

Practical ways to measure important dog population parameters

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What to measure?

- What is the aim?
 - Reduce dog population size/density
 - Improve dog welfare/reduce euthanasia rates
 - Reduce zoonotic disease risk to people
- Limited time and resources
 - Select methods that are relatively simple and allow for regular repetition

Dog population size

- How many dogs in your city?
 - Significant time and resources to establish a reliable estimate
 - Meaningless number to an average citizen
 - Absolute population size increases with city growth

Dog population size

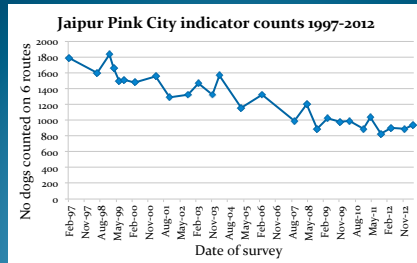
- How many dogs in your city?



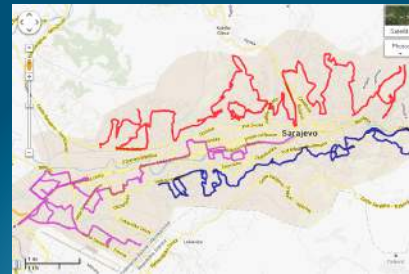
- Jaipur, India
- 10 years = 1/3 ↑ human population
- ↑ resources =
- ↑ dog pop size
- ? Dog density?

Dog population size

- What's the density of dogs in your city? Dogs per km
- How is this changing over time?



Dog population size



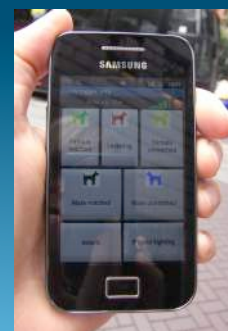
- 3 driven routes
- Record no. dogs with phone app
- Ear tagging during mass neuter allows for mark – resight baseline estimate
- Dog and tag survival estimates not known

Dog population size

- Practicalities of surveying
 - If possible, select routes that are part of a regular routine or commute
 - Survey at dawn – peak roaming time for dogs and doesn't get in the way of the 'day job'
 - Include surveyors in analysis and interpretation and don't leave it to the end
 - Include helpful tools to make surveying easy

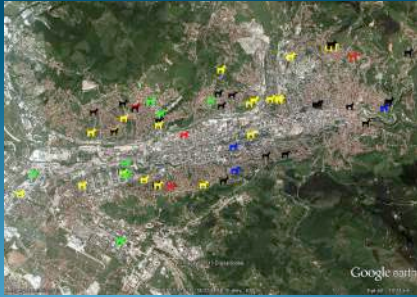
Survey app

- <http://www.conservationresearch.co.uk/DogDensity/DogDensity.htm>
- Settings/layouts to use with free app – OSMtracker
- Access database to store analyse data
- GPS coordinates to create maps



Sarajevo dog survey

-  Entire female
-  Entire male
-  Spayed female
-  Castrated male
-  Lactating female



Reproduction

- Changes in reproductive activity will lead change in population density
- Number of puppies?
 - Hidden
 - Clustered
 - Observers disagree



Photo taken in Jaisalmer, India

Reproduction

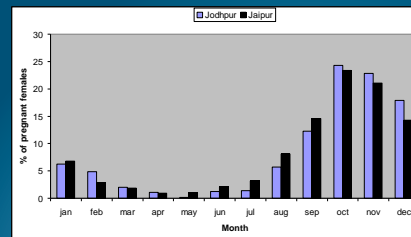
- Changes in reproductive activity will lead change in population density
- Number of puppies?
- Proportion of females that are lactating
 - More visible
 - Observers agree



Photo taken in Jaisalmer, India

Seasonal breeding

Graph of % pregnant at spaying in Jaipur and Jodhpur



- Compare % lactating at same time of year
- Planning intervention activities? Avoid peak whelping for spaying females

Dog welfare

- Body condition scores (limited categories)



Photos taken in Tanzania

Dog welfare

- Visible skin condition

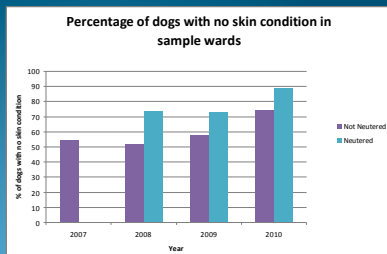


Photo taken in Bali, Indonesia

Dog welfare

- Visible skin condition

- Colombo, Sri Lanka – 2007 launched humane dog population management project (WSPA, Blue Paw Trust and Colombo Municipal Council)

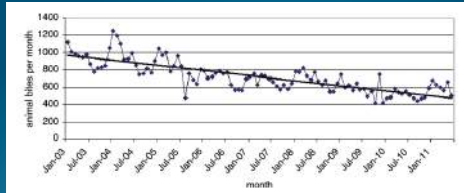


Dog bites/rabies incidence

- Ideally incidence of dog and human rabies cases over time
 - Commonly underreported (e.g. not all countries list rabies as a reportable disease, misdiagnosis, people die at home because disease is fatal)
 - Can increase reporting of cases through community based veterinary/medical staff or volunteers (GARC/ Rabies blueprint)
- Dogs bites
 - Require costly treatment and so records may be more reliable
 - Proxy for rabies burden and problem in their own right

Dog bites/rabies incidence

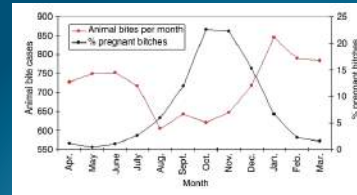
Number of animal bites per month treated at the Bite Unit of the SMS Hospital in Jaipur from January 2003 to June 2011



- Significant reduction in bites over time. Concurrent reduction in dog density and breeding through surgical sterilization programme
- Concurrent increase in human population, consider presenting bites per unit of population served by the hospital (e.g. 100,000 people)

Dog bites/rabies incidence

Monthly averages of human animal bites and canine pregnancies in Jaipur over the years 2003–2011



- Peak in bites in Jan follows 10 weeks after peak whelping in November
- Suggests maternal aggression may be motivating some bites
- Positive impact of sterilization on biting behaviour and not only dog density

Reece et al (2013) Decline in human dog-bite cases during a street dog sterilisation programme in Jaipur, India. *Vet Record*, doi: 10.1136/vr.101079

Owner attitude and behaviour

- Questionnaires (telephone, door-to-door or social media?)
 - Quantitative data: e.g. pop size, age/sex, acquisition, survival
 - Attitudes: e.g. 2 of 18 statements

1. Having a dog is a waste of money:

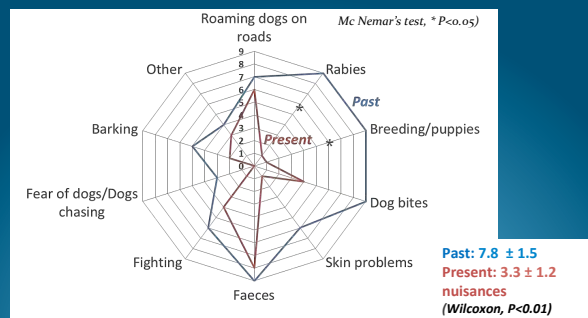
1 Strongly Disagree 2 Moderately Disagree 3 Slightly Disagree 4 Unsure 5 Slightly Agree 6 Moderately Agree 7 Strongly Agree

5. Dogs add happiness to people's lives:

1 Strongly Disagree 2 Moderately Disagree 3 Slightly Disagree 4 Unsure 5 Slightly Agree 6 Moderately Agree 7 Strongly Agree

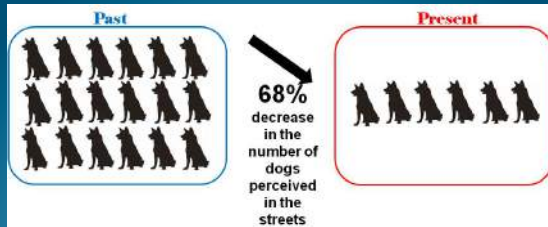
- Focus groups / informal group interviews / participatory research

Perceived abundance



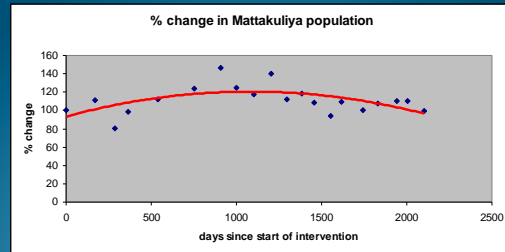
Perceived abundance

- “What do you think about the number of roaming dogs in your area? Now and before the programme started”



Perceived abundance

Change in dog population in Mattakuliya (largest ward in Colombo) from day 1 of intervention at 100%



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Logos of partner organizations: ICPIA International, HUMANE SOCIETY INTERNATIONAL, IEAW, ARC, and WSPA (World Society for the Protection of Animals).