul style="list-style-type: none"> • Highly sensitive to touch: certain areas of the body can be especially sensitive including the feet, mouth, genitals, and belly • Highly sensitive to approach and physical contact (all senses); may feel threatened by people leaning over them, approaching head on, or getting too close too fast 	<ul style="list-style-type: none"> • Avoid contact with areas of the body that tend to be most sensitive; observe body language to determine how and where individuals respond best • Approach slowly, steadily from the side, avoid rapid stroking, sudden manipulations, and restrictive restraint • Provide stable footing, non-slip surfaces, address pain promptly

Appendix F: Opportunities for Positive Social Contact in the Shelter

Type of social contact		References
Calm interactions with people	<p>Quiet time (e.g. time out of enclosure in an office)</p> <p>Petting, massage</p>	<p>Protopopova et al. 2018</p> <p>Hennessy 1998</p> <p>Shiverdecker et al. 2013</p> <p>Dudley et al. 2015</p> <p>McGowan et al. 2018</p> <p>Perry et al. 2020</p>
Active interactions with people	<p>Reading books</p> <p>Play with toys (e.g. fetch, tug)</p> <p>Walking, jogging</p> <p>Training using positive reinforcement</p>	<p>Tuozzi et al. 2021</p> <p>Coppola et al. 2006</p> <p>Shiverdecker et al. 2013</p> <p>Hunt et al. 2022</p> <p>Braun 2011</p> <p>Menor-Campos et al. 2011</p> <p>Laule 2003</p> <p>Thorn 2006</p> <p>Grant and Warrior 2017</p> <p>Kogan et al. 2017</p>
Interactions with members of the same species	<p>Group housing of compatible animals (see Facilities: Co-housing)</p> <p>Playgroups (dogs)</p>	<p>Belpedio et al. 2010</p>
Foster Care	<p>Overnight fostering (dogs)</p>	<p>Gunther et al. 2019</p> <p>Gunter et al. 2021</p>

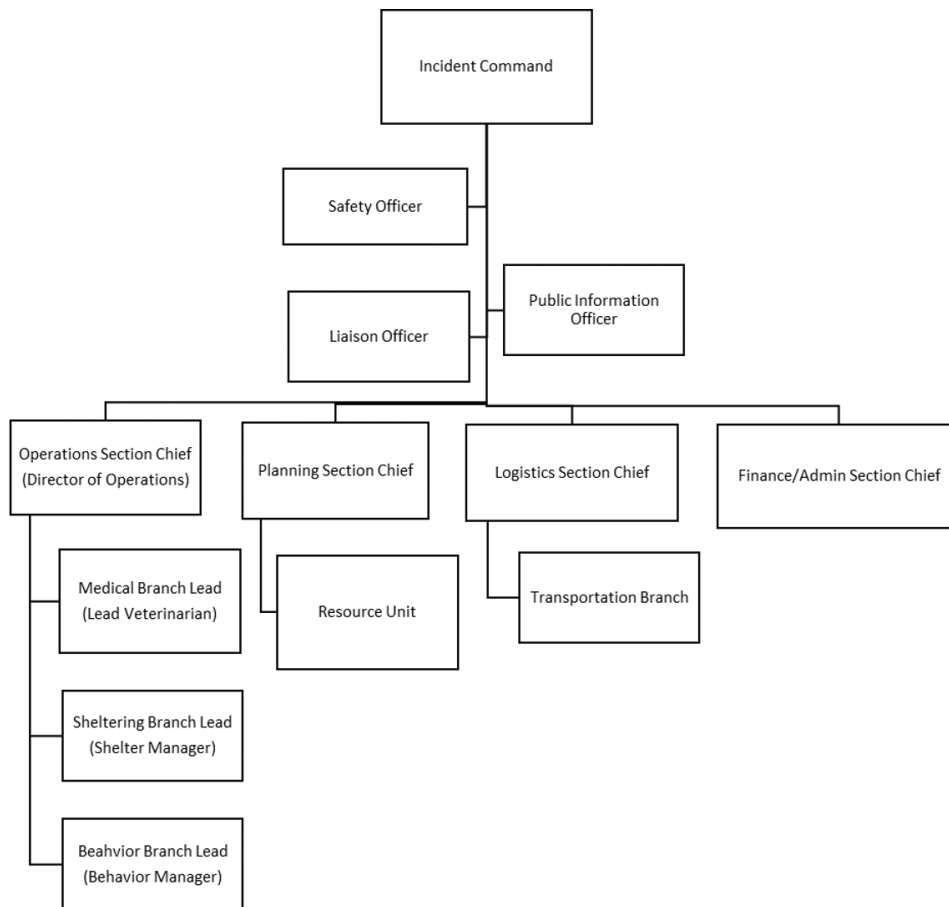
Appendix G: Ideas for Enrichment Within Shelter Enclosures

Type of enrichment	Examples	Additional considerations
Feeding	<p>Commercially available or home-made devices that provide mental stimulation by requiring animals to work to extract food such as food puzzle toys, cardboard boxes, or plastic cups (Griffin 2006, 2009a; Schipper 2008; Shepherdson 1993)</p>	<p>Provide to dogs individually because they are competitive eaters; can be given to cats housed singly or in amicable groups (Dantas et al. 2011)</p>
Scent	<p>Certain essential oils, food scents, prey odors, and catnip (Ellis and Wells 2010, Graham et al. 2005, Binks et al. 2018, Amaya et al. 2020, Murtagh et al. 2020)</p>	<p>Pheromone products without a comprehensive plan for stress reduction and enrichment are less likely to be effective (Janeczko 2022)</p>
Auditory	<p>Classical music, soft rock, reggae, nonmusical white noise, audiobooks, or (for cats) species-specific specially composed music (Kilcullen-Steiner and Mitchell 2001; Wells et al. 2002; Kogan et al. 2012; Snowdon et al. 2015; Bowman et al. 2015, 2017; Brayley and Montrose 2016; Hampton 2020)</p>	<p>Choice of sound type and volume is critical. Reducing excess noise from animal and non-animal sources may be more important than adding additional sound. Balance music preferences of animals and personnel to optimize benefits.</p>
Visual	<p>Windows overlooking natural environment</p> <p>Protected outdoor access</p> <p>Visual access to members of the same species</p> <p>Interesting stimuli such as aquariums or bubbles</p> <p>Videos</p>	<p>Enrichment videos may be less helpful for cats and dogs compared to other species, as they Dogs and cats do not seem to spend a significant amount of time looking at the screen and lose interest if the videos are played for extended (i.e. multiple hours) periods of time (Graham et al. 2005; Ellis and Wells 2007).</p>
Tactile	<p>Soft bedding</p> <p>Scratching posts</p> <p>Petting</p> <p>Massage</p>	

Appendix H: Disaster Response Resources

- Standards and Best Practices:
 - NASAAEP Animal Evacuation and Transportation
 - NASAAEP Disaster Veterinary Care: Best Practices
 - NASAAEP Emergency Animal Decontamination Best Practices
 - NASAAEP Emergency Animal Sheltering Best Practices
 - NASAAEP Animal Search and Rescue
 - FEMA Hazard Mitigation Planning
- Books
 - *Animals in Disasters*, Dick Green, ed. Elsevier, 2019
 - *Animal Management and Welfare in Natural Disasters*, James Sawyer & Gerardo Huertas, eds. Routledge: Taylor Francis Group, 2018
 - *Veterinary Disaster Response*, Wayne E. Wingfield & Sally B. Palmer, eds. Wiley Blackwell, 2009

Appendix I: Example ICS Chart for Animal Shelters



*Positions in parentheses are examples of typical shelter roles, with the corresponding operational ICS roles they may fill during a disaster. (See Disaster Response)

Appendix J: Resources for Workplace Safety

Organization		Area of concern	Website
CDC	Center for Disease Control and Prevention	-United States Health Protection Agency	http://www.cdc.gov
NIOSH	CDC's National Institute for Occupational Safety and Health	-Workplace Safety Guidance	https://www.cdc.gov/niosh/index.htm
OSHA	Occupational Safety and Health Administration	-Occupational Health Regulations	https://www.osha.gov/
EPA	Environmental Protection Agency	-Sanitizers and Disinfectants -Indoor Air Quality -Topical Pesticides -Wastewater control	https://www.epa.gov/
FDA	Food and Drug Administration	-Animal Food Safety -Animal Drugs -Medical Devices	https://www.fda.gov/
DEA	Drug Enforcement Administration	-Drug Disposal -Controlled Substances	https://www.dea.gov/
	State Health Departments and Departments of Agriculture	-Reportable Diseases -Animal Bites and Scratches -Animal Carcass Disposal	https://www.cdc.gov/publichealthgateway/healthdirectories/healthdepartments.html https://www.vetca.org/

Article

Solutions-Based Approach to Urban Cat Management—Case Studies of a One Welfare Approach to Urban Cat Management

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Simple Summary: When multiple urban free-roaming cats are being cared for by an owner or a cat caregiver, it often results in public complaints due to concerns about nuisance behaviors, their effect on wildlife, and human and pet health. The typical response from the authorities is to implement a cat management strategy based on trap–adopt or kill. Because the cats are often timid or shy, many are euthanized. This strategy is detrimental to the well-being of the people who care for urban cats, and is not effective at reducing the free-roaming cat population. This qualitative study aimed to explore the impacts of a free sterilization, microchipping, and vaccination program on the people who care for multiple urban free-roaming cats. Several main themes arose during the interviews. The results demonstrate the strong bond the participants had with the cats they cared for, and the positive impact the free sterilization program had on the cat carers' well-being and quality of life. It is recommended that this care-centered approach be used instead of current lethal cat management strategies, to improve the well-being of people and cats, reduce the free-roaming cat population, and minimize public complaints and cat impoundments.



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Abstract: Urban free-roaming cats create concern about their impacts on wildlife and human health, leading to the use of trap–adopt–kill methods to manage these populations. This method is ineffective at decreasing the free-roaming cat population and has a negative impact on cat caregivers' well-being. Using semi-structured interviews, this study explored the relationship that semi-owners (people who feed cats but do not perceive ownership) and owners of multiple cats have with the cats they care for, and the social and psychological impacts of an alternative assistive-centered approach to urban cat management. This approach to semi-owned and owned cats provided free sterilization and preventative healthcare. Our findings demonstrate that the caregivers had a strong emotional bond with the cats they cared for. The caregivers also experienced a positive impact on their quality of life, and indicated an improvement in the cats' welfare after having the cats sterilized through this program. Additionally, the cat caregivers indicated that they had a negative view of agencies, such as the municipal council. It is recommended that an assistive-centered approach to urban cat management be prioritized by local councils and welfare agencies to improve caregivers' quality of life and psychological well-being, whilst also improving cat welfare. The implementation of this assistive-centered management approach could improve the relationship between communities and the agencies involved, leading to the continuous reporting of free-roaming cats for sterilization. This assistive-centered approach has the potential to reduce the free-roaming cat population, their effects on wildlife, nuisance complaints, and council impoundments, and is aligned with the One Welfare philosophy.

Keywords: free-roaming cats; One Welfare; urban cat management; semi-owner; pound; shelter; euthanasia; sterilization; Australia

1. Introduction

Over the last 2000 years, free-roaming cats (*Felis catus*) have been actively transported to almost every part of the world as companions or for rodent control [1], and have successfully established themselves due to their high fecundity, versatile diet, and range of habitat [2]. A large population of free-roaming cats creates concerns about their effects on wildlife populations and human health and, in some cases, the cats' welfare [3–5]. In Australia, cats are categorized as feral or domestic, with feral cats having no reliance on humans, and living and reproducing in the wild, separate from humans [6–8]. Domestic cats live in the vicinity of humans and depend wholly or partially on humans for survival. Free-roaming cats in urban and peri-urban areas and around farm buildings are domestic cats, and are either owned, semi-owned (fed by one or more people who do not perceive ownership), or unowned (obtain food from humans unintentionally). If unidentified with a microchip or collar and tag, they are considered stray cats [6–8]. In Australia, fears of wildlife predation and complaints about nuisance behaviors, such as urinating, defecating, and the noise caused by fighting, often take priority over cats' welfare [2,9,10]. This has led to a focus on lethal enforcement-centered management. The standard management strategy in Australia is trap–adopt–kill, whereby free-roaming cats are trapped, held for a mandated holding period (usually 3–8 days) and, if not reclaimed by the owner, the socialized cats are adopted or transferred to a rehoming organization and the remainder are euthanized [11]. Stressed or fearful cats that appear timid, shy, aggressive, or unfriendly are frequently deemed feral and are euthanized without being given time to acclimate to the shelter environment, which may take eight or more days [12,13]. Applying the word feral to free-roaming domestic cat populations happens regularly and is problematic, as it makes lethal management methods more palatable by devaluing the cat's life. This implies that these animals can be treated differently from those that are deemed to be pets [14]. This trap–adopt–kill management leads to the unnecessary euthanasia of healthy and treatable cats and kittens. In Australia, from 2018 to 2019, 33% of the cats that entered shelters and municipal animal facilities were euthanized [15].

1.1. Effects of Enforcement-Centered Management on Human Well-Being

Shelter staff performing the euthanasia of healthy and treatable animals experience negative psychological impacts and higher rates of suicide [16–18]. Shelter employees are five times more likely to show symptoms of post-traumatic stress disorder than the US national average [18], providing further evidence that lethal enforcement-centered management has detrimental physical and psychological effects on human well-being [16]. Recently, the negative impact of lethal enforcement-centered management on cat semi-owners (cat caregivers) has been documented [19]. Semi-owners are people who feed or provide care for cats, but do not perceive that they own them, and are also referred to as cat caregivers [6,20]. Cat semi-owners feel sympathy and affection for stray cats [21], suggesting that they are compassionate people who care for cats with the intention of improving the cats' welfare. These semi-owners have been shown to have similar levels of attachment to the cats they care for as owners do for their pets [22]. Additionally, semi-owners give their time and money to care for these cats, typically providing food once or twice a day, and health care when necessary [23]. At the Port of Newcastle in New South Wales, Australia, cats that had been cared for by semi-owners for up to 18 years were culled by shooting [19]. The semi-owners described the immediate impact of the cull as "traumatic" and "horrific". The long-term impact on the semi-owners' well-being was evident 12 months after the cull, with some having to take a leave from work and others being unable to eat normally due to the stress [19]. Many cat semi-owners have a distrust of authorities regarding the management of stray cats, due to concerns that the cats will be killed [19,24]. This distrust, and other issues like cost [25], create barriers for cat semi-owners to access support, such as sterilization. These barriers may be the reason that semi-owned cats are less likely to be sterilized and more likely to have a litter of kittens than owned cats [26].

1.2. Public Opinion

Due to concerns over the euthanasia of healthy animals, lethal management strategies have failed to gain public support [9]. In New Zealand, only 23% of survey respondents supported lethal management strategies [27]. Similarly, in Brisbane, only 28% of respondents supported the lethal management of urban stray cat populations; this number decreased further (18%) when respondents were given information about non-lethal alternatives [9]. These studies highlight the need to move towards non-lethal alternatives. In countries which have similar attitudes towards companion animals, assistive-centered management strategies are favored by the public, with 90% of survey respondents in Ontario, Canada, supporting responsible pet ownership education, and 86% favoring low-cost spay/neuter programs [28].

1.3. Effectiveness of the Current Management Strategy and a One Welfare Alternative

One Welfare is a philosophy which describes the links between animal welfare, human welfare, and environmental conservation and sustainability [29,30]. The current lethal enforcement-centered management strategy is ineffective in the long term at reducing the free-roaming cat population in cities and towns, is not cost-effective, and is unacceptable to a large portion of people [31,32]. This suggests that this management strategy is ineffective at reducing the impact that free-roaming cats have on wildlife and the environment, and is costly to the municipal pounds and shelters that implement this strategy. Additionally, this management strategy has a negative impact on the psychological well-being of shelter workers and cat semi-owners [16–19]. Therefore, lethal enforcement-centered management fails to encompass a One Welfare approach, and instead results in negative impacts on people, animals, and the environment. In contrast, an assistive-centered management strategy, which aims to help owners and semi-owners care for their animals and is based on the sterilization of free-roaming cats, acknowledges the mutual dependency of animals, humans, and the environment, and has been documented to reduce shelter intake and euthanasia [33]. Moreover, community-based trap–neuter–return (TNR) has been shown to lower cat intake and euthanasia at shelters and municipal pounds by reducing the number of kittens born. Return-to-field (RTF), where cats in shelters and pounds that cannot be readily adopted are sterilized, ear-tipped, and returned to the location where they were found by animal shelters, decreases the euthanasia of timid and shy cats [25,34,35]. Supporting cat semi-owners in caring for cats through assistive-centered management could improve the welfare of semi-owners and the cats they care for. Additionally, this strategy could help to decrease the environmental impact cats have, by reducing their numbers through preventing kittens being born [31,36]. Assistive-centered cat management is aligned with a One Welfare approach, which aims to balance and optimize the well-being of people and animals, whilst also protecting wildlife and the environment.

1.4. Gaps and Aims

Whilst the negative psychological impact of lethal enforcement-centered urban cat management on semi-owners has been documented [19], the positive impacts of an assistive-centered urban cat management strategy on semi-owners' mental well-being have yet to be investigated. People caring for multiple cats were selected for this study because the authorities frequently use lethal enforcement-centered management in an attempt to mitigate cat-related issues [37]. This involves the repeated trapping and removal of cats, which are typically euthanized because they are often timid and shy, and are frequently deemed "feral" if they show normal fearful behaviors, such as growling, striking, or hissing shortly after trapping. Domestic cats can require, on average, anywhere between 5 days and 5 weeks to acclimatize to a new environment and stop showing fearful behaviors [38]. Fines and even jail sentences may be given for feeding stray cats [37]. Less frequently, when multiple cats are being cared for on public property, other lethal methods, such as shooting, are employed [19].

This study aimed to use qualitative methodology to investigate, firstly, the relationship between semi-owners caring for multiple cats and the cats they care for. Secondly, we aimed to investigate the perceived impacts on cat caregivers prior to and after the implementation of an assistive-centered program based on free sterilization, microchipping, and preventative veterinary care for their cats. Specifically, we aimed to investigate the perceived impacts on cat caregivers' quality of life, cat welfare, nuisance behaviors, support from agencies, and social capital (social relations that produce individual and collective benefits [39]). Thirdly, we aimed to investigate what caregivers thought might have happened if they had not received this assistance.

If an assistive-centered approach to cat management is documented to be beneficial to cat semi-owners' psychological well-being and quality of life, it would provide further evidence to local governments and welfare agencies of the beneficial impacts of alternative urban cat management strategies.

2. Materials and Methods

2.1. Research Design

This study used a phenomenological approach to understand and explore the lived experience of people who have had the cats they care for sterilized through a Community Cat Program. In this program, cats being cared for by cat caregivers (semi-owners) and owners were provided with free sterilization, microchipping, vaccination, endo- and ectoparasite control, and veterinary care for the issues affecting the welfare of their cats. The program is an initiative of the Australian Pet Welfare Foundation in collaboration with the Royal Society for Prevention of Cruelty to Animals (RSPCA) Queensland, and the Animal Welfare League Queensland, with funding and in-kind support from multiple organizations, including the Fondation Brigitte Bardot for sterilizations and MSD Animal Health for vaccinations and parasite control. The cats that were not owned were desexed, microchipped, and ear-tipped as Restricted Matter (approved by the Queensland Government under a Department of Agriculture and Fisheries Scientific Research Permit No. PRID000825). Animal Ethics Approval (Permit Number 2019/AE000207) from the University of Queensland's Research Ethics and Integrity Unit covered the cats in this study. For the semi-owned cats, when there was no owner registered on the microchip, the cat was registered as <suburb name> Community Cat, with the Australian Pet Welfare Foundation phone number listed as the secondary contact.

A phenomenological approach allows the researcher to understand a phenomenon from the perspective of the people involved [40]. "The phenomenon dictates the method (not vice-versa) including even the type of participants" [41] (p. 294). Thus, this is an appropriate methodological approach with which to investigate the thoughts and feelings of cat semi-owners regarding an assistive-centered cat management strategy. The population of this study were semi-owners and owners caring for multiple cats located in the city of Ipswich, Queensland. Semi-structured interviews were conducted by the first author (CC) and were used to enable a deeper understanding of the social and psychological outcomes of assistive-centered cat management on cat semi-owners.

2.2. Participants

Due to the nature of this study, the participants were recruited through a targeted process, whereby owners and semi-owners caring for multiple cats who had had their cats sterilized through the Community Cat Program were approached to participate in this study. The participants were all over the age of 18, residents of Ipswich City, and were recruited via phone and email. Their contact details were obtained via the Community Liaison Officer for the Community Cat Program and the Cat Assistance Team (C.A.T) Coordinator. A total of 12 participants were recruited, with 10 interviews taking place between 9 June 2023 and 20 July 2023. One interview was excluded for not meeting the criteria of caring for multiple cats. Four participants were interviewed during two of the interviews; the remaining interviews only had one participant. Of the interviews used for

analysis, seven of the participants identified as female and the remaining four identified as male; 10 of the participants were estimated to be in middle-to-late adulthood, with one participant estimated to be in early adulthood. One of the interviews was conducted on a farm, one interview was conducted at a business, and the remaining interviews were at private residences. At the time of the interviews, the participants were caring for between 3 and 16 cats, with a median of 7 cats. Of these, three households had taken ownership of the cats (4–7 cats), five did not own the cats they cared for (3–16 cats), and one had a mix of owned (4 cats) and unowned cats (3 cats).

2.3. Data Collection

Ethics approval was obtained from the University of Queensland Human Ethics Committee (2023/HE000587) before beginning this study. This study used purposive sampling [42] to reach the owners and semi-owners who cared for multiple cats and had had their cats sterilized through the Community Cat Program. Potential participants were contacted via phone and email and invited to participate in this study. Once the participants indicated interest in taking part, they were provided with a participant information sheet (PIS) and a consent form via email, or as a printed document. The PIS informed the individuals that participation in this study was voluntary, they did not have to answer any questions they did not feel comfortable with, and they could withdraw from the study at any time. The participants were also informed that any information they provided was confidential, and any information that would disclose their identity would not be published without their consent. The PIS also indicated that during the interview, participants could be asked to discuss uncomfortable memories, and the contact information for three different counselling support lines was provided in case the participants should require any assistance or emotional support.

