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«Don't feed Kea»:

Perceptions of feeding Kea *(Nestor Notabilis)* amongst visitors to Arthur's Pass, New Zealand

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Acknowledgements

The inspiration for this study originated from observing the close interactions happening between Kea and visitors in New Zealand. It is unusual to see a bird this curious and fearless of humans. It comes very close to people and linger around roads, at tourist attractions and in villages. Seeing all the signs about not feeding Kea while travelling in New Zealand made me wonder how big an issue this is, and why some people feed it. I wanted to find out whether these signs are successful or not, and how it might better target the people that feed Kea.

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Abstract

The population status of Kea *(Nestor Notabilis)* was in 2017 changed from Vulnerable to Endangered on the IUCN Red List of Endangered Species after a rapid decline of 50-80% in the last three generations. Feeding of Kea is by research and experts referred to as an ongoing issue threatening the species. The study aimed to examine the perceptions of feeding Kea amongst visitors in Arthur's Pass.

The study applied the belief elicitation method from the Theory of Planned Behaviour (TPB) to examine the interactions, attitude and beliefs that visitors to Arthur's Pass have towards feeding of Kea. Analysing their interactions with Kea suggested that most visitors only watch or photograph the bird, while very few have closer encounters, like feeding or playing with it. Of the 306 visitors who participated in a self-reported questionnaire on-site, only 18 stated having fed Kea. Signs and more knowledge were by the visitors considered important in stopping feeding of Kea. *«Don't feed Kea»* was the most remembered message from the signs in Arthur's Pass, suggesting that this management measure has been effective in targeting the behaviour. The feeders were predominantly domestic visitors with a lot of nature experience, who state to have a lot of knowledge of Kea. There are indications that they might have an attitude of *«knowing better»* than the park managers, and it might be necessary to find a different approach to stop them from feeding. It is proposed that the interpretation should focus on educating the large group of visitors who might feed if given the opportunity.

Keywords: *Human-wildlife interaction; feeding wildlife; Nestor Notabilis; endangered bird species; Wildlife tourism; visitor management; Theory of Planned Behaviour; interpretation*

Sammendrag

Kea *(Nestor Notabilis)* ble i 2017 opplistet fra sårbar til truet på IUCNs rødliste over truede arter etter en rask nedgang på 50-80% i løpet av de siste tre generasjonene. Mating av Kea er i følge forskning og eksperter referert til som et pågående problem som truer arten.

Denne studien anvender *«Belief Elicitation»* fra Theory of Planned Behaviour (TPB) for å undersøke hva slags kunnskap, holdninger og oppfatninger de besøkende til Arthur's Pass har om mating av Kea. Resultatene viste at de fleste besøkende kun ser på eller fotograferer Kea, mens svært få har hatt nære møter, som å mate eller leker med den. Av de 306 besøkende som deltok i et selvrapportert spørreskjema på stedet hadde bare 18 matet Kea. Skilt og mer kunnskap ble vurdert som viktig i å stoppe mating av Kea. *«Ikke mat Kea»* var budskapet flest husket fra skiltene i Arthur's Pass, noe som tyder på at dette tiltaket har vært effektivt i å forhindre denne adferden. De som har matet Kea var hovedsakelig besøkende fra New Zealand med mye erfaring med natur, som sier at de har mye kunnskap om Kea. Det er indikasjoner på at de har en holdning om at de *«vet bedre»* enn forvalterne, som kanskje gjør det nødvendig å finne en annen tilnærming for å hindre at de mater Kea. Det foreslås at naturveiledningen fokuserer på å øke kunnskapen til den nokså store gruppen besøkende som er trolige til å mate Kea dersom de får muligheten.

Nøkkelord: *Interaksjoner mellom mennesker og dyr; mating av dyreliv; Nestor Notabilis; truede fuglearter; dyrelivsturisme; forvaltning; Theory of Planned Behaviour; naturveiledning*

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1.0 Introduction

In a world that increasingly gets more urbanised, many people travel to get back in touch with nature. Interactions with wildlife in their habitat have therefore increasingly become an attraction for tourists, especially unusual and endangered species (Shackley, 1996). Feeding of wildlife has grown to be a popular activity where tourists can get close interactions with wildlife in their natural habitat (Orams, 2012). Birds are for many their main connection to nature. Bird-watching has in many areas become a big business and an important source of income, with over 80 million people in the USA and almost one out of three people in the UK watching or feeding wild birds (Birdlife International, 2018) They feed birds for aesthetic and educational purposes or to increase the survival chance for birds in winter (Martinson & Flaspohler, 2003).

There are 461 endangered bird species at this point, out of the total 11,122 recognized by Birdlife International and the IUCN (Birdlife International, 2017), where tourism threatens 63 of them (Steven & Castley, 2013). There are 487 recognized bird species in New Zealand, where 71 of their native species are threatened and 15 *Nationally Endangered,* which means that they are in a serious risk of extinction in the short term (Robertson, et al., 2016; BirdLife International, 2018). New Zealand is a hotspot for biological diversity, having a unique natural environment and wildlife. New Zealand's nature is for many visitors the reason for travelling there, and the protected areas attract a range of different types of visitors searching for a rich nature-based experience (Department of Conservation, 2016; Viera & Carla, 2012). Kea is the world's only alpine parrot and native to the South Island of New Zealand (Diamond & Bond, 1999). In the mountain village Arthur's Pass, Kea has become a famous local, as it regularly visits the town and the scenic lookouts alongside the road (Menary, n.d.).

Kea is considered one of the most intelligent birds that exists (Orr-Walker, 2010; Avoca Design, 2013b). Its' curious, adaptive and explorative nature help its' survival by finding food sources everywhere, but also often gets it into trouble. Additionally, its destructive behaviour and lack of fear for new things, results in Kea making trouble for humans. Kea seek human contact actively, which is one of the factors for its status as *Nationally Endangered* (Huber & Gajdon, 2006; Gajdon,

Fijn & Huber, 2004; GrrlScientist, 2018; BirdLife International, 2018; Department of Conservation, n.d.3). In 2017, Kea moved up the IUCN Red List of Endangered Species from Vulnerable to Endangered after a rapid decline of 50-80% in the last three generations (BirdLife International, 2018). When people give them wrong food, they are unintentionally obstructing conservation efforts to save the only alpine parrot in the world from extinction (Birdlife International, 2017). With a slow reproductivity, the species is in a high risk of declining with just a few individuals' deaths (Reid et al. 2012).

There are several threats to Kea, and the cause of its endangered status is a combination of many factors. Predation, pest control (unintentionally), lead poisoning, persecutions by farmers and others perceiving Kea as a pest and feeding by tourists are some of the concerns that have an impact on the species (Orr-Walker, 2010; Orr-Walker, 2012; Charteris, 2012). The birds that live in areas where they interact with humans, human food and objects, are more likely to be at risk from pest control operation than those living in their natural habitat and rarely find unnatural food sources (Department of Conservation, n.d.2).

Aim of the study

Feeding of wildlife is progressively getting more, yet it is a scarcely studied activity related to tourism (Knapp, et al., 2013). The aim of the study was to provide information about the issue of feeding Kea by attaining a better understanding of the reasons why some tourists are feeding the Keas and why some are not. To study behaviour and how to change it, the Theory of Planned Behaviour is a much-used model. The first step in this model is to identify salient beliefs, which affects attitudes, intentions to perform behaviour and in the end, the behaviour. When the beliefs towards a target behaviour is identified and measured, it enhances the ability to influence it. This can in turn explain why a specific message intervention was successful or not, which makes it useful for wildlife managers (Hughes, Ham & Brown, 2009) in Arthur's Pass.

The nature in New Zealand has a unique, but vulnerable biodiversity, because of impacts from introduced pests and weeds, farming, development and tourism. A lot of tourists visit their protected areas and have contact with

threatened species (Department of Conservation, 2016). The current study is the first known TPB-based application in Arthur's Pass, and the first to connect it to feeding of Kea. The study can assist in reducing the impacts of depreciative behaviour towards Kea and other threatened wildlife. This gives it potential to add to the literature on communication research in countries where nature-based tourism is a large part of the economy and conflicts with vulnerable wildlife.

Providing visitors with opportunities to observe endangered and unusual wildlife while at the same time protecting the species from negative impacts is a significant challenge for wildlife managers (Sorice, Shafer & Ditton, 2006). The results of the current study can be useful indicatives for the Kea Conservation Trust (KCT) and the Department of Conservation (DOC), to whether or not they reach out to people with their conservation projects and management measures. Knowledge about psychological aspects behind a depreciative behaviour is useful for the management in developing effective measures to prevent it. How the visitors perceive feeding of Kea affect their behaviour and can give indications to the extent of the issue.

The research question was therefore:

«What are the visitors' perceptions of feeding Kea in Arthur's Pass?»

To study this research question, the following sub-questions were used:

«How do the visitors interact with Kea?»
«What are the visitors attitudes towards human-Kea interactions?»
«What beliefs do the visitors have about feeding Kea?»
«How effective is the signs in Arthur's Pass in preventing feeding of Kea?»

This paper will first give an explanation of concepts and an overview of theory on human-wildlife interactions and the theory of planned behaviour, before the case description of Kea in Arthur's Pass is presented. Furthermore, the study will explain the reasons behind the choice of method used to gather the information. The information that was collected will then be presented in the

results, before it is discussed against theory and existing research in the chapter of discussion. This chapter will end with discussing management implications and limitations of the study, before some proposals for further research are presented.

The methodology of the study was quantitative, using self-reported visitor questionnaires conducted at six different locations in Arthur's Pass. Interviews with managers and conservationists at DOC and KCT to provide expert sources for the case description. The experts were Christ Stewart, head of the office at DOC, Graeme Kates, working for DOC and KCT and studying Keas since the late 90's, and Dr Laura Young in KCT. She has been involved in Kea research since 2009 and completed her PhD on Kea in 2012. These interviews provided information about the threats facing Keas and the efforts of the conservation to help its survival, which is presented in the case description.

2.0 Theoretical Framework

2.1 Wildlife tourism

Visitors can be defined as people who travel *«outside their usual environment for personal or business/professional purposes»* (United Nations World Tourism Organization, 2008). Fredman et al. (2009:24) defined **nature-based tourism** as activities in nature areas outside of their usual environment. The visitors in this study is described as international and domestic visitors that have travelled to Arthur's Pass and does not live there normally. Tourism in Arthur's Pass happens essentially on the terms of nature. It is founded on its natural environment, especially the conservation lands, and remains a relatively low-impact industry coherent with the wishes and values of the community (Kapelle, 2001). This means that a large part of the tourism in Arthur's Pass is nature-based. In many cases, revenues from nature-based tourism to protected areas contributes largely in funding and raising awareness of the conservation of threatened bird species (Buckley, Castley, Pegas & Steven, 2012; Steven, Castley & Buckley, 2013). When nature-based tourism includes interactions with wildlife, it's called wildlife tourism.

Wildlife tourism is defined as *«tourism based on encounters with non-domesticated… animals… either* [in] *the animals' natural environment or in*

captivity» (Higginbottom, 2004, p.2). Wildlife or nature is the main attraction for tourists to travel to a destination, which leads to interactions varying from distanced watching of animals, to more close encounters as playing with them, touching or feeding them (Newsome & Rodger, 2008; Higginbottom, 2004).

Wildlife watching is a form of wildlife tourism where tourists interact with free-ranging, or non-captive, animals. The interest for free-ranging wildlife tourism has increased, which leads to concerns about the dangers facing wildlife and their natural environment. This is intensified when the tourists want to encounter endangered species (Higginbottom, 2004). For the visitors, non-captive wildlife tourism provides a chance to observe the natural behaviour of the animals, but it's not guaranteed that the animals are visible (Higginbottom, 2004).

2.3 Human-wildlife interactions and feeding of wildlife

For centuries, humans have had close relationships with animals. Animals have been our supply of food, and therefore a significant part of the way humans live. Viewing wild animals as a tourist attraction for recreation purposes is a more modern way of interacting with wildlife (Orams, 2002).

