Public Perceptions of Coyotes in Vancouver

Report prepared at the request of the Stanley Park Ecological Society's Co-Existing with Coyotes Program, in partial fulfillment of UBC Geography 419: Research in Environmental Geography, for Dr. David Brownstein.

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Executive Summary

The coyote (*Canis latrans*) has benefitted from the urbanization of previously undeveloped areas and have successfully expanded their range across North America. As they are newcomers, it is interesting to track how the public interacts with and perceives the species. This study is modelled after a past thesis examining public opinion on the coyote in Vancouver and sought to provide updated findings for the use of wildlife management groups. The Stanley Park Ecological Society's Co-Existing with Coyotes program is interested in updating the research to offer a newer perspective of public opinion to guide further business conducted by the organization. A survey was designed to fill this research gap.

In consultation with current scientific research surrounding urban wildlife and coyote ecology, two primary sources of negative attitudes towards the species were identified: misconceptions regarding cases of aggression towards humans and pets by coyotes, and coyote diet. The survey, which ran from March 4th to March 28th 2015, collected 255 responses from Vancouver residents and included questions related to personal concerns, attitudes and knowledge towards coyotes.

The survey results suggest that a majority of Vancouver residents are aware of coyote presence in the area. While 56.6% of respondents indicated that they felt positively towards coyotes and 30.4% indicating neutral attitudes, negative feelings towards the urban wildlife species was linked to misconceptions and overestimation of coyote size and cases of aggression. When compared to the results collected 20 years ago, more residents appear to have positive attitudes towards the species and misconceptions surrounding the species have decreased. However, the results still showed environmental illiteracy surrounding management issues such as the belief that relocation is a sustainable option.

Based on the results, recommendations were made to target pet owners for educational campaigns, increase advertisement of existing resources, and to clarify role to public in collaboration with other government agencies and through self-promotion. Further research on garbage and compost storage habits in relation to the public perception of coyotes is also suggested.

Introduction:

As urban sprawl continues to grow, some wild animal species have adapted to these changes and thrived in human formed landscapes. Adaptable and generalist species such as the raccoon, squirrel and coyote, among others, have made urban centres and surrounding suburbs into their realized niche. The coyote (*Canis latrans*) has benefitted from increasing urbanization of previously undeveloped areas, as reduction of wolf populations and the clearing of densely forested land increased available habitat (Ellins, 12). The species has expanded their range and colonized urban areas where coyotes were once absent (Gese, et al, 2012), having only been first reported in the Vancouver area in 1982 (Ford, 2000). As the habitats of these wild animals intersect with urban spaces, the human dimensions of coyote existence must be examined to understand how the public interacts with and perceives the species.

Many studies have undertaken the task of examining public perceptions of urban wildlife studies in various cities in North America. This particular study will model itself after a thesis project by Kristine Webber, which was published in 1997. Webber's thesis was conducted in collaboration with the Stanley Park Ecological Society (SPES), and has guided the establishment and direction of their Coexisting with Coyotes program since its inception (Worcester and Boelens 2007**).** As the program has presently been established for eight years, the SPES is interested in updating the research to offer a newer perspective of public opinion to guide further business conducted by the organization. The primary goal of this research project is to examine public attitudes towards coyotes and identify misconceptions held by residents of Vancouver. In order to come up with management solutions and form educational materials, it is crucial to know what opinions

those who will be affected by any coyote management or education programmes hold. A consultation of various urban wildlife studies in conjunction with an online survey targeting Vancouver residents will be used to fill this research gap.

Literature Review

In order to evaluate misconceptions in the public's knowledge and understanding about coyote life patterns and behaviour, along with researching what the sources of positive versus negative opinions may be, other studies examining coyote ecology and public opinion on urban wildlife were consulted.

Animals that cause property damage (such as attacks on pets) and that can cause bodily harm are particularly disliked, demonstrated by studies examining perceptions of urban wildlife (Kellert 1985). However, as determined by Webber's study, many instances of coyote's apparent risks to humans were actually misconceptions, such as the belief that coyotes can spread diseases like rabies to humans and pets (Webber 1997). The complex relationship of humans and coyotes has generated misunderstanding of the species, especially among those who learn through indirect sources, namely dramatization within the media of the risks coyotes pose to livestock and the livelihood of farmers (Ellins 2005). These misconceptions alter how the public perceives the species, as they relate to risks posed to an individual or an individual's property. Two main potential sources of misinformation were identified and researched, instances of aggression and diet.

i) Instances of aggression

The belief that coyotes pose a threat to humans, notably children, is a major source of negative public perception of the species. In Webber's original study, 30% of

respondents believed coyotes would attack children and 9% believed coyotes would attack adults. The Co-existing with coyotes program emerged in part due to growing concerns surrounding human safety and coyote presence, as there were three biting incidents involving children that received significant media attention (Boelens, 2006). It is difficult to provide an analysis of coyote attacks rates in the past to compare with current cases, as no standards for information to record exist. In a 1989 study of coyote attacks in national parks within western Canada, the researchers did suggest that the increase of human presence in the area had lead to increased attacks (Carbyn, 1989). This study had an extremely limited scope as it concerned few attacks (only 4 reported to park wardens); however, the existence of this study demonstrates a perceived public threat within western Canada. It has also been suggested that attacks occur most often when coyote acclimation with food sources made available by humans occurs (Gehrt and White 2009). Within Canada, studies in Calgary examining the spatial distribution of more aggressive encounters concluded that a small number of coyotes caused repeated nuisance reports and that actual conflict reporting is quite low (Lusaik and Shelley 2011).

