

Urban Wildlife in Vancouver

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Introduction



*Figure 2 – Many animals occupy our urban landscape forming urban ecosystems.
(https://upload.wikimedia.org/wikipedia/commons/6/69/Urban_wildlife_-_squirrel.jpg)*

The increasing flux of people to Vancouver is putting immense pressure on wildlife with increasing densification and expansion outwards into natural spaces. There are two central dimensions to this issue, namely human-wildlife interactions and biodiversity ecosystem services. In a good exemplification of human-wildlife interaction, the BC SPCA (British Columbia Society for the Prevention of Cruelty to Animals) explains that with nowhere else to go, animals move into the urban “habitat”, often resulting in interactions with humans, some of which are undesirable. Some adaptive species with minimal predators prosper and multiply; whereas others struggle to adapt to this new environment and find it insufficient. Overall, biodiversity is suffering wherever human development is. In areas around Vancouver that are home to many species, we are seeing ecosystem health suffer. Human health is intimately linked with biodiversity and ecosystem health, therefore we have quite a vested interest in maintaining wildlife populations of all species, and protecting enough habitat to sustain them all (Olive, 2014). Due to its multidimensional nature and the differing values of the stakeholders, we have ourselves a wicked problem.

UBC Endowment Lands 2015



Figure 5 – UBC is situated between the University Endowment Lands of Pacific Spirit Regional Park. An aerial view using Google maps provided by Map Data Copyright 2015 Google shows this close proximity of dense settlement and wildlife habitat.

Framing the Problem

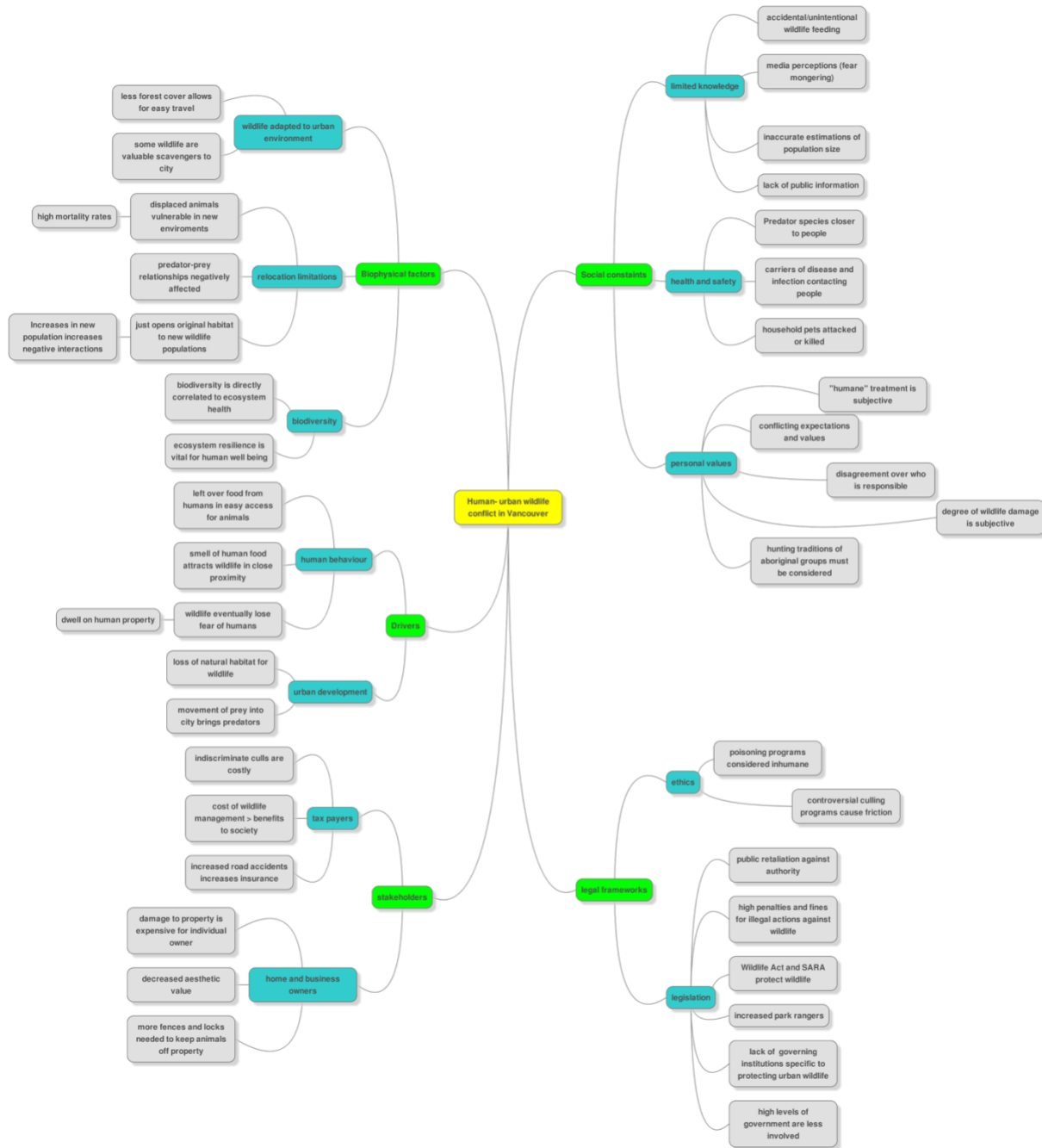


Figure 6 – mind map illustrating connections between varying dimensions of this wicked problem.

Discussion of Mind Map

Biophysical Factors

Numerous biophysical factors perpetuate urban wildlife as a wicked problem. Firstly, wildlife has adapted to urban environments through easier travel along human constructed roads and highways (BC SPCA). Relocation options of wildlife are limited because displaced animals

become vulnerable in new environments due to their reliance on humans and wildlife mortality rates are high. In addition, predator-prey relationships are negatively affected in both environments as urban habitats are now open for new populations to enter. Lastly, given that biodiversity is directly correlated to ecosystem health, resilient ecosystems are vital for human health and wellbeing.