There is a growing demand to experience close encounters with animals, and feeding is a way of ensuring that (Newsome & Rodger, 2008), which can give visitors an enhanced emotional engagement (Higginbottom, 2004). Some people have a deep need for interaction with wildlife or want to give something back for the destruction of nature caused by humans, while others just want better opportunities for photographing the animals (Green & Giese, 2004). This could make feeding of wildlife a way of increasing the visitation to a destination, resulting in an added economic value both locally and nationally (Sorice, Shafer & Ditton, 2006; Newsome & Rodger, 2008). In some situations, feeding wildlife can be a method to increase awareness and knowledge of wildlife (Newsome & Rodger, 2008). Direct experiences with nature can promote emotional empathy towards nature, which in turn can lead to nature-protective behaviour (Kals, Schumacher & Montada, 1999). It can make people support conservation measures if they at the same time are being educated, which could make their attitudes more positive towards wild animals (Green & Giese, 2004).

Orams (2012) explains that there are different reasons to why humans feed wildlife; a social interaction like feeding ducks with your children, conservationists aiding injured animals, which is especially important in the case of threatened species, while for a tourist it could be to encounter unusual or exciting animals or for education purposes. The behaviour of feeding is an extensive and increasingly popular tourism activity, and results in impacts both for wildlife and for the tourists (Orams, 2002; Knapp, et al., 2013). Hand-feeding wildlife can encourage unnatural behaviour in animals (Higginbottom, 2004). Provision of food over a long time can make animals dependent on it, they can become aggressive and the wrong food can make them unhealthy, sick or poisoned. The moral arguments against feeding include the decrease of wilderness; by making the wild animals become tamer, and by teaching people to perceive animals as toys, expecting them to perform for photos (Green & Giese, 2004).

Feeding of wildlife is a controversial part of wildlife tourism. It can give psychological and economic benefits for humans, but besides the deliberate feeding to aid sick or injured animals or help recovering a threatened species, there is hardly any other biological justification of this behaviour (Orams, 2002).

3.7 Theory of Planned Behaviour

Research from social psychology has established that humans make behavioural decisions guided by three types of beliefs: behavioural beliefs, normative beliefs and control beliefs (Figure 1). The combination of these beliefs will lead to the decision of whether or not an individual will perform any given behaviour. This concept was the foundation when Ajzen (1991) formed the Theory of Planned Behaviour (TPB). The method identifies the *salient beliefs,* preferably through open-ended questions (see chapter 4.5). Salient beliefs are the easy accessible beliefs; the first that comes to mind when the respondents answer the open-ended questions (Ajzen & Fishbein, 2000).

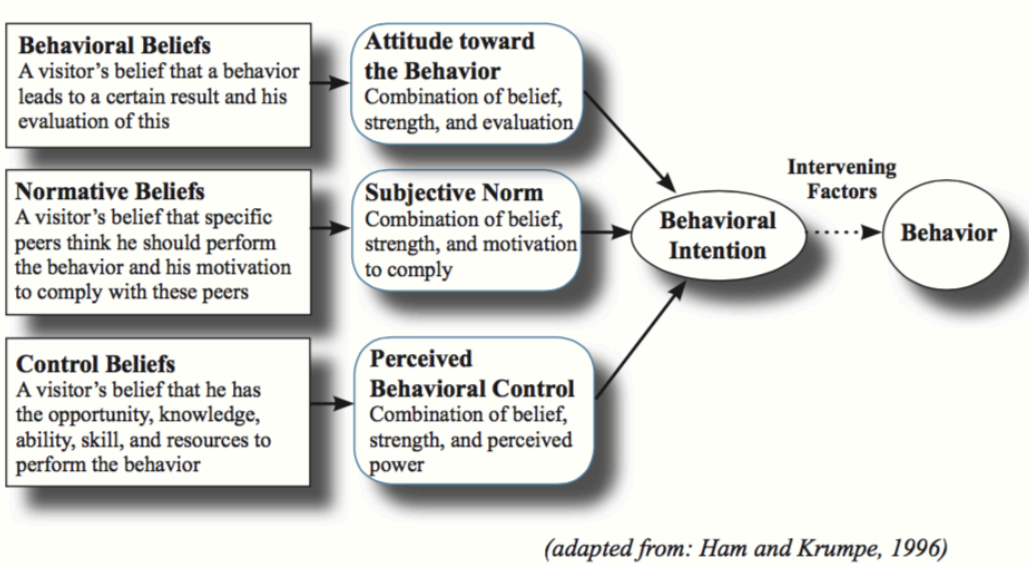

Figure 1: Theory of Planned Behaviour (Hughes, Ham & Brown, 2009)

Behavioural beliefs are beliefs about specific outcomes of performing a behaviour. Whether the individual evaluate this outcome as positive or negative, it will lead to their attitude towards the behaviour becoming favourable or unfavourable.

Normative beliefs are beliefs related to whether other people would approve or disapprove of the individuals' performance of the behaviour. These people could be their spouse, family or friends. This, together with the motivation to comply with the expectations from those people, will lead to a subjective norm toward the behaviour.

Control beliefs are beliefs about factors that facilitate or obstruct the performance of the behaviour and whether the individual thinks they can influence these factors. These factors could be having the opportunity, knowledge, ability, skill or resources. Together with their perceived power, it will result in perceived behaviour control.

Attitude, subjective norm and perceived behavioural control towards the behaviour will again lead to behavioural intentions. This intention eventually has an effect on (with or without the influence of intervening factors) whether the individual performs the behaviour or not.

The TPB can be used to design and test persuasive bird feeding signs (Ballanyne & Hughes, 2006). Using information about salient beliefs towards the target visitor-group has been proven valuable in making effective and persuasive

messages, such as discouraging feeding of birds in national parks (Ballantyne & Hughes, 2006; Ham et al., 2008). Targeting the visitors' salient beliefs can hence be a good method to study depreciative behaviour in visitors. The TPB is therefore considered to be a potentially useful theoretical framework for understanding visitors' beliefs and behaviour towards feeding Kea.

2.4 Interpretation as a management tool

Tourism management is about balancing the visitor's needs and the needs of the resources to resolve potential conflicts between tourism development and nature protection. Management of visitor activities and resources is therefore equally important (Kuo, 2002). There are different ways of managing and controlling visitor impacts on an environment, as Orams (2012) explains. Physically separating visitors from the natural environment is often used in sensitive areas like protected nature areas, but it will remove the possibility of visitor experiences. Prohibition or restriction of human behaviour that has a negative impact on nature or wildlife could be for example having fines or imprisonment as consequences of intentionally hurting or killing endangered animals. Education can be used to get visitors to voluntarily and willingly adapt a more responsible behaviour and reduce their impact. This type of environmental education program is called 'interpretation'. Tilden (1977, p.8) was the first to extensively promote this term, and defined interpretation as:

> *«An educational activity which aims to reveal meanings and relationships through the use of original objects, by firsthand experience, and by illustrative media, rather than simply to communicate factual information».*

Interpretation takes many forms. Face-to-face guiding is a very important part, but also the non-personal communication that can be at a site, such as signs, exhibits, brochures, electronic media and self-guided walks (Ham & Weiler, 2002). This is used in places such as museums, zoos, heritage sites or national parks, to communicate to the visitors the importance of what they see (Moscardo, Woods & Saltzer, 2004).

In a study on wildlife tourism in New Zealand and Australia, results from visitor surveys showed that the most common visitor suggestions to improve wildlife interpretation were all about providing more and improved information. They want to know more about the wildlife and of the specific species in the area and where to find them (Moscardo, Woods & Saltzer, 2004).

Interpretation is a useful tool in managing visitor behaviour in nature-based tourism areas. Visitors are more likely to support management policies after they have participated in interpretation (Kim, Airey & Szivas (2011). Interpretation can enhance and positively impact a person's experience and create or reinforce positive or appreciative attitudes (Ham, 2013). Interpretation could therefore be a way to impact environmental attitudes and make people care about nature and the environment (Ludwig, 2015). This intellectual and emotional connection need an interpretation that is personal, relevant and meaningful for the visitors. Since this kind of education happens at time of leisure, it needs to be entertaining and enjoyable, so that the visitors will listen and understand the message (Tilden, 1957; Ham, 2013). It also needs to be thematically organised with information that personally relates to them (Kuo, 2002).

There is a varying range of elements that an interpretation sign can contain, depending on what approach is used. Ballantyne, Packer & Hughes (2009) describe three ways that signs targeting feeding of wild birds tend to practise. A constructivist approach would typically direct common misunderstandings about birds' health and well-being. The Protection Motivation Theory predict behaviour on the causes of evoking fear to change behaviour (Boer & Seydel, 1996), which might be focusing on the possible danger bird feeding can cause to people, while an approach from Theory of Planned Behaviour would express the long-term impacts of the behaviour.

3.0 Case Description

3.1 Tourism in Arthur's Pass

In Arthurs Pass, 40% of the total traffic is generated by tourists. Arthur's Pass is part of the West Coast of New Zealand. There was not found a number on how many New Zealanders visit Arthur's Pass. There is a dominance of international tourists, where the largest markets are visitors from UK, Ireland, Nordic countries and Australia. Arthur's Pass is often part of a larger roundtrip from Christchurch to Queenstown, especially for visitors not resident to South Island (Vuletich & Becken, 2007). The map in Figure 2 show the total estimated number of international visitors to Arthur's Pass are over 25.000 and almost 35.000 visitor nights (last updated 21. Feb. 2018). Each bubble represent the average visitor number since 2002 (Ministry of Business, Innovation & Employment, 2018). It illustrates that Arthur's Pass is a small tourist destination compared to Christchurch and Queenstown. Even though a high number of entry points makes it difficult to estimate the number of visitors, Kapelle (2001) found that there was a steady increase with more than 110,000 visitors in the year 2000. Tourism is the providing income for the locals in the village, but the overnight capacity is relatively low in the village.

The conservation lands are valuable for the economy, as it being what draws tourists to the area. While Espiner (1995) thought a new era with intensive use, technological development and expanded recreational use of the environment would be the up-coming challenges, Kapelle (2001) found that tourism in Arthur's Pass village still were low-commercial with few impacts on nature. This she thanked the proximity of the National Park, which makes it difficult to expand the commercial development. She also stated that the rocky, hostile environment of the Park restrict what type of visitors that stay overnight, since the selection of more passive activities are limited to shorter walks and a visit to the Visitor Centre.

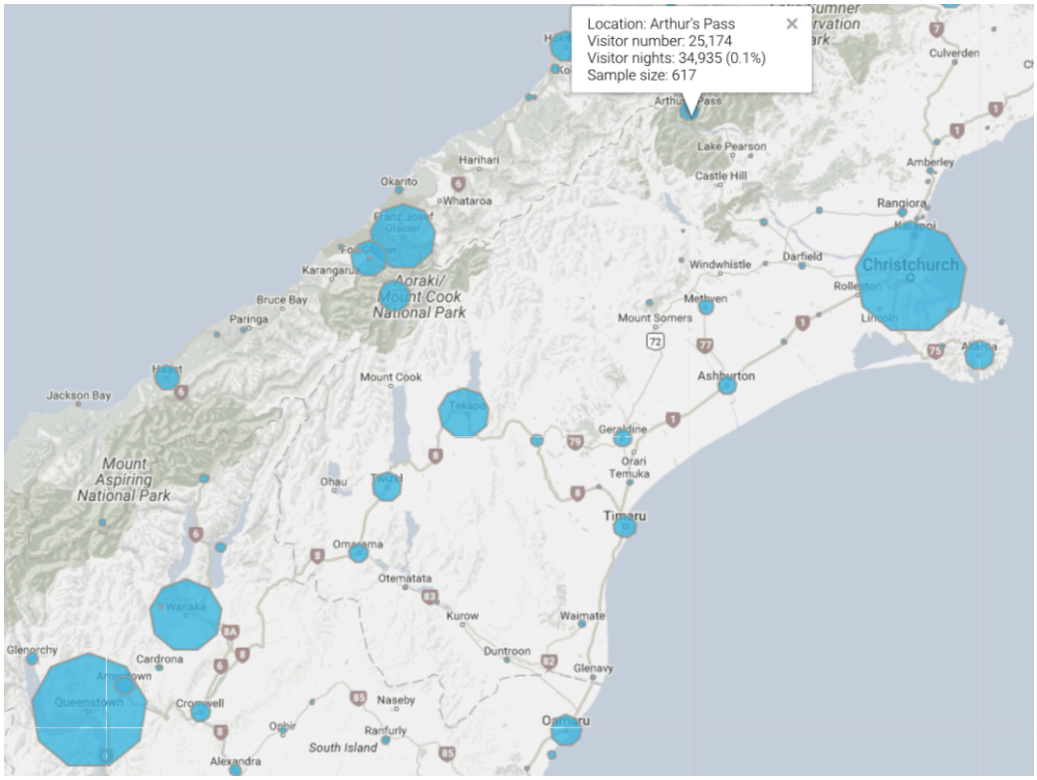

Figure 2: Map of estimated number of international visitors to Arthur's Pass (Ministry of Business, Innovation & Employment, 2018).