An important finding of the literature review was that very few attacks involved rabies, leading to the conclusion that the disease was not prominent among coyotes and was not a significant cause of attacks. No cases of rabid coyotes have been reported within the Vancouver region or British Colombia. Gehrt and White also hypothesized that many of the attacks were linked to human provided food sources, as most occurred during the day on residential properties (2009). They supported their hypothesis by incorporating other studies that showed that coyotes tend to prefer natural areas, as well as suggesting a link in the concentration of attacks in California (49% of their findings) to

studies in the same area that found coyotes sourced their 25% of their diet from human-sources like garbage and pet food.

ii) Diet

When urban wildlife depends on garbage as a food source, they experience increasing conflict with humans due to greater activity in human landscapes. In a 2004 study of black bears in the Sierra Nevada Valley, the process of supplementing carnivorous urban wildlife diets with garbage was associated to habituation with humans (Beckmann and Berger 2004). These findings support other coyote specific studies that demonstrated that anthropocentric food source utilization by urban wildlife could result in increased risk to humans (Gehrt and White 2009).

In general, coyotes are a very adaptable species. Scat and stomach content analysis studies demonstrate that the coyote eats a greater variety of foods than other canine species, and predators more generally. Coyote diet variety has grown with the intersection of human inhabited territory with gardens, refuse and domestic pets serving as a food source for the species (Ellins 2005).

Survey methods and design

In order to collect information regarding Vancouver residents' attitudes towards, and knowledge of coyotes, I designed a survey for an online platform. Many studies examining perceptions of various urban wildlife species utilize surveys to collect information about public opinion. In Webber's previous study of public perceptions of coyotes in the metropolitan Vancouver area, two surveys were designed and conducted through phone and in person interviews (1992. I consulted other wildlife research that

utilized surveys, alongside survey methodology literature, to design an optimized version of Webber's original instrument.

When designing a survey, a researcher faces many trade-offs to optimize its structure. The accuracy, and thus utility of a survey's results is a function of the quality of the questions posed and the representativeness of the sample (Webber 1992). Research in the field of survey design methodology suggests that the product of a survey is deeply influenced by the framing of the sample (Fowler 2009); if the results are spread out too thin over a target population, the results would be susceptible to bias and error. The sample frame was focused on the City of Vancouver rather than the entire metropolitan area, as was the case in Webber's 1992 study, in order to concentrate limited resources over a smaller population. While coyotes evidently to not respect political boundaries in their habitats, focusing resources on Vancouver rather than the entire metropolitan area allows for the production of a more concentrated and reliable sample.

The increasing accessibility of the Internet has allowed for an increase in surveying to be conducted online. While there are limitations to an online survey, such as issues in randomizing the sample (who is exposed to the survey) as well as missing the input of those without access to online resources (notably elderly respondents) (Van Selm and Jankowski 2006), there are also many benefits. Lower costs, ease of storage of collected data and ease of distribution of the survey are the primary reasons the survey was designed for an online platform. While the survey was modelled after a paper and phone survey, it has been argued that the issues related to overall construction are essentially the same (ibid).

The primary goals of the survey were to collect information on public opinion and to identify misconceptions that could be influencing these perceptions. Public managers, in this case, the Stanley Park Ecological society, can utilize this information to formulate specific approaches to meet education and management needs. While these organizations usually hear from a small but vocal group with complaints about urban wildlife, surveys need to be conducted of a wider sample size to collect a range of views and a more accurate picture of general public opinions. Where conflicts occur with the intersection of human landscapes and coyote can be identified through survey questioning.

The survey consisted of a combination of closed and scale questions, along with a select few options for open-ended response ("other" option). The survey was published on various social media sites and through the Co-existing with Coyotes homepage. A press release by the SPES was also picked up by local news sites and published the survey link. The survey ran from March 4th-28th, 2015 and 255 valid responses were collected.

Results & Discussion

i) General Attitudes

The overwhelming majority of survey respondents (98.4%) indicated awareness that coyotes were present in Vancouver, with only 3 respondents (1.1%) indicating that they were unsure and 1 "no" response (Fig 1). While this high "yes" response could be viewed as related to some of the platforms the survey was promoted to the public through, such as through the Coexisting with Coyotes homepage, 91.4% reported personally seeing a coyote within the city (Fig 2). This suggests that the high awareness

of the species presence may be related to high visibility of the species, rather than simply the method the respondents were reached.

The majority of respondents (82%) categorized their attitude towards coyotes as neutral, positive or extremely positive. 56.6% of responses were on the positive side and only 13% reporting negative attitudes (Fig 3). This can be contrasted with Webber's 1996 study, where out of the 173 the Metro Vancouver residents surveyed, less than 30% reported positive attitudes and approximately 20% reported negative attitudes (p. 29 Webber).

This shift towards more positive attitudes may be associated with a decrease in those reporting misconceptions about the species as fact. For example, while most still overestimated the weight in this survey, a smaller portion of respondents believed coyotes weighed 31-38kg and 38kg +, which were the highest weight class options given. This is illustrated in Figure 6. This was further demonstrated by the majority of respondents indicating they believed a low portion of coyote diets consists of domestic animals and the belief of low incidence of coyotes attacking children (Fig 8 and 9). In fact, 41.6% underestimated the number of incidents of coyotes attacking children, choosing the option of none rather than the correct answer (1-10, accounting for 49.6% of responses).

In addition, when asked to indicate True/False/Uncertain to the statement that local coyotes carried rabies, only 10% responded incorrectly with "true", in contrast to 29% in Webber's survey of Metro Vancouver (27 Webber). However, the majority of respondents (64.5%) were uncertain. Many of the True/False/Uncertain survey questions had a high proportion of "uncertain" responses, such as to whether coyotes were known

to be carriers of Sarcoptic Mange or whether they could interbreed with domestic dogs. High proportions of "uncertain" responses do demonstrate a knowledge gap that could be targeted by future educational programmes.

ii) Negative attitudes

It is interesting to explore the responses of those indicating negative feelings towards coyotes in comparison to general responses. Overall, negative attitudes towards coyotes can be associated with an overestimation of coyote size, percentage of domestic pets in diet, and incidence of aggression towards children. Responses indicating a "dislike" or "strong dislike" of coyotes accounted for 13% of the total sample.

