Street Dog Management Program Monitoring and Evaluation
Mussoorie, Uttarakhand, India October 2018

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Street Dog Management Program

Monitoring and Evaluation

Mussoorie, Uttarakhand, India

October 2018

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-Monitoring, Evaluation and Impact Assessment Department -

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THE UTTARAKHAND ABC PROJECTS’ IMPACT ASSESSMENT

In 2016 Humane Society International India has signed a Dog Population Management Program MoU with three different Municipal Corporations in Uttarakhand (Dehradun, Nainital and Mussoorie). As part of the MoUs three individual dog population surveys were conducted in three cities in October 2016 to estimate the dog population and to establish a baseline against which progress can be measured.

The Spay/Neuter program in Dehradun City started immediately after the dog population survey results with a focus on female dogs (as per the MoU signed, 90% Female dogs and 50 % Male dogs should be sterilized). As a result of the continuous high-volume and female dog-centric sterilization program in Dehradun the dog population has declined by about 32% within two years (see the discussion part of the report), which shows that the program is highly successful and result oriented.

In Nainital, the sterilization team started in mid-2017 and the team has sterilized 88% of all female dogs in only three months, resulting in a decline of 23% lactating Females in one-year (from 29% to 6% - Oct-16 v/s Oct-17) and no pups on the street (Oct-2018 index count). Both indicators show the success of the sterilization program.

In Mussoorie, due to infrastructure challenges the sterilization program was delayed until 2018 and the team started the sterilization program in September/October 2018. Due to the delay there are no effects of the program measurable yet. However, surveys continued and we have observed an increase in the dog density over the last two years in Mussoorie Town. The dog density increased by 26.8 % in the October 2018 index survey compared to the October 2016 survey results. This shows that without interventions the dog population in Mussoorie and one can assume in the other program areas as well, would not decrease naturally but rather increase.

Hence, the ABC program in Dehradun and Nainital are the first programs in India that prove that a female targeted and high-volume sterilization program can in fact reduce the number of dogs on the streets and improve the lives of street dogs in a very short time. Similar approaches should be considered for other programs in India as this new approach provides municipalities with an effective, high welfare and better resource allocated program than the non-targeted ABC programs.

BACKGROUND

Mussoorie is a hill station and a municipal board in the Dehradun District of the northern Indian state of Uttarakhand. It is about 35 kilometres from the state capital of Dehradun and 290 km north of the national capital of New Delhi and has a human population of 30,282.

Image 1: Geographic location of Mussoorie, Uttarakhand (Google Maps)
In October 2016 Humane Society International (HSI) conducted a baseline survey of the street dog population in Mussoorie with further monitoring surveys conducted in May 2017, October 2017, May 2018 and October 2018. This document describes the methodology and results of the surveys, which may now be used in further discussions of dog population management programs.

In planning any dog management project, it is essential that one obtains a baseline assessment of the street dog (and private dog) population before development and implementing a management program. These population estimates serve several important functions. First, a street dog population size estimate quantifies the scope of the “problem”. Second, quantifying the problem allows proposed
implementers of a program to make an informed estimate of the resources and the timeline required to achieve the desired outcomes. Finally, the population estimates function as a yardstick against which to measure progress as the dog management program moves forward.

Baseline survey estimates establish a framework for the calculation of metrics that may be used to plan effective, feasible, and properly targeted strategies for reducing roaming dog population size, reducing or eliminating human and dog rabies cases (enables spot checks of vaccination rates), and reducing public health and nuisance costs over time.

Monitoring surveys are conducted in order to evaluate the success of interventions and to allow changes to be detected in street dog dynamics following the implementation of interventions. Comparisons can be made with baseline data and trends can be analysed which allows for foreseen and unforeseen changes to be detected within the different dog populations and measures implemented to account for this. Monitoring surveys can detect changes in dog numbers along with other population indicators such as changes in body condition, the prevalence of skin conditions, and the number of lactating females in the population. Any such changes can be reliably detected and targeted in order to further reduce the number of fertile street dogs while also aiming to improve the health of dog populations.

SURVEY METHOD

HSI conducted street dog surveys in Mussoorie, India in October 2016, May 2017, October 2017, May 2018 and October 2018.

