Canine Catch-Neuter-Return (CNR) Good Practice Guides

An evidence-based approach to dog population management

Learning Outcomes:

1. List the four states of roaming dogs
2. Recognise that human behaviours are the single biggest driver of dynamic processes in dog populations.
3. Population dynamics of roaming dogs
4. Explain the population dynamics of free roaming dogs and their importance for dog population management
5. Describe the nine elements of a DPM system, where reproductive control forms only one element of the DPM system

Free-roaming dogs may pose a serious risk to public health through dog bites and transmission of diseases such as rabies, leishmaniasis and human cystic echinococcosis. Over 95% of human deaths from rabies involve transmission of the virus through dog bites. In 2015 the World Health Organisation found that "the number of human deaths globally due to dog-mediated rabies is estimated to be 59 000 annually" (*The World Health Organisation expert coalition on rabies, 2018).*

These free-roaming street dogs can transmit infectious diseases to pet dogs, livestock and wildlife, and may also predate livestock. Free-roaming dogs are often a source of nuisance through barking, may pollute areas with faeces and can lead to road traffic accidents. The risks of dog bites and the nuisance the dogs can cause, lead to ~~a~~ poor human-animal relationships within the community and the risks to public health can have huge economic implications too.

All of these challenges mean that in many situations, communities may want to manage the behaviour or numbers of free roaming dogs in their local area. The global dog population is estimated to be at least 500 million individuals and around seventy-five percent of these are free-roaming and potentially reproductive so management of dog populations helps to maintain good dog welfare, prevent unwanted puppies and reduce the risks that dogs may present to people and other animals.

The International Companion Animal Management Coalition define dog population management as "To manage roaming dog populations and the risks these may present, including population size reduction when this is considered necessary".

Dog population management (DPM) is not a time-limited project, but a system of services that must be sustained and adapted to change the way in which people keep and live amongst dogs.
When people think about dog population management, their minds are usually focused on the unowned free-roaming dogs, sometimes called 'street dogs' or 'stray dogs'.

These free-roaming dogs, are able to roam freely in the community unrestricted by physical boundaries, though they may well return to a familiar property or feeding station to rest and eat. But are all roaming dogs unowned, feral or wild dogs? The answer is no. In fact, in most countries, many roaming dogs have an 'owner' but they are currently roaming unsupervised. Even those without a specific household may not be entirely unowned, they may be community dogs, with more than one household offering some form of care in the form of food, shelter or even limited veterinary care.

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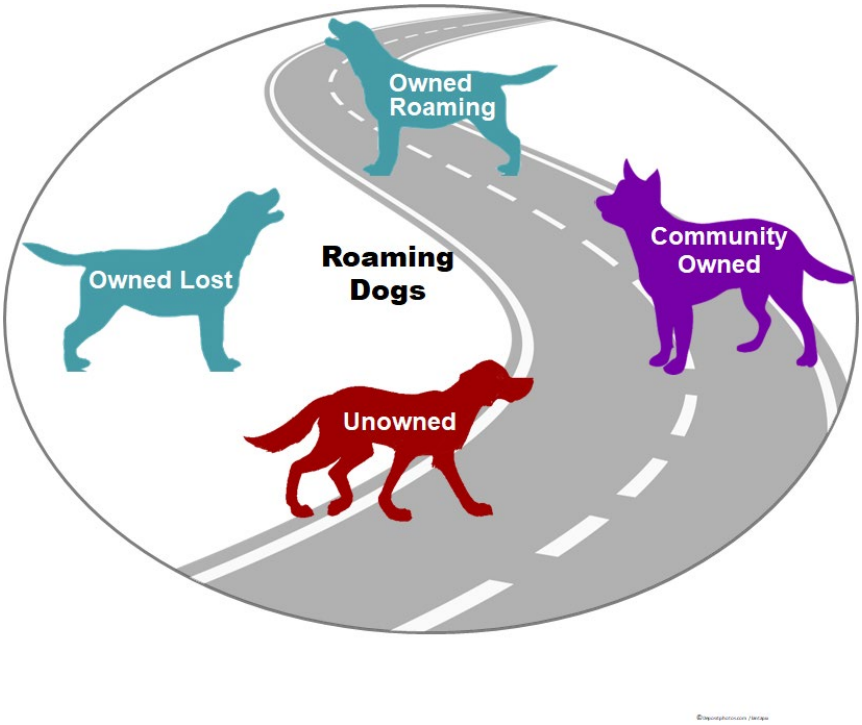

The four states of roaming dogs

Why do these distinctions of dog type or state matter? Well, for dog population management we want to know all the different places these dogs come from. Because DPM cannot only deal with the roaming dogs of today, that's just the symptom of our dog management problem, they also need to work on the root cause, or the sources of the dogs on the streets.