When questioned about the proportion of domestic pets in a coyote diet, 43% overestimated, with 12.5% indicating that over 50% was comprised of pets. Only 3% of the total sample believed it to be over 50%. When comparing the estimated coyote weight given by respondents, the prevalence of misconceptions within the negative attitude group becomes even more apparent, with 18% correctly identifying the weight range, compared to 26.3% in the total sample. Overestimation of weight can be interpreted as a higher perception of threat, as it indicates that the respondent views them as larger. The majority within the negative attitude group indicated garbage and pets as primary diet, and often incorrect or unsure in the True/False/Uncertain section (for example, 72% indicated unsure or true to carriers of rabies).

iii) Perceptions of Coyotes and Domestic Dogs

In the True/False/Uncertain portion of the survey, it was stated that coyotes are dangerous and that domestic dogs are dangerous. In Figure 7.1 and 7.2, the similarities

between the portions of responses are illustrated. There is a clear divide in opinion, as most indicated True or False rather than uncertain, and the proportion between the two responses are quite even. More respondents indicated that domestic dogs were dangerous over coyotes. This is an interesting statistic to guide future management plans. While some do view coyotes as dangerous, the indication that domestic dogs are also dangerous suggest a healthy respect for the species, but also the possibility of coexistence. It is possible that the respondents view coyotes as a potentially dangerous wild animal, but not necessarily a constant threat. This is inferred from 73.9% of respondents indicating that whey would be willing to change their behaviour if it helped co-existing with coyotes.

vi) Management

In the survey, it was asked which management agency/agencies were responsible for coyote related issues and what method(s) were appropriate for dealing with urban coyotes. Similarly to Webber's study, the respondents were split between the various options. With 527 total responses, the most popular options were the Ministry of environment (60.8%) and Municipal Governments (54.5%). The SPCA and non-profit animal rehab centres also had many responses (Fig 10). This confusion as to who is responsible is an education gap and a potential for cross-agency collaboration. The responses to what method(s) were appropriate for dealing with coyotes also demonstrated an education gap and environmental illiteracy. Most (82.7% of 351 individual responses) included public education campaigns as a suitable response, but 38.8% also indicated that relocation was a desirable option (Fig 11). While it has been hypothesized that relocation is a popular option for the public since it is perceived as humane, it demonstrates environmental illiteracy as the "problem" coyote will likely reoffend in its introduced

environment and the territory is often replaced by another coyote (Webber 1996). While relocation had dropped in favour since Webber's study, it is still a potential target for continued education.

v) Discussion of Sample

It is important to cast a critical lens over the respondents of any survey, as the validity of the information collected is a function of the sample. In order to have a better picture of the age distribution of the sample, it was included as a survey question. As can be seen in Figure 12, the majority of respondents are young adults between 19 and 34. The other age classes have reasonable representation (with the exception of under 18), but the high proportion of young adult respondents is important to take into account when analyzing the survey results. The survey respondents are not necessarily representative of the Vancouver population; willingness to complete the survey could indicate a base of interest in the species. However, this would not necessarily mean that the survey is skewed toward positive results, as those who feel negatively about coyotes would also be interested in taking a survey to voice their opinions and concerns.

Recommendations and Conclusions

Vancouver is a growing and changing city, and it is interesting to examine how public perceptions of coyotes, as an urban wildlife species residing within the area, has changed. Public perception alone is not enough to guide management programs; why residents hold certain opinions, which are often linked to misconceptions and risk perception, is crucial. "Why" is what this survey and its contextualization within a larger body of research has attempted to accomplish. These results could help an agency to

formulate a response and create legislation, educational programs and policy that addresses public concerns.

The results of this survey have indicated a general positive attitude towards the species, a positive attitude that has grown since the survey results collected in 1996. Generally, the intensity of many misconceptions has gone down, with those correctly answering knowledge based questions related to risk perception increasing and those in the overestimation extremity categories decreasing. However, misconceptions are present, especially among those reporting negative attitudes towards the species. Educational programmes could target these misconceptions. Many respondents did indicate a desire for more information to be available to them. Respondents cited reasons such as lacking awareness of who to contact if they see a coyote or if one begins to act aggressively, and the belief that their peers had limited knowledge. Increased advertising of already existing resources provided by the Stanley Park Ecological Society's Co-existing with Coyotes program would address some of this concern, such as their coyote sighting report system.

Confusion as to who is responsible also leads to the recommendation of increased self- promotion by the organization. Collaboration with these other agencies in both future programs and in directing residents to the appropriate resource would be helpful in addressing this persisting knowledge gap. As for new educational campaigns, coyote diet in relation to pets was a large source of misconception and pet safety was the most citied reason for coyotes being a concern. These results suggest that it would be useful to target pet owners in educational programmes and campaigns.

Lastly, I would recommend further research to be undertaken that focuses on garbage and compost storage habits and prevalence of home gardens in relation to public perceptions of coyotes. While this survey a shorter design in an attempt to minimize the number of abandoned and incomplete surveys, more questions can be asked to residents that could guide future management programs. This survey focused on misconceptions surrounding pet and human safety and the risks coyotes posed in that regard, but the literature review revealed many opportunities for further exploration into how residents may be unknowingly providing human food resources to the species. As researchers have found increased use by coyotes of anthropogenic food sources like garbage is linked to increased cases of aggression (Gerht and White 2009), this would be an interesting social aspect of coyote existence to examine in further research. Biological and geospatial studies of the species focusing on their distribution within the city, range patterns and scat analysis, such as those conducted in Calgary and Chicago (Gese, Morey, Stanley 2012) (Liccioli 2012) (Lukasik, Alexander 2011), would be an interesting direction for future research as well.

