

The Conundrum of Human-Wildlife Coexistence

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Objective 2: Reasoning	Hunter	Gavin
Objective 3: Research	Hunter	Gavin
Summary	Luke	Connor
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Chapter 1: Introduction

Human interaction with wild animals is an issue worldwide. Urbanization, along with a common lack of education, and a lack of caring or incompetence of individuals exaggerates this issue leading to more occurrences that can harm humans or the wild animals they interact with. A recent example was when an American social media influencer, visiting Australia, picked up a baby wombat which visibly distressed it and its mother. The woman released the wombat but was deported for this reckless behavior that could have injured herself or the wombats (Kim, 2025). Human incompetence can have major implications for wild animals. While only one example, occurrences similar to this happen often and all around the world.

Aotearoa, New Zealand, is home to a vast array of vulnerable wildlife, including flightless kiwi birds, little blue penguins, sea lions, and many others. These encounters are sometimes harmless, such as taking pictures from afar; however, many interactions can have harmful effects on wildlife, such as food acquisition changes, injury or fatality from dogs or other human pets, spread of disease, and vehicle-wildlife collisions (Schell et al., 2020). Due to the inevitability of human-wildlife interactions, most modern societies promote coexistence. In this case, coexistence involves creating an environment where people accept and tolerate the presence of other species (Souter, 2024). The coexistence of humans and wildlife in New Zealand requires the public to be knowledgeable about interacting with wildlife and willing to prevent or not participate in harmful human-wildlife interactions.

The Department of Conservation Te Papa Atawhai (DOC) is a public service department in New Zealand that is responsible for conserving the country's natural and historic heritage. The DOC's jobs include protecting native wildlife, managing national parks, and preserving significant historical sites. They collaborate closely with local communities, Māori tribes, and various other organizations to promote sustainability and coexistence in many aspects of life in New Zealand.

This project group will collaborate with the DOC to identify, address, and diminish harmful human-wildlife interactions. To achieve this goal, the project group developed the following three objectives:

- Objective 1: Identify critical issues around people interacting with wild animals in urban areas.

- Objective 2: Discover which of the public's actions or preconceived notions influence the public's potentially harmful behavior.
- Objective 3: Research effective solutions and strategies that have successfully improved human-wildlife interactions in New Zealand and around the world.

By completing these objectives the group aims to understand major issues and potential solutions regarding human-wildlife interaction in Aotearoa, New Zealand. The group will then create a comprehensive list of suggestions for the DOC, aimed to diminish these issues and provide an eventual coexistent environment for both people and wildlife in Aotearoa, New Zealand.

Chapter 2: Background

This chapter analyzes information concerning the current effects of urbanization, a lack of public education regarding proper interaction with wild animals, a lack of respect for wild animals, and past actions of the Department of Conservation Te Papa Atawhai (DOC) in New Zealand. These are four major topics necessary to understand the current problems that New Zealand is facing and the actions the DOC is taking to address them.

2.1 Urban Expansion

Urbanization causes habitat loss, pollution, dislocation of animals, and other negative occurrences. Figure 1 explains how land development, specifically urbanization harms ecosystems. In New Zealand, urban areas comprise 0.85% (228,000 hectares) of total land mass (Ministry for the Environment, 2019), which is generally low compared to the United States' 3% of land (27,000,000 hectares). However, the impact on wildlife remains substantial (University of Michigan, 2024). The Shared Socioeconomic Pathways (SSP) narratives estimate that urban expansion will yield an additional 11 to 33 million hectares of natural habitat loss worldwide from urban expansion by the year 2100, driven in part by a lack of information about urbanization's impacts on habitat fragmentation and species loss (Li, 2022).

Land development has been a detriment to New Zealand's environmental quality, with Environment Aotearoa (2019) reporting that 65% of natural forests have been removed for land development, 90% of wetlands drained, waterways near farmlands polluted, and 5% of land area classified as highly erosion-prone (Environment Aotearoa, 2019). This is a direct result of land development which impacts local wildlife and their habitats.

Replacing native vegetation with exotic forest, grasslands, or urban areas can increase erosion and degrade land, freshwater, and marine environments.