To work out what these sources are we need to broaden our perspective and also look at the owned dog population. There is an intrinsic link between owned pet dogs and more general dog overpopulation.

- Indiscriminate breeding of pet dogs generates puppies which often end up in shelters or free-roaming on the street as there are limited life-long homes available even for pedigree puppies.
- Changes in the owner's ability to provide for the dog or legal regulatory changes may mean that the pet dog can no longer remain in the household so are abandoned on the streets.
- Cultural differences in pet ownership and these street dogs being reproductively active lead to a growing dog population.

Population dynamic processes are active between and within these four states of roaming dogs population dynamic processes include birth and death that bring dogs into and out of the population, as well as abandonment and adoption that move dogs between different states. Additionally, we should consider where owners get their dogs from and whether this influences later processes like abandonment. It's key at this point to realise that although we are talking about the population dynamics of dogs, all these processes are strongly influenced by the actions of people.

Human behaviours are the single biggest driver of dynamic processes in dog populations. DPM must work to influence human behaviour, encouraging and supporting humane and responsible behaviours and creating barriers to those behaviours that are inhumane or a risk to the community.

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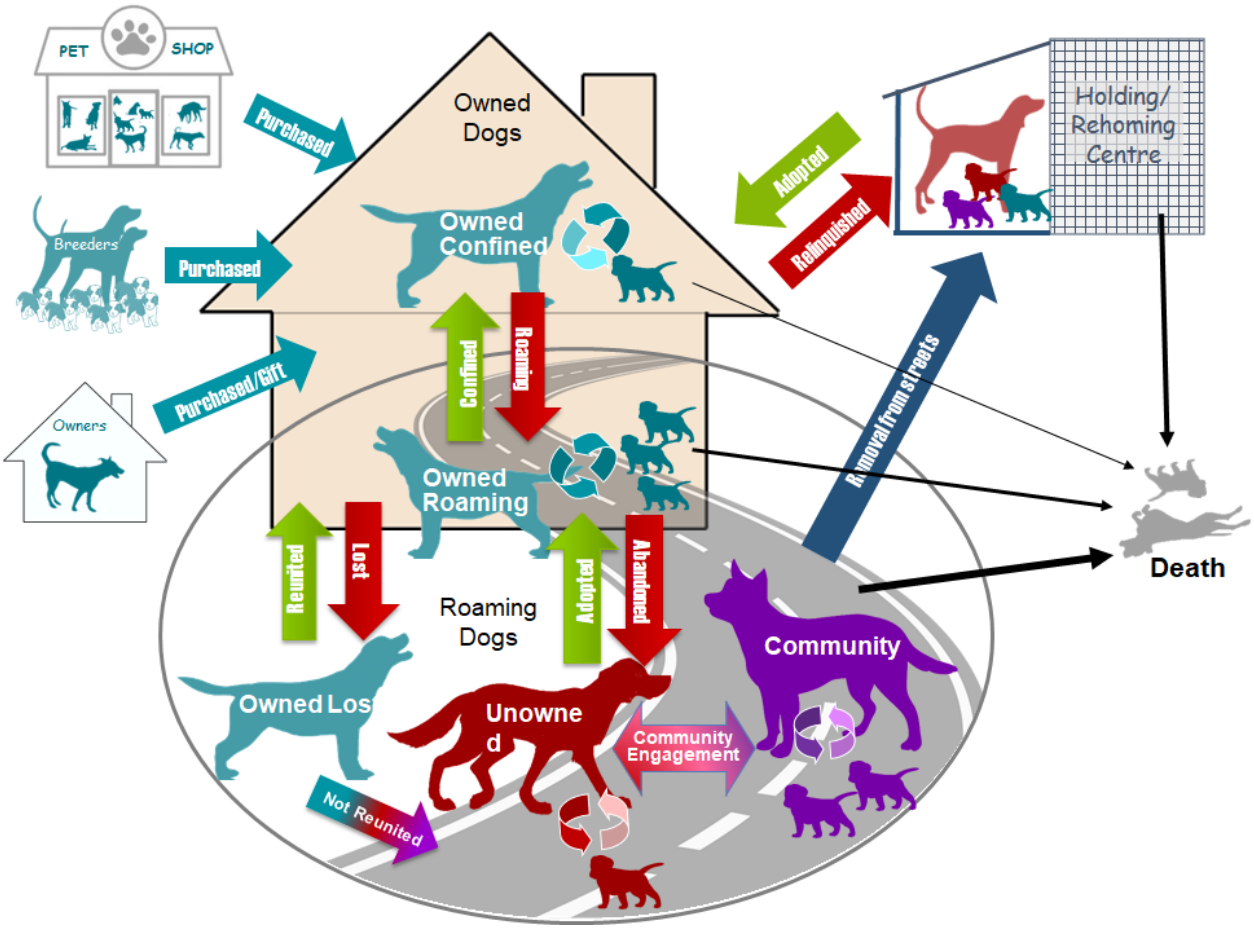