The data were collected using semi-structured in-depth interviews. The interviews were conducted in person and voice recorded using an Olympus Voice Recorder VN-541PC. Before beginning the interviews, the participants were read the PIS and given the consent form to sign. The interviews lasted between 38 min and 83 min (average 55 min). The questions focused on the participants' relationships with the cats they cared for, their experience before receiving support from the Community Cat Program, their experience after receiving support from the Community Cat Program, and what they thought would have happened if they had not received support from the Community Cat Program. Once all the interviews were completed, eight were transcribed by the first author (CC) and two, which had multiple interviewees, were transcribed by a professional transcription service (Pacific Transcription Pty Ltd., Brisbane, Australia). The recordings and transcripts were kept private and were saved in secure password-protected files at the Australian Pet Welfare Foundation. The transcripts were then analyzed using thematic analysis to search for recurring words or units of meaning and organized into groups and themes [43]. This was performed by coding the transcripts and organizing these into corresponding themes. The interpretation of the data was then discussed amongst the research team until a consensus was reached. All the human names were omitted, and the cat names were changed during the write-up of the results to maintain the confidentiality and privacy of participants.

3. Results

Several main themes and sub-themes were extracted from the interview transcripts as a result of the thematic analysis. These themes and sub-themes are discussed in the following results section and have been tabulated with context examples (see Table 1).

Table 1. Major themes and sub-themes with context examples from interview transcripts.

Theme	Sub-Themes	Context Examples
Relationships with Cats	<ul style="list-style-type: none"> • Strong bond • Calming/joy • Investment • Responsibility 	<p>"We'd never be without them."</p> <p>"They're very calming, you know, it's really nice and they love being stroked."</p> <p>"So, we had to buy (...) a big pen, and they sleep in there." "If I don't feed them, nobody else is gonna feed them."</p>
Without the Community Cat Program	<ul style="list-style-type: none"> • Surrender cats • Sad/devastated 	<p>"Yeah, I would have had to surrender them."</p> <p>"Yeah, I was gonna take them all down to the pound."</p> <p>"They probably would have been put down, you know, and that would have made me really sad, really."</p>
Before the Community Cat Program		
Human Quality of Life	<ul style="list-style-type: none"> • Strains on social relationships • Powerlessness and lack of knowledge • Worried 	<p>"Neighbours used to throw letters and that over the fence, [saying] do something with your cats (they weren't my cats)."</p> <p>"I was worried about having repeated unwanted litters. Not knowing how to deal with the fact that there are all these stray cats hanging around."</p> <p>"I was worried about how much it would be to desex like 20 cats."</p> <p>"I couldn't afford desexing or the microchipping in the position that I was in."</p>
Nuisance Behaviors	<ul style="list-style-type: none"> • Noise • Defecation • Unwanted litters 	<p>"[There] used to be a lot of strays [that] used to come round here and used to annoy me (...) it kept me awake during the night."</p> <p>"Biscuit would (...) terrorize everyone, he would force himself I suppose onto the females, and it was just a lot of fighting, a lot of fighting."</p> <p>"They were just defecating everywhere and it was not pleasant. Yeah, it didn't smell nice either."</p> <p>"I thought, no, it's just not good. It's not fair on them for having so many litters. It's not fair on them and it's not fair on us."</p>
Cat Welfare	<ul style="list-style-type: none"> • Poor condition • Injuries • Lack of play • Concern for safety 	<p>"She looked really skinny. So, we were concerned for her."</p> <p>". . .he was pathetically skinny."</p> <p>"They used to fight. (...) One or two of them would come back with just a heap of hair missing or whatever."</p> <p>". . .their hair had looked like they weren't cleaning themselves properly. I think they probably were too stressed."</p>
Perception of Authorities	<ul style="list-style-type: none"> • Lack of support • Negative interactions • Fear of outcome for cats 	<p>"We kept asking for help, and there was just nobody there to help."</p> <p>"I never took anything back once I found out what they [the Council] do. Healthy cats, they're just put to sleep, and I thought, no."</p> <p>"I suppose I was a bit wary of Council."</p> <p>"[I] strongly suspected that if Council took the animals, their outcomes probably wouldn't be great."</p>

Table 1. Cont.

Theme	Sub-Themes	Context Examples
After the Community Cat Program		
Human Quality of Life	<ul style="list-style-type: none"> • Less worried • Fulfilment and satisfaction • Pride and empowerment • Improved relationship with cats 	<p>“Just for me, just getting it done knowing that my cats are safe is. . . is great.”</p> <p>“Yeah, we’re all getting sleep like the cats aren’t overwhelming us.”</p> <p>“It feels really good to see her do that. (. . .) Now she wants to play with us and chase us around the yard.”</p> <p>“We enjoy showing them to people. We can show them to people, and we were never ashamed of them, but now, we definitely aren’t ashamed.”</p>
Social Capital	<ul style="list-style-type: none"> • Improved social connections • Community engagement 	<p>“I know there is a community that I can go to if something’s wrong or if I need help with them [the cats].”</p> <p>“ . . .now that they’re desexed and microchipped, [my friend is] so much more, you know, chill with [accepting] them.”</p> <p>“All the ones that I’ve rehomed, I’ve always connected them in with the cat team and RSPCA so they’ve [the new owners] all done the responsible thing too and gotten them desexed.”</p> <p>“I started thinking, well, maybe there’s other cats out there that I could trap, work with, get desexed.”</p>
Improved Cat Welfare	<ul style="list-style-type: none"> • Improved health • Play behaviors 	<p>“If you see those cats now, the mother cats, they are in such good condition. I cannot get over it.”</p> <p>“But since it’s all been sorted, Poppy now has the zoomies of an afternoon (. . .) like she’s playing, and we’ve never seen her play.”</p>
Perception of the Community Cat Program	<ul style="list-style-type: none"> • Supported • Educated • Flexibility and ease • Trust 	<p>“I know they’re the ones to go to now [Community Cat Program team], because they are the ones that will support me through it. So, they’re pretty much the only ones I refer to now.”</p> <p>“There was somewhere I could go to get the help, that it wasn’t going to bankrupt me.”</p> <p>“I feel a lot of gratitude to the program for. . . for the support and for helping. . . I suppose for educating.”</p>

3.1. Relationship with Cats

The semi-owners and owners (caregivers) indicated that they cared deeply for the cats they were feeding and had strong emotional bonds with them. When asked to discuss their relationship with the cats, the interviewees described the cats as part of the family and likened them to having children. They used words such as “love” and “my babies”. The majority of cat caregivers saw the cats as their cats, even if they did not take official ownership. The human–animal bond is illustrated in the quotes below:

“I love them. I love them, and he loves his cats, you know.”

“I wouldn’t be without them.”

“They are the reason, I get up.”

“They’re my babies, sort of like they’re my kids.”

Additionally, several responses showed that the cats had a positive effect on the caregivers' well-being. The caregivers described the cats as calming, discussed finding comfort in the cats' presence when feeling unwell, and finding joy in talking about the cats with other people. This positive impact on the carers mental well-being is described in the caregivers' own words below:

"I get joy from hanging out with them, and sometimes particularly if I feel unwell, (...) we'll have a pat and that helps."

"[If] I was having a bad day and if I was to talk about them my moods just lifted. (...) I know if I'm really down, I'll actually come out here and cuddle them..."

Whilst all the caregivers were providing food for the cats, many of the caregivers were also spending a significant amount of money on caring for the cats, by buying materials with which to build outdoor enclosures, providing veterinary care to treat injuries and illnesses, and some buying cameras to monitor the cats' welfare. These purchases were all made despite the participants living in low-income suburbs. This investment is shown in the excerpts below:

"I've probably spent. . . I think I stopped calculating at about 1600 [AUD], with the crate, the traps, the security cameras, the palace, the fairy lights for the palace, the toys, and that doesn't include the food or the kitty litter."

"He's been on antibiotics, and we spent about AU \$3000 on him for the hospital."

Some of the cat caregivers also indicated that they felt a sense of responsibility or duty to the cats and the overall situation surrounding issues with the free-roaming cat population, with some mentioning that they wanted to do "the right thing". This is shown by their responses during the interview in the excerpts below:

"They're here, somebody's gotta do something about it (. . .) So I guess we just took on the responsibility of how do we sort these cats out."

"Even if I don't have that ownership, it's like a bit of a duty to them."

3.2. Before the Community Cat Program

The participants were asked several questions about their situation before becoming involved with the Community Cat Program. The analysis of the responses to these questions revealed four main themes.

3.2.1. Human Quality of Life

When given the opportunity to talk about the issues the cat caregivers had before receiving support from the Community Cat Program, the responses suggested a lower level of quality of life. The responses indicated strains on their social relationships, feelings of powerlessness, and a lack of knowledge on how to best deal with all of the cat-related issues. As well as this, the caregivers indicated two further themes which are linked to human quality of life: worries about cat welfare and cost, and cat nuisance behaviors.

The strains put on social relationships, the feelings of powerlessness, and the lack of knowledge are shown through quotes from the transcripts:

"Having so many cats in the yard, it did start affecting my husband and my relationship a little bit. (...) We kind of had a few little tiffs about how to manage it."

"That sense, not quite hopelessness, but (...) this sense that there's a problem and not feeling that I had the power to do something about it."

"So, yeah, because I didn't know who to turn to before. I thought, well, I'm not going back there [the pound], and if they come here again and I'm going to get a fine. It was very, very stressful. Yeah. I mean, our health isn't the best, so, I mean, we didn't want that extra stress."

Caring for the cats often led to worries about the cost of caring for them, and many of the participants indicated that they could not afford veterinary care, such as desexing, in addition to the cost of feeding the cats. This is articulated in the participants' own words below:

"It was costing us a fortune, it was getting too much."

"...by the time I took him down for desexing they went his eye needs to come out (...) I was at that point going shit I'm going to have to surrender him because I can't afford eye surgery on the cat (...) [the Community Cat Program] were very good, they put him through and got his eye sorted for us."

"Couldn't afford the veterinary care. Yeah, yeah. No way. Everyone [veterinarians] around here, the general quote was 350 to 400 dollars to get a female desexed, the males were about 280 to 300 and considering there were so many, there was no way I could do that. So, I just couldn't afford that, and feed them all at the same time."

3.2.2. Nuisance Behaviors

Problems arising from cat nuisance behaviors were a strong theme in several of the interviews, with words such as "noise", "feces", and "unwanted litters", frequently mentioned. These nuisance behaviors often led to a decrease in quality of life, as they affected the caregivers' environment, sleep habits, and created worries about the health implications. The nuisance behaviors and their impacts are relayed in the caregivers' own words:

"I mean they spray, and they poop, and they smell, (...) you're doing something [at home] and then all of a sudden there's a whole lot of cat poop on you."

"...they have fights at night, and that sets off our dog."

"It was very destructive to the property. Like my daughter couldn't really play outside without stepping in something. (...) You couldn't really walk barefoot anywhere [because] like there's a health implication with so much feces around."

"We did have a flea problem at one stage."

3.2.3. Cat Welfare

The interview data suggested that the welfare of the cats being cared for was poor before receiving support from the Community Cat Program. The cat caregivers discussed the poor condition the cats were in, the injuries they had, and that the cats did not show play behaviors. These indicators of poor welfare are evidenced in the following quotes:

"They were skinny and their stomachs were shrunk in, and they looked—you know, like they were tired."

"It made me upset, the fact that I could hear them fighting and when they got desexed and brought back, they actually told us that they had a lot of scarring because of the fighting..."

"She doesn't know how to play with toys, she's never had toys. Like I bring out toys and she gets scared whereas the kittens [are] going nuts. She doesn't know how to play with other cats."

The caregivers also expressed concern about the safety of the cats before receiving support from the Community Cat Program. These concerns generally motivated them to start caring for the cats. This is shown in the quotes below:

"The kittens could have been killed by the dogs getting into the wrong yard, run over by cars. (...) It's just about them getting hurt and being hungry and not being loved and out in the weather, out in the cold."

“We have not so nice neighbors in the junkyard, (. . .) we were very concerned that if he got his hands on any of them, the cats wouldn’t live.”

3.2.4. Perception of Support from Agencies

When asked about whether they had reached out for support before engaging with the Community Cat Program, the semi-owners and owners indicated three main sub-themes: a perceived lack of support from the authorities, negative interactions with the authorities, and a fear for the outcomes of the cats. These are demonstrated in the quotes below:

“It was more like, can we get some traps? Can we get some help with this? And they [the council] were just like they were so blasé about it. They didn’t really care, and they didn’t understand just how bad the problem was.”

“I didn’t know what my chances were, after that conversation with the council, what my chances were of catching them, how hard it would be. I suppose it still felt out of my grasp to do something.”

The semi-owners who dealt closely with the council regarding complaints relayed that they had had negative interactions with the authorities, and that these had led to feelings of anger and fear. The following excerpts provide more context:

“I was worried. I was petrified, actually, that I was going to get fined and all this carry on. She [the council] said, well, when I come back here and I see you feeding them again, she said, I will get rid of all your cats. (. . .) I felt really angry.”

“Because I used to dread when I came home on an afternoon, and I would be looking for a van out there. I thought, oh, no. It just got to me, you know, that every time I pull up over here, they’ll [the council] be waiting for me.”

“The council says, oh, can you go up and touch them? I said, I can. I said, they come to us, but strangers? No. They’re feral, she said, they’re feral. I said, they are not feral. I can go out there now and I can run my hand right down the backs of them. I thought, why is she calling them feral?”

Several of the interview participants spoke about how they did not want to engage with the authorities and worried about nuisance complaints from neighbors, as they believed that the cats would be taken away and euthanized. The quotes below provide some insight into the participants’ perception of the outcomes for the cats:

“I don’t want to engage the Council until yeah, I . . . I know the answers to those questions, because if they turn around and say, well, you’ve got too many cats, you gotta get rid of them, then what do I do? Yeah, it’s my fault then. (. . .) [They say] so you’ve gotta get rid of them, and they’ve gotta go to the RSPCA, and then my worst nightmare happens, that Molly gets put down because she’s antisocial.”

“I was just really worried that they were going to go to sleep [euthanized] and not be in my backyard.”

“I didn’t want them [the council] to take my cats away.”

“I don’t want them to have a bad ending, yeah, through a council process, I suppose.”

3.3. After the Community Cat Program

The semi-owners and owners were asked a series of questions to explore their experience after receiving support from the Community Cat Program. The analysis of the responses to these questions extracted four main themes, which are shown in the following paragraphs.

3.3.1. Human Quality of Life

The cat caregivers’ responses appeared indicative of an improvement in their quality of life after receiving support from the program. Specifically, they explained that they felt

less worried, more empowered, had an improved relationship with their cats, and felt a sense of pride and fulfilment. Additionally, the theme of social capital was found during the analysis of the transcripts, which is strongly associated with quality of life.

The caregivers discussed that after receiving support from the program they felt less worried about several things: fighting, unwanted litters, the cats being removed by the council, and their own health and well-being. Words and phrases, such as “less stressful”, “less concerned”, and “relieved” were used in the responses. The carers’ thoughts and feelings are given more context in the following extracts:

“We can sit out the back and lay in the grass and they can cuddle up with us. So, we don’t have to worry about getting sick doing that.”

“I feel really good. Yep. Really good. I feel less stressful, I should say.”

“[I’m] relieved (. . .) because I know they can’t have babies anymore and they can’t get pregnant mothers anymore.”

“I don’t have to worry about them [the council] coming. (. . .) Not having the worry of coming home and they’re gone and just yeah, overall, happy.”

The participants also suggested a feeling of fulfilment and satisfaction through their caring for the cats after receiving support from the program. This sense of fulfilment generally came from seeing the change in the cats’ circumstances and welfare, and being the person who facilitated that change. This is evidenced in the quotes below:

“It’s really satisfying and brings a lot of joy to see that transformation in an animal.”

“These things [the cats] are so spoiled, so loved, and it’s like it’s nice to know that I played a part in that.”

“It makes me happy. Yeah, I know I’ve made a difference here.”

“. . . it’s really satisfying to see him get well to the point where he can play and he’s got that energy and a little bit of joy in life actually, that certainly wasn’t there [before].”

“I’m really happy and satisfied that I was able to provide somewhere safe for them.”

The caregivers further revealed they had a sense of pride given the outcome of the cats, and a feeling of empowerment now they had the knowledge and resources to act in the best interests of the cats. These feelings are explored in the quotes below:

“Yeah, I love looking at them now. I thought, oh, all that hard work and now they’re looking really good.”

“It’s helped to take that intent to do the right thing and turn it into some sort of an action because I feel like I can, yeah.”

“It’s made it easier for us to make a difference, not just in the cat’s lives, but in the community too.”

“Just simply having some knowledge was empowering.”

Some of the caregivers also explained that they had experienced an improvement in their relationships with the cats after they had been sterilized, as the cats had become more friendly, calmer, and more willing to have contact with the caregivers. This improvement in the human–animal bond is shown in the following quotes:

“The relationship has got better since they were desexed because before we couldn’t get near them.”

“So yeah, they just get a lot more friendly. (. . .) Yeah, it feels good that you can actually get beside them and give them a bit of a pat.”

“. . . the bond with them wouldn’t have grown into what it is without having them desexed.”

3.3.2. Social Capital

When given the opportunity to talk about the semi-owners' and owners' experiences after receiving support from the Community Cat Program, the theme of social capital arose. The interview data suggested an improvement in social capital, which is linked to quality of life, through two main sub-themes: social connections and community engagement. The cat caregivers indicated an improvement in their social connections after having the cats sterilized through the program, and discussed feeling that they had a support network that they could rely on if they needed help. This perception of social connectedness is shown in the following excerpts:

"It gave us something to talk about quite a lot. Yeah. Yeah, because there was that common interest between us."

"... probably a bit of marriage help too, because the Community Cat Program was there, I wasn't turning to my husband and saying, OK, I need AU \$100 per cat, you know, I need AU \$1000 to go and desex these things and there would have been arguments and stuff like that."

"I know that, through the local resident's association, that there are people who are right behind the program. So, well, even if the program ended, there are some people who self-identified that I could reach out to if I needed."

The analysis of the interview data suggested that the cat caregivers were participating in community engagement, specifically by recommending the Community Cat Program, after receiving support from the program themselves. Some of the caregivers discussed that they were planning to actively engage with their local neighborhoods to trap and sterilize stray cats with the support of the program. The following quotes give context to this:

"... I make sure that I say, oh, there's this program that, you know, looks after community cats and stray cats, and you can get your cat desexed if you live in these areas and stuff like that. So, I make sure I get it out there."

"[I was walking past] the front of our back neighbor's property, there was a little cat and [I'm] like, oh, I haven't seen that cat before you know, and I'm [wondering] what's going on and then my partner happened to bump into her [the neighbor] down at the shops and she happened to mention there's these strays. And then I gave her a call and I'm like, hey, do you wanna trap and things?"

"I was thinking the other day of just doing a letterbox drop around to say like do you have a stray cat? (...) Are you aware of stray cats or anything like that? Get in contact with me, I've got the facilities where I can come and get them desexed and see if we can rehome them."

3.3.3. Improved Cat Welfare

When asked about the welfare of the cats after receiving support from the program, the responses from the caregivers suggested an improvement in the cats' welfare. Specifically, an improvement in their general health was discussed, as well as the fact that the cats now displayed play behaviors. These indicators of improved health and welfare are evidenced by the quotes below:

"They [the cats] are more settled, they're more relaxed, and I think it's better for them, actually. (...) They have put on weight and they look really nice. You run your hand on them and they feel like velvet."

"They [the cats] weren't bad before, but in comparison, the condition is very, very good now and (...) their health is actually really good for what they eat, yeah."

"Now they're [the cats] just playing all of the time, running around all of the time and it's... it's really good to see that. It's sort of like they're enjoying their life a bit more."

3.3.4. Perception of the Community Cat Program

When given the opportunity to discuss their experiences and perceptions of the Community Cat Program, the caregivers described having positive experiences with the program, which were articulated through four main sub-themes: feeling supported, educated, the program being flexible and easy to engage with, and having trust in the outcomes for the cats. Those who had previously reached out or had interactions with the council also compared their experience to that with the Community Cat Program, indicating having had a more positive experience with the Community Cat Program. Evidence of this is provided in the following excerpts:

“I feel more confident with the situation and partly because the program gave me sort of information and insights about it, but also feeling that there’s some support, which is a level of support that I certainly didn’t feel from council.”

“[The Community Cat Program has] allowed us to make a difference and having that support under [us] has meant that I can now think of what else I can do in the community to help.”

“... just having somebody there to support you and understand why you’re doing it and also helping you try and achieve a better situation for them [the cats]. It’s really good.”

Additionally, the cat caregivers suggested that they felt educated by the Community Cat Program, gained knowledge on how to handle cat-related situations, and were given an awareness of where to go if they had questions regarding the cats. The caregivers described this in their own words in the quotes below:

“I suppose having a greater awareness of the presence of shelters and rescues around the place, who I might be able to call upon, even if it’s just for advice.”

“[The Community Cat Program’s Community Liaison Officer] is just there to help. (...) Because she explains things to you, and if I ask her a question she answers it. That’s all you need.”

The flexibility and ease of the program was discussed by the cat caregivers, suggesting that the flexibility of the program gave those who could not miss work the ability to have their cats sterilized. As such, the caregivers perceived the program to be easy to engage in, with members of the Community Cat team appearing to build a good rapport with the caregivers. This sub-theme is given more context in the following quotes:

“The ease of the program was fantastic and that was one of the big things that we thought was just great because we’re busy enough. Just all the little things like with [the Community Cat team] being able to come out here and pick up these cats and take them and deal with them and deliver them back (...) So that was—to us, that was probably a big thing too because our time is money as well.”

“I could go to work, knowing that the cats are being picked up and they’re being taken care of, and then I’d come home and they’d be here and or I just need to set up a trap and just wait. So it was, it was really easy.”