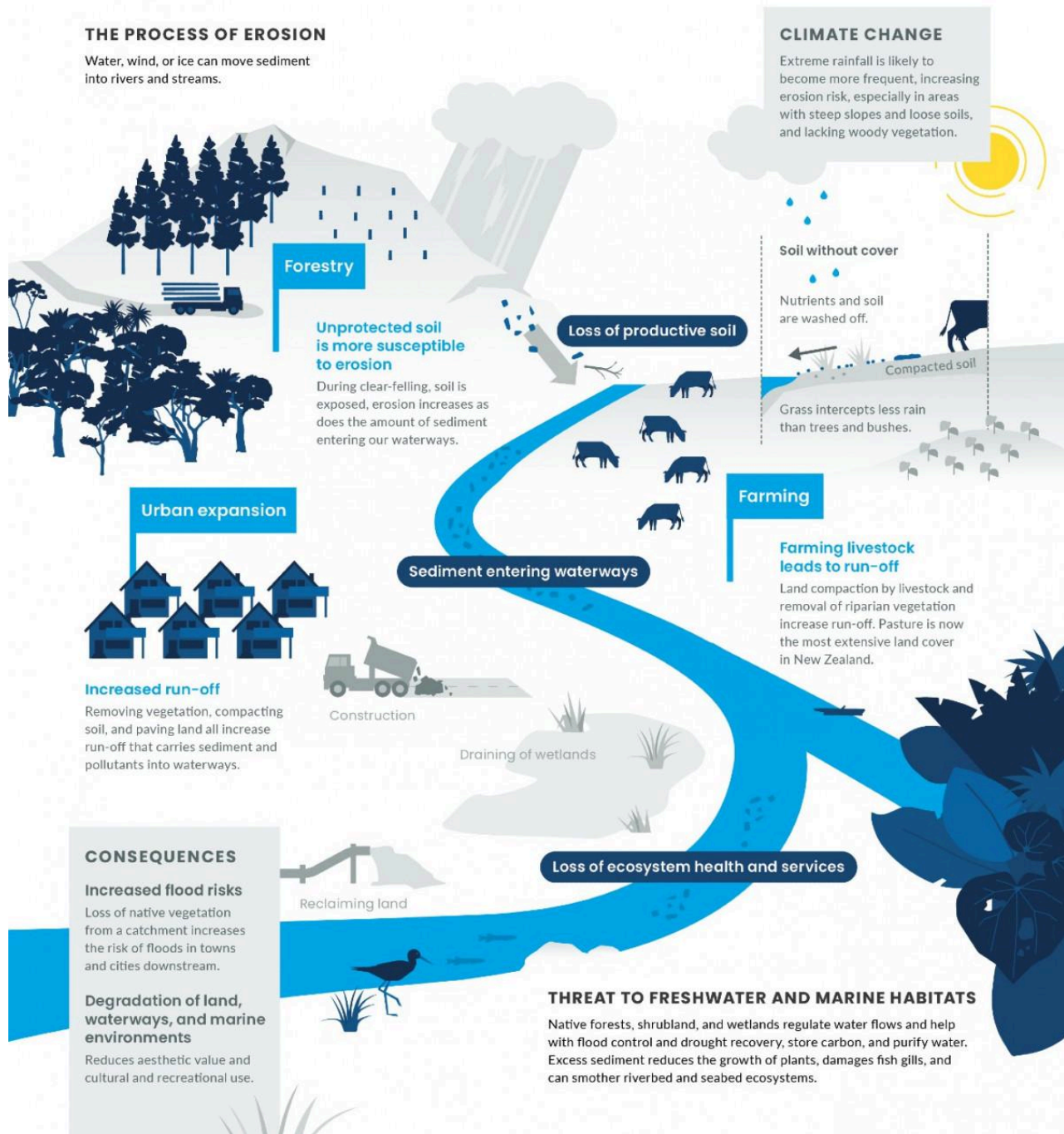


Figure 1. Impacts of urbanization and land development (Ministry for the Environment, 2019)

Urban development has been particularly destructive because cities are typically located at ecosystem junctions: areas with fertile land, access to fresh water, and ideal building conditions (Rastandeh 2018). Unlike deforested areas or farmland, urban spaces are rarely

reforested and instead tend to keep expanding. Wellington is a prime example of this challenge, being in one of the world's most important biodiversity hotspots while also experiencing rapid growth. To mitigate some urbanization impacts, Wellington has implemented spatial planning with vegetation patches and green spaces to reduce ecological disruption (Rastandeh, 2018).