In conclusion, this survey and its context within a larger body of literature allowed for an analysis of the local attitudes towards the species and the factors influencing these perceptions. Vancouver residents do perceive risks towards co-habitation with the species, but also see benefits suggesting that they would be receptive to further educational and management programs that underscore co-existence. Awareness of the human dimension of coyote existence within the city is important to guide future management, as public concerns are challenges that must be faced by city wildlife managers. The results of this study led to the recommendation of self promotion

of the Co-existing with Coyotes program, further educational programmes targeting pet owners, and further research into how Vancouver residents could be providing coyotes with anthropogenic food sources.

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Appendix

Fig 1.

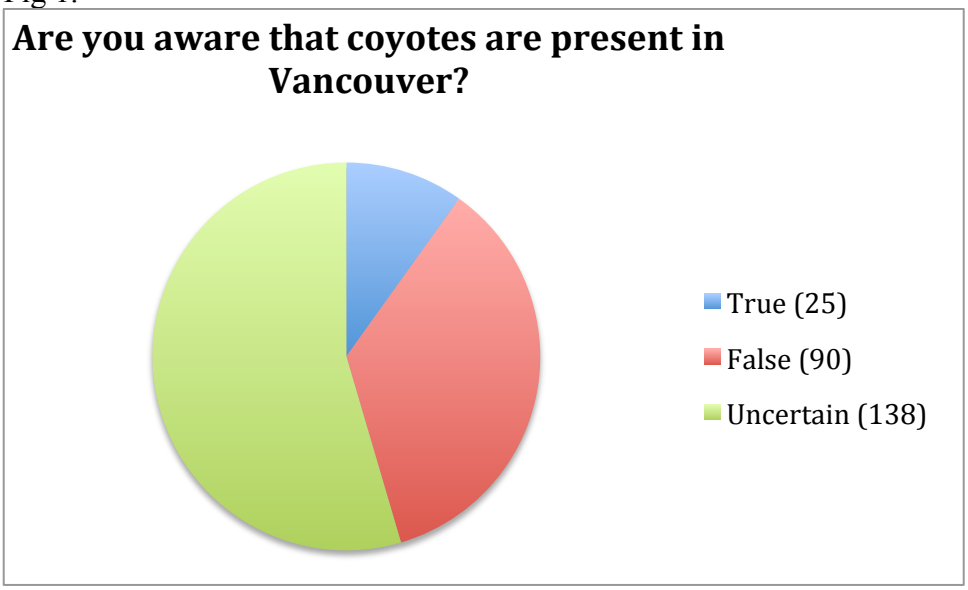


Fig 2.

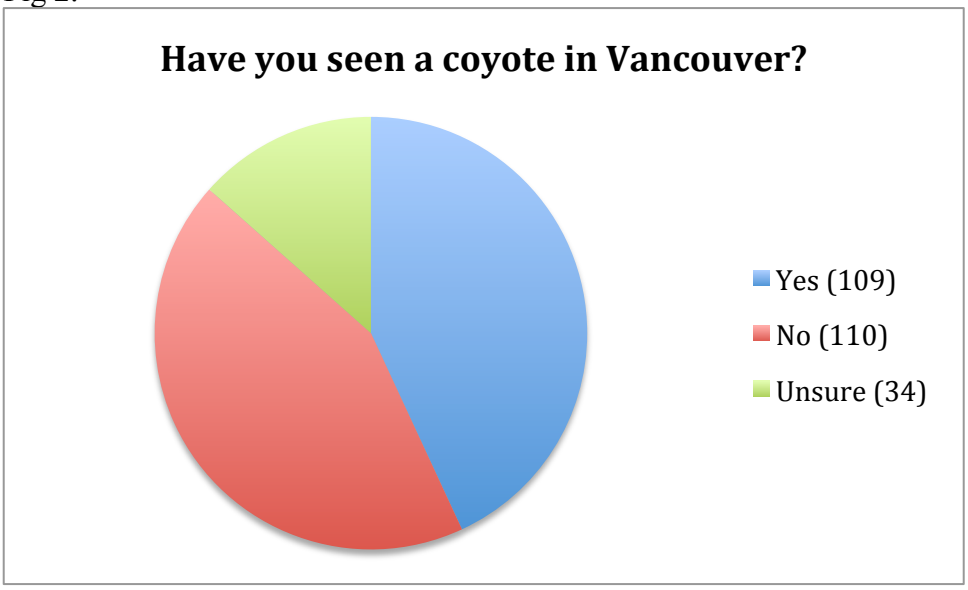


Fig 3.