Stakeholders

There are conflicting interests between main stakeholders (taxpayers and home/business owners). Property damage is expensive and results in a decrease in aesthetic value. Taxpayers are reluctant to spend large amounts of money on wildlife management, when they do not know about the benefits to society. However, others like lobby groups (environmental NGOs and special interest groups) recognize this importance more. An example could be the SPCA or The Stanley Park Ecology Society. Both urban wildlife and domestic animals are also stakeholders, though they cannot contribute their opinions in the same way. There are fundamental differences between these groups and in every individual around what holds value. For instance, some might think animals are secondary to humans, while others see all creatures as equal and deserving of life.

Social Constraints

Social constraints affect stakeholders' opinions. Limited knowledge leads to the outlook that feeding wildlife is not harmful or results in accidental or unintentional wildlife feeding. Perceptions are also formed from the media in the form of fear mongering. Media portray some urban wildlife, such as cougars and bears, as highly dangerous. There exists a lack of public information on how to deal with urban wildlife. Inaccurate estimations on population size could also be an issue in biodiversity conservation. Health and safety is another social constraint. Predator species that have moved closer to prey (urban wildlife) are a threat to people and their pets. New species in urban environments are coming into contact with people and can be carriers of disease and infection. The last dimension of social constraints addressed is personal values. "Humane" treatment of urban wildlife is subjective and results in conflicting expectations and values of stakeholders. The degree of wildlife damage is also subjective; some citizens fail to recognize the importance of well-functioning ecosystems and healthy populations. Finally, there are disagreements over who is responsible for the issue of urban wildlife, which poses problems for creating solutions.

Legal frameworks

Some legal frameworks are in place, but opinions clash on ethical grounds that are not part of legislation. For example, poisoning programs are potentially considered inhumane. Controversial culling programs cause friction between stakeholder groups. Some legislation is in place; however, with severe repercussions for illegal actions regarding wildlife. Much of this legislation will be discussed in the governance analysis to come.

Relative Importance

In order to come up with viable solutions to the array of issues present, we need to judge importance to prioritized issues. The root cause of conflict between these two groups is urban development; however, as this is likely not going to stop, discussion must be had on solutions to human-wildlife interactions and biodiversity ecosystem services. These are just as important as the drivers themselves. Interactions make up the conflict between humans and urban wildlife. These interactions encompass all of the issues. Human health is linked to the

biodiversity, resilience, and health of ecosystems, as we all depend on the natural services they provide like clean air and nutrient cycling. Decreasing biodiversity is a major issue when species are competing with humans need for urban development space. Biodiversity conservation is arguably a more pertinent issue than human wildlife interaction, for it affects more than just a select group of affected individuals: ecosystem health and thriving populations affect all.

Other dimensions include main stakeholders as they drive development and biophysical factors, such as wildlife adapting to urban environments without viable option to relocation is also important. There are limitations to relocating them, so it becomes difficult to pose solutions. Social constraints such as limited knowledge, health and safety problems and conflicting personal values are another issue that cause problems to implementing solutions. These are constraints in society that add to the complexities of dealing with urban wildlife, but are not the main issues of the central conflict. Legal frameworks, including ethics and legislation, is the final dimension still key to the main conflict. It is part of the solution, but without the drivers changed legislation cannot be created to fix the issues.

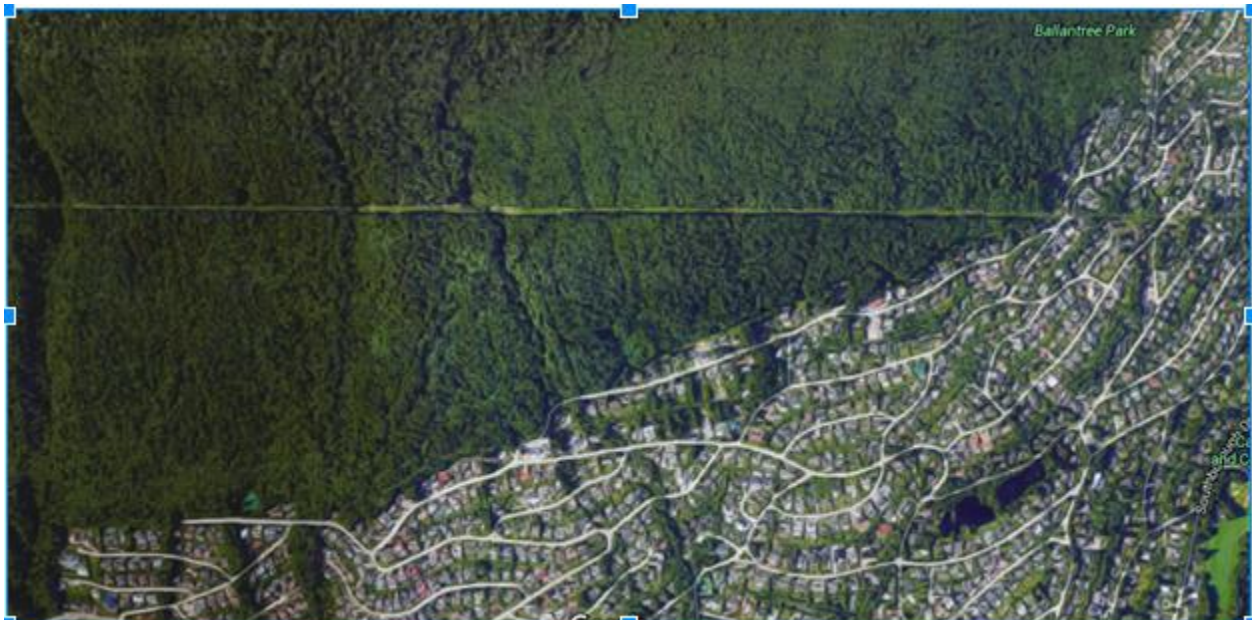


Figure 7 – The upper limits of West Vancouver show the striking border between suburban neighbourhoods and natural wildlife habitat. Google maps provided by Map Data Copyright 2015 Google.

Analysis of Governance Framework and Practices

The following is a discussion of the governing structures surrounding the issue of urban wildlife in Vancouver. The wildlife in our city elicits a wide range of responses, for the sub-issues in urban wildlife are many. When it comes to governance of this issue there are two aspects to address. First of all, there is a lack of policy in general that addresses the issue directly. Globally or internationally there are no institutions in place to govern urban development at the level related to urban wildlife protection. Since the issue is so city-specific, even federally and provincially the laws do not apply to urban wildlife interactions. There is no local urban wildlife legislation, but wildlife is protected by the BC Wildlife Act (City of Vancouver, 2012). In a more general sense they are arguably addressing urban wildlife, but

the more nuanced issues relating to our city are not simply wildlife in general. Second of all, the issue has two central dimensions that are affected by legislation. The first dimension is the issue of creatures living alongside humans in the urban landscape and the effects of this on both parties. The second dimension deals with ecosystem health, which is directly linked to high biodiversity (pre-human interference levels). Biodiversity conservation is very important in the maintenance of the healthy ecosystems of the planet we all depend upon: urban wildlife is a part of this. Maintaining healthy populations of as many species as possible has actually been proven to improve both ecosystem resilience and human well-being (Olive, 2014). Thus, it definitely is pertinent to know the governing bodies currently in operation surrounding this issue and how they operate, for we want to be sure that we are handling the issue as best as we can.

The key decision makers that affect the governance of urban wildlife issues are all levels of the Canadian government, City of Vancouver councillors and staff, voting citizens, lobby groups (such as environmental NGOs and special interest groups), and indigenous peoples. It should be noted; however, that although Vancouver must abide by legislation set out at the federal and provincial levels, the higher levels of government seem less involved in the issues directly, in contrast with the local government. That being said, we wish to mention a couple notable pieces of legislation at the federal level to bear in mind while reading about the rest of governance, most of which occurs at the local scale. These are the Species at Risk Act (SARA) and the Canada Wildlife Act, both of which set policies for the management and protection of wildlife and wildlife habitats via policy creation and punishment measures should they not be adhered to. The BC Ministry of Environment then takes the federal legislation and implements the policies on a more specific scale, such as preparing the Hunting and Trapping Regulations Synopsis within British Columbia.

The first dimension, that of direct human-wildlife interaction, is affected by local legislation in the form of bylaws from the Board of Parks and Recreation of the City of Vancouver. This manages practices at a local level, such as the policy that prohibits the “deposit of food or grain on any area in a park except in litter cans” to prevent the unintentional feeding of wildlife (Park By-Laws, 2010). There are also special interest groups and NGOs like the Stanley Park Ecology Society, which are players as well. They launched the “Co-Existing with Coyotes” program to help educate Vancouverites on what to do when they encounter a coyote, and how to peacefully co-exist with them. Other initiatives like this exist to shape citizen behavior and improve positive wildlife experiences. Enforcing public behaviours towards animals is a difficult task; people are often not aware or choose to disobey regulations.

The second dimension, that of maintaining biodiversity conservation goals while urban development is continuing, is a little more complex legislatively. The governing bodies currently in operation on this issue are those that control urban development. Inevitably, when a development proposal is put forward, habitat is being destroyed. It is in attempting to strike a balance between the needs of both people and animals that we can hopefully maximize our gains and mitigate our harms. This is principally under the control of city councillors. Additionally, the city staff who are responsible for reviewing and recommending development proposals, and influencing the decisions of the city councillors. In this process, a development proposal is created and includes an environmental impact assessment (EIA) to outline the wildlife inventory of the site, and the likely impact the proposal will have. Here we can see how the costs and benefits are being considered. The decision in approval or dismissal of development proposals lies entirely with the city council. That being said, they must abide by the federal legislation already mentioned, as well as local and provincial legislation. On the

provincial level, there is the ministry of Environment which regulates species conservation and management within its borders (Government of British Columbia, n.d.). So if a development proposal were to put a specific population at risk, the provincial government may wish to stop or impose restrictions in order to protect populations of the threatened species in question. On the local level, the city of Vancouver is unique in that it operates under the *Vancouver Charter*, not under the *Local Government Act* like the rest of the municipalities in BC (although they operate much the same). This document gives powers to Vancouver to introduce land use controls in their jurisdiction (including zones, environmentally sensitive areas, and special development permit areas) on their land and require and issue permits. The permit process is the vehicle through which the city exercises its powers.

It should be noted too that these two central dimensions play off one another. Urban expansion and subsequent habitat reduction causes species displacement. Some species are forced out of their natural habitats, while other species may find new homes within the city. This increases the number of interactions mentioned above. Another aspect to note is the sometimes unique case of wildlife in Vancouver when it comes to Indigenous peoples. Agreed upon treaties have tried to deal with the challenge of balancing the right of Aboriginal people to continue traditional hunting while acknowledging the need to protect wildlife. This was seen in the Nuu-chah-nulth agreement that “includes rights to harvest wildlife and migratory birds for food, social and ceremonial purposes limited by conservation, public health and public safety” (BC treaty commission, 2009).

In terms of analyzing the governing practices based on the criteria of transparency, accountability, and participation, we see that governance practices are relatively transparent and accessible. Information is available online and specific laws are listed. Actions taken and those proposed are described in ways the public would understand. The science behind the issues has been explained. In accordance with accountability, different stakeholders are held responsible for their actions because regulations are shared between the three levels of government (Saxe and Campbell, 2011). However, our research indicated few mechanisms other than this for holding key decision makers accountable. There were no investigations to determine if current measures were working. Nowhere in any of these documents is there any information relating to *who* is accountable should biodiversity goals fail, for example. There seem to be no tangible repercussions for not meeting biodiversity conservation goals. With decision making power lying with the democratically elected city council, citizen’s voices are being heard. Regarding land use and the creation of the Regional Growth Strategy, the city of Metro Vancouver surveyed “members of the public, community groups, regional agencies, and member municipalities” (Friesen, 2003, 29). Interviews were done and ideas about what different participants would like were developed into bigger concepts. A democratic process was allowed through participation of different groups. Thus, although not a perfect system for participation, it is likely the best one possible with such a large collective.

After our in-depth look at the governance framework surrounding Vancouver’s *wicked* urban wildlife issue, we conclude that development proposals go through some good and necessary steps to see if they should be ratified. It is a democratic and involved process. However, with the increasing urban demands we need more protectionist measures to maintain the population levels. An overarching theme is that there is a lack in policies and legislation regarding urban wildlife *specifically*. The cumulative effects of land use have large impacts across the city as a whole, and it definitely is a big question whether or not the urban wildlife will be protected enough to survive. More on recommendations will be discussed in another portion of this case study.



Figure 3 – Hazards to both humans and urban wildlife emerge as multiple species attempt to reside in the same environment. <https://www.flickr.com/photos/orcmid/4962726960>

Moving Forward

To form recommendations to solve this wicked problem, we began formulating our solution by focusing in on two main areas mentioned above: human-wildlife interactions and biodiversity ecosystem services. If we can improve both of these aspects then we can improve conditions for the urban wildlife within our city. Beneficial human-wildlife interactions begin with the education of locals. The concerns of the people must be addressed and human behavior must be changed in order for there to be a positive outcome. For example, feeding certain species encourages them to come in close contact with people causing issues that are not well understood such as continued destruction, possible injury, and spread of disease. Once civilians understand how to responsibly coexist with urban wildlife and value that relationship, positive interactions will result.

Another area of focus must be preserving biodiversity and ecosystem services. Where humans inhabit, biodiversity declines. We can prevent further problem by creating a linked network of natural areas and parks that will serve as viable and safe habitats for existing populations. Expansion is inevitable and removing wildlife from the city is not a sustainable solution, thus we must incorporate environments within our city that will successfully preserve biodiversity. Metro Vancouver, has included this concept of connected natural areas in their regional growth strategy. The city plans to “Implement the Metro Vancouver Regional Parks and Greenways Plan in collaboration with municipalities, to identify, secure and enhance habitat, park lands and buffer, where feasible, park and conservation areas from activities in adjacent areas” (City of Vancouver, 2010, 34). Plans that include legislation regarding urban wildlife are crucial for biodiversity within our urban environment.

Lastly, more legislation is necessary to govern wildlife in this urban setting. The first step is to increase the knowledge of those people in positions of power such as city councilors. When they understand the connection between urban biodiversity and growth in social, economic, and human health they are more likely to take action. The recent increase in environmental legislations is not specific to urban wildlife, thus policies must be implemented to protect those species that reside within our cities and target issues people have against them. In addition, people must be held accountable for their actions. Penalties for the feeding as well as the displacement of animals should be put into place. By implementing these ideas mentioned above, it can be expected that species that were once negatively interacting with humans can find an urban niche among us. Through the strengthening of human-wildlife interactions and biodiversity ecosystem services as well as implementing new governance practices, it is possible to solve the wicked problem of urban wildlife in Vancouver.

References

Peer Reviewed Articles

Adams, L. W. (2005). Urban wildlife ecology and conservation: A brief history of the discipline. *Urban ecosystems*, 8(2), 139-156. doi:10.1007/s11252-005-4377-7

In this journal article Adams provides a brief history of wildlife conservation from when the idea first began in the 1930s. He argues: “I think it is most likely that urbanization will continue into the foreseeable future. Without thoughtful planning, the process will continue to alter, fragment, and isolate wildlife habitat. Humans growing up in urban areas tend to be isolated from natural processes and biotic events. Education programs directed toward urban residents can help to reverse this trend” (Adams, 2005, p. 150). He claims that most research has been conducted on birds to evaluate how urbanization is affecting populations. He states that “research shows that species richness generally declines with increasing urbanization and species composition of the community changes, with loss and decline of native species and the addition of exotic species” (Adams, 2005, p. 147). This article is useful to our project research because it helps provide a base history of how the ecology and conservation movement has developed throughout the last 100 years or so. Adams adds credibility to his argument by citing multiple reliable references.

Boelens, R. (2006). Co-existing with coyotes in Vancouver (and anywhere else, for that matter). *PM.Public Management*, 88(11), 26-30. Retrieved

from <http://search.proquest.com.ezproxy.library.ubc.ca/docview/204185350?accountid=14656>

In this journal article, Boelens summarizes the appearance of coyotes of Vancouver and discusses the Coexisting with Coyotes (CwC) plan created by the Stanley Park Ecological Society. “The CwC plan aims to reduce conflict among people, pets, and coyotes by providing information to both targeted and general audiences as well as providing a direct response to individual coyotes that are starting to, or are displaying, behavior of concern” (Boelens, 2006, p. 27). Coyotes arrived in Vancouver due to the large amount of green space and availability of food. They have been a cause for concern ever since due to their attacks on pets and young children. There have been a total of six incidents where a coyote attacked a child, however, “of the six incidents in which a coyote has bitten a child, four of the involved animals had been deliberately fed by adults” (Boelens, 2006, p. 29). This reference is useful to our project because it provides information as to why coyotes dwell in Vancouver as well as how humans generally deal with them. The article itself does not present any new research findings itself, however, it reproduces them in an article that is easy to read and understand.

Er, K. B. H., Innes, J. L., Martin, K., & Klinkenberg, B. (2005). Forest loss with urbanization predicts bird extirpations in Vancouver. *Biological Conservation*, 126(3), 410-419. doi:10.1016/j.biocon.2005.06.023

This is an article from the *Journal of Biological Conservation* on an experiment the authors conducted to deduce whether the observed number of (forest-dependent) bird extirpations after forest loss with urbanization is comparable to that predicted by the species–area function. They found this to be true “only with species closely associated with lowland forests and restricted in their geographic distribution”. Their methodology is well-researched and to me seems reliable. It gives strong support for each step of the experiment and is clear about the assumptions being made and why they made them. I especially liked the images that really exemplified the scale of deforestation. This is valuable information to my issue of urban wildlife in Vancouver for it shows the direct negative effect deforestation has on wildlife in the city: extirpation. There is also much information in the article on the change in forest cover throughout Vancouver’s history up until almost present day. This source is very good at showing the implications that increasing urbanization (analogous with deforestation) has on our wildlife in Vancouver. The authors also go on to suggest that urban planners should conserve natural habitat fragments from the onset to help save these birds, which shows us the potential for mitigating our species loss problem.

Friesen, Mark A. (2014). *Democracy, governance, and Metro Vancouver: Decision-making and the regional growth strategy*. Retrieved from summit.sfu.ca/system/files/iritems1/14732/etd8683_MFriesen.pdf

Hyndman, J., Schuurman N., and Fiedler R. (2006). Size matters: Attracting new immigrants to Canadian cities. *Journal of International Migration and Integration*, 1, 1-25. doi: <http://dx.doi.org.ezproxy.library.ubc.ca/10.1007/s12134-006-1000-6>

Hyndman, Schuurman and Fiedler’s peer-reviewed article, “Size Matters: Attracting New Immigrants to Canadian Cities” explains the appeal of immigrants to Vancouver and the need for a more even distribution of people arriving in Canada. This reference is significant because it contains in-depth studies and surveys to produce its knowledge. It uses an index based on the Longitudinal Survey of Immigrants to Canada results and statistics (p. 1). This index “weighs and displays various characteristics of cities to rank which centres outside Greater Vancouver are most attractive to new immigrants” (p. 6). This way it can be

determined why Vancouver is alluring to immigrants to Canada. Immigrants tend to want to settle in bigger cities with more resources and ones that have family and friends. It starts off with describing settlement patterns and asserts that more economic integration is necessary. Physical attractiveness is also a characteristic important to immigrants. MCE or Multi-Criteria Evaluation is used to create the index. Other characteristics are available jobs, education and lifestyle. The article explains that this is just a brief overview. Aspects of housing or how welcoming a city is are not considered. Another problem is possible dissimilarities between data and opinions of immigrants. It suggests some methods on how to attract immigrants to smaller towns in Canada and what further studies should entail. This article in the Journal of International Migration Integration provides insight to the appeal of Vancouver to immigrants and how this is increasing the population. It is relevant as to providing solutions to the issue of increasing urban populations regarding the immigrants. It is reliable and provides appendixes with methodologies used (p. 21-23). It cites Citizenship and Immigration Canada.

Kheraj, S. (2012). Demonstration wildlife: Negotiating the animal landscape of Vancouver's Stanley Park, 1888-1996. *Environment and History*, 18(4), 497-527.

doi:<http://dx.doi.org.ezproxy.library.ubc.ca/10.3197/096734012X13466893037062>

The main argument of Kheraj's peer reviewed journal article is that "the everyday interactions between people and animals within shared urban environments also influenced Canadian perceptions of wildlife and the management policies and attitudes toward the place of animals in parks were not always informed by imagined, idealized concepts about wildlife from a distance but were shaped and changed over time according to local concerns and regular interactions between people and animals living in a shared environment" (Kheraj, 2012, p. 497). Canada has become majority urban (meaning more than 50% of the population live in cities) and most people do not encounter wildlife in the distant wilderness; they encounter it in urban areas. Kheraj argues that because of this there is a need for further sustained studies of human-animal relations in urban environments. It is a complex relationship that is continually changing. Kheraj's argument is well supported; he cites multiple creditable references throughout his article. It is useful in our research because it provides insight on how the relationships between animals and humans develop.

Olive, A. (2014). Urban awareness and attitudes toward conservation: A first look at Canada's cities. *Applied Geography*, 54, 160-168. doi:10.1016/j.apgeog.2014.08.002

This article is peer-reviewed and appears in the *Applied Geography Journal*. It looks into the awareness of urbanites in both Vancouver and Toronto to Conservation and finds that most civilians lack awareness on both policy and biodiversity loss, in addition to feeling little responsibility for the issue. Their methodology was mail in surveys completed by 900 respondents. I believe the survey was good, although I must admit that I am not sure how accurately that represents the whole population of Vancouver or Toronto. They acknowledged this as well. Nevertheless, that doesn't impede the validity of many of the comments in this article, which are not connected to the public opinion aspect. I particularly enjoy this article for my purposes since it touches on studies that prove a positive relationship between high urban biodiversity and good well-being. This is key for me to show that urban wildlife interactions are something people value, and that it is a bad issue when we start to lose biodiversity in our cities. It ends with speculations on the potentially positive impacts Canadian cities can have on their biodiversity via intelligent urban planning decisions

Rosol, M. (2013). Vancouver's "EcoDensity" planning initiative: A struggle over hegemony? *UrbanStudies*, 50(11), 2238-2255. doi:10.1177/0042098013478233

Marit Rosol's peer-reviewed article, titled "Vancouver's "EcoDensity" Planning Initiative: A Struggle over Hegemony?" demonstrates the necessity of any development plan to have the support of those not in power. This is the concept of modern day hegemony (p. 2240). It then discusses density as a strategy to incorporate growth in Vancouver and brings into discussion the opponents of this density development. These opponents were against this initiative because of affordability, ecological sustainability and liveability (p. 2246-2248). This article outlines the concerns of another group of stakeholders, the current homeowners and activist organizations they create and how they contribute to a diverse group. Their concerns include high-rises: "They questioned, for example, the sustainability of the proposed demolition of old housing stock and the erection of high-rises instead. They demanded low- and mid-rise densification that respected the surrounding building forms" (p. 2246-2247). The article goes on to explain that because of the opposition there had to be an engagement role put into place. It is relevant to the topic of urban wildlife as it shows a group who add to the problem of development creeping into wild habitats because of an opposition towards density and high-rises. It is reliable as it has an assortment of resources, ranging from journal articles to newspaper articles. It is published in UrbanStudies journal. Savard, J. P. L., Clergeau, P., & Mennechez, G. (2000). Biodiversity concepts and urban ecosystems. *Landscape and Urban Planning*, 48(3), 131-142. Retrieved from http://www.cabnr.unr.edu/weisberg/NRES675/Savard_2000.pdf

In this journal article, Savard, Clergeau, and Mennechez argue that "enhancement of biodiversity in urban ecosystems can have a positive impact on the quality of life and education of urban dwellers and thus facilitate the preservation of biodiversity in natural ecosystems" (Savard, 2000, p. 131). They discuss how biodiversity has become an increasingly important issue and urban ecosystems have been known to negatively impact biodiversity. The authors then provide research on how the proportion of introduced species in breeding bird communities of urban areas relates to urbanization. They found that "the reproductive success of birds often varies with the type of habitat selected. We found such a pattern in the reproductive parameters of European Starlings that varied from low in the downtown area to high in peri-urban sectors" (Savard, 2000, p. 136). They then provide 5 approaches to enhance urban biodiversity: plantation of trees and shrubs, provision of artificial nesting structures, provision of bird feeders, regulating human behavior, and creation, restoration and management of natural areas. The article is well cited and utilizes many references in presenting their argument. The article is useful to us because it helps provide some possible solutions to enhance our urban biodiversity.

Saxe, Dianne and Campbell, Jackie. (n.d.). Canadian environmental law introduction: Legislation. Retrieved from <http://envirolaw.com/canadian-environmental-law-learn/intro-environmental-law/>

Soule, M. (1991). Land use planning and wildlife maintenance : Guidelines for conserving wildlife in an urban landscape. *Journal of the American Planning Association*, 57(3), 313-323. doi:10.1080/01944369108975502

This is a peer-reviewed article from the *Journal of the American Planning Association* that looks at the consequences of urban development (and more specifically habitat fragmentation) on biodiversity. With a case study of San Francisco, it makes several general policy recommendations for conserving wildlife in an urban setting. It also talks about the popular idea of wildlife corridors. It is an extensively supported work and seems to me to be reliable, for it is presented in a professional journal. It is useful in my research for it

makes recommendations for how the urban planning can shape our interactions with urban wildlife, and how we can best mitigate the loss of biodiversity we are currently experiencing.

Government Documentation

British Columbia. Ministry of Environment. (2014). Develop with care 2014: Environmental guidelines for urban and rural land development in British Columbia. Retrieved from <http://www.env.gov.bc.ca/wld/documents/bmp/devwithcare/#Main>

British Columbia. Ministry of Environment. (n.d.). Legislations and regulations. Retrieved from http://www.env.gov.bc.ca/epd/main/laws_regs.htm

City of Vancouver. (2012). Wildlife. Retrieved from <http://vancouver.ca/parks-recreation-culture/wildlife.aspx>

City of Vancouver. (2013). City of Vancouver regional context statement official development plan. Retrieved

from <http://former.vancouver.ca/commsvcs/BYLAWS/odp/rcs.pdf> City of Vancouver. (2015). Greenest city action plan. Retrieved from <http://vancouver.ca/files/cov/Greenest-city-action-plan.pdf>

This reference is important in seeing the focus of our future plan, as explained in an extensive “pdf” file, for the year 2020. In becoming one of the greenest cities, planting trees and adding more “green” urban areas (parks, greenways), Vancouver is to become one of the most environmentally friendly cities and reduce its ecological footprint significantly. This has implications for urban wildlife; however, the plan did not go into detail about ecosystems or endangered species. The Metro Vancouver source is a better one for more factual numbers; however, this one is important to look at for this is also a city website, and this is an official plan. Perhaps it is just less detailed, or perhaps there is another reason for the lack of urban biodiversity goals.

City of Vancouver. (2015). Land use and development policies and guidelines. Retrieved from <http://vancouver.ca/home-property-development/land-use-and-development-policies-and-guidelines.aspx>

City of Vancouver. (2010). Metro Vancouver 2040: Shaping Our Future. Retrieved from <http://www.metrovancouver.org/services/regional-planning/PlanningPublications/RGSAdoptedbyGVRDBoard.pdf>

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Environment Canada. (2014). Compliance and enforcement policy for wildlife legislation. Retrieved from <https://www.ec.gc.ca/alef-ewe/default.asp?lang=En&n=39897788-1>

Government of British Columbia. (1953). Vancouver charter. Retrieved from http://www.bclaws.ca/Recon/document/ID/freeside/vanch_00

Government of British Columbia. (1982). Wildlife act: Wildlife act general regulation. Retrieved

from http://www.bclaws.ca/EPLibraries/bclaws_new/document/ID/freeside/26_340_82

Government of British Columbia. Ministry of Environment. (2010). British Columbia urban ungulate conflict analysis: Summary report for municipalities. Retrieved

from http://www.env.gov.bc.ca/cos/info/wildlife_human_interaction/UrbanUngulatesSummaryReportFINALJune21-2010.pdf

Government of British Columbia. Ministry of Forests, Lands and Natural Resource Operations. (n.d.). Wildlife in B.C. Retrieved from <http://www.env.gov.bc.ca/fw/wildlife/>

Government of Canada Justice Laws Website. (2015). Wildlife area regulations. Retrieved from http://laws-lois.justice.gc.ca/eng/regulations/C.R.C.,_c._1609/index.html Government of Canada.

Natural Resources Canada. (2015). Sustainable forest management in Canada. Retrieved from <http://www.nrcan.gc.ca/forests/canada/sustainable-forest-management/13183>

Metro Vancouver. Greater Vancouver Regional District Board. (2011). Regional growth strategy:

Metro Vancouver 2040, shaping our future. Retrieved from <http://www.metrovancouver.org/services/regional-planning/PlanningPublications/RGSAdoptedbyGVRDBoard.pdf>

Metro Vancouver. (2015). Regional planning. Retrieved from <http://www.metrovancouver.org/services/regional-planning/conserving-connecting/Pages/default.aspx>

This website is a fantastic source with a wide variety of information very useful to me. It is not peer-reviewed; however, it is the website of the former Greater Vancouver Regional District, now called Metro Vancouver, which is a reliable source. This website has graphs, data, writing, and informative links on a wide range of topics. Under the regional planning umbrella are the plans for conserving and connecting natural areas, regional planning maps, and regional data and statistics. In here information can be found on drivers behind and the plans for regional growth. Additionally, the plans they have for conserving natural spaces for animals to thrive can also be found.

Popular Media:

Hume, S. (2013, June 8). Urban wildlife: Many in B.C. find animals in the backyard a curse. The Vancouver Sun. Retrieved

from http://www.vancouversun.com/technology/Urban+wildlife+Many+find+animals+backyard+curse/8496916/story.html?_lsa=8e9a-a379

In this article Hume argues that “the general — and justifiable — standard is that when a top-of-the-food-chain predator shows no fear of humans, it has to be killed before it starts preying on us” (Hume, 2013). This leads to the shooting of cougars and other threatening species, even though attacks are so rare. It has been shown that coyotes actually don't kill as many cats and dogs as previously thought, and that they are actually helping us by removing pests such as rats. He then goes on to state: “The migration of wildlife from backcountry to downtown is a continental phenomenon, one of the fascinating developments of the 21st century. Scientists call it ‘synurbization.’ It refers to a growing recognition that cities themselves represent a new evolutionary trend, what one researcher has described as an explosion of new and strange types of artificial environments in the natural landscape to which wildlife adapted over millions of years” (Hume, 2013). Animals are moving into places that humans think belong to them and we are taking issue with that. While this is only a newspaper article and not a well supported journal article, Hume brings up some valid points that are important to consider when thinking about our broader issue.

Kesler, Z. (2014, April 25). Zee Kesler: Why the city of Vancouver should legalize tiny houses. The Georgia Straight. Retrieved from www.straight.com/news/633681/zee-kesler-why-city-vancouver-should-legalize-tiny-houses

Zee Kesler's newspaper article, “Why the City of Vancouver should legalize tiny houses” explains one solution to increasing human populations and the encroachment upon wildlife territories. But it also offers a competing view of homeowners and neighbourhood activist organizations that dislike high-rise buildings that destroy oceanfront views or mountain views (paragraph 18). The activists claim that these towers “undermine affordability, block

public views and ignore the Community Plan” (paragraph 18). The City of Vancouver proposed a different solution because of these potential problems in the form of laneway houses, but they are still largely unaffordable. It explains that tiny houses would be more sustainable, but are not currently legal. Newspaper articles in general, including this one, are not always as reliable sources as scholarly peer-reviewed articles because they include opinions of the authors. But this one provides information on different stakeholders like those opposing higher density buildings. It is significant because it includes new concepts and systems of development and though it is a newspaper article provides a few references. It also provides evidence of data collecting methods. These include quotes from organizations: “Researcher Rose Quint of National Association of Home Builders claims homeowners are downsizing because they “are responding to Americans’ concerns over high energy costs and the realization that smaller homes cost less to operate” (paragraph 11). Kesler’s article is useful to my research, as it gives examples of basic resolutions to the Wicked Problem. In addition it gives a basic explanation of another stakeholder, the current homeowners and neighbourhood preservation organizations. However, this seemingly easy solution is more difficult because of stakeholders that possess opposing views.

McDonald, L. (2013). Crimes against ecology: Is the Harper government guilty? You be the judge. Alternatives Journal. Retrieved from <http://www.alternativesjournal.ca/policy-and-politics/crimes-against-ecology>

Grey Literature

BC SPCA. (2013). Urban wildlife. Retrieved from <http://www.sPCA.bc.ca/welfare/wildlife/urban-wildlife/squirrels.html>

Feinberg D. and Hostetler, M. Conserving urban wildlife in the face of climate change. Retrieved from the IFAS Extension: University of Florida website: www.edis.ifas.ufl.edu/pdffiles/UW/UW38100.pdf

In Feinberg and Hostetler’s article “Conserving Urban Wildlife in the Face of Climate Change” there is a discussion on how humans and increasing populations are contributing to climate change, which in turn reduces territory of wild animals. These animals are then forced to move into urban areas. Climate change is reducing coastal territory specifically for wildlife as ocean levels are rising (p. 2). It provides some advice for how to mitigate the impacts on urban wildlife. They suggest directly protecting habitat and reducing carbon emissions. This reference is relevant to this topic in regards to urban wildlife and humans as stakeholders and how the human population has an interest of expanding their territory and using energy. This competes with wildlife interests of keeping their territories where they would prefer to live. It is a reliable resource based on information from scientific publications and other online resources. It is written in association with the University of Florida. It is not challenging to read, though there are some scientific processes described. It is coming from the perspective of someone who believes that there are some wrongdoings to wildlife. This article does not necessarily provide leading-edge information, but provides an addition for research on the competing interests of human and wildlife populations. A positive aspect of it is that it lists potential starting solutions for this mega problem.

Historica Canada. (2015). Environmental Governance. Retrieved from <http://www.thecanadianencyclopedia.ca/en/article/environmental-governance/>

Stanley Park Ecology Society. (n.d.). Co-existing with coyotes. Retrieved from <http://stanleyparkecology.ca/conservation/co-existing-with-coyotes/>

This website (which was previously discussed in the Boelens article cited above) provides useful information to Vancouverites on how to co-exist with coyotes. They provide links to information such as pet safety, school programs, community outreach programs, sightings maps, and more. It is clear that coyotes are a very prevalent issue throughout the lower mainland. This website is useful because it provides information that is available to everyone. Since it is not a peer reviewed journal article anyone can view it to quickly and easily get the information they need on how to properly deal with coyotes. While the article may not be as reliable as one that contains research, it is very informative and can assist the general public with their inquiries.

Stanley Park Ecology Society. (n.d.). Urban wildlife. Retrieved from <http://stanleyparkecology.ca/conservation/urban-wildlife/>

The IUCN Red List. (2015). The IUCN red list of threatened species. Retrieved from <http://www.iucnredlist.org/search>.

This is an international organization that provides a database for threatened species across the globe. I have been introduced to this in my conservation courses and therefore trust it as a reliable source. It is a good source for it is unbiased politically, and it is very extensive. It is also especially useful for I can even refine my search based on the reasons for threatening, for example : residential development. I wish to have the raw data that there are many species at risk in Vancouver and British Columbia as a result of human activity.

Data Sources

Government of Canada. (2005). Recent immigrants in metropolitan areas: Canada – A comparative profile based on the 2001 census. Retrieved from www.cic.gc.ca/english/resources/research/census2001/canada/partg.asp

This Canadian government statistical data reference, “Recent Immigrants in Metropolitan Areas: Canada – A Comparative Profile Based on the 2001 Census”, compares different regions of Canada and the immigrant situations concerning them. It determined that immigrants move to larger cities and that “more than 60% of immigrants and 70% of recent immigrants live in Canada’s three largest cities – Toronto, Montreal and Vancouver” (paragraph 2). These data sets are relevant to this topic because it outlines that great numbers of immigrants are moving to cities like Vancouver and some of the reasons why. It is reliable as it is based on censuses and produced by Statistics Canada. It is also produced through records at Citizenship and Immigration Canada. It explains that immigration rates to Vancouver are increasing. Areas other than Toronto, Montreal and Vancouver do not provide as many opportunities for new immigrants. A point made is that “in Toronto and Vancouver, recent immigrants make up more than one-fifth of the population (23% and 21%, respectively)” (paragraph 5). Immigrants entering into the economic category are more numerous than those entering into the family class. They are also more likely to have university degrees than those who are Canadian-born. Recent immigrants have a lower labour force participation rate than Canadian-born in Vancouver. This point demonstrates greatly why immigrants might move to Vancouver: “Average income is higher in the cities than in the rest of Canada, and it is generally highest in the largest cities, except for Montreal” (paragraph 27).

Statistics Canada. (2011). Human activity and the environment: Detailed statistics. Retrieved from <http://www.statcan.gc.ca/pub/16-201-s/16-201-s2011001-eng.pdf>

This Statistics Canada database, “Human Activity and the Environment: Detailed Statistics” contributes more to an understanding of wild animals as stakeholders and the extent of their involvement in the issue. It shows the variety of wildlife that are affected and outlines

Canada's wildlife status as a population, extinct species and ones at risk. It also lists extirpated species and probable causes (p. 27). There are a number of charts listing specific species and their status on the extinction scale. There are a variety of levels to this, ranging from extinct to exotic. Different groups of species are included such as vertebrates, vascular plants and invertebrates (p. 58). There are species listed for different years. These increase by five year increments and the number at risk has doubled in ten years. A separate chart lists wildlife species that are legally protected with categories like endangered and threatened with a total of 220 species endangered (p. 61). This database is relevant to consider the extent which humans have already endangered wildlife and how these species are important stakeholders. It is a dependable resource written by Statistics Canada.

Multimedia

Google. (2015). Map Data: Google. [Google Maps]. Retrieved from <https://www.google.ca/maps/place/Ballantree+Park,+West+Vancouver,+BC+V7S/@49.3624458,-123.1464235,2172m/data=!3m1!1e3!4m2!3m1!1s0x54866faf67326a85:0xb17580abdefeaac5>

Google. (2015). Map Data: Google. [Google Maps]. Retrieved from <https://www.google.ca/maps/place/Ubc+Endowment+Lands+Ecological+Reserve/@49.2444332,-123.2231584,2249m/data=!3m1!1e3!4m3!3m2!1s0x5486732f16c5c8b9:0x246220312098b840!4b1>

Hamilton, D. (2010). Deer in the Headlights [Photograph]. Retrieved from <https://www.flickr.com/photos/orcmid/4962726960>

Stanley Park Ecology Society. (n.d.). Coyote Sightings Map. [Map]. Retrieved from <http://stanleyparkecology.ca/conservation/co-existing-with-coyotes/coyote-sightings-map/?month=2015-09-01> The Stanley park ecological society has a feature on its website that allows you to view where coyotes have been spotted and whether they have attacked a pet or human, or are injured or dead. The information is not the most accurate because it is based solely on information from citizens of Vancouver; however, it is a good base map on where you can find coyotes in Vancouver. The map would be more helpful if you could view multiple months at the same time, you are currently only able to view one month at a time which really cuts down on the overall trend of the location of the coyotes. (See image below).

Coyote Sightings Map

Co-Existing with Coyotes relies on reports from people like you to help us keep track of coyote activity in Vancouver. Each paw print represents a single [coyote report](#) made to our info-line. Click on paw prints to find more information including the date, time of day (in 24 hour clock) and basic details of the report. The map is updated with the help of volunteers at the end of each week. Review past month's sightings by clicking the links above the map.

To report a sighting please use our [online report form](#) or call 604-681-WILD (9453). All reports are kept anonymous, your name and address will not appear on the map.

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Wikipedia. (n.d.). Urban Wildlife Picture. [Photograph]. Retrieved from: https://en.wikipedia.org/wiki/Urban_wildlife

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