Beyond physical expansion, people and their actions have a large impact on wild animals in urban areas. Limited knowledge of wildlife coexistence compounds the challenges wild animals face in these expanding urban areas.

2.2 Lack of Education

Education about appropriate behavior is a critical barrier holding back human-wildlife coexistence in New Zealand. Many residents and tourists mistakenly assume wildlife is harmless, often influenced by pop culture and media describing nature as “mysterious and benevolent” (Siegrist & Berthold, 2024, p. 1). This romanticized view fails to acknowledge the unpredictable nature of wildlife and can lead to serious consequences if people try to approach, feed, or handle wild animals.

Research confirms the negative impact on uneducated human-wildlife interactions. Flint, Hawley, and Alexander (2016) documented the negative impacts of human interactions on wildlife. They observed mongoose behavior in Botswana and found that the “banded mongooses exhibited significantly higher rates of within-troop aggression while foraging in garbage” (Flint, Hawley, & Alexander, 2016), demonstrating how animals in human-generated environments can destabilize their pack social structure and increase health risks. These results highlight how necessary public education is to develop proper wildlife management practices.

Wildlife regulatory organizations have lobbied for targeted educational initiatives to improve the behavior of the public. Ballantyne, Packer, and Scarles (2023) describe significant improvements in human-wildlife interactions through social marketing campaigns, clear regulatory information, proper signage use, and consistent rule enforcement. Their findings suggest that the public more readily adopts safe practices when provided with engaging, accurate, and motivating information (Ballantyne, Packer, & Scarles, 2023).

Human-animal conflict includes interactions between domesticated and wild animals. Most notably, poorly managed dogs remain a significant threat to New Zealand’s native wildlife. To combat this, the Department of Conservation Te Papa Atawhai (DOC) has launched multiple

social awareness programs, like *Lead the Way* (see Figure 2), which “focuses on public engagement to minimize the impact of dogs on coastal wildlife. [They] want dog owners to feel empowered and know how to act to protect wildlife.” (DOC, n.d.). This style of targeted outreach encourages local dog owners to protect wild animals and reinforces their expectations of them when interacting with wildlife.



Figure 2: *Lead The Way Partnership* (Department of Conservation Te Papa Atawhai, 2025)

2.3 Lack of Caring and Incompetence

Gaps in education can explain some of the problematic wildlife interactions, but a more challenging issue emerges when people deliberately act carelessly around wildlife. Since the English government passed the first laws against cruelty towards horses, sheep, and cattle in 1822, there has been significant growth in animal safety legislation. New Zealand followed shortly after, establishing similar laws in 1840 and enacting the Cruelty to Animals Act of 1878, the Police Offences Act of 1884, the Animals Protection Act of 1960, and the Animal Welfare Act of 1999 (Swarbrick, 2017). Despite these advances, the laws have had a limited impact on people due to a lack of enforcement and widespread cultural adoption.

Dog owners who allow their pets to roam free are a large manifestation of this problem. Their off-leash pets often result in physical or psychological harm to wild animals (Kiapara 2024). Figure 3 is an example of how it occurs in nature. Conservationists in Chile found that most dog owners show little concern about the consequences of free-roaming dogs, regularly

letting their pets off leash (Khadka 2019). This issue has been exacerbated by inadequate enforcement of regulations and a failure to hold negligent dog owners accountable.



Figure 3. Dogs can terrify (and even kill) wildlife (Daly, 2024)

The deliberately careless actions of humans have significantly disrupted wildlife and the environment. This is particularly evident in New Zealand since their ecosystem is fragile and threatened by both direct factors, like human actions, and indirect factors, such as climate change (D.G.B, 2021). Organized conservational efforts in delicate regions like these are critical when trying to protect native wildlife and their ecosystems.