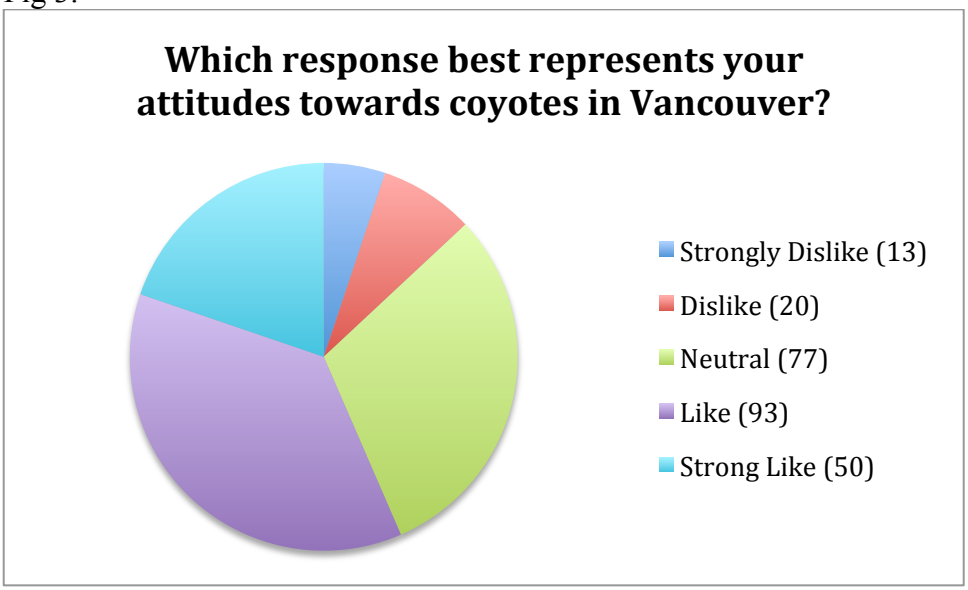

Which response best represents your attitudes towards coyotes in Vancouver?
Strongly Dislike (13)
Dislike (20)
Neutral (77)
Like (93)
Strong Like (50)

Fig 4.

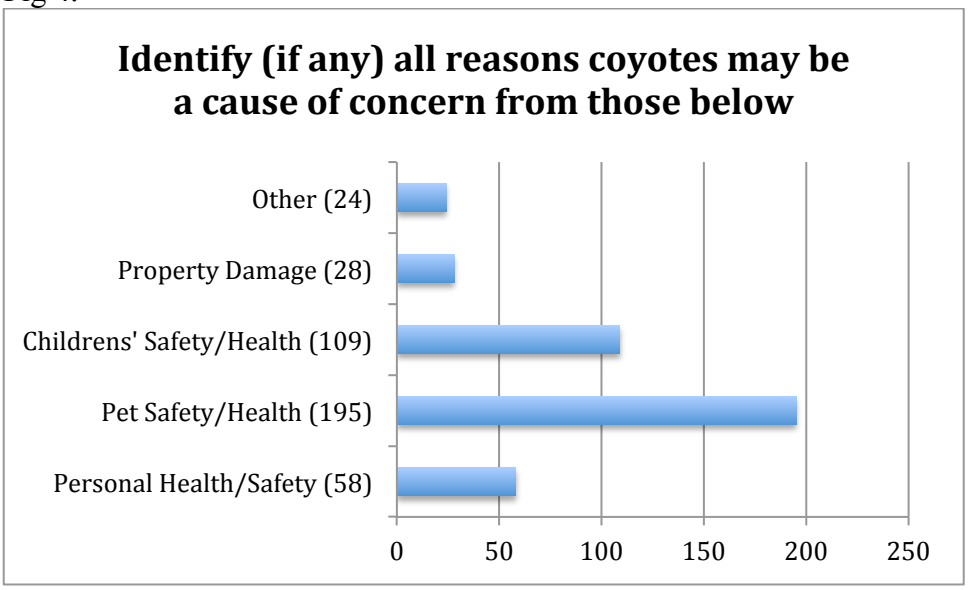

Identify (if any) all reasons coyotes may be a cause of concern from those below
Other (24)
Property Damage (28)
Childrens' Safety/Health (109)
Pet Safety/Health (195)
Personal Health/Safety (58)
0
50
100
150
200
250

Fig 5.

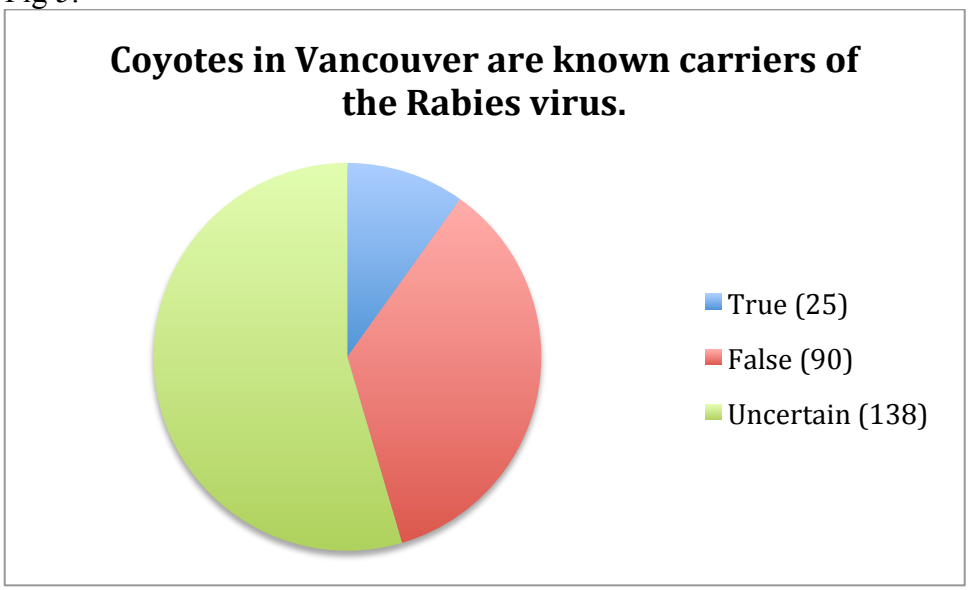

Coyotes in Vancouver are known carriers of the Rabies virus.
True (25)
False (90)
Uncertain (138)

Fig 6.