The research of Simmons (1980) are referred to as consistent findings in later studies of visitors to Arthur's Pass (Espiner, 1995; Kapelle, 2001; Vierla & Carla, 2012). The studies showed that the visitors to the National Park are primarily men, young and with high education. The travel groups tend to be small in size and family oriented. The largest visitor group is those who just pass through, that use the services and facilities in the village but don't use the Park. Most of the Park users are staying for a short visit, with a high number of international visitors, or day-trippers, where many comes from Christchurch. Campers are mostly family groups, while mostly young people come for hiking, hunting or climbing. There are also skiers, using the Temple Basin skifield or in the terrain of the Park (Simmons, 1998). Family is important for the introduction to use of the Park, and friends for continuing the use (Espiner, 1995). They are all important sources of information about the Park (Vierla & Carla, 2012).

3.2 Human-Kea interactions in Arthur's Pass

Arthur's Pass has been a productive area for Kea and attracts Kea from surrounding areas, making the population here large (Kea Conservation Trust,

2015). Kea can get up to 35 years, but they rarely get that old (Kates, pers comm, Oktober 14, 2017). In Arthur's Pass, the average lifespan is lower than more remote areas, because they have direct contact with people and their property. This makes it a high-risk site for the population of Kea (Kea Conservation Trust, 2015, p. 4). The population of Kea in Arthur's Pass has been 60 birds on average. The last survey in 2016 showed that there were only 15 birds left (G. Kates, pers comm, October 14, 2017). There are not enough DOC funds to pay for the recovery of all the sick and injured birds, with up to a dozen Kea needing medical attention every year, only in the area of Arthur's Pass (Kea Conservation Trust, 2015).

In wildlife tourism, killing or injuring animals can occur either deliberately or accidentally. Deliberate killing can involve elimination of problem animals, or for safety or comfort (Greene & Giese, 2004). Kea adapted to attacking sheep, which made it a pest for many farmers. This made it bounty hunted in the 19th century, a policy that almost drove it to extinction, before it got forbidden in 1971. The parrot was granted a full protection in 1986, which made shooting one result in prosecution (Kemp, 2013; New Zealand Birds Online, 2013). The penalty for killing a protected species is a fine up to $100,000 and up to two years in prison (Barraclough & Irwin, 2017).

Figure 3: Kea walking on the road in Milford Sound, stopping traffic to be photographed by tourists.

Accidental killing of wildlife can be caused by collision with vehicles (Greene & Giese, 2004). Cars have killed several Keas as they walk around at the roads instead of flying over it (Fletcher, 2016). Kea are subject to injuries and deaths on the roadsides, which has become a serious issue in the Arthur's Pass

area, where there is a lot of traffic in the summer and winter seasons. Visitors encourage Kea to feed close to the roads, which place especially the young Keas in a vulnerable position (Orr-Walker, 2012). Adult Keas have lately been killed on the road, which is unusual, since they learn to be alert around cars. Graeme Kates hypothesise that pecking on lead has caused brain damage. If feeding of Kea had not attracted them to be around humans, this would not be a problem (G. Kates, pers comm, October 14, 2017).

Since Kea is an omnivore bird and curious by nature, it results in them eating everything they can get. Kea get poisoned by eating lead from the roofs in the village, chocolate either fed or found, and pest control pellets like the toxic 1080 (Kea Conservation Fund, n.d.). The case of 1080 was a manufacturing fault causing the death of seven Keas. When Kea lives around human areas, it's in more risk of eating pest control pellets than if it lives in its natural environment (Kea conservation trust, n.d.; Department of Conservation, n.d.2). Even if it won't happen again, they now have an anti-1080 group vandalizing DOC cars and signs The managers had experienced an *«anti-DOC feeling»* among this group, with people swearing at them, especially if they were wearing the uniform (G. Kates, pers comm, October 14, 2017).

When Kea are being fed, the food it given are not their natural food sources. It is often high on energy and lack the nutrients they need. The Kea-conservationists state that feeding of Kea is a continuous challenge.

> *«The feeding of Kea is always an issue. There is signage everywhere at the café telling you not to feed kea every three meters or something, but people still do it. People still accidently do it mostly. They finish their meal and walk away, and their leftovers are still on the table. The Keas have no trouble getting that»*
>
> (G. Kates, pers comm, October 14, 2017)

One of the park managers thinks it comes down to people protecting their own meal from being stolen by Kea, but once they have finished they stop caring and walk away. Kea have become celebrities at the café, especially now when they are so few and people know they are endangered. Two years ago, there would be

twenty Kea there, but now there is only one or two at the most (G. Kates, pers comm, October 14, 2017). Kea seem to love having their photos taken, and every camera is out (C. Stewart pers comm, October 14, 2017). People feed it to get a closer shot, though Kea don't need to be fed to get close (G. Kates, pers comm, October 14, 2017).

Keas need to hunt. When they get fed, they get bored. Then they get creative trying to find ways of getting a thrill. Many young birds at the Viaduct Lookout are practicing something called *car-surfing*. They get a thrill by sitting on the back of a car or campervan and open their wings at high speed to get the rush of air and then take off. Adult birds have learned how to manoeuvre the flight, but juvenile birds tumble in the air and break their neck. About 4-5 birds are lost each year just of that activity alone (G. Kates, pers comm, October 14, 2017). When Kea don't need to spend time foraging, they have time to do mischief instead and put themselves in danger as well as being a nuisance to people. *«They get into trouble because they are so curious and need to know everything about everything. Everything is a target, especially in our human world. It's worthwhile ripping the antennas off car because there might be food»* (G. Kates pers comm, October 14, 2017)

Feeding might even turn Kea aggressive towards people. One of the birds has found out that if he bites, the person will let go of the food, so it can fly away with it. *«It's a quite aggressive behaviour by a Kea. It's not doing a lot of harm, but we have had reports of the bird just biting people, and of course they let go of their food. That's a learned behaviour there»* (G. Kates, pers comm, October 14, 2017).

The Kea issue show how the behaviour, health and even distribution of a population can be changed dramatically. Since Kea get attracted to human activity, they are actually more likely to be found around rubbish areas, car parks, ski fields and backcountry cabins than in its natural habitat up in the mountains of the Southern Alps (Diamond & Bond, 1999). The behaviour of feeding Kea, both unintentionally and intentionally, is one of the factors threatening the survival of the species. The human benefits of this practice cannot simply justify the feeding because of the risks associated with it.

3.4 Management of Kea in Arthur's Pass

In New Zealand, the agency that works with the conservation of the natural and historical heritage of the country is the Department of Conservation (DOC). Their vision is: *«New Zealand is the greatest living space on Earth. A place where, increasingly, the knowledge and commitment of New Zealanders is focused on restoring and sustaining a natural environment»* (Department of Conservation, n.d.2). Until year 2040, their target outcomes is restoring and protecting the natural heritage and history of New Zealand, getting the New Zealanders' engaged in conservation and that both New Zealanders and visitors get greater outdoor experiences (Department of Conservation, n.d.2).

The Department of Conservation has a visitor centre and office in Arthurs Pass, dealing with nature conservation issues and providing visitor information. Chris Stewart represents DOC on the Board. Graeme Kates is self-employed but also work for DOC. They also engage in Arthur's Pass Wildlife Trust, which through independent funding, supports projects concerning conservation and recovery of species. This includes monitoring endangered species, like Kea. The Trust also works with education and use outdoor interpretation material to increase knowledge and make people care about saving endangered species and protecting their environment (Arthur's Pass Wildlife Trust, 2015).

In the Wildlife Trust, Graeme is the one that works with Kea. He is also working with the Kea Conservation Trust (KCT). This is a charitable Trust, created to help conservation of wild Kea and increase husbandry standards of captive Kea (Kea Conservation Trust, n.d.). They work with tagging all the Kea and doing blood checks for checking their lead levels. The tagging project is helping to make a Kea Database. Dr Laura Young in KCT was one of the initiator for making the database and has been working with it since. The database is made by the public, where people report sightings of Kea by checking the tags on their legs. This has been working well, and after five months they already had 500 sightings. This also helps when they are looking for sick birds. KCT also do nest monitoring to find out how the breeding success is and what the predators do to Kea (L. Young, November 22, 2017 & G. Kates, pers comm, October 14, 2017).

The Community Kea Project Plan of the KCT described three focal points in Kea conservation that the locals in Arthur's Pass wanted to get involved in:
«i) reduction of local threats (pest control, removal of lead from buildings), ii) care of injured kea and iii) education of visitors to the area to reduce conflict and exposure of kea to dangerous situations» (Kea Conservation Trust, 2015, p. 4).

The aims with the third focal point is to reduce the conflicts and inappropriate behaviour of visitors by education. This program is to raise awareness of: *«a) kea are endangered and fully protected, b) no feeding of kea, c) conflict resolution and d) call to action»* (Kea Conservation Trust, 2015, p. 8). To achieve this, they will among other things have interactive Kea talks at schools and with tourist groups, promote the reporting of Kea sightings on the database (Kea Conservation Trust, 2015).

Education is a big part of the management work, especially when trying to stop people feeding Kea. DOC had the first 'Don't feed the Kea' campaign in 1989, with the intention that if Kea would stop to associate humans with food, the Keas' destructions on human property would decrease. DOC started working with the residents and educated tourists, so the Keas wouldn't get attracted to campsites and picnic areas (Diamond and Bond, 1999). This is still an on-going project. DOC, KCT and others have put up signs and posters at places where humans interact with Kea. They have made pamphlets, articles, given talks and educating in schools, with local communities and visitors (Mankelow, 2012; G. Kates & C. Stewart, pers comm, October 14, 2017).

Figure 4: The interpretation at the "Kia Kiosk" in Arthur's Pass, build by the Kea Conservation Trust

The most common type of interpretation in Arthur's Pass is signs with information about the Keas or warnings against feeding Kea. The *«Kea kiosk»* (Figure 4) by the car park opposite the Visitor Centre is a new addition, built to educate people about Kea and the issues facing it. Inside this interpretation shelter there are large signs with facts, research and management about Kea, and how the visitors can help its survival by behaving appropriately towards it and report sightings to the Kea database.

At the Otira Viaduct lookout there is a large sign about not feeding Kea and why (Figure 7). The sign was put up in 2014 to increase awareness of the threats facing Kea and how small changes in people's behaviour can prevent conflict situations and help protecting it (Avoca Design, 2013a). The sign has listed up four simple rules: don't feed Kea, watch out and slow down for Kea, put your gear away and close your car-doors. The same sign is located at the public toilets (Figure 9). The camping area had smaller signs with similar information (Figure 8), adding that people should not leave their tent unattended. Kea has been attracted to the area because of feeding, and it has therefore been causing problems ripping tents. The sign warning about Kea on the road (Figure 7) was put up in a high-risk area for Keas getting injured or killed on the road. After this was put up there has not been any accidents with Kea and cars from this direction (G. Kates, pers comm, October 14, 2017).