2.4 Department of Conservation Te Papa Atawhai

The Department of Conservation Te Papa Atawhai (DOC) is responsible for New Zealand's wildlife and environment. The agency implements conservation efforts on New Zealand's many islands including predator eradication, bird banding, and maintaining historical landmarks. Additionally, the DOC hosts opportunities for public education about wildlife, the environment, and human-wildlife interactions.

The DOC has implemented several programs to increase public awareness regarding human-wildlife interactions (James, 2000). For instance, the DOC has conducted training programs for dogs. This training uses electric shocks to encourage dogs to avoid wild animals when they meet one. However, in a test of 13 dogs, only one dog fully learned to prevent the kiwi carcass, while three others showed hesitation (Jones, 2006). Additionally, the DOC provided education kits to schools to teach about kiwi conservation. Through educating children,

this program hoped to influence parents to become more aware of kiwi conservation (James, 2000). The DOC has used many methods to increase public awareness, including signage (see Figure 4), door knocking, media campaigns, and sparingly shocking tactics (James, 2000). These programs work to educate the public and provide training. However, it can be difficult to reach the entire public and make sure everyone follows the correct behavior around wildlife, especially in locations where the DOC does not actively monitor, such as private property.



Figure 4: DOC signage warns beachgoers about nesting penguins (Forest & Bird - Places for Penguins on Facebook 2023)

As a government agency, the DOC is limited in the methods it can implement to prevent harm to wild animals. The DOC must maintain positive relationships and work closely with landowners because many kiwis and other wildlife inhabit areas in and around private property, which requires the owners' participation in conservation. For this reason, more drastic measures to educate the public might cause a backlash against the DOC and reduce the public's willingness to support conservation efforts (James, 2000). The DOC constantly struggles to educate the public while maintaining good relations.

The DOC has developed many programs aimed at educating the public which have had varying levels of success at effecting change. However, many of the DOC's conservation efforts

are limited by external factors. For this reason, the project team is working with the DOC to develop a plan to effectively reach the public.

2.5 Project Stakeholders

The stakeholders identified for this project include DOC employees, park rangers, wildlife experts, and members of the public. DOC employees will offer the project group insights into their experience managing wildlife interactions, enforcing relevant laws, and any related struggles. Wildlife experts will provide them with accurate and reliable information we can rely upon when trying to understand animal behavior and ecological impacts. The general public will help them determine the public's attitudes and perceptions related to wildlife and how to behave around them. Outlining the stakeholders allows them to tailor their methods to these groups and gives them a greater chance of achieving a sustainable coexistence in this community.

Chapter 3: Methodology

This chapter provides an explanation of the team's three objectives and the methods the project team is proposing to address them. The team will work with the Department of Conservation Te Papa Atawhai (DOC) to identify, address, and diminish harmful human-wildlife interactions in New Zealand. The following are the three objectives for the project:

- Objective 1: Identify critical issues around people interacting with wild animals in urban areas.
- Objective 2: Discover which of the public's actions or preconceived notions influence the public's potentially harmful behavior.
- Objective 3: Research effective solutions and strategies that have successfully improved human-wildlife interactions in New Zealand and around the world.

The team will use a variety of methods to achieve an understanding of how these issues affect wildlife in New Zealand, how solutions can be put into place to diminish conflict, and how to best deliver findings to the DOC and the public. These methods include interviewing experts, case studies, surveys of the general public, and research. Figure 5 outlines the flow of the project and which methods the team will implement to achieve each objective.