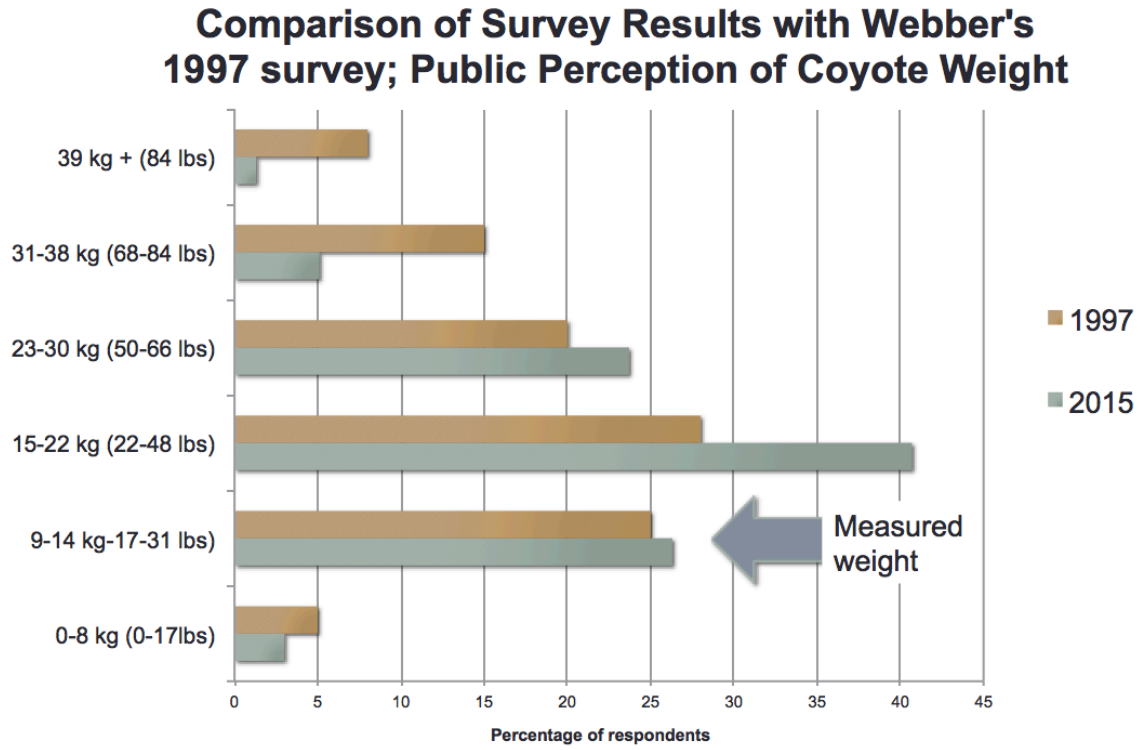

Comparison of Survey Results with Webber's 1997 survey; Public Perception of Coyote Weight
39 kg + (84 lbs)
31-38 kg (68-84 lbs)
23-30 kg (50-66 lbs)
15-22 kg (22-48 lbs)
9-14 kg-17-31 lbs)
0-8 kg (0-17lbs)
Measured weight
1997
2015
0
5
10
15
20
25
30
35
40
45
Percentage of respondents

Fig 7.1

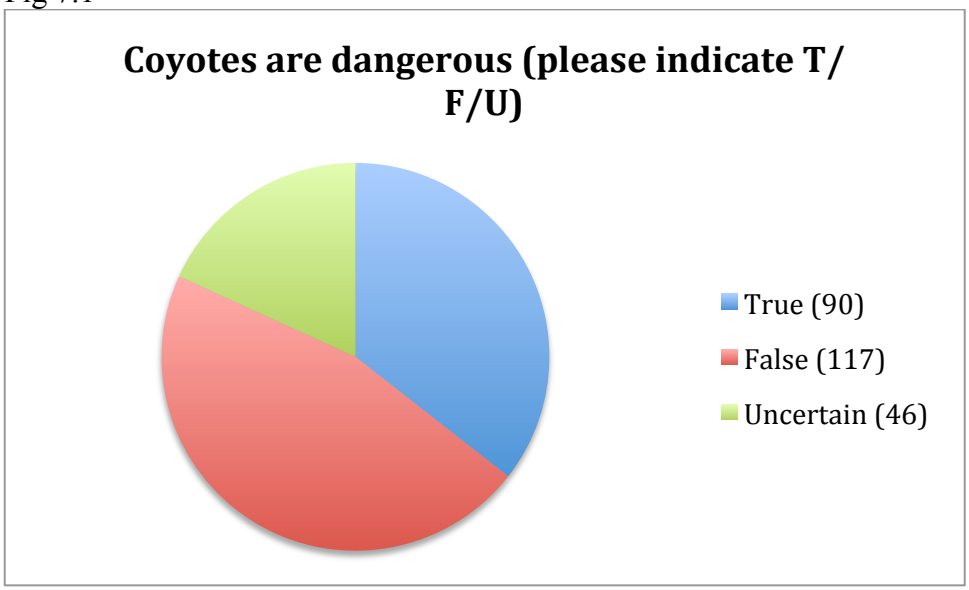

Coyotes are dangerous (please indicate T/F/U)
True (90)
False (117)
Uncertain (46)