Population dynamics of free-roaming dogs

This image depicting the whole dog population, demonstrates why culling or catching and removing dogs to shelters are so ineffective. They are only addressing the symptom of the current roaming population and doing very little to address the source of future roaming or unwanted dogs.

“There is no evidence that removal of dogs has a significant impact on the dog population density or the spread of rabies. Mass culling of dogs should not be an element of a rabies control strategy: it is ineffective and can be counterproductive to vaccination programmes.” WHO 2013

Culling is often strongly opposed by local people especially when the methods used to kill dogs are inhumane and the suffering of dogs is visible on the streets. From a public health, dog welfare and community point of view, culling is not a humane or effective approach to dog population management. However, humane euthanasia of animals that are suffering or where treatment is not possible is an important part of DPM and access to vets that can perform euthanasia using humane methods will be essential for rehoming centres, owners and carers to protect dogs from suffering.

Removing dogs to rehoming centres requires a large infrastructure and it is difficult to meet the both the physical and psychological needs of the dogs in such an environment. Hence they are expensive. Without high rates of adoption they quickly fill to capacity, whilst dogs are replaced on the street and hence are also ineffective. If used, rehoming centres should only provide temporary shelter before adoption to a new home.

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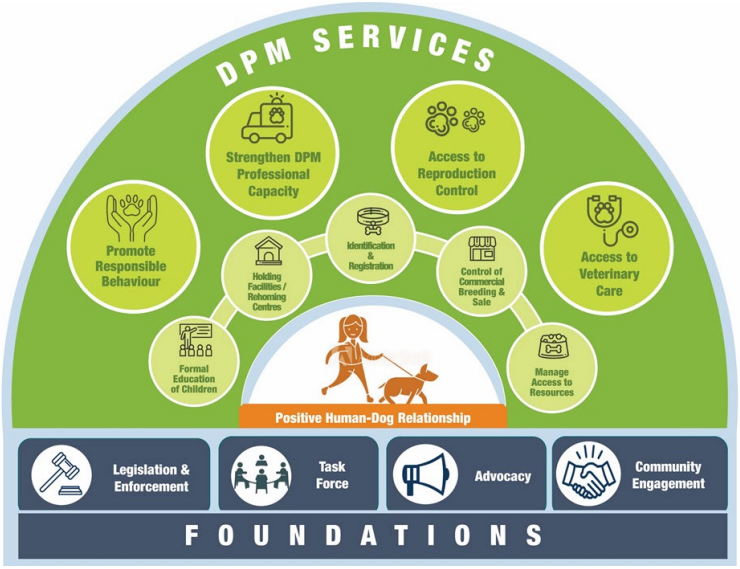
Understanding dog population dynamics allows us to develop our population management services intelligently. DPM aims to have a sustained influence on the processes within dog population dynamics in order to changed sub-populations of dogs in a targeted way. For example, reducing abandonment of owned dogs, reducing breeding in unowned and community dogs and increasing community engagement will result in a smaller unowned dog population and a better cared for and stable population of community dogs.