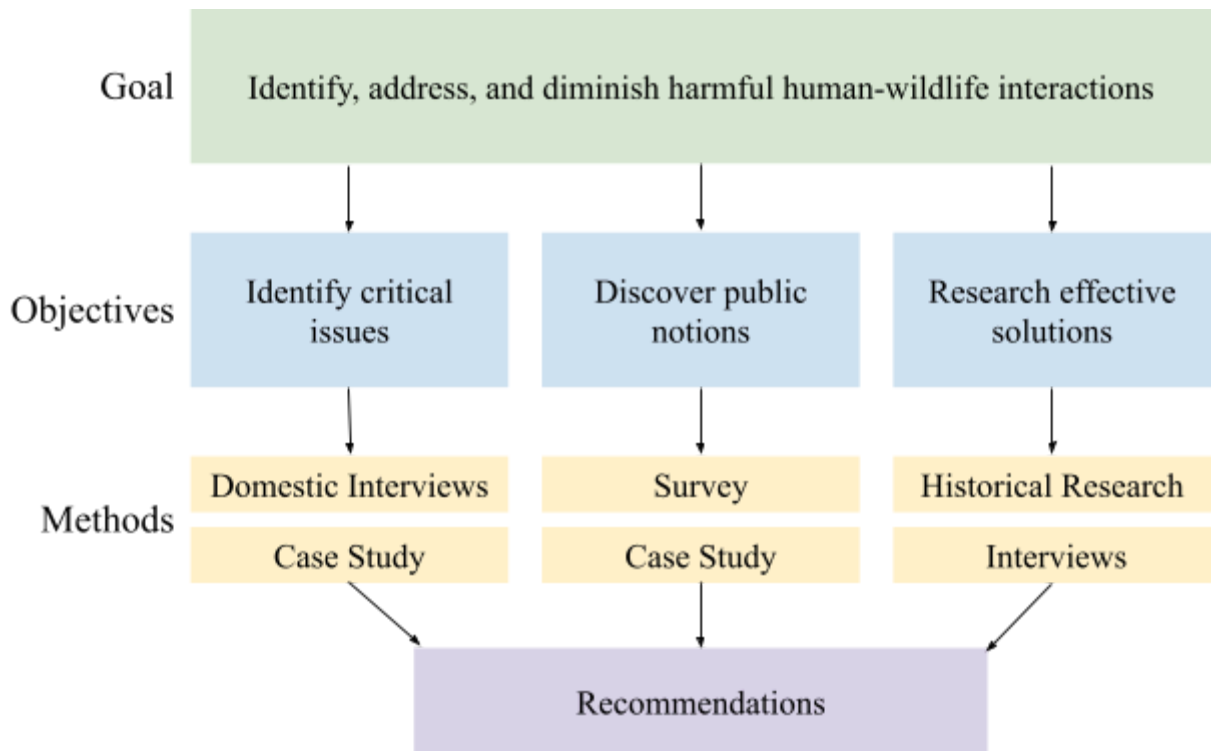


Figure 5: Project Outline

3.1 Objective 1: Identify critical issues around people interacting with wild animals in urban areas

The first objective is to identify critical issues around people interacting with wild animals in urban areas through the use of interviews and case study analysis. The team hopes these methods will allow them to dissect the contributing factors behind human-wildlife interactions and help them generate evidence-based solutions to improve urban coexistence in New Zealand.

Domestic Interviews

The group will conduct semi-structured interviews with wildlife experts such as employees at the DOC and rangers who may have first-hand experiences in dealing with these issues. They have prepared unique interview questions for each group they are going to interview in order to maximize the value received from each questioning (see Appendix B). For objective 1, the interviews will primarily focus on questions B7, B8, B9, B10, and B11, which are all

aimed at identifying human-wildlife conflict, regulation enforcement issues, and how different organizations have responded to this type of conflict. They will inform each participant of these interviews of the study's purpose and of their rights regarding confidentiality, voluntary participation, and the team's usage of their responses. They will require the participant to sign the consent form (see Appendix A) and grant permission for audio recording (question B1) prior to the start of the interview. These interviews will provide additional, first-hand cultural perspectives, personal experiences, and opinions from a diverse range of experts regarding human conflict with wildlife which may allow them to gain additional insight into the previously analyzed case studies. These interviews will provide personal, relevant, and valuable perspectives that will complement our other findings.