Fig 7.2

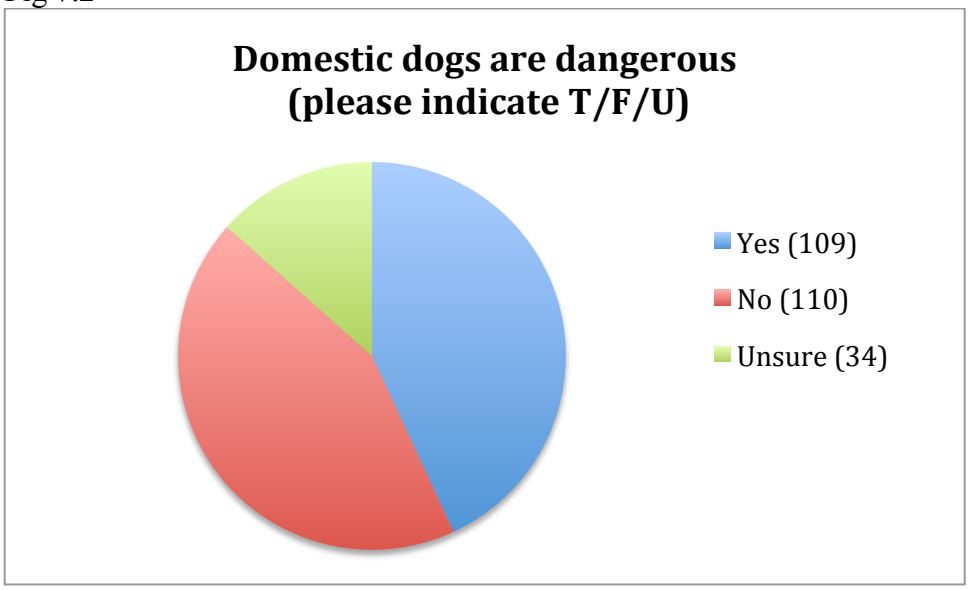

Domestic dogs are dangerous (please indicate T/F/U)
Yes (109)
No (110)
Unsure (34)

Fig 8.

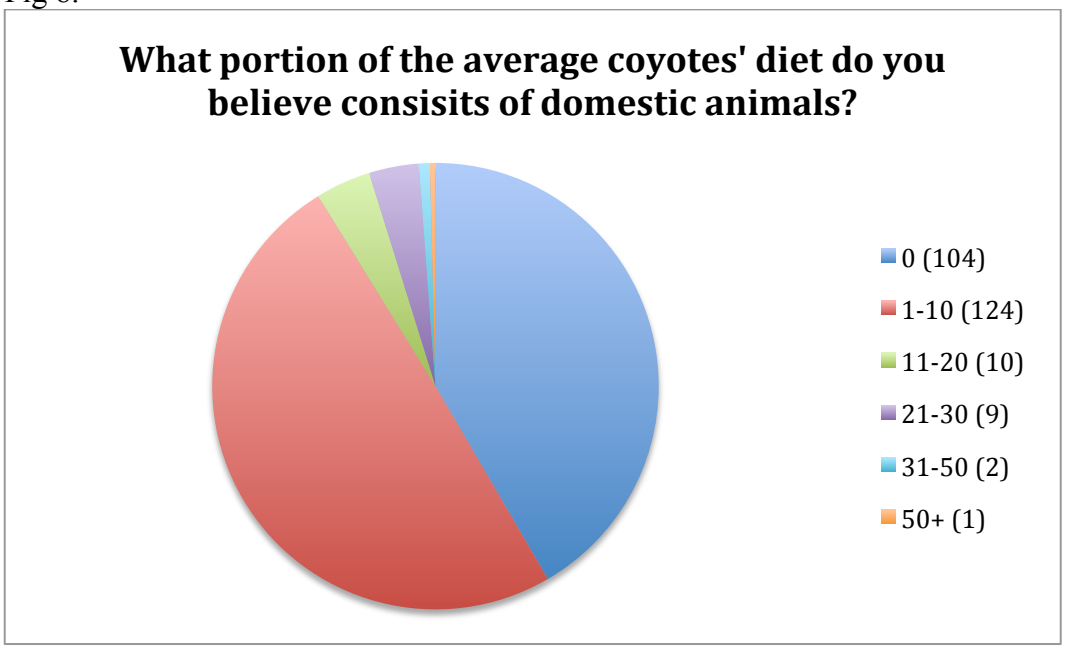

What portion of the average coyotes' diet do you believe consisits of domestic animals?
0 (104)
1-10 (124)
11-20 (10)
21-30 (9)
31-50 (2)
50+ (1)

Fig 9.

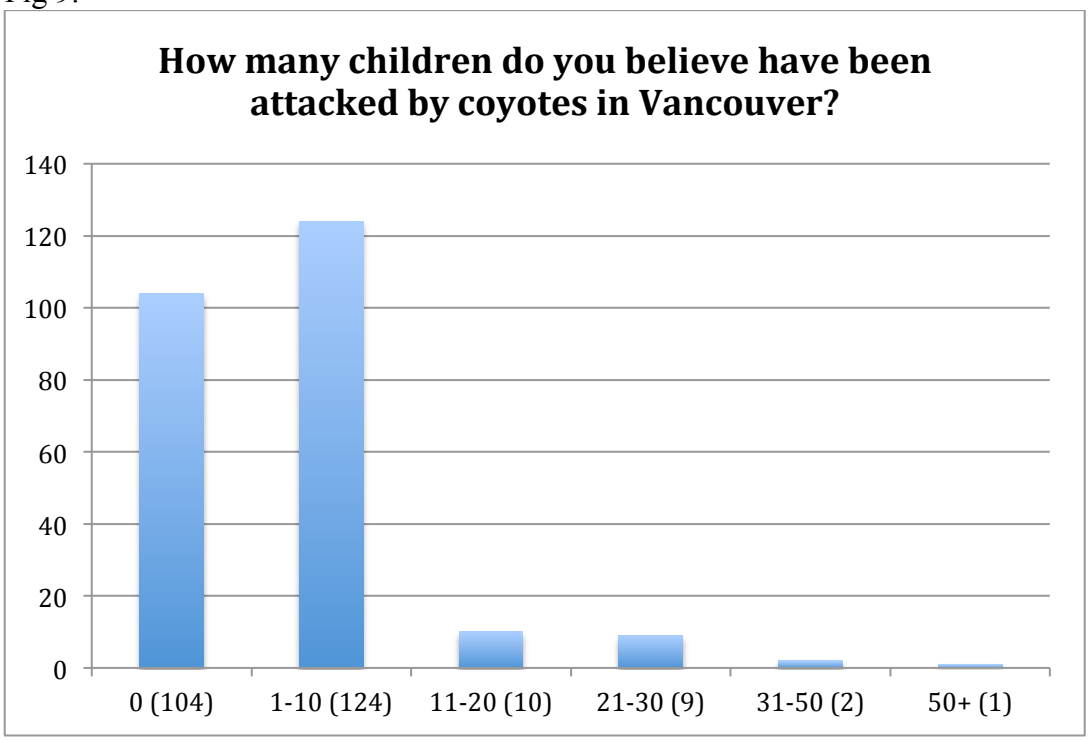

How many children do you believe have been attacked by coyotes in Vancouver?
140
120
100
80
60
40
20
0
0 (104)
1-10 (124)
11-20 (10)
21-30 (9)
31-50 (2)
50+ (1)