The cat caregivers indicated that they trusted the Community Cat Program and that the outcomes for the cats and the caregivers were going to be positive. Additionally, the knowledge that healthy cats were not going to be euthanized appeared to help build this trust, as evidenced in the quotes below:

“I trust them [the Community Cat Program] heaps more, oh, yes. I have no problems. Because I know they’re going to do what’s best for the cat and what’s best for me, and—I trust them.”

“What I liked, was that yeah, she wasn’t going to be killed just because she was wasn’t able to be found a home.”

3.4. Without Support from the Community Cat Program

The cat caregivers were asked during the interviews what they would have done if they had not received support from the Community Cat Program. The responses to these questions revealed that several of the caregivers would have surrendered the cats to the authorities, with some assuming negative outcomes for the cats. The caregivers used words like “devastated” and “sad” when describing how they felt about surrendering the cats. The perception of what may have happened without assistance from the Community Cat Program is shown through the following quotes:

“Well, we would have to end up taking them to the council.”

“If the program hadn’t have been here, (. . .) I suspect I might have ended up dumping them with Council and they, I assume, therefore they [the cats] would need to pass health checks and behavioral checks and find an owner within a couple of days, before they’re killed so. . . Um which isn’t a great outcome for them”

“If I haven’t got them desexed, and it kept continuing that my own cats were attacking me, I would have to give them up to protect myself and my cats. (. . .) I would have been devastated, the fact that I wasn’t able to provide basically a home for them, (. . .) it would have broken me to have to give them up.”

3.5. Impact on Rural Participants

One interview was conducted with two participants who worked and lived on a farm, and some of the responses from their interview differed from those living in urban areas. We believe that these are important to report, and the farmers’ relationship with the cats and the impact of the Community Cat Program on the farmers are shown in the following section.

The results from the thematic analysis indicate that the farmers viewed the cats they cared for as working animals. They discussed having a problem with rodents, which had improved with the presence of the cats. This made the cats extremely important to the caregivers, and is described in their own words below:

“We never ever have to rejoin a wire and basically that was most of what the technician was doing, was just coming back finding cut wires that had been chewed by the rats and mice and—so yeah, they’re a pretty important. We definitely don’t intend to get rid of them.”

“Like our dad came here nearly 70 years ago—there would have been rats and mice in the haysheds and in the sheds but now we don’t see any. We don’t even see a mouse.”

The reduction in rodent problems reduced financial worries for the farmers by saving money from hiring electrical technicians and buying rodent poison. This is shown in the quotes below:

“A couple hundred dollars a year worth of saving by not using [rodent] bait stations and stuff like that.”

“So, in that, it probably has a financial saving of somewhere between AU\$3000 and AU\$4000 a year [for technician time to fix wiring].”

The farmers stated that without the Community Cat Program, they would not have been able to afford sterilization, and would have had to cull the cats to keep the numbers under control, which they indicated they did not feel positively about. This is shown in the excerpts below:

“The greatest benefit to us was because we’re struggling dairy farmers, we didn’t have to pay to get it done and that was—yeah, that was great—that was the big thing—and, to tell you the truth, in the situation that we were in, especially at that time, we wouldn’t have even given it a thought because we couldn’t afford it.”

“It could well have got to that point where we might have had to cull them or something (...) it wouldn’t have been a real good option.”

“We would have had to cull them somehow, I’d say. (...) We had to put down animals in the droughts, so we don’t really want to do it, if we don’t have to.”

4. Discussion

We conducted a qualitative analysis of the interviews with people who were caring for multiple cats, with the aim of exploring their relationship with the cats and the impact of an assistive-centered management strategy on the caregivers’ psychological well-being and quality of life. The key findings of our research are the strength of the bond between the caregivers and the cats they cared for, and the positive impacts of an assistive-centered management strategy on the cats’ nuisance behaviors, the caregivers’ quality of life and social capital, and the cats’ welfare. Additionally, we found that the Community Cat Program was perceived more positively when compared to agencies such as the council.

4.1. Relationship with Cats

The cat caregivers described the strong emotional bond they had with the cats they cared for, regardless of perceived ownership, with several of the participants describing the cats as family members or children—“they’re my kids”. Additionally, the caregivers discussed the calming effects of spending time and interacting with the cats, and the benefits this had on their mental well-being, saying things like, “if I’m really down, I’ll actually come out here and cuddle them”. There is an extensive literature that focuses on the bond between pets and their owners and the benefits of this bond [44–48]. Additionally, studies have shown that viewing pets as family suggests a strong emotional attachment to the animal [49,50]. Our study demonstrates that those feeding and caring for stray cats also have a strong bond, and feel similar benefits to their mental well-being as those who own companion animals, which is consistent with other studies [19,21,22,26]. A recent study, which used the Comfort from Companion Animals Scale, found the strength of the bond between cat caregivers and their cats (mean 39.6, SD 5.9) was almost identical to the bond cat owners felt with their pet cats (mean 39.6, SD 4.8) [22]. The strength of the bond was also evidenced by the amount of money the caregivers spent on the cats, despite living in low socioeconomic areas, with many spending more than the average spent on owned cats [51]. The level of perceived ownership appears to have little impact on the strength of the human–animal bond and the associated benefits. Furthermore, the value individuals place on free-roaming cats may improve the case for the cost-effectiveness of a free sterilization program [52]. These findings are important when considering animal management strategies, because the killing of the cats being cared for by multi-cat carers has been shown to have long-term adverse psychological impacts due to the sudden severing of this strong bond [19]. Therefore, when estimating the economic case for urban cat management, the value that individuals place on free-roaming cats is important to consider [52], as well as the cost of severing that bond.

4.2. Nuisance Behaviors

Before becoming involved with the Community Cat Program, the caregivers spoke about the issues they had with the cats surrounding nuisance behaviors, such as “they spray and they poop, and they smell” and “they have fights at night, and that sets off our dog”. These nuisance behaviors appeared to impact their quality of life, due to the negative effects on the caregivers’ physical environment and the potential health risks, suggested by statements such as “there’s a health implication with so much feces around” and “it keeps me awake during the night.” When asked about their experiences after the program, the participants made no mention of the issues surrounding nuisance behaviors, suggesting that the situation had improved for the caregivers. This perceived decrease in nuisance behaviors is consistent with the findings in the literature, whereby an increase in sterilized cats through a low-cost sterilization program led to a decrease in cat complaints,

impoundments, and euthanasia [53]. Additionally, the World Health Organization (WHO) has indicated in their quality of life assessment scale, that an individual's or population's environment is the most important indicator of quality of life [54]. Moreover, less sleep has been associated with lower levels of happiness and quality of life [55,56]. The perceived reduction in nuisance behaviors is important when considering animal management strategies, as a reduction in nuisance behaviors is likely to reduce complaints made to the council about urban free-roaming cats, whilst having a positive impact on the cat caregivers' well-being.

4.3. Quality of Life

Before receiving support from the Community Cat Program, issues surrounding the cats were perceived to be impacting the cat caregivers' quality of life. Many of the caregivers experienced a strain on their marriages, friendships, or relationships with their neighbors. Several of the caregivers were worried about the cost of caring for the cats and indicated that cost was a barrier to the caregivers sterilizing their cats, stating "I couldn't afford the desexing" and "I'm not prepared to pay that amount of money". Additionally, being faced with a problem, but not having the knowledge or the means to do anything about it gave caregivers a sense of powerlessness. The feeling of wanting to do the right thing but not being able to do it due to external barriers has been shown to cause moral distress, leading to negative psychological impacts [57]. This is consistent with our findings, as the participants indicated feelings of powerlessness, e.g., "there's a problem and not feeling that I had the power to do something about it". Additionally, financial worries can have a negative psychological impact on an individual and lead to a decrease in quality of life [58,59]. These negative impacts can be diminished by social support [59,60]. However, the responses during the interviews suggested that due to the strain on their social relationships, the caregivers had no way of ameliorating their negative emotions, leading to a further negative impact on their quality of life.

This differs from the responses caregivers gave when asked about their experience after engaging with the Community Cat Program. The participants discussed feeling less worried and were relieved that they had received support, stating "I feel really good" and "we don't have to worry". Additionally, the caregivers explained that they felt a sense of empowerment, as they had been given the resources and knowledge to take action, with one stating that "simply having some knowledge was empowering". When discussing the change they had seen in the overall situation with the cats, the caregivers spoke about finding satisfaction in being able to make a difference, with one stating "I'm really happy and satisfied". This indicates a sense of fulfilment, and the participants discussed the sense of pride they felt that the cats had a positive outcome, such as "We enjoy showing them to people". These positive emotions and sense of accomplishment and life satisfaction indicate an improvement in their quality of life [54,61,62]. Additionally, positive emotions, such as empowerment, can influence behavioral changes [63,64]. This is important because positive behavioral changes are key to the success of urban cat management programs [36,65].

Our findings have highlighted the fact that after receiving assistance from the Community Cat Program, the cat caregivers felt an improvement in their quality of life. This is significant, as it demonstrates that assistive-centered management is beneficial to the caregivers' psychological well-being and is aligned with a One Welfare approach which optimizes the well-being of humans, animals, and the environment.

4.4. Social Capital

When the caregivers were asked about their experiences after receiving assistance from the Community Cat Program, they discussed an improvement in their social capital. The cats were facilitators of social contact, improving and facilitating caregivers social relationships, e.g., "It gave us something to talk about". Additionally, engaging with the program seemed to have helped enable community participation, by giving the caregivers resources, such as the knowledge and equipment to engage with their local community.

The caregivers discussed giving their neighbors information about the program, and some talked about plans to work within their local community to help trap and sterilize free-roaming cats. Whilst there appears to be no research on the impacts of semi-ownership on social capital, our findings are consistent with the literature on pet ownership and social capital, which indicates that pet owners have higher social capital than non-pet owners [45,66]. Moreover, increased social capital is strongly associated with an increased quality of life [67,68]. Cat caregivers are generally women [9,21,26,69] who live in low socioeconomic areas [26,69]. This demographic has been shown to have lower social capital, leading to inequalities in health [70,71]. Our findings suggest that assistive-centered cat management can improve social capital, providing members of the community who are likely to experience lower levels of social capital with the resources with which to build social and community connections. Additionally, the increase in community engagement is not only beneficial to the caregiver's social capital and quality of life, but is vital for the success of urban assistive-centered cat management programs [64,65].

4.5. Cat Welfare

Before receiving support from the Community Cat Program, the participants expressed concern over the welfare of the cats they cared for. They mentioned that the cats were in poor health and looked "really skinny", and suggested that the cats were frequently getting injured due to fighting, e.g., "they had a lot of scarring because of the fighting". In contrast, after the cats had been sterilized through the Community Cat Program, the caregivers indicated an improvement in their welfare, e.g., "they are in such good condition" and "they're playing all of the time". An improvement in cat welfare after sterilization is well documented [72,73] and consistent with our findings; several studies have shown a decrease in aggressive behaviors after cats have been sterilized [74,75], leading to a decrease in injuries. Overall, this shows that sterilization through a One Welfare approach improved the health and welfare of the cats being cared for.

4.6. Perception of Support

The participants discussed their perception of support from agencies before engaging with the Community Cat Program. The caregivers who had contacted various agencies, such as the local council, and asked for help illustrated that they felt unsupported, e.g., "there was just nobody there to help". They discussed feeling that without support they did not feel like they could do anything about the issues surrounding the cats they were caring for, e.g., "it still felt out of my grasp". The caregivers who had worked closely with the council regarding complaints discussed feeling angry about how the council dealt with the complaint, e.g., "I felt really angry", and relayed their feelings of fear about the possibility of future interactions with the council, using words such as "dread". Several of the participants indicated that they did not trust the various agencies and feared the cats would be taken away and euthanized; therefore, they did not engage with them, stating "I didn't want them to take my cats away" and "I don't want to engage with the council". Negative interactions with and distrust of authorities have been shown to be barriers to engagement with community services, particularly in low socioeconomic areas [76,77], which is consistent with our findings. Additionally, these interactions and lack of support create negative emotions for caregivers, which have been shown to lower their quality of life [59]. These findings are similar to those of previous research conducted on enforcement-centered cat management [19]. The negative perception of the council may be perpetuated by animal control officers not being able to provide the appropriate support to communities due to policy and financial restrictions. One study indicated that animal control officers faced barriers to engaging with the community, due to a lack of funding, staff, and resources, even though many animal control officers perceived programs like the sterilization of stray cats (TNR) as good for the community [78].

The caregivers' perceptions of the support they received from the Community Cat Program differed from their perceptions of agencies, such as the council. The caregivers

relayed feeling supported and educated, e.g., “there was somewhere I could go to get the help”, and stated the trust they felt in the program, “I trust them”. Ongoing communication from the Community Cat Team to determine if additional assistance, such as cat food or cat litter, was required is likely to have helped build these feelings of support and trust. Additionally, the caregivers appreciated the flexibility and ease of the program, stating: “the ease of the program was fantastic”. This appeared especially helpful for those who could not take time off work to get the cats sterilized, e.g., “I could go to work” and “our time is money”. For low-income workers, taking time off work can result in the loss of income, and is an additional obstacle to getting cats sterilized. The program generally led to positive emotions, with participants using words such as “gratitude” and “confidence”. Similar to other studies, our findings indicate that positive engagement with communities, including the provision of educational materials, can build trust [64,65]. This has been suggested to increase the reporting of unowned cats for sterilization and to reduce the number of unwanted litters [65]. Moreover, community engagement is likely to improve social capital [45] and, coupled with the positive emotions experienced by the caregivers due to the assistance from the Community Cat Program team, suggests a positive impact on their quality of life [54,61,62,67,68]. The difference in the perceived level of support from agencies, such as the council, and the perception of the support received from the Community Cat Program is evident from our findings. This is crucial when considering animal management strategies, because an assistive-centered approach appears to build trust with communities, creating positive behavioral changes, which are essential to the success of urban cat management programs [36,65]. Additionally, an assistive-centered management approach encompasses the One Welfare philosophy by positively impacting the caregivers’ quality of life. The barriers animal control officers face to engaging with an assistive-centered approach should be investigated, as these may hinder a One Welfare approach to urban cat management.

4.7. Without the Community Cat Program

When the participants were asked what they would have done had the Community Cat Program not provided assistance, most of the caregivers stated that they would have surrendered the cats to the council or an animal rescue shelter, e.g., “we would have to end up taking them to the council.” The caregivers also indicated that they assumed the cats would have been euthanized, and used words such as “devastated” and “sad” to express how that would have made them feel. Most cats surrendered by the public to shelters are strays [79,80], and one study found that over a third of stray cats were associated with a caregiver (semi-owner) for more than a month before being surrendered [79]. Our findings suggest that an assistive-centered cat management strategy focusing on semi-owned cats may decrease the number of stray cats and kittens entering shelters and municipal facilities. Additionally, the responses from the interviews indicate that without the assistance of the Community Cat Program, the caregivers may have felt a negative impact on their quality of life. Overall, this indicates that an assistive-centered management strategy not only improves the outcomes for caregivers and cats, but could also reduce the workload for animal management officers and shelter staffs.

4.8. Impact on Rural Participants

Our findings show that the relationships with the cats and the impacts of the Community Cat Program differed for the rural participants. The farmers who were interviewed indicated that they saw the cats as valuable working animals, using words such as “important” to describe them. Additionally, the presence of the cats improved their rodent problem and, therefore, lowered operation costs: “we don’t even see a mouse” and “a financial saving of somewhere between AU \$3000 and AU \$4000 a year [for technician time to fix wiring]”. This is important, as the farmers noted that they struggled financially, stating “we’re struggling dairy farmers”. This decrease in operational costs could also decrease their financial worry and positively impact the farmers’ quality of life [58].

Furthermore, the farmers discussed not being able to afford sterilization, indicating that without assistance from the Community Cat Program, they would have had to cull the cats to keep their numbers under control. When discussing this management option, the farmers appeared to feel negatively about it: “we don’t really want to do it if we don’t have to” and “it wouldn’t have been a real good option”. No research has been conducted on the impacts of farmers culling working animals, such as cats or dogs. However, the culling of livestock during epidemics has been shown to lead to negative emotions, substantial psychological distress, and post-traumatic stress disorder in farmers [81,82]. Drawing from the farmers’ responses and the literature, it could be assumed that the culling of the cats would have negatively impacted the farmers’ quality of life. There needs to be further research conducted on the relationship farmers have with the cats they care for, as well as the impact of assistive-centered cat management on farmers’ psychological well-being. However, our findings provisionally suggest that using a One Welfare approach to cat management had a positive impact on the farmers’ quality of life. Additionally, decreasing the number of kittens born would be expected to decrease the environmental impacts, such as native wildlife predation and contamination by toxoplasmosis oocysts, because cats under one year of age are the predominant source of oocysts [83,84].

4.9. Limitations

We recognize the small sample size of this study; however, the aim of this study was to gain an in-depth understanding of the bonds caregivers have with the cats they care for, and the impact of an assistive-centered cat management strategy. To gain this in-depth understanding, a smaller sample size was necessary to gather rich and detailed data within the time and financial constraints. Additionally, the semi-owners of multiple cats are only a small proportion of cat semi-owners. The Community Cat Program has sterilized over 2600 cats in 3 years, and this included cats from 13 multi-cat sites, which had a median of seven cats per site. Therefore, our sample size of 11 multi-cat semi-owners is an appropriate representation of this small population. Previous qualitative research of a similar nature has used a small sample size to gain an in-depth and rich understanding of a topic [19]. We hope that our findings can act as a foundation for future research to build upon, as well as a resource and catalyst for other communities seeking to implement an alternative strategy for urban cat management based on a One Welfare approach.

5. Conclusions

This study has demonstrated the positive impacts of an assistive-centered cat management strategy on caregivers’ psychological well-being and quality of life, and a positive impact on cats’ health and welfare. Additionally, we have shown the caregivers’ negative perception of agencies like the municipal council, and the potential this has to hinder urban cat management efforts. Moreover, the results have provided further evidence of the strength of the bond between caregivers and the cats they care for, regardless of perceived ownership. Implementing an assistive-centered management approach not only improves human well-being and cat welfare, but also creates a positive relationship between the community and the agencies involved. This can lead to improved reporting of cats requiring sterilization, which is key to the success of an assistive-centered management program. Therefore, this One Welfare approach to urban cat management has the potential to reduce the free-roaming cat population, their impact on wildlife, and nuisance complaints, and to reduce council and shelter impoundments and costs. We hope our findings will provide evidence to local governments and welfare agencies of the beneficial impacts of an alternative, assistive-centered urban cat management strategy. We hope that our study can be used as a pilot study, and that the themes which arose during the interviews can be used as a base for future studies to build upon, and as a global resource for the development of effective urban cat management programs based on a One Welfare philosophy.

As one of the participants commented: “. . .cases where there’s 10 or 15 cats on one property, if the council can deal with it in the way that we dealt with it, they’re not going to

end up with 10 or 15 cats at the pound. They're actually going to end up with these cats back where they are, not causing any trouble to anyone. (...) It'd be a fantastic thing for the councils to be able to take it on board. It's just a good outcome for everybody."

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ORIGINAL RESEARCH ARTICLE

A Cat Is a Cat: Attachment to Community Cats Transcends Ownership Status

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Abstract

Introduction: Despite the considerable recent interest in the human–animal bond, the relationship between community cat caregivers and the cats they care for has received relatively little attention. In addition, the instruments typically used to measure the human–animal bond contain questions specific to in-home interactions with pets or interactions representative of specific behavior traits of the animal (e.g. lap-sitting), effectively excluding community cat caregivers.

Methods: Using a slightly modified version of the Comfort from Companion Animals Scale, we surveyed community cat caregivers in Jefferson County, Kentucky, to measure the degree to which they are attached to the cats in their care. Participants for the online survey were recruited via email from a nonprofit organization that provides sterilization and wellness care for community cats in the area.

Results: Of the 329 individuals who participated in the survey, 295 (90.2%) indicated that they had provided food, water, or shelter to one or more community cats currently or within the recent past. These caregivers tend to identify as white, female, and middle-class. Levels of attachment to the cats in their care (mean: 39.6, standard deviation [SD]: 5.9) are nearly identical to those previously reported by cat owners (mean: 39.6, SD: 4.8). Monthly expenditures and other sacrifices made as part of their caregiving duties provide further evidence of the strong attachment these individuals feel for community cats.

Conclusion: The fact that community cats are unowned in no way diminishes the strength of the bond caregivers feel. Such findings have clear policy implications – validating, for example, the common practice of returning healthy cats lacking identification (i.e. collar or microchip), regardless of perceived level of sociability, to where they were found, following sterilization and vaccination.

Keywords: attachment; community cats; free-roaming cats; human–animal bond; trap-neuter-return

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Supplementary material

Supplementary material for this article can be accessed here.

As noted in their most recent ‘free-roaming cat position statement’, published in May 2023, the American Association of Feline Practitioners (AAFP) ‘supports the humane management of free-roaming cats’ in part because the organization recognizes the importance of ‘free-roaming cat caregivers and their human–animal bond’.¹ This is particularly noteworthy because the AAFP’s previous statement, published in 2012, made no mention of caregivers.² In recent years, the human–animal bond, particularly the interaction between humans and their companion animals, has garnered significant attention, even as research findings often challenge the perceived health benefits for humans.^{3,a} Despite

this increased attention, there remains an area within this sphere that requires further exploration: the relationship between caregivers and community cats (a term typically applied to unowned, free-roaming domestic cats).

Although cats and dogs enter U.S. shelters in roughly the same numbers, cats comprise 55% of healthy and treatable animals killed^b, and the majority of a shelter’s feline admissions are typically classified as ‘strays’.^{4,5} Strategies to manage community cat populations, such as trap-neuter-return (TNR) and return to field (RTF), are

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becoming increasingly common.^{6,7} In the absence of such programs, these cats are among the most at risk of being killed, regardless of whether or not they have caregivers. Moreover, community cat caregivers are sometimes faced with legal barriers, as well as threats to their personal safety and that of the cats in their care.^c For these reasons, a deeper understanding of community cat caregivers has become increasingly important.