Figure 5: Signs at Challenge café and store

Figure 6: Road sign warning about Kea on the highway

Figure 7: Sign at the Otira Viaduct Lookout and a tourist photographing a Kea sitting on the top of it

Figure 8: Sign at the camping

Figure 9: Sign at the carpark/public toilets, same as at the Viaduct

Educating visitors is a difficult and continuously task. *«It's like a vacuum in the village, you just finished telling some people that they shouldn't be feeding the Kea. Then they disappear and then the next people come in, and you start again and start again»* (G. Kates, pers comm, October 14, 2017). Many of the visitors to Arthur's Pass are just quickly passing through, and they don't notice the signs even if they are all over the place. It might be that the visitors get too focused on what they are doing to notice the signs. *«I think it could be better signs at the café and the store, you know some more obvious, in-your-face kind of signs or warnings about it»* (L. Young, pers comm, November 22, 2017).

The park managers working with Kea has advised that the visitors should be educated as they fly to New Zealand with rules for appropriate behaviour while

staying in New Zealand, and one of them is don't feed the birds and wildlife. It is often a challenge to get the message across when the Kea beg for food (G. Kates, pers comm, October 14, 2017). Another issue it is not easy for everyone to understand what a Kea is, unless they come from New Zealand. There is now signs on mandarin which instead of saying *«don't feed Kea»,* it says «*don't feed the birds»*. This has been working, which might mean that many just did not understand English (G. Kates, pers comm, October 14, 2017).

One of the park managers has experienced that New Zealanders are less receptive than international visitors. While international visitors are normally very apologetic when they are caught feeding Kea, saying they didn't know, with New Zealanders it can often turn into a heated argument. *«They will swear at you and tell you that they know better, that the Kea are not endangered or that they are a pest that should be killed»* (G. Kates, pers comm, October 14, 2017).

Another explanation could be that it is rather about different individuals: *«I think some visitors are receptive to learning about Kea and really excited to see them, and other ones just don't care».* A lot of people think they are doing Kea a favour by feeding them: *«You can explain why you shouldn't feed them and they sort of understand it, because they claim they didn't know».* Then there are those who knowingly are feeding them, even though they know it's bad. There are also a few farmers and backcountry people that don't like Kea because of the government bounty in the 19th century. *«They think that Kea still are a problem for farming, even though they are not»* (L. Young, pers comm, November 22, 2017).

Roberts (2012) explains that there is obvious evidence to suggest that visitors feed Kea, despite all the signs and people discouraging this behaviour. The signs could have an effect in preventing the number of people feeding Kea, but what kind of impact they have is unknown. Sometimes visitors even feed Kea right in front of the signs telling them not to.

4.0 Methodology

The study is affected by the lack of similar research to support it and should therefore be perceived as a base for further research on visitor-Kea interactions and the perceptions on feeding Kea. Because of the limited knowledge found on the area, interviews with experts were included as part of the theory.

4.1 Quantitative Method

A quantitative questionnaire is commonly used in leisure and tourism research, since it often calls for the general, quantified information (Veal, 2011). To get a picture of the visitors to Arthur's Pass and their perceptions on feeding Kea it required enough respondents for it to be representable to the population. A questionnaire was therefore better than interviews, because even though it would give valuable data of the depth in the visitor's beliefs of feeding, it was desirable to describe the beliefs of the population. Other methods of surveying the population could be an internet-based questionnaire, but this would not give opportunity to communicate with the visitors and explain the questions if needed. With a majority of international visitors some could have difficulties understanding, especially if English was not their first language.

In quantitative studies numbers are the main medium, while in qualitative studies words are the medium. Quantitative methods give measurable data as numbers that can be analysed by coding answers and statistics. The questionnaire had both multiple answers, and open-ended questions, and is therefore a semi-structured questionnaire (Veal, 2011; Johannesen, 2010).

The questionnaire includes both open-ended and pre-coded questions, which made the results both quantitative and qualitative. Nevertheless, the results are presented in a quantitative format to give descriptive data that could be generalizing across the group of people that were surveyed (Muijs, 2010). The questionnaire was designed with inspiration from literature. The questions giving a description of socio-demographics for the visitors were inspired from the questionnaire of Espiner (1995). The part about elicitation of salient beliefs was applied from the Theory of Planned Behaviour (TPB) (Ajzen, 1991; Ajzen, 2006a, Ajzen, 2006b) with a few changes to the measurement of normative beliefs.

4.4 Field Research

Preparations for the data collection were conducted through a visit-study to Arthur's Pass in October 2017, to get familiar with the area and the issues facing the Kea population in the area. Observations of Kea and their interactions with humans, talking with the locals about Kea and interviews with the managers provided insights and background information which were fundamental to the study.

Literature research and interviews with staff from the Department of Conservation (DOC) and the Kea Conservation Trust (KCT) was used to figure out the nature of the issue and observation was used to find out what current interpretation was available at Arthur's Pass. The interviews with Graeme Kates and Dr. Laura Young provided information about the previous and current conservation issues facing Kea and how the conservation are working with these issues. They had worked with Kea issues for a long time and are considered experts on the subject. Chris Stewart, head of DOC in Arthur's Pass, was interviewed to get the management point of view, to discuss the questionnaire and help with the practical issues of the surveying.

The interviews with Kates and Stewart were conducted at the DOC office, while the interview with Young was over the phone as she was at another location. The interviews were recorded and transcribed to correctly quote the Kea experts and because it was a lot of information. The interviews were unstructured, which means that it had open questions where the theme was given in advance, but the questions were adapted to the situation of the interview (Johannesen, 2011).

4.2 Survey locations

The surveying was conducted over 8 days from the 14th to the 21th of November 2017 with mostly sunny weather. The total number of visitors that participated in the questionnaire were 306. Out of the six locations, most of the surveys were conducted at Challenge Arthur's Pass Café and Store, the carpark and toilet area and Otira Viaduct Lookout (Table 1). Devils Punchbowl and Avalanche Peak were added while surveying to give additional data to the most important Kea-areas.

Table 1: Number (N) and percent (%) of respondents surveyed at six locations in Arthur's Pass

Survey location	%	N
Total visitors participating in the study	*100.0*	*306*
Challenge Arthur's Pass Café and Store	34.0	104
Carpark and toilet area	17.6	54
Otira Viaduct Lookout	16.7	51
Visitor Centre	14.7	45
Devils Punchbowl	14.4	44
Avalanche Peak	2.6	8

All of the locations were popular places to visit while in and around the village and areas were Keas often are present. Some of the locations are more frequently visited by Keas than others. The Visitor Centre is the central place for tourist information and the location of the DOC office. There is a lot of information about Kea and how to behave around them. They have many signs, posters and a little *«Kea corner»* exhibition dedicated to Kea. Challenge Arthur's Pass Café and Store have both indoor and outdoor dining. Keas are frequent visitors, stealing food and drinks from tourists and posing for photos.

The carpark and public toilets are located over the road from the Visitor Centre. There are signs about Kea related to camping and feeding (Figure 6) and a *«Kea Kiosk»* (Figure 4). Otira Viaduct Lookout, the western entry to Arthurs Pass is about 6 km out of town. It is a popular place to spot Kea, and there is a big sign about Kea there (Figure 9). Devils Punchbowl and Avalanche Peak were added while the surveying was conducted. There were fewer respondents at these locations than the others. Avalanche Peak is a popular mountain to hike. Since it was a long hike (6-7 hours) and not effective considering the number of visitors, it was not time to do more than one surveying there. On the mountain, Keas can be observed in their natural habitat, but it requires effort of the visitors to get there. Devils Punchbowl is a shorter hike requiring less effort, but still more than the other locations. The surveying was conducted at the parking at the foot of the hike. There were a lot of visitors there, but no information about Kea.

4.3 Population and Sampling

A *population* is *«the total category of subjects which is the focus of attention in a particular research project»* (Veal, 2011:356). In this study, the population was everybody who visit Arthur's Pass who understands English. This population was too large to survey. Therefore, a *sample* was selected from the population. For the sample to be representative, the aim was to achieve a *random sample* of the population.

All members of the population then had to have an equal chance to be part of the research. To get a random sample, a common method is to select every fifth person or group for the questionnaire, which is rarely possible since they enter at a varying rate and some spend more time answering the questions than others (Veale, 2011). This was proven difficult also in this study. Therefore, the method used was convenience sampling, to get enough respondents on short time. This is often used but can affect the reliability of the study, since it is not random or representatively sampled (Johannesen, 2010).

The participants of the questionnaire are in this study called *respondents.* Those who had fed Kea will further be called *non-compliers,* and those who had not fed Kea will be called *compliers,* which means that the person has complied with the messages of not feeding Kea.

4.4 Visitor belief elicitation questionnaires

A questionnaire can be explained as a *«written/printed or computer-based schedule of questions…* [and] *are used when a specified range of information is required from an individual or organisation»* (Veal, 2011: 255-256). While qualitative methods are good for exploring individual attitudes and perceptions, a questionnaire can show how widespread these attitudes and perceptions are in a population (Veal, 2011).

The questionnaire included quantitative one-item rating scales and pre-coded questions, where some had multiple answers and some only one answer, and qualitative open-ended questions *(see Appendix 5 for the questionnaire)*. The options of answers were chosen on the background of a previous study (Espiner, 1995), the description of visitors to Arthur's Pass (Simmons, 1980; Espiner, 1995; Kapelle, 2001; Vierla & Carla, 2012) and the accessible resources of the area.

The one-item rating scale is a common scale to use in attitude research, asking the one question that most directly measures the attitude of interest. It is not as reliable as other attitude scales, but it is simple and sufficient enough for many research and survey purposes (Petty & Cacioppo, 1996). The scales in this questionnaire ranged from 1 to 7, and were used for measuring nature experience, knowledge of Kea, attitudes towards human-Kea interactions and normative beliefs. The respondents' *experience with nature* was reported on the range 1, *no experience* to 7, *a lot of experience*. The scale measuring *knowledge of Kea* ranged from 1, *no knowledge*, to 7 *a lot of knowledge*.

In this study, *attitudes* towards the target behaviour of feeding Kea and towards other interactions with Kea was measured in one question. The visitors were asked what they thought about the following interactions with Kea: watching, photographing, playing and feeding on a scale ranging from 1, *negative* to 7, *positive.* These interactions were chosen based on observations by conservation staff, personal observations on site and from media *(see Appendix 7 for examples of interactions).* Normative beliefs were also measured on one-item rating scales, ranging from 1, *disapproval* to 7, *approval.*

Pre-coded questions are often applicable when asking about quantified information (Veal, 2011). Each answer has been assigned a number, or code, beforehand. Age groups are for example coded in a range from 1, *18-29* to 8, *80 yrs +.* To describe the *socio-demographic variables* of the sample, the questionnaire collected information about gender, age, education, residence and their travel group, how many times they have visited Arthur's Pass and how much time they would spend there. In these questions, the respondents were to choose only one answer. It was important that not more than one answer was correct and that the answers did not overlap. For example, with age groups, it should be 20-29 and 30-39, not 20-30 and 30-40. In the question about what activities they would engage in during their visit, they could check any that applied.

To measure the behaviour of the respondents, they were first asked whether they had seen Kea. The respondents who had seen Kea were asked three pre-coded questions: *«where in Arthur's Pass did you see Kea?», «how close were you to the Kea?»* and *«how did you interact with Kea?».* The interactions were the same as in the scales measuring attitudes. Distance to Kea was one answer only,

ranging from touching Kea to being over 10 meters away from it. All respondents were asked if they had expected seeing Kea in Arthur's Pass, to find out if they knew that Arthur's Pass is a likely place to spot Kea.

