

# **Bird Aware Cat Care: Youth Citizen Scientists Protect Birds and Keep Cats Safe in B.C.**

## **Report – March 2018**

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## Executive Summary

Free-roaming cats present a significant predation pressure for local bird populations (Blancher 2013). However, free-roaming pet cats also face numerous threats by being outdoors. There is a strong cultural resistance to limiting cat access to outdoors, and we felt that a positive approach, working at the youth and family scale, was a good strategy for long-term success. This two-year Habitat Stewardship Program (HSP) project worked at the youth and family scale in 35 communities across BC to reduce predation on birds while keeping cats safe via public awareness and the provision of positive alternatives. The two main methods that we employed in this project included: 1) a public awareness campaign, including educational outreach and online surveys, and 2) an experiment aimed at testing the effectiveness of three bird-catching deterrents.

Over the two-year period of the project, we used online surveys to gauge the public's awareness, attitudes, and perceptions regarding the impact of cat predation on birds and other wildlife. We used a "pre-survey" to gather data prior to the initiation of our outreach and public education campaign, and a "mid-" and "post-survey" to evaluate the progress and success of the project. In total, we received 167 responses to our online surveys—81 "pre-survey" responses, 56 "mid-survey", and 30 "post-survey". In addition, NatureKids members, as well as Guides, Scouts, and students were asked if they wanted to volunteer to be Junior Scientists and participate in our bird-catching deterrent experiment. In Year 1, we only included youth that owned cats, but in Year 2 we allowed all youth (cat owners and non-cat owners) to participate. The experiment included three components: 1) control data on "normal" cat behaviour (collected for pet cats as well as neighbourhood cats), 2) treatment data of cat behaviour while utilizing one of three bird-catching deterrents (for cat owners only), and 3) bird observation data. The three experimental bird-catching deterrent treatments that were randomly assigned and tested included: 1) use of a brightly coloured collar (from BirdsBeSafe collar - <http://www.birdsbesafe.com/>), 2) use of a collar bib (from CatBib - <https://catgoods.com/order-catbib/>), or 3) attempting to walk cats on a harness and leash versus free roaming. Training materials were developed and sent to the volunteers (e.g., training video, instructions, etc.) and the youth citizen scientists were asked to record data about birds and cats (e.g., their own cat or neighbourhood cats). The youth were asked to record their experiment via datasheets provided to them, and via photos and videos where possible. Lastly, once the Year 1 volunteers had completed their experiment, they were asked to complete a project evaluation to provide feedback for improvements to Year 2.

Based on our pre-survey, which had the largest sample size, 35% of our respondents owned at least 1 cat at the time of the survey, which was only slightly lower than that reported for Canadian households in general (37%). Approximately 82% of those cats went outside, with 78% had largely unlimited access to roam freely outdoors. These values were similar for the mid-survey respondents, the majority of which allowed their cat to go outdoors because they felt that their cat was happier and healthier when it roamed freely outdoors, and that their cat helped with rodent control. The majority of cat owners claimed that they had seen their cat chase birds but few had seen their cat catch a bird and / or bring dead or injured birds home. Those respondents who had never owned a cat before tended to think that it was easier to keep a cat indoors, compared to respondents who had owned a cat. In terms of the post-survey respondents that had participated in the project experiment and had cats at the time of the survey (i.e., were the most engaged in the project and overall educational campaign), the majority said that they had not reduced the amount of time that their cat spends outdoors and that they did not support municipal bylaws or policies that limit free-roaming cats despite the fact that they said that their knowledge regarding the effects of cats on birds had changed. The majority said that they were currently using an anti-predator device. In comparison, when all 27 post-survey respondents were

considered (including non-cat owners), approximately half (52%) of respondents were somewhat to very supportive of bylaws or policy changes that limit cats access to the outdoors.

When comparing the results of our online surveys across the three survey periods, a total of 14% of the mid-survey respondents knew that 200 million birds are killed by free-roaming cats each year in Canada compared to only 2.5% of the pre-survey respondents (i.e., prior to the education campaign). We saw little to no change in the amount of time that cats spend outdoors across the three survey periods. However, a higher percentage of mid-project survey respondents had tried some sort of technique or device to deter cat predation on birds, as well as a wider variety of techniques or devices, compared to the pre-project survey. As well, the proportion of survey respondents that said that their cat “Never” chases or kills birds increased during the mid- and post-survey compared to the pre-survey period.

In total, 53 youth from across BC volunteered to be Junior Scientists in our bird-catching deterrent experiment. In total, 10 of the 34 youth volunteers that owned cats were able to complete the full experiment. The main causes of non-completion included cat deaths, evacuations due to wild fires, limited time, and equipment issues, the latter of which provided valuable insights into potential barriers to use. Although 8 of our 10 experiment volunteers who completed the project saw their cats chasing or catching a bird during the limited experiment period, 4 volunteers witnessed their cat killing a bird, and none of the cats caught birds during the treatment period of the experiment, a large proportion of volunteers said that they were not willing to think about or change the way that they manage their cat’s outdoor time or continue to use the free equipment that we had provided them with. The ease with which cats and owners adjusted to the equipment was highly variable and we learned that many cats do not wear or tolerate collars, which was required for two of the three treatment options. Also, some volunteers were concerned about the safety of their cat while using the CatBib, and were not willing to try it or continue to use it. These results reinforce the challenges faced by those attempting to change attitudes and human behaviour.

As a result of our survey and project experiment, we have provided some recommendations to help change attitudes and behaviour, and to protect wild birds. We found a wide range of cat behaviours in terms of outdoor activity and bird predation that likely results from some biases in human observation but also the expected natural differences in animal behaviour that occur within a population. Some cats are more likely to chase and catch birds than others. As a result, we suggest targeting education campaigns at those cat owners whose cats likely contribute most to bird predation versus all cat owners in general. This may garner greater support from within the cat owner population. To alleviate the challenges associated with a new behaviour for both the cat owner and the pet itself, we suggest that education campaigns encourage cat owners to initiate any bird-deterrent techniques, such as enclosures, collar use, and harness and leash walking, early on in the cat’s life (e.g., as kittens). Lastly, we believe that the cultural hypocrisy that allows pet dogs and cats to be treated differently needs to be addressed via the use of municipal by-laws in order to begin to erode the irresponsible pet ownership that goes hand-in-hand with free-roaming pet cats.

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## 1.0 Introduction

Free-roaming cats present a significant predation pressure for local bird populations. It is estimated that cats kill 200 million birds across Canada each year (Blancher 2013). However, free-roaming pet cats also face numerous threats (e.g., disease, vehicle collisions, fights with wildlife) by being outdoors, experiencing significantly shorter lives compared to their indoor counterparts. Thus both cats and birds derive benefit from cat owners taking a more cat-safe approach to pet ownership. However, increasing the percentage of indoor cats is not simple and requires a multi-pronged approach.

Many cat owners have strongly held views about their pet having access to the outdoors. Municipalities that have tried to implement indoor cat or leash bylaws have faced significant resistance. Opinions that cats should have access to the outdoors and be permitted to exercise their “natural” hunting behaviour remain entrenched. In addition, some cats do not adjust well to life indoors. Given the strong cultural resistance to limiting cat access to outdoors, we felt that a positive approach, working at the youth and family scale, is a good strategy for long-term success.

There are a variety of measures that can be taken to conserve birds and improve cat safety, and the level of effort can be catered to meet the owner’s needs and values. For example, on the low end of the spectrum, in terms of cat and bird safety, owners can fit cats with various types of collars that reduce their bird predation success. Mid range along the scale are various types of cat enclosures and leash training. On the high safety end for both cats and birds, owners can choose to keep cats indoors. Our approach was to engage families and youth in testing and talking about these strategies to enhance awareness and support.

## 1.2 Objectives

This project addressed two main HSP objectives:

### *1. Support habitat projects that benefit species of interest beyond those listed under the Species at Risk Act:*

Rural and urban areas pose a major threat to bird species through loss and degradation of habitat, non-native species issues (predation, disease), and collisions (vehicles, windows, etc.). Increased awareness of bird conservation issues and potential mitigation measures among the public living in rural and urban areas can lead to changes that make these expansive environments, which are often geographically situated along critical migration flyways, safer for birds and lead to increased populations. The focus of this project was on ground and shrub nesting and foraging birds that are susceptible to cats in rural and urban areas.

### *2. Enable Canadians to become actively and concretely involved in stewardship projects that will result in tangible and measurable conservation benefits:*

Youth NatureKids members learned about the impact of cats on birds and were trained to conduct an experiment that tested the efficacy of various tools to reduce cat kills. Members were also involved in a survey to explore attitudes and perceptions about cats and birds.

## **2.0 Methods**

### **2.1 Outreach, Surveys, & Project Evaluation**

In fall 2016 (Year 1) and spring 2017 (Year 2), all NatureKids BC families were sent a link to an online survey that provided us with an understanding of the awareness and attitudes of our members regarding free roaming cats and bird conservation (see Appendix A). In Year 2 we also sent the survey link to Guides, Scouts, and educators (teachers). In Year 2, NatureKids BC used the acquired knowledge and experience from the Year 1 survey and experiment to engage in a public awareness campaign (e.g., via social media) focused on cat and bird safety. As such, these latter two surveys served as a “pre project” and “mid project” assessment regarding our education campaign. At the end of the experiment in Year 2, NatureKids BC members were sent a link to an online “post-project” survey that aimed to evaluate the overall success of our outreach and education campaign. All three surveys contained questions related to cat ownership, the amount of time cats were allowed to spend outdoors, attitudes regarding free roaming cats, cat predation on birds, an assessment of the experiment some members participated in, attitudes towards and use of the anti-predator devices / techniques, etc.

At the end of the experiment in Year 1 volunteer youth citizen scientists were sent a link to fill in an online project evaluation (Appendix B). Volunteers were asked about their experience using the equipment, collecting data, design of the project, potential changes in attitude or behaviour, and recommendations. The results were used to improve upon the project in Year 2.

At the end of the project in Year 2, once all of the surveys, project evaluation, and experiments had been completed, we created an educational video about the issue of free roaming cats and bird predation based on what we had learned: <http://www.naturekidsbc.ca/be-a-naturekid/projects/>.

### **2.3 Training and Experiment**

At the end of the Year 1 and Year 2 pre and mid surveys mentioned in section 2.1, members were asked if they wanted to volunteer to be Junior Citizen Scientists, collecting data on bird and cat behaviour.

Volunteers were sent a link to a training video and randomly assigned to one of three bird-catching deterrent experimental treatments:

- 1) use of a brightly coloured collar (from BirdsBeSafe collar - <http://www.birdsbesafe.com/>)
- 2) use of a collar bib (from CatBib - <https://catgoods.com/order-catbib/>)
- 3) attempting to train their cats to walk on a harness and leash versus free roaming

In Year 2, youth volunteers that did not own a cat were included in the experiment as a means of expanding the educational opportunities. They were asked to collect data in birds, and any neighbourhood cats that may venture onto their property.

An experiment package (see Appendix C) was sent to volunteers that contained:

- Bird Aware Cat Care Factsheet
- Experiment checklist with schedule
- Instruction sheet with:
  - random allocation of treatment and timing of treatment versus control part of the study
  - links to training videos
- Equipment (1 of 3 mentioned above)

- Bird identification materials
- Datasheets (bird data, control cat data, treatment cat data)

The youth were asked to record their experiment via datasheets and visually (i.e., through photos and videos).

### **3.0 Results**

#### **3.1 Outreach, Surveys & Project Evaluation**

##### YEAR 1 – Pre-Project Survey Results

A total of 81 respondents completed the online survey regarding free roaming cats and bird conservation. The full results are presented in Appendix A. A summary of key findings is presented here.

The majority of NatureKids BC respondents did not have a cat at the time of the survey in fall 2016 (n = 53; 65%), while 28 (35%) did (21 respondents had 1 cat, and 7 had 2+ cats).

Of the 28 respondents with cats, the majority were older than 5 years of age (57%), and 82% of them roam freely outdoors for some amount of time. Only 5 of the 28 (18%) respondents had cats that were never allowed to roam freely outdoors. The primary reasons these 5 respondents do not allow their cats to roam freely was a concern for their safety of their pet as well as impacts on birds and other wildlife.

Of the 23 respondents that have free roaming cats, the majority have either unlimited access to roam freely (n = 10; 43%) or they roam freely during the majority of the day (n = 8; 35%). Only 13% of the cats were out for less than one hour per day or only 'occasionally' (Fig. 1).

The majority of survey respondents greatly underestimated the number of birds killed by free roaming cats each year in Canada, with only 2.5% correctly selecting 200 million. When asked "Does your cat chase or catch birds?", 86% of respondents selected 'Never' (19%) to 'Sometimes' (66%). Only 9.6% said 'Often'. Approximately 36% of respondents said that their cat(s) never kills birds. In contrast, 14% of respondents said that their cat(s) kill 3 or more birds on average per week.

When asked "On average, how often does your cat(s) bring home injured or dead birds?", 9 of the 21 respondents (43%) replied 'Never' and 9 (43%) replied 'A few times year'. Only 1 respondent (4.8%) replied 'Daily' (Fig. 2).

When asked if respondents had ever tried any bird catching deterrents on their cats, 8 (36%) claimed that they had not. Half (50%) had tried using a collar with a bell, and 27% had limited the number of hours that their cat spent outdoors. None had tried any of the three treatments NatureKids had employed in their Bird Aware Cat Care experiment, although two claimed to be using bright cat collars similar the BirdsBeSafe models. Two respondents said that they had removed or limited their cat's access to the bird feeder.

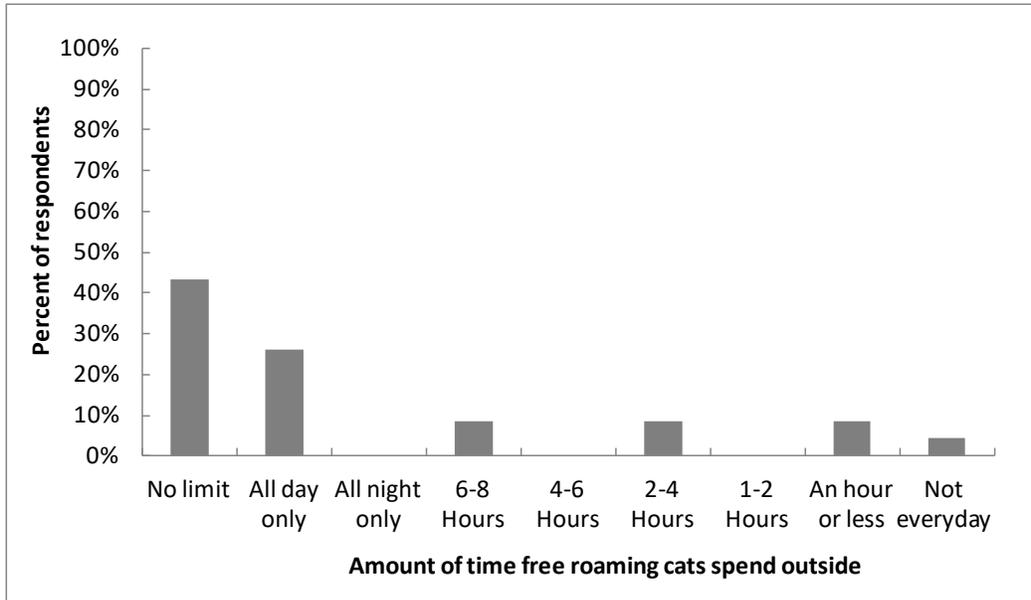


Figure 1. Amount of time free roaming cats are allowed to spend outdoors per day.

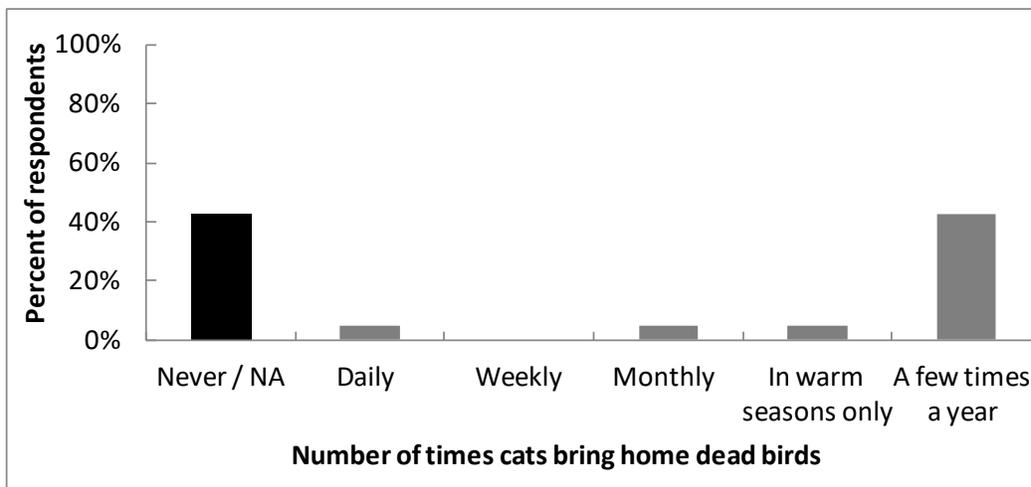


Figure 2. Number of times free roaming pet cats bring home dead birds.

### YEAR 2 – Mid-Project / Education Campaign Survey Results

In total, there were 56 respondents in our mid-project survey, 75% of which (n = 42) were NatureKids members, 5% were Scout or Guide members or leaders, and 7% were teachers or students. Of the 56 respondents, 50% were from the Lower Mainland, 30% from Vancouver Island, and 20% from the interior and north of BC. A total of 14% of respondents knew that 200 million birds are killed by free-roaming cats each year in Canada.

Of the 56 respondents, 62.5% had owned a cat before while 37.5% had never owned a cat. Those who had never owned a cat before tended to think that it was easier to keep a cat indoors, compared to respondents who had owned a cat (Fig. 3).

Of the 56 respondents, 29 had a cat at the time of the survey (52%); 17 (57%) had 1 cat, 7 (24%) had 2 cats, and 5 (17%) had 3 or more cats. Of the 29 respondents with cats, 3 did not answer any further survey questions. Of the 26 respondents with cats that completed the survey, only 3 (12%) do not allow their cat(s) to roam freely outside. The majority of cat owners allow their cats to roam freely outside “often” (77%), 39% of which have “no limit” to the amount of time that their cat spends free-roaming outdoors. Less than a quarter of respondents cats (23%) roam freely “occasionally / not every day” to less than 4 hours per day. When asked why they allow their cat(s) to roam freely outdoors, the majority of cat owners selected the following three options: “our cat(s) is happier when s/he can go outside” (22%), “our cat(s) is healthier because s/he goes outside” (13%), and “cats help with rodent control” (12%).

In terms of bird predation, respondents were asked three different questions pertaining to cats chasing or killing birds. When asked “Does your cat chase or catch birds?”, 30% of respondents answered “Never”. The majority of these latter respondents had older cats (6-11 years old or more than 12 years old; 6 of 7 respondents), while one had a young cat (less than 1 year old). As well, all but one of the latter cats had somewhat limited access to the outdoors (e.g., a few hours a day or only occasionally / not every day). Of the 23 respondents with free-roaming cats, 16 respondents (70%) stated that they have seen their cat(s) “chase or catch birds”, 10 (43%) said that their cat(s) “catch birds” weekly, and 9 (39%) said that their cat(s) have brought injured or dead birds home. This suggests that the majority of cat(s) owners see their cat(s) chase birds but less than half of respondents see them catch birds or have cats that bring dead or injured birds home.

Of the 23 cat owners, 19% (n = 6) had not tried any device or technique to reduce cat predation while 63% (n = 15) said that they had; 2 did not respond. The top three options that respondents had tried were a bell on the collar (35.5% of respondents), keeping their cat’s claws trimmed (16% of respondents), and a reduction in the number of hours that their cat(s) spent outdoors (13% of respondents). Three respondents had tried the three techniques include in NatureKids BACC experiment (i.e., colourful colour, CatBib, and a leash).

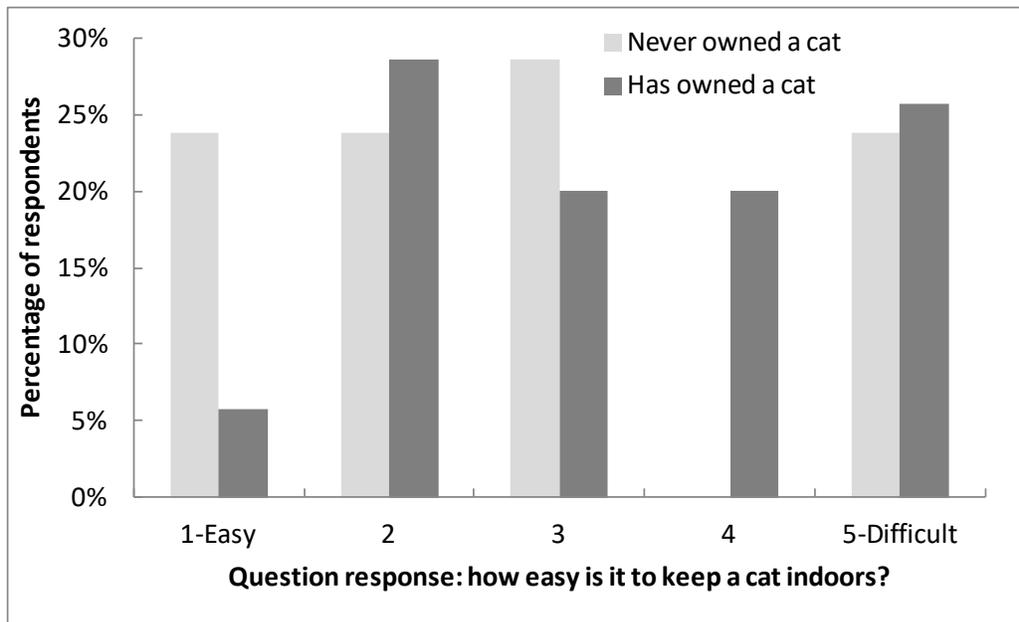


Figure 3. Comparison of survey responses for respondents that own, or have owned, a cat compared to those who had never owned a cat.

#### YEAR 2 – Post-Project / Education Campaign Survey Results

In total, there were 30 post-project / education campaign survey respondents, of which 27 surveys were fully completed. Of the 30 survey respondents, 15 had participated in the pre- and/or mid-project surveys, 13 had volunteered to participate in the experiment, and 10 had cats.

In terms of those respondents that participated in the project experiment and have cats (e.g., were the most engaged in the project and education campaign), the majority (62.5%) said that they have not reduced the amount of time that their cat(s) spend outdoors despite the fact that they say that their knowledge has changed regarding the effects of cats on birds (62.5%; Table 1). However, 62.5% said that they are currently using an anti-predator device. Half of respondents (50%) say that their cats “Never” catch birds, and approximately 62.5% do not support municipal bylaws or policies that limit free-roaming cats. Lastly, 62.5% of respondents said that they are not negatively affected by free-roaming neighbourhood cats.

In comparison, when all 27 survey respondents were considered, approximately half (52%) of respondents were somewhat to very supportive of bylaws or policy changes that limit cats access to the outdoors (Table 2). Of the 27 respondents, 22% said that neighbourhood cats did not affect them in any way (Table 3).

Despite the challenges associated with estimating changes in knowledge and behaviour, we compared our pre-project survey results to our mid- and post-project / education campaign survey results. A total of 14% of mid-survey respondents knew that 200 million birds are killed by free-roaming cats each year in Canada, compared to only 2.5% in the Year 1 pre-survey (i.e., prior to the education campaign). We saw little to no change in the amount of time that cats spend outdoors across our pre-, mid-, and post-project survey responses (Fig. 4). There was a higher proportion of survey respondents that said that their cat “Never” chases or kills birds in the post-project survey, however there was also a higher

proportion of respondents in the post-project survey period that said that their cat “Often” chases or kills birds (Fig. 5). A higher percentage of mid-project survey respondents had tried some sort of technique or device to deter cat predation on birds, as well as a wider variety of techniques or devices, compared to the pre-project survey (Fig. 6).

Table 1. Survey responses of 8 experiment volunteers, reflecting potential changes in attitude and behaviour.

Survey Question	Response	# of respondents	% of respondents
In the last two years, have you reduced the amount of time that your cat(s) spends outdoors unsupervised?	Yes	3	37.5%
	No	5	62.5%
Compared to two years ago, which of the statements is most accurate for you	I am more aware of issues associated with free roaming cats, cat safety, and bird predation	5	62.5%
	My knowledge and awareness around free roaming cats, cat safety, and bird predation has not changed	3	37.5%
Are you currently using a device that restricts your cat’s ability to chase and catch birds (i.e., an anti-predator device)?	Yes	5	62.5%
	No	3	37.5%
Estimate how many birds you think that your cat(s) may catch in an average week, when it is relatively active outdoors?	Catches birds ("once or twice a year"; "1 bird every couple of months"; 2 x "1-2/week"	4	50.0%
	0 (Never)	4	50.0%
How supportive are you for municipal bylaws and policy changes that limit domestic free roaming cats access to the outdoors?	5 (not supportive)	4	50.0%
	4	1	12.5%
	3 (somewhat supportive)	2	25.0%
	2	1	12.5%
	1 (very supportive)	0	0%
Select from the list all the ways that free roaming cats in your neighbourhood may or may not negatively affect you	They chase or catch birds, &/or scare them from feeders/baths	2	25.0%
	They are not negatively affected by them	5	62.5%

Table 2. Number and percentage of 27 post-project survey respondents that support municipal bylaws or policy that limits free-roaming cats.

<b>How supportive are you for municipal bylaws and policy changes that limit domestic free roaming cats access to the outdoors?</b>	<b># of respondents</b>	<b>% of respondents</b>
1. I'm very supportive	7	25.9%
2.	1	3.7%
3. I am somewhat supportive	6	22.2%
4.	2	7.4%
5. I am not supportive of using municipal bylaws	10	37.0%
6. I am not supportive of limiting free roaming cats <i>in any way</i>	1	3.7%
<b>Total</b>	<b>27</b>	<b>100%</b>

Table 3. Number and percentage of 27 post-project survey respondents that are affected by free-roaming neighbourhood cats.

<b>Select from the list all the ways that free roaming cats in your neighbourhood may or may not negatively affect you</b>	<b># of respondents</b>	<b>% of 27 respondents</b>
They use my garden as a litter box	17	63.0%
They chase or catch birds that are in my garden	15	55.6%
They scare birds away from my bird feeder or bird bath	9	33.3%
They go on/under my parked vehicle (dirt issues or safety concerns)	6	22.2%
They get into fights with my cat	6	22.2%
They do not negatively affect me	6	22.2%
<i>Comments re: ways that "free roaming cats in your neighbourhood may or may not negatively affect you"</i>		
<ul style="list-style-type: none"> <li>• Feral colonies are rampant and uncontrolled and are the reason I acquired an abandoned kitten.</li> <li>• In my neighbourhood there are very few free roaming cats.</li> <li>• Feral cats murder millions of wild birds every year</li> <li>• They are a danger to our guinea pigs</li> <li>• I worry for their safety</li> <li>• I like them to visit our yard because they kill the mice and rats</li> </ul>		

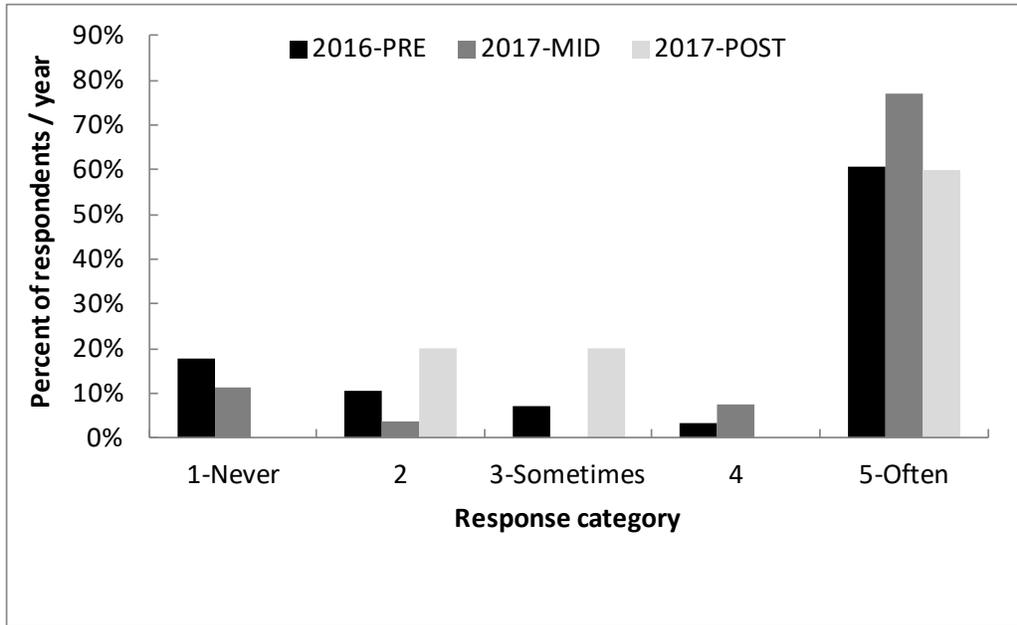


Figure 4. Percentage of pre-, mid- and post-project survey respondents whose cats roam freely outdoors.

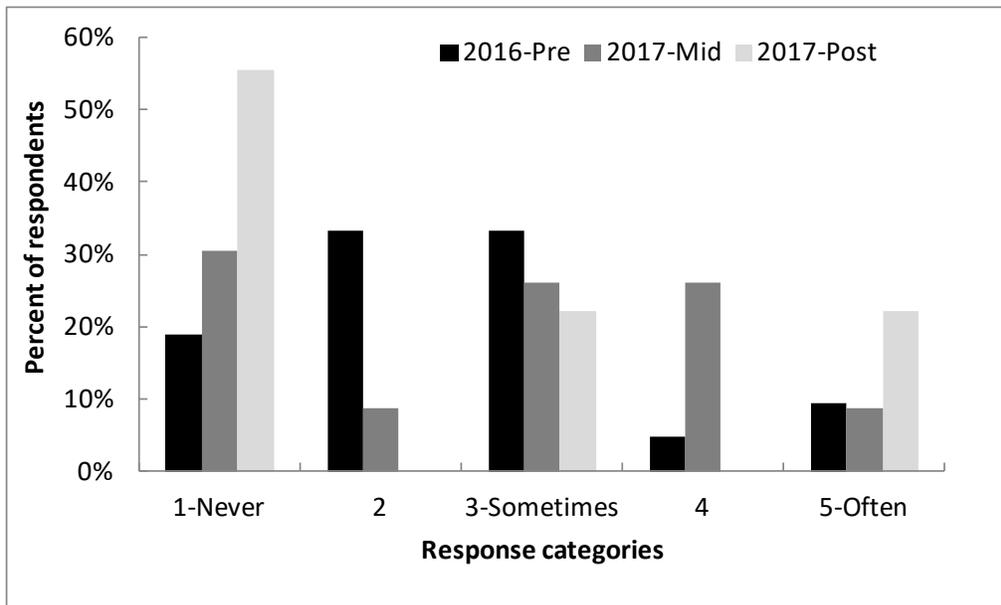


Figure 5. Percentage of pre-, mid- and post-project survey respondents whose cats chase and kill birds.

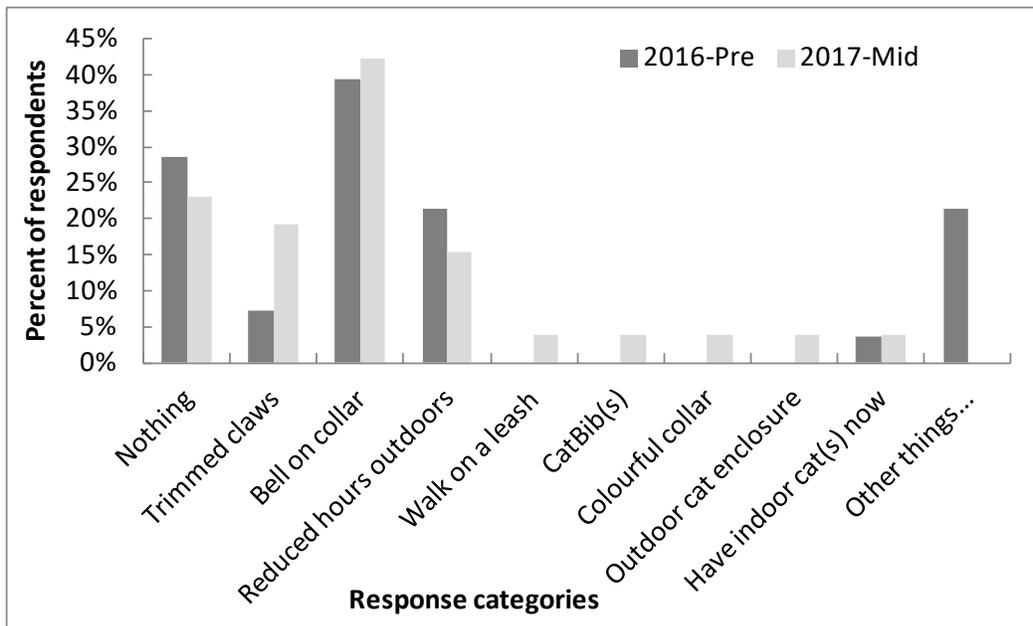


Figure 6. Techniques and devices survey respondents have used to deter cats from chasing and catching birds.

### 3.2 Experiment Results

#### YEAR 1

A total of 13 youth from 9 NatureKids clubs from across BC volunteered to participate in the Bird Aware Cat Care experiment (Table 4). The three treatment types, and the timing of the control versus treatment data collection, were approximately equally distributed among the volunteers.

Of the 13 volunteers, 5 were able to complete the full experiment, 2 collected partial data, and 6 were not able to complete it (Table 1). For those that completed the experiment, all were from the south coast (Lower Mainland and Vancouver Island). Of the 8 that did not fully complete the experiment, 1 was from northern BC, 2 were from the interior, and 5 were from the south coast.

Of the 8 volunteers that did not complete the experiment, 2 families lost their cats during the period of the experiment (i.e., their cats died), 1 had equipment failure (a piece was missing on the harness we sent them, but they did notify us in time to replace it), 2 could not get the equipment onto their cat (cat would not wear a collar), 1 felt that the CatBib was “dangerous” for their cat and 1 said that the bib “stressed” their cat so they did not want to use it, and 1 family was too busy to do the experiment.

In total, 5 volunteer NatureKids families completed data for the full experiment, collecting both control and treatment cat behaviour data and bird observation data (1 volunteer completed bird observation data only). Of those 5, 2 used the BirdsBeSafe colourful collar, 2 the harness and leash, and 1 the CatBib.

All 5 volunteers observed their cat stalking, chasing, or catching birds during the control period of the experiment. One cat was observed ‘catching and killing’ a bird during the study, twice during the control period. The most common cat behaviours observed pertaining to birds was ‘watching’ and ‘stalking’ birds. During the treatment period of the experiment, 2 cats engaged less in the ‘watching’ birds

behaviour compared to the treatment period (suggesting that the treatment was deterring this behaviour) while 1 watched birds more. Relative to the control period, 3 cats ‘stalked’ less during the treatment period while 2 ‘stalked’ more. Two cats ‘chased’ birds during the control period but not during the treatment period.

Table 4. Location within BC of project youth volunteers

Location	Number of volunteers	Number that completed experiment	Treatment Type			Timing of Treatment	
			Colourful Collar	CatBib	Harness & Leash	Control first	Treatment first
Northern BC	1	0	1		1	1	1
Interior BC	2	0		1			1
Lower Mainland / Bowen Island	7	4	1	2	3	4	3
Vancouver Island	3	1	2	2		1	1
<b>Total</b>	<b>13</b>	<b>5</b>	<b>4</b>	<b>5</b>	<b>4</b>	<b>6</b>	<b>7</b>

*Summary of results per volunteer family:*

**Charley** (8 years old; East Vancouver; Fig. 7) – cat’s name = Love; 3.5 yrs old; # hrs cat spends outside per day = 7

- Control period (2 weeks) - Love watched birds every day but one, and watched, stalked something and chased a bird(s) on 1 occasion each
- Treatment period (2 weeks; CatBib) - Love watched birds every day but 2, and made no attempts to stalk something or chase a bird
- Bird Observations (4- week period) - Charley has a bird feeder in her yard and observed 1 to 5 species of birds in her yard every day (e.g., Chickadee, Anna’s Hummingbird, Downy Woodpecker, Northern Flicker, Crow, Song Sparrow, Dark-eyed Junco, Bushtit); she did not find any dead birds in her yard over the 4 week observation period



Figure 7. Charley, her cat “Love” wearing the CatBib, and some examples of the birds she observed at her feeders.

**Oscar and Robin** (11 and 9 years old; Burnaby; Fig. 8) – cat’s name = Royce; 3 yrs old; # hrs cat spends outside per day = 7

- Control period (2 weeks) - Royce stalked something on 3 occasions, watched a bird(s) on 2 occasions, and held / killed / ate a bird on 2 occasions
- Treatment period (2 weeks; Harness and Leash) – in most cases they were able to get the harness and leash on in under one minute, but they were able to get Royce to go outside with the harness and leash on 3 out of 12 occasions. As well, he usually only travelled a few metres over the 10 minute period. However, Royce stalked something on 2 of the 3 occasions when he went outside but no birds were captured or killed
- Bird Observations (4- week period) - Oscar and Robin observed 5 different species of birds in their yard over the course of the bird observation period, but no more than 1 species was observed during any period and no birds were observed during approximately 50% of the time
- Comments:
  - “In general, we found that when we put the leash on Royce, for the most part he just sat there and didn’t do anything.”; “Walks better if you are not holding the leash”
  - “During the control period, on 2 occasions we saw him with a dead bird and on another occasion we saw him with a dead rat (I don’t feel so bad about the rat being caught). “
  - “Thanks for running such a great experiment - I loved that my kids learned about how a real experiment was done (with a control and a treatment side), and it definitely increased our awareness of the local impact outdoor cats make. The harness didn’t work for us...It was not difficult to get our cat into the harness and leash, but once wearing it our cat did not act naturally and was very inactive. We bought the bib because we thought it would be a better solution for us, and it has proved to be so... Our cat now has normal activity, but is hampered by the bib when it comes to chasing and catching birds...it has helped prevent bird deaths but not affected our cat catching mice, so we are pleased with that. ”

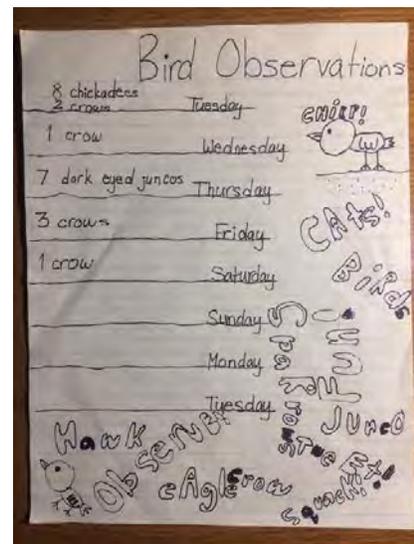


Figure 8. Oscar and his cat Royce wearing the harness and leash, Robin recording data, and examples of the birds they observed in their yard.

**Molly, Maggie, and Jack** – (Cobble Hill) cat's name = Kittie; 9 yrs old; # hrs cat spends outside per day = 10

- Control period (2 weeks) - On only 1 of 13 occasions when Kittie was outdoors s/he stalked something
- Treatment period (2 weeks; Colourful Collar) – On none of the 14 occasions when Kittie was watched outdoors wearing his/her colourful collar, did s/he watch, stalk, chase, or hold/kill any bird(s)
- Bird Observations (4- week period) - Molly, Maggie, and Jack observed at least 12 different species of birds in their yard over the course of the bird observation period, with up to 3 species observed at once (e.g., Northern Flicker, crow, hawk, Junco, robin, hummingbird, wren, Towhee, Nuthatch, Chickadee, raven, sparrow)
- *Comments:*
  - “Today is day 2 of the cat wearing the bright collar. The cat is able to get the collar off within minutes - the collar is a breakaway collar (with the bright cat collar cover). The collar breaks away too easily (I am sure for safety reasons)”

**Sophia and Rachael** (12 and 8 years of age; Vancouver) – cat's name = Rica; 7 yrs old; # hrs cat spends outside per day = less than full day

- Control period (2 weeks) - On 2 of 14 occasions Rica stalked something when outside
- Treatment period (2 weeks; Colourful Collar) – On 5 of the 14 occasions Rica stalked something when outside
- Bird Observations (4- week period) - Sophia and Rachael observed at least 5 different species of birds in their yard over the course of the bird observation period, with up to 3 species observed at once (e.g., hummingbird, chickadee, Junco, finches, robin)
- *Comments:*
  - “Rica is sporting her "collar of mortification" and will hardly leave the deck - Good news for the birds though!”
  - “The colourful collar was a discussion piece! Many people made fun of the cat (including Daddy) and thought she was too embarrassed to go out in it. Really, she just prefers to be inside. Surprised that Dad was so opposed to collar on cat because he thought it made her look silly! Kids thought she looked festive!”
  - “We have mostly finished, but kitty has been refusing to go outside with all the rain so we think our data may be skewed.”
  - “Often have neighbourhood cats in our yard (1-2 times / week). No neighbourhood cats have “bird protection” collars. Likely influenced the number of birds seen.”
  - “Repeat in spring when there are more birds about. We continue to use the colourful collar on cat when she goes outside (which is infrequently). I am not sure that our cat is a "prolific birder" (i.e. has only caught 2 birds in the past year that we know about) so this likely may have skewed results with respect to effectiveness of the collar.”
  - “Fun as a parent to participate in this experiment with the kids.”
  - “Perhaps bird safety / colourful collar etc. are ideas that can be promoted at cat adoption agencies (SPCA etc.) and / or through vet clinic promotion?”

**Charlotte Patenaude** (7 years of age; Langley) – cat’s name = Beowulf; 1 yr old; # hrs cat spends outside per day = 8

- Control period (2 weeks) – 5 stalking, 1 chase, 1 watching birds, and 4 occasions where Beowulf was watching or chased a small mammal (mouse or vole)
- Treatment period (2 weeks; Harness and Leash) – Charlotte was able to get the harness on Beowulf each time, and it generally got easier over time and took less than 5 minutes. On 4 occasions Beowulf laid down after the harness was put on, 4 times he struggled or ran, and 3 times he walked. On those occasions when Beowulf did not lay down, Charlotte was able to walk him for 5-10 minutes for 5-100 m. While on harness and leash, Beowulf stalked birds on 6 occasions and watched them on 4.
- Bird Observations (4- week period) – Charlotte saw at least 15 species of birds, but did not find any dead birds in her yard over the 4-week period (e.g., mallards, crows, Canada Goose, Bald Eagle, hummingbird, Stellars Jay, Dark-eyed Junco, House Sparrow, Northern Flicker, Starling, Red-tailed Hawk, Towhee, Sapsucker, Varied Thrush, heron).
- *Comments:*
  - “Our cat never became a fan of the harness/leash. While it did become easier to put on him, he didn't like walking on the leash and would just run sporadically, causing the leash to go taught and yank him on his neck when he tried to run away.”
  - “I wouldn't recommend the harness and leash but would be interested in trying the cat collar and/or bib.”

## YEAR 2

A total of 40 youth from across BC volunteered to participate in the BACC experiment with NatureKids BC in Year 2 of the project (Table 5). Of these, 30 were from NatureKids BC members, 2 were from Scouts or Guides, 4 had heard through school / teacher, 2 from a friend, 1 from Facebook, and 1 that did not indicate the source of information. Of the 40 volunteers, 21 had cats while 19 did not. Of the 40 initial volunteers, 25 (62.5%) did not respond to our email reminders (e.g., to start their experiment), enquiries about whether they had received their experiment package or how their experiment was going, or requests for their data at the end of the experiment.

The three treatment types were equally distributed across the 21 volunteers: 7 volunteers received the colourful collar (1 of which could not finish); 7 volunteers received the CatBib (1 of which could not finish); 7 volunteers received the harness and leash (1 of which could not finish).

Of the 21 volunteers with cats, 3 let us know that they could not finish the experiment for various reasons (e.g., their cat died; evacuated due to the wild fires; too busy). Of the 9 volunteers that did finish the experiment, 5 had cats (2 colourful collar, 2 CatBib, 1 harness and leash) and 4 did not. Of the 5 volunteer cat owners that submitted data, 3 saw their cat chase or kill a bird, and 1 saw their cat stalk birds during the control period. Only 1 cat did not watch, stalk, chase or catch birds.

Table 5. Location within BC of project youth volunteers

Location	Total Number of volunteers		Number that completed the experiment		Treatment Type			Timing of Treatment	
	Non cat owner	Cat owner	Non cat owner	Cat owner	Colourful Collar	CatBib	Harness & Leash	Control first	Treatment first
Northern BC	2	1	0	0	0	1	0	1	0
Interior BC	3	4	1	1	1	1	2	3	1
Lower Mainland	11	6	2	2	3	1	2	4	2
Vancouver Island	3	10	1	2	3	4	3	3	7
<b>Sub-total</b>	<b>19</b>	<b>21</b>	<b>4</b>	<b>5</b>	<b>7</b>	<b>7</b>	<b>7</b>	<b>11</b>	<b>10</b>
<b>Total</b>	<b>40</b>		<b>9</b>		<b>21</b>			<b>21</b>	

## Data Results

### Cat Owners:

**Cyrus** - (Chilliwack) cat's name = Storm; 2 years old; # hrs cat spends outside per day = 7

- Control period (10 observations) - On 4 of 10 occasions when Storm was outdoors she stalked birds. She also stalked squirrels and insects.
- Treatment period (7 observations; Catbib) – On none of the 7 occasions when Storm was watched outdoors wearing her Catbib, did she watch, stalk, chase, or hold/kill any bird(s).
- Bird Observations (23 observations) - Cyrus observed 7 different species of birds in her yard over the course of the bird observation period, with up to 3 species observed at once (e.g., crow, Junco, hummingbird, Pine Siskin, chickadee, Stellar's Jay)
- Comments:
  - During the Control period: "We took her inside on days when there were flocks of little birds feeding in our trees, as otherwise she would have been stalking them"

**Olive** - (Comox) cat's name = Leafy; 1 year old; # hrs cat spends outside per day = 22

- Control period (9 observations) - On 1 of 9 occasions when Leafy was outdoors s/he stalked something. She also chased a shrew on 1 occasion.
- Treatment period (11 observations; Colourful Collar) – On 2 occasions when Leafy was outdoors s/he stalked something, twice s/he watched something, and one time s/he was observed "holding / killing / eating a bird". Olive has only ever found one dead bird in her yard.
- Bird Observations (20 observations) - Olive observed 9 different species of birds in her yard over the course of the bird observation period, with up to 4 species observed at once (e.g., Spotted Towhee, European Starling, American Robin, Rufous Hummingbird, Swainson's Thrush, sparrow, 3 unknown species). Olive has a feeder in her yard.
- Comments:
  - Leafy (a semi-feral cat) slipped out of the collar after 6 days of treatment data collection, but Olive and her mom were interested in continuing to try using the collar so they ordered one in order to complete the study and for future use.

**Stella** - (Nelson) cat's name = Jerry; 6 years old; # hrs cat spends outside per day = 6

- Control period (10 observations) - On 4 of 10 occasions when Jerry was outdoors he watched birds. He also stalked something on 5 occasions. On 5 occasions he chased a mouse or bunny. On one occasion he brought a bird indoors that had hit the window.
- Treatment period (10 observations; Harness and Leash) – Stella was able to get the harness and leash onto Jerry every time they wanted to walk him outdoors. On none of the 10 occasions when Jerry was walked outdoors wearing his leash, did he watch, stalk, chase, or hold/kill any bird(s). However, he would simply sit or lay down when outdoors on the leash, so that he was not walked very far.
- Bird Observations (12 observations) - Stella observed 7 different species of birds in her yard over the course of the bird observation period, with 7 species observed at once (e.g., Common Raven, American Robin, Stellar's Jay, Downy Woodpecker, Mountain Chickadee, Pine Siskin, Black-capped Chickadee). Stella's family does not have a bird feeder in the yard.

**Navi** - (Courtenay) cat's name = Tika; 13 years old; # hrs cat spends outside per day = 3

- Control period (9 observations) - On 6 of 10 occasions when Tika was outdoors she watched birds.
- Treatment period (11 observations; Catbib) – On 1 occasion when Tika was outdoors she stalked something. Navi did not find any dead birds in her yard.
- Bird Observations (24 observations) - Navi observed 7 different species of birds in her yard over the course of the bird observation period, with up to 5 species observed at once (e.g., Black-capped Chickadee, European Starling, House Finch, House Sparrow, Chipping Sparrow, unknown species, sparrow). Navi has a feeder in her yard.
- *Comments:*
  - Navi found it challenging to get the Catbib onto Tika – her mom helped her with that. Tika found it difficult to walk with the bib on and Navi and her mom were concerned about her safety while wearing the bib (e.g., she would not be able to run away from danger). When I was at their house doing an interview, I noticed that her collar was too loose causing the bib to hang down to the ground (very low), hindering her ability to walk.

**Rachel and Sophia** - (Vancouver) cat's name = Rica; 7 years old; # hrs cat spends outside per day = < 1  
(2<sup>nd</sup> time doing the project / experiment)

- Control period (8 observations) - On 2 of 8 occasions when Rica was outdoors she stalked or killed a bird.
- Treatment period (10 observations; Colourful Collar) – On 4 occasions when Rica was outdoors she stalked something (2 times) or watched a bird (2 times).
- Bird Observations (19 observations) – Rachel and Sophia observed 5 different species of birds in their yard over the course of the bird observation period, with up to 3 species observed at once (e.g., chickadee, Dark-eyed Junco, finch or sparrow, crow, American Robin). Rachel and Sophia do not have a feeder in their yard. They have seen a dead bird in their yard on 3 occasions over the past year.
- *Comments:*
  - “When we caught Rica eating a bird, we started our treatment phase (even though [the] control phase [was] not finished)”

- Rachael wrote the following story for *NatureWILD* magazine (Volume 19, Issue 1):

**My cat wouldn't eat a bird, would she?**  
**By Rachael grade 4**

**I have a cat called Ricka. We never thought in a million years that Ricka would ever eat a bird, although sometimes she sits at the window and makes clicking noises when she sees birds in the garden.**

**She is not aggressive but when it comes to birds, it is a different story. This summer I caught her in the act: When I saw her come in she had a moustache of bird feathers and there were feathers on the porch. I knew that she ate a bird and then I saw it on the deck. I felt sorry for the chickadee, so we decided to do something about it - that is when we put a colourful collar on Ricka, since obviously a bell was not enough to protect the birds from Ricka.**

**Jenn Dextras Tyler (no data submitted)**

“Hello Elke,  
I'm attaching some photos of our cat Joey in his collar [Fig. 9], we are observing him this week with it on. He doesn't go out for long now that the weather has changed, and seems to want us to take it off as soon as he comes in...so not much to report yet. Anyway there are lots of birds out these days and we are having fun recording them.  
All the best,  
Jenn”

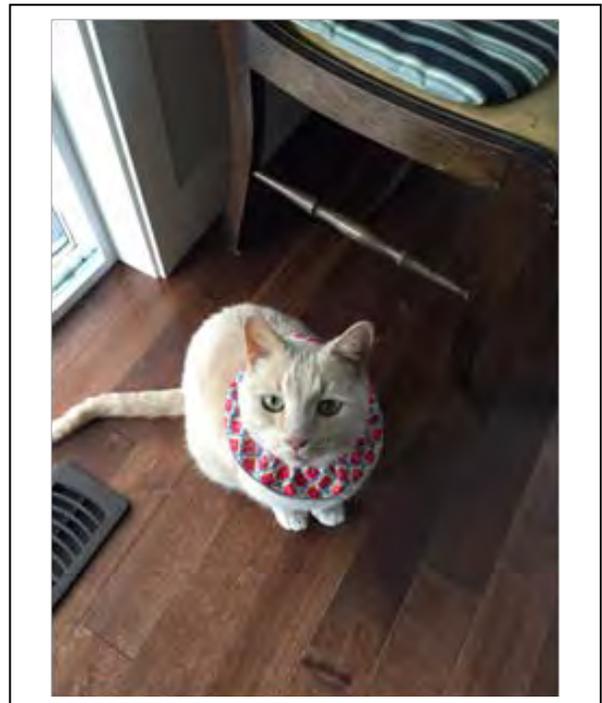


Figure 9. Joey wearing his colourful collar.

## Non-Cat Owners:

### Cameron – (Chilliwack)

- Control period (10 observations) – Cameron observed a neighbourhood cat in his yard on 10 occasions. On two of those occasions the cat chased another cat.
- Bird Observations (10 observations) - Cameron observed 4 different species of birds in his yard over the course of the bird observation period, with up to 2 species observed at once (e.g., crow, hummingbird, Mourning Dove, 1 unknown species). Cameron has a feeder in his yard.
- *Comments:*
  - Cameron has never observed any dead birds in his yard.

### Emmé – (Penticton)

- Bird Observations (8 observations) - Emmé observed 3 different species of birds in his yard over the course of the bird observation period, with up to 2 species observed at once (e.g., California Quail, flicker, magpie).

### Owen and Brynna – (Victoria)

- Control period (9 observations) – Owen and Brynna observed a neighbourhood cat (Frankie) in their yard on 9 occasions. On one occasion Frankie got into a “fight” with a crow, on two occasions he was observed to “hold / kill / eat” a mammal (i.e., mouse and a squirrel). On two occasions he was observed stalking something.

### Zeta – (Vancouver)

- Control period (24 observations) – Zeta did not observe any cats in her yard over 24 observations.
- Bird Observations (8 observations) - Zeta observed 15 different species of birds in her yard over the course of the bird observation period, with up to 5 species observed at once (e.g., Bushtit, American Goldfinch, Red-breasted Nuthatch, chickadee, junco, finch). Zeta has 3 bird feeders in her yard. She has never observed a dead bird in her yard.

## **3.3 Project Evaluation**

In Year 1, we received 10 completed project evaluation forms from the 13 volunteers for the experiment (62%), 5 from individuals that completed or partially completed the experiment and 5 from individuals who did not.

*In terms of using the three types of treatment equipment:*

- The volunteers that completely finished the project found it ‘easy’ or ‘somewhat easy’ to use the equipment, which represented all three types of equipment. Volunteers that partially finished or did not finish found the equipment ‘difficult’ to use.
  - There was no pattern between the group that found it easy or difficult to use the equipment, but 2 volunteers that found the equipment to be ‘difficult’ have cats that would not take to a collar (required for both the colourful collar and the CatBib), and in

1 case the equipment was faulty (the harness was missing a piece and could not be used)

- In terms of their willingness to continue to use the equipment:
  - 50% of the respondents said that they would be willing to use the equipment again to keep wild birds and pet cats safe
  - 30% of respondents (n = 3) said that they were not willing to use the equipment, or something similar (none of these 3 had completed the experiment and found the equipment difficult to use), and
  - 20% said that they were 'a little' willing to use it.
- When volunteers were asked if they wanted to keep the equipment, 78% said 'No' (of those who had completed the experiment, 50% said 'Yes' and 50% said 'No')
- Approximately 20% of the volunteers would probably or definitely recommend the equipment to others, 60% were neutral or might recommend it, and 20% would not. In the latter case, both volunteers found that their cat was stressed out or would not adjust to the equipment
  - One volunteer that had been given the CatBib treatment felt that the equipment posed a risk to getting caught on fences / barbed wire. Note: volunteers were sent break-away collars to keep their cats safe.

*In terms of volunteers changing their behaviour regarding cats and bird conservation, or sharing their knowledge with others, as a result of the experiment:*

- 60% of respondents said that they would not be willing to think about limiting the amount of time that their cat spends outside, or keeping their cat indoors
  - Only 1 respondent (10%) said that they were willing to think about it
- 80% were willing, or somewhat willing, to share what they had learned about cat safety and bird conservation
- 60% said that they were more, or somewhat more, aware about the huge number of birds that are killed by cats each year
- 80% said that they more, or somewhat more, aware that they can do things to help keep wild birds and pet cats safe

*Comments / Experiences from Experiment Volunteers*

*Vancouver:*

"We participated twice in this study: the first go around we did control, then intervention [treatment] (collar) but were not really convinced collar made a difference. Kitty lost collar and we didn't think anything of it. Second go, we caught kitty eating a bird during control period; then replaced [BirdsBeSafe] collar -->kitty has not caught bird since. Kitty now not allowed outside without bird safe collar (and no further dead birds noted in subsequent months). I would like to see more public information about options such as [BirdsBeSafe] collars e.g., at Vet clinic, cat adoption agencies, pet stores etc. Also, it would be nice if the collars were more easily available - I have only seen them via mail-order from the USA."

*Burnaby:*

"Since we have started using the Cat Bib it is very rare for our cat to now kill a bird"

*Nanaimo:*

"Less birds brought in the house" (since starting to use the BirdsBeSafe collar)

(they estimated that their cat was catching 1-2 birds in an average week, when it is relatively active outdoors)

## **5.0 Discussion**

The results from the three project surveys provided us with some valuable insights into the knowledge, understanding, and potential barriers that surround the use of bird and cat-safe equipment. Based on the pre-project survey of NatureKids members, approximately 66% of 81 respondents indicated that they did not own a cat at the time of the survey, while 34% did. This is only slightly lower than that found for the Canadian population as a whole, where 37% of households own one or more cats (Oliviera 2014). In Year 1, only 2.5% of pre-project survey respondents knew that 200 million birds are killed annually in Canada, compared to 14% of mid-project survey respondents in Year 2. This suggests that NatureKid's educational campaign and outreach resulted in increased awareness on the subject. However, the increased education and awareness did not translate into significant behavioural or attitude changes, such as cat owners keeping their cat's indoors or support for by-laws that would restrict free-roaming cat's access to the outdoors. A small proportion of cat owners that participated in the experiment continue to use the devices we provided them with, such as the colourful collar and CatBib, that allow their cats to continue to roam freely outdoors.

There are a number of factors that may hinder behavioural changes in cat owners. Despite the report that 200 million birds are killed annually in Canada by free roaming cats (Blancher 2013), most survey respondents have seen their cat chase birds but have never seen their cat kill birds or had their cat bring an injured or dead bird home. Some cat owners may need direct evidence of their cat's predation on birds before changes in attitude or behaviour will take place. However, 8 of our 10 experiment volunteers who completed the project saw their cats chasing or catching a bird during the limited experiment period; 4 volunteers witnessed their cat catching and killing a bird. Despite these direct observations, a large proportion of experiment participants were not willing to think about or change the way they manage their cat's outdoor time, or continue to use the free equipment that we had provided them. These results reinforce the challenges that this issue faces when attempting to change attitudes and human behaviour.

We gained valuable insights into potential barriers that this type of equipment may pose to some cat owners. For example, some volunteers expressed that they felt that the CatBib posed a "safety concern" for their cat (e.g., to defend itself from other cats) or that their cat became "stressed" when wearing the bib. As such, these volunteers did not want to use it. Other volunteers owned cats where the use of collars was not an option (e.g., they could not get the collar on, or the cat continually slipped out of the collar). As such, the colourful collar would not work for them (and neither would the CatBib option).

## **5.0 Conclusion and Recommendations**

This project has informed a large group of people in many communities throughout BC about the impact of free roaming cats using an educational (non-shaming) campaign designed to shift attitudes, change behaviour, and reduce bird deaths. Although the ideal approach would be to keep cats indoors, we provided information on tools and strategies to help reduce bird mortality for those cats that will continue to go outdoors. The results include valuable information regarding some of the barriers that prevent cat owners from helping conserve bird populations and demonstrated the need for continued

education. There has been an increase in awareness campaigns on cat and bird safety in the past few years. Working at the youth and family scale, NatureKids has filled a gap in the existing awareness campaigns and complemented the work of other provincial organizations working on this issue.

The main observations, issues, and recommendations from this project include:

- The majority of cat owners do not see their cats chasing or killing birds or any evidence of predation (e.g., dead birds in their yard or brought into the house). This suggests that either the statistics around the number of birds being killed by cats are not accurate and / or that cats kill and leave or consume their bird prey away from their yards or the visibility of their owners (e.g., under shrubs, etc.).  
**ISSUE:** Some cat owners may need to see direct evidence that their cats are contributing to the problem before they feel any sense of responsibility or be prompted to take any corrective actions (i.e., it is someone else's problem).
- It is highly likely that a bell curve of cat behaviours exists among the population, where the majority of free roaming cats chase or kill birds on occasion (e.g., a few a month or year), while at the extreme ends of the curve some are prolific bird predators (e.g., almost daily) and others very rarely or never chase or catch birds.  
**ISSUE:** Education campaigns may be more successful if they target those cat owners whose pets are contributing most significantly to the bird predation problem. This would likely be best achieved by using tactics that bring the majority of cat owners on board, to work as a team to change the behaviour of those who own problematic cats, versus an all encompassing campaign that may create defensiveness among all cat owners.
- Some of our experiment volunteers were concerned about their cat's safety when using the predator deterrent devices. They talked about how their cat(s) cannot wear or tolerate a collar, quick-release collars are lost within a day, and concerns that some of the equipment might pose a risk to their cat while outdoors (e.g., CatBib). The inability of some cats to tolerate or wear a collar affects the success of some of the bird predator deterrent devices (e.g., colourful collar, CatBib).  
**ISSUE:** Education campaigns needs to encourage cat owners to train their cats in wearing and tolerating a collar and other devices, starting when the cat is young. The use of collars fitted with tracking devices would solve some of these issues. Lost collars could be retrieved via a tracking device. As well, some owners may feel more comfortable fitting quick release collars more securely if they can tracked their cat more closely (e.g., if the cat ran into trouble, such as being snagged on a fence or vegetation). Clear instructions need to be included with each predator deterrent device. For example, the Catbib comes in different sizes and the quick release collar and Catbib both need to be sized properly on the cat to allow the cat to walk naturally and for the owners to feel comfortable with the device. Equipment users also need to be encouraged to allow for a longer adaptation period for them and their cats regarding the various devices before use outdoors or before they give up on them (e.g., use the device on the cat only when it is indoors, until the animal is comfortable).
- If we compare dog ownership to cat ownership it is obvious that there is a hypocrisy between the two. Society has deemed it unacceptable to allow dogs to roam freely / unsupervised through the neighbourhood, especially in urban environments, defecating where they choose. Some people may be attracted to cats as pets exactly because of this entrenched hypocrisy.

They feel that cats require less attention, work, or responsibility. They can be more hands-off with a cat, simply opening a door and allowing their cat to roam freely. The time commitment required to walk a pet, clean up its waste, etc. are barriers to dog ownership and responsible cat ownership.

**ISSUE:** Until municipal by-laws come into place, and are enforced, that make it illegal to allow cats to roam freely, people will continue to do it. Negligent cat owners as those who have unlicensed cats, unsprayed or unneutered cats, cats that go outside without a collar (e.g., no license or identification if lost), cats that are allowed to roam freely outdoors (killing wildlife and / or and defecating in neighbouring properties), and those that leave cat food outside for their cat and / or neighbourhood, stray cats (attract pests such as rats, raccoons, and deer)

Given the extensive list of techniques and devices that are now available to cat owners, there is no longer any excuse for negligent cat ownership in terms of cat safety, bird safety, and disrespectful behaviour towards neighbours. Just like dogs, cats can go outside, but it is unacceptable to allow them to roam freely (Table 6). Beliefs and values are deeply entrenched. It will take generations, and the instillation and enforcement of by-laws, to change attitudes and behaviours. Working with youth is an important strategy for changing how future generations will care for their pet cats and protect wild birds.

Table 6. Excuses and solutions for responsible cat ownership.

<b>Excuse for Free Roaming Cats</b>	<b>Solution</b>
<b><i>Cat needs to go outside</i></b> because: they are healthier / happier; they need exercise; it's cruel to keep them indoors; the neighbourhood is safe; hunting prey is natural cat behaviour	Enclosure; harness and leash walk
<b><i>Dislike using a litter box</i></b>	Enclosure; harness and leash walk; use available techniques and devices to toilet train your cat
<b><i>Family member has allergies to cats</i></b>	Cat door that leads to an enclosure for freedom to come and go; harness and leash walk
<b><i>Pest (rodent) control</i></b>	Follow alternate available pest control measures (e.g., remove attractants like unsecured garbage; fill access holes to buildings; remove cover and access ways from around buildings; use traps, etc.)
<b><i>Cat can't be contained indoors</i></b> – cat escapes; is a nuisance	Cat door that leads to an enclosure for freedom to come and go
<b><i>Cat can't wear / won't tolerate a collar</i></b> ; will lose quick-release collar	Harness and leash walk; enclosure; use a quick release collar fitted with a tracking device to locate dropped collars
<b><i>Cat safety re: the predator deterrent devices</i></b> (e.g., fear of using a collar or CatBib)	Use a quick release collar fitted with a tracking device to locate dropped collars; ensure that the CatBib or other devices are properly fitted for the cat so that it can walk and run; give the cat plenty of time to adapt to the new device (e.g., when indoors) before allowing it roam freely outdoors with the device

## 6.0 References

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## 7.0 Appendices

### **Appendix A. Online Survey Utilized to Assess NatureKids Member Awareness and Attitudes Regarding Free Roaming Cats and Bird Conservation.**

#### **NatureKids Bird Aware Cat Care PRE SURVEY – FALL 2016**

##### **Q1 NatureKids Club:**

##### **Q2 City:**

##### **Q3 How many birds do you think cats kill across Canada each year?**

2,000	20 million
20,000	200 million
200,000	2 billion
2 million	

##### **Q4 How difficult or easy do you think it is for cats (in general) to be kept happily indoors?**

1 Difficult	4 (no label)
2 (no label)	5 Easy
3 (no label)	

##### **Q5 How many cats do you have? – *If no cats, survey ends here***

None	2
1	3 or more

##### **Q6 How old is/are your cat(s)?**

under 1 year	6-11 years old
under 2 years	more than 12 years old
3-5 years old	

##### **Q7 Do you allow your cat(s) to roam freely outdoors? – *If never, survey goes to Q20***

1 Often	4 (no label)
2 (no label)	5 Never
3 Sometimes	

##### **Q8 On average, how long is your cat(s) allowed to roam freely outside per day:**

No limit	2-4 Hours
All day only	1-2 Hours
All night only	An hour or less
6-8 Hours	Occasionally / not everyday
4-6 Hours	

##### **Q9 Tell us why your family lets your cat(s) roam freely outdoors (check all that apply):**

Our cat(s) is happier when s/he can go outside	Our cat doesn't kill enough birds or small animals to make any difference
Our cat(s) is healthier because s/he goes outside	Our neighbourhood is safe for cats
It is cruel to keep a cat(s) indoors	Cats help with rodent control
Cats need to go outside	We don't want a litter box in our home
Outdoor hunting is a natural behaviour for a cat	Our cat cannot be contained indoors (e.g., we have a dog door)

Our cat needs exercise  
Our cat(s) is feral / stray

Our cat(s) becomes a pest when kept indoors  
Cat allergies are an issue for my family

**Q10 Does your cat chase or catch birds?**

1 Often  
2 (no label)  
3 Sometimes

4 (no label)  
5 Never

**Q11 Estimate how many birds you think that your cat(s) may catch in an average week?**

Never/ not applicable  
0-2  
3-5

6-10  
more than 10  
Comments about multiple cats...

**Q12 On average, how often does your cat(s) bring home injured or dead birds?**

Never/ not applicable  
Daily  
Weekly

Monthly  
In warm seasons only  
A few times a year

**Q13 Has your family ever tried to reduce your cat's ability to catch birds? (check all that apply)**

We haven't tried anything  
We keep our cat's claws trimmed  
We put a bell on his/her collar(s)  
We reduced the number of hours the cat(s)  
spends outdoors  
We walk our cat(s) on a leash

We use a CatBib(s)  
We use a SafeBirds colourful collar(s)  
We use an outdoor cat enclosure / fenced yard  
We have an indoor cat(s) now  
Other things you've tried...

**Q14 If your cat(s) has ever been injured or gotten sick while outside, what happened? (check all that apply)**

Not applicable  
Been in a fight with another cat  
Hit by a car  
Got fleas, ticks, worms, parasite  
Got a disease e.g. rabies, leukemia etc.

Chased by a dog  
Attacked by wildlife (raccoon, coyote etc)  
Injury from unknown cause  
Other

**Q15 Child/ren's Name(s):**

**Q16 Parent / Guardian Full Name:**

**Q17 Email address:**

**Q18 Full mailing address**

**Q19 Additional Comments**

**Q20 Tell us why you choose to keep your cat(s) indoors (check all that apply)**

**Q21 Full name**

**Q22 Email**

**Appendix B. Online Project Evaluation Questions Sent to Junior Scientist Experiment Volunteers.**

Email Address

First Name

LastName

NatureKids Club:

City:

Junior Scientist Full Name(s):

Your Age(s):

Which equipment did you use in your experiment?

Which, if any, materials did you find helpful for the experiment?

- Experiment instructions
- Bird Aware Cat Care Fact sheet (7 ways to keep birds and cats safe)
- Data sheet (the chart used to record your observations)
- Bird ID sheet (bird pictures and info)
- NatureKids training videos (You Tube)
- All of the materials were helpful
- I didn't look at any of them
- None
- Other /Comments (please specify)

How easy was it to use the equipment? (e.g. collar, bib, or leash)

1 – Difficult

2 – Somewhat difficult

3 – Somewhat easy

4 – Easy

Comments

Did your cat(s) get used to the equipment?

1 - Not at all

2

3 - A little bit

4

5 - Yes

Comments

What part(s) of the experiment did you like the most?

- Watching the NatureKids You Tube training videos
- Using the CatBib, colourful collar, or harness and leash on my cat
- Watching my cat's behaviour
- Watching birds
- Recording data
- Looking for dead birds around my home
- Taking photos and videos
- Talking to people about the experiment
- Knowing that my cat(s) will catch fewer birds
- Knowing that I can help make a difference
- I liked everything
- Other /Comments

The experiment instructions were:

1 –I could not understand them

2

3 - I needed some help to understand what to do

Comments

4

5 - Very easy to understand and I didn't need help

What part(s) of the experiment did you find the hardest?

- Understanding what to do
- Using the CatBib, colourful collar, or harness and leash on my cat
- Observing and recording every day
- Watching my cat's behaviour
- Watching birds
- Recording data
- Looking for dead birds around my home

- The weather
- The time of year
- The length of time for the experiment (4 weeks total)
- Everything was hard
- I didn't find anything hard
- Other / Comments

The amount of time needed for the experiment and what I had to do was:

1 - Too much

2

3 - Just the right amount

4

5 – Too little

Comments

Did anything surprise you about your experiment? Check all that apply

- No
- How much I like being a Junior Scientist
- How many birds my cat catches / kills
- What my cat(s) does when outside
- How easy it was to use the equipment on my cat(s)
- How difficult it was to use the equipment on my cat(s)
- How fast my cat got used to the equipment
- That my cat did not get used to the equipment
- The number of birds around my home
- The variety of birds around my home
- That people were interested to hear about my experiment
- Other (please specify) / Comments

How likely is it that you would recommend using a colourful cat collar, cat bib, or harness and leash to others with a cat(s)?

1 - I wouldn't recommend the equipment

2 - I might recommend it

3

4 - I would probably recommend it

5 - I would definitely recommend using the equipment

Comments

Do you have any ideas about how to make the experiment better?

*After doing this experiment with NatureKids are you more...*

Willing to use equipment (like a colourful cat collar, Catbib, or harness and leash) to help keep wild birds and pet cats safe

- |                |         |
|----------------|---------|
| 1 - No         | 4       |
| 2              | 5 - Yes |
| 3-A little bit |         |

Willing to think about limiting the amount of time your cat(s) go outside

- |                |         |
|----------------|---------|
| 1 - No         | 4       |
| 2              | 5 - Yes |
| 3-A little bit |         |

Willing to think about keeping your cat(s) indoors

- |                |         |
|----------------|---------|
| 1 - No         | 4       |
| 2              | 5 - Yes |
| 3-A little bit |         |

Willing to share what you learned about birds and cats with others

- |                |         |
|----------------|---------|
| 1 - No         | 4       |
| 2              | 5 - Yes |
| 3-A little bit |         |

*After doing this experiment with NatureKids are you more...*

Aware about the huge number of birds that are killed by cats

- |                |         |
|----------------|---------|
| 1 - No         | 4       |
| 2              | 5 - Yes |
| 3-A little bit |         |

Aware that you can do things to help keep wild birds and pet cats safe

- |                |         |
|----------------|---------|
| 1 - No         | 4       |
| 2              | 5 - Yes |
| 3-A little bit |         |

What other ideas do you have for keeping wild birds and pet cats safe?

Would you like to continue to use the equipment that NatureKids sent you?

- Yes
- No
- Comments

## Appendix C. Example Contents of Training Kit Sent to Junior Scientists to Conduct Bird-Catching Deterrent Experiment.

### COVER LETTER

Dear Junior Scientist,

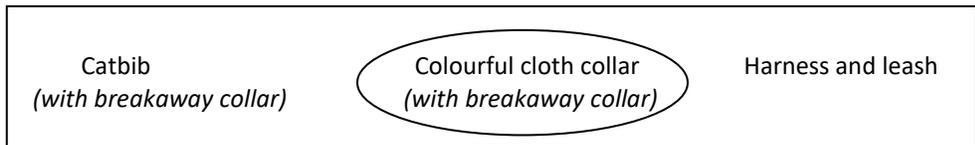
Thank you for volunteering to help with NatureKids BC **Bird Aware Cat Care** experiment. Inside this experiment package you will find:

- Instruction booklet
- FactSheet
- Bird ID sheet (4 species of particular interest to the project), with tracking schedule on the back
- Backyard Bird Safari ID card (common bird species)
- Control Datasheet
- Bird Observation Datasheet
- your Treatment Datasheet
- your Treatment equipment

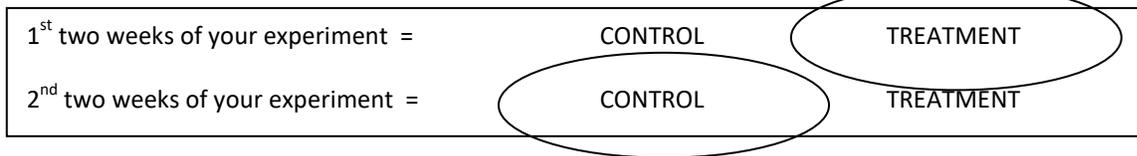
*See below for your treatment type and experiment order*

Please check that all of the contents are included in your experiment package, read through all of the provided forms, and watch the training video before you begin your experiment.

#### Your Treatment Type is:



#### Your Experiment Order is:



Feel free to contact me at [citizenscience@naturekidsbc.ca](mailto:citizenscience@naturekidsbc.ca) if you have any questions. We look forward to seeing your data and hearing about your experiences!

Sincerely,  
Elke Wind  
NatureKids BC **Bird Aware Cat Care** Project Lead

# BIRD AWARE CAT CARE | FACTSHEET

A PROJECT TO KEEP PET CATS & WILD BIRDS SAFE

**Risk → Injury**  
getting hit by car!

**Risk → Injury**  
fights with other cats,  
dogs and wildlife like  
raccoons, coyotes  
and raptors

**DANGER**

Free-Roaming Pet Cats Face  
Many Dangers Outside!

**Risk → Disease**  
contact with other cats  
can spread diseases  
like feline leukemia,  
rabies, toxoplasmosis &  
cat-scratch disease.

Did you know? **Free-roaming cats live shorter lives** than indoor cats  
(Outdoor cats live 2-5 years but indoor cats live 10-20 years!)

**Free-roaming cats** are estimated to  
**Kill 200 million birds**  
across Canada each year

## 7 WAYS YOU CAN KEEP CATS & BIRDS SAFE

- *Keep cats indoors*
- *Use a cat bib that makes it more difficult for a cat to catch birds*
- *Use a colourful cloth scrunchie collar that birds can see*
- *consider an outdoor screened cat enclosure*
- *Spay or neuter your cat*
- *Train your cat to walk on a leash*
- *Do not feed unowned or feral cats*
- *Keep bird feeders off the ground and away from hiding places for cats*

SUPPORT PROVIDED BY:

STEWARDSHIP CENTRE FOR BC CAT GROUP

The Gosling Foundation



A JUNIOR CITIZEN SCIENCE PROJECT OF



# BIRD AWARE CAT CARE | BIRD ID SHEET

A PROJECT TO KEEP PET CATS & WILD BIRDS SAFE

We are particularly interested in observations of the following four focal bird species that forage and nest in shrubs and on the ground

## Pine Siskin

Range: Province-wide Size: 13 cm  
Distinct features: yellow wing bars and at base of tail; streaked chest; thinner bill than other finches



Sources: <http://tinyurl.com/zsbcv43>

## Purple Finch

Range: Province-wide Size: 15 cm  
Distinct features: red over most of male, brightest on head and rump; streaked back; notched tail. Similar species – House Finch



Sources: <http://tinyurl.com/jzmvnqc>; <http://tinyurl.com/zsku90>

## Orange-Crowned Warbler

Range: province wide Size: 13 cm  
Distinct features – olive above, paler below; blurred streaks on sides; may see very pale orange patch on top of the head of the male. Similar species – Tennessee Warbler



Sources: <http://tinyurl.com/jln52e>; <http://tinyurl.com/zw2xgk>

## MacGillivray's Warbler

Range: Province-wide Size: 13 cm  
Distinct features: grey head and olive yellow body and wings; white crescents above and below eye.



Sources: <http://tinyurl.com/z8s4r4z>; <http://tinyurl.com/v8l9c7>

SUPPORT PROVIDED BY:

STEWARDSHIP CENTRE FOR B.C. (AT GOOLS)

The Gosling Foundation



vancouver foundation



A JUNIOR CITIZEN SCIENCE PROJECT OF:



## Hello Junior Citizen Scientist!

Welcome to the Bird Aware Cat Care project. We hope you have fun doing your experiment and thanks for helping birds and cats!\*

## WHY are we doing this project?

Many bird species populations across Canada are declining. Birds face many threats including loss of habitat, window collisions, and disease. It is estimated that free-roaming cats (i.e., feral cats and pet cats that are allowed to roam outdoors) kill approximately 200 million birds across Canada every year. Yikes, that is a LOT of birds! We hope that this project will raise awareness of this issue and encourage more pet owners to keep cats indoors. As well, we'd like your help to test some things that cat owners can use to help reduce the number of birds killed if they do let their cats go outside.

## How does the experiment work?

Every Junior Scientist (that's you!) who volunteers for the project will collect 2 types of data:

- 1) Natural cat behaviour ("control" data);
- 2) Data on local birds.

Those volunteers who own a cat that roams outdoors will also collect data on:

- 3) Cat behaviour when exposed to a "treatment",

and will be randomly assigned to one of three "treatments" for their experiment: A brightly coloured cloth collar; a cat bib; or a harness and leash.

You will also be asked to collect your data in a specific order. Either,

TREATMENT DATA for the first 2 weeks → followed by CONTROL DATA for the second 2 weeks.

**OR**

CONTROL DATA for the first 2 weeks → followed by TREATMENT DATA for the second 2 weeks.

The "control" part of the study provides *baseline information* about your cat (i.e., natural cat behaviour when outdoors). We will compare the natural cat behaviour data from all of the members to the treatment data. Both aspects are very important to the success of the study. You will also be collecting data on bird observations during the entire 4-week study period.

\* Note: This activity can be used towards a NatureKids Action Award.



This study was designed for volunteers with cats, but non cat owners can help too by collecting "control" data on neighbourhood cats and birds.

## Here are the **steps** for your experiment:

1. **Check your experiment package** from NatureKids BC.  
The package should contain:

- Instruction booklet
- Factsheet
- Bird ID sheet (4 species of particular interest to the project)
- Backyard Bird Safari ID card (common bird species)
- Bird observation data sheet
- Control datasheet
- For those volunteers with cats that roam outdoors, your randomly assigned
  - Treatment datasheet
  - Treatment equipment (cloth collar, catBib, Harness and leash)
- Model consent form (for photo and video use)

**NOTE: If your experiment package is missing something, or if your equipment breaks, please let us know immediately so we can replace it.**

2. **Watch the training videos:** Part I = [https://youtu.be/CrtW\\_k4Jv44](https://youtu.be/CrtW_k4Jv44)  
Part II = <https://youtu.be/MM6zC4yeDiM>

3. **Begin your experiment.**

Over the whole 4-week period you will collect data on bird observations. Record your observations on the datasheet provided in your experiment package. For two weeks all volunteers will collect "control" cat data, using the data sheet in your package. Those who own a cat will collect data on their cat, while those volunteers without a cat will make observations from neighbourhood cats. For those volunteers with cats, you will collect cat "treatment" data for two weeks as well. NatureKids will tell you which type of cat data to collect first.

## Tips before you begin your study

### Before you begin your study

- Fill in the top sections of all the datasheets that you will be using (e.g., Junior Scientist name, club name, cat's name, etc.).
- If your Treatment type is the CatBib or cloth collar, ensure that your cat has the **CatBib** or **cloth collar** on *before* it is allowed to go outside during the whole two week Treatment period of the study.
- If your Treatment type is the **harness and leash**, give your cat time to get used to the harness and leash indoors first. For example, a couple of days before walking your cat outside, put the harness on your cat and let it drag the leash around the house on occasion.
- Keep your binoculars and bird identification cards handy (e.g., by a window or door) for when you see birds outside.
- **Have fun** keeping birds and cats safe!

## Detailed Instructions for your Junior Citizen Science Experiment

### Bird Observation Data Collection (4 week period)

- Over the 4-week experiment period, collect data on birds that you see around your home and garden
- Collect at least 20 observations of birds for at least 15 minutes each
- Record all the bird species that you observe during each 15-minute period (see Bird Datasheet)

In addition to live birds that you see in your yard, walk around your home and yard looking for any evidence of injured or dead birds (e.g. on decks, near doorways, under bushes, at the base of trees etc.).

### Control Cat Behaviour Data (2 week period)

- Over a 2-week period, collect data on your cat's (or neighbourhood cats if you don't own one) behaviour when it is outside.
- Collect at least 10 control observations of your cat for at least 15 minutes each.
- Check all of the cat behaviour boxes that apply over each 15-minute period (see Control Datasheet).

### Treatment Cat Behaviour Data (2 week period)

- If you own a cat, over a 2-week period collect data on your cat's behaviour when it is outside using the treatment equipment.
- Collect at least 10 treatment observations of your cat for at least 15 minutes each:
  - » CatBib and Colourful cloth collar – Be sure to put the treatment equipment on before allowing your cat to go outside. Try to watch from a window or a deck. Be careful if you go outside, as your presence may change your cat's behaviour (e.g., it may come over to say hello). Check all of the cat behaviour boxes that apply over each treatment observation period (see Treatment Datasheet).
  - » Harness and leash - After you have let your cat get used to the equipment indoors, try walking your cat on leash outdoors. Try to walk with your cat for at least 15 minutes initially, going farther and longer as the experiment progresses. Once you have completed your walk, answer the "Leash Walking" questions on the Treatment datasheet and check all of the cat behaviour boxes that you saw your cat doing during the walk outdoors on leash.

#### 4. Take videos and photos of your cat (or neighbourhood cats) while it is outside.

5. Submit your photos, videos, and datasheet(s) to NatureKids BC at the end of your study by emailing them to [citizenscience@naturekidsbc.ca](mailto:citizenscience@naturekidsbc.ca), or mail your datasheets to:

NatureKids BC  
1620 Mt. Seymour Rd.  
North Vancouver, BC V7G 2R9

SUPPORT PROVIDED BY:

STEWARDSHIP CENTRE FOR BC, (AT GOOSIS)

The Gosling Foundation

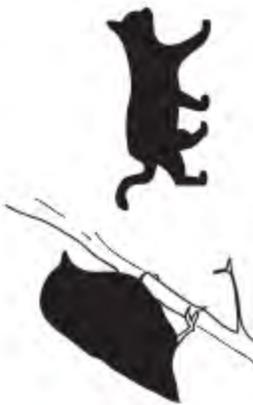


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foundation



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# BIRD AWARE CAT CARE

A PROJECT TO KEEP PET CATS AND WILD BIRDS SAFE

Stay on track by checking the boxes below!

## Week 1 & 2

<b>Day 1</b> <input type="checkbox"/> Cat data <input type="checkbox"/> Bird data	<b>Day 2</b> <input type="checkbox"/> Cat data <input type="checkbox"/> Bird data	<b>Day 3</b> <input type="checkbox"/> Cat data <input type="checkbox"/> Bird data	<b>Day 4</b> <input type="checkbox"/> Cat data <input type="checkbox"/> Bird data	<b>Day 5</b> <input type="checkbox"/> Cat data <input type="checkbox"/> Bird data	<b>Day 6</b> <input type="checkbox"/> Cat data <input type="checkbox"/> Bird data	<b>Day 7</b> <input type="checkbox"/> Cat data <input type="checkbox"/> Bird data
<b>Day 8</b> <input type="checkbox"/> Cat data <input type="checkbox"/> Bird data	<b>Day 9</b> <input type="checkbox"/> Cat data <input type="checkbox"/> Bird data	<b>Day 10</b> <input type="checkbox"/> Cat data <input type="checkbox"/> Bird data	<b>Day 11</b> <input type="checkbox"/> Cat data <input type="checkbox"/> Bird data	<b>Day 12</b> <input type="checkbox"/> Cat data <input type="checkbox"/> Bird data	<b>Day 13</b> <input type="checkbox"/> Cat data <input type="checkbox"/> Bird data	<b>Day 14</b> <input type="checkbox"/> Cat data <input type="checkbox"/> Bird data

## Week 3 & 4

<b>Day 15</b> <input type="checkbox"/> Cat data <input type="checkbox"/> Bird data	<b>Day 16</b> <input type="checkbox"/> Cat data <input type="checkbox"/> Bird data	<b>Day 17</b> <input type="checkbox"/> Cat data <input type="checkbox"/> Bird data	<b>Day 18</b> <input type="checkbox"/> Cat data <input type="checkbox"/> Bird data	<b>Day 19</b> <input type="checkbox"/> Cat data <input type="checkbox"/> Bird data	<b>Day 20</b> <input type="checkbox"/> Cat data <input type="checkbox"/> Bird data	<b>Day 21</b> <input type="checkbox"/> Cat data <input type="checkbox"/> Bird data
<b>Day 22</b> <input type="checkbox"/> Cat data <input type="checkbox"/> Bird data	<b>Day 23</b> <input type="checkbox"/> Cat data <input type="checkbox"/> Bird data	<b>Day 24</b> <input type="checkbox"/> Cat data <input type="checkbox"/> Bird data	<b>Day 25</b> <input type="checkbox"/> Cat data <input type="checkbox"/> Bird data	<b>Day 26</b> <input type="checkbox"/> Cat data <input type="checkbox"/> Bird data	<b>Day 27</b> <input type="checkbox"/> Cat data <input type="checkbox"/> Bird data	<b>Day 28</b> <input type="checkbox"/> Cat data <input type="checkbox"/> Bird data

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