Fig 10

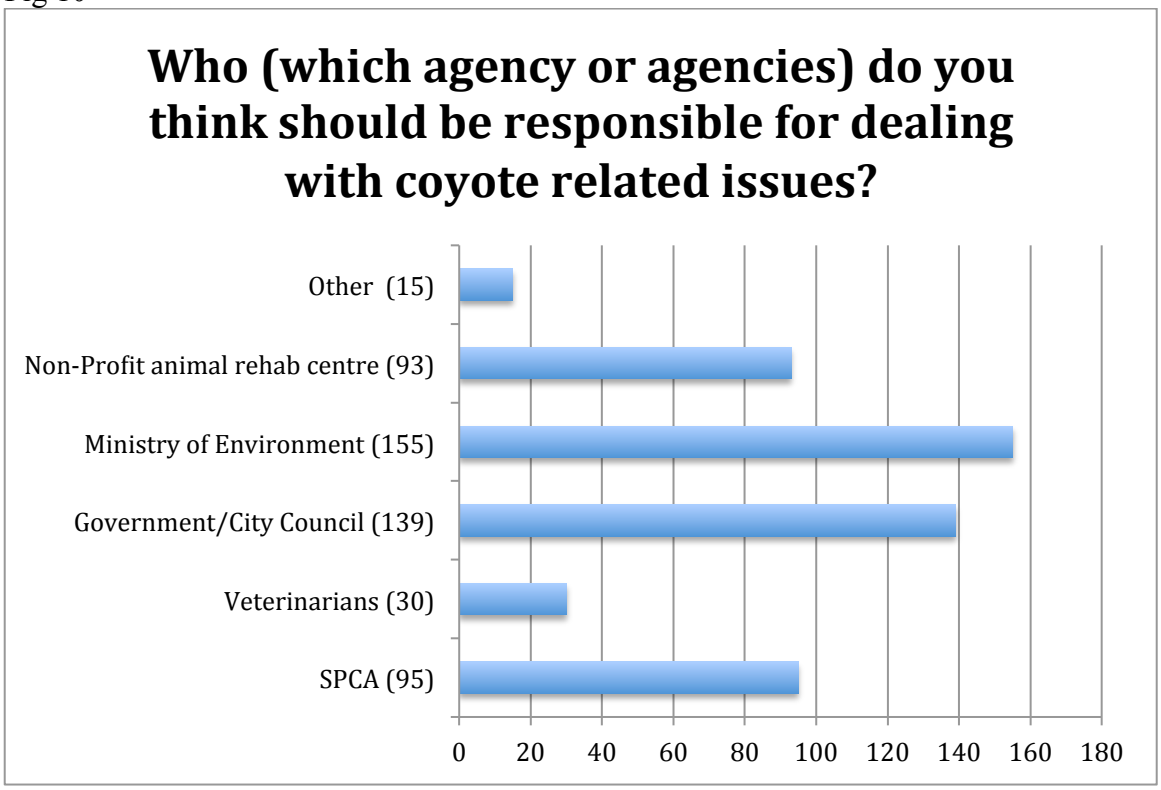
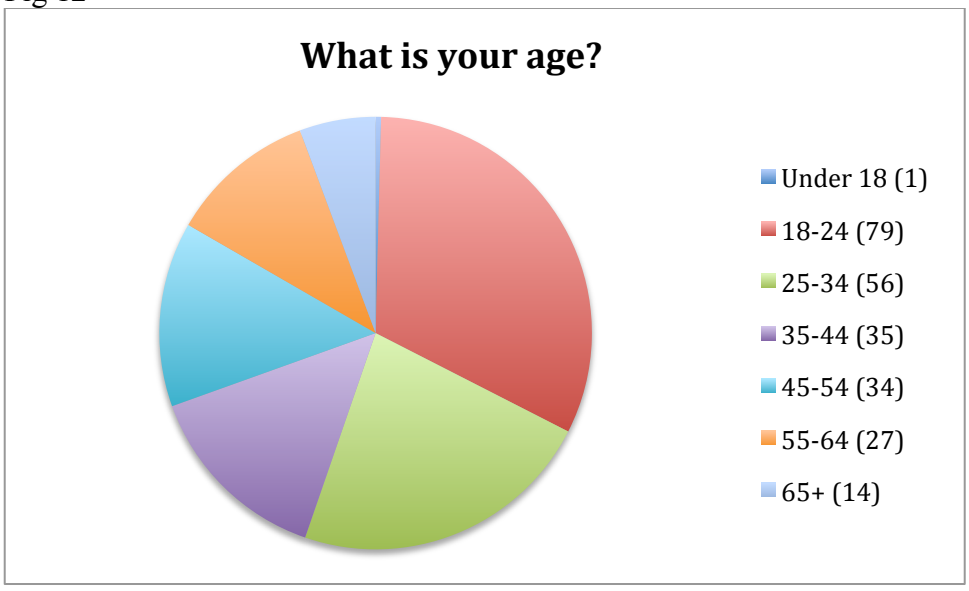


Fig 12



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