Street survey objectives:

- Generate a reliable estimate of the relative and total dog population in Mussoorie
- Estimate the proportion of sterilized dogs in the street dog population
- Asses street dog welfare by tracking body condition score and skin conditions as a proxy measure

To generate a dog abundance estimate (total dog population size) we created set routes, also called index or standard routes, in Google Maps along residential roads and highways but avoiding expressways (dogs tend to avoid these roads). Routes are marked with a starting (flag) and end point (police officer). For easy access, the routes are saved as KML files and stored in Google My Places, which can be accessed from smart phones (online and offline). A survey team, consisting of a driver and an observer mounted on motorcycles, conducted the surveys early in the morning during the dawn hours. The observer uses both the Google Maps app and the OSM Tracker app on a mobile phone. OSM tracker is an application that enables the observer to record a dog sighting and relevant specifics about a dog (female, male or unknown adult, sterile/notched female or sterile/notched male, pup, lactating) as well as recording welfare indicators such as skin problems and body condition scores (BCS1 to BCS5). These are saved together with GPS coordinates of the sighted dog. OSM Tracker produces a track record of all sighted dogs and their specifics along the route which was followed during the survey. The data is subsequently downloaded and stored in an Access database for analysis. The survey route was surveyed on two consecutive days, by the same survey team, to measure variability and power to detect change.
PROGRAM GOALS AND OBJECTIVES

The main objectives of the program are to decrease the street dog density, reduce the human-dog conflicts and improve the welfare of street dogs. Besides the welfare indicators we track in our ABC programs, other welfare issues are reduced, for example the occurrence of TVT in Bhutanese dogs has significantly reduced in a short timeframe after the implementation of an ABC program (Kartal & Chaudhari, 2019)1.

There is a growing pool of evidence that dog populations and population dynamics are largely influenced by (dependent on) dog interactions and relationships with the local human community (e.g. Morters et al., 2014; Villatoro et al., 20162, and unpublished HSI data). Therefore, it is crucial to address dog populations comprehensively and in the human dominated environment they live in.

In Mussoorie the program follows a well-established and evidence based strategy of high-volume sterilization. At baseline and throughout the program direct measures, dog surveys and clinical data, are employed to maintain a focused program with the best allocation of efforts possible. Typically, such projects aim to sterilize around 70% of the population and include to some degree private dogs.

DOG DENSTY AND TOTAL DOG POPULATION

One survey route, 17.9 km long, was designed to sample the streets throughout Mussoorie. The route covered 30.2% of the 59 km of Google Maps roads and streets within the Mussoorie region.

The baseline survey of October 2016, within the puppy season, showed 7.2 dogs per km along the survey track. This figure increased to 8.7 dogs per km by October 2017. During the last survey in October 2018 it was found that the number of dogs per km had increased further to 9.1 dogs/km, an increase of 1.9 dogs/km since October 2016 (Table1 & Figure1).

A similar trend is shown for the total number of dogs counted throughout the project. October 2016 recorded 128.5 dogs while 163 dogs were recorded in October 2018. An increase of 34.5 dogs (Figure 2). That means that the density has increased by 26.8%

1 Kartal, T. & Chaudhari, A. (in preparation): Reduction and control of TVT in street dogs in Paro, Bhutan after the implementation of an ABC program.


Table 1: Dogs per km by survey

<table>
<thead>
<tr>
<th>Month/year</th>
<th>Total Count</th>
<th>Route length (km)</th>
<th>Dogs counted per km</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oct-16</td>
<td>128.5</td>
<td>17.9</td>
<td>7.2</td>
</tr>
<tr>
<td>May-17</td>
<td>123</td>
<td>17.9</td>
<td>6.9</td>
</tr>
<tr>
<td>Oct-17</td>
<td>156.5</td>
<td>17.9</td>
<td>8.7</td>
</tr>
<tr>
<td>May-18</td>
<td>155</td>
<td>17.9</td>
<td>8.7</td>
</tr>
<tr>
<td>Oct-18</td>
<td>163</td>
<td>17.9</td>
<td>9.1</td>
</tr>
</tbody>
</table>

Figure 1: Street dogs counted per km

Figure 2: Total street dogs counted
Several indicators were tracked over the last three years to monitor and evaluate the effect of the Mussoorie street dog population ABC program. Indicator measures are proxy measures of the program’s progress in achieving its long term goals and help to adjust strategies as well as allocation of resources throughout the program.

Active sterilization began in October 2018. It is therefore too early to draw any conclusions in terms of the long term effectiveness of the ABC program. However changes were noticed within the month’s survey period which gives an indication of the impact in the future. Throughout India there is an annual breeding and pup season. Surveys conducted pre- and post-pup season will therefore yield different proportions of pups and lactating females on the streets. This seasonality needs to be incorporated in analyses and the May survey data should be compared with May data and the same for October survey data.