Case Study Analysis

The group will select and analyze prior reports of human-wildlife conflict offered by the DOC covering harmful interactions between people and animals to identify common factors and possibly root causes behind this problematic behavior. By examining these incidents, the strategy will be to identify patterns and themes which they can then use to guide their interview questions for the DOC employees and park rangers. This style of analysis will allow them to recognize patterns across various incidents to uncover root causes of problematic interactions.

3.2 Objective 2: Discover which of the public's actions or preconceived notions influence the public's potentially harmful behavior

For this objective, the group will explore individuals' cultural backgrounds and past experiences through ethnographic case studies, phenomenological case studies, and interviews to determine whether intentional actions or misguided attempts to help cause harmful interactions with wildlife. The team hopes to identify patterns between these backgrounds and the reasons behind negative human-wildlife interactions. To achieve this plan, they will conduct surveys of diverse individuals within New Zealand, such as locals and tourists. By doing this, the team can gather insights from different cultural backgrounds, precisely the Māori, to better understand the causes of these behaviors which will help come up with a course of action for the DOC.

Surveys

To gain a comprehensive understanding of the cultural and unintentional vs intentional actions towards human-wildlife interactions, the team plans to conduct surveys (see Appendix D) with a diverse range of participants in New Zealand, including residents, tourists, and other visitors interested in wildlife. Participants will be recruited through wildlife organization email lists and posing on social media groups such as Instagram and Facebook. Additionally, the team plans to travel to public parks or hiking areas to survey people. Surveys will be conducted through Qualtrics, a web-based survey platform that will streamline data analysis. The survey questions (see Appendix D) aim to explore how different groups interact with wildlife.

Phenomenological Case Study Analysis

A phenomenological approach exploits individual lived experiences to understand individuals' or groups' deeper intention in human-wildlife interactions. This method is embedded in our semi-structured interviews with experts (see Appendix B) to capture perceptions and rationalizations of behavior. Many people may approach wildlife with good and proper intentions, but unknowingly, they are causing harm through behaviors that they believe are helpful. They will explore whether harmful behavior originated from misunderstandings or past experiences with bad intentions. By analyzing the personal experiences of people and experts across New Zealand, the group can identify patterns in how experts and regular people rationalize their interactions with wildlife. These patterns will be analyzed through using Likert scale questions that can easily be analyzed.

3.3 Objective 3: Research effective solutions and strategies that have successfully improved human-wildlife interactions in New Zealand and around the world

To address objective 3, the first step will be to investigate successful methods to diminish harmful human-wildlife interactions. By examining initiatives in locations around the world, the project team strives to identify the most effective strategies to use. Understanding where past attempts have both failed and succeeded will be equally as important, as this will reveal shortcomings to avoid in our final product for the Department of Conservation Te Papa Atawhai

(DOC). To learn about the past attempts they will work with the DOC by looking into their archives and getting their analysis of past initiatives. Additionally, they will work with parks to gain insight into successful methods. They will utilize historical research, and interviews to gather information about practical approaches to improving human-wildlife interactions.

Archival Research

The group will use historical research to analyze previous successful and unsuccessful initiatives implemented by the DOC, park rangers, and other relevant groups or organizations. Reviewing historical research is essential, as analyzing past documents, reports, flyers, and other initiatives can identify which strategies are best for the DOC. This research aims to understand how public awareness efforts and different techniques were successful and unsuccessful.

Interviews

While interviews are being conducted to address all three objectives of this project, the interviews related to this objective will specifically focus on identifying effective strategies and solutions for improving human-wildlife interactions. Participants will primarily consist of DOC employees, park rangers, and experts from other organizations that have tried spreading awareness about human-wildlife interaction. The team will primarily use interview questions B12, B13, and B14 (see appendix B) which are designed to gather insights on successful past initiatives, common challenges and key factors that contributed to both the success and failures of these strategies. They will require the participant to sign the consent form (see Appendix A) and grant permission for audio recording (question B1) prior to the start of the interview. The information gathered will help the team develop evidence-based recommendations for the DOC to help future initiatives avoid past mistakes and build on proven methods.