Open-ended questions can give a more varied material that might not show on a pre-coded list (Veal, 2011). The effectiveness of the signs was measured by asking whether the respondents had noticed any signs about Kea in Arthur's Pass. If they answered yes, they were asked to explain what they remembered as the key messages. The answers from this open-ended question were categorized into 8 themes, which were coded into numbers of 1, *yes* or 2, *no* of whether they had answered within the theme. The themes were created by writing down all responses and find the connections between answers. The themes were created on the basis of frequent responses with similar ideas and what would be relevant for the analysis. This evaluation was subjective, which needs to be taken into consideration, since it was the foundation of the analysis described in the results. The responses that could not be meaningfully categorised were named 'Other'. The aim is to not have too many in this category (Veal, 2011).

Behavioural beliefs were measured through open-ended questions about what advantages and disadvantages the visitors' thought could occur by feeding Kea. The measurement of **normative beliefs** was different than the original belief elicitation (Ajzen, 1991). Instead of having an open-ended question, it was a one-item rating scale. Normative beliefs with respect to six referent groups were considered: 1) spouse/partner, 2) friends, 3) family, 4) other people in the group I'm travelling with, 5) other people visiting Arthur's Pass, and 6) managers working at Arthur's Pass.

Control beliefs were measured through open-ended questions, asking what circumstances that would make it more likely (facilitating factors) and less likely (obstructing factors) for them to feed Kea. The answers to the questions about behavioural and control beliefs were categorized into relevant themes the same way as the key messages from the signs in Arthur's Pass.

The strength of the beliefs was not measured in this study, since a belief elicitation of the visitors was needed first. Since this was not possible, frequently mentioned beliefs could only be potentially salient if the study used open-ended questions (Ajzen, Ham & Weiler, referenced in Ballantyne & Hughes, 2006). The

elicitation of the normative belief was not an open-ended question, because the questionnaire needed to be shortened and more concise. Though the peers were chosen on the background of research, it have to be taken into consideration that there might be other people affecting the visitors' motivation to comply who is not included in the study.

4.5 Data analysis

The answers from the questionnaires were entered into a spreadsheet in Microsoft Excel. The answers to the open-ended questions were grouped into categories, as explained earlier. The data was then entered into the statistical software SPSS for analysis. The answers were operationalized into variables to make them specific, so they could be measured or classified in the analysis. Variables are specific characteristics that can be specified in different values or categories (Johannesen, 2010). The coding of dependent and independent variables is described in Table 2 and Table 3. The categories will later be termed as *subgroups,* as they were the groups used to describe and analyse the results.

Table 2: Coding of dependent variables from the questionnaire. The names of the categories are used in the results. The measures show how the answers from the question are coded.

Dependent variable	Category	Measures
Gender	Female	-
	Male	-
Age	Under 30 years	18-30 years
	30 years and older	30 + years
Nationality	Domestic	New Zealand
	International	32 other countries
Size of residence	Urban	City with 20,001 – 200,000 inhabitants
	Rural	- Town/village with 2,001 – 20,000 inhabitants - Village with 2,000 or fewer inhabitants - Rural area
Education	Lower education	Lower than university
	Higher education	University

Table 3: Coding of independent variables from the questionnaire. The names of the categories are used in the results. The measures show which scores on the seven-point scales that are included in each category.

Independent variable	Category	Measures
Experience with nature	Low nature exp.	1-3
	Moderate nature exp.	4-5
	High nature exp.	6-7
Knowledge about Kea	Low knowledge	1-2
	Moderate knowledge	3-4
	High knowledge	5-7

Frequencies analysis presents counts, percentages and averages of the responses for the variables. This is a *univariate analysis* of how the units are distributed to the values on one variable (Veal, 2011). This was the first analysis that were conducted and provided an overview over the results.

Chi-square is a crosstabulation of two *nominal* variables (the value is categorical but without logical order), to find out if the differences between groups also applies to the respective groups in the population (Johannesen, 2011; Veal, 2011). There have to be over 5 respondents to do the test and the p-value must be under 0,05, for the differences to be considered significant (Hansson, 2013).

4.6 Ethics

The research project processed personal data that could have been indirectly identifiable through a combination of background information. It was therefore reported to the Norwegian Centre for Research Data (NSD) and ethically approved. All respondents were informed about the project in writing and orally and agreed to participate by signing the questionnaire. On the questionnaire, the respondents also confirmed being over 18 years old. The information was only accessed by the researcher and was made anonymous after coding.

4.7 Validity and reliability

Validity means compliance between the desired value and what the study actually measures (Hansson, 2013). That means that the data from the study needs to be connected to the aim of the study and give answers to its research questions. The results show what it was supposed to measure: the perceptions visitors have of feeding Kea, their knowledge about Kea, their attitudes and beliefs towards the behaviour and the effectiveness of the signs in Arthur's Pass. Since questionnaire surveys rely on self-reported data from respondents, several factors can create problems for the accuracy and validity of the data (Veal, 2011). There were a lot of open-ended questions in the questionnaire. Response rates can be low on these questions because people often don't have time or don't want to use their time to fill them out (Veal, 2011), which occurred in this study. This means that the perceptions of these visitors were not included in the results, which could affect the representation of the populations' perceptions of feeding.

The degree of accuracy in the measurements is called **reliability,** which determine whether the results can be trusted (Hansson, 2013). The research findings should be the same if repeated later with a different researcher or with a different population (Veal, 2011; Selnes, 1993). Since questionnaires rely on self-reported data from respondents, it makes it subject to a range of biases (Ballanyne & Hughes, 2006). It could be influenced by how the respondents have answered, they could have misunderstood some questions or answered falsely. To avoid misunderstandings the researcher was present while they answered the questionnaire. Something could have happened in the coding of the data; wrong numbers could have been entered, answers misread or placed in an unsuitable category. Frequencies was used as an analysing-method to control-check the coded answers in SPSS by looking for unusual results.

The categorizing of the open-ended questions was time-consuming, and some judgement was necessary to which individual answers that could be grouped together, which might cause mistakes (Veal, 2011). This is why open-ended questions are used as pilot-studies, creating a coded list of categories to later be used in a main survey (Veal, 2011). What the categories contain are explained with quotes from the questionnaires. Pre-coded questions reduce the chance of misunderstanding the answers of the respondents, while open-ended

questions could be interpreted differently depending on the researcher (Selnes, 1993). The open-ended questions could not have been pre-coded because predetermined alternatives could have influenced their answers. On the questions about their beliefs towards a depreciative behaviour, it was particularly important to minimize the risk of leading their answers. There is still a risk of dishonesty on the questions about feeding and interactions with Kea. Just by asking the questions, participants could think feeding is negative.

5.0 Results

The questionnaire had 306 respondents. Out of the 30 questions, some had a low response rate, especially the open-ended questions. Some respondents even refrained from answering any of the open-ended questions. The rate of non-responses was quite high on the questions on the three beliefs. On behavioural beliefs, 55 respondents did not answer what they saw as advantages of feeding Kea and 29 on what they saw as disadvantages. On control beliefs, 41 respondents did not answer the question about obstructing factors and 82 on facilitating factors. On the normative belief, those who did not answer ranged from 7 to 15 people on the different scales. To the question of whether they had fed Kea, 28 respondents did not answer.

5.1 Description of the visitors to Arthur's Pass

5.1.1 Socio-demographic characteristics

The following presents an overview of the socio-demographic characteristics of the visitors in this research to better understand who they are and find out whether their background affect their beliefs, attitudes and behaviour. *For more details, please see Appendix 1 A (gender), Appendix 1 B (age), Appendix 1 C (education), Appendix 1 D (size of residence), Appendix 1 E (nationality), Appendix 1 F (country of residence), Appendix 2 A (time spend in AP), Appendix 2 B (activities), Appendix 2 C (nature experience), Appendix 3 A (travel group), Appendix 3 B (number of people in group) and Appendix 3 C (children in group).*

There was a majority of international visitors (68.8%), but divided by country, New Zealand has the largest part of the sample (31.2%). The international visitors were from 32 different countries. There were most visitors from the following countries (in descending order): USA (13.2%), Australia (9.6%), United Kingdom (9%), Germany (5%), France (3.7%) and Canada (3.3%). Most of the respondents were from urban areas. The data show that a lot of the visitors to Arthur's Pass live in highly inhabited areas, with more than half of the sample coming from big cities with over 200,000 inhabitants (66%). Only a few respondents were from villages with 2,000 inhabitants or fewer (7%).

The gender of the respondents was almost equally sampled with nearly 47% females and 53% males. It was also quite evenly distributed between those below 30 years (over 46%) and those 30 years and older (over 53%). The age group with most respondents was 20-29 years (over 43%). The data show that a high proportion were highly educated visitors, with over twice as many that had studied at university compared to those with a lower level of education. Most of the visitors travelled with their spouse, friends or family. This reflects the size of travel groups, of which most travelled two, three or four people together. Almost everyone travelled without children under 15 years.

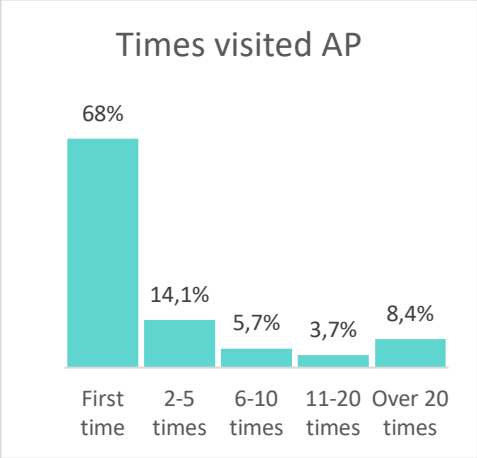

Figure 10: Number of times the respondents have visited Arthur's Pass

There were mostly first-time visitors or visitors that have been to Arthur´s Pass 2-5 times (Figure 10). Most of them spend less than 1 hour there. The most popular activities to do in Arthur's Pass were taking a short walk, photographing and visiting natural attractions. Going on a day-long hike was as popular amongst

visitors as was bird watching. There were many other activities they did that was not an alternative on the questionnaire. The alternative that most of the respondents answered was that they were only passing through Arthur's Pass. Other activities included short stops at the café, picnic spots or toilets, mountaineering or climbing and being a driver or tour guide.

A large part of the sample stated having moderate to a lot of experience with being in nature. The definition of nature experience is subjective to each individual, which needs to be taken into consideration. One of the respondents said she had grown up on a farm and therefore considered herself to be experienced, while others might associate it with being skilled in mountaineering or having walked a lot in city parks.

5.1.2 Knowledge of Kea

The study required some insights to how much knowledge the visitors had of Kea, and whether they knew what a Kea was at all, as part of the background information about the respondents. That was important to know because it could affect how they answered the other questions. The information about their knowledge could help discussing whether there is a need to increase the public knowledge about Kea conservation, what management measures might be needed. If any knowledge gaps are found, it could suggest what the interpretation should focus on.