Unfortunately, the existing body of literature tends to focus predominantly on relationships between humans and animals that cohabitate and/or are legally owned. Furthermore, the surveys typically used to measure the human–animal bond contain questions that are specific to in-home interactions with animals or interactions representative of specific behavior traits of the animal (e.g. lap-sitting). Consequently, the bond between unowned animals and their caregivers is often overlooked. This is evident in instruments such as the Lexington Pet Attachment Survey (LAPS)⁸ and the more recent Family Bondedness Scale,⁹ which often employ terms such as ‘pet’ and ‘owner’, effectively excluding community cat caregivers. However, previous research has shown that 10–26% of U.S. households provide resources such as food, water, and/or shelter for cats they do not own.^{10–13} This phenomenon highlights a significant gap in our understanding of the relationships between unowned animals and their human providers.

The purpose of this research was two-fold. First, it advances a modification of a validated survey tool for future use in free-roaming animal attachment analysis and evaluates the attachment between a sample of community cat caregivers and the cats they care for. In addition, by

focusing on the often-overlooked bond between community cats and their caregivers, the present study aims to shed light on an important aspect of human–animal interaction, with potential implications for both public policy and animal welfare.

Methods

We used an online survey for this cross-sectional study of caregivers’ attachment to community cats, collecting information about factors such as length of caregiving, investment in caregiving, interaction level with the cats, and basic demographic data about the caregivers.

Recruitment

We used a combination of convenience and snowball sampling. The survey was conducted using Qualtrics (March–April 2023), distributed through an email list managed by Alley Cat Advocates (ACA), and was open for a 1-month period during March and April 2023. Recipients of the email were also asked to forward the survey to others who may be interested in completing it. ACA is a non-profit organization in Louisville, Kentucky, that provides sterilization and wellness care for community cats in and around Jefferson County. ACA was identified as a partner for this research project due to its connections to the individuals who care for cats in the region. In addition, Jefferson County is somewhat unique in its approach to managing unowned cats. In 2012, the Louisville/Jefferson County Metro Government adopted an ordinance that identified TNR as the official method by which community cats would be managed in the Louisville Metro area and allocated government funding for that purpose. Moreover, Jefferson County has been studied previously as an example of successful, collaborative community cat management.¹⁴

Participation in the survey was entirely voluntary, and no incentives were provided. Respondents were free to quit the survey at any point and were able to skip any question that they did not want to answer. All responses were anonymous. The research protocol was reviewed and approved by the Institutional Review Board at Southern Utah University under the protocol number 28-022023b.

Survey structure

The survey consisted of four sections, the first asking respondents about their experiences with ACA’s programs. The data obtained from this part of the survey are not included in this study, as they were for internal evaluation purposes by ACA. The second section of the survey used a slightly modified version of the Comfort from Companion Animals Scale (hereafter CCAS-mod) originally developed and tested by Zasloff¹⁵ in 1992. This original CCAS instrument, which includes 11 Likert-scale items, was designed in response to previous surveys

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showing levels of attachment associated with cat ownership lower than with dog ownership. Zasloff hypothesized that this was a result of functional biases in the types of questions traditionally asked on surveys such as the LAPS⁸ and specifically designed the CCAS to interrogate the emotional aspects of the bond with pets that were independent of confounding species-specific behavior traits.¹⁵ This survey instrument was evaluated for internal validity by Zasloff.¹⁵ Construct validity was evaluated¹⁶ as a function of correlation with the LAPS⁸ (correlation coefficient -0.68 , $P < 0.05$), and reliability was found to be good (Cronbach's alpha of 0.85 , $P < 0.01$). The avoidance of specific behavioral traits was originally intended to resolve species-specific bias, but doing so also makes the tool uniquely appropriate for community cats, whose behavior may differ from that of cats who spend significant amounts of time in the home.

Minor modifications to the survey instrument developed by Zasloff¹⁵ included systematically replacing the word 'pet' with 'community cat(s)'. This was done for two reasons. First, community cats are, by definition, not owned by their caretakers. Second, the term 'pet' implies a degree of interaction that may not apply to community cats (e.g. sitting in one's lap). In addition, the survey invitation did not reference the term 'owned cat' and instead invited responses from individuals who currently provide care for community cats. Finally, the CCAS-mod uses a five-point Likert scale instead of the original four-point scale used by Zasloff.¹⁵ Five-point scales are more commonly accepted in cases where aggregate scores must be treated as interval level data for descriptive statistical purposes.¹⁷

Survey scoring

The results of the CCAS-mod were analyzed in two ways. The first analysis included all survey submissions for which respondents had valid responses for all 11 of the CCAS-mod statements, including those indicating the respondent neither agreed nor disagreed with 1 or more statements. Doing so generated results that can be used in future research since it is a more widely accepted method of providing values that can be summarized statistically. In this analysis method, the scoring schema was a 5-point scale (1 = strongly disagree to 5 = strongly agree).

The second approach was undertaken to score the CCAS-mod in a way to make it comparable to the original instrument developed by Zasloff,¹⁵ with no neutral category. To be able to compare the results of this research with the scores from the owned-cat research, all response sets that included any value(s) of 'neither agree nor disagree' were eliminated, and a 4-point scale was used for scoring (1 = strongly disagree to 4 = strongly agree). The average score was then compared to that reported by Zasloff.¹⁵ Scores were summarized, and descriptive statistics were calculated using Excel (Microsoft Corporation, version 2307).

The remaining sections of the survey included questions about the types and levels of investment individuals make when caring for community cats (e.g. monthly expenditures) and basic demographic information about the survey respondents. These data were gathered to understand the characteristics of individuals responding to the survey. Cat-specific questions included items such as the number of groups cared for, size of the groups, proximity of the groups to the home residence, and the level of interaction that respondents had with the cats they provide care for. The complete survey is provided as supplementary material.

Results

Results are reported in accordance with the Enhancing the QUALity and Transparency Of health Research (EQUATOR) Network's Checklist for Reporting Of Survey Studies (CROSS),¹⁸ where applicable.

Caregiver demographics

A total of 329 individuals consented to participate in the survey. Of these, 295 (90.2%) indicated that they had provided food, water, or shelter to 1 or more community cats currently or within the recent past. Respondents' demographic information is provided in Table 1.

Comfort from Companion Animals Scale

Respondents indicating that they had provided food, water, or shelter to 1 or more community cats currently or within the past 12 months were then asked to respond to the CCAS-mod instrument. Results for each of the 11 CCAS-mod items are provided in Table 2.

As noted previously, the CCAS-mod responses were analyzed two ways: the first using a 5-point schema and the second using the same 4-point scoring schema used by Zasloff.¹⁵ Descriptive statistics for both methods are provided in Table 3.

Caregiver resources and investment

Caregivers were asked about how long they have been caring for community cats, how frequently they provide care, and the financial resources they have committed. A summary of their responses is provided in Table 4.

Based on 254 valid responses, the caregivers we surveyed reported spending an average of \$103 (median \$50) for food and veterinary care each month for the cats in their care (apart from any expenditures for their pets). Individuals who responded at the high end of the range (e.g. \$1,500/month) were those who noted that they performed humane trapping of cats other than those they care for. Respondents were also asked about the number of cats in their care and how many groups of cats they cared for. A summary of their responses is provided in Table 5.

Table 1. Caregiver demographics

	n (%)
Gender identity (N = 290)	
Male	43 (14.8)
Female	227 (78.3)
Other	2 (0.7)
Prefer not to answer	18 (6.2)
Age (N = 290)	
<20 years of age	1 (0.3)
20–29	10 (3.5)
30–39	20 (6.9)
40–49	36 (12.4)
50–59	64 (22.1)
60–69	93 (32.1)
≥70 years of age	52 (17.9)
Prefer not to answer	14 (4.8)
Race/ethnicity (N = 278)	
American Indian/Alaska Native	0 (0.0)
Asian	0 (0.0)
Black or African-American	4 (1.4)
Hispanic or Latino	2 (0.7)
Native Hawaiian or other Pacific Islander	0 (0.0)
White	252 (90.7)
Other (please specify)	0 (0.0)
Prefer not to answer	20 (7.2)
Level of education (N = 261)	
Master's degree	41 (15.7)
Bachelor's degree	55 (21.1)
Associate's degree	14 (5.4)
Post-secondary non-degree award	4 (1.5)
Some college, no degree	94 (36.0)
High school diploma or equivalent	42 (16.1)
No formal educational credential	0 (0.0)
Prefer not to answer	11 (4.2)
Residence type (N = 292)	
House	244 (83.6)
Apartment, flat	20 (6.9)
Condo	6 (2.1)
Duplex	3 (1.0)
Mobile home	7 (2.4)
Other (please specify)	8 (2.7)
Prefer not to answer	4 (1.4)
Residence status (N = 290)	
Mortgage or loan (by respondent or other household member)	137 (47.2)
Owned outright (by respondent or other household member)	89 (30.7)
Rented	40 (13.8)
Occupied without payment	2 (0.7)
Prefer not to answer	22 (7.6)
Length of residence (N = 289)	
<1 year	9 (3.1)

Table 1 continues

Table 1. Caregiver demographics

	n (%)
2–5 years	49 (17.0)
6–10 years	36 (12.5)
11–15 years	45 (15.6)
15–20 years	40 (13.8)
> 20 years	103 (35.6)
Prefer not to answer	7 (2.4)
Total pre-tax household income during 2022 (N = 284)	
<\$15,000	19 (6.7)
\$15,000–34,999	43 (15.1)
\$35,000–49,999	42 (14.8)
\$50,000–74,999	39 (13.7)
\$75,000–99,999	24 (8.5)
\$100,000–149,999	27 (9.5)
>\$150,000	15 (5.3)
Prefer not to answer	75 (26.4)

Finally, caregivers were asked to respond to four statements describing sacrifices they have made due to their caregiving duties. A summary of their responses is provided in Table 6.

Discussion

Caregiver demographics

The vast majority of survey respondents (78.3%) identified as female, which corresponds to the results of previous surveys. Zasloff and Hart,¹⁹ for example, found that 74.3% of caregivers surveyed on the island of Oahu identified as female; Centonze and Levy²⁰ found that 84.6% of caregivers surveyed in north central Florida identified as female. More than 9 in 10 (90.7%) of our respondents identified as white, compared to 70.3% of Jefferson County residents.²¹ Similarly, Zasloff and Hart¹⁹ found that 58.1% of Oahu caregivers surveyed identified as white compared to 23% of island residents generally.

More than one-third (34.5%) of our caregiver respondents were 40–59 years of age, with more than half (54.1%) being 50–69 – somewhat older than caregivers on Oahu¹⁹ and somewhat younger than those in north central Florida.²⁰ Although these previous studies suggest that the typical caregiver is ‘middle-class’, it is worth noting the considerable number of respondents who fall below that (ambiguous) household income threshold. Nearly half of our respondents (49.8%) reported annual incomes of less than \$50,000 compared to the median household income of \$61,633 in Jefferson County.²¹ And although 43.1% of respondents reported annual incomes of \$50,000–150,000, which is generally considered ‘middle class’,²² 29.7% reported annual incomes of less than \$35,000. To put this into context, the U.S. Department of

Table 2. Responses to modified Comfort from Companion Animals Scale (CCAS-mod)

Statement	N	n (%)				
		Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
The cats I care for provide me with companionship	290	5 (1.7)	26 (9.0)	71 (24.5)	106 (37.0)	82 (28.3)
Providing for community cats gives me something to care for	289	5 (1.7)	14 (4.8)	58 (20.1)	112 (38.8)	100 (34.6)
Being a caregiver to community cats provides me with a pleasurable activity	291	4 (1.4)	10 (3.4)	29 (10.0)	126 (43.3)	122 (41.9)
The cats I care for make me play and laugh	290	4 (1.4)	13 (4.5)	69 (23.8)	113 (40.0)	91 (31.4)
Providing for community cats gives me something to love	292	6 (2.5)	14 (14.8)	62 (21.2)	113 (38.7)	97 (33.2)
I get comfort from caring for community cats	290	5 (1.7)	7 (2.4)	34 (11.7)	129 (44.5)	115 (39.7)
Being a caregiver to community cats is a source of constancy in my life	290	4 (1.4)	17 (5.9)	60 (20.7)	111 (38.3)	98 (33.8)
I enjoy watching the community cats I care for	291	5 (1.7)	5 (1.7)	14 (4.8)	117 (40.2)	150 (52.0)
The community cats I care for make me feel loved	291	6 (2.0)	10 (3.4)	71 (24.4)	105 (36.1)	99 (34.0)
The community cats I care for make me feel trusted	291	4 (1.4)	5 (1.7)	52 (17.9)	120 (41.2)	110 (37.8)
Being a caregiver to community cats makes me feel needed	287	3 (1.0)	8 (2.8)	56 (19.5)	117 (40.8)	103 (35.9)

Table 3. Level of caregiver attachment based on CCAS-mod data (see text for details)

5-Point schema (N = 276)	
Mean (SD)	44.7 (8.1)
Median	44.0
Range	11–55
Q1	40
Q3	53
4-Point schema (N = 133)	
Mean (SD)	39.6 (5.9)
Median	42
Range	12–44
Q1	34
Q3	44

Health and Human Services' most recent poverty guideline for a family of four is \$26,500/year.²³

Caregiver attachment to community cats

The results of our 4-point CCAS-mod analysis (mean: 39.6, SD: 5.9) are nearly identical to those reported by Zasloff¹⁵ for cat owners (mean: 39.6, SD: 4.8). To our knowledge, this is the first time this type of scale has been used to measure caregiver attachment to community cats. It is worth noting that the majority of respondents (73%, N = 292) indicated that they were able to pet at least some of the community cats that they care for. This might be one reason that caregiver scores in this survey were so similar to those of pet owners in Zasloff's¹⁵ survey of cat owners.

Our findings validate the AAFP's recognition that 'free-roaming cat caregivers and their human-animal bond'²¹ be a consideration in the policies and practices governing the management of free-roaming cats. It is

reasonable to assume, for example, that many of the cats entering a shelter as 'stray' have caregivers who would miss them should they disappear (regardless of the ultimate outcome). The strong attachment that caregivers feel for community cats suggests that they are likely to grieve the disappearance of a community cat much as they would the disappearance of a pet. Our findings also validate the common practice of returning healthy cats lacking identification (i.e. collar or microchip), regardless of perceived level of sociability, as part of a shelter's TNR and RTF programs. The underlying assumption that these cats are sociable due to regular human contact is supported by the fact that nearly three quarters of caregivers surveyed were able to pet at least some of the cats in their care. Furthermore, our data show that caretakers are likely to be concerned if their community cats go missing. The vast majority of respondents (92.1%) either agreed (37.8%) or strongly agreed (54.3%) that they worry when cats do not show up as expected. All of which should give policymakers and shelter managers pause, since the stray category makes up the majority of feline admissions at many shelters.^{4,5}

Group size, cat numbers, and cost of care

Nearly three quarters (72.4%) of our respondents care for 1 group of cats, typically made up of three cats. This corresponds with the results of previous studies in which 75–79% of caregivers reported caring for a single group of cats.^{19,20} Nearly nine in 10 of our respondents (88.2%) care for cats on their own property, a much higher rate than Zasloff and Hart¹⁹ reported among Oahu caregivers (34%) and somewhat higher than Centonze and Levy²⁰ reported in Florida (62.1%). The typical group size (i.e. medians ranging from 3 to 6) corresponds with previous

results. Nearly two-thirds of the caregivers (65%) surveyed by Zasloff and Hart¹⁹ reported caring for groups of no more than 10 cats. Centonze and Levy²⁰ reported

a mean group size of 5.1 cats after TNR efforts were underway. Some other studies have reported median group sizes of 10–12 cats,^{24–26} while still others have reported median group sizes of 6 cats or fewer.^{27,28} The maximum group size reported from our survey respondents was 100 cats. Other studies have reported maximum group sizes of 59¹⁹ and 89 cats.²⁰ Such large ranges suggest that caregivers likely interpret the term *colony* – often used when referring to groups of free-roaming cats – differently. (It is unlikely that 100 cats are gathering in close proximity even during mealtime.) In any case, although the term might bring to mind very large groups

Table 4. Caregiving specifics and caregiver commitment

	n (%)
How long have you been caring for these community cats? (N = 291)	
<1 year	38 (13.1)
1–2 years	63 (21.6)
3–5 years	87 (29.9)
6–10 years	54 (18.6)
11–15 years	20 (6.9)
>15 years	29 (10.0)
How often, on average, do you care for community cats? (N = 293)	
2× daily	182 (62.1)
1× daily	70 (23.9)
Every other day	3 (1.0)
1× weekly	7 (2.4)
2× weekly	2 (0.7)
Other	29 (9.9)
How would you describe the area where your cats are? (N = 289)	
Urban	84 (29.1)
Suburban	135 (46.7)
Rural	57 (19.7)
Other	13 (4.5)
How do you travel to reach the cats you care for?*(N = 271)	
None, I feed the cats in my own yard	239 (88.2)
Vehicle that I own	22 (8.1)
Carpool	0 (0.0)
Rely on family or friends	1 (0.4)
Public transportation	0 (0.0)
Paid transportation (taxi, Uber, or Lyft)	0 (0.0)
Bicycle	0 (0.0)
Walk	3 (1.1)
Other (please specify)	6 (2.2)

* Multiple responses were permitted.

Table 5. Number of cats being cared for

Group size, respondents caring for one group of cats (N = 198)	
Minimum	1
Maximum	40
Mean	4.7
Median	3
Q1	2
Q3	5
Smallest group size, respondents caring for multiple groups of cats (N = 74)	
Minimum	1
Maximum	30
Mean	4.8
Median	4
Q1	2
Q3	6
Largest group size, respondents caring for multiple groups of cats (N = 70)	
Minimum	1
Maximum	100
Mean	10.6
Median	6
Q1	4
Q3	12

Table 6. Sacrifices reported by community cat caregivers

	N	n (%)				
		Very often	Often	Sometimes	Rarely	Never
I have postponed or canceled a vacation in order to care for the community cats	287	18 (6.3)	12 (4.2)	58 (20.2)	53 (18.5)	146 (50.9)
When going out of town, there is someone who can cover for me as caretaker	289	131 (45.3)	63 (21.8)	50 (17.3)	17 (5.9)	28 (9.7)
I have gone without purchasing something for myself because I needed the money to provide care for community cats	290	27 (9.3)	24 (8.3)	57 (19.7)	59 (20.3)	123 (42.4)
I go outside when the weather is poor to provide for community cats	287	200 (69.7)	47 (16.4)	30 (10.5)	5 (1.7)	5 (1.7)

of cats, the empirical evidence suggests that such groups are the exception rather than the rule.

The monthly expenditures for food and veterinary care reported by the caregivers we surveyed (i.e. mean \$103, median \$50) differ somewhat from those reported in previous studies. Centonze and Levy,²⁰ for example, reported a median of \$5/week, or \$37/month when adjusted for inflation, for food alone. Zasloff and Hart¹⁹ found that 65% of caregivers spent no more than \$50/month for food (\$93 when adjusted for inflation). The reasons for these differences are not clear, although it is worth noting that residents of Jefferson County (and others nearby who take advantage of ACA's services) typically receive veterinary care for community cats at no cost or at heavily subsidized rates. It is also worth reiterating that caregivers spending the most were also incurring costs from the humane trapping of cats other than those they care for. Interestingly, the expenditures documented here exceed those of U.S. cat owners, who report spending roughly \$47/month on food and veterinary care combined.²⁹

Caregiver sacrifices

The sacrifices that individuals make in order to provide for community cats can be seen as an additional measure of attachment. Nearly one-third (30.7%) of our respondents have postponed or canceled a vacation, so that they can care for community cats. And 37.2% have gone without purchasing something for themselves because the money was used for community cat care. Caregivers' concern for the welfare of the cats in their care is an additional reflection of their attachment and indicates their knowledge of, and concern for, these cats as individuals. The vast majority of respondents (92.1%) either agreed (37.8%) or strongly agreed (54.3%) that they worry when cats do not show up as expected. These results will likely come as a surprise to some; to caregivers, however, our findings are likely to ring true.

Unfortunately, the bond caregivers have with the cats in their care is often ignored – or seen as a character flaw, making caregivers the object of ridicule, bullying, and scorn. In an incident that gained national attention in late 2022, two residents of Wetumpka, Alabama, were found guilty of multiple misdemeanors related to 'feeding and trapping cats on public property'. Body camera footage of their arrest showed both women, one 61 and the other 85 years old, being handcuffed and then driven away in police vehicles.^d Support for their defense resulted in more than \$90,000 being raised

d. Yurkanin A. 'Y'all have three cop cars because I'm feeding cats?' Two Alabama women guilty in trial over feral felines - al.com. AL.com. Published December 14, 2022. <https://www.al.com/crime/2022/12/yall-have-three-cop-cars-because-im-feeding-cats-two-alabama-women-guilty-in-trial-over-feral-felines.html>. Accessed May 30, 2023.

online, mostly in small amounts (more than 3,200 donations in all).^e

Conservationists opposed to TNR have often dismissed the critical role caregivers can play in conducting periodic censuses of the cats in their care,^{30,31,f} arguing that caregivers 'have not been trained on population ecology field protocols'.^g And some conservationists have suggested that the people involved with TNR might suffer from mental illness.^{30,32,33}

As the aforementioned examples demonstrates, the concerns caregivers have for their reputation and personal safety are well founded. So, too, are their concerns for the cats in their care – which might very well be greater than concerns for themselves. Incidents of community cats under threat of removal,^h or even being shotⁱ by individuals who were both fully aware that the cats were being cared for and unrepentant for their actions, are all too common. This shows blatant disregard for the bond that exists between cat caretakers and the animals in their care; and caregivers rarely have any means of recourse since they do not own the cats.

In December 2020, an unannounced culling (via shooting) of community cats at the Port of Newcastle's Stockton Breakwall in New South Wales, Australia, left caregivers to 'discover trails of blood, missing cats, cats with open, gaping wounds, and cats with broken limbs'.³⁴ The incident's impact on caregivers was, not surprisingly, directly related to their feelings of attachment for the cats in their care, 'evident when the caregivers talked of the individual cats by name and pointed out their favourites, when they

e. n.a. Cat Ladies of Wetumpka Defense Fund, organized by Cat Ladies Defense Fund, LLC. [gofundme.com. https://www.gofundme.com/cat-ladies-of-wetumpka-defense-fund](https://www.gofundme.com/cat-ladies-of-wetumpka-defense-fund). Accessed July 22, 2023.

f. Hostetler M, Wisely SM, Johnson S, Pienaar EF, Main M. *How Effective and Humane Is Trap-Neuter-Release (TNR) for Feral Cats?* University of Florida, Institute of Food and Agricultural Sciences Extension; 2020. <https://edis.ifas.ufl.edu/pdffiles/UW/UW46800.pdf>.

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h. Foderaro LW. At a Long Island Beach, Human Tempers Flare Over Claws and Feathers. *The New York Times*. Published April 18, 2015. <https://www.nytimes.com/2015/04/18/nyregion/a-battle-over-cats-and-birds-on-a-long-island-beach.html>. Accessed May 31, 2023.

i. n.a. State seeks removal of feral cat feeding stations because of negative impacts on nēnē | Maui Now. Maui Now. Published April 12, 2023. <https://mauiNOW.com/2023/04/12/state-seeks-removal-of-feral-cat-feeding-stations-because-of-negative-impacts-on-nene/>. Accessed May 31, 2023.

Streitfeld D. As Google Feeds Cats, Owl Lovers Cry Foul. *The New York Times*. <https://www.nytimes.com/2018/05/26/technology/google-cats-owls.html>. Published May 26, 2018. Accessed August 5, 2018.

i. Chamings A. *The East Bay Regional Park District is shooting cats in Oakland, causing outrage*. SFGATE. <https://www.sfgate.com/bayarea/article/East-Bay-Parks-are-shooting-cats-causing-outrage-15782797.php>. Published December 8, 2020. Accessed May 31, 2023.

Rice H. Galveston bird-watcher calls feral cats fair game. *Houston Chronicle*. Published April 13, 2007. <https://www.chron.com/news/houston-texas/article/Galveston-bird-watcher-calls-feral-cats-fair-game-1810590.php>. Accessed May 31, 2023.

voiced concern for the wellbeing of cats who ‘went missing’ after the cull, and when they shed tears over the deaths of the cats killed in the cull during the interview process’.³⁴

Limitations

Our survey was sent to individuals who had interacted in some way with a single community cat organization, and so the sample population is not necessarily representative of all community cat caregivers. It is possible that those who have sought out services from ACA are more attached to the cats in their care. In addition, the survey was deployed in a limited geographic area and so may not be generalizable to other communities. Moreover, comparing the results of Zasloff’s¹⁵ original survey to the CCAS-mod is somewhat problematic, both because the response categories were not identical (i.e. a 4- vs. 5-point scale) and because the original survey was conducted 31 years ago in a different community (San Francisco). The benefits of using a 5-point scale¹⁷ suggest that the CCAS-mod would be most appropriate for future research.

Finally, although correlation analyses would be a logical extension of the results presented here, the earlier research reporting attachment levels of owners to their pets did not provide a breakdown of how variables (e.g. gender identity, length of ownership, number of cats owned) correlated to attachment. As a result, such analyses fall outside of the scope of this study. Future researchers might therefore consider exploring factors influencing the degree of attachment to community cats.

Conclusion

The fact that community cats are unowned in no way diminishes the strength of the bond caregivers feel. Such findings have clear policy implications – validating, for example, the common practice of returning healthy cats lacking identification (i.e. collar or microchip), regardless of perceived level of sociability, to where they were found, following sterilization and vaccination.

Authors’ contributions

Sue M. Neal: conceptualization, analysis, and writing.
Peter J. Wolf: analysis and writing.

Conflict of interest statement

In recognition of JSMCAH policy and our ethical obligations as researchers, the authors acknowledge that one of us (PJW) is employed by a national animal welfare organization that promotes TNR and RTF programs.

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Characteristics of cat semi-owners

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Abstract

Objectives Unowned ‘stray’ domestic cats threaten wildlife, as well as create a community nuisance and contribute to high rates of euthanasia in animal shelters. These cats can experience poor welfare, contribute to the pet cat population and compromise attempts to control feral cats. However, many unowned domestic cats are cared for by semi-owners who do not consider they own these cats; therefore, semi-owners are a potentially important target population for human behaviour change interventions. The present study aimed to describe the characteristics of cat semi-owners and compare these with the general population of cat owners and non-cat owners to inform future cat management interventions.

Methods An online questionnaire open to all residents of New South Wales, Australia was developed and advertised. Respondents were asked ‘do you care for other free-roaming or stray cats (not including the cats you own)?’, whether they owned cats, about characteristics of their home and their agreement with 15 capability, social opportunity and motivation (COM) items relating to cat containment.

Results Questionnaire responses were received from 8708 people, including 588 semi-owners (7%). Semi-owners were significantly more likely to be female, live in urban areas, live in lower socioeconomic areas and rent their home. Most semi-owners also owned their own cats and owned more cats than non-semi-owners.

Conclusions and relevance Semi-owners of unowned ‘stray’ cats are a valuable potential target audience for human behaviour change interventions. Understanding that these semi-owners often have their own cats, might already be overwhelmed with cat-caring responsibilities and are disproportionately from lower socioeconomic backgrounds should guide intervention design. A nuanced approach is needed that prioritises the wellbeing of cats and semi-owners for semi-owners to ‘buy in’. Any intervention should also recognise that semi-owners often face multiple, complex barriers to neutering or claiming ownership of the cats they care for, especially cost, and trust in the authorities.

Keywords: *Felis catus*; free-roaming; stray; domestic; feral; semi-owner; population management; behaviour change; human–animal bond

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Introduction

Every year, thousands more cats arrive at animal shelters in Australia than they have the capacity to rehome, resulting in many cats being euthanased.^{1–3} The pressure to reduce the euthanasia of healthy and treatable animals in animal shelters is increasing the need for humane interventions that reduce animal shelter cat intake, thus reducing the need for euthanasia. Most cats entering both municipal pounds and animal welfare organisation shelters originate as ‘strays’ – a term used to describe cats who are free-roaming and generally unowned.⁴ However, research from Australia and overseas suggests many cats surrendered as ‘strays’ are in fact fed or provided with other care by one or more persons who do not consider that they own these cats.^{2,4–6} This population of cats is

increasingly referred to as being ‘semi-owned’.^{7–9} ‘Stray’ cats and the people who care for them have been identified as important targets for human behaviour change interventions;¹⁰ however, to date, this human population remains poorly described.

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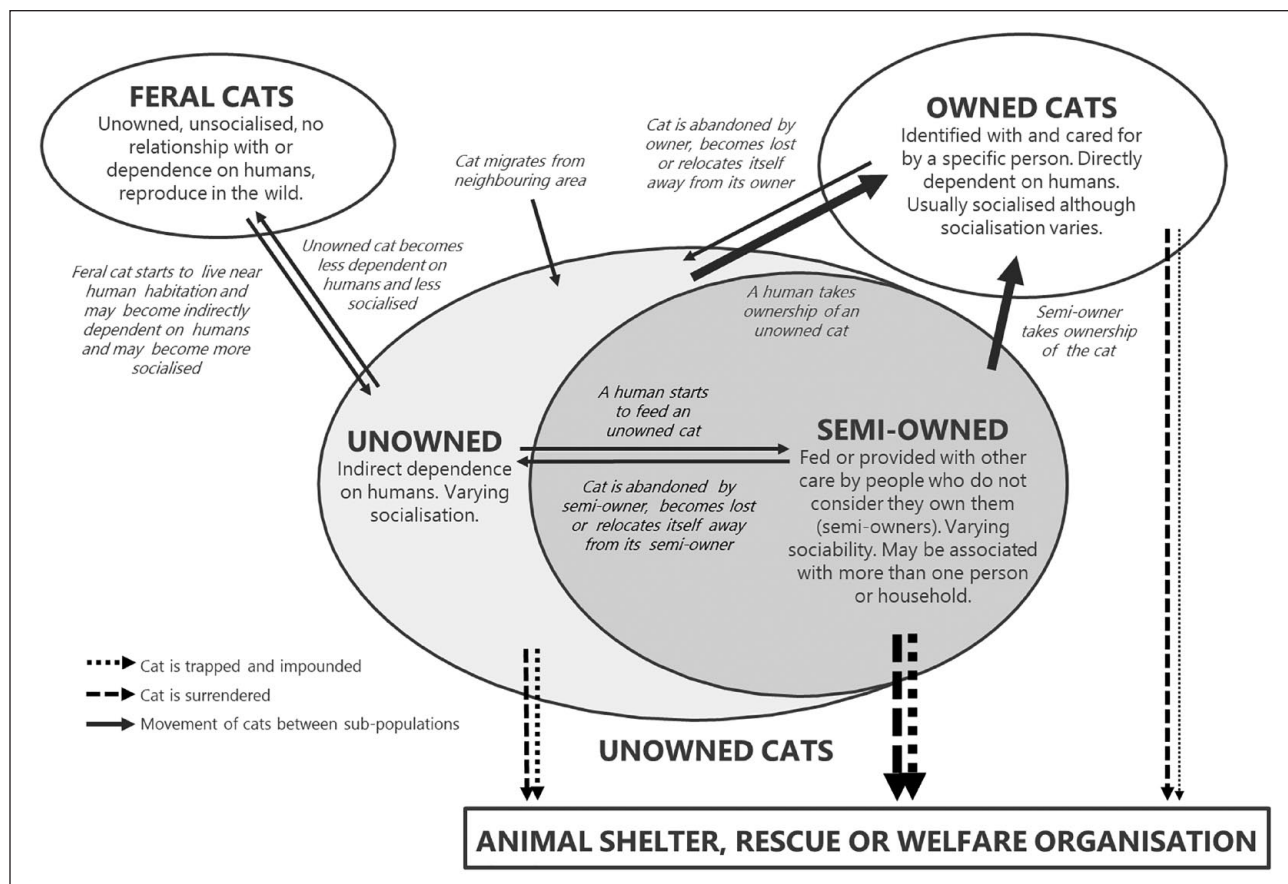


Figure 1 Cat subpopulations and their interactions with humans⁷

All cats in Australia belong to a single species, *Felis catus*; however, distinct but inter-related populations exist with different relationships to humans, including domestic (owned, semi-owned and unowned) and feral populations (Figure 1). This has important implications for management. As defined by RSPCA Australia, feral cats are those that are unowned, unsocialised, have no relationship with or dependence on humans, and reproduce in the wild.⁷ In Australia, feral cats are managed as an invasive pest species under separate regulatory frameworks from domestic cats. The commonly used term 'stray' is problematic as it describes the cat's free-roaming behaviour but not their ownership status. Free-roaming domestic cats are associated with a variety of problems in addition to their contribution to animal shelter intakes. Cats reproduce rapidly and, while kitten mortality is often high, their high reproductive rate means that sexually intact free-roaming cats quickly result in overpopulation, especially when provided with supplementary food and shelter.¹¹ Free-roaming cats can transmit diseases of importance to human health, agriculture and wildlife such as toxoplasmosis,¹² and can create a nuisance in the community through noise, soiling with faeces and urine, property damage and disturbing other companion animals. Free-roaming domestic cats have also been

associated with biodiversity loss via predation, especially in areas already subject to external stressors such as urban environments.^{13–16} In addition, unowned and semi-owned free-roaming cats may have poor welfare.^{9,17–19}

The semi-owned and unowned domestic cat population in Australia has been estimated at 0.7–2 million, or 60–100 cats per 1000 human residents, depending on location.^{1–2,20–22} Many, even most, unowned domestic cats are provided with some care (food, shelter, veterinary treatment) by people who do not consider they own them.^{2,7,9} This semi-owned population are generally sexually intact with a high reproductive rate owing to supplementary feeding and hence their offspring contribute to animal shelter intakes and swell the feral and owned pet cat populations (Figure 1). Semi-owned cats may or may not be socialised with people;⁹ lack of socialisation to people makes many semi-owned cats unsuitable to be rehomed²³ and may be a barrier to semi-owners assuming full ownership.⁶ Nonetheless, cat semi-owners can have high levels of attachment to the cats they care for,^{24,25} and care provided to semi-owned cats, while variable, can be indistinguishable from care provided to owned cats.^{4,9}

Cat semi-ownership is relatively common in many countries, including Australia,^{9,6,25} Ireland,²⁶ Thailand²⁷

and the USA.²¹ However, obtaining valid data directly from cat semi-owners can be difficult, especially where the practice of caring for unowned cats is discouraged or penalised by local authorities.^{6,9,27} One Australian study has described the characteristics of semi-owners compared with owners surrendering cats to an animal shelter and found that most semi-owners also had cats of their own.⁶ Another Australian study of a similar semi-owner population described barriers such as already having companion animals, not wanting a cat and restrictions of their accommodation as preventing semi-owners from adopting their semi-owned cats.¹⁸ However, how these findings relate to the wider semi-owner population is unknown.

Semi-owned cats have a human caregiver who can serve as the target for behaviour change interventions that aim to reduce cat overpopulation, improve free-roaming cat welfare, reduce animal shelter cat intake and euthanasia, and reduce cat impacts on wildlife.⁷ Effective behaviour change interventions require a thorough understanding of the characteristics of the target population and the barriers to, and drivers for, undertaking the target behaviours.²⁸ McLeod et al²⁹ demonstrated the use of an integrative framework based on the community-based social marketing and the behaviour change wheel and associated capability, opportunity, motivation (COM)–behaviour model to design better, equitable and ethically acceptable interventions for free-roaming cat management. Gaining a better understanding of the target audience’s current behaviour and the likelihood of adopting new behaviours, along with their capabilities (physical and psychological capacity to engage in a behaviour), opportunities (external factors that prompt or enable a behaviour) and motivations (factors internal to an individual that energise or direct behaviour), equips planners and policymakers with a multilevel approach for designing more feasible, targeted interventions. Using this framework, the present study aims to describe the characteristics of cat semi-owners and compare these with the general population of cat owners and non-cat owners to inform future cat management interventions.

Materials and methods

Questionnaire

An online questionnaire was developed and advertised throughout New South Wales (NSW), with links available through the RSPCA NSW website and social media and it was shared by other external stakeholders such as veterinary practices and councils throughout NSW. The questionnaire was open to all residents of NSW, both cat owners and those who did not own a cat.

Respondents were asked ‘do you own any cats?’, ‘how many cats do you own?’ and ‘do you care for other free-roaming or stray cats (not including the cats you own)?’. Demographic information (age and gender) was collected from all respondents. Cat owners were

asked about their current cat containment behaviours and asked to estimate the time their owned cat currently spent roaming freely outside.³⁰ They were asked about the characteristics of their property (location, the type of dwelling, access to an outside space and home ownership) that had the potential to influence containment behaviour (physical opportunity). In addition, cat owners were asked to rate their agreement (on a five-point Likert scale) to 15 COM items relating to cat containment (Table 1). These COM items addressed four important themes that had been identified from previous research.^{6,31,32} Respondents that did not own a cat were also asked to rate their agreement to 10 COM items within three of these themes (Table 1).

Statistical analysis

As COM items were worded as either drivers or barriers in the survey, all barrier items were reverse scored for analysis. All data were tested for compliance to the assumptions for parametric statistical analyses: normality, outliers, multicollinearity, non-linearity, homoscedasticity and non-independence assumptions. COM agreement data from Likert scales were treated as interval data, following the common practice used in medical and psychological research.³³ Internal consistency of the COM variables containing multiple items was tested using the Cronbach’s α test.³⁴

ANOVA and Pearson χ^2 were used to compare the differences in demographic and situational variables between respondents. ANOVAs were used to compare the differences between the COM ratings of semi-owners and other respondents. All analysis was conducted using SPSS, version 29 (IBM).

Ethical approval

The study was approved by the Human Research Ethics Committee of the University of Sydney (protocol code 2021/473; 27 July 2021).

Results

All respondents

Responses to the online questionnaire were received from 8708 people; 404 responses were excluded due to insufficient data or respondents indicating they were not from within NSW, leaving a total of 8304 responses for analysis. Responses were received from 105 of the 128 local government areas within NSW. Two-thirds of respondents (5581; 67%) lived in major urban centres (Sydney, Newcastle, Lake Macquarie, Central Coast, Wollongong and Shoalhaven), with the remaining third coming from regional areas (2723; 33%).³⁵ The overall mean \pm SD age of respondents was 49.2 ± 14.6 years, ranging from 18 to 90 years. Three quarters of the respondents were female (6243; 75%), with 1721 males (21%) and 320 (4%) identifying as non-binary and 20 respondents (2%) not offering a response.

Table 1 Reliability of capability, social opportunity and motivation (COM) themes and individual items relating to cat containment that were rated by respondents in an online survey

COM themes	Cronbach's α
Capability to contain cat (three items)	0.82
1. Preventing cat roaming is too difficult (reverse score)	
2. Confident can prevent cat roaming freely	
3. Confident can provide everything to ensure contained cat is happy	
Social opportunity for cat containment (five items)	0.83
4. A practice that my family and friends would agree with*	
5. A practice that veterinarians would agree with*	
6. A practice that my neighbours would agree with*	
7. A practice that other cat owners would agree with	
8. Council should have law requiring cats to be kept on owners' premises*	
Containment motivation associated with cat's welfare (three items)	0.77
9. Should be prevented from roaming to keep them safe*	
10. Should be prevented from roaming as good for their health & wellbeing*	
11. Believe cats do not like being contained (reverse score)*	
Containment motivation associated with supporting the community (four items)	0.85
12. Should be prevented from roaming to protect wildlife*	
13. Should be prevented from roaming as can be nuisance to neighbours*	
14. Would prevent from roaming if required by law	
15. Believe cats should be allowed free to roam (reverse score)*	

*COM items rated by respondents that did not own cats

Semi-owners

When asked 'do you care for other free-roaming or stray cats (not including the cats you own)?' 588 of 8304 (7%) respondents answered 'yes'. These respondents are hereafter referred to as 'semi-owners'. Semi-owners were younger on average than respondents who were not semi-owners (45.5 ± 14.7 years vs 49.5 ± 14.6 years; $F = 39.37$, $df = 1$, $P < 0.001$, $\eta^2 = 0.01$). The semi-owners were mostly female (487; 83%), with 84 (14%) males and 17 (3%) non-binary. This proportion of females was significantly higher compared with the overall survey response (Pearson $\chi^2 = 19.05$, $df = 2$, $P < 0.001$, $r = 0.05$).

Three-quarters of the semi-owners (447, 76%) lived in major urban centres (Sydney, Newcastle, Lake Macquarie, Central Coast, Wollongong and Shoalhaven), with the remaining quarter coming from regional areas (141; 24%). Semi-owners were more likely to live in urban areas than people who were not semi-owners (Pearson $\chi^2 = 22.30$, $df = 1$, $P < 0.001$, $r = 0.05$). They were also more likely to live in areas with lower average scores on the index of socioeconomic disadvantage (1006.1 ± 75.48) than respondents who were not semi-owners (1029.3 ± 63.94 ; $F = 69.91$, $df = 1$, $P < 0.001$, $\eta^2 = 0.01$).³⁶

Cat ownership

Just over half of the respondents to the questionnaire were cat owners (4461; 54%), while the remaining 3843 (46%) were people who did not own cats (hereafter referred to as 'non-owners'). Cat owners were younger (46.0 ± 13.7 years) than non-owners (52.8 ± 14.8 years)

($F = 455.04$, $df = 1$, $P < 0.001$, $\eta^2 = 0.0$) and more likely to be female than non-owners (82.2% vs 67.0%; Pearson $\chi^2 = 306.44$, $df = 3$, $P < .001$, $r = 0.19$). Cat owners were more likely to live in major urban areas (3162; 70.9% cat owners and 2419; 62.9% non-owners) and non-owners in regional areas (1299; 29.1% cat owners and 1424; 37.1% non-owners; Pearson $\chi^2 = 58.99$, $df = 1$, $P < .001$, $r = 0.08$).

Semi-ownership and cat ownership

Most semi-owners also owned their own cats, such that they were both semi-owners and cat owners (416 of 588; 71%). Semi-owners who were also cat owners were:

- significantly younger (44.3 years) than all other groups ($F = 160.9$, $df = 1$, $P < 0.001$, $\eta^2 = 0.06$) (Table 2);
- more likely to be female than semi-owners who were not cat owners (88% vs 77%; Pearson $\chi^2 = 7.41$, $df = 2$, $P = 0.03$, $r = 0.11$), but no more likely to be female than cat owners who were not semi-owners (88% vs 82%); Pearson $\chi^2 = 2.44$, $df = 2$, $P = 0.30$, $r = 0.02$); and
- more likely to live in major urban areas than all other groups (79% vs 70%; Pearson $\chi^2 = 5.21$, $df = 1$, $P = 0.02$, $r = 0.09$).

Compared with cat owners who were not semi-owners, cat owners who were also semi-owners were (Table 3):

- less likely to own their home and more likely to be renting;

Table 2 Comparison of age, gender and location variables between semi-owners and those that were not semi-owners further segmented by cat ownership

Variables		Semi-owners	Not semi-owners
		Mean \pm SD	Mean \pm SD
Age (years)	Cat owner	44.3 \pm 14.1	46.2 \pm 13.6
	Non-owner	48.0 \pm 15.7	53.1 \pm 14.8
Gender (female)	Cat owner	354 (88%)	3315 (82%)
	Non-owner	133 (77%)	2441 (67%)
Location (urban)	Cat owner	327 (79%)	2835 (70%)
	Non-owner	120 (70%)	2299 (63%)

- more likely to own three cats or more;
- less likely to contain their own cats; and
- more likely to own cats that were always outdoors.

No statistical differences were found between the type of dwelling or access to outside space.

Semi-owners and COM agreement ratings

All respondents that owned cats were asked to rate their agreement with COM statements pertaining to their

capability, social opportunity and motivation for containing their cats. Cronbach's α for the multi-itemed COM items are shown in Table 1. All items reflected an adequate internal consistency.³⁴ Scale scores for each of these themes were computed by averaging the items, which were then used for this analysis.