Dog population dynamics differ between communities and therefore population management needs to be adapted to local conditions, there is no one size fits all solution.
In order to design a tailored DPM system you need to assess and understand your local dog population dynamics, and then continue to monitor the dog population in order to allow for evidence-based evaluation.



The elements of a DPM system by ICAM

This infographic shows the elements of a DPM system. At the base are the foundations that provide the legal basis, political and social will for DPM. At the top are the services, the on-the-ground actions that are designed to influence those dynamic processes in the dog population and the human behaviours that drive those processes.

These top services are fundamental, they are critical to have in place in all effective DPM systems. Although locations will vary in their dog population dynamics, there are some processes that will always need to be managed:

- Reproduction needs to be managed to avoid unwanted litters
- Veterinary care needs to be accessible so that dogs both enjoy good welfare and present minimal risk to other dogs, animals and people – this includes preventing zoonotic diseases.
- Responsible dog ownership in accessing services for their dogs
- Services to be delivered by capable professionals.

All of these services require the full engagement of veterinary professionals.

The inner ring of services are those context dependent services that can be just as influential on dog population dynamics as fundamental services, but this will not be the case in every location, they will become important when and where dog population dynamics demand them.

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CNR is where dogs are caught, surgically sterilised and then returned to the exact location where they were caught. The aim of CNR is to minimise the process of reproduction in the population of dogs that are already roaming, stemming this source of the next generation of roaming dogs and also creating a healthier population by reducing the energetic costs of reproduction and the stress and disease risks involved in breeding. It also prevents the birth and suffering of many puppies who would otherwise have died within their first year of life on the streets.

Dogs going through CNR are usually also vaccinated against rabies so that they cannot transmit this virus to other dogs or humans. Where these dogs make up a large proportion of the dog population, this vaccination through CNR can also create herd immunity, where enough of the dogs are immune to rabies that the virus can no longer persist and dies out.

However, achieving herd immunity for rabies usually also requires concerted mass vaccination of the whole dog population, not just those dogs going through CNR. Epidemiological models looking at annual mass vaccination campaigns have suggested that at least 70% of the dog population needs to be vaccinated annually to keep above the critical proportion of immune dogs. This 70% target allows for population turnover – where some vaccinated dogs die and puppies are born - between vaccination campaigns.

There is evidence to suggest that a combination of neutering, vaccinating and returning dogs back into their community:
· reduces the dog population
· reduces the prevalence of rabies
· reduces the number of dog bites
· improves individual dog physical wellbeing
· improves human-animal relationships between dogs and communities in which they live

CNR has been shown to have benefits, but we should note that it acts on just one part of dog population dynamics, all be it an important part. To achieve effective and sustainable management, it must be used in combination with other DPM services.

CNR can also be considered an alternative approach to removal of dogs from the street either through culling or sheltering – and may be particularly appropriate where the roaming dog population exceeds the potential number of adoptive homes.

There are a huge number of free-roaming, reproductively active dogs in the world. The number of street dogs is as a result of uncontrolled breeding and abandonment of both street and pet dogs. Free-roaming dogs may be a source of nuisance, potential risk to livestock and wildlife and pose serious public health risks. Appropriate solutions in dog population management must consider the specific problems faced within a community, the origin of the dogs, their movement patterns, behaviour and reproductive activities, and the connectivity between the pet and street dog populations in order to successfully address the challenges within that community. Whilst CNR may be a useful tool in controlling dog populations, all surgical procedures have risks, and CNR creates the potential for welfare problems including injury, disease transmission and even death. Also the potential longer-term detriments of elective neutering cannot be overlooked. To ensure good dog welfare standards are maintained, the focus of CNR needs to be on individual dog welfare as well as the number of dogs to be neutered. This series of videos will provide evidence-based guidance on safeguarding dog welfare and clinical standards in catch-neuter-return programmes.

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Checklist:

- ✓ DPM must be sustainable and adaptive
- ✓ Dog population dynamics varies with location, so DPM services must also vary, there is no single intervention that works everywhere.
- ✓ CNR forms part of the fundamental services of a DPM system but it must be used alongside other services as it only addresses part of dog population dynamics.
- ✓ DPM must work on all sources of roaming dogs Human behaviours are the single biggest driver of dynamic processes in dog populations. DPM must work to influence human behaviour, encouraging and supporting humane and responsible behaviours and creating barriers to those behaviours that are inhumane or a risk to the community.

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