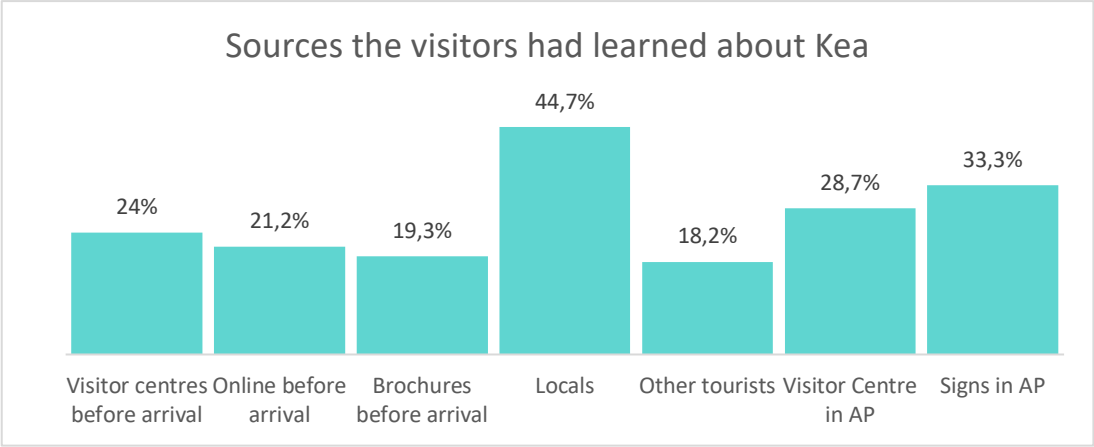

Figure 11: Sources the respondents had learned about Kea

Figure 11 show the proportion of the total 306 respondents that had learned about Kea from each of the seven different sources. The local community was the source where most respondents had learned about Kea, while signs in Arthur's Pass were the second most important source of information about Kea. Several of the respondents implied that they found it important to increase the knowledge people have of Kea, by education and more information. One of the respondent suggested that focusing on educating the local community and get them to spread the word to visitors could be a good solution to the feeding of Kea, especially if children were encouraged to teach grown-ups. Another respondent commented: *«If Kea are common in Arthurs Pass, why is there no Kea information point or museum?».*

82.7% of the respondents had heard of Kea before participating. Figure 12 show how much knowledge the respondents think they have of Kea on a seven-point scale from no knowledge to a lot of knowledge. The majority reported having little knowledge about Kea; most of the answers were focused on 1-3 at the seven-point scale (Figure 12).

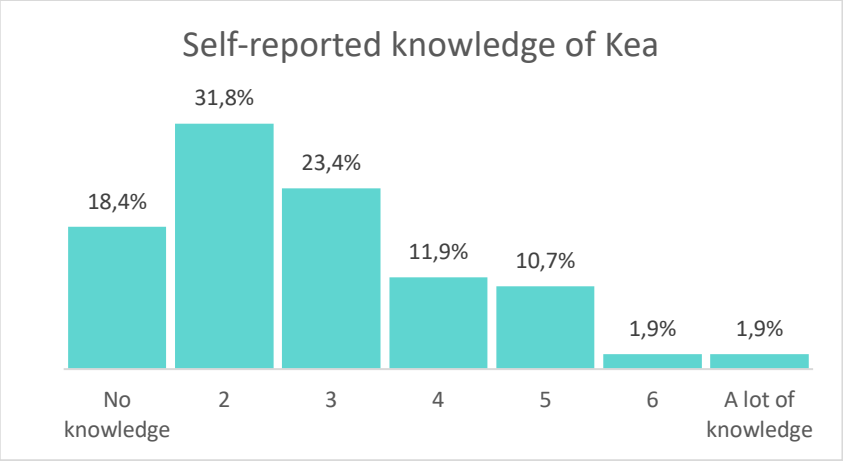

Figure 12: The visitors' knowledge about Kea

On the endpoints of the scale, only 1,9% answered 7, *a lot of knowledge,* while 18,4% answered 1, *no knowledge*. Table 4 show the differences between those reporting having little knowledge (1-2 on scale), which were 50,2% and those reporting having a lot of knowledge of Kea (5-7 on scale), which were 14,7%.

Table 4: Analysis of differences in knowledge of Kea between subgroups. The response rate of the responses 1-2 (little knowledge) and 5-7 (a lot of knowledge), is explained in percent (%) and number (N)

Category	Little knowledge (%)	N	Chi-square	A lot of knowledge (%)	N	Chi-square
International Domestic	68.9 14.6	115 13	Chi sq. = 68.362; Sig. < 0.000	7.8 28.1	13 25	Chi sq. = 18.938; Sig. < 0.000
Under 30 years 30 years and older	56.8 43.8	63 64	Chi sq. = 4.212; Sig. = 0.040	8.1 19.9	9 29	Chi sq. = 6.915; Sig. = 0.009
Low nature exp. Moderate/high nature exp.	71.8 46.5	28 100	Chi sq. = 8.442; Sig. = 0.004	2.6 17.2	37 1	Chi sq. = 13,093; Sig. = 0.42
High nature exp. Moderate/low nature exp.	35.9 60.3	37 91	Chi sq. = 14.514; Sig. < 0.000	24.3 8.6	25 13	Chi sq. = 11.807; Sig. = 0.001

The results show that New Zealanders had significantly higher knowledge of Kea than international visitors. The older group stated having a lot of knowledge of Kea, while the younger stated having little knowledge. Statistically more of the respondents with a lot of nature experience stated having more knowledge of Kea than those with moderate/little experience with nature. There was no difference between men and women, high and low education level or between urban and rural residence. Even though these results suggest that the sample had low knowledge of Kea, many of the respondents expressed information about Kea and the problems facing it in the answers to the open-ended questions. This is further reported in section 5.3, *beliefs about Kea* and 5.4, *effectiveness of the signs in Arthur's Pass.*

5.2 Interactions with Kea

To acquire insights in the visitors' behaviour towards Kea, the research question *«How do the visitors interact with Kea?»* was examined. The target behaviour of the study was feeding of Kea, since it is a behaviour that creates problems for the conservation and protection of Kea. There were 288 compliers (non-feeders) and only 18 non-compliers (feeders) in the sample of this study.

Table 5: Analysis of differences between subgroups on the question «Have you ever fed Kea?». The response rate of the answer «yes» is explained in percent (%) and number (N).

Category	Yes (%)	N	Chi-square
Female Male	6.4 4.3	9 7	Chi sq. = 0.641; Sig. = 0.423
International Domestic	2.4 11.8	5 11	Chi sq. = 11.180; Sig. = 0.001
High nature exp. Moderate/low nature exp.	9.8 2.8	11 5	Chi sq. = 6.678; Sig. = 0.010
Low knowledge Moderate/high knowledge	1.5 10.8	2 14	Chi sq. = 9.590; Sig. = 0.002

On the question if they *had ever fed Kea*, the results showed a significant difference between international and domestic visitors, where more New Zealanders had fed Kea than international visitors (Table 5). There were also more of those with high nature experience that had fed Kea than moderate/low nature experience, and more of the respondents with a lot of knowledge compared to those with little knowledge of Kea.

5.4.1 Reasons for feeding or not feeding Kea

The respondents were asked to explain why they had fed or not fed Kea in an open-ended question. The extensive range of answers were categorized into a total of 13 themes. Six of the themes were from the compliers; those who had not fed Kea, one theme from the compliers who might feed if they later get the opportunity, and six themes from the non-compliers; those who had not fed Kea (Table 6).

Table 6: Reasons to why the visitors feed or not feed Kea, for the compliers and non-compliers. Response rate is explained in numbers (N)

Category	Reasons for feeding/not feeding Kea	%	N
Complier	*Total answers*	100	*243*
	Against feeding wildlife	17.6	43
	Not allowed or other people/signs/information told them they should not feed Kea	22.6	55
	Feeding results in problems for Kea	41.9	102
	Affects nature, ecology and environment	11.5	28
	Kea becomes a problem for humans	4.9	12
	Other reasons (no specific reason/don't like animals/food is precious)	1.2	3
Might feed if given the opportunity		1	84
Non-complier	*Total answers*	100	18
	Previously non-complier	22.2	4
	Wanted to interact with Kea/have it as a friend	11.1	2
	Kea begged/looked hungry/they wanted to share food	22.2	4
	Others were feeding	11.1	2
	Unintentionally, stole their food	16.7	3
	Other reasons (only fed pet Kea/ it was funny/cute and curious)	16.7	3

Compliers*:* The results showed that most answers in this category were about feeding *causing problems for Kea*, where they wrote things like: *«they become reliant on humans for food and then fail to survive in the wild», «they become attracted to humans and can't feed themselves», «habituates them to interact with people»* and *«they start to eat 1080 & lead flashing».* The theme with second most answers were that they didn't feed Kea because it *wasn't allowed* or that other people or signs had *told them not to*. They answered for example: *«it was the rules», «I read that it was forbidden», «signs say no», «DOC officers recommend not to», «I would think that's frowned upon at least»* and *«because we were brought up to never feed wild animals».* There were also a large number of respondents who didn't feed

Kea because they were *against feeding* and wrote for example: *«as an NZ'er who spends time in the alpine it is known not to feed them», «it's not good to feed native birds», «did not think it was appropriate », «never feed wildlife»* and *«I dislike feeding wild birds».* Others did not feed because they thought it would be *bad for the environment.* Some of the answers that fitted into this category was: *«why do people have to feed? It is an attempt to change the wild into the controlled. Watch but do not interfere»* and *«it interferes with the ecosystem».* Another group did not feed because it caused *problems for humans*, where some of them wrote: *«it can make them aggressive to tourists/people»* and *«it might bite».* A few answers fell under an '*other*'-category, because they were not relevant for the analysis.

Might feed if given the opportunity: Several of the answers of the compliers were interpreted to mean that they were not against the behaviour, they just hadn't gotten the opportunity yet. They wrote things like: *«If I saw one I would», «haven't got the chance», «never had the food to give», «it doesn't get close, so I can't feed out of hand»* and *«I really do not know what to feed them».*

Non-compliers: Since there were very few non-compliers, there were also few answers included in each of these themes. There were as many *previous non-compliers* as those who had fed Kea because it *begged* for food, the two themes with most answers. The *previous non-compliers* wrote that they didn't know it was wrong to feed Kea at the time and answered for example: «*back in the 1960s when we didn't know it was bad»*. Of those who fed because *Kea begged* wrote for example: *«it looked hungry»* and *«the Kea is right in your face. I fed it at a ski field, but I realize it is not a wise thing to do».* Some had *unintentionally* fed Kea, because it stole their food*: «last time I visited a kea came to our table at the cafe, and while I tried to take a photo of it, it took my entire muffin».* The '*other*'-category included the reasons that had too few answers and didn't fit into any category, where they wrote for example: *«only fed a pet Kea», «we fed some dried fruit, very funny. Took heaps of photos» and «it was so cute and curious».* Two respondents fed Kea because *others were doing it,* who answered*: «saw others feeding»* and *«we watched others feeding them and they looked like they were enjoying it»*. Two other respondents fed Kea because they wanted an *interaction* with it: *«I really wanted a close interaction with it»* and *«because I feed every friendly bird: Bush Robins and Fantails. I also don't have many friends, so I bribe birds with food».*

Table 7: Analysis of differences between subgroups on the reasons to not feed Kea. The response rate is explained in percent (%) and number (N).

Theme	Category	%	N	Chi-square
Not allowed	Female Male	25.8 14.5	34 21	Chi sq. = 5.520; Sig. = 0.019
Not allowed	Low nature exp. Moderate/high	31.9 17.2	15 38	Chi sq. = 5.294; Sig. = 0.021
Affects nature	Under 30 years 30 years and older	3.8 15.2	5 22	Chi sq. = 9.931; Sig. = 0.002
Problems for Kea	Lower education Higher education	26.5 42.1	22 80	Chi sq. = 6.006; Sig. = 0.014
Problems for Kea	High nature exp. Moderate/low nature exp.	52.4 25.8	55 42	Chi sq. = 19.587; Sig. < 0.000
Problems for Kea	High knowledge Moderate/low knowledge	57.1 37.3	20 76	Chi sq. = 4.917; Sig. = 0.027
If opportunity	Under 30 years 30 years and older	38.5 23.4	50 34	Chi sq. = 7.283; Sig. = 0.007
If opportunity	Urban Rural	32.4 18.4	73 9	Chi sq. = 3.802; Sig. 0.051
If opportunity	Low nature exp. Moderate/high nature exp.	44.7 27.1	21 60	Chi sq. = 6.507; Sig. = 0.011
If opportunity	Low knowledge Moderate/high knowledge	30.5 16.5	36 20	Chi sq. = 6.507; Sig. = 0.011

The most noted theme from the compliers were that feeding *results in problems for Kea*, that feeding was *not allowed* or that *others/signs told them not to*. There were too few responses to do analysis on the themes of the non-compliers, but most answers were that they had previously fed Kea (before they knew it was wrong) and that they fed because the Kea came begging.