All cat owners who fully contained their cats had significantly stronger agreement ratings to all four COM themes than those cat owners who did not contain their cats, regardless of their semi-ownership status; capability ($F=1468.74$, $df=3$, $P<0.001$, $\eta^2=0.50$), social opportunity ($F=591.25$, $df=3$, $P<0.001$, $\eta^2=0.00$), cat welfare motivation ($F=822.50$, $df=3$, $P<0.001$, $\eta^2=0.36$) and community motivation ($F=641.99$, $df=3$, $P<0.001$, $\eta^2=0.30$) (Figure 2). Cat owners who were also semi-owners agreed less strongly than cat owners who were not semi-owners to the community motivation theme (Table 4). Therefore, cat owners who were also semi-owners agreed less strongly than cat owners who were not semi-owners that:

- cats should be prevented from roaming to protect wildlife;
- cats should be prevented from roaming to prevent them causing a nuisance to neighbours;
- they would prevent their cat from roaming if required by law; and
- cats should not be allowed to roam freely.

Table 3 Comparison of cat-owner situational and cat ownership variables between semi-owners and those who were not semi-owners

Variables		Semi-owners N (%) [Z_{resid}]	Not semi-owners N (%) [Z_{resid}]	χ^2	df	P	r
Dwelling	Own	283 (69%) [-3.8]	3103 (77%) [3.8]	14.66	1	<0.001	0.06
	Rent	128 (31%) [3.8]	913 (23%) [-3.8]				
Type of dwelling	Free standing house	310 (75%) [-0.4]	3056 (76%) [0.4]	0.14	1	0.71	0.01
	Apartment / other	104 (25%) [0.4]	981 (24%) [-0.4]				
Outdoor space	Access	336 (75%) [-1.5]	3395 (84%) [1.5]	2.39	1	0.12	0.02
	No Access	78 (25%) [1.5]	642 (16%) [-1.5]				
Cats per household	1 cat	133 (32%) [-8.6]	2181 (54%) [8.6]	232.65	4	<0.001	0.22
	2 cats	129 (31%) [-0.7]	1319 (33%) [0.7]				
	3 cats	63 (15%) [4.9]	323 (8%) [-4.9]				
	4 cats	36 (9%) [7.5]	91 (2%) [-7.5]				
	5 cats or more	53 (13%) [11.2]	96 (2%) [-11.2]				
Containment behaviour	Fully contained	272 (65%) [0.3]	2612 (65%) [-0.3]	6.08	2	0.05	0.01
	Night curfew	86 (21%) [-1.8]	999 (25%) [1.8]				
	Not contained	58 (14%) [2.0]	433 (11%) [-2.0]				
Time spent outdoors	Never	226 (55%) [-1.2]	2313 (58%) [1.2]	13.82	4	0.01	0.04
	Sometimes	121 (29%) [0.2]	1154 (29%) [-0.2]				
	Half the time	47 (11%) [0.1]	452 (11%) [-0.1]				
	Most of the time	10 (2%) [1.3]	63 (2%) [-1.3]				
	Always	10 (2%) [3.4]	30 (1%) [-3.4]				

Z_{Resid} = adjusted standardised residual, where $Z_{\text{Resid}} > |2|$ is significant at $P<0.05$. r = Pearson's correlation coefficient; $r \geq 0.5$ indicates strong effect size, $r=0.3$ indicates medium effect size, $r=0.1$ indicates weak effect size

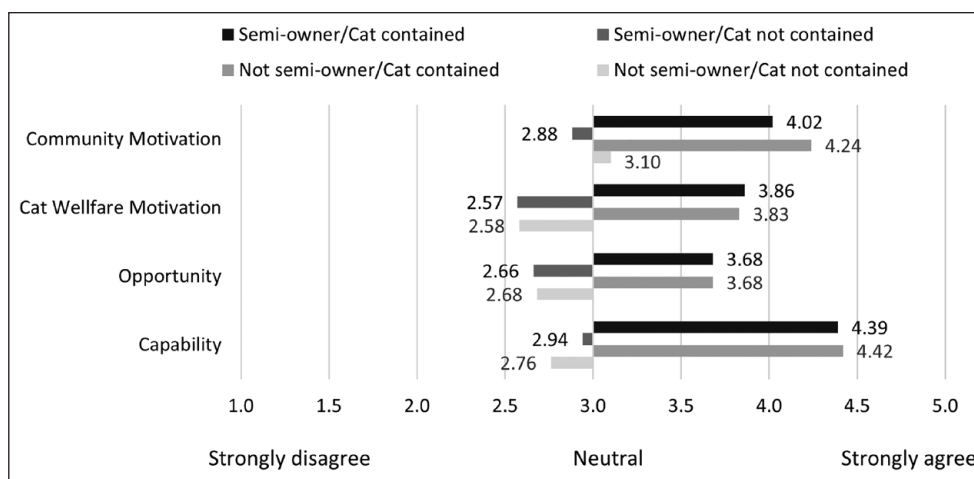


Figure 2 Average agreement ratings to capability, social opportunity and motivation (COM) themes for cat owners who are also semi-owners compared with those who are not semi-owners

Respondents who did not own cats were also asked to rate their agreement with relevant COM statements pertaining to their perceived social opportunity and motivation for cat containment. All respondents who did not own cats significantly rated their agreement higher than cat owners for two of the three COM themes, with respondents who were not semi-owners agreeing

more strongly than semi-owners; social opportunity ($F = 407.41$, $df = 3$, $P < 0.001$, $\eta^2 = 0.13$) and community motivation ($F = 444.12$, $df = 3$, $P < 0.001$, $\eta^2 = 0.02$) (Figure 3). Non-owners who were also not semi-owners had a significantly stronger agreement rating than all cat owners and semi-owners for the cat welfare motivation theme ($F = 13.07$, $df = 3$, $P < 0.001$, $\eta^2 = 0.01$) (Table 4).

Table 4 Comparison of capability, social opportunity and motivation (COM) themes across semi-ownership, cat owner and cat containment groups

COM themes*	Cats contained		Cats not contained		F	df	P	η^2
	Semi-owners	Not semi-owners	Semi-owners	Not semi-owners				
Capability	4.39 ^c	4.42 ^c	2.94 ^b	2.76 ^a	1468.74	3	<0.001	0.50
Social opportunity	3.68 ^b	3.68 ^b	2.66 ^a	2.68 ^a	591.25	3	<0.001	0.29
Cat welfare motivation	3.86 ^b	3.83 ^b	2.57 ^a	2.58 ^a	822.50	3	<0.001	0.36
Community motivation	4.02 ^c	4.24 ^d	2.88 ^a	3.10 ^b	641.99	3	<0.001	0.30
COM themes	Cat owners		Non-owners		F	df	P	η^2
	Semi-owners	Not semi-owners	Semi-owners	Not semi-owners				
Social opportunity	3.39 ^a	3.42 ^a	3.73 ^b	4.12 ^c	407.41	3	<0.001	0.13
Cat welfare motivation	3.41 ^a	3.39 ^a	3.41 ^a	3.52 ^b	13.07	3	<0.001	0.01
Community motivation	3.66 ^a	3.88 ^b	4.07 ^c	4.58 ^d	444.12	3	<0.001	0.14

*Mean scores for COM themes using scale: 1 = strongly disagree, 5 = strongly agree. Means with different lettered superscripts (in rows) differ significantly at $P < 0.05$ Tukey's honestly significant difference; means with the same lettered superscripts are not significantly different η^2 = effect size where $\eta^2 = 0.01$ indicates a small effect, $\eta^2 = 0.06$ indicates a medium effect and $\eta^2 = 0.14$ indicates a large effect

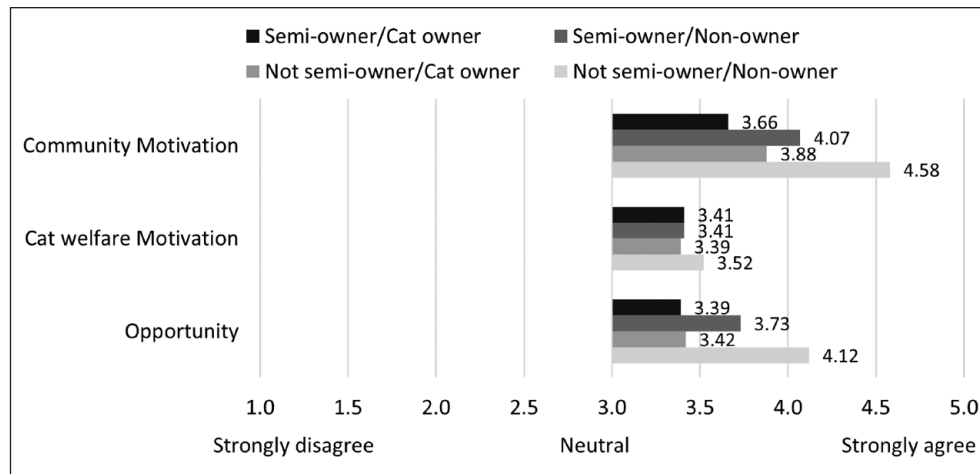


Figure 3 Average agreement ratings to capability, social opportunity and motivation (COM) themes for cat owners and non-owners who are also semi-owners compared with those who are not semi-owners

Non-owners who were also semi-owners agreed less strongly than non-owners who were not semi-owners that (Figure 3):

- councils should have a law requiring cats to be contained;
- containment was a practice their family and friends agreed with;
- containment was a practice that veterinarians agreed with;
- cats should be prevented from roaming to keep them safe;
- cats should be prevented from roaming as it is good for their health and wellbeing;
- cats like being contained;
- cats should be prevented from roaming to protect wildlife;
- cats should be prevented from roaming to prevent them from causing a nuisance to neighbours; and
- cats should not be allowed to roam freely.

Discussion

The present study demonstrates that cat semi-ownership is common in Australia and is the first to describe characteristics of semi-owners from a large survey. Overall, more than one in 15 respondents, both cat owners and those who do not have pet cats, provide care for cats they do not consider they own. Most semi-owners also own their own cats. Cat-owning semi-owners were more likely to allow their own cats to roam and were less concerned about wildlife and nuisance issues associated with free-roaming cats. Importantly, and consistent with the findings of previous research, semi-ownership was more common among those who rented than those who owned their homes and was associated with living in a lower socioeconomic area.^{10,37,38}

The presence of populations of unowned domestic cats is associated with socioeconomic disadvantage.^{10,37,38} Hence, it is unsurprising that semi-owners, who care for these unowned cats, disproportionately live in lower socioeconomic areas. These are areas where cost can be an important barrier to accessing neutering for pet cats, contributing to unplanned breeding, overpopulation, and abandonment of cats and kittens.³⁹ Access to reliable means of transport and access to veterinary services can also be important barriers.⁴⁰ Other factors might also contribute to lower uptake of neutering in lower socioeconomic areas, such as lower levels of educational attainment, a lack of knowledge around 'responsible' pet ownership practices and different social norms around pet guardianship.

People living in lower socioeconomic areas might also be more likely to passively acquire pet cats (ie, become cat owners without deliberately sourcing a cat; for example, by finding an unowned cat or kitten, or being given a cat or kitten as a gift). Living in lower socioeconomic areas has been associated with having unowned cats on your property, feeding unowned cats and surrendering cats to animal shelters multiple times,³⁸ which are all scenarios that might also lead to cats, and especially kittens, being passively acquired. This might explain, at least in part, the high proportion of cat semi-owners who are also cat owners; many of these owned cats might have previously been unowned or semi-owned. Indeed, it has been estimated that around half of all pet cats in Australia were passively acquired.⁴¹ The relationship between socioeconomics, semi-ownership and passively acquiring pet cats is an important area for future research and in-depth, qualitative research in this area could be particularly valuable.

Our findings that most semi-owners (more than 80%) also own cats of their own, own more cats on average than

non-semi-owning cat owners and are more likely to own more than four cats, suggests that many semi-owners are already overwhelmed with cat caring responsibilities. This has been found to be an important reason for semi-owners not claiming ownership of the unowned cats they care for.¹⁸ Semi-owners can be valuable potential adopters of unowned free-roaming cats. However, if already overwhelmed, semi-owners might experience moral distress when unable to take on more responsibility for the cats they care for, despite being concerned for their welfare. The negative emotional and psychological consequences for semi-owners when cats they care for have poor outcomes are starting to be described.²⁴ In addition, there could be potential cat and human wellbeing issues associated with semi-owners taking on responsibility for multiple cats or more cats than they can effectively provide for. For example, if the semi-owner already has their own cats, adding an additional cat or cats can result in conflict between the cats, which is one of the major sources of stress in owned cats, especially when contained.^{42,43}

A growing body of research suggests that there are very few genuinely unowned cats and that unowned cats quickly become semi-owned as they are noticed by compassionate community members.^{4,24,44} Because of this, semi-owners are a crucial target audience for human behaviour change approaches that aim to reduce unowned cat populations. However, a nuanced approach to intervention design is needed that prioritises the wellbeing of cats and semi-owners for semi-owners to 'buy in'. Unowned free-roaming cat management is resource-intensive because unsocialised cats are difficult to trap, especially when they are provided with supplementary food and are less motivated to enter traps.⁴⁵ In our experience, trapping programmes can also be sabotaged by members of the public (potentially semi-owners), deliberately releasing cats from traps. Semi-owners know where to find unowned free-roaming cats and, if positively engaged in the programme, can often catch them or assist with trapping programmes and can gradually socialise the cats over weeks and months, making them easier to trap and neuter or rehome.²³ Semi-owners can also be invaluable for ongoing surveillance for new-arrival unowned cats and for monitoring the health, welfare and size of the population. Hence, it is often in the interests of local government and animal welfare organisations to work collaboratively with semi-owners on the management of unowned free-roaming cats.

An understanding of the importance of semi-owners in the management of unowned free-roaming cats highlights problems with demonising and criminalising semi-ownership. Penalising semi-owners for feeding free-roaming cats, restricting the number of cats per household, mandating registration of pet cats and mandating cat containment all make effective management of unowned free-roaming cats more

difficult by creating barriers to semi-owners formally adopting unowned cats, or coming forward to report the cats they care for. Imposing these restrictions on cat ownership, as is common and increasing among local and state governments in Australia, does not prevent or stop the compassionate behaviour of semi-owners^{24,46,47} and does not address the underlying reasons for the presence of unowned free-roaming cat populations, such as affordability of veterinary services, lack of surrender options, abandonment of unwanted cats and kittens, and immigration of feral cats to populated areas.⁷ Instead, they erode the trust of semi-owners in the authorities and encourage negative community sentiment against semi-owners, which can shift the behaviour of caring for unowned cats underground.²⁴ Obstructive legislation also limits the management options for unowned cats that are available to local governments and animal welfare organisations, especially for cats that are poorly socialised, leading to higher rates of euthanasia.^{1,2} For example, trap-neuter-release interventions are difficult to implement in Australia, where legislation prohibits the release of 'feral' cats and the 'abandonment' of unowned domestic cats.⁴⁸

Cat semi-owners are unlikely to be one homogeneous group and it might be important to differentiate between those, for example, who are feeding only one or two unowned cats, those who care for multiple cats at their place of work, those caring for multiple unowned cats at their home and those who travel to feed groups of cats at other locations. Understanding different semi-owner audience segments is another important area for future research and might impact how behaviour change interventions are targeted.¹⁰ Some semi-owner segments will be overwhelmed with more cats than they can effectively care for, and management programmes should only return cats if they can reasonably expect that they would have acceptable welfare and will receive ongoing care.⁷ Hence, interventions need to incorporate long-term planning for each cat and ideally provide options for cats to be surrendered for rehoming where they are locally overpopulated.⁴⁹ Programmes also need to consider and address health, disease and safety concerns, which are commonly encountered among free-roaming unowned cats.^{7,17,19} Euthanasia of unowned free-roaming cats can be an appropriate outcome for some cats where their quality of life is poor (eg, owing to untreatable medical conditions), where overpopulation is significant or where rehoming options are overwhelmed.

Clearly defining target behaviours is an important first step in designing interventions to influence human behaviour around unowned free-roaming cats.²⁸ Consistent with McDonald and Clements,¹⁰ we suggest that a key target behaviour is *reporting cats to management programmes*. This is a behaviour that is relatively simple to perform and does not cost anything, and considers the fact that semi-owners are often overwhelmed, have

limited resources and are acting compassionately towards animals who are ultimately not their responsibility. However, semi-owners will likely only report cats when they are confident the outcome will be humane.^{24,46,47} As such, in our experience, an effective intervention for semi-owned cat management needs to:

- 1) Engage all stakeholders, including multiple potential semi-owners with varying relationships with the cats in question, landowners and non-semi-owning neighbours.
- 2) Establish a long-term plan both for individual cats and the area, including confirmation of who will be designated as the guardian of the cat(s). The guardian is responsible for the ongoing care and monitoring of the cat(s) and can be an individual or organisation. Note that the requirements on guardians differ between jurisdictions. Some may be required to permanently identify, register and/or contain cats they 'own'.
- 3) Trap, neuter and permanently identify cats that will remain at the site with the consent of their guardian. Note that ensuring true informed consent has been obtained for neutering is an important component of gaining the trust and confidence of semi-owners who are often wary and sceptical.²⁴
- 4) Trap and rehome or euthanase other cats after careful consultation and with the consent of all stakeholders, noting there are often multiple semi-owners caring for individual cats who will be invested in their outcome.

Other target behaviours that might be incorporated into semi-owner behaviour change interventions include presenting cats for neutering and claiming ownership of cats. However, semi-owners face multiple and complex barriers to engaging in these behaviours.^{10,18} Many of these barriers can be overcome with careful intervention design. In our experience, semi-owners can be secretive and defensive and can also be socially isolated. As a result, trust is often the most important barrier, which can be overcome by proactive community engagement, removing penalties and demonisation of semi-ownership, as well as ensuring humane, non-lethal outcomes for the unowned cats.²⁴

The cost of neutering is another important barrier for many semi-owners and relates to these cats predominantly being present in lower socioeconomic areas.^{10,18,37} In addition to the financial limitations often experienced by semi-owners, the willingness to pay for interventions for cats they do not consider they own can be especially low. In our experience, neutering must be free in order to get good engagement from semi-owners. The ability

to transport cats to and from veterinary appointments, the ability to catch or trap cats, and access to appropriate carriers in which to transport cats can also be significant barriers.⁴⁰ Knowledge, language and cultural barriers can also be important in some communities and might explain some of the differences observed in community motivation scores between semi-owners and non-semi-owners in the present study.⁵⁰ These barriers necessitate careful consultation and engagement with local stakeholders, such as community organisations, schools, human social services and businesses. Lack of availability of pet-friendly housing, especially for renters, is another important barrier to semi-owners taking on ownership responsibility of the cats they care for.⁴⁰ This was reflected in our findings that semi-owners were more likely to be renting.

Semi-owners are unlikely to seek out services for the unowned free-roaming cats they care for, mainly because they do not consider these cats their responsibility. This can be overcome by engaging with semi-owners directly through door-knocking and letterbox drops. Social marketing that encourages the community to notice and report unowned cats might also be especially valuable, noting the need to reassure semi-owners that outcomes for cats will be humane and non-lethal, both to effectively engage semi-owners and avoid stoking anti-cat sentiment.

Conclusions

Unowned 'stray' domestic cats threaten wildlife, as well as create a community nuisance and contribute to high rates of euthanasia in animal shelters. This population of cats can have poor welfare, contribute to the pet cat population and compromise attempts to control feral cats. Semi-owners of unowned cats are a valuable potential target audience for human behaviour change interventions to manage this important cat subpopulation. Understanding that these semi-owners often have cats of their own, might already be overwhelmed with cat-caring responsibilities and are disproportionately from lower socioeconomic backgrounds should guide the design of these interventions.


Conflict of interest The authors declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

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Ethical approval This work did not involve the use of animals and therefore ethical approval was not specifically required for publication in *JFMS*.

Informed consent This work did not involve the use of animals (including cadavers) and therefore informed consent was not required. No animals or people are identifiable within this publication, and therefore additional informed consent for publication was not required.

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Article

The Impact of Lethal, Enforcement-Centred Cat Management on Human Wellbeing: Exploring Lived Experiences of Cat Carers Affected by Cat Culling at the Port of Newcastle

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Simple Summary: Free-roaming cats in urban areas frequently cause complaints. In Australia, cats are classed as domestic or feral depending on how and where they live, with cat management practices varying depending on the cats' classification. Cats classified as feral can be managed, when considered appropriate by authorities, by shooting them. In 2020, this approach was employed to manage urban cats being fed daily by cat caregivers. This qualitative study aimed to document the lived experience of these cat caregivers to understand their motivations for caregiving and their relationships with these cats. A secondary aim was to explore caregiver perceptions of the lethal management approach and if psychological impacts were experienced. Several main themes arose from interviews with caregivers. The results demonstrate strong relationships between the caregivers and the cats, and negative impacts on caregiver mental health and quality of life associated with this lethal cat management practice. It is recommended that a care-centred approach be taken, whereby authorities identify and assist caregivers to implement neutering and, if possible, adoption. This would improve cat welfare, minimize public complaints, and reduce psychological hazards to caregivers. Legislative amendments should be prioritized to facilitate these recommendations and a revision of the classification between domestic and feral cats should be actioned.

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Abstract: In urban and peri-urban areas of the world, free-roaming cats often pose management challenges for authorities. Most are wandering owned or semi-owned cats (fed by people who do not perceive ownership). Some are lost or abandoned, or unowned cats who obtain food from humans unintentionally. Unidentified cats are classified as “stray” in shelter data, and by government agencies as “stray” or “feral” based on their behaviour. However, legally feral cats are usually considered to live and reproduce in the wild with no support from humans. Cats classified as feral in Australia can be managed using lethal methods, including shooting, poisoning, trapping, and blunt trauma. The impact of killing animals on shelter staff is well documented. However, no previous research has investigated psychological impacts of lethal cat management on citizens who care for free-roaming cats. Using semi-structured interviews, this study explored the lived experience of six cat caregivers affected by lethal management of cats by shooting, instigated by the Port of Newcastle in 2020. Results demonstrated strong relationships between the caregivers and cats, and negative impacts on caregiver psychological health and quality of life associated with lethal management. It is recommended that a care-centred approach to cat management be prioritized in future, whereby authorities aid neutering and, if possible, adoption, to improve cat welfare, minimize cat nuisance complaints, and reduce psychological hazards to caregivers. Further, a revision of relevant legislation used to distinguish between domestic and feral cats in Australia should be actioned to prevent unnecessary killing of domestic cats.

Keywords: free-roaming cats; animal caregiver stress; traumatic stress; cat cull impacts

1. Introduction

In urban and peri-urban areas of the world, free-roaming cats often pose a management challenge for authorities [1]. Management is important because there are concerns about free-roaming cats' negative environmental impacts. These include the effects of nuisance behaviours [2], such as urinating, defecating and fighting; perceived risk of disease spread to humans, pets, and wildlife; and wildlife predation [3,4]. In Australia there is heightened concern regarding free-roaming cats because of evidence feral cats are a contributing factor to the extinction of native animals, and because of reports estimating that large numbers of native animals are caught by cats in urban and peri-urban areas [4–9]. There are also concerns for the health, welfare, and safety of free-roaming cats [2]. Unfortunately, existing management approaches for free-roaming cats typically have not achieved any long-term decrease in the number of cat-related complaints, or the number of cats subsequently impounded by authorities [10–14]. Hence, cat management remains an ongoing issue in many municipalities.

Under government legislation relating to domestic animal management, biosecurity, and feral pests, cats in Australia are considered either domestic or feral. While these terms are inadequately defined in legislation [15], the classification is important, because cat management, prescribed under various state government acts, reflects the terminology used. In New South Wales (NSW), for example, under the Companion Animal Act 1998 [16], cats that are companion animals (domestic cats) are required to be identified with a collar and tag or microchipped by 12 weeks of age, and to be registered (licensed) by 6 months of age. The act relates to companion animals (dogs and cats) but also states “the fact that an animal is not strictly a “companion” does not prevent it being a companion animal for the purposes of this Act”.

In NSW, cats considered companion animals are prohibited from food preparation and consumption areas and designated wildlife protection areas, but are allowed to roam off their owners' property provided they do not cause a nuisance [16]. If free-roaming domestic cats result in complaints to local government authorities, methods such as trapping are often employed as a management strategy. Typically, complainants are loaned a trap cage and deliver the trapped cat to the local government animal management facility. Owners are contacted to reclaim trapped cats identified through collar tags or microchip databases. If no form of identification is present, the cat is held for a mandated period of typically between 3 and 7 days depending on the state, after which any cat not reclaimed by owners can be either rehomed or killed.

In Australia, feral cats [17,18] are considered to live and reproduce in the wild and survive by hunting and scavenging, with none of their needs met by humans [19]. Feral cats are regarded as an invasive pest species, and state and local governments, and in some cases landowners, have a responsibility to manage these cats, often using lethal methods, such as shooting, poisoning and sometimes blunt-force trauma [20–23].

Cats in urban and peri-urban areas that are identified as feral based on behaviour and appearance are not required to undergo a minimum holding period in a shelter or animal management facility before being killed [24]. However, research clearly demonstrates that it is not possible to distinguish between feral and domestic cats or their adoptability based on behaviour. Many cats are fearful and stressed in local government animal facilities (municipal pounds) and animal welfare shelters where trapped cats are taken, and appear aggressive or timid, resulting in high kill rates for healthy cats [1,11,25–28]. Even owned pets can appear fearful and stressed when trapped, resulting in incorrect classification [19,22,25–27,29–31]. To address this issue, the peak animal welfare organization in Australia, the Royal Society for Prevention to Cruelty to Animals (RSPCA), and some federal [19] and state government documents [22,32] recommend definitions based on how and where cats live. Based on these definitions, domestic cats are fed intentionally or unintentionally by humans, and live in the vicinity of humans. Domestic cats are sub-categorized into owned, semi-owned (fed by people who do not perceive ownership), or unowned (receive food unintentionally from humans). In contrast, feral cats live and

reproduce in the wild with no support from humans, and survive by hunting and scavenging.

This is an important recommendation since it would mean that cats living in the vicinity of humans, currently deemed feral by state authorities due to a lack of apparent socialization to humans, would instead be deemed domestic and, therefore, subject to different and potentially more humane management methods. In Australia, 3% to 9% of adults report feeding an average of 1.5 cats daily that they do not perceive they own, and are often referred to as cat semi-owners [2,33]. Although most semi-owners feed only one to two cats [2,33], some participate in feeding more, with an average of twelve cats fed in multi-cat situations in Australia [34]. Several cat semi-owners or caregivers may be involved in caring for the same cat group (referred to as cat colonies by authorities), and the care they provide may be organized using feeding rosters [34,35]. Attempts to ban feeding of these cats have had little success, perhaps because, as claimed by some authors, it is difficult to ban compassion, and is costly and difficult to enforce [36].

In other countries, a trap–neuter–return (TNR) approach, whereby free-roaming cats are trapped, neutered, and then returned to the site from which they were captured, is increasingly being used to manage cats in cities and towns, as well as on farms [10,11,37–39]. Typically, in TNR programs, kittens and, when possible, friendly adults, are rehomed [34]. When applied with high intensity and purposefully targeted, these programs are documented to reduce cat-related complaints, cat admissions into municipal animal facilities (pounds) and animal welfare shelters and, therefore, decrease the killing of cats. For example, a reduction of 64% in the number of complaints, 32–66% in the number of admissions, and 60–95% in the number of cats killed have been reported over 2 to 3 years [11,37,38,40–42].

In Australia, under state and local government legislation relating to biosecurity (feeding feral animals), animal care and protection (abandonment), and domestic animal management (wandering cats), TNR is illegal. It is still practiced on a small scale [34,35], particularly in some states, such as New South Wales and Victoria, where legislation is less stringent, authorities more lenient, or enforcement less robust.

Because management by population control using TNR is limited in application in Australia, authorities typically respond to complaints about free-roaming cats using an enforcement-centred approach, such as trap–adopt/kill or trap–kill [24,43]. This results in large numbers of healthy but fearful, stressed, timid or shy adult cats, and pre-weaned kittens being killed [1]. Moreover, although most trapped cats are humanely killed by lethal injection performed by veterinarians in shelters, municipal pounds, or in private veterinary practices under arrangements with local governments, if cats are deemed feral by local government authorities based on behaviour, they can also be managed by shooting, if this is not considered to pose a risk to the community [22]. The impact on cat welfare of different methods of killing is highly contentious, but beyond the scope of this paper [44]. More relevant here is that no consideration is typically given as to whether the cats in question are being actively supported by human caregivers or not, or even if they are unidentified owned cats [24].

The impact on shelter workers of animal euthanasia (killing) is well documented, with participation in this process being associated with negative psychological effects, including depression, traumatic stress, suicide, and substance abuse [36,45–51]. In one recent study, physiological indicators of stress in animal carers were elevated during the process of killing, and involvement in making decisions about which animals are killed was found to be predictive of traumatic stress [52]. The complex and poorly understood relationships between occupational stress, traumatic stress, and long-term mental health outcomes in shelter workers who engage in animal killing have resulted in the implementation of various interventions [53]. Given the potential severity of the effects on mental health, it has been proposed that all shelters should engage mental health workers, such as social workers, to mitigate the risks and mobilize protective factors for workers [52–55].

Although the adverse effects of killing animals on the psychological health of shelter workers is well documented, we could locate no previous research investigating the psychological and social impacts of lethal cat management on the citizens who care for free-roaming cats. However, cat caregivers (semi-owners) have reported being emotionally attached to the cats they are caring for [33], so it is likely that they suffer negative mental health impacts when the cats they are caring for are trapped and/or killed. This is supported by the literature documenting grief and mourning in companion animal guardians and animal care workers, including those who work in animal shelters, veterinary clinics, and wildlife rescues [56–59]. Anecdotal reports in social media document profound effects on cat caregivers when lethal methods are employed in response to complaints, with caregivers reporting symptoms, such as nightmares, anxiety, insomnia, headaches, and other physical ailments [60,61]. To our knowledge, such anecdotal reports have never been formally investigated.

We believe this to be a significant omission from the literature on the effects of cat control measures. If psychological harm to citizens is formally documented, then local government officials would be wise to consider these adverse effects when deciding on the most appropriate approach for the management of cats in circumstances in which one or more human caregivers intentionally support these cats.

In December 2020, local and national media in Australia reported that a cat cull by shooting had taken place at the Port of Newcastle, a large industrial port in the state of New South Wales, on a breakwall—a permanent barrier constructed at a coastal area that protects a harbour or shore from the full impact of tides, currents, waves, and storm surges. The breakwall and port are under the authority of the Maritime Authority of NSW (state government). The port was privatized in 2014, and the joint Chinese/Australian partners have “obligations to provide safe public access to the breakwalls” under their 98-year lease conditions [62]. Multiple cats were living on the breakwall, being supported by local caregivers. The mostly female caregivers, some of whom belonged to a group called the ‘Stray Cat’s Project’, had been caring for the cats for several years. They indicated that their caregiving was known by authorities for at least five years, and included using a TNR program to reduce numbers from 100 to about 40.

According to a report published by the Australian Broadcasting Commission [63], several cats were maimed or blinded during the cull attempt conducted by a licensed and experienced contractor. The report noted that, after the cull took place, those involved in caring for the cats arrived at the site to discover trails of blood, missing cats, cats with open, gaping wounds, and cats with broken limbs. This is clearly unacceptable from an animal welfare perspective, and hundreds of people subsequently gathered to protest the cull, demanding that the future planned culls be cancelled [64]. This event also provided a unique opportunity to investigate short- to medium-term impacts of this lethal, enforcement-centred approach to urban stray cat management on local cat caregivers. The aim of this study was to gain a better understanding of the motivations of stray cat caregivers, and the relationships between them and the cats they care for. Further, this study aimed to explore how caregivers involved in the caretaking of multiple cats perceived the event of the Stockton Breakwall cat cull, and to explore any potential psychological impact on caregivers.

2. Materials and Methods

2.1. Research Design

This study used an exploratory approach [65] to enable valid knowledge building about the impacts of stray cat culling on those who care for them. The lived experiences of cat caregivers were at the centre of this research to ensure the voices of marginalized women, who appear to have been neglected in the decision-making process to undertake a cull of cats which they had been caring for, are amplified. The population of this study were caregivers of cats living at the Stockton Breakwall, located at the Port of Newcastle,

New South Wales. Semi-structured interviews were conducted by a trained counsellor (VR) and used to explore the thoughts, feelings, and emotions of the caregivers (participants) regarding stray cat culling, and to gain an understanding of any health and psychological impacts experienced because of the cull. This enabled a deep understanding of the lived experiences of these cat caregivers, and the potential impacts on their health and wellbeing.

2.2. Participants

The very specific nature of this study required a targeted recruitment process whereby known caregivers of the Stockton Breakwall cats were contacted via social media and invited to participate. Given that there was anecdotal evidence of trauma and distress experienced by caregivers, recruitment and interviews were conducted by a qualified counsellor to mitigate further distress and provide support if necessary. A total of six caregivers, who identified as female and were estimated to be in middle to late adulthood, were recruited for this study between October 2021 and December 2021 (cull occurred December 2020). Two additional caregivers were invited to participate but declined.

2.3. Data Collection

Before commencing the study, ethics approval was obtained from the University of Queensland Human Ethics Committee (2021/HE001680). Two forms of sampling were used in this study: purposive and snowballing [66]. Purposive sampling was used to reach potential caregivers involved in caring for the Stockton Breakwall cats at the Port of Newcastle. Specifically, the social media platform Facebook was used to advertise this research and call for voluntary participants. Snowballing strategy [67] was also used, involving using word of mouth to access those not engaged with social media platforms. Interested persons were encouraged to contact a member of the research team (VR) via email. Potential participants were then contacted in return and were provided with a Participant Information Sheet (PIS) and consent form, before scheduling interviews at a mutually agreeable time. The PIS informed individuals that participation was voluntary and confidential, and that no information that could disclose their identity would be published without their consent. Participants were also informed that they did not have to answer any question they felt uncomfortable answering and that they were free to withdraw from the study at any time for any reason. The PIS informed individuals that the interview involved discussing topics that some individuals may find upsetting, and should they require any assistance and emotional support, they could access support and speak to a counsellor. To this end, the names and contact details of three counselling support lines, including the university's counselling and crisis line, were provided in the PIS.

Semi-structured interviews were conducted via telephone and were voice recorded. Before beginning the interviews, participants were read the PIS and consent form to which their verbal consent was provided. Interviews lasted between 46 and 88 minutes, with the average length being approximately 65 minutes. Questions focused on three key issues—the participant's motivations for caring for the cats, their immediate response to the cull, and any longer term impacts they personally experienced. The interviews occurred approximately 12 months after the culling event.

Once all interviews were completed, they were transcribed by a professional transcription service (Pacific Transcriptions®, Brisbane, Australia). The text was analysed independently by one author (RS) using thematic and narrative analysis [68] to identify comments related to the three primary areas of concern and to interpret each participant's story of the lived experience of the cat culling event, respectively. Extraction was confirmed by a second independent analyst (VR) and interpretation was discussed among the research team.

3. Results

The caregivers had been caring for the cats for between 1.5 years and 18 years (average = 6.75 years) (Table 1). The frequency at which the caregivers attended the Breakwall to care for the cats ranged from once per week ($n = 1$) to twice a week ($n = 1$), three times a week ($n = 1$), and 4–5 times a week ($n = 3$). The type of care provided included feeding, supplying fresh drinking water, administering first aid (e.g., removing fishing hooks, fishing lines, and plastic bags from cats), trapping the cats for medical attention and/or neutering, and providing the cats with human interaction and socialization. Feeding rosters were established by the carers to ensure the cats were fed and watered twice daily.

Table 1. Participant demographics; Stockton Breakwall Cat Caretakers.

Participant	Years of Caring	No. of Days Attending Breakwall Per Week
1	1.5	once
2	2	twice
3	3	3 times
4	6	4–5 times
5	10	4–5 times
6	18	4–5 times

The inductive approach to the analysis resulted in the extraction of several main themes and sub-themes from the interview transcripts. These have been tabulated and context examples are provided (see Table 2). It was also observed that the caregivers commented on the broader social and political impacts of the event. The discussion of these broader themes is beyond the scope of this paper, which is narrowly focused on why the caregivers were motivated to care for the cats and any immediate and long-term individual emotional and psychological consequences of the cat culling event.

Table 2. Major themes and sub-themes with context examples from interview transcripts.

Theme	Sub-Themes	Context Examples
Caregivers' Motivation to Provide Care for Cats	• Animal welfare concerns	"We had so many cats and it was this real desperation to get them off the wall, to reduce the population... I just thought, this is going to be my way of helping a problem that's been created by us, by people. I just really wanted to see these cats taken care of, and be part of a solution, not the problem"
	• Relationships with individual cats	"We just wanted to reduce the numbers, so there was less cats out there for the reason that we were—you know, there was the people out there that used to call them the feral cats, and say they'd be better off dead or they'd say, well, we want to kill these cats or we want to hurt these cats." "...the amount of fishing line and dog poo because people walk along the Breakwall with their dog, and they shit everywhere. No one says a thing about that. We're constantly picking up fishing line. There's three or four times we've actually rescued seabirds that we've found in distress with lines around them and hooks..." "One of the cats had a hook in its paw and I realized then the risks to the cats...careless fishing folk, but also lots of people walked out there in thongs and they walked out there barefooted. So that led me to picking up fishing line and so on as well" "...they're basically the same as a pet cat that you'd have at home. They have names. They have personalities. They have their little

	<p>traits that they each individually have... The bonds that we have with them are just as strong as the bonds as my own cats that live in my house...we think of them as our cats.”</p> <p>“(Dusty) has been here before. She’s an old soul. I think I knew Dusty in another life. I don’t know who we both were, but I believe we both knew each other before.”</p> <p>“...I always felt like I needed a purpose in life, but I never really felt like I found it till I found the Breakwall cats. I feel it’s my one time in my life that I’ve made a difference and, yeah, I help save cats’ lives now...”</p>
<p>Immediate Emotional Impact of the Cull</p> <ul style="list-style-type: none"> • Trauma • Disbelief • Shock • Grief 	<p>“...we just went down there to feed them like normal and were met with a—just bloodbath of blood everywhere...lines of blood and then they just end at the end of the Breakwall... The whole thing was just horrific.”</p> <p>“...imagine coming home to your own house and finding your cats shot and injured and bleeding and terrified. Imagine coming home to that scene. Well, that’s what we (experienced)—that’s what happened. I think, yeah, the whole thing was just horrific.”</p> <p>“...we just didn’t know what had happened and we didn’t know how many had been killed, and were they killed outright? We don’t even know the ones they took away if they were actually dead. We don’t know what they did with them. We don’t know who they took. We don’t know who died days after...”</p> <p>“...we just felt absolutely grief stricken. I cried like I’d lost all of my pets my whole life a million times over, because I didn’t know exactly who had gone, who was left injured.”</p> <p>“...it was the way in which it was done and the blood that was just left everywhere. There were some attempts to do something with it, but for anyone to go out there, it would have been just—and it was for many locals, many people—so traumatic. There were lots of people traumatized by what had happened.”</p>
<p>Long-Term Psychological Impacts—“The Aftermath”</p> <ul style="list-style-type: none"> • Complicated grief • Betrayal • Pervasive distrust • PTSD-like symptoms 	<p>“Horrible. Months and months and still today of horrible nightmares. Nightmares about cats being injured and jumping into the water and me trying to get in the water to find them and I can’t. Just that repeated nightmare because I couldn’t help them, and I was—felt so helpless.”</p> <p>“They didn’t even tell us. That’s, I think, the hardest part was knowing that all these years we’d had this good relationship with the Port of Newcastle, they at the end did not honour or respect us as people who really cared for these animals. That’s a hard thing to process, that betrayal and being deceived, and just trying to find forgiveness for these people. It was just horrible. It was really horrible. A horrible thing to do.”</p> <p>“That girl will kill herself over the cats. Then to have someone do what the Port of Newcastle did, it’s a personal attack... the amount that had been invested emotionally, personally, financially and the—what’s the word? The attitude, just the attitude of the Port who couldn’t care less.”</p> <p>“I thought they’ve [Port of Newcastle] got blood on their hands from the cats, now they don’t want blood on their hands with a human life as well. They thought maybe that oh gee, someone</p>

might be so upset they might kill themselves, and gee that would make us look bad, wouldn't it?"

3.1. Caregivers' Motivation to Provide Care for the Stockton Breakwall Stray Cat Colony

Caregivers were asked how they became involved in caring for the Stockton Breakwall cats, with their responses falling into two main categories—a general concern about the health and welfare of the cats, and the personal relationships they subsequently developed with individual cats.

3.2. Animal Welfare Concerns

Caregivers commonly voiced that their primary concerns were for the welfare and wellbeing (care) of the cats. These concerns motivated them to provide food and water, encouraged them to consider the safety and protection of the cats, and motivated them to decrease the numbers of cats on the wall by facilitating the adoption of kittens and suitable cats, and by neutering (desexing) and returning the cats to the Breakwall who were not suitable for adoption. Not all cats were suitable for adoption due to constraints, such as a lack of resources, limited numbers of suitable homes, and some cats being deemed too timid or shy to be rehomed. Cats living on the Breakwall were deeply cared about and for by the caregivers. The caregivers relayed their thoughts and feelings toward the cats and their desire to help ensure all cats were looked after—that their care, needs, and safety were tended to. Caregivers believed the cats required human intervention to ensure their good welfare as injuries or illnesses were relatively common. The quotes below typify how caregivers viewed the Stockton Breakwall cats and provide examples of the motivational factors driving them to devote their time and care:

"The number of cats out there—it was concerning because while the cats looked well enough and they were obviously being fed, yeah, they were still quite skinny and that, and I just thought I've got to help these cats."

"...they looked like they didn't have enough to eat. When I first started there was approximately 100 cats out there so you would assume that even if one person walked along, there would always be some that were missed... It was upsetting enough that I thought I actually had to do something... They just were not healthy looking. Obviously, some of them had cat flu and various other issues. Yeah... I wouldn't have been able to continue walking out there without helping."

"It was just too big a project. I was like, look if we desex one cat a week, one cat a fortnight whatever we can manage, by the end of the year, that's 26 to 52 cats we'll have done. You know what I mean? So, if we just chip away at it slowly we should be able to get there, and have them all desexed and all the ones that can be rehomed, rehomed."

The caregivers also relayed how the safety of the cats was often at risk due to harmful debris left in the environment, such as fishing lines and plastic bags. There was concern expressed about incidences of intentional harm and injury inflicted upon the cats by members of the public. The caregivers' motivation to care for the cats beyond simply providing food and water is evidenced in the quotes below:

"If there were fishhooks in their mouths, we would try and get them out. I've even taken antibiotics out there for cats that have had obvious infections."

"If we saw an injured cat then you would obviously try and get it. In fact, I have one here at home who was out there that had—his back leg was swinging. Both bones had been completely snapped in half, so I brought him home—and he's now my darling cat."

"... then we became aware that not everyone liked the cats—that there were fishermen out there that didn't like the cats—that there were people out there that were wanting to hurt the cats."

“One particular time out near the Adolphe wreck, I stood there for about three-quarters of an hour preventing him from throwing the fishing line into the rocks to damage cats.”

“...two different men, one 70 to 80 [years] who had dogs who would ‘sic’ the dogs onto the cats... I’ve stood over the years, in front of where the cats were, to prevent dogs attacking the cats on many occasions, many occasions, but those two men at different times were the worst, because they were doing it deliberately. And occasionally a cat was killed that way.”

3.3. Relationships with Individual Cats

The connections cat caregivers had with individual Stockton Breakwall cats was evident for all the caregivers. They conveyed having bonds and special friendships with the cats using words, such as ‘love’, ‘my cats’, and ‘family’. The level of connection was evident when the caregivers talked of the individual cats by name and pointed out their favourites, when they voiced concern for the wellbeing of cats who ‘went missing’ after the cull, and when they shed tears over the deaths of the cats killed in the cull during the interview process.

Caring for the Stockton Breakwall cats further cemented the deep bond which the caregivers had with the cats. When asked to describe their relationship with the cats, the caregivers relayed having a profound connection with them:

“They sort of like become your own cats. Even though there was 100, there were still very special ones...”

“...the most beautiful pets anyone’s ever had. It says a lot about the label they get. To have these bonds, it’s like having a million children at your feet. We name them all. They all have their names and they’re just so special—so, so special, you know. It is, it’s like having your own child. I have a child, but when they can’t talk and they’re looking at you to keep them safe and fed and the excitement of you being there—because some of them, they just didn’t want to eat. They just wanted to hang out with you, and they’d walk with you. So, I’d just stop and sit down and have a little chat.”

“I had a particular cat who is now called Thunder, but he used to come and sit on my lap every morning, and in the winter and when it was raining, I’d open my jacket up and he’d snuggle up. One day, he went missing but I later found out that this other group had him... Please let us know when you catch one, so that we know not to worry that one’s missing.”

“I had a favourite called (Nala) and she was one of the ones that got killed... There’s people that really, really had such strong feelings for these animals... They are very loved.”

“They’re not feral. They’re pets waiting to go home, they really are. They’ve proven that to all of us that care for them. They just deserve better.”

3.4. Immediate Emotional Impact of the Cull

When provided the opportunity to discuss their immediate response to the cat cull, caregivers described the scene they were met with on the morning after the event using words such as ‘horrific’ and ‘bloodbath’. In response to this event, caregivers described their immediate emotional responses using words such as ‘traumatic’, ‘mortified’, ‘disbelief’, and ‘shock’. Their immediate responses to the cull also included feelings of betrayal. The immediate emotional impact is illustrated in the quotes below:

“...the worst area. There was blood everywhere. All over the rocks, all over the pathway, like drag marks. So, once I’d sat with them, I’m going, ‘far out!’—something horrendous has happened here... I just started crying because the realization that out of the cats that were there, they probably only spotted about five. It was like, oh my God, what the hell has happened out here?”

“... two men came back in sort of like council suits, and they had some wheelie bins with them. They proceeded to scrub the blood away. They had cleaning products, and they were cleaning up the mess. We asked them what they were doing, and they laughed at us. That’s when we knew that this was something way bigger than we ever imagined.”

“We looked over onto the rocks... There was this trail of blood. I said, there’s a cat down there—there has to be a cat down there. She just climbed down and sure enough, she pulled out Lily who was the headline of the Breakwall. She’d been shot straight through the head. She’s blind.”

“... we were left with very many injured cats and also cats that had got away and passed away within the rocks. So even though we didn’t know who they were exactly, the smell was absolutely horrifying.”

“I kept calling out, Charlie, Charlie. Suddenly he pops up with his leg just hanging off him, coming up towards me, and I thought, oh my God. Thank God you’re alive. But his best friend, Max, had died, and here he was all alone, injured, terrified, not sure of what was going to happen next. It was just brutal. It was absolutely brutal.”

3.5. Long-Term Psychological Impacts—The Aftermath

The caregivers reported decreased levels of daily functioning and several negative impacts on their wellbeing following the cat culling event. For some, approximately 12 months after the event, these impacts were still felt. Caregivers also spoke about difficulties related to not knowing the fate of some of the cats and being unable to say goodbye. The following excerpts from the interviews provide more context:

“... when it happened and I knew I was obviously affected... I took a month-long service leave when it happened from my job, and that was to spend time out there trying to help the cats that were still out there, and also to deal with the emotional side of it, and deal with the rescue side of it.”

“... we’ve shed many a tear out there when you find a cat dead or a concern that some are missing. Because so many went missing...”

“... it’s just the pressure of everything. I mean I didn’t eat. I couldn’t eat for weeks. I still—I’m 38 kilograms or something. I’m that thin and it’s because when the stress of the cull happened, I literally couldn’t eat.”

“I still get emotional and it’s certainly moving on the 12-month mark. Thinking about that is really quite hard for myself and the other feeders, but I feel like I’ve—I don’t think I’ve fully dealt with it... People are okay if I get teary.”

“We had Scritch with a broken leg. We had Charlie who had been shot in the leg. We had Maggie who’d been grazed along the neck... To this day, it still impacts me.”

“... the thing that stays with us, the cats that they actually picked up and took away in a garbage bin, were they dead? Did they make sure that they were dead? We just would have liked to have had them scanned [for a microchip] so that we know who they actually took away—where did they take them? Not that it matters in one sense, but it does to us because we just wanted to know who they had.”

“... we want at least to say goodbye to them... We want their bodies. We want to bury them, or we want to know who’s dead or who’s injured amongst the rocks.”

Many of the caregivers expressed concern for the long-term welfare and wellbeing of the Stockton Breakwall cats in the wake of the lethal cull. Some described feelings of self-blame as well as fear and trepidation when they return to the Breakwall each day to undertake their caring duties; fearing they may find more cats killed or injured. The long-term psychological impacts on the cat caretakers are expressed in their own words below:

“... it’s just a constant fear that they will do it again... Just the feeling that we let them down because a lot of the desexed ones... they weren’t tame enough to rehome... We put

them back on the wall... Maybe if we hadn't have let them go back there, they wouldn't be dead now. But they weren't tame enough to rehome."

Caregivers conveyed feeling betrayed by the Port of Newcastle and that this had significant impact on their ability to cope and process the cat culling event. Specifically, the caregivers felt that they and the work they do was disregarded in the decision to initiate and fund the lethal cull.

"...there's still an injured cat out here for God's sake. I mean, it's nowhere near ended. So that just annoys the shit out of me, the fact that—I mean everyone makes mistakes but at least own it and try and make up for your mistake—try to right your wrong."

Several respondents reported that the cull was initiated after a complaint arising from an incident when a child fell off their bicycle when a cat ran across the Breakwall in front of the bike. The Port of Newcastle website stated they "engaged a licensed and experienced external contractor to help control feral cats on the Breakwall to reduce risks to the community, native fauna, and the environment." While the original statement has since been removed (originally accessed April 2022), it can be seen documented in local news media posts [60,62]. The cat caregivers expressed care for wildlife as well as the cats, but their observations of the wildlife–cat interactions happening at the Breakwall did not raise concerns over this issue.

"... lots of people who were concerned about the cats damaging the wildlife but the native rats, the Rakali, well they thrived from the cat food. They intimidated the cats."

"... they should be allowed in that environment because there really isn't any wildlife to speak of that the cats are a danger to. I have never seen a pile of feathers out there where a cat has caught a bird. Most of the birds there are seabirds such—like seagulls. There's crows. Well, the crows chase the cats anyway. There's native water rats out there. But the water rats actually eat the cat food with the cats. The cats don't seem to attack them. In fact, I've seen water rats chase away cats, and bite a cat's tail so that the cat would leave and he could get the food. So in terms of native wildlife, I don't see the issue but that is a concern to me."

"They weren't causing any problems with native wildlife. The rakali that are the native water rats used to cohabitate with them and share their food. They weren't causing any problem there."

As a consequence of feeling betrayed, what was also evident in the caregivers' discussion was a pervasive distrust of the authorities who organized the event. The quotes below provide some insight into the perceived response of the Port of Newcastle after the cull, and the caregivers' thoughts and feelings relating to the post-cull assistance from the Port of Newcastle:

"...even today there's still one cat there that was shot through the leg—front leg whose leg now can't bend... Seeing him there like that every day for nearly the last year and trying to catch him to get him the help he needs. The Port never did anything about those injured cats. We caught them all. We're still trying to catch whose still there. They never did anything. They just don't care."

"The Port offered us Lifeline (Lifeline is Australia's leading suicide prevention service. They are a national charity that provides all Australians experiencing a personal crisis with access to 24-hour crisis support). They gave us Lifeline's link. I was like, you're kidding me. You've fucked over one charity—excuse the French—and now you're going to send us to another charity, when you're a multimillion-dollar company, to get some help... I was not going to go through that making phone calls when I'm feeling like topping myself. Like not really, but you know what I'm saying. Like needing someone to talk to and then the phone rings out. I'm not even going to go there. Don't even suggest ringing Lifeline to me, because that would top you over."

"You stood all over us, one Newcastle charity, and now you're going to use Lifeline Newcastle, another Newcastle charity, to mop up your mess. Get some respect and own

what you did. You know what I mean? Instead of—like yeah that really annoyed me so much.”

Additionally, the caregivers spoke about the physical and behavioural impacts on the remaining cats, on other caregivers, and on the public:

“... some [cats] are just so scared of people because they’ve been given so much grief since the cull. I regularly experience people throwing rocks at them, trying to kick them, trying to go at them on their bikes.”

“... then the extra trauma was finding the wounded cats. Many of them became more furtive because after this experience they were hiding, so that added to not only their pain, but the upset of so many, not just the cat ladies but so many other people.”

“... very bittersweet feeling now when I go out on the wall, because it’s wonderful that there’s only so few cats, but the reality is, are we even going to get these ones, and what is their future?”

“Just upset, very upset. Not just for the animals, but for the girls involved because I know what a toll it takes...”

“There’s a couple of the ladies who aren’t there anymore. It just got too much for them... I can’t leave them (the cats). I can’t leave. I can’t turn my back on them. I’d feel like I’d let them down if I left... They can’t say it was successful in any way, because they left cats there severely injured and left them to die.”

“He can’t even go out there and walk in this most beautiful spot in all of Newcastle. He can’t even go out there, because he found that cat and he’s scared; he doesn’t ever want to do that again.”

4. Discussion

In the case study described, lethal enforcement-centred management for the cats being fed daily by cat caregivers was implemented by the Port of Newcastle, NSW, Australia to “help control ‘feral’ cats on the Stockton Breakwall to reduce risks to the community, native fauna, and the environment”. Several respondents reported that the cull was in response to perceived risk to humans, after a child fell off their bicycle when a cat ran across the Breakwall.

The mismanagement of the culling process was evident from the reports of the cats left badly injured, and it would be instructive in the future to debate the relative merits of the various methods of killing cats from an animal welfare perspective. Engaging in this debate is beyond the scope of this study, which focused on the effects of the event on local residents who cared for the cats, often on a daily basis. There are several important findings from this study exploring the lived experiences of the cat caregivers affected by the culling, including the strong bonds the caregivers have with the cats and the short- and long-term impacts on their psychological health. We maintain that these findings should be considered when authorities are considering management methods for urban stray cats.

Several main themes arose from the interviews with the six cat caregivers, whose cat caring experience ranged from 1.5 to 18 years. These themes relate to their motivations to provide care, the immediate emotional impacts of the cat cull, and the long-term consequences of the lethal event.

4.1. Motivation to Provide Care for the Stockton Breakwall Stray Cat Colony

The caregivers of our study reported considerable concern regarding the health and safety of the cats, and they also described the lengths to which many of them went to ensure the cats’ good welfare. They reported that the cats on the Breakwall were sometimes afflicted with injuries or harm due to environmental debris and human cruelty. Further, concern was also reported for other animals and the public in relation to the presence of harmful debris, and their efforts to remove it from the Breakwall were described.

Free-roaming or stray cats in cities and towns are frequently fed by people who are compassionate and who enjoy interacting with cats. They feel responsible for improving their health and welfare and commit substantial time and finances to their needs, despite existing legal and financial difficulties [34,35,43]. These people are considered semi-owners, and most feed one to two cats. In some cases, 10 to more than 100 cats are fed, and especially when larger numbers of cats are present, care may be provided by multiple people and organized through rosters [34,35]. The respondents in our study clearly identify themselves as belonging to this broader group of cat semi-owners.

Concern for the welfare of urban stray cats is often centred around a person's love of animals, sympathy towards cats that may be hungry, injured, or unhealthy, and ethical concerns [69]. Caregivers often provide not only food and water, but also first aid and (self-funded) veterinary attention for cats within their care, including neutering [34,39], as did the caregivers in our study. The caregivers in our study expressed a desire to reduce the number of cats by neutering and adoption, out of concern for the cats' welfare. Indeed, the caregivers in the current study reported that through neutering and adopting socialized cats and kittens, they had reduced the population from approximately 100 cats to 40 cats. This is consistent with the reasons cited by respondents for beginning TNR in an Australian study: it was a humane (compassionate) approach to cat management and, even if illegal, an effective way to reduce the cat population over time [43].

4.2. Caregivers' Bonds with the Cats

The motivations for care were further strengthened by the bonding and relationships each participant felt with the Breakwall cats. This study revealed the strength of the relationship between caregivers and individual cats, even though they reported there were 40 or more cats at times, and they did not own them in a legal sense. They nonetheless felt responsible for their welfare. The caregivers described their bonds with the cats as being as strong as the bonds with their own pets and asserted that they thought of them as their cats. They even described them as being like their own children, in that the cats looked to them (the caregivers) to keep them safe and fed. They "all had their names and personalities". This relationship appeared reciprocal, evidenced by the close interactions described by the caregivers between themselves and individual cats; the cats would curl up in the caregivers' jackets, butt them for head scratches, and run to meet them on the Breakwall. The benefits of human-animal relationships for psychological and psychophysiological health in people have been well established in the literature [70]. This is supported by a study of cat caregivers in Australia in which the caregivers reported that feeding cats "makes me feel good", "it is the right thing to do", and "the people who I care about would approve" [33]. Our study provides further evidence of the positive impacts of human-animal interactions and relationships, but unfortunately also highlights the psychological trauma that can result when the relationship is unexpectedly severed.

4.3. Psychological Impact of the Event

During the interviews, the caregivers described the culling event as 'horrific' and 'traumatic'. Since the caregivers were not informed the cull was to occur, they had no opportunity to prepare for the event, so it is perhaps not surprising that the caregivers also described the event as 'shocking'. The 'bloodbath' that they witnessed may have also intensified their feelings of shock and horror. Events that are unexpected and out of an individual's control can have the potential to cause greater psychological impact [71].

The emotional costs of cat management have been documented in shelter staff tasked with killing cats and kittens. Traumatic stress and increased suicide risk have been reported in shelter and animal control staff associated with the euthanasia of healthy animals [47,50,52,54,72]. Grief reactions have also been documented in animal caregivers [56–59]. The findings extend this research and show that lethal cat management can lead to intense immediate emotional reactions as well as longer term psychological impacts in cat caregivers.

All the caregivers described psychological impacts after the cull, with the impact still being felt nearly one year later. The interviews revealed that the cull affected their daily functioning, with one participant reporting that they took time off work and other caregivers reporting persistent weight loss and nightmares after the event. Nightmares may be characterized as an intrusive symptom which, together with initial feelings of horror and persistent negative changes in mood, may be indicative of posttraumatic stress [73]. This is consistent with findings that animal rescue workers exposed to euthanasia are more likely to be psychologically impacted than those who are not exposed to euthanasia [74]. What is different here though is that this was a mass killing conducted by shooting, rather than what might occur in an animal shelter environment where animals are likely to be killed individually via lethal injection. To this end, it is possible that the former may have an even greater psychological impact. Most urban stray cats that are managed by enforcement are trapped, rather than killed outright. Killing the cats being cared for after trapping them may on the other hand have similar traumatic impacts if caregivers are not informed or if they disagree with the practice, and/or the fate of the trapped cats remains unknown. This is an area which requires further research.

Strong bonds with the cats were evident in these caregivers. Therefore, not only did they experience the event as traumatic, but they may also have experienced grief from the loss of individual cats [59]. In interviews, feelings of self-blame are evident in relation to the returning desexed cats, who could not yet be rehomed, to the Breakwall, even though the caregivers could not have foreseen the fate of those that were returned. These feelings of guilt and self-blame can commonly manifest in those who are grieving and can have a detrimental impact on later adjustment [75]. A review found feelings of guilt can negatively impact adjustment in those who are bereaved, with studies finding guilt is associated with outcomes such as traumatic reactions, impaired physical health, and psychological distress [75].

The intensity of a grief response can be a function of one's level of attachment, whereby those more closely attached may experience grief more intensely than those less attached [59]. Caregivers in our study referred to the cats as 'pets' and 'children', so it is likely that the grief experienced from this traumatic, sudden, and unexpected loss was profound. The lack of closure resulting from not knowing what happened to the 'missing cats' could have compounded these feelings of grief. This form of loss, known as ambiguous loss, has been linked with long-lasting, detrimental impacts on individuals [59].

Not only is there evidence of posttraumatic stress and grief resulting from this event, but there is evidence of feelings of betrayal and altered perceptions of authorities. An implicit social contract between the cat caregivers and the authorities was potentially violated, which may have contributed to the event being difficult to process for some. As one interviewee noted: "They didn't even tell us. That's, I think, the hardest part, knowing that all these years we'd had this good relationship with the Port of Newcastle, they at the end did not honour or respect us as people who really cared for these animals. That's a hard thing to process." This feeling of betrayal may have also intensified the impact of this event and perhaps led to long-term distrust.

4.4. Implications and Considerations Arising from the Stockton Breakwall Cat Cull

Although the authorities at the Port of Newcastle deemed the cats feral, this was not consistent with how the caregivers viewed the cats— "they're not feral. They're pets waiting to go home". Nor was it consistent with the RSPCA definition of feral cats in their Best Practice Domestic Cat Management report (RSPCA 2018) or the Australian Federal government's Threat Abatement Plan for Predation by Feral Cats, adopted in 2015 [19]. In these documents, feral cats are defined as those which are unowned, unsocialized, have no relationship with or dependence on humans, survive by hunting or scavenging, and live and reproduce in the wild. In contrast, domestic cats are defined as cats with some dependence (direct or indirect) on humans. Despite these definitions, local government and animal management officers often determine a cat is feral based on behaviour and

appearance, which allows the cat to be killed immediately after being trapped [24–28] or through shooting when it is not considered a risk to humans or pets. We believe this is inappropriate if cats are living in the vicinity of humans. On the evidence presented by the caregivers in our study, the cats in their care were being fed regularly and the majority were well habituated to people. Therefore, the Stockton Breakwall cats were not feral and should not have been (mis)managed in this way.

The Port of Newcastle's aim was "to reduce risks to the community" but the severity of the adverse psychological impacts, and the morbidity rate amongst the cat caregivers we interviewed, was far greater than would be expected as a risk to the community if the cats had remained at the site. We therefore suggest that potential legal ramifications should be considered before authorities intentionally choose a method of management that is likely to inflict substantial harm on community members.

Given the reported ramifications of the lethal cat cull to both the caregivers and the remaining cats on the Breakwall, it would be prudent to make mention of the alternatives that could have been employed to address the presence of the cats on the Breakwall. Specifically, this group of cat caregivers was, according to the caregivers, making a significant impact on the cat numbers, and had reduced them from over 100 to less than 40 over a 3-year period. This was achieved by some caregiver's using TNR, which typically consists of providing food, some veterinary care as required, neutering the cats to reduce their numbers over time, and adopting kittens, and when possible, social adults [34,35,41]. Although technically illegal in Australia, TNR has been implemented successfully when supported by authorities, often after traditional methods have failed to reduce complaints or cat numbers [2,35,43]. This method could also be considered a care-centred approach to cat management, as it protects against psychological and emotional trauma in those who care for, and are deeply attached to, the cats. Further, the care-centred approach has been shown to be successful in multi-cat situations in Australia and overseas [34,76]. It can improve animal welfare, reduce the numbers of cats present over time, and reduce complaints from the community [10,11,13,35,37,39]. A care-centred approach to urban cat management is also consistent with the One Welfare philosophy, which aims to balance and optimize the wellbeing of animals, people, and their physical and social environment [77,78]. The benefits of TNR are several: healthy, adoptable cats are provided with forever homes; healthy cats which cannot be adopted are neutered and thus rendered unable to reproduce but are cared for and allowed to live out their lives at their home; and caregivers are afforded the physical and psychological benefits of maintaining a bond and mutually beneficial relationship with the cats [79]. Benefits may not occur if an insufficient number of cats are sterilized to prevent population growth and when best practice is not followed to resolve complaints [34]. Moving forward, the benefits to authorities in adopting a care-centred approach to addressing cat populations that are under the care of people will strengthen community trust and acceptance, as well as contribute to their social license to operate.

5. Conclusions

This study demonstrated that lethal enforcement-centred management can be detrimental to cat caregivers' psychological health, quality of life, and physical health. This is in addition to the clearly unacceptable impact of this approach on the welfare of the cats in question, at least some of which were left with severe trauma and horrific physical injuries. The results provide evidence of the strength of the relationships that form between caregivers and the cats they care for, and the negative impact on mental health and quality of life associated with the implementation of lethal cat management by authorities. Based on these research findings, there may be legal implications if authorities in the future disregard the potential for creating profound adverse psychological damage to caregivers of stray cats, and knowingly implement management strategies which will be harmful to human health and cat welfare. While cats cannot seek legal redress for harms inflicted on them by poor policies, impacted humans are able to challenge the legitimacy of

management practices, as was evidenced by the substantial grass-roots protests that followed the poorly executed cull described in this paper.

It is hoped that this research will inform local government and welfare agencies of the negative impacts of current practices and provide evidence that will lead to the adoption of either a care-centred approach with regards to the cat caregivers, or perhaps more generally an approach centred on care for both humans and the non-human animals we feel obliged to ‘manage’. Cat conflicts with other free-roaming animals or people may need to be managed, but this process should be informed by widespread community consultation and compassion. This is likely to provide long-term solutions which benefit the greater community. In a care-centred approach, authorities could assist caregivers to get cats neutered and adopted when possible, as well as assist with the provision of feeding and shelter stations to optimize cats’ welfare and minimize the risk of complaints.

Legislative amendments need to be prioritized to facilitate this change, including clearly defining domestic cats as those that live in the vicinity of humans, and are provided food or other care intentionally, or in some cases unintentionally, and feral cats defined on how and where they live, and not based on behaviour or appearance. Legislative changes would enable a care-centred approach to be implemented with the aim of resolving concerns related to complaints, humanely reducing cat numbers through neutering, and when feasible, adoption, and improving overall welfare.

As one of the caregivers concluded “...it was really heartbreaking, because a lot of cats that died in the cull were just waiting for a home, you know. That’s the really hard part that I personally struggle with, is that so many of them just could not have been there, but they were, and they died. What can you do? I mean, it’s happened now, it’s not going to change, but what we can do is try and advocate for them, for that not to be the way that they die”.

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