The baseline surveys in October 2016, within the puppy season, shows 14% lactating females being observed followed by a decline to 9% in October 2017 and an increase to 11% in October 2018 (Figure 3).

Outside of the puppy season, May, the number of lactating females being observed reduced slightly from 6% in May 2017 to 5% in May 2018.

Any variation observed in the data is likely the result of naturally occurring variation between years. As sterilization continues over the next years, a trend for an overall reduction in lactating females is expected.

Figure 3: Percentage lactating females on the street

The percentage of pups observed on the streets in Mussoorie was as expected (Figure 4). The baseline surveys in October 2016, within the puppy season, shows 11% pups being observed followed by a decline to 6% in October 2017 and an increase to 10% in October 2018.
Outside of the puppy season, May, the number of pups being observed increased from 6% in May 2017 to 10% in May 2018.

Figure 4: Pups recorded during the surveys

The comparison of the observed percentage of lactating females and pups is shown in table 2. October 2016, May 2017, October 2017 and May 2018 are classified as baseline data collected before sterilization began in the area. The two variables can be considered closely linked. Due to the short project period of only October 2018 any correlation between the two variables is not strong for the last survey. However with baseline data now in place future trends can be analysed with the percentage of pups and lactating females expected to reduce over time and both variables expected to be significantly correlated.

Table 2: % Lactating females vs % Pups

<table>
<thead>
<tr>
<th>Month/Year</th>
<th>% Lactating females</th>
<th>% Pups</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oct-16</td>
<td>14%</td>
<td>11%</td>
</tr>
<tr>
<td>May-17</td>
<td>6%</td>
<td>6%</td>
</tr>
<tr>
<td>Oct-17</td>
<td>9%</td>
<td>6%</td>
</tr>
<tr>
<td>May-18</td>
<td>5%</td>
<td>10%</td>
</tr>
<tr>
<td>Oct-18</td>
<td>11%</td>
<td>10%</td>
</tr>
</tbody>
</table>

R² = 0.0323

Figure 5 shows the percentage of sterilized females and lactating females observed during street surveys. The first survey results to be collected since the commencement of sterilization can be found
in October 2018. Following sterilization in October 2018 the number of sterilized females being observed has significantly increased from 0% to 7%.

Figure 5: percentage sterilized females against percentage lactating females

STERILIZATION RATES

The first four surveys, October 2016, May 2017, October 2017 & May 2018 showed that 0% of the observed dogs had been sterilized. This was due to no sterilization efforts taking place. In October 2018, following sterilization efforts for about one month, the number of sterilized dogs had risen to 10%.

Table 3: Gender and sterilization percentages

<table>
<thead>
<tr>
<th>Date</th>
<th>% Female</th>
<th>% Male</th>
<th>% Total Sterilized</th>
<th>% Sterilized Female</th>
<th>% Sterilized Male</th>
<th>% Lactating</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oct-16</td>
<td>38</td>
<td>63</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
<td>14%</td>
</tr>
<tr>
<td>May-17</td>
<td>36</td>
<td>64</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
<td>6%</td>
</tr>
<tr>
<td>Oct-17</td>
<td>36</td>
<td>64</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
<td>9%</td>
</tr>
<tr>
<td>May-18</td>
<td>37</td>
<td>63</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
<td>5%</td>
</tr>
<tr>
<td>Oct-18</td>
<td>38</td>
<td>62</td>
<td>10%</td>
<td>7%</td>
<td>12%</td>
<td>11%</td>
</tr>
</tbody>
</table>
DISCUSSION

In the last three years valuable information has been gathered regarding street dog demographics in Mussoorie. Seasonal variation has been shown to occur in the percentage of lactating females on the street throughout the study providing information to help the development of future sterilization projects and provide a baseline in order to track the success of future interventions. While similar trends were not detected in the number of pups being observed throughout the year, this baseline data will also allow the project’s success to be monitored. From the one month of data collected following sterilization efforts, October 2018, we can see that the percentage of sterilized females being observed has significantly increased. From this promising early data we can make better evaluation of the program’s effects in the upcoming years.

Monitoring surveys should continue to be conducted twice a year to ensure that the program’s efforts remain properly focused. Monitoring surveys will provide valuable information to allow informed decisions to be made about any changes which need to be implemented in order to adapt to changing population dynamics on the street. Considering the success of the female dog focused ABC program in Dehradun it is advisable to use a the same approach in Mussoorie.