The results showed that more women than men complied because feeding was *not allowed.* For the age groups, more of those 30 years and older than below 30 years complied because it *affects nature* and the environment while more from the youngest group might *feed if given the opportunity* than the older group. In the same theme, there were also more respondents from urban areas than rural, with a weak significance. The highly educated complied because feeding results in *problems for Kea*, to a larger degree than those with lower education level than

university. There were significantly more with low than moderate/high nature experience that complied because feeding was *not allowed*, and who might feed if given the *opportunity*. There were more respondents who were highly experienced with nature that complied because feeding results *in problems for Kea* than the less experienced respondents. In the same theme, there were also less respondents with little knowledge of Kea compared to those with moderate/a lot of knowledge of Kea. Additionally, there were more respondents with little knowledge of Kea than moderate/a lot of knowledge that might feed *if given the opportunity*. There were no significant differences between international and domestic visitors on the reasons not to feed Kea.

5.4.2 Other interactions

About 40% of the visitors had expected to see Kea in Arthur's Pass, while almost 60% did not. Almost half-and-half had seen (47%) and not seen (52%) Kea on this visit to Arthur's Pass. Of those who had encountered Kea, most of them had looked at (almost 96%) and photographed it (almost 61%), but very few had fed (about 4 %) or played with (under 3%) Kea. There were no significant differences on the four interactions from this visit to Arthur's Pass in any of the subgroups (Chi-square). Of the 46,7 % of the total 306 respondents, the differences in distances to Kea is distributed as displayed in Figure 13. The visitors had been relatively close to the Kea. 43% had been under 10 meters away from it, while about 3% were over 10 meters away.

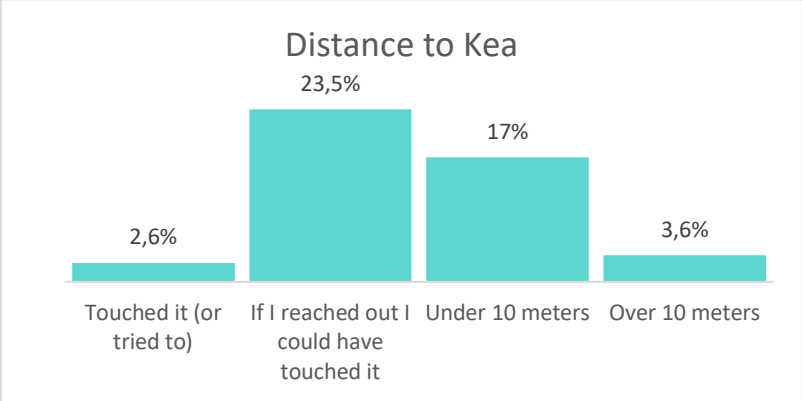

Figure 13: The visitors' distance to Kea of the total 46.7% having encountered Kea on this visit to Arthur's Pass

5.2 Attitudes towards human-Kea interactions

Attitude toward the behaviour is one of the factors influencing intentions to perform a behaviour, and includes a combination of belief, strength and evaluation (Hughes, Ham & Brown, 2009). The questionnaire measured the respondents' attitudes towards the target behaviour of feeding and three additional human-Kea interactions. The four seven-point scales measured attitudes towards watching, photographing, playing with and feeding Kea, where each interaction in ascending order had a closer interaction between bird and human. The overall result show that the visitors generally have positive attitudes towards watching and photographing Kea, and negative attitudes towards playing with and feeding Kea (Figure 14).

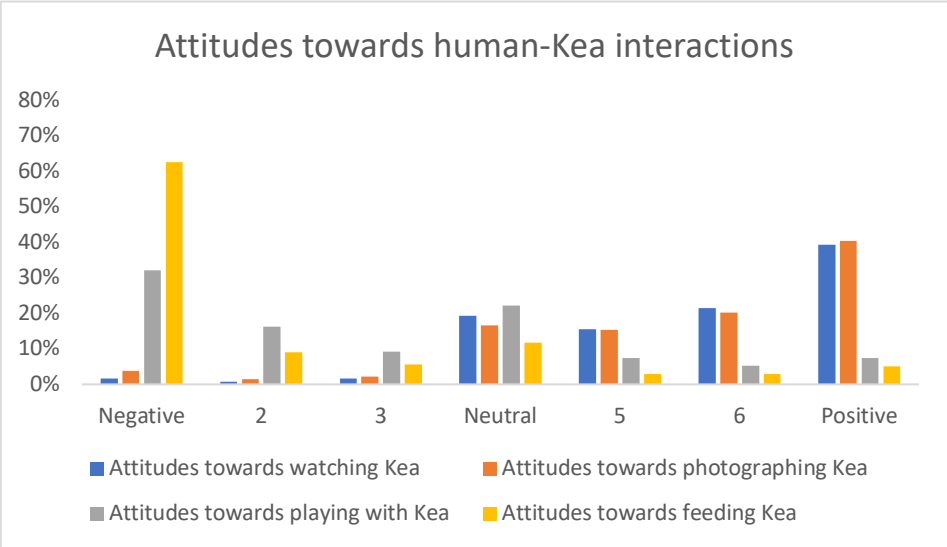

Figure 14: Attitudes towards the four interactions with Kea

The analysis of the respondents' attitudes towards the four human-Kea interactions showed significant differences between some of the subgroups (Table 8). There was a significant difference between urban and rural residents on the attitudes towards *watching* Kea, where rural residents had stronger attitudes about it, both positive and negative than the urban residents.

Table 8: Analysis of differences between subgroups on attitudes towards watching, photographing, playing with and feeding Kea. The response rate of the endpoints 1 (negative) and 7 (positive) on the scale is presented for each category, explained in percent (%) and number (N).

Theme	Category	Negative (%)	N	Positive (%)	N	Chi-square
Watching Kea	Urban Rural	1.7 2.0	4 1	38.1 46.0	90 23	Chi sq. = 13.523; Sig. = 0.035
Watching Kea	Lower education Higher education	1.2 2.0	1 4	27.9 44.2	24 88	Chi sq. = 17.483; Sig.= 0.008
Watching Kea	High nature exp. Moderate/low nature exp.	0.9 2.3	4 1	50.5 32.2	55 55	Chi sq. = 18.474; Sig. = 0.005
Watching Kea	Low knowledge Moderate/high knowledge	2.5 0.0	3 0	35.5 48.8	43 62	Chi sq. = 14.584; Sig. = 0.024
Photographing Kea	Lower education Higher education	3.5 3.6	3 7	29.1 45.6	25 89	Chi sq. = 13.975; Sig. = 0.030
Photographing Kea	High nature exp. Moderate/low nature exp.	0.9 5.4	1 9	51.8 32.3	57 54	Chi sq. = 14.612; Sig. = 0.024
Playing with Kea	Low nature exp. Moderate/high nature exp.	31.3 32.1	72 15	12.5 5.8	6 13	Chi sq. = 13.823; Sig. = 0.032

Those with university education were more positive towards *watching* and *photographing* Kea than those with lower education than university. Those with low nature experience were more positive towards *playing* with Kea, while those with high nature experience were more positive towards *watching* and *photographing* Kea. Those with little knowledge of Kea were more negative towards *watching* Kea than those with moderate/a lot knowledge. The attitude towards feeding had no significant differences between subgroups. The results showed no significant differences between men and women, international and domestic visitors or between the age groups below and over 30 years on any of the attitudes.

5.3 Beliefs about feeding Kea

The study aimed to examine what beliefs the respondents have about feeding, which according to the TPB are the first step in changing a behaviour (1991). This was the main part of the study. The results show the behavioural, normative and control beliefs of the visitors, which could be targeted through interpretation to prevent feeding.

5.3.1 Behavioural Beliefs

Behavioural beliefs were measured through open-ended questions, and the answers were categorized into themes, called "high-order theme" in Table 9.

Table 9: The number (N) and percent (%) of different behavioural beliefs.

High-order theme	Raw data theme	N[a]	%[b]
Behavioural advantages		*251*	
No advantages	Don't see any advantages of feeding Kea. It's bad for its future. Seen signs that it's not good for Kea	134 11	53.4 4.4
Don't know	Don't know of any advantages or what food to feed Kea		
Photo opportunities	Gives better photo opportunities	6	2.4
Protection of Kea	Knowledge and awareness of Kea, caring about Kea and wanting to protect it	7	2.8
Tourism	Tourism in AP benefit from the possibilities to meet Kea, tourists will enjoy feeding it	7	2.8
Experience	Getting a unique and enjoyable experience, being close to Kea, in contact with nature	35	13.9
Help in survival of Kea	Kea benefits from being fed, not being hungry or starved. Will help the population	51	20.3
Friendlier Kea	Kea get more friendly and happy, stays curious and keep close for easier interactions	16	6.4
Other advantages	Specify other advantages. (Cute, makes you want to feed them/It's good to feed birds/would have something to tell friends/keeps them quiet)	8	3.2

Behavioural disadvantages		*277*	
No disadvantages	Don't see any disadvantages	7	2.5
Against feeding	See only disadvantages/never feed any wildlife.	4	1.4
Don't know	Don't know any disadvantages/ doesn't know Kea	7	2.5
Bad for Kea	Will harm Kea/change its feeding habits	219	79.1
Traffic danger	Makes traffic a bigger risk for Kea	9	3.2
Human danger	Reduced fear of humans/makes Kea used to hang around humans/increased human-Kea interactions/makes Kea dependent on or overfriendly to humans	30	10.8
Bad for the environment	Interferes with nature/makes Kea less wild/it's unsustainable/should only be part of conservation	39	14.1
Bad behaviour	Kea get more dangerous or annoying	48	17.3
Other disadvantages	Specify other disadvantages. (Signs say you shouldn't feed/Kea may get overexcited/pollution and waste/you spend all your food/more Keas comes)	8	2.9

[a] N = 306 visitors were surveyed.

[b] Percentages may exceed 100% because multiple beliefs were reported per visitor; N = 251 elicitations on behavioural advantages; N = 55 did answer the question; N = 277 elicitations on behavioural disadvantages; N = 29 did not answer the question.

Behavioural advantages were about what good things the respondents thought could occur by feeding Kea. The theme that most of them answered was that they *didn't see any advantages* of feeding Kea. They answered things like *«none», «seen sign now that it's not good»* and *«Kea could come closer but it's not good for its future».* The second most noted advantage was that feeding Kea *might help its survival*. There was a whole range of different answers that were included in this theme, amongst them were: *«perhaps if they become very close to extinction we should but only by DOC or people who are keeping track of what, how much and when», «if it's a hard season, but only from DOC, not tourist», «supplements in low times of year like winter», «if one is starving then you might keep it healthy», «Kea might get extra calories with little effort», «it keeps them quiet and fed», «avoid*

extinction», «Kea will have food and not be hungry», «reproduction rate increase because of more food resources», «helping to feed endangered species» and *«life expectancy».* The third most noted advantage was that feeding Kea would give a *unique and enjoyable experience*. They answered that *«more people will see the bird» «it's a good experience, especially as Kea is a native bird of NZ», «children enjoy the activity», «being in contact with nature», «it's willing for approach», «unique experience»* and *«maybe they will show more».*

Behavioural disadvantages were about what bad things the respondents thought could occur by feeding Kea. The theme with most answers was about how feeding was *bad for Kea*. They wrote things like: *«completely wrong. They can't eat human food», «don't find their own food, which would become problematic during low season when not as many people are around to feed them»* and *«it would be sad if they depended solely on handouts».* The second most noted theme was that feeding result in Kea making problems with *bad behaviour*, a few examples from their answers are: *«encourages them to steal food», «Kea probably attack people»* and *«it teaches them that we are a good source of food, leading to nuisance issues».* The third most noted theme was a about feeding being an *issue for the environment*, going beyond the Kea-issue. *«It interferes with nature», «it's unsustainable», «I'm not sure that encouraging them to interact with humans is right?», «they will inhabit places which are not their natural habitat. May attract them to the village»* and *«feeding wild animals lead to dependency on humans for food»* are a few citations from this theme.