3.4 Data Analysis

The project team will collect both quantitative and qualitative data in this study. Questions using the Likert scale will be gathered and analyzed using Qualtrics, a web-based survey platform. This tool will allow them to view statistics and identify trends in our data among different stakeholders. The open-ended questions will be captured either by audio or text and will be analyzed with Python-based data analysis strategies to show them patterns, themes, and insights into human-wildlife interactions. By compiling the results together, the team hopes

it will ensure their research addresses the established objectives and lead to a list of actionable recommendations for the Department of Conservation Te Papa Atawhai.

3.5 Deliverables

Our goal is to deliver a comprehensive list of actionable recommendations that the Department of Conservation Te Papa Atawhai (DOC) can implement to improve human-wildlife interactions in New Zealand. This project hopes to develop data-driven strategies that will help the DOC limit occurrences of conflict between humans and animals and create a more sustainable coexistence between New Zealand's residents and their native wildlife.

Chapter 4: Conclusion

Aotearoa, New Zealand, is home to a vast array of wildlife, much of which is defenseless and vulnerable to human interaction. Urbanization, a lack of education, and a lack of caring or incompetence exaggerate this vulnerability, often leading to unintentional physical or psychological harm. While the Department of Conservation Te Pa aims to create a coexistent environment where humans and wild animals can live together in peace, a variety of factors remain that inhibit this idea.

By completing our goal to identify, address, and diminish harmful human-wildlife interactions, the group hopes to create a list of suggestions for the Department of Conservation Te Papa Atawhai (DOC). This list would aim to diminish issues regarding human-wildlife interaction. The hopeful implementation of these recommendations by the DOC should lead to an eventual coexistent environment in Aotearoa, New Zealand.

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Appendices

Appendix A: Consent Form for Stakeholder Interviews

Informed Consent Agreement for Participation in a Research Study

Principle Investigator: Professor Robert Kinicki

Student Investigators: Gavin Ford, Connor Jason, Hunter Maher, and Luke McQuillan

Contact Information: wildlife-d25@wpi.edu

Title of Research Study: The Conundrum of Human-Wildlife Coexistence

Sponsor: The Department of Conservation Te Papa Atawhai

Introduction: We are students from Worcester Polytechnic Institute (WPI) and we ask you to participate in a research study. Before you agree, you must be fully informed about the purpose of the study, the procedures to be followed, and any benefits, risks or discomfort that you may experience as a result of your participation. The purpose of this study is to gain an understanding of both the direct and indirect interactions that citizens of New Zealand have with wildlife. This form presents information about the study so that you may make a fully informed decision regarding your participation.

Procedures to be followed: This interview will solely involve the interviewer asking the interviewee a set of questions and the interviewee will give their best answer.

Risks to study participants: There are no risks associated with taking this interview. The interviewee is able to skip any questions that they do not wish to answer.

Benefits to research participants and others: Participating in this interview is solely for the benefit of the Department of Conservation Te Papa Atawhai (DOC) and the Wildlife research group from WPI which aims to gain valuable information from these surveys.

Record keeping and confidentiality: If you do not request to remain confidential, your name may be included in final publications or presentation of this data along with summarizations of your ideas or direct quotes from the duration of this interview. You are able to request confidentiality at any point before, during, or after this interview, either verbally or via the email address above. Upon request, we will only share the name of the interviewee with the other members of the group, the DOC, and WPI. In any public viewing of this data, we will replace your name with “[Job Title] #[participant number]”. We will keep records of your participation in this study confidential so far as permitted by law. However, the study investigators, the

sponsor, or its designee, and under certain circumstances, the Worcester Polytechnic Institute Institutional Review Board (WPI IRB) will be able to inspect and have access to confidential data that identifies you by name.

Compensation or treatment in the event of injury: There are no identifiable ways that taking this interview could result in any injury that requires medical attention. For this reason, we will not give compensation to the interviewee or anyone participating in the interview if such an event occurs. You do not give up any of your legal rights by signing this statement.

Cost/Payment: Being a part of this interview does not give any form of Compensation or have any cost.

For more information about this research or about the rights of research participants, or in case of research-related injury, contact: The group that conducted the research at wildlife-d25@wpi.edu. Or the WPI IRB manager Ruth McKeogh, Tel. 508 8316699, Email: irb@wpi.edu) and the Human Protection Administrator (Gabriel Johnson, Tel. 508-831-4989, Email: gjohnson@wpi.edu).

Your participation in this research is voluntary. Your refusal to participate will not result in any penalty to you or any loss of benefits to which you may otherwise be entitled. You may decide to stop participating in the research at any time without penalty or loss of other benefits. You may also skip any individual question asked in the interview. The project investigators retain the right to cancel or postpone the experimental procedures at any time they see fit.

By signing below, you acknowledge that we (the interviewers) have informed you of and consent to be a participant in the study described above. Please ensure that all of your questions are answered to your satisfaction before signing. You are entitled to retain a copy of this consent agreement.

Study Participant Signature

Date: _____

Study Participant Name (Please print)

Signature of Person who explained this study

Date: _____

Appendix B: Stakeholder Interview Questions

Demographics

B1: Do you permit us to record this interview with audio?

B2: Who is conducting the interview

B3: What is your gender?

General Questions

B4: What is your work title?

B5: How long have you worked with this organization / held your current title?

B6: How often do you work directly with wild animals?

B7 Do you believe human-wildlife conflict is an issue in the general area where you are employed?

B8 What are the major problems you see regarding human-wildlife interaction in New Zealand?

Ranger Specific Questions

B9: To what extent do you believe that current laws regarding human-wildlife conflict are enforced?

B10: Which laws if any do you believe are not well enforced

Expert Specific Questions

B11: What does your organization do to improve aspects of human-wildlife conflict

Appendix C: Consent Form for Online and in-Person Surveys

Record keeping and confidentiality: By taking this survey, your email will be recorded and remain in our record. This is to ensure that each individual takes the survey only once, however, your name or email will not be publicized in any research paper or study done by this group. Your email will be visible to other members of the group, the DOC, and WPI. In any public viewing of this data your name or email will be replaced with “survey participant number”. We will keep records of your participation in this study confidential so far as permitted by law. However, the study investigators, the sponsor, or its designee, and under certain circumstances, the Worcester Polytechnic Institute Review Board (WPI IRB) will be able to inspect and have access to confidential data that identifies you by name or email.

Your participation in this research is voluntary. Your refusal to participate will not result in any penalty to you or any loss of benefits to which you may otherwise be entitled. You may decide to stop participating in the research at any time without penalty or loss of other benefits. You may also skip any individual question asked in the interview. The project investigators retain the right to cancel or postpone the experimental procedures at any time they see fit.

Compensation or treatment in the event of injury: There are no identifiable ways that taking this interview could result in any injury that requires medical attention. For this reason, we will not give compensation to the interviewee or anyone participating in the interview if such an event occurs. You do not give up any of your legal rights by signing this statement.

Cost/Payment: Being a part of this interview does not give any form of Compensation or have any cost.

By continuing to fill out this survey, you are stating that you have read and agree to what is written in this consent form.

The Wildlife D25 project group thanks you for your participation in this survey.

Appendix D: Online and In-Person Surveys

Demographics

C1: Are you 18 years old or older?

C2: What is your gender?

C3: Do you live in New Zealand?

C4: What is your occupation?

General Questions

C5: How often do you interact with wild animals?

C6: To what extent do you believe you know how to act properly around wild animals?

C7: To what extent do you believe you would know how to identify if a wild animal is sick or hurt?

C8: To what extent do you believe you would know what to do if you saw a sick or injured wild animal?

C9: To what extent do you know what the Department of Conservation Te Papa Atawhai does?

C10: To what extent do you believe enough is being done to protect New Zealand's wildlife?

C11: To what extent do you believe human-wildlife conflict is an issue in New Zealand?

Maori Specific Questions

C12: To what extent do you believe human interaction with wild animals is promoted in a

C13: way that meets Maori tradition?

Tourist Specific Questions

C14: How long have you been in New Zealand

C15: How well have you been informed of laws and proper practices regarding interaction with wild animals

Local Specific Questions

C16: How long have you lived in New Zealand