

**What Makes Dog Owners Unique? Part 2:  
Targeting behavioral change and testing the effectiveness  
of interventions to alter dog owner behavior to reduce the  
impact of dogs on coastal wildlife**



Submitted by:  
Emily Flavin  
Hayden Furcolo  
Emily Proctor  
Elena Stratis



Project Advisors:  
Professor Joshua Rosenstock  
Professor Constance Clark

Project Sponsor:  
New Zealand Department of  
Conservation

# **What Makes Dog Owners Unique? Part 2: Targeting behavioral change and testing the effectiveness of interventions to alter dog owner behavior to reduce the impact of dogs on coastal wildlife**

An Interactive Qualifying Project Report  
Submitted to the Faculty of  
Worcester Polytechnic Institute  
in partial fulfillment of the requirements for the  
Degree of the Bachelor of Science  
in cooperation with the New Zealand  
Department of Conservation  
Submitted on  
March 1, 2019

**Submitted by:**

Emily Flavin  
Hayden Furcolo  
Emily Proctor  
Elena Stratis

**Submitted to:**

**Project Sponsor:**

Laura Boren, Science Advisor  
Marine Species and Threats Team, DOC

**Project Advisors:**

Professor Constance Clark  
Professor Joshua Rosenstock

*This report represents the work of four WPI undergraduate students submitted to the faculty as evidence of completion of a degree requirement. WPI routinely publishes these reports on its website without editorial or peer review. For more information about the projects, please see <https://www.wpi.edu/Academics/Project>*

## Abstract

The New Zealand Department of Conservation seeks to lessen the threat of domestic dogs to endangered coastal wildlife through awareness and intervention. Through behavioral observation, surveys, a Pet Expo, and a social media campaign, we hoped to offer the Department of Conservation new and effective methods of intervention. Through group specific social media posts, we sought to create a more educated culture of dog owners that protect the threatened species while exercising their dogs in shared environments.



Titahi Bay (Stratis, 2019)



Paekakariki Beach (Stratis, 2019)

## Executive Summary

In numerous coastal communities in New Zealand, it is common for dog owners to encounter wildlife while walking their dogs along the coastline. These encounters have led to an increasing number of dog attacks on coastal wildlife, such as the little blue penguin and fur seal. Many of these species are endangered, which has led to the Department of Conservation intervening. In the past few years, there has been an increase in the number of regulations surrounding dogs and lead laws on beaches in order to mitigate this problem.



Figure A. Proctor, 2019

Our project, which is the conclusion of a multi-year project, focused on analyzing how effective these past measures have been in protecting endangered coastal wildlife and preventing dog attacks on beaches. We achieved this by surveying dog owners in the Greater Wellington Area, as well as conducting behavioral observations. In addition, we proposed a social media campaign consisting of posters and a video series, in order to increase dog owner awareness of coastal wildlife. Another focus of our project was to educate dog owners on the proper handling of dogs while around wildlife. We utilized the Lead the Way campaign and held a Pet Expo to demonstrate correct dog owner control. By implementing these new strategies, we hope to mitigate dog and coastal wildlife interactions.

## Background

New Zealand is home to a variety of distinct species, including flightless birds. Since the first introduction of domesticated animals, New Zealand's biologically diverse ecosystem has been threatened. The endangered coastal wildlife of New Zealand is especially a concern, as they often fall victim to dog attacks. These species include the little penguin, the yellow-eyed penguin, and the New Zealand fur seal. In recent years, there have been a number of fatal dog

attacks on little penguins along the coastline, which is often due to people walking their dogs off-lead at the beach.



Figure B. Proctor, 2019

Penguins here live in small colonies making them vulnerable to dog attacks, especially during the molting season. As for seals, owners and their dogs can interrupt sleeping patterns, and other critical behaviors. Dog attacks on seal pups have also been reported, raising even more concern. To combat these threats, lead laws are in place throughout New Zealand and vary among the beaches, depending on the coastal wildlife present in that area. The main method of informing the public of these issues and regulations is through posted signage. A method not yet explored is social media. Social media is used in today's society as a crucial tool for sharing information and often replaces other methods of communication. Our group plans to use social media as a method for informing the public of the threats dogs pose to coastal wildlife and to emphasize the importance of lead laws and regulations.

## Methodology

The main goal of our project was to minimize the threat dogs pose to New Zealand's coastal wildlife. We attempted to fulfill this goal by focusing in on four objectives to make dog owners more aware of the wildlife present on beaches and educate them on proper dog handling.

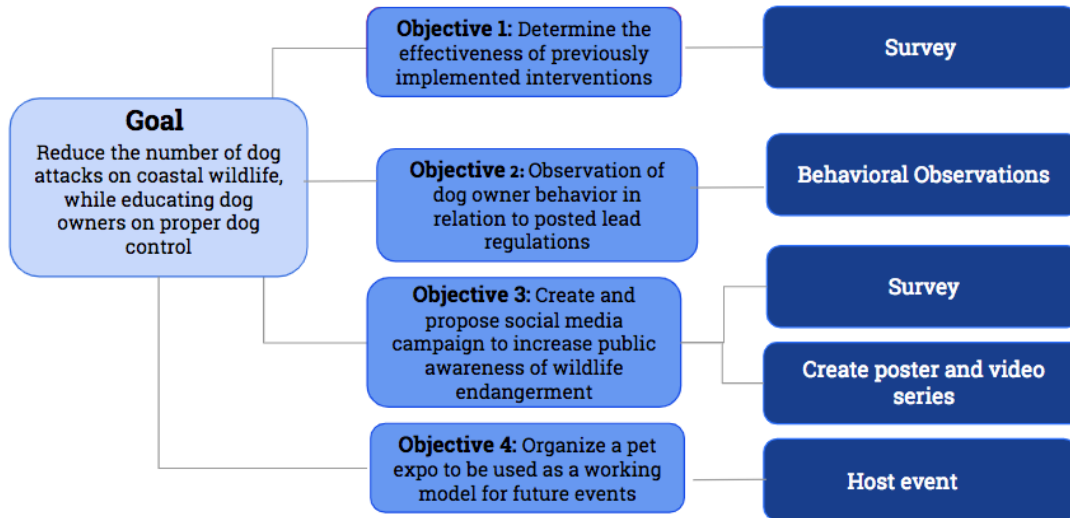


Figure C. Flow chart

### *Objective 1: Determine the effectiveness of previously implemented interventions, including signage and survey results*

Last year, an Interactive Qualifying Project (IQP) team, a WPI student research project, was provided with a similar task by the New Zealand Department of Conservation (DOC). The focus of the project was to reduce the interactions between coastal wildlife and domesticated dogs. For our first objective, we analyzed the effectiveness of past DOC interventions put in place in 2018. To do this we surveyed dog owners at beaches in the Greater Wellington Area including Ngati Toa Domain, Whitireia Park, Oriental Bay, Lyall Bay, and Paekakariki beach. We administered the survey through the Qualtrics app and used it to analyze our results. The data was used to compare to the results from last year in order to identify trends and to determine how effective previous campaigns have been.

### *Objective 2: Observation of dog owner behavior in relation to posted lead regulations*

While surveying dog owners at Greater Wellington Areas beaches, our group recorded behavioral observations. We took note of how many dogs were on-lead and off-lead at each beach, while recording the posted lead regulations for that area. This helped us gain general knowledge about dog owner behavior based on how many dog owners followed the current lead laws.

### *Objective 3: Create and propose a social media campaign to increase public awareness of wildlife endangerment*

We conducted a social media survey that focused on understanding the social media preferences and habits of specific populations of dog owners. Using our results from our social media survey, we then proposed a social media campaign, to increase the Greater Wellington Area public awareness for the endangered coastal wildlife species. By creating this social media campaign, we have helped DOC capitalize on the increasing popularity of digital technology in today's world. From our initial social media survey results, we concluded that the most popular social media platform among dog owners in the Wellington area was Facebook. Knowing this, we designed two posters to be posted on relevant Facebook pages, in addition to a video series for the DOC website. A one minute video introduces the concern for dog interactions with wildlife, and later on highlights threatened coastal species in the Greater Wellington Area, while also providing suggestions for dog owners. A mini video series was created focusing on the animals at risk.

### *Objective 4: Organize a pet expo to be used as a working model for future events*

We hosted *A Dog's Day Out Pet Expo* at Titahi Bay on the 16th of February, 2019. At the event, we promoted the Lead the Way campaign by organizing games for dog owners and their dogs to educate them on how to act in the presence of coastal species. We showed dog owners our proposed social media posters and videos, in order to gain feedback from the dog owners themselves.

## **Results & Discussion**

Our initial survey gave us the information needed in order to determine if past DOC interventions have been effective. One noteworthy finding is that 81% of dog owners reported being aware of endangered coastal wildlife, which shows that a vast majority are aware of the wildlife that DOC's campaigns have targeted. Therefore, we can conclude that New Zealand dog owners are generally aware of coastal wildlife that are present on the beaches where they exercise their dog. Our data revealed that there are conflicting opinions among dog owners on if dogs can pose a threat to wildlife. 45% of dog owners reported dogs can be a threat to wildlife, while 28% disagreed, and 27% remained neutral. The most common response we received from dog owners was "Some dogs can be a threat to wildlife, but my dog isn't." This finding shows that there is still work that needs to be done to educate dog owners that all dogs can be a threat to wildlife. Our behavioral observations supported this, as we found that dog owners are aware of lead regulations on the beaches, but do not follow them. Additionally, we asked dog owners specifically about several DOC campaigns. Our data showed that 18% are aware of increased DOC lead law signage on beaches, 11% have heard of previous DOC Pet Expos, and 6% reported knowing about the Lead the Way campaign. These campaigns have been introduced recently and show great potential for growing in the future, since the campaign is so new.

Our second survey provided insight on the social media behaviors of New Zealanders. The data collected showed that the average time spent on social media is between 2-4 hours per day. The overwhelming majority of dog owners responded that their preferred platform of social media is Facebook. Due to these responses, we tailored our social media campaign to be most effective on Facebook. We proposed four posters to be posted in relevant Facebook groups and developed an informative video series on this issue to be displayed on DOC's website. Additionally, the majority of respondents reported they would respond favorably to our suggested campaign.

We held *A Dog's Day Out Pet Expo* at Titahi Bay on the 16th of February 2019. During this event, we promoted the Lead the Way campaign by inviting dog owners to play games with their dogs in order to educate them on proper dog control behaviors. The pet expo was successful in spreading awareness about the Lead the Way campaign and the issues surrounding dog and coastal wildlife interactions. A total of 50 people attended, along with 27 dogs, who responded positively to the messages we were spreading. A common response was "I learned a lot tonight. It was a very fun event, they should be held more often." We also showed dog owners the posters and videos we created and we received positive feedback. One response that stood out was, "If you can get people to actually care about this issue, then they will be inspired to seek out more information on their own." This shows that our proposed campaigns effectively get the message across and elicit a positive response in dog owners.

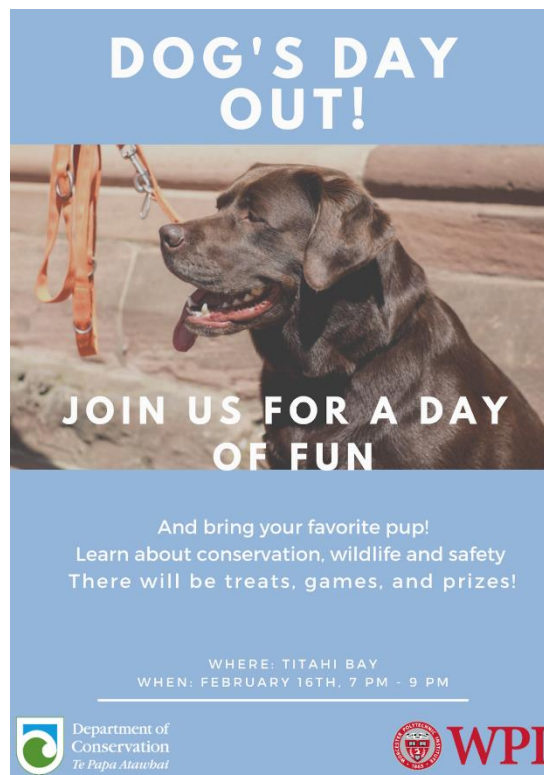


Figure D. Dog's Day Out Flyer



## Recommendations & Conclusion

The data and research collected for this project have allowed us to confidently suggest future recommendations for DOC surrounding the dog and coastal wildlife matter. Our main proposal is that social media should be utilized as a means of educating the public and promoting awareness of this issue. We have created a variety of sample posters, stickers, and videos that we suggest be launched as a social media campaign in the near future. A mini video series was created in order to highlight the main coastal wildlife species and be used for educational purposes.



Figure E. Lead the Way Flyer

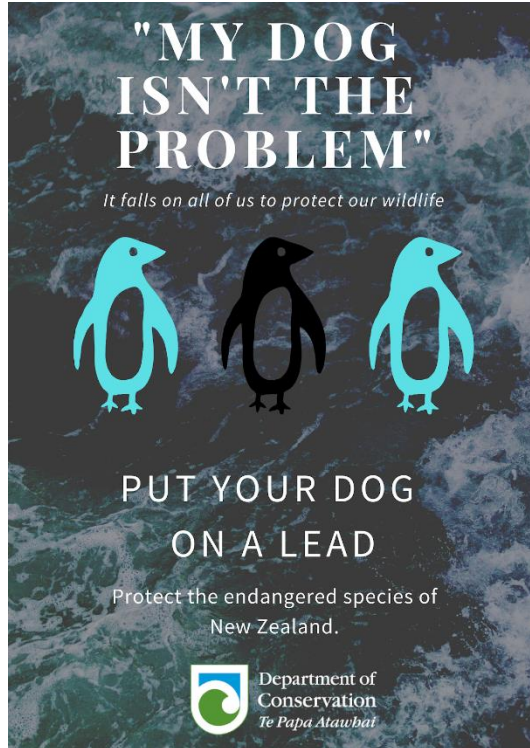


Figure F. Protect Wildlife Poster

During our time working on this project, we have learned that many dog owners are aware of the rules and regulations surrounding dog-wildlife interactions, yet do not follow them. Although our results show that many dog owners care about protecting the endangered coastal wildlife, they care about their dogs more. By introducing a social media campaign in the future, our hope is that this will alter the attitudes of dog owners in the years to come.

Throughout the three years that dogs owners have been surveyed, we have seen positive changes through the implementations that have been introduced. Thus, interventions targeting dog owners over the last three years have made a positive impact on their knowledge of the dog and coastal wildlife issue, but there is still room for improvement.

## Acknowledgements

Our group would like to sincerely thank the following individuals and organizations for their assistance and support throughout our project. Without them, our project would not have been possible.

### Thank you to the Department of Conservation and staff...

- Laura Boren, for being the head contact from the Department of Conservation throughout our time in New Zealand, as well as during our time during ID2050, and for giving us her time, featuring herself in our video, and allowing us to use her dog, Mack, in our videos
- Hannah Hendricks, for assisting us in initiating the first phases of our project, as well as connecting us with contacts throughout the Department of Conservation to move our project forward
- Jeff Dalley, of the DOC Social Science team, for helping us make our surveys the best they could be
- The DOC Social Media team, for helping us understand social media activity in New Zealand and assisting us in getting our social media plans approved
- The DOC Publishing team, for assisting us in getting approval of poster plans and using the DOC logo
- Gary Wheaton, for taking us to Whiteria Bay and allowing us to reach a larger demographic of dog owners
- Ian Angus, for motivating our team to achieve our greatest potential

### Thank you to those who helped A Dog's Day Out...

- The Titahi Bay Canine Obedience Club, whose presence at the event allowed dog owners to learn more about dog control
- Jesikah Triscott, who gave us advice on how to make *A Dog's Day Out* the best event it could be

### Thank you to WPI faculty and staff..

- Professor Josh Rosenstock and Professor Constance Clark, who provided irreplaceable insight and assistance in writing our report
- Dr. Nick Williams, who assisted us in preparing for our project during ID2050
- Professor Mike Elmes and IGSD, because without them, the New Zealand project site would not be as incredible as it is.

## Authorship

All members contributed equally to complete the paper. The entire group contributed to surveying dog owners, having conversations and completing behavioral analysis, and attending interviews with experts.

**Emily Flavin** created posters and ad campaigns for Lead the Way and for the social media campaign. She also contributed through paper edits, survey analysis, and was the main point of correspondence for the group to outside parties. Emily assisted in running games at *A Dog's Day Out*.

**Hayden Furcolo** took the lead in creating a series of educational videos. He prepped, filmed, and edited all material, as well as produced the script seen in the video series. Hayden surveyed dog owners on their reaction to our video at *A Dog's Day Out*.

**Emily Proctor** gathered conversational data with dog owners. She was responsible for online survey outreach, and researched potential outlets on which we could post surveys. She talked to local dog owner groups and held regular correspondence with dog owners online to gather data. Emily assisted in running games at *A Dog's Day Out*.

**Elena Stratis** contributed major edits to the paper, and was responsible for formatting and information flow. She was responsible for organization of the paper and project, and completed survey analysis and visualization. Elena surveyed dog owners on their social media preferences at *A Dog's Day Out*.

# Table of Contents

Abstract	iii
Executive Summary	iv
Acknowledgements	x
Authorship	xi
List of Figures	xiv
List of Tables	xiv
Chapter 1: Introduction	1
Chapter 2: Background	4
2.1 Global Threats to Wildlife	4
2.2 Global Rules and Regulations	5
2.3 New Zealand Threatened Wildlife	6
2.4 Regulations Protecting Wildlife in New Zealand	8
2.4.1 New Zealand Application of Regulations	11
2.5 New Zealand’s Perception and Predisposition Towards Wildlife	12
2.6 Social Media Usage in a Campaign	13
Chapter 3: Methods	15
3.1 Determine the effectiveness of previously implemented interventions, including signage and survey results	16
3.2 Observation of dog owner behavior in relation to posted lead regulations	18
3.3 Create and propose a social media campaign to increase public awareness of wildlife endangerment	19
3.4 Organize a pet expo to be used as a working model for future events	23
Chapter 4: Results	24
4.1 Analyzing the effectiveness of previously implemented interventions	24
4.1.1 Previous Interventions Survey Results	24
4.1.2 Conversations with Dog Owners	27
4.2 Observation of dog owner behavior in relation to posted lead regulations	27
4.3 Create and propose a social media campaign to increase public awareness of wildlife endangerment	29
4.3.1 Social Media Preferences Survey Results	29
4.3.2 Social Media Proposal Results	30
4.4 Organize a pet expo to be used as a working model for future events	33
4.4.1 Dog’s Day Out Pet Expo	33
4.4.2 Creating a Checklist for a Model Event	35
Chapter 5: Discussion	35
5.1 Discussion of Findings	35

5.1.1 Summary and Significance of Previous Interventions	36
5.1.2 Summary and Significance of Behavioral Observations	38
5.1.3 Summary and Significance of Social Media Survey	38
5.1.4 Summary and Significance of A Dog’s Day Out Pet Expo	39
5.2 Limitations	40
5.3 Recommendations	40
5.3.1. Launch Social Media Campaign	41
5.3.2 Facebook Posters	43
5.3.3 Educational Video Series	43
5.3.4. Recommendations for Subsequent IQP	43
5.4 Conclusion	44
5.5 Reflections	46
References	47
Appendices	60
Appendix A: Verbal Consent Form	60
Appendix B: Evaluation of Past Interventions Survey	61
Appendix C: Social Media Preferences Survey	64
Appendix D: Map of A Dog’s Day Out Plan	68
Appendix E: Seven Simple Steps to Share the Beach	69
Appendix F: General Video Script	69
Appendix G: Little Penguin Video Script	70
Appendix H: Fur Seal Video Script	70
Appendix I: Checklist for Future Event	71
Appendix J: A Dog’s Day Out Facebook Event	73
Appendix K: Public Perceptions: Risks in Dog and Coastal Wildlife Interactions Data, n = 205	73

## List of Figures

Figure 1: Little Penguin .....	7
Figure 2: New Zealand Fur Seal .....	7
Figure 3: Interactive Map of Coastal Areas and Regulations .....	10
Figure 4: Modified Timeline Gantt Chart .....	16
Figure 5: Proposed Geofilter .....	20
Figure 6: Example Social Media Poster for Facebook .....	21
Figure 7: Are Dogs a Threat to Wildlife? .....	26
Figure 8: Beaches as Off-Lead Exercise Areas .....	26
Figure 9: Social Media Usage .....	30
Figure 10: Proposed Poster Campaign .....	31
Figure 11: DOC Video Stills .....	31-32
Figure 12: Dog’s Day Out Poster .....	33
Figure 13. Dog’s Day Out Pet Expo .....	34
Figure 14. Dog’s Day Out Sticker .....	41
Figure 15. Lead the Way Online Poster .....	41

## List of Tables

Table 1. Beach Regulations in the Greater Wellington and Lower Hutt Regions .....	11
Table 2: Observations of Wellington Region Dog Owners .....	18
Table 3: Dog Owner Awareness of DOC Campaigns .....	26
Table 4: Behavioral Observations .....	28

## Chapter 1: Introduction

Domestic animals, such as dogs and cats, can cause harm to wildlife. Many people assume that cats are the greatest threat to wildlife. Cats, a popular pet around the world, are often left to roam around outside. While many assume cats exclusively hunt mice and rats when outdoors, recent studies have reported that cats attack a wide range of wildlife, especially small birds (Kobilinsky, 2016). An unexpected domestic threat to wildlife are dogs. Dogs constitute a genuine threat to wildlife, as 900 million domesticated dogs roam the globe (The Bark Side, 2017). They require daily exercise, which typically takes the form of walks around local neighborhoods and parks. Dog attacks and disturbances have contributed to the extinction of at least eleven species worldwide. Today, dogs are a known risk to 188 threatened species, which makes dogs the third most invasive mammalian predator (Wirsing, 2017).

In beachside environments, uncontrolled domestic dogs can attack endangered coastal wildlife. In these areas, dogs are commonly walked on beaches off-lead, which threatens the existence of these animals. For example, dogs in Wellington, New Zealand have made the news in recent years for attacks on threatened animal species. Coastal animals most at risk include penguins, small birds, and seal pups. In June 2017, an attack on two little penguins (*Eudyptula minor*) by a pet dog in the Houghton Bay area of Wellington was reported. Little penguins are endangered in New Zealand and protected by the Wildlife Act of 1953 (New Zealand Department of Conservation (b), n.d.). This act allows the Department of Conservation (DOC) to prosecute people that have brought harm to endangered animals.

According to the “2016 Wellington Dog Policy,” regulations have been put into place to manage dog access to public places. For instance, there are currently “Controlled Public Places,” where dogs can be allowed on lead, “Exercise Areas,” where dogs can exercise and socialize off-lead, and “Prohibited Places,” where dogs are not allowed at any time (Wellington City Council, 2016). Even though these regulations have been put into place, they are not always enough. While signage is present, many locals ignore recommendations in favor of personal experience. The wildlife is “out of sight, out of mind,” and if the dog owner has not seen the species themselves, they do not fear their dog harming them. In addition, most beaches have sections that are designated off-lead right next to areas where dogs are prohibited. If a dog is exercising in an off-lead area and catches the scent of a penguin in an adjacent restricted area, the dog will likely chase after the animal into the prohibited area. Without having the dog on a lead, the owner’s

control over their dog is limited. Additionally, dogs are prohibited from certain beaches during the workday but are free to roam the shoreline at night or during the weekends, to allow time during the day for families to visit the beach without dogs. In this case, wildlife is protected during some periods but left vulnerable during others. There are also some areas where the restrictions placed on dogs do not always line up with where penguins are nesting, leaving gaps in the protection (New Zealand Department of Conservation, 2018). It becomes apparent through research that there are many shortcomings in the regulations regarding lead laws on Wellington area beaches.

Multiple attempts have been made in the past to mitigate the damage done to coastal wildlife by domesticated dogs. In 2018, a group of Worcester Polytechnic Institute (WPI) students traveled to New Zealand to address these issues for their Interactive Qualifying Project (IQP). IQP is an opportunity for students to assist a local organization to address a societal need. The students found that owners preferred dedicated off-lead areas for dogs, as it provided their pets with greater freedom and socialization, despite warnings that these types of areas posed a greater threat to wildlife (Burke, Iler, Randall, Restrepo, 2018). The first group's surveys found that while 80% of dog owners understood that there are dog regulation policies in New Zealand, only 30% knew what species were present in the locations where the group surveyed (Dellaripa, Rooney, Banatoski, Naidoo, and Hires, 2017). This shows that while many dog owners are aware of information that is applicable to their dogs, there is a gap in their knowledge when it comes to coastal wildlife. Therefore, focusing a campaign on the endangered wildlife closes this gap. If dog owners become more aware of how often coastal wildlife are injured by dogs, and how fragile wildlife security is, they may be more willing to comply with regulations and put their dog on a lead. To combat this lack of knowledge, the students improved existing signage at beaches by creating more effective campaigns. Additionally, they proposed to introduce signs in areas where they did not currently exist.

The work completed by past groups of WPI students and DOC has encompassed multiple facets of dog ownership in New Zealand. The past WPI groups were effective in implementing new signage and the Department of Conservation has created multiple campaigns targeting dog owners. These campaigns included one called Lead the Way, which informed dog owners of where and when they can walk their dogs, and a color-coded system of leads indicating the temperament of their dogs. Other campaigns included blogs, videos, and wildlife



certification quizzes. Although many interventions have been put in to place, some aspects of improving wildlife safety have remained unfinished. This is indicated by the high number of attacks on coastal wildlife still occurring. The dog owners who contribute to these attacks by failing to control their pets have yet to be persuaded of the importance of this issue. One major untouched platform for increasing awareness is social media, an effective method of public outreach. As a result, social media is a key focus of our project.

The goal of our project was to emphasize the importance of keeping dogs under control when walking them on the beach. Our hope was that if more dogs are placed on lead, their owners would have more control over them, and therefore, would be able to keep them away from wildlife. This is critical in protecting the endangered species found on New Zealand beaches. We planned on bringing awareness to this issue by proposing a social media campaign to DOC in order to appeal to a wide audience. By using a targeted Facebook post, and the creation of a short educational video series for the Department of Conservation website, we illustrated the importance of protecting the coastal species that rely on the beaches for shelter and breeding. By introducing these interventions, we hoped to improve the human-wildlife interactions on the beaches of New Zealand.

## Chapter 2: Background

Wildlife is vital to the survival of ecosystems and biodiversity throughout the world. Domestic animals can be a danger to wildlife and pose threats to endangered species. In New Zealand, dogs are one of the main threats to endangered coastal wildlife. The Department of Conservation of New Zealand (DOC), the leading governmental organization involved in protection of nature, has worked to protect the coastal animals at risk. One improvement that must be made to current campaigns is increased focus on the public's perception of nature and its importance. By understanding New Zealanders' attitudes towards wildlife, the motive behind dog owners' actions can be addressed. Additionally, the complexity of this issue has made it difficult to investigate the most effective methods of informing the general public about this issue. Use of social media is of particular interest, due to its wide reach and general appeal. As society becomes more reliant on digital advances, social media is rapidly becoming a primary mode of influence.

### 2.1 Global Threats to Wildlife

Animals around the world are becoming threatened because of human influences, which involve a variety of factors. There are currently measures in place to try to improve these issues and reduce the impact humans have on wildlife. For example, a variety of laws and regulations have been put into place to try to prevent scenarios that cause such harm. These include imposed fines, hunting bans, and protected habitats. For example, cages are placed over sea turtles' eggs that are laid on various beaches in North Carolina, USA, in order to prevent raccoons and birds from eating them (Heber, 2017). In New Zealand, several species of penguins and seals are threatened. Today, these species are facing habitat loss from increasing farm pasture; threats from climate change; accidental fishing catches; oil from fishing boats; and predators including sharks, seals, sea lions, orca, skua, and some domestic animals (New Zealand Department of Conservation, n.d.). In recent years, this has resulted in a dramatic population decline in some areas of New Zealand. The New Zealand DOC has put together community efforts, replanting shrubs and plants, and providing nesting boxes, as certain seals and penguins have a "Nationally Endangered" conservation status. It is important to protect these species as they are an integral part of New Zealand's ecosystem.

One of the most preventable impacts humans have on endangered species is our history of domesticating animals. Today, common attacks on endangered species are caused by domesticated dogs and cats (New Zealand Department of Conservation, n.d.). In many areas worldwide, humans and animals are sharing habitats, which has exacerbated these problems. Cats are often let outside by their owners and left to roam around, unsupervised. Surveys show that many members of the public are not aware of the effect cats have on a wide variety of animals. The majority believes the stereotype that cats only attack mice in the wild (Kobilinsky, 2016). However, when cats are left to wander around outside, they often attack birds and small mammals, like squirrels and bunnies (Kobilinsky, 2016). A study in the United States of America found that 21 species of mammals and 62 species of birds fell victim to domestic animal attacks in 2012. Dogs also pose a major threat to wildlife, which is an issue typically gone overlooked. Dogs negatively impact wildlife through predation, habitat disturbances, and disease transmission (Kobilinsky, 2016). Even a well fed and cared for dog, if left unchecked, can be a threat (Australian Department of the Environment and our Heritage, 2004). Extinction caused by human intervention is a prevalent issue that has confronted many countries across the world.

## 2.2 Global Rules and Regulations

International governments have had to respond to the growing need for legislation and protection of endangered species from the increasing impact of humans. Many regulations and laws have been put in place to prevent the harm domestic animals can have on the habitats and endangered individuals. One example of a successful campaign to prevent harm to threatened species is the plight of the piping plover (*Charadrius melodus*). By implementing strict policies along beaches in East Coast states, the United States was able to raise the endangerment status of the piping plover from near extinction to threatened (U.S. Fish & Wildlife Service, 2006). These policies detailed time restrictions for beach access, which would allow the plovers time in their habitat to be undisturbed by beachgoers. These policies also limited vehicle access to the beaches in another attempt to limit auditory disturbances for the birds (U.S. Fish & Wildlife Service, 2006). In addition to these regulations, during nesting season, dogs must remain on-lead, and physical barricades are erected to prevent dogs from attacking the birds (Massachusetts Office of Coastal Zone Management, n.d.). There are also federally mandated rules that protect the piping

plover from human impact. This legislation is called the Migratory Bird Treaty Act, and most coastal birds, including the piping plover, are protected under penalty of jail time or fines of up to \$250,000 (U.S. Fish & Wildlife Service, MBTA, 2018).

Another important example of birds being harmed by domesticated dogs is snowy plovers (*Charadrius nivosus*). The snowy plover lives in the Golden Gate National Recreation Area (GGNRA) in San Francisco, where the birds have been threatened since 1993 (About Snowy Plovers, n.d.). The GGNRA is the only national park that allows dogs off-lead in the United States. This open exercise area for dogs is important to the dog owners of San Francisco, and they're eager to keep this rule in place. The GGNRA has proposed limiting lead-free recreation to about 2.5 miles of beach for dogs in order to protect the snowy plover, but the true problem lies in the lack of enforcement (Lee, 2016). Data from the GGNRA shows that 70% of dog owners do not comply with the lead laws already in place in snowy plover nesting areas, and the rangers do not enforce the rule in fear of upsetting passionate dog loving groups (Lee, 2016). Even though mortality rates of the birds due to domestic dogs have been lower in recent years, even minor disturbances are a significant event to migratory birds such as the snowy plover. Repeated disturbances by dogs and their owners exhaust the small birds and make migration patterns more difficult to uphold, which are crucial to their survival and reproduction (Lee, 2016.) It's not only the snowy plover the GGNRA is trying to protect. There are other coastal birds that are impacted by the presence of off-lead dogs, such as gulls and sanderlings, who are chased from the water line by off-lead dogs (About Snowy Plovers, n.d.). The Golden Gate National Recreation Area still struggles with enforcing and maintaining the use of leads to protect the snowy plover in 2018. This is a significant example of how lead laws and ensuring dog owners are aware and understanding of the issue of threatened animals in their own community is a complicated problem. From the example of the snowy plover, we can learn that most of the battle comes from educating dog owners on the importance of protecting wildlife and that enforcement is difficult to manage.

### **2.3 New Zealand Threatened Wildlife**

New Zealand is a country of two main islands, located in the middle of the Pacific Ocean and the southern hemisphere (Whitmore, 2014). Isolated for nearly 85 million years, New

Zealand became an ideal place for the evolution of a variety of distinct species that couldn't exist anywhere else in the world (Nathan, 2007). This isolation left plenty of time free from human settlement and domesticated animals, making New Zealand's environment suitable for the evolution of flightless birds. A select few of these birds includes three species of penguins, the little penguin (*Eudyptula minor*), the yellow-eyed penguin (*Megadyptes antipodes*), and the fiordland crested penguin (*Eudyptes pachyrhynchus*).



**Figure 1: Little Penguin (Proctor, 2019)**



**Figure 2: New Zealand Fur Seal (Proctor, 2019)**

Several species of penguins, mentioned above, are endangered in New Zealand. This is due to the disruption of their natural habitats and nesting behaviors. These small penguin species favor coastal habitat with quality nesting conditions, where they can nest in burrows dug from bare sand, under vegetation or in rocky crevices (New Zealand Department of Conservation, n.d.). Along the coasts, they live in small colonies of often less than five pairs, which makes them vulnerable to predator attacks (Forest and Bird, 2018). During the molting season, which lasts 2-3 weeks during the months of December-March, the penguins are especially at risk due to domestic animal attacks. Molting causes them to be unable to swim and hunt, requiring them to fast (Forest and Bird, 2018). In October 2018, a series of dog attacks resulted in fifty-eight fairy penguins being on a beach in Tasmania. Fairy penguins, which only live in Tasmania and New

Zealand, are a threatened species, and are particularly vulnerable due to this attack (AFP, 2018). Increased tourism in New Zealand has also posed threats to the nesting of these birds and disturbed their breeding process, thus, causing nests to fail. By walking their dogs in beachland habitats, humans pose a threat as dogs have the capability of wiping out an entire colony (New Zealand Department of Conservation, n.d.). Other threatened coastal wildlife species affected by this matter are the New Zealand sea lion (*Phocarctos hookeri*) and the New Zealand fur seal (*Arctocephalus forsteri*) (New Zealand Department of Conservation, 2018). These animals are most at risk in New Zealand. In the Wellington area, most fur seals prefer to reside on sandy beaches and usually hunt for prey no greater than 200 m below sea level. People and dogs can interrupt sleep patterns, as well as other significant behaviors (New Zealand Department of Conservation, n.d.). In addition, fur seals are a major victim of dog attacks on the shoreline.

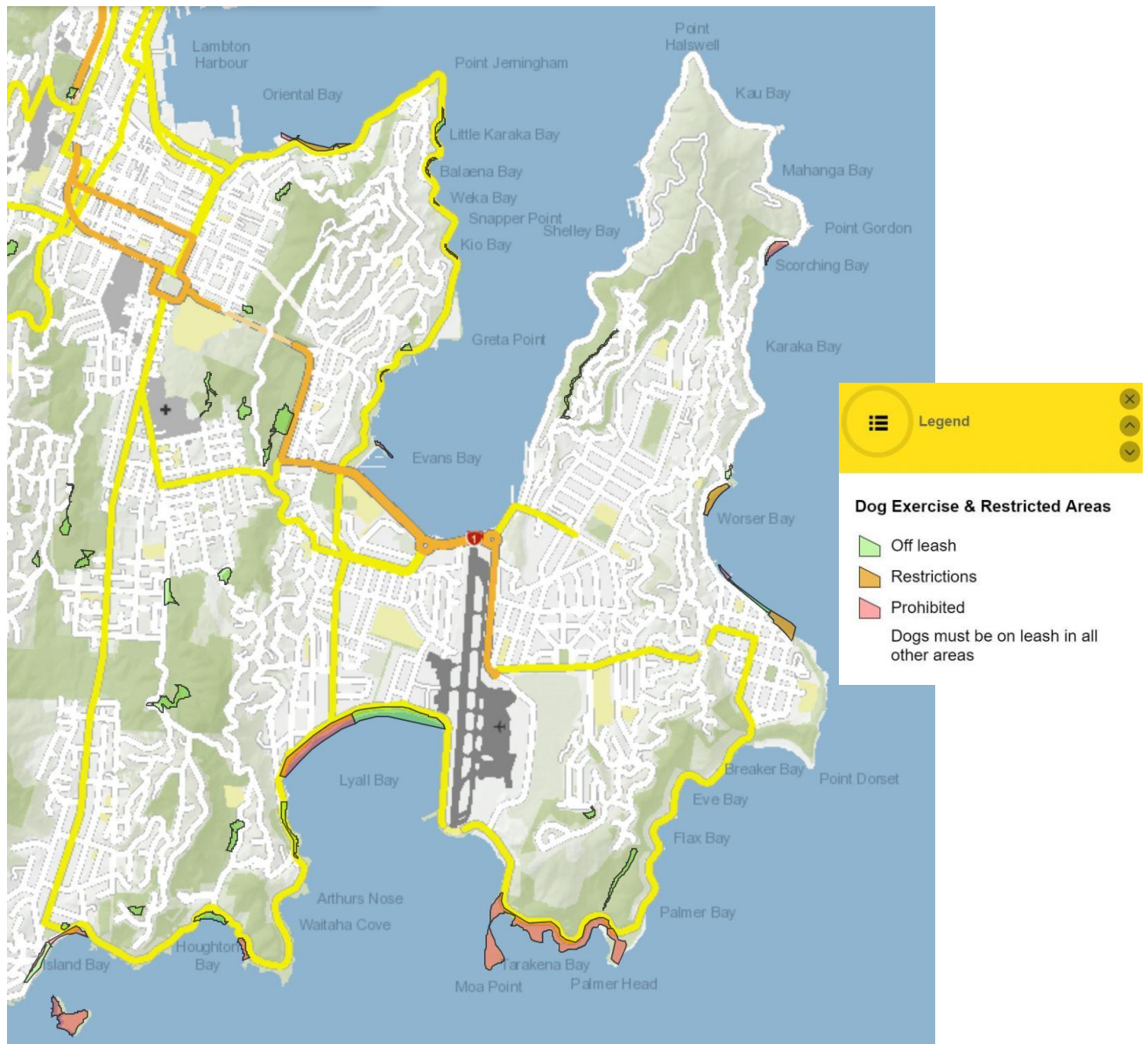
Prevention is the most effective way to help the coastal wildlife, such as restrictions requiring dogs to be walked on-lead, as many dog-penguin attacks are lethal, even with medical intervention. The most common injuries resulting from dog attacks are puncture wounds, which lead to uncontrollable internal bleeding (New Zealand Department of Conservation, 2018). Birds are especially vulnerable, as they have little blood and bleed out very quickly, so surgeries are risky and frequently unsuccessful. Many die slow and painful deaths, which cannot be seen from the external injuries (New Zealand Department of Conservation, 2018). Dogs owners in New Zealand are required by the law to ensure they are doing their part to prevent their dogs from causing harm (New Zealand Department of Conservation, 2018). In New Zealand, laws and regulations have been put into place in order to protect endangered species such as those previously described from threats.

## **2.4 Regulations Protecting Wildlife in New Zealand**

With many endemic animals in New Zealand, it is critical that the biodiversity of the islands be preserved. Dogs pose a threat to the coastal wildlife living and nesting along the beaches of New Zealand, which often coincide with where dog owners prefer to let their dogs exercise and socialize. There are existing policies that are specifically focused on dogs in New Zealand. If a dog qualifies as “menacing,” indicating that the dog has attacked a person before or done damage to an endangered habitat, the dog must be on-lead and muzzled at all times in public, and be fenced in at home (New Zealand Legislation, 1996). Since more people and dogs

have immigrated to New Zealand, and the endangerment status of many animals has changed since 1996, amendments had to be made to the existing legislation concerning dogs.

In 2016, Wellington, New Zealand set forth its own policy regarding the impact dogs have on the environment and natural habitats. This policy clearly defines three types of public lands in which dogs are allowed. The first is referred to as a “Controlled Public Place.” In a Controlled Public Place, dogs are allowed to enter, however they are required to be on a lead at all times. The second category of land is referred to as “Exercise Areas.” In these areas, dogs are allowed off-lead to exercise and socialize with other dogs. The third and final category of land is referred to as “Prohibited Areas.” No dogs are allowed in these areas, except for official service dogs (Wellington City Council, 2016). An example of this can be seen in Figure 3, below, which shows dog restrictions enforced within public land in the Greater Wellington Area.



**Figure 3: Interactive Map of Coastal Areas and Regulations (Wellington City Council, 2018)**

There are additional fees that can be accrued if a dog owner violates these laws, or if a dog harms, or kills, a threatened species. However, this policy is particularly difficult to enforce, as it is required to prove malicious intent the part of the owner, which, if proved, results in a fine of 700 to 1000 New Zealand dollars (Wellington City Council, 2016). New Zealand’s laws and regulations encompass the many threats that domestic dogs pose to wildlife. However, regulations will not make a difference if they fall on deaf ears or are not enforced. The attitudes



of the people of New Zealand make a significant difference in how effective these regulations are.

### 2.4.1 New Zealand Application of Regulations

The areas of most concern for endangered coastal wildlife are beaches. The majority of beaches in New Zealand fall under these Controlled Public Places, with restrictions regarding dogs. Our project is specifically focused on the Greater Wellington and Lower Hutt area beaches including Oriental Bay, Freyberg Beach, Lyall Bay, Paekakariki, Ngati Toa, and Whitireia Park. Table 1, below, shows the regulations enforced in each of these areas.

**Table 1: Beach Regulations in the Greater Wellington and Lower Hutt Regions**

Beach	Dog Policy
Oriental Bay	*Dogs allowed off-lead from May 1st to October 31st *Prohibited from the beach from November 1st to April 30th
Freyberg Beach	*Dogs prohibited from beach at all times
Paekakariki	*During the winter and summer months, dogs permitted on-lead from the Southern end of Ames Street Reserve to the mouth of the Wainui Stream *Dogs permitted off-lead from the other side of Wainui Stream mouth to the coastal areas of Queen Elizabeth Park *Rules apply strictly between the times of 7pm and 10am due to nocturnal wildlife activity
Lyall Bay	*Dogs permitted off-lead from steps in seawall, opposite 30 Lyall Parade (200 metres from the eastern side of the children's playground) to the airport at end of beach *Dogs prohibited from steps in seawall opposite 30 Lyall Parade (200 metres from the eastern side of the children's playground) to the western end of beach towards bathrooms

Ngāti Toa Domain	*Dogs permitted off-lead in beach areas and on-lead in green areas
Whitireia Park	*Dogs permitted off-lead from 6am to dusk, must be under control at all times *Dogs permitted on-lead only in Onehunga Bay area of park

Wellington City Council, 2016

## 2.5 New Zealand’s Perception and Predisposition Towards Wildlife

New Zealand is home to a large number of animal species unique to its islands and, overall, New Zealanders want to preserve their country’s beauty and indigenous habitats. This is particularly true in regard to its Maori culture (Shah, 2014). Preserving the environment and culture is important to New Zealand people as they believe in taking great care of nature and all things, which have a “mauri” or life force. Damage to the mauri or human domination of it leads to loss of ecosystems and degrades human life. Due to this belief, New Zealanders are, overall, passionate about protecting nature, however, much of the population is not aware of the endangerment many wildlife species face. According to last year’s WPI IQP team, 32% of all people surveyed were unaware of the coastal wildlife species threatened in New Zealand (Burke et al., 2018). Our hope was that if people were better informed about the issues going on in nature, the response to these protection efforts would improve. How dog owners feel towards the value of the environment is significant to implementing successful interventions that protect vulnerable coastal wildlife.

Last year’s IQP team researched the motivations of dog owners and created a Dog Owner Model with four different categories of dog owners by cross-tabulating the dimensions of knowledge and behavior (Burke et al., 2018). The first category is the “Conscientious Dog Owner” which is made up of those who have a large amount of knowledge of the coastal wildlife and have control over their dogs. The second category is the “Uninformed Dog Owner.” This group is made up of those who have control over their dogs but do not have much knowledge of the coastal wildlife. The third category is the “Reckless Dog Owner.” This group is made up of dog owners who are uninformed of the coastal wildlife and their dog’s impact on it; these dog

owners do not have their dogs under control. The final category in the model is the “Negligent Dog Owner.” These owners have knowledge of the coastal wildlife but do not believe that their particular dog could be a problem or do not care about the potential harm that may occur to wildlife. Last year’s IQP group decided to focus intervention methods on the “Uninformed” and “Reckless” categories of dog owners and omitted interventions that targeted the other two groups of dog owners. Our main focus will be on the “Uninformed” category of dog owner, since the largest remaining gap is related to dog owners understanding how their dogs pose threats to wildlife (Burke et al., 2018). Social media is an effective way to fill this gap, by providing a bridge for dog owners to understand how the control of domesticated dogs protects endangered coastal wildlife species. Utilizing a social media campaign allowed our group to reach and inform dog owners that have control over their dog, but are unaware of how their pets pose a danger to wildlife by helping owners learn more about the species at risk.

## **2.6 Social Media Usage in a Campaign**

Social media is defined as any online platform that is used as a tool for social networking. It comes in a variety of different formats, including Facebook, Snapchat, and YouTube. In particular, youth are gravitating towards Snapchat, preferring the photo-focused app over other social media outlets. In New Zealand, three quarters of young citizens aged 18 to 24 use Snapchat daily (Waldegrave, 2018). On the other hand, Facebook and YouTube are popular among older populations, where 56% of the population reported using one of these platforms daily (Jones, 2013). In today’s society, social media is an essential tool in facilitating conversation and sharing information among the public. Therefore, social media has replaced other means of campaigning that have been used in the past (Rogers, 2018).

Other tactics, such as posting signs, are not as effective as social media campaigns in changing public action (Acevedo, Acevedo-Gutiérrez, Belonovich and Boren, 2010). Studies have shown that respondents are more likely to forget what is on a sign compared to an advertisement seen on the internet. Social media is often interactive, which has been proven to further aid in its effectiveness. When an individual consumes ads on social media, they are tailored specifically to that individual’s interest. These studies focused on how social media consolidates information and advertisements, and thus is more effective than general signage and advertisements in other forms of consumption (Social Media, 2016). Additionally, the

information posted on social media is continuously at our fingertips, as the average person checks their phone 160 times per day (Allagui and Breslow, 2016). In 2009, a study in New Zealand looked at the effectiveness of posted signage. The signs told people to stay at least five meters from seals sunning themselves on the beach. The study results showed that signs made no difference in how close people got to the seals (Acevedo, Acevedo-Gutiérrez, Belonovich and Boren, 2010).

In this age of networked technology, social media campaigns are used more and more. Starting in 2013, the town of Monmouthshire, Wales started using social media to combat the issue of people not picking up after their dogs. They made comical posts to get the community's attention on the importance of cleaning up after your dog. Just days after, the posts had received over 200 tweets and 300 Facebook likes. Unfortunately, no follow up reports were conducted to evaluate the success of the campaign in the years following (Reynolds, 2014). One example of a successful social media campaign was completed by a company called Wealthsimple in 2019. Wealthsimple created a paid advertising campaign that utilized social media to reach out to their target age demographic of 29- year-olds (Joyce, 2018). The company interviewed 56 real people about their money problems and posted videos on different platforms including YouTube, Instagram, Facebook, and Twitter (Beltrone, 2017). The videos received millions of views, including 1,851,028 views on YouTube within the first five months, in addition to the company obtaining widespread attention from the videos. Anyone could react to these videos, post comments, or tag friends and this is the reason the ad campaign was so successful (Grace, 2018). By using a hashtag, comment, retweet, or open group on social media, anyone can post their thoughts, experiences, and reactions to the topic. This can push a public conversation and it puts common faces to the problem at hand (Cooper, 2018). This form of individual contribution and impact is why our project sought to implement a social media campaign to educate the public about dog owner control over their dogs. By proposing a social media campaign, our group gave DOC the tools needed to allow the public to become more aware of the impact they have on protecting vulnerable coastal wildlife.

## Chapter 3: Methods

The primary goal of our project was to minimize the threat of domestic dogs to the endangered coastal wildlife of New Zealand. We planned to target dog owner behavior to bring about this change through intervention and education. Our goals were defined through the following objectives:

- Determine the effectiveness of previously implemented interventions, including signage and survey results
- Observation of dog owner behavior in relation to posted lead regulations
- Create and propose a social media campaign to increase public awareness of wildlife endangerment
- Organize a pet expo to be used as a working model for future events

To accomplish our objectives, we utilized a variety of methods to gather information. These methods included surveys, behavioral observation, interviews, a pet expo, and designing a social media promotion in accordance with New Zealand's most frequented social media sites. Figure 4 shows a timeline of our proposed interventions. At the conclusion of surveying and behavioral observation, we analyzed the data collected. A video series was created, not to educate people of the rules and regulations of dog control, but rather to make an emotional appeal to the audience in order to show people why they should care about controlling their dogs and protecting the coastal wildlife. A pet expo was organized as another method of educating dog owners and spreading awareness in person.

	Week 1: 1/6 - 1/12	Week 2: 1/13 - 1/19	Week 3: 1/20 - 1/26	Week 4: 1/27 - 2/2	Week 5: 2/3 - 2/9	Week 6: 2/10 - 2/16	Week 7: 2/17 - 2/23	Week 8: 2/24 - 3/2
Behavioral Observation								
Effectiveness of Prior Interventions Survey								
Filming for Video								
Video editing								
Phase 2: Behavioral Observation & Survey for Social Media Intervention Method								
Implementing Campaign and Expo								
Writing for Results Section								
Writing for Conclusion Section								
Editing and Revision								
Presentation								

Figure 4. Modified Timeline Gantt Chart

### 3.1 Determine the effectiveness of previously implemented interventions, including signage and survey results

One of our goals was to evaluate the efforts of a 2018 WPI student IQP team, as they had recommended new signage that DOC has since implemented. Our focus was analyzing how effective these new measures have been in changing the opinions and behaviors of dog owners, in relation to dog and coastal wildlife interactions (Burke et al., 2018). We used on site surveys and behavioral observations to gather the data we needed to evaluate the interventions implemented in the previous year.

Surveying dog owners gave us the quantitative and qualitative data needed to directly compare with the information gathered from the past year’s IQP research, and determine if the interventions initiated by DOC have been effective in preventing the negative impacts of dogs (McLeod, 2014). The focus of these past efforts was to increase the number of dogs on lead by the coastline through the use of signs. By counting the number of dogs on lead at each location before and after a specific implementation, we achieved a preliminary indication of the effectiveness of the past campaign. Last year’s IQP team’s survey asked participants how often they leash their dog, ranging from always on lead to always off lead (Burke et al., 2018). If an increase in the ratio of dogs on lead to dogs off lead was measurable, the interventions

implemented in the previous year would be considered effective. Any increase in the percentage of dogs kept on lead, compared to the past year, was a significant increase in regard to our project, and we considered this to be evidence of effectiveness.

Our group traveled to Ngati Toa Domain, Whitireia Park, Oriental Bay, Lyall Bay and Paekakariki beach. All these locations, excluding Oriental Bay, are the same locations surveyed by last year's IQP group. This kept our results consistent for comparison to last year's data. Based on last year's research, the highest foot traffic on beaches occurred between 7 and 9 in the morning. To take advantage of this, we arrived on sites and began surveying during these times (Burke et al., 2018). However, we made our own observations and surveyed at various points throughout the day, as demographics can vary at different time periods. Our goal was to gather two hundred responses from dog owners on the beaches of New Zealand. We came to this acceptable number of responses after talking with Jeff Dalley, a social science specialist working with DOC. Jeff advised us to increase the number of responses from last year's project in order to have statistically significant results that can be applicable to the wider dog owner population of Wellington. We also aimed to interview those who do not have dogs, in order to get a broader view of the public's attitudes and opinions towards this issue. However, dog owners constitute the primary focus of our study.

Participants were chosen randomly through convenience sampling and asked if they would be willing to take our survey and sign a confidentiality waiver. When we were surveying a participant, one of us was reading the questions and recording the responses while another team member was writing down observational data on the participant and their dog. Last year's IQP team recommended this method to us because it is not as intimidating to the participant as having four interviewers listening. This tactic also let the participant keep their hands free to control their dog and it let the second team member jot down quick notes, quotes, and qualitative data (Burke et al. 2018).

We used the Qualtrics app and website on our phones to administer the surveys on site and store the results online in a secure location. We gathered a sample size of two hundred and four participants. The survey we used can be found in Appendix B, and it includes topics we wanted to know the average dog owners' opinion on, such as how they feel about keeping their dogs on lead and the importance of biodiversity. These questionnaires were crucial to our understanding of how open dog owners are to intervention and education on how to protect

endangered species from the impact of domesticated dogs. Our survey was made with clear and concise questions and a Likert scale for answers. A Likert scale is a format with available answers ranging from “strongly disagree” to “strongly agree” (Trochim, 2006). After results were gathered, the Likert scale responses were used to analyze our data for later reference in Qualtrics. The scale allowed us to see trends in the data, such as which demographics answered with “strongly agree” to a question compared to a different demographic that answered “strongly disagree.”

After the survey data was collected, we were able to separate the responses by the way the participants answered. The main way we coded the data was by grouping responses by positive, negative, or neutral answers. We used the Qualtrics site to analyze the survey data and an Excel spreadsheet to display the data graphically (Trochim, 2006). This showed us how the recent interventions affected people’s perceptions of protecting coastal wildlife and their opinions towards dog control.

### 3.2 Observation of dog owner behavior in relation to posted lead regulations

**Table 2: Observations of Wellington Region Dog Owners**

Record Number	Behavior	Date	Location	Time
1	Dog off lead, running across beach	17/01/19	Lyll Bay, Wellington	10:24 AM
2	Dog on lead, close to owner	18/01/19	Hataitai, Wellington	9:15 AM

It was critical that we understood how the dog owners themselves were changing their thoughts and behaviors towards protecting endangered species, not only that they were recognizing signage and legislation. To understand this issue, we took part in behavioral



observations, while administering our first surveys at the previously specified beaches. We made qualitative observations of the beach or region being observed, and included how many people were present with dogs, how many dogs were off-lead, and how many owners were obeying the indicated lead laws (University of Nebraska Lincoln, n.d.). Table 2 is an example of how we modeled our field notes and recorded observations. The table is based on a lecture on behavioral observation given at University of Nebraska (University of Nebraska Lincoln, n.d.). Behavioral observation served as an effective method to gaining a preliminary understanding of this complex issue.

While observing the behavior of the dog owners, we conversed with them about their opinions and feelings towards the policies that restrict dog activity. The conversations we had with the dog owners provided further insight into the reasoning behind their actions that, when paired with observations, gave us a distinctive viewpoint of dog owners. The discussions resulted in interesting quotes and opinions that laid the foundation for our social media campaign. We used the ideas of dog owners to form the media to be exactly what the owners wanted to see.

### **3.3 Create and propose a social media campaign to increase public awareness of wildlife endangerment**

Following the first phase of behavioral observation and surveying dog owners about past interventions, we implemented an additional survey to understand how dog owners in New Zealand perceive social media. Before creating and proposing a social media campaign, it was crucial that we understand which platforms dog owners frequent the most and how they perceive messages portrayed to them through social media (Waldegrave, 2018). The social media surveys can be found in Appendix C, and contain questions concerning which applications New Zealand dog owners favor, how often they use them, and if their social media profiles accurately portray their interests. The survey gave us information on how our specific demographic of dog owners use social media.

Our third objective was to utilize technology by creating a social media campaign, in order to increase public awareness of endangered wildlife. Effective social media campaigns can involve concepts of imagery and social modeling, which we proposed to be implemented in the form of social media posts, particularly via Facebook. Imagery is a very powerful marketing tool

to help the mind formulate an idealized social model to promote certain behaviors or even product purchases (WD, Evans, 2008).

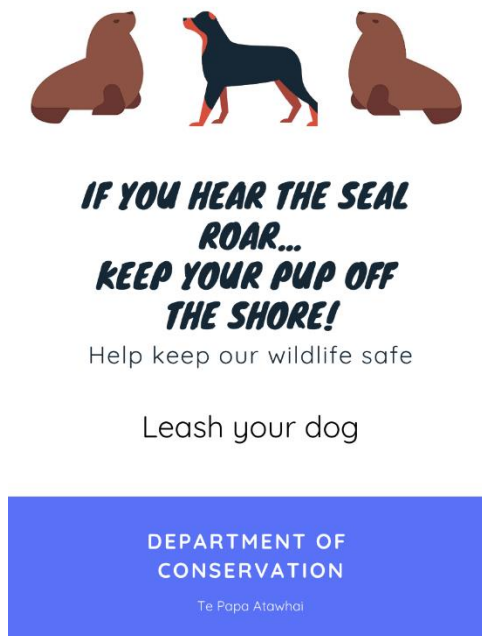
In New Zealand, Snapchat is a popular social media app for young adults, aged 18-30 years old. Among all dog owners in New Zealand, 67% are between the ages of 18-34, which makes young adults the primary demographic of dog owners (Companion Animals in New Zealand. 2016). In order to reach this audience, we created a Snapchat Geofilter. A Geofilter is a design that appears on a Snapchat when the user is in a specific location (Snapchat, n.d.). The filter, Figure 5, was designed by our team, and featured the New Zealand Department of Conservation logo, to deliver a visually appealing and succinct message about the importance of protecting New Zealand's endangered species from domesticated dogs. However, the results of our preliminary social media preference survey did not support the research, as Snapchat was not one of the most popularly reported social media sites used among dog owners. Additionally, the create your own Geofilter feature was not yet active in New Zealand, and therefore our Geofilter was not able to be created.



**Figure 5: Proposed Geofilter**

A 2017 study found that the most common social media platform is Facebook, when looking at the New Zealand population as whole (Pacheco & Melhuish, 2018). This makes

Facebook an ideal platform for social media posts, as it is popular among older generations as well (Jones, 2013). Therefore, posting on Facebook would be another effective method of educating dog owners on the threats their dogs have on coastal wildlife. For instance, if a dog owner follows a Facebook group for dog videos, that person will mostly see media focused on dogs within their feed. One example of a potential post includes the following illustration, shown in Figure 6. Figure 6 displays a simple slogan, “If you hear the seal roar, keep your pup off the shore,” to grab the reader’s attention. It is short and succinct to get the point across that dogs can be harmful to coastal wildlife. Each of these figures would pop up as a post within a user’s feed, each including a link to the New Zealand DOC’s website article related to each program. This provided the option for these social media users to educate themselves further on the issue. Furthermore, posts such as Figure 6 could be posted in specific dog walking Facebook groups in Wellington, such as a very popular group known as Walkies Adventures Wellington. Many dog owners follow this page and offer the opportunity to contact each other.



**Figure 6: Example Social Media Poster for Facebook**

The posters were made using Canva, a design website that specializes in creating designs targeted to specific websites, as well as posters that can be physically printed out. The designs were based around common themes found during our conversations with dog owners during preliminary surveying, such as appreciating nature and not believing an owner’s dog would

attack another animal. We used free template designs to create the backgrounds of the posters and used three different rhetorical styles to create specific emotional appeals. Then, the DOC logo was added to the posters.

After creating the posters, we sent them to the social media team and the publishing team at DOC, and after repeated correspondence, DOC approved the designs for potential use within a social media campaign. Figure 10c, found in section 4.3.2 was decided as the best option, because it matched the current campaigns that DOC is running in 2019. DOC's main critique of the posters was that the DOC logo had specific requirements to be used. Additionally, the messages had to be carefully written as to not seem accusatory.

Additionally, we created a video series that consisted of a main video just under two minutes long and two shorter videos, that we recommended to DOC to post on the homepage of their website. To make the video series we filmed on a GoPro Hero Series 7 camera. At each beach we surveyed, we filmed landscape shots and close up shots of dogs on the beach. For all of our landscape filming we mounted the GoPro on a tripod for stability. We wrote up a script to narrate each video. After the script was approved by DOC, we recorded the audio narration of Laura Boren, a DOC science advisor, at Titahi Bay. We chose this location because it is a popular dog walking area in Porirua. We recorded the audio on a UHF Wireless Microphone System. This lapel microphone allowed us to record Laura's voice clearly while only picking up a small amount of the background noise on the beach. We recorded each script narration at least twice and gathered over three hours worth of footage in order to have ample footage to choose from we started creating the videos in Adobe Premiere.

Once we completed filming at all the sites, we backed up all of the footage to a computer and to a five hundred gigabyte external hard drive. After this, we imported the media into Premiere, a video editing software by Adobe. We matched up each video clip to the audio narration, so when the narrator was talking about fur seals, a clip of a fur seal would play. Because dogs often came up to us while we were unprepared, some of the clips were quickly filmed without the tripod, and as a result, appeared shaky. In order to edit these shaky clips, we used the built-in warp stabilizer effect on Premier to smooth out the resulting media. We used color corrections on most clips to highlight the object of focus in the frame. This effect helped make the wildlife in any landscape shots stand out against the background. Using a Creative Commons web search, we found five options of background music that complemented the tone

of the video. We chose the one that we felt best conveyed our message. We used vocal enhancers on all of the audio narrations to make Laura's voice stand out from the background noise. We also added a high pass filter of one hundred hertz to negate the noise from wind that the lapel microphone picked up. Once we finished all of the video and audio effects, we added open captions to the video. After each version of the video we created, we received feedback from DOC and revised the video. We went through eight versions of the main video and three versions of the shorter videos before we were satisfied with the results.

### **3.4 Organize a pet expo to be used as a working model for future events**

On 16 February, 2019 we held *A Dog's Day Out* Pet Expo at Titahi Bay, Porirua NZ from 7pm-9pm. Our group organized this event in the preceding weeks. This consisted of gaining approval from the Porirua City Council to hold an event at the beach, creating a health and safety plan, and submitting an outline to them mapping out how we would be set up along the coastline. This map can be viewed in Appendix D. We designed posters and flyers to be used to hang out at the event and to be used online for advertisement. Our designs first went through a series of approvals from DOC's Marketing, Publishing, and Social Media teams. Several series of modifications and redesigns occurred in order to adjust our mockups to match DOC's brand. Once our poster was approved, seen in Figure 12, below, a Facebook event was created on DOC's page to promote the event. We posted about the event in several other Facebook pages, "Wellington Animal Services," "Whitireia Restoration Group," and "Titahi Bay Canine Obedience Club" to encourage dog owners to attend. A screenshot of the event page can be found in Appendix E.

In order to make the event a success we reached out to a variety of individuals. First, we reached out to Jesikah Triscott from DOC, as she organized and launched the Lead the Way Pet Expo in Dunedin in 2018. She gave us logistics and tips for running a successful event, including what games to run, how to get people to come, and what messages from Lead the Way we should focus on. We contacted the pet store Animates to get dog toys and dog treats donated to the event. The toys and treats were used as prizes for the beach game we ran. We contacted the Canine Obedience Club in order to have responsible dog owners and trainers at the event to model proper dog behavior. Other members from DOC attended the event to further promote the Lead the Way Campaign launched in 2018. Dog owners at the event were able to take a wildlife

certification quiz and then purchase a lead to become involved in the campaign. We also administered our initial social media survey to gather more responses.

These four objectives were used to guide our project and complete our goal of preventing domesticated dogs from harassing and injuring the coastal wildlife in New Zealand. Through analyzing past projects and implementations, creating a social media campaign across various platforms, and tracking changes in the behavior of dog owners throughout the project, our team aimed to effectively change the culture of dog walking in New Zealand and protect coastal wildlife.

## **Chapter 4: Results**

In this chapter, we present the data collected through a series of different surveys targeting the behaviors, attitudes, and social media preferences of dog owners in the Greater Wellington Region of New Zealand. In addition, we report behavioral observations taken during our time at local beaches. Following our observations and surveys, we created a tailored campaign for social media and held a pet expo, in order to address the dog and coastal wildlife issue. After thorough analysis of our data, we present our major findings.

### **4.1 Analyzing the effectiveness of previously implemented interventions**

In 2018, DOC introduced a variety of new campaigns, including newly designed signage, blog posts, and the Lead the Way Campaign. A focus of the survey we administered was to determine how well the public knew about these new interventions and if they had changed dog owners' opinions on the matter. This survey was the second part of a longitudinal study and the data collected this year was compared to survey data collected last year to determine any changes in dog owner behavior.

#### **4.1.1 Previous Interventions Survey Results**

Over the course of two and a half weeks, we gathered 204 total responses to our survey, 195 of which were dog owners. Only the responses from dog owners were used for data analysis. Surveys were completed both online and in person. Seventy-two of those responses were gathered in person at Greater Wellington Area beaches, with the remaining responses received

online through Wellington Facebook dog owner groups. The dog owner groups chosen were “Dog Lovers of Porirua,” “The Real Dog Owners of Wellington,” and “Hound and About Dog Walking.” These Facebook groups were chosen because they were the groups with the most members and the highest activity. In addition, “Dog Lovers of Porirua” was suggested by DOC.

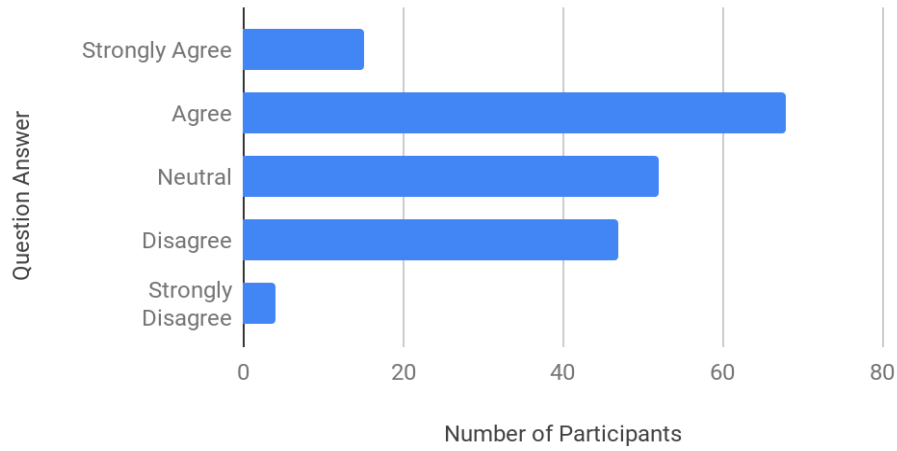
An interesting result is that 81% of the dog owners we asked said they knew about the species that are endangered in New Zealand. This backs up our previous research that indicated that New Zealanders are aware of the niche New Zealand species and their endangerment. However, just because dog owners are aware of the species, it does not indicate that they are keen to protect them.

The most conflicting finding was whether respondents thought dogs were a threat to wildlife. Overall, as shown in Figure 7, 45% of respondents agreed that dogs posed a threat to wildlife and 28% disagreed. In addition, 27% of respondents answered “neutral” to this question. The most common response we received with this question was, “Some dogs are a threat, but mine isn’t.”

Even though we found that almost half of dog owners believed dogs were a threat to wildlife, 75% of participants responded that beaches were a good area for dogs to run freely off-lead (Figure 8). Contradictorily, 60% of respondents also said that dog activity on beaches should be regulated for the sake of wildlife. Additionally, 70% of dog owners disagree with the possibility of a regulation stating that dogs must be on-lead on beaches at all times.

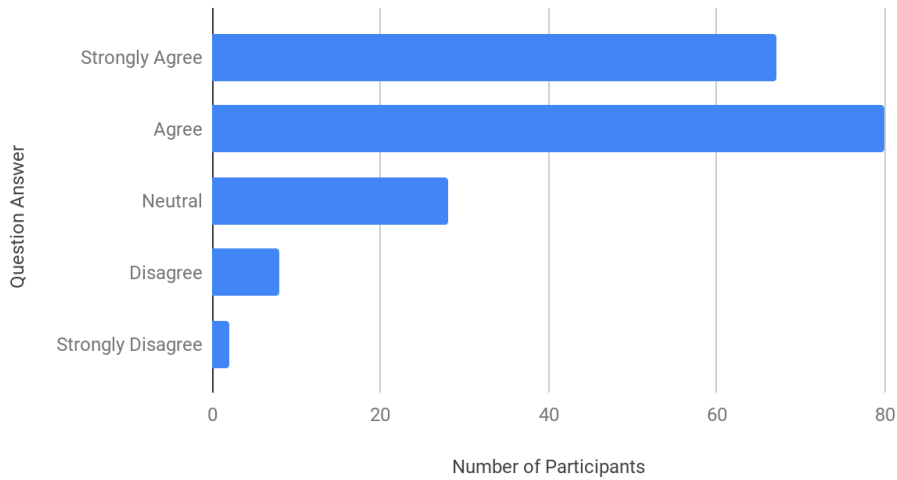
Our results show that the majority of dog owners are unaware of recent campaigns implemented by DOC. Since the introduction of the Lead the Way campaign in 2018, only 6% of participants indicated that they had heard about it, which is displayed in Table 3. We also found that 11% of people had heard of DOC’s Pet Expo and 18% were aware of the increased beach signage.

### Dogs are Dangerous to Wildlife



**Figure 7: Are Dogs a Threat to Wildlife?**

### Beaches are Good Areas For Dogs to Run Freely



**Figure 8: Beaches as Off-Lead Exercise Areas**

**Table 3: Dog Owners Awareness of DOC Campaigns**

Campaign	Percentage of Respondents
Lead the Way	6.21%
DOC Blog Campaign	1.13%



DOC Pet Expo	10.7%
DOC Increased Beach Signage	18.1%

#### 4.1.2 Conversations with Dog Owners

Throughout our time spent surveying, we were able to have interactive conversations with dog owners. As our conversations continued, common themes began to reveal themselves. These discussions allowed us a deeper understanding of the dog owners’ positions on DOC and lead laws, and how they feel towards interventions being conducted by DOC. Our conversations with dog owners showed that many individuals recognized that their dog was off-lead in a strictly on-lead area. However, our survey data showed that they were also aware of the threat dogs posed to wildlife, with 45% of dog owners agreeing that dogs pose a threat to wildlife in New Zealand. One quote that came up in multiple interviews is, “My dog would never attack another animal.” Additionally, a common belief held among dog owners is that dogs do not pose a threat in Wellington specifically. Quotes that exemplify this belief are, “Wellington is not a problem area,” and “some wildlife can be threatened by dogs, like dingos in Australia.” One common comment by dog owners indicated that while they are aware of the issue facing coastal wildlife in New Zealand, they don’t believe their dogs have any involvement in the issue. One dog owner mentioned to us that, “leashing is a good start, but it will never solve the problem at hand.”

#### 4.2 Observation of dog owner behavior in relation to posted lead regulations

By observing the actions of dog owners while walking their dogs on the coast, we found a variety of things that occur. Primarily, dog owners do not respect the posted signs depicting the lead laws and regulations. Our behavioral observations, described in Table 4, were taken by one team member while another surveyed the dog owner. We recorded the number of dogs we saw on-lead and off-lead at each location, while taking note of the posting regulations. For example, at Oriental Bay, five dogs were recorded to be on-lead and one off-lead, when the dog policy of the area clearly states that dogs are prohibited from the area between November 1st to April 30th. In addition, at Freyberg Beach, located next to Oriental Bay, three dogs were observed on-

lead, even though dogs are prohibited from this beach at all times. Overall, we observed that the majority of dog owners do not follow the posted signs and regulations present at beaches.

#### **Table 4. Behavioral Observations**

Table 4, below, shows the behavioral observations collected at a variety of locations in the Greater Wellington Area. The observations include the number of dogs seen on and off-lead, along with any behaviors that were particularly distinctive.

<b>Location</b>	<b>Dogs On- Lead</b>	<b>Dogs Off- Lead</b>	<b>Dog Policy</b>	<b>Behavioral Observations</b>
Oriental Bay 11/01/2019 9am-1pm	5	1	*Dogs prohibited from the beach from November 1st to April 30th	*Many dogs present when the rules prohibited dogs during that time
Freyberg Beach 11/01/2019 9am-1pm	3	0	*Dogs prohibited from beach at all times	*Dog present when the rules state no dogs allowed
Lyall Bay 22/01/2019 12pm-7pm	6	37	*Dogs permitted off-lead from steps in seawall, opposite 30 Lyall Parade (200 metres from the eastern side of the children's playground) to the airport at end of beach	*A particularly aggressive dog on-lead, all dogs running off-lead in approved section
Paekakariki 17/01/2019 9am-2pm	5	3	*During the winter and summer months, dogs are permitted on-lead from the Southern end of Ames Street Reserve to the mouth of the Wainui Stream	*Dog off-lead digging large holes

Ngāti Toa Domain 24/01/2019 10am-2pm	3	0	*Dogs permitted off-lead in beach areas and on-lead in green areas	*Not many dogs present
Whitireia Park 27/01/2019 9am-12pm	1	12	*Dogs permitted off-lead from 6am to dusk *Permitted on-lead only in Onehunga Bay area of park	*Almost all dogs off-lead ignoring all of the posted regulations

### 4.3 Create and propose a social media campaign to increase public awareness of wildlife endangerment

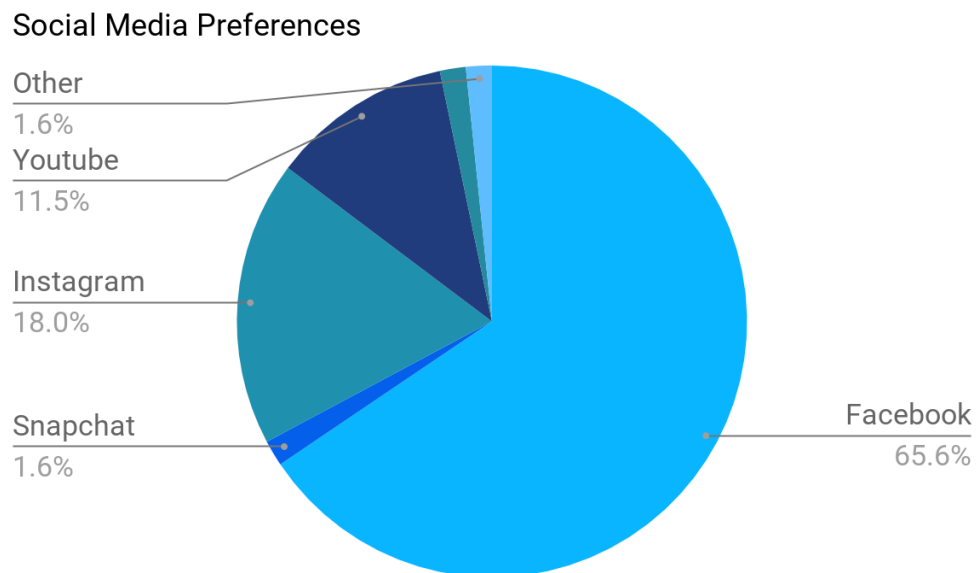
We created a social media campaign in order to promote positive dog owner behavior to mitigate dog and coastal wildlife interactions. By surveying the public before proposing our campaign, we were able to determine the most frequently used social media platforms among New Zealanders, primarily dog owners. Our proposed campaign, seen in Figure 10, was focused primarily on Facebook. We created a promotional video series for DOC’s website and social media accounts. In addition, we planned and organized *A Dog’s Day Out Pet Expo*, which took place on 16 February 2019 at Titahi Bay, Porirua NZ.

#### 4.3.1 Social Media Preferences Survey Results

We posted our social media preference survey on different Facebook group pages in addition to the New Zealand specific social media site, Neighbourly, and multiple subReddits targeted towards Wellington. The Facebook group pages included “Dog Lovers of Wellington,” “The Real Dog Owners of Wellington,” “Wellington Dog Walkers,” and “Dog Lovers of Porirua.” Our data, seen in Figure 9, showed that out of the participants that were dog owners 65.6% reported that Facebook was their favorite social media platform. Following Facebook, 18.0% of dog owner respondents said Instagram was their favorite platform. 11.5% of dog owners respondents said YouTube was their favorite platform. Furthermore, 94% of all respondents said that, in their opinion, they use social media often. Additionally, 69% of all participants estimated their daily social media usage to be between 2-4 hours. When asked how they would respond to our campaign idea if they saw our graphics and videos on social media the

majority of responses were positive. The most common responses included “That would be fine,” “I would be interested,” and “Good idea.”

Additionally, only 1.6% of respondents said that Snapchat was their preferred platform, which shows that it is not as popular as other platforms. In our original social media mockups, we had included a Snapchat Geofilter to launch along with our posters and video. However, through learning about New Zealand culture and by our survey responses, it became evident that Snapchat is not a prominent social media platform in New Zealand, as we originally thought. Therefore, a Snapchat Geofilter was not included in our campaign because it would not reach a large population of dog owners.

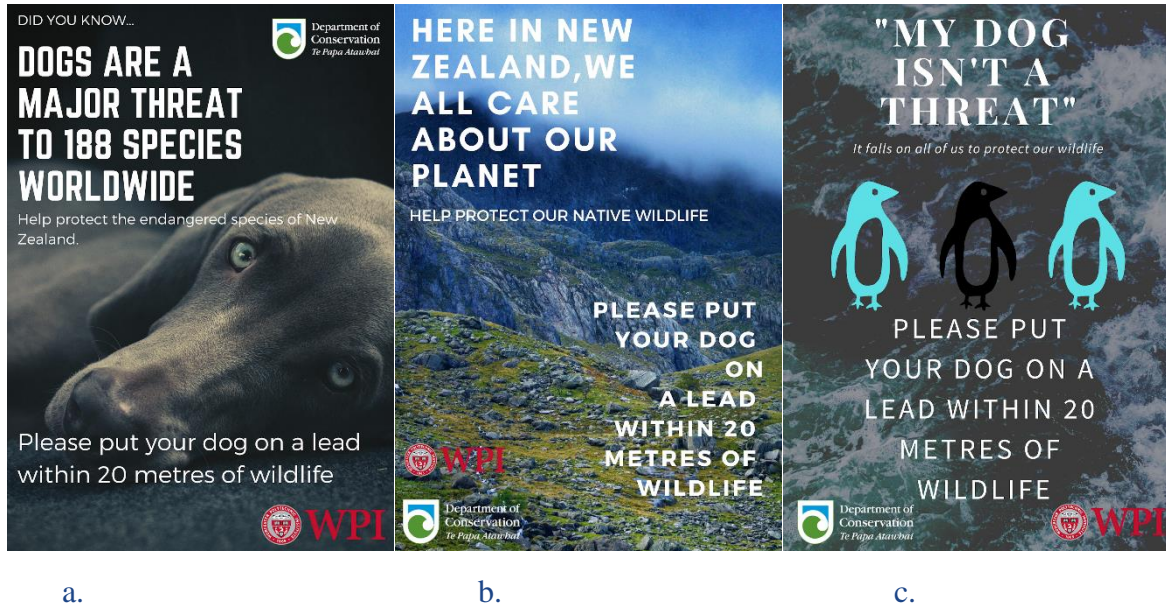


**Figure 9. Preferred Media Usage**

### 4.3.2 Social Media Proposal Results

We created a variety of graphics to promote on social media, in order to spread awareness and educate the public on the severity of dog-wildlife interactions. A focus of these campaigns is to inform the public, in the hopes of increasing the number of dogs on-lead while on beaches. The graphics we created can be seen in Figure 10, below. The poster in Figure 10a depicts a dog, targeting the issue that dogs are a threat, and that you would never want your dog to be the dog known for attacking another animal. In Figure 10b, the poster focuses on the message that protecting native wildlife and species is important, as New Zealand citizens greatly value the

diversity of wildlife in their country. Figure 10c, targets the idea that every person plays a role in preventing their dog from attacking wildlife.

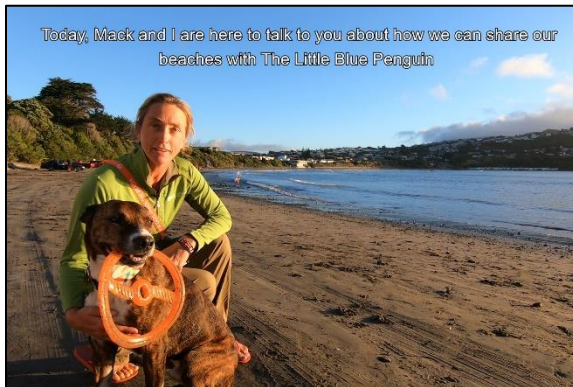


**Figure 10. Proposed Poster Campaign** Posters designed for a social media campaign targeting dog owners to mitigate dog and coastal wildlife interactions

In addition to the posters, we created a promotional video series for DOC's website to educate viewers on the importance of keeping dogs under control. Stills for each video are included below. Figure 11a is a still from the large main video. Figure 11b is a still from the Little Blue Penguin specific video. Figure 11c is a still from the Fur Seal Specific video.



a



b



c

**Figure 11. DOC Video Stills** Stills from the video created for the DOC website promoting safe sharing of the beach to protect endangered wildlife

The main video included a brief introduction to the problem and provided suggestions for dog owners. The video focused on the narrator talking about domestic dogs being capable of attacking coastal wildlife, and the importance of dog owners preventing these attacks (Maquire, 2016). The script for the narration of each video can be seen in Appendix F through Appendix H, which was spoken by DOC's Laura Boren. The narrator's voice discussed the importance of controlling your dog and how coastal creatures can be disturbed due to the dogs' activity. However, it reminded dog owners that if they keep their dog under control, and on a lead when marked, coastal wildlife can stay safe. The overall message was that everyone can share the beach as long as you stay the recommended twenty meters away from wildlife. Throughout the video, scenes of area beaches are shown, along with dogs walking on beaches. Coastal wildlife,

including seal pups and little blue penguins, are shown throughout the video. This developed the audience's (the dog owners) emotional connection towards the coastal wildlife (Maquire, 2016).

The two shorter videos focused on the little penguin and fur seal, independently. Both of the shorter videos start with a shot of Laura and her dog, Mack, speaking directly to the camera and introducing the animal of focus for the video. The penguin specific video then went into different shots of the little penguin taken at the New Zealand National Aquarium. The video ended with helpful tips on how you can better control your dog in order to protect the little penguins. The fur seal video transitioned to video clips and pictures of fur seals. The video ended with tips, much like the penguin video, on how to protect the fur seals. A representative of our sponsor, Laura Boren, suggested making the shorter videos as an addition to the longer main video, to create a video series on the subject of sharing the beach focusing on the wildlife. At the end of each video, DOC's logo came into focus. On the 16th of February 2019, at *A Dog's Day Out Expo*, we showed the main video to the participants at the event and gathered their reactions and opinions on the video.

## 4.4 Organize a pet expo to be used as a working model for future events

### 4.4.1 Dog's Day Out Pet Expo

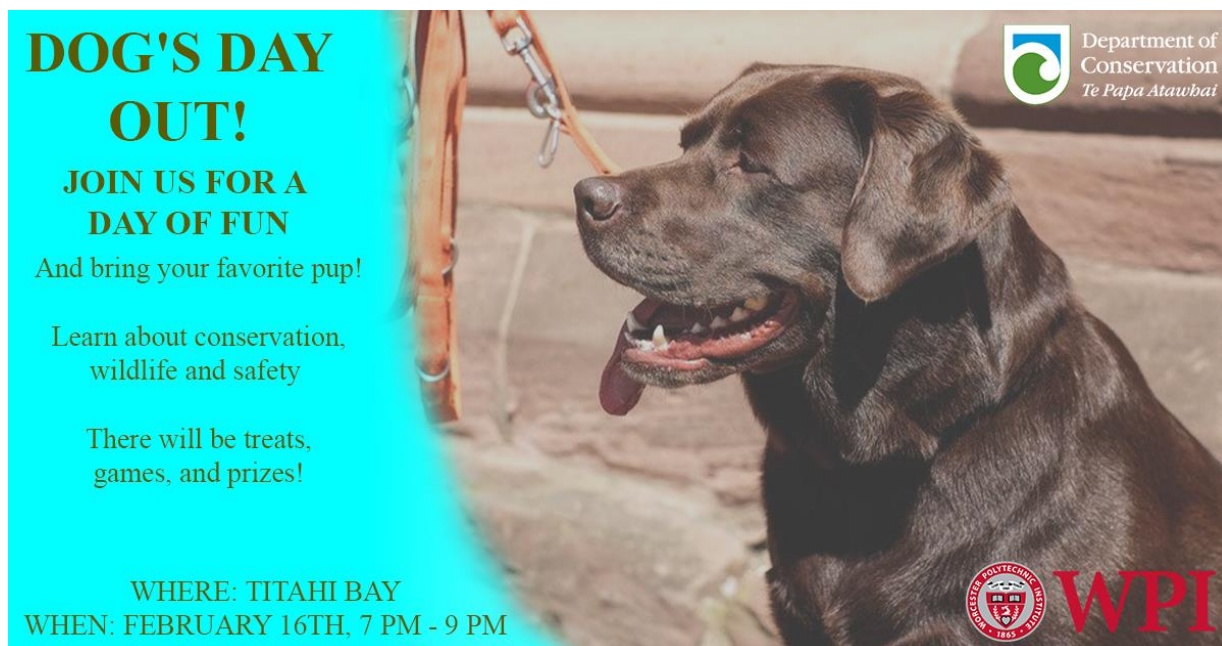


Figure 12. Dog's Day Out Poster

During *A Dog's Day Out Expo*, we promoted the Lead the Way campaign. We asked dog owners to take DOC's Lead the Way wildlife certification quiz and sold Lead the Way leads. We promoted "Seven Simple Steps to Share the Beach," which can be found in Appendix I. The "Seven Simple Steps" refers to the post Laura Boren made on DOC's blog that outlines how to share the beach with the coastal animals. By spreading awareness in this manner, a large number of dog owners were able to hear first-hand how important it is to prevent dog and coastal wildlife interactions.

At the event we ran the "Guess and Throw" game to teach dog owners about keeping a safe distance from wildlife on the beach. In this game, the dog owners threw a toy and guessed how far the throw was, and then their dog retrieved it. The purpose of this game was to show dog owners what 20 meters looked like, so they are able to protect wildlife on the beach and keep a safe distance from wildlife. It also taught dog owners other responsible practices, such as using a dog toy as a decoy to distract dogs if wildlife is present. The game was also a way for dog owners to see how well their dog listens to them and fetches the toy. Figure 13, seen below, is a picture from the event half an hour after the start. We had two tables set up underneath the gazebo, one table had information on the Lead the Way program and our team worked at the other table showing our video to the attendees and gathering feedback on it. To the left of the gazebo is where we held our Guess and Throw game for the attendees.





**Figure 13. A Dog's Day Out Pet Expo**

#### **4.4.2 Creating a Checklist for a Model Event**

Due to the success of *A Dog's Day Out Expo*, DOC asked us to create a checklist that can be used to plan future events. They want to use this as resource when holding additional awareness expositions. DOC wanted to expand events such as *A Dog's Day Out* to be run with limited DOC involvement, so organizations such as the Titahi Bay Canine Obedience Club can host educational events on their own. The checklist can be found in Appendix J.

## **Chapter 5: Discussion**

### **5.1 Discussion of Findings**

Our research and project work gave us a significant amount of raw data and observations of how dog owners present an important niche in wildlife conservation in New Zealand. The two surveys we administered offer a range of insights into how effective past interventions implemented by DOC have been and how effective a social media campaign can be.

### **5.1.1 Summary and Significance of Previous Interventions**

One particularly noteworthy finding was that dog owners as a whole are very aware of endangered species in New Zealand. Out of 195 respondents who owned dogs, this year 81% of participants stated they know of these species, compared to last year where 77% of surveyed participants reported knowledge of these endangered species. This increased awareness is an indication of the effectiveness of DOC's campaigns implemented in 2018. As previously mentioned, our group discussed data collection method with Jeff Dalley, a social media specialist of DOC. Although the group in 2018 collected fewer responses, we decided it was still imperative to the success of the overall project that we compared our data between iterations of the project. As previously explained in the results section, 18% of dog owners noticed an increase in signage pertaining to lead laws in popular dog walking areas along the coast. While this number seemed like a small percentage, it was important to understand that this signage was placed in October of 2018, leaving about three months for dog owners to take notice of the new signs. However, a smaller percentage of dog owners, only 6%, had noticed the Lead the Way campaign DOC has initiated. This indicated that the method in which Lead the Way was being marketed may not have been the most effective style for that specific campaign, and was not reaching the target audience. Thus, Lead the Way had great potential to benefit through a social media campaign and increased coverage.

One of the major takeaways from our surveys showed that there was an increase in the amount of people who had noticed DOC's increased signage and lead regulations on beaches. When compared to the first iteration of this three year project, there has been an increase in the percentage of people who confidently report they are aware of the endangered coastal wildlife in New Zealand. However, dog owners are still resistant to regulations on beaches. Many believe beaches are a good area to exercise dogs, and therefore dogs should be allowed to run off-lead. Last year's IQP group investigated why dog owners value their dogs' time off-lead when on a beach. Through transcripts of interviews with dog owners, their findings showed that dog owners overwhelmingly valued their dog's ability to get more exercise and social time with other dogs (Burke et al., 2018). Our data from our preliminary survey that focused on dog owner behavior showed that a similar belief still prevailed, as 75% of dog owners strongly agreed or agreed that beaches are good areas for dogs to be allowed to run off-lead. This opinion remained consistent throughout the three year duration of the project. Contradictorily, a majority of dogs owners still

reported that endangered species on beaches should be protected. Our data showed that 60% of dog owners strongly agreed or agreed that dog and human activity should be regulated for the sake of wildlife protection. The first group to tackle this issue in 2017 found that their data supported a similar position, as their data showed 48% of dog owners agreed that beaches are more important for native wildlife than for human and dog activity (Dellaripa et al., 2017).

As an additional interesting comparison of data, during the first iteration of this project, the students posed a question asking “Should dogs be prohibited during breeding seasons?” Their data showed that 64% of dog owners agreed with this restriction. Our survey posed a more fixed question, asking “Should dogs be leashed on certain beaches at all times?” Unsurprisingly, 70% of dog owners disagreed with this statement. The interesting observation that can be drawn from this comparison is that the limitation of restricting dogs from beaches during specific breeding seasons could offer a compromise between wildlife conservationists and dog owners. While dog owners were unwilling to put their dogs on lead at all times, they agreed that it is important to provide protection to species during mating and nesting seasons. This agreement offers the opportunity to create a compromise between those who want the freedom to run their dog off-lead and those who place a higher value on the protections of wildlife. Graphs from the report completed in 2017 can be found in Appendix K.

One of the most significant takeaways from our first survey on previous interventions was that dog owners as a population are ambivalent on if they view dogs as a threat to coastal wildlife. This disagreement within the population further supported that there was a crucial a gap in the dog owners’ connection between the threats to the endangered coastal wildlife and what posed the threat. Many dog owners agreed that dogs can be dangerous to wildlife, but do not associate their own pets with that threat. Previous campaign efforts have fallen short in informing dog owners that even their “well-behaved” dog could pose a threat to wildlife on the coastline. This gap is what our group attempted to target with the social media campaign. After this realization, the major goal of our project became to create a delivery system to allow dog owners to understand their unique role in the ecosystem of New Zealand and how they offer a specific protection to coastal wildlife by placing leads on their dogs.

### **5.1.2 Summary and Significance of Behavioral Observations**

Based on our behavioral observations and through conversations with dog owners, we found the majority of dog walkers are aware of the posted regulations, however, do not follow them. Because many people still walk dogs off-lead, when they should be walked on-lead, further methods of awareness need to be explored. We found through these observations that signs are not the most effective way to change behavior, as dog walkers know these rules exist, but do not feel compelled to change. Therefore, additional studies need to be done in order to determine why dog owners in New Zealand do not want to follow lead laws.

### **5.1.3 Summary and Significance of Social Media Survey**

Our graphic posters were met with positive responses from our target demographic of dog owners that use social media, specifically Facebook. It was important to see that the large majority of respondents said that they use social media often, because this directly influences the effectiveness of any potential DOC social media campaign. This supported our idea for a social media campaign and made our idea more viable as a credible campaign strategy. Having the majority of respondents say their average time spent on social media per day is 2-4 hours was also promising. According previous studies in 2018, the average amount of time New Zealanders spend on the internet on any site in 6 hours per day (Waldegrave, 2018). This report is greater than the number of hours people have been self-reporting through our survey. While our survey shows less time per day spent online, the data still supported that social media is used several hours per day in New Zealand.

Even though only half of survey respondents said they notice ads, if a social media ad reached half of the dog owners that use social media, that would be a large improvement. Surprisingly, the responses to “I notice ads when I’m using social media” were almost evenly spread from strongly agree to strongly disagree. The response to our question pertaining to how the user would feel if they saw our campaign on their social media feed was mostly positive. Responses included quotes such as “Nice idea!,” “I would love it!,” and “Both traditional & social media is important for the targeted audience. As traditional media acts as a reminder, with social media, it would make me continue to watch the ad.” Dog owners seemed interested in this campaign more than just any advertisement that they would see on social media because it pertains to them directly. We gathered from the responses that people are more interested, and

more likely to read, posts that are pertinent to their lives and about which they have opinions on. This approach is backed up by a 2015 article in the *Harvard Business Review* which found that in order to hold an audience's attention, an advertisement, or post, must engage with the audience in a way that the audience finds meaningful. A successful example of this strategy was when an advertisement for Duracell batteries starred a mountain climber specifically to target and engage with the outdoor enthusiast viewers (Teixeira, 2015). In this same way, our posters will engage with the dog owners as our campaigns revolve around dogs.

#### **5.1.4 Summary and Significance of A Dog's Day Out Pet Expo**

*A Dog's Day Out* was a successful event. Approximately fifty people attended the event for a long enough time to participate in the games, and discuss the threats posed to coastal wildlife by dogs with us and other DOC representatives. Every dog in attendance played fetch with us, meaning that everyone accompanying a dog was able to learn to stay twenty meters away from animals to prevent dangerous interactions. The public that attended the event reported that they enjoyed the time to socialize their dogs and learn about the animals they share the beach with. The owners also appreciated the snacks and toys that were provided for their dogs. At the end of the event, our group asked dog owners how we could improve on events in the future for further recommendations to be made to DOC. Feedback we received indicated that dog owners would have preferred the event to be at an earlier time in the day, and that it should have been advertised more within dog groups dedicated to specific regions of New Zealand, such as Porirua.

The only critiques of our campaign that we received were focused on the soundtrack of the video, with claims of the music being “sappy.” However, dog owners conveyed that they did feel more educated on the issue after viewing the video, and that the video did trigger an emotional reaction. An interesting quote from one owner was “the video is really good. If you can get people to actually care about this issue, then they will be inspired to seek out more information on their own.” *A Dog's Day Out* was an excellent opportunity for us to engage with dog owners and ask how they feel about the current lead laws on beaches and how they would suggest reducing the number of dog-wildlife interaction on beaches.

## 5.2 Limitations

Though we have made every effort to diminish limitations to our project, many are unavoidable. Initially, we thought it would be helpful to eliminate survey biases by using last year's survey to compare results. However we learned through surveying that most dog owners found that survey represented dog owners "unfavorably," and did not agree with DOC receiving information from that survey. From comments we received, we realized that we could have edited the survey to still obtain comparable results to last year's survey. From our experiences, dog owners were particularly upset at the prospect of the results of the survey implying that they believed their dog to have a greater intrinsic value than coastal wildlife.

Another major limitation we found is there is a lack of diversity of social media platforms in New Zealand. We found that social media strongly revolves around Facebook, therefore many platforms are unusable. Platforms such as Instagram and Snapchat generate less interest in New Zealand than in the United States, and although we planned part of our campaign around those platforms, research conducted while in New Zealand support that platforms outside of Facebook and Reddit would generate far less community involvement. This became a problem when obtaining enough results for our social media survey because in order to reach our goal of 100 responses, we found that posting the survey in Facebook and Reddit would help us reach this goal under our time constraints. Taking into consideration that 72% of our respondents chose Facebook as their favorite social media platform, when collecting the majority of our responses from Facebook, could potentially mean that our results from this specific survey are biased.

Although there were limitations present during our surveying procedures, social media presents a promising platform of outreach for DOC. It has the potential to reach a new generation of young dog owners and educate them on the impact their dogs could have on the coastal animals. From the coastal wildlife knowledge gap found in the "Dog Owner" survey, and discovering the Greater Wellington Area's most popular social media platforms, the ultimate goal of filling this knowledge gap will be fulfilled in the near future.

## 5.3 Recommendations

After several series of surveys given to dog owners, we were able to better understand the opinions and social media behaviors of this demographic in the Greater Wellington Area. By comparing what we found to data from previous years, we have been able to analyze the

effectiveness of previous efforts to mitigate dog-coastal wildlife interactions. After taking into account all of our survey data and behavioral observations of dog owners, we created a variety of recommendations. Our recommendations focus on capitalizing on social media as a means of informing and educating the community.

### **5.3.1. Launch Social Media Campaign**

Based on the data that we have collected, our recommendations focus on increasing DOC's presence on social media and using this as a means of awareness and education. Social media usage has climbed a significant amount in the past decade worldwide, which means the social media community in New Zealand has become larger, and is likely to continue to grow. We found that the dog owner population we surveyed uses social media often, approximately 2-4 hours each day. We also found that the majority of respondents said that they do notice advertisements on social media. Current reports state that social media ad spending in New Zealand was increased by 25% during 2017. This was predicted because most businesses are beginning to recognize that 90% of New Zealanders, over the age of 15, use social media, especially YouTube and Facebook (Waldegrave, 2019). These two findings support our recommendation that DOC continues to utilize social media.

We have created a variety of posters, flyers, and videos to be used as part of a social media campaign. We recommend that DOC continues to post these on their website and various social media accounts. These mockups can be seen in Figure 14 and Figure 15.

Our social media proposal is set to tentatively launch at the beginning of Seaweek, a DOC-run, week-long event promoting the health and safety of New Zealand's oceans and coastal wildlife. During this week, DOC will select which components of our proposal they see fitting to each event. DOC will have access to all graphics shown previously in the report, as well as the educational video series.



Figure 14. Dog's Day Out Sticker



Figure 15. Lead the Way Online Poster



### **5.3.2 Facebook Posters**

We recommend that DOC posts our proposed social media posters on their Facebook page and utilize paid advertisements to reach a wider target audience. Posting on Facebook specifically will ensure that awareness will spread more efficiently than it would if posted on another platform because, according to our initial social media survey results, Facebook is the most utilized social media platform among dog owners. Almost 70,000 people follow the DOC page on Facebook so by only posting on their page they would reach a large audience. We recommend that DOC shares the posts on their page for no cost and then use paid adverts to promote the campaign. By running advertisements with our posters and videos, DOC would be able to reach the Facebook users that do not follow the DOC Facebook page.

### **5.3.3 Educational Video Series**

We also recommend continuing work on the video series that our team started. This video series could be uploaded as weekly sessions on DOC's YouTube channel and on their website with the facts about each animal. By focusing more on the wildlife, it might increase the number of dog owners following beach regulations because they would be aware of the specific animals that their dog can impact. The video series attempted to target the dog owners' ability to empathize for the animals they are putting at risk, as our data shows that 51% of dog owners believe that some dogs do pose a threat to wildlife.

Future things to consider are that oversaturation of this campaign may cause more harm than good. Utilizing social media offers a potential method to reduce the amount of signage along beaches and prevent oversaturation, as it would reduce the amount of physical signage present on the coastline. The message of putting your dog on a lead when necessary can be spread in a more indirect manner, especially if the campaign is focused on leading by example. Easily persuaded individuals who often notice the signage and social media postings will feel more obligated to put their dog on a lead, resulting in a larger dog owner demographic that leads by example.

### **5.3.4. Recommendations for Subsequent IQP**

Our initial plan included the launch of a Snapchat Geofilter to remind dog owners to put their dog on a lead. However, from our social media survey we found that Snapchat is not as

popular in New Zealand, and New Zealanders are unable to design and post their own Geofilter. If the next “What Makes Dog Owners Unique” IQP team could have the Wellington community retake our survey, they would be able to see whether or not Snapchat has grown, to figure out if designing and posting a Snapchat Geofilter could possibly be another positive step towards growing our social media campaign.

Other areas that can be further explored include other avenues of education. For example, DOC could partner with the Wellington Zoo and create a program that promotes safe dog walking behaviors on beaches, in order to protect wildlife, particularly spreading the Lead the Way campaign. While the public is learning about different animals, they could also learn about how staying twenty meters away from wildlife they may see on the coast helps keep them safe. This would be an effective way to reach the public, as they are able to see many of the animals that are currently being threatened by dogs. By creating promoting an educational message in a fun environment people may not be as resistant to these messages.

## 5.4 Conclusion

The main goal of our project was to educate dog owners in order to lessen the number of attacks on coastal wildlife by dogs. Through our work, we have learned that many dog owners are aware of the rules and regulations surrounding this issue, yet do not follow them. Our results show that although many care about protecting the endangered coastal wildlife, they care about their dogs more. By introducing our social media campaign, we hope this will alter the attitudes of dog owners in the years to come.

As this is the conclusion of a multi-year project involving dog owners and wildlife, it is important to note that significant changes have occurred due to the variety of interventions that have been implemented. Throughout the three years that dog owners have been surveyed, we have seen positive changes through the implementations that have been introduced. At the start of the initial project, the majority of dog owners reported that they were not aware of the endangered coastal wildlife found on beaches. In addition, dog owners that were surveyed were not aware of the lead laws and regulations on their local beaches. Since then, more signage has been posted along the coastline designating on-lead and off-lead areas. Signs have also gone up informing beachgoers of the wildlife present on the beach. From the time these new signs were introduced in the Greater Wellington Area through our most recent surveying period, there was

an increase in the knowledge of dog owners. The results of the latest survey showed that over 81% of dog owners surveyed were aware of the endangered coastal wildlife species and almost 60% of dog owners surveyed supported the idea that there should be beach and lead regulations in order to protect wildlife. Thus, interventions targeting dog owners over the last three years have made a positive impact on their knowledge of the dog and coastal wildlife issue.

## 5.5 Reflections

### **Emily Flavin:**

This project has personally impacted me significantly over the course of seven weeks. Through planning our event for DOC, to creating posters and graphics for our social media campaign, I've learned a lot about my working habits and organizational skills. This project is the largest scale on which I have worked during my time at WPI, and it has shown to be the one with the greatest reach and purpose. The dog owners of New Zealand are extremely passionate and excited as a population, and it has been a privilege working with them.

### **Hayden Furcolo:**

I was very fortunate to be a part of this project and grow relationships with The Department of Conservation and our student team. I learned skills that I had little to no experience in such as the program Premier that we used to create the video and Photoshop which we used to make the sticker and posters. Over the course of this project our goals for the project were changed and we had to adapt and change with it. This experience has taught me how to work efficiently in a team and gave me the opportunity to explore New Zealand and meet many different people from all across the country.

### **Emily Proctor:**

Over the course of these past seven weeks, working on this project, I have learned how to contribute to such a significant project, how to build strong relationships with others, and about the unique New Zealand culture. I am incredibly grateful to have this opportunity to have worked alongside DOC and the very cooperating Wellington dog owner community. Writing and structuring our report, hosting a DOC event, and surveying the Wellington dog owner community on and offline, has helped me learn better organizational skills, and a great amount about the New Zealand people and their lifestyle. I am so happy to have been a part of this unforgettable learning experience.

### **Elena Stratis:**

Working on this project throughout the last seven weeks has allowed me to grow both personally and professionally. I have learned a great deal about time management, organization, and how to work effectively with others. It has been a pleasure to work with DOC on a project that I am deeply passionate about, and I will never forget the conversations I was fortunate enough to have with New Zealand's dog owners or my time spent in this beautiful country.

## References

A. G. Hocken. (2010). Cause of Death in Blue Penguins (*Eudyptula m. minor*) in North Otago, New Zealand. *New Zealand Journal of Zoology*. 27(4), 305-309. Retrieved from <https://www.tandfonline.com/doi/abs/10.1080/03014223.2000.9518239>

*About Snowy Plovers*. (n.d.). Retrieved Dec 10, 2018, from

<https://goldengateaudubon.org/conservation/snowy-plovers/about-snowy-plovers/>

This source, written by the Golden Gate chapter of the Audubon Society, focuses on the Snowy Plover in San Francisco County and the recovery efforts that are currently in place. The Golden Gate Audubon Society, part of the National Audubon Society, works with U.S. Fish & Wildlife Service, informs the public about native bird and engages them to help protect them. The article is relevant to our project for our background research into past and ongoing conservation campaigns for coastal animals.

Acedvedo, L., Acevedo-Gutiérrez, A., Belonovich, O., & Boren, L. (2010). How Effective are Posted Signs to Regulate Tourism? An Example with New Zealand Fur Seals. *Tourism in Marine Environments*. 7(1), 39-41. doi:10.372711544273 IOX12826772784874

AFP. (2018). 58 fairy penguins killed in suspected dog attack in Australia. *The Journal.ie*.

Retrieved Nov 19, 2018, from <http://www.thejournal.ie/fairy-penguins-killed-4290685-Oct2018/>

This source is about the death of fifty eight fairy penguins killed in Australia believed to be done by dogs. It is relevant to our project because it is an example of dogs attacking coastal wildlife in a location other than New Zealand. "The Journal" is a part of the Press Association, an online international journal that collaborates with authors around the world. The Journal represents news sources from organizations known as *Fora*, *The 42* and *The Daily Edge*.

Allagui, I., & Breslow, H. (2016). Social Media for Public Relations: Lessons from Four Effective Cases. *Public Relations Review*. 42(1), 20-30. Retrieved from <https://www.sciencedirect.com/science/article/abs/pii/S0363811115001575>

Audubon Connecticut. (n.d.). 8 Ways to Help Piping Plovers. Retrieved Nov 6, 2018, from <http://ct.audubon.org/news/8-ways-help-piping-plovers>

This source explains some tactics used in the state of Connecticut to protect the Piping

Plovers. Our project team used this resource to help gather information on how we can develop a campaign to protect the coastal wildlife in New Zealand. Audubon Connecticut is part of the National Audubon Society, whose mission is to educate the public about the conservation and protection of birds.

Baird, S. J. (2011). New Zealand Aquatic Environment and Biodiversity Report. *New Zealand Aquatic Environment and Biodiversity*. (No. 72). Retrieved from <http://docs.niwa.co.nz/library/public/NZAEBR72.pdf>

Bellingham, P. (2010). New Zealand Island Restoration: Seabirds, Predators, and the Importance of History. *New Zealand Journal of Ecology*, 34(1), 115-136. Retrieved from <https://newzealandecology.org/nzje/2905>

Beltrone, G. (2017). Errol Morris Shot 56 Soothing Ads for Wealhsimple, and He Stars in the Best One of Them All. *Ad Week*. Retrieved from <https://www.adweek.com/creativity/errol-morris-shot-56-soothing-ads-for-wealthsimple-and-he-stars-in-the-best-one-of-them-all/>

Boren, L. (2018, Nov 15,). Dog Owners: Seven Simple Steps to Share The Beach. *New Zealand Department of Conservation*. Message posted to <https://blog.doc.govt.nz/2018/11/15/dog-owners-seven-simple-steps-to-share-the-beach/>

This blog post was made by our sponsor Laura Boren. The post outlines seven steps that dog owners can take to protect the coastal wildlife and prevent harmful interactions between dogs and the wildlife. Our project promoted this post and we used a large pull out poster of the seven steps at *A Dog's Day Out Expo*. The Department of Conservation is a government agency responsible for persevering wildlife and nature in New Zealand.

Braswell, T. (2001). *Eudyptes pachyrhynchus* Fiordland penguin. *Animal Diversity Web*. Retrieved Nov. 18, 2018, from [https://animaldiversity.org/accounts/Eudyptes\\_pachyrhynchus/](https://animaldiversity.org/accounts/Eudyptes_pachyrhynchus/)

This source provided information on the fiordland penguin. We used this information in our background research because this was one of the animals of focus for our project.

This source is an educational resource associated with the University of Michigan and University of Michigan Museum of Zoology, which provides information about the origin of and conservation of biodiversity

Burke, M., Iler, K., Randall, K., & Restrepo, A. (2018). What Makes Dog Owners Unique? *Worcester Polytechnic Institute, Interactive Qualifying Projects*, Retrieved from [https://web.wpi.edu/Pubs/E-project/Available/E-project-030118-175729/restricted/IQP\\_NewZealand\\_2018\\_DOC\\_dogs.pdf](https://web.wpi.edu/Pubs/E-project/Available/E-project-030118-175729/restricted/IQP_NewZealand_2018_DOC_dogs.pdf)

This is a WPI IQP report from the 2018 project team that worked on this project in the previous year. We used the information that they gathered in their surveys to compare to our results in a longitudinal study and determine if the interventions implemented in the last year have been effective.

Busch, J., & Cullen, R. (2008). Effectiveness and cost effectiveness of Yellow-Eyed Penguin conservation measures. *Research Gate*. Retrieved from [https://www.researchgate.net/publication/23508039\\_Effectiveness\\_and\\_cost\\_effectiveness\\_of\\_Yellow-Eyed\\_Penguin\\_conservation\\_measures](https://www.researchgate.net/publication/23508039_Effectiveness_and_cost_effectiveness_of_Yellow-Eyed_Penguin_conservation_measures)

Chung, A. (2011). *Eudyptula minor* little penguin. *Animal Diversity Web*. Retrieved from [https://animaldiversity.org/accounts/Eudyptula\\_minor/](https://animaldiversity.org/accounts/Eudyptula_minor/)

This source provided information on the little penguin. We used this information in our background research because this was one of the animals of focus for our project. We also used the information in this source to help make the video on the little penguin.

Clayton, S. D., & Myers, G. (2011). In Myers G. (. G. (Ed.), *Conservation psychology : Understanding and promoting human care for nature* (2nd ed. ed.). Hoboken: Wiley-Blackwell.

Collette, D. (2017). Two more dog-related penguin deaths in Wellington frustrates councillor. *Dominion Post*. Retrieved Nov 1, 2018, from <https://www.stuff.co.nz/dominion-post/news/93640412/two-more-dogrelated-penguin-deaths-in-wellington-frustrates-councillor>

Collins, C. J., Chilvers, B. L., Osborne, A., Taylor, M., & Robertson, B. C. (2017). Unique and Isolated: Population Structure has Implications for Management of the Endangered

New Zealand Sea Lion. *Conservation Genetics*, 18(5), 1177. doi:10.1007/s10592-017-0969-z

Companion Animals in New Zealand. (2016). *The New Zealand Companion Animal Council Inc.* Retrieved November 23, 2018, from <https://www.nzcac.org.nz/>

Cooper, C. (2018). New social media campaign spotlights Texas' deadly roads. *Kens-TV*. Retrieved Nov 12, 2018, from <https://www.kens5.com/article/news/local/new-social-media-campaign-spotlights-texas-deadly-roads/273-612611054>

This source is from a San Antonio, Texas news station's website and includes a report and video about the dangerous roads in Texas and how the state transportation officials are using a social media campaign to bring awareness to the problem. We used this source in our project to get an idea of how other social media campaigns have been used in to bring awareness to a problem.

Davison, I. (2012, Apr 7,). New Zealand's Most Endangered Species. *New Zealand Herald*. Retrieved from [https://www.nzherald.co.nz/nz/news/article.cfm?c\\_id=1&objectid=10797165](https://www.nzherald.co.nz/nz/news/article.cfm?c_id=1&objectid=10797165)

Dellaripa, B., Rooney, E., Banatoski, I., Naidoo, L., & Hires, S. (2017). Public Perceptions: Risks in Dog and Coastal Wildlife Interactions. *Worcester Polytechnic Institute, Interactive Qualifying Projects*. Retrieved from <https://digitalcommons.wpi.edu/iqp-all/1743>

Donnison, J. (2015, Dec 12,). The Dog that Protects Little Penguins. *BBC News*. Retrieved from <https://www.bbc.com/news/magazine-35039105>

Endangered Species Coalition of Washington D.C. (n.d.). *Importance of The Endangered Species Act*. <http://www.endangered.org/importance-of-the-endangered-species-act/>

Endangered species of New Zealand. (2012). *Natural Heritage Collection*. Retrieved Oct 30, 2018, from <http://www.nhc.net.nz/index.html>

Faherty, M. (2018). Piping Plover Nesting Brings Beach Restrictions. *WCAI*. Retrieved Nov 11, 2018, from <https://www.capeandislands.org/post/piping-plover-nesting-brings-beach-restrictions-0#stream/0>



Fast Facts about Blue Penguins. (2018). *The West Coast Penguin Trust*. Retrieved from <http://www.bluepenguin.org.nz/about-blue-penguins/>

This source provides facts about the little penguin. We used this information to add to our background research section on the animal. This source was also relevant in providing information in our video on the little penguin. The Penguin Trust website provides information about the little blue penguin to inform the public and help save them from endangerment. The Penguin Trust conducts research and relays information to DOC and Wellington Zoo.

Ferland, D. (2013). *Phocarctos hookeri* New Zealand sea lion. *Animal Diversity Web*. Retrieved Nov. 18, 2018, from [https://animaldiversity.org/accounts/Phocarctos\\_hookeri/](https://animaldiversity.org/accounts/Phocarctos_hookeri/)

This source provided information on the New Zealand sea lion. We used this information in our background research because this was one of the animals of focus for our project.

Fiordland crested penguin. (2017). *New Zealand Endangered Species*. Retrieved Dec. 17th, 2012, from

<https://sites.google.com/a/cloud.waimeaint.school.nz/newzealandendangeredspecies/home/room-9/room-9-s-endangered-species-project/the-fiordland-crested-penguin>

This source provided information on the fiordland penguin. We used this information in our background research because this was one of the animals of focus for our project. This is an educational resource from teacher at Waimea Intermediate School, Nelson, New Zealand.

Flemming, S. A. (2013). Little penguin. *New Zealand Birds Online*. Retrieved from <http://nzbirdsonline.org.nz/species/little-penguin>

This source provides facts about the little penguin. We used this information to add to our background research section on the animal. This source was also relevant in providing information in our video on the little penguin. This source is an online encyclopedia of birds sponsored by DOC and the Te Papa museum.

Flint, E., Minot, E., Perry, P., & Stafford, K. (2010). Characteristics of Adult Dog Owners in New Zealand. *New Zealand Veterinary Journal*, 58(2), 69-73.

doi:10.1080/00480169.2010.65261

Forest and Bird. (2018). *Little penguins (kororā) life cycle*. Retrieved Nov 18, 2018, from <https://www.forestandbird.org.nz/resources/little-penguins-korora-life-cycle>

Freedman, B., & Duncan, L. (2004). Endangered Species - Human Causes Of Extinction And Endangerment, Why Are Endangered Species Important? *Science Jrank*. Retrieved Nov 3, 2018, from <http://science.jrank.org/pages/2467/Endangered-Species.html>

Government, L. (2018). Registered dogs and owners. *Local Government in New Zealand*. Retrieved Nov 1, 2018, from [http://www.localcouncils.govt.nz/lqip.nsf/wpg\\_url/Profiles-Local-Government-Statistical-Overview-Registered-Dogs-and-Owners?OpenDocument](http://www.localcouncils.govt.nz/lqip.nsf/wpg_url/Profiles-Local-Government-Statistical-Overview-Registered-Dogs-and-Owners?OpenDocument)

Grace, J. (2018). 7 Of The Best Social Media Campaigns (And What You Can Learn From Them). *Hootsuite*. Retrieved Nov 14, 2018, from <https://blog.hootsuite.com/social-media-campaign-strategy/>

Heber, S., Wilson, K., & Molles, L. (2008). Breeding Biology and Breeding Success of the Blue Penguin (*Eudyptula minor*) on the West Coast of New Zealand's South Island. *New Zealand Journal of Zoology*, 35(1), 63-71. doi:10.1080/03014220809510103

History of the yellow-eyed penguin species. (2017). *Yellow-eyed Penguin Trust*. <https://www.yellow-eyedpenguin.org.nz/penguins/about-the-yellow-eyed-penguin/history-of-the-species/>

Hughes, J., & Macdonald, D. W. (2013). A Review of the Interactions Between Free-Roaming Domestic Dogs and Wildlife. *Biological Conservation*. 157, 341-351. doi:10.1016/j.biocon.2012.07.005

Hunter, P. (n.d.). Margin of Error and Confidence Levels Made Simple. *iSixSigma*. Message posted to <https://www.isixsigma.com/tools-templates/sampling-data/margin-error-and-confidence-levels-made-simple/>

Jones, D. (2013). Social Media Market Share and Demographics in New Zealand. *Digital Marketing Blog*. <https://www.duncanjonesnz.com/social-media-marketshare->

demographics-zealand/

Kobilinsky, D. (2016, Oct 28,). JWM study: Domestic Cat Attacks Cause Variety of Wildlife Deaths. *The Wildlife Society*. Message posted to <http://wildlife.org/jwm-study-domestic-cat-attacks-cause-variety-of-wildlife-deaths/>

Lee, F. (2016). Off-leash dogs at ocean beach could be deadly for endangered birds, experts warn. *Hoodline*. Retrieved Dec 10, 2018, from <https://hoodline.com/2016/03/off-leash-dogs-at-ocean-beach-could-be-deadly-for-endangered-birds-experts-warn>  
This source talks about the risk dogs pose to the snowy plover in San Francisco and the proposed dog management laws. This was relevant to our project because it was important to research how other places dealt with protecting the coastal animals from domestic dogs. From seeing how other places handled this problem, our team created our social media campaign idea. *Hoodline* is an online newspaper providing the latest stories in major cities in the USA.

Long, J. (2017). DOC pleads with pet owners after two seal pups mauled to death by dogs. *Stuff National*. Retrieved Oct 31, 2018, from <https://www.stuff.co.nz/national/97941390/doc-pleads-with-pet-owners-after-two-seal-pups-mauled-to-death-by-dogs>

Mace, J., & Emeny, M. (2017). Caring for Wellington's coastal wildlife. *Dominion Post*. Retrieved Nov 1, 2018, from <https://www.stuff.co.nz/dominion-post/comment/94374608/caring-for-wellingtons-coastal-wildlife>

Maquire, A. (2016). 8 steps to creating a promotional video. *The Startup* Retrieved December 4, 2018, from <https://medium.com/swlh/how-to-create-a-promotional-video-707fa7a63019>

*The Startup* is an online publishing platform, including blogs. This source contained tips on how to create a promotional video. We used this reference when first conceiving our idea for a video series to write out an outline for what we wanted in our videos. We also used this source when writing the script for the video to ensure that the script flowed and made the objective of the video apparent to the viewer.

Massachusetts Office of Coastal Zone Management. (n.d.). Bring Your Dog to the Beach the

Coast-Friendly Way. Retrieved Nov 6, 2018, from <https://www.mass.gov/service-details/cz-tip-bring-your-dog-to-the-beach-the-coast-friendly-way>

McClug, M., Seddon, P., Massaro, M., & Setiawan, A. N. (2003). Nature-based Tourism Impacts on Yellow-eyed Penguins *Megadyptes antipodes*: Does Unregulated Visitor Access Affect Fledging Weight and Juvenile Survival? *Biological Conservation*, 119(2), 279-285. Retrieved from <https://doi.org/10.1016/j.biocon.2003.11.012>

McKeever, C. (2016). Biodiversity loss breaching safe limits worldwide. *Natural History Museum*. Retrieved Dec 5, 2018, from <http://www.nhm.ac.uk/discover/news/2016/july/biodiversity-breaching-safe-limits-worldwide.html>

McLeod, S. (2014). The Interview Method. *Simply Psychology*. Retrieved from <https://www.simplypsychology.org/interviews.html>

Murphy, E. (2001). The Impact of Predation by Introduced Mammals on Endemic Shorebirds in New Zealand: A Conservation Perspective. *Biological Conservation*, 99(1), 47-64. Retrieved from <https://www.sciencedirect.com/science/article/pii/S0006320700001877>

Mussen Deidre. (2012). Dogs savage precious blue penguin colony. *Stuff Environment*. Retrieved Oct 31, 2018, from <http://www.stuff.co.nz/environment/7183183/Dogs-savage-precious-blue-penguin-colony>

N.K., J. (n.d.). New Zealand fur seals – general information. *The Secret Life of Seals*. <https://thesecretlifeofseals.wordpress.com/general-information/>

This source compiled the information from multiple other sources including DOC's page on fur seals. This article focuses on the facts about the fur seals life such as diet, habitat, and phylogeny and less on the threats dogs pose to the animal. This source was relevant to our project because one of the animals of focus for our project was the fur seal. *The Secret Life of Seals* is a blog written by Julia N.K., who cites all references at the end of each blog post.

Nathan, S. (2007). Conservation- A history. *Te Ara - The Encyclopedia of New Zealand*. Retrieved from <https://teara.govt.nz/en/conservation-a-history/print>

- Neely, P. (2018). How to measure social media effectiveness. *AdStage*. Retrieved Nov 12, 2018, from <https://blog.adstage.io/2018/03/13/how-to-measure-social-media-effectiveness>
- New Zealand Department of Conservation. (2016). Threats to the New Zealand sea lion. <https://www.doc.govt.nz/nature/native-animals/marine-mammals/seals/new-zealand-sea-lion/threats/>
- New Zealand Department of Conservation. (2018a). Dog attacks on seals concerns DOC. <https://www.doc.govt.nz/news/media-releases/2018/dog-attacks-on-seals-concerns-doc/>
- New Zealand Department of Conservation. (2018b). Lead the Way programme. <https://www.doc.govt.nz/our-work/lead-the-way/>
- New Zealand Department of Conservation. (a). (n.d.). *Chatham island oystercatcher/tōrea*. Retrieved Oct 31, 2018, from <https://www.doc.govt.nz/nature/native-animals/birds/birds-a-z/chatham-island-oystercatcher-torea/>
- New Zealand Department of Conservation. (b). (n.d.). The Conservation Act 1987, National Parks Act 1980 and other key legislation guide DOC's work. Retrieved Oct 30, 2018, from <https://www.doc.govt.nz/about-us/our-role/legislation/>
- New Zealand Department of Conservation. (c). (n.d.). Where can I take my dog? Retrieved Dec 12, 2018, from <https://www.doc.govt.nz/parks-and-recreation/know-before-you-go/dog-access/where-can-i-take-my-dog/>
- New Zealand Legislation. (1996). Dog Control Act 1996. *Parliamentary Counsel Office*. <http://www.legislation.govt.nz/act/public/1996/0013/latest/DLM374410.html>
- Owning a dog. (n.d.). *New Zealand Now*. Retrieved from <https://www.newzealandnow.govt.nz/resources/owning-a-dog>
- This source describes in detail the responsibilities for owning a dog in New Zealand, and supplied essential information for our background sections, backing up our methods.
- Pacheco, E., & Melhuish, N. (2018). New Zealand teens' digital profile: A factsheet. *Netsafe*. <https://www.netsafe.org.nz/wp-content/uploads/2018/02/NZ-teens-digital->

profile factsheet Feb-2018.pdf

Peters, C. (n.d.) How to design and analyze a survey. *Zapier*. Retrieved Dec 3, 2018, from <https://zapier.com/learn/forms-surveys/design-analyze-survey/>

In an online story written by data scientist Christopher Peters, this source explained in detail how to design an effective survey and how to analyze the results from a survey. This source was relevant to our project because we referenced it when designing both of our surveys and after we gathered the results to analyze the surveys.

Protecting our wildlife: Responsible pet ownership. (2004). *Australian Government Department of the Environment and Heritage*. Retrieved Nov 8, 2018, from <http://www.environment.gov.au/resource/protecting-our-wildlife-responsible-pet-ownership>

This source talks about the impacts domestic pets can have on the wildlife in Australia and what you can do to protect the native wildlife if you do own a pet. We learned from this source how the Australian Government Department of the Environment and Heritage sought to protect their native wildlife and we used that information to influence how we designed our project and campaign. This source is an Australian government website for the Department of the Environment and Energy which focuses on conserving biodiversity and providing this information openly to the public.

Reynolds, H. (2014, January 3,). Foul Play – Council's Online Campaign Shames Dog Owners Leaving Mess. *The Guardian*. Retrieved from <https://www.theguardian.com/local-government-network/2014/jan/03/monmouthshire-social-media-campaign-dog-poo>

Rogers, N. (2018). 5 Best Nonprofit Social Media Campaigns. *Meltwater* Retrieved Feb. 21, 2019, from <https://www.meltwater.com/blog/5-best-nonprofit-social-media-campaigns/>

This source talked about successful examples of nonprofit social media campaigns and what may have made them so successful and popular. We used this information when designing our own social media campaign. This blog was written by data scientist and social media expert Nick Rogers.

Schänzel, H. A., & McIntosh, A. J. (2000). An Insight Into the Personal and Emotive Context of

Wildlife Viewing at The Penguin Place, Otago Peninsula, New Zealand. *Journal of Sustainable Tourism*, 8(1), 36-52. doi:10.1080/09669580008667348

Shah, A. (2014). Why is Biodiversity Important? Who Cares? *Global Issues*. Retrieved from <http://www.globalissues.org/article/170/why-is-biodiversity-important-who-cares>  
This article explains why biodiversity is important to humans because of the impact of biodiversity on the economy, medicine, and ecosystems. This source was relevant to our paper because we had to learn and explain why global biodiversity is important and then why it is important in New Zealand.

Shirky, C. (2011). The Political Power of Social Media. *Foreign Affairs*, 90(1), 28-41.  
Retrieved from <https://www.foreignaffairs.com/articles/2010-12-20/political-power-social-media>

Sigmar, G. (2007, March 9,). Biodiversity 'Fundamental' to Economics. *BBC News*. Retrieved from <http://news.bbc.co.uk/2/hi/science/nature/6432217.stm>

Sincero, S. (2012). Types of Survey. *Explorable*. Retrieved Dec 3, 2018, from <https://explorable.com/types-of-survey>

Snapchat (n.d.) Retrieved from <https://www.snapchat.com/create>

This is the Snapchat corporation's main website on which an individual can create a Geofilter connected to a specific location and can feature any design. The website has all tools necessary to import designs for Geofilters or to design on them on the site itself, and allows the user to pick the location of the filter.

Teixeira, T. S. (2015, October 14,). When People Pay Attention to Video Ads and Why. *Harvard Business Review*. Retrieved from <https://hbr.org/2015/10/when-people-pay-attention-to-video-ads-and-why>

The Most Popular Dogs in New Zealand. (2017, May 22,). *New Zealand Herald*. Retrieved from [https://www.nzherald.co.nz/lifestyle/news/article.cfm?c\\_id=6&objectid=11858283](https://www.nzherald.co.nz/lifestyle/news/article.cfm?c_id=6&objectid=11858283)

Trochim, W. (2006). Likert Scaling. *Web Center For Social Research Methods*. Retrieved December 3, 2018, from <http://www.socialresearchmethods.net/kb/scallik.htm>

University of Nebraska Lincoln. (n.d.). Behavior Observations and Sampling. Unpublished manuscript.

US Fish and Wildlife Service. (2006). Cats and Dogs and Birds on the Beach A *Deadly Combination*. Retrieved from <https://www.fws.gov/northeast/pipingplover/pdf/catseat.pdf>

Waldegrave, T. (2018). Social Media Usage in New Zealand 2017 to 2018. *Adhesion*. Retrieved November 23, 2018, from <https://www.adhesion.co.nz/blog/social-media-usage-in-new-zealand>

WD, Evans. (2008). Social marketing campaigns and children's media use. *NCBI*. 18(1), 181-203. Retrieved from <https://www.ncbi.nlm.nih.gov/pubmed/21338010>

Wellington City Council. (2016a). *Policies and Bylaws*. Retrieved Nov 11, 2018, from <https://wellington.govt.nz/services/consents-and-licences/dogs/policies-and-bylaws>

Wellington City Council. (2016b). *Wellington Dog Policy*. Retrieved Oct 31st, 2018, from <https://wellington.govt.nz/~media/your-council/plans-policies-and-bylaws/plans-and-policies/a-to-z/dogs/files/dogpolicy.pdf?la=en>

Whitmore, R. (2014). New Zealand today. *New Zealand in History*. Retrieved from <http://www.history-nz.org/today.html>

This source gives factual information on New Zealand such as land size, population, and political structure. This source was relevant to our project because we used this information when researching the country before coming to New Zealand.

Williams, K. J. H., Weston, M. A., Henry, S., & Maguire, G. S. (2009a). Birds and Beaches, Dogs and Leashes: Dog Owners' Sense of obligation to leash dogs on beaches in Victoria, Australia. *Human Dimensions of Wildlife*, 14(2), 89-101. doi:10.1080/10871200802649799

Wirsing, A. J., Dickman, C., Nimmo, D., Ritchie, E., Newsome, T. & Doherty, T. (2017a). The bark side: Domestic dogs threaten endangered species worldwide. *The Conversation*. Retrieved Nov 11, 2018, from <http://theconversation.com/the-bark-side-domestic-dogs-threaten-endangered-species-worldwide-76782>



World Wildlife Fund. (n.d.). New Zealand sea lions.

[https://www.wwf.org.nz/what\\_we\\_do/species/sealions2/](https://www.wwf.org.nz/what_we_do/species/sealions2/)

The World Wildlife Fund supplied us with a sufficient amount of information that was needed to include enough background information on the New Zealand Sea Lion. This species is nationally endangered in New Zealand, and why we aimed to focus on this coastal wildlife species within our project.

Young, J., Olson, K., Reading, R., Amagalanbaatar, S., & Berger, J. (2011). Is wildlife going to the dogs? Impacts of feral and free-roaming dogs on wildlife populations. *BioScience*, 61(2), 125-132. Retrieved from

<https://academic.oup.com/bioscience/article/61/2/125/242696>

Zaffar Rais Mir, Athar Noor, Bilal Habib, & Gopi Govindan Veeraswami. (2015). Attitudes of local people toward wildlife conservation: A case study from the kashmir valley.

*Mountain Research and Development*, 35(4), 392-400. doi:10.1659/MRD-JOURNAL-D-15-00030.1

## Appendices

### Appendix A: Verbal Consent Form

We are conducting a study on what makes dog owners unique for our school. We are all enrolled at Worcester Polytechnic Institute in the United States. Would you be willing to answer a few questions to help with our research?

#### PARTICIPATION

Your participation in this survey is voluntary. You may refuse to take part in the research or exit the survey at any time you wish. You are free to decline to answer any particular question you do not wish to answer for any reason.

#### RISKS

There are no foreseeable risks involved in participating in this study other than those encountered in day-to-day life.

All of your answers will be coded and no names or personal information will be included with the results of our study.

#### VERBAL CONSENT

If you have had all your questions answered and would like to participate in this study then we just need your verbal consent and we can continue.

Name of Researcher obtaining consent (print)

---


Signature of Researcher obtaining consent

---

Date:

---

## Appendix B: Evaluation of Past Interventions Survey



Do you own a dog?

Yes

No

---

Maintaining biodiversity is important.

Choose one

Strongly Agree

Agree

Neutral

Disagree

Strongly disagree

Maintaining habitats is important to saving endangered species.

Choose one

Strongly Agree

Agree

Neutral

Disagree

Strongly Disagree

---

I have a good idea of what species are endangered in New Zealand.

Choose one

Strongly Agree

Agree

Neutral

Disagree

Strongly disagree

Dogs should be leashed on beaches at all times.

Click to write Scale point 1

- Strongly Agree
  - Agree
  - Neutral
  - Disagree
  - Strongly Disagree
- 

Dogs are dangerous to wildlife.

Choose one

- Strongly agree
  - Agree
  - Neutral
  - Disagree
  - Strongly disagree
- 

Wildlife is dangerous to dogs.

Choose one

- Strongly Agree
  - Agree
  - Neutral
  - Disagree
  - Strongly disagree
- 

Leash laws would prevent interactions between dogs and wildlife.

Choose one

- Strongly Agree
- Agree
- Neutral
- Disagree
- Strongly Disagree

Beaches are good areas for dogs to run freely.

Choose one

- Strongly Agree
- Agree
- Neutral
- Disagree
- Strongly Disagree

Human and dog activity on beaches should be regulated for the sake of wildlife.

Choose one


- Strongly Agree
- Agree
- Neutral
- Disagree
- Strongly Disagree

Have you heard of any past DOC campaigns involving dogs and wildlife? Please check all that apply.

- Lead The Way
- DOC Blog Campaign
- DOC Pet Expo
- DOC Increased Beach Signage



## Appendix C: Social Media Preferences Survey



Do you own a dog?

Yes  
 No

---

I use social media often.

Please choose one

Strongly Agree	<input type="radio"/>
Agree	<input type="radio"/>
Neutral	<input type="radio"/>
Disagree	<input type="radio"/>
Strongly Disagree	<input type="radio"/>

I view social media as one of my primary methods of communication.

Please choose one

Strongly Agree	<input type="radio"/>
Agree	<input type="radio"/>
Neutral	<input type="radio"/>
Disagree	<input type="radio"/>
Strongly Disagree	<input type="radio"/>

---

I actively keep my social media up to date and use it to keep up to date with my friends and family.

Please choose one

Strongly Agree	<input type="radio"/>
Agree	<input type="radio"/>
Neutral	<input type="radio"/>
Disagree	<input type="radio"/>
Strongly Disagree	<input type="radio"/>

My social media reflects my interests.

Please choose one

- Strongly Agree
  - Agree
  - Neutral
  - Disagree
  - Strongly Disagree
- 

I notice ads when I'm using social media.

Please choose one

- Strongly Agree
  - Agree
  - Neutral
  - Disagree
  - Strongly Disagree
- 

I find that these ads are tailored to my interests.

Please choose one

- Strongly Agree
  - Agree
  - Neutral
  - Disagree
  - Strongly Disagree
- 

I use ad blockers on social media.

- Yes
  - No
  - Unsure
-

My favorite social media platform is:

- Facebook
  - Snapchat
  - Instagram
  - Twitter
  - YouTube
  - Linked In
  - Tumblr
  - Reddit
  - Pinterest
  - Other
- 

Please choose as many as apply

My primary reason for using social media is:

- Keep in touch with family and friends
- Local News
- Global News
- Information about travel
- Shopping
- Other

How many social media accounts do you have?

- 1
  - 2
  - 3
  - 4
  - 5
  - 6
  - 7
  - 8
  - 9
  - 10
- 

How many hours do you spend on social media daily?

- 0-1 hours
  - 2-4 hours
  - 4-6 hours
  - 6+ hours
- 

Our team is thinking of making posters and geotags on social media platforms to raise awareness of the coastal wildlife on these beaches. How would you react if you saw an ad campaign for this when you are scrolling through your feed?



What gender do you identify with?

- Male
  - Female
  - Transgender female
  - Transgender male
  - Gender variant / nonconforming
  - Prefer not to answer
- 

How old are you?

- 18-24
  - 25-34
  - 35-44
  - 45-54
  - 55-64
  - 65-74
  - 75+
- 

What is your highest level of completed education?

- Secondary
- University
- Technical

# Appendix D: Our Map of A Dog's Day Out Plan



## Appendix E: Seven Simple Steps to Share the Beach



## Appendix F: General Video Script

My name is Laura Boren, I am a Science Advisor at the New Zealand Department of Conservation.

Our beaches are great spaces for dogs to romp and play, and we know that many people enjoy exercising their dogs in these environments.

But it is quite easy to... not think about the consequences if your dog does run into wildlife.

Even a seemingly harmless interaction with a nesting Oyster Catcher or a Little Blue Penguin for example, can provoke the animal to leave its nest and its family, just because of that one small disturbance. Interactions between your dog and larger animals, such as fur seals, can not only harm the seal but can cause serious injury to your companion.

It is important to recognise that there is wildlife living on and around our beaches that you may not be aware of. And that it comes down to the individual, it comes down to you, to be aware of these animals and control your dog in order to protect both our native New Zealand wildlife and your dog.

## **Appendix G: Little Penguin Video Script**

Hi, my name is Laura Boren, I am a Science Advisor at the New Zealand Department of Conservation.

Today, Mack and I are here to talk to you about how we can share our beaches with The Little Blue Penguin.

These adult birds come ashore between May and June to prepare nests. They can waddle up to a kilometer and a half from the sea, and climb up to 300 m to find the perfect nest site. So they don't just hang out right at the water's edge.

Us at DOC are working hard to protect these little guys by building nesting boxes and fencing off specific areas for them.

By putting your dog on a lead around penguin areas and warning others nearby of any nesting locations, you can help keep these little penguins safe.

## **Appendix H: Fur Seal Video Script**

My name is Laura Boren, I am the Science Advisor at the Department of Conservation.

Mack and I are here to talk about how we can share our beaches with fur seals.

These guys can be found on rocky shores around the mainland, Chatham Islands and the subantarctic islands.

It's always an incredible sight to see fur seals, they are incredible animals, but remember to be cautious, they are wild animals and they carry infectious diseases. And they will aggressively defend their territory and pups.

Always keep dogs under control and put them on a leash when wildlife is present, and keep a 20 meter distance. This will keep the seals, and your dog, safe to share and enjoy the beach together.

## Appendix I: Checklist for Future Event

### Checklist for running a local event with DOC...

- Obtain permission from local council... example: Porirua City Council
- Begin advertising event once you've locked down the location
  - This can be through a Facebook event, local advertising, or in small local groups
  - Engage with your target audience by keeping an eye on discussion boards for any questions concerning your event
- Food service requires a permit, so if you want food at your event, apply for the permit and book the food service as soon as you can
  - Food trucks can be secured if contacted approximately a month in advance
- Put together and advertise games related to the purpose of your event to make the event seem more fun and appealing to the public
  - For instance, at our Dog's Day Out event, we put together a fun fetching game to educate dog owners to stay 20 metres away from coastal wildlife
- Obtain incentives for attendees
  - For example, at *A Dog's Day Out*, incentives included dog treats, toys, collars, and samples of high end dog food
  - Pet supplies stores are willing to donate food samples if contacted early enough
- Gather volunteers

### Equipment you may need...

- Gazebo or tent cover
- Folding tables
- Banners and/or posters
- Signs
- A health and safety plan
  - A sign in sheet for your volunteers, recognizing that they have been briefed on the health and safety plan
  - First Aid Kit
- Stakes

Tablets for potential surveys

Cash float

Tool box

Keep:

Have games and engaging activities at all times throughout your event to keep your audience present

2 hours is an effective time limit

Ask attendees how they think the event is going to keep an open conversation

Stop:

A 2 hour event does not necessarily require food. If there are other requirements for the event to prioritize, don't focus on acquiring food

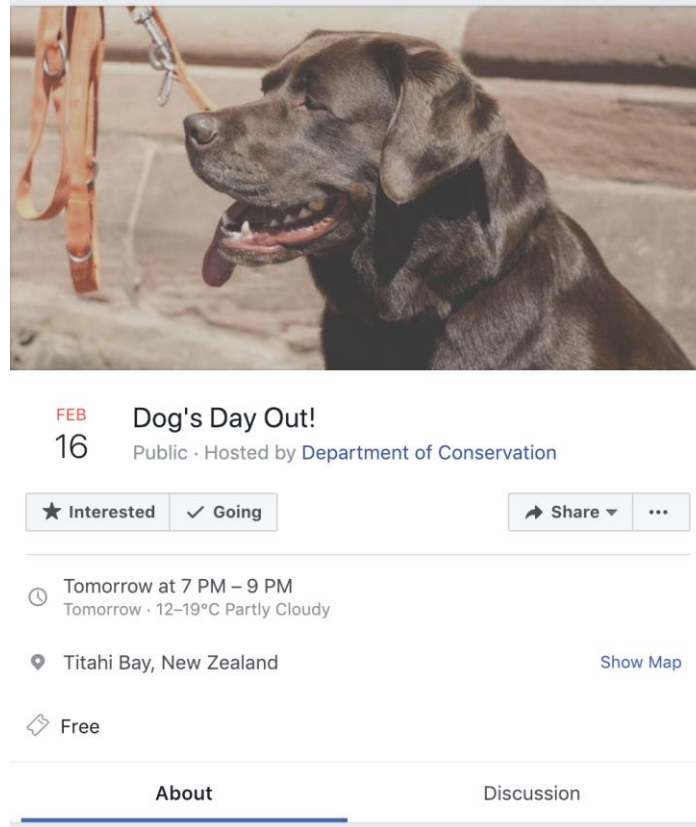
Advertise more than 1 week in advance, and reach out to popular local pages to advertise for you. Create an event page on Facebook and link a post to it on other pages.

Start:

Have volunteers at the event that don't necessarily have an assigned role, but are extra hands in case of an emergency, or are just there for attendees to chat with

If your event includes animals, have a plan for if they harm each other

## Appendix J: A Dog's Day Out Facebook Event



## Appendix K: Public Perceptions: Risks in Dog and Coastal Wildlife Interactions Data, n = 205

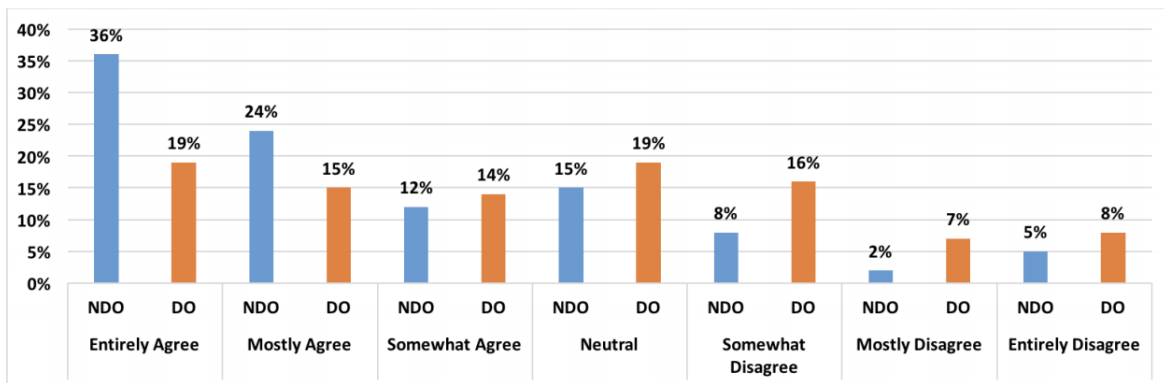


Figure 19: 'Beaches are more important for native wildlife than for human and dog recreation' (n=205).

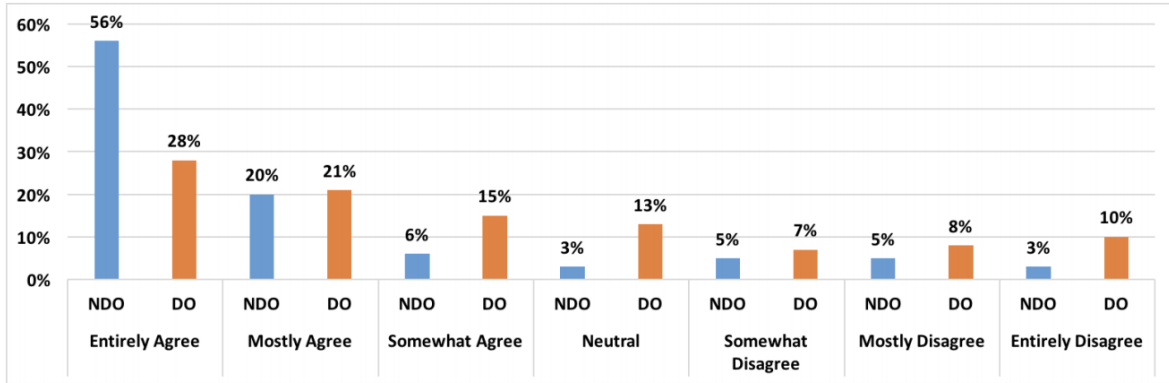


Figure 20: 'Dogs should be prohibited during breeding seasons' (n=205).