Table 10: Analysis of differences between subgroups on behavioural beliefs, divided in the answers to advantages and disadvantages of feeding Kea. The response rate is explained in percent (%) and number (N)

Advantages				
Theme	**Category**	**%**	**N**	**Chi-square**
Tourism benefits	Female Male	5.4 0.7	6 1	Chi sq. = 4,979; Sig = 0.026
Kea benefits	Female Male	13.5 25.2	15 35	Chi sq. = 5,250; Sig. = 0.022
Kea benefits	International Domestic	16.8 28.0	28 23	Chi sq. = 4.298; Sig. = 0.038
Kea benefits	Under 30 years 30 years and older	26.2 14.3	32 18	Chi sq. = 5.493; Sig. = 0.01

Kea benefits	Low knowledge Moderate/high knowledge	11.2 22.3	12 25	Chi sq. = 4.808; Sig. = 0.028
No advantages	Under 30 years 30 years and older	43.4 63.5	53 80	Chi sq. = 10.019; Sig. = 0.002
Unique experience	Under 30 years 30 years and older	18.0 9.5	22 12	Chi sq. = 3.794; Sig. = 0.051
Unique experience	Low nature exp. Moderate/high nature exp.	25.6 12.4	10 25	Chi sq. = 4.633; Sig. = 0.031
Disadvantages				
Theme	**Category**	**%**	**N**	**Chi-square**
Traffic risk	International Domestic	1.6 6.9	3 6	Chi sq. = 5.235; Sig. = 0.022
Traffic risk	Under 30 years 30 years and older	0.8 5.5	1 8	Chi sq. = 4.783; Sig. = 0.029
Traffic risk	Lower education Higher education	0.0 4.7	0 9	Chi sq. = 3.878; Sig. = 0.049
Traffic risk	High knowledge Moderate/low knowledge	18.4 1.0	7 2	Chi sq. = 27.212; Sig. < 0.000

Advantages is in this study referred to as good things that can occur by feeding Kea. There were significantly more women than men who thought *tourism would benefit* from feeding of Kea, and more men than women that thought *Kea would benefit* from feeding (Table 10). There were also more New Zealanders than internationals who answered that *Kea benefits* from being fed. The results showed significant differences between the age groups in some of the themes. There were more of the respondents 30 years and older that answered that they *didn't see any advantages* of feeding than those below 30 years. Those under 30 years had a weak significant higher percent who answered that *the experience* was an advantage of feeding. They also thought *Kea benefit* from being fed, more than the older group. Those with low nature experience saw *the experience* of feeding as an advantage, more than those with moderate or a lot of nature experience. The respondents with moderate or a lot of knowledge of Kea answered that *Kea benefits* from being fed, more than those with little knowledge of Kea. Those with a lot of knowledge of Kea had more answers of *traffic* causing a bigger risk for Kea.

Disadvantages is in this study referred to as bad things that can occur by feeding Kea. The only significant differences were found in the theme about the increased *danger traffic* posed to Kea. There were more New Zealanders than internationals that perceived *traffic* being a bigger risk for Kea because of feeding. Those 30 years and older had more answers that fit under this theme than those under 30 years. Those with university education had more answers than those with lower education relating to *traffic* becoming a bigger risk for Kea. The results showed no significant differences between urban and rural residents or between those with a lot of nature experience and those with moderate or low nature experience in either themes about advantages or disadvantages.

5.3.2 Normative Beliefs

Normative beliefs were measured through scales signifying what degree the respondent thought different people would approve or disapprove if the respondent fed Kea. The results from the normative belief-scales showed that the visitors generally thought people would disapprove of them feeding Kea (Figure 15). The distribution of answers from the scale clearly showed a concentrated result of visitors answering 1, a strong disapproval *(see Appendix 4)*. The strongest perceived disapproval was from the managers in Arthur's Pass, while fewest answered 1 on the scale on friends and other visitors (Figure 15). Many thought their spouse, family and other people in their travel group would disapprove. The respondents considered other visitors being more neutral to the feeding.

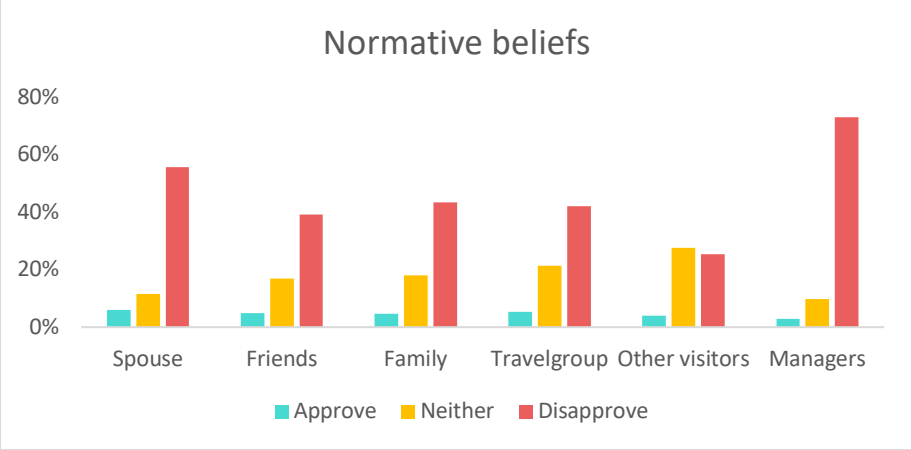

Figure 15: Distribution of perceived approval and disapproval of feeding Kea from different peers

The results of comparing normative beliefs to each subgroup showed only significant differences between the age groups under and over 30 years and between lower and higher education (Table 11). A significantly higher number of younger respondents thought their friends, family and the managers of Arthur's Pass would disapprove, while the older group thought their friends, family and the managers would disapprove. The respondents with university education thought their friends would disapprove more than those with a lower education level. There were no significant differences between men and women or between international and domestic visitors, between urban and rural residents, between different level of nature experience or between those with little and much knowledge of Kea.

Table 11: Analysis of differences between subgroups on normative beliefs. Response rate of the endpoints 1 (disapprove) and 7 (approve) on the scale is explained in percent (%) and number (N).

Theme	Category	Disapprove (%)	N	Approve (%)	N	Chi-square
Friends	Under 30 years 30 years and older	27.8 49.3	37 74	7.5 2.7	10 4	Chi sq. = 19.508; Sig. = 0.003
Friends	Lower education Higher education	35.9 40.1	28 81	5.1 5.0	4 10	Chi sq. 12.602; Sig 0.050
Family	Under 30 years 30 years and older	30.8 54.7	40 81	6.9 2.7	9 4	Chi sq. = 19.340; Sig. 0.004
Managers	Under 30 years 30 years and older	62.6 82.6	82 119	3.8 2.1	5 3	Chi sq. = 18.824; Sig. = 0.004

5.3.3 Control Beliefs

Control beliefs were about which circumstances would make it more likely (facilitating factors) and less likely (obstructing factors) for the visitors to feed Kea. The answers from the open-ended questions were categorized into themes, called *high-order theme* in Table 12.

Table 12: The number (N) and percent (%) of different control beliefs

High-order theme	Raw data theme	N[a]	%[b]
Facilitating factors		*265*	
Wouldn't feed	Nothing could make it more likely to feed because they don't or won't feed Kea anyway. Don't know of any advantages or what food to feed Kea	141	53.2
Don't know	Don't know the answer to the question/would be more likely to feed Kea if they didn't know they shouldn't	8	3.0
Others told them	If others told them they could feed Kea	19	7.2
Herd behaviour	If others were feeding	1	0.4
Had the opportunity	If they got the opportunity. (Saw a Kea/if the Kea came to them/if it begged them for food)	9	3.4
Had the resources	If they had the resources. (Food was the right diet for Kea/DOC approved/people explained how to feed correctly)	27	10.2
No harm to Kea	If they had knowledge about whether feeding is harmful for Kea or not	5	1.9
Unobserved	If nobody/few people are there to see them	2	0.8
Kea in need	If they thought it was a Kea in need of help or care	36	13.6
Friendly Kea	To get a connection with Kea. (If Kea was friendly/get it as a friend/keep Kea close)	4	1.5
Other facilitating factors	Specify other circumstances that would make it more likely to feed Kea. (If there were signs that encourage feeding/was bored/on drugs or drunk/if safe, etc.)	32	12.1
Obstructing factors		*224*	
Wouldn't feed	Nothing could make it less likely to feed because they don't or won't feed Kea anyway	105	46.9
Don't know	Don't know the answer to the question/didn't know Kea/would be less likely to feed Kea if they didn't know they shouldn't	7	3.1
Others say no	If others told them not to do it (DOC, locals). If others disapprove, it affects whether they feed.	9	4.0
Anti-herd behaviour	If other people were present	7	3.1
"Don't feed Kea"-signs	If there were signs about not feeding Kea	34	15.2

No opportunity	If they don't get the opportunity. (Didn't see one/if Kea were far away or shy/didn't have time to feed)	9	4.0
Don't have any food	If they didn't have the resources. (Didn't have any food or the right food)	6	2.7
More knowledge	If they were more informed about consequences of feeding. (Public knowledge and education)	18	8.1
Punishment	If there were incentives/punishments. (High penalties/fines/have people monitoring/ recording)	9	4.0
No need to feed	If Kea didn't need to be fed. (Healthy/in a group/summer/abundance of food)	3	1.3
Kea health	If feeding put Kea in danger. (Interrupts their daily habit/threatens wildlife/if it is afraid)	9	4.0
Risk to the visitor	If it puts the feeder at risk. (Dangerous/aggressive or annoying Kea/negative experiences of feeding)	14	6.3
Other obstructing factors	Specify other circumstances to make it less likely to feed Kea (close to a restaurant/road/conservation area/not bored/visitor is very hungry, etc.)	13	5.8

[a] N = 306 visitors were surveyed.

[b] Percentages may exceed 100% because multiple beliefs were reported per visitor; *N* = 265 elicitations on facilitating control beliefs; *N* = 41 did answer the question; *N* = 225 elicitations on obstructive control beliefs; *N* = 81 did not answer the question.

The three most noted themes about **facilitating factors** were: 1) Wouldn't feed, 2) Kea in need, and 3) Other facilitating factors. Some of the citations from the first theme were: *«after reading the signage in Arthurs Pass, I will no longer feed a Kea, period»* and *«no, I follow the rules».* The reasons behind feeding if Kea was in need were for example: *«only if harmed or hurt to rescue them», «if the bird looked ill or underfed»* and *«during winter when times are rough».* Answers that were included in the "Other" theme, were for example: *«the only thing would be letting my future kids do it», «throw seeds as a distraction», «if under vet instruction»* and *«only in places of supervised captivity - like a zoo».*

The three most noted themes about **obstructing factors** were: 1) Wouldn't feed, 2) «Don't feed Kea»-signs, and 3) More knowledge. An example from those who wouldn't feed Kea anyhow is: *«Kea is a nice bird, but I would not feed it».* Some

of the respondents that saw signs as a facilitating factor wrote: *«on the way there are some signs about kea that makes me more careful», «when I am somewhere with signs up everywhere telling me not to feed them»* and *«more signs with reasons not to».* Answers that were included in the third theme were for example: *«if I had knowledge of why it's bad»* and *«if I was informed that it is forbidden».*

Table 13: Analysis of differences between subgroups on control beliefs, divided in the answers to facilitating and obstructing factors to feeding of Kea. The response rate is explained in percent (%) and number (N)

Facilitating factors				
Theme	**Category**	**%**	**N**	**Chi-square**
Kea in need	Female Male	9.1 17.4	11 25	Chi sq. = 3.831; Sig; = 0.050
Kea in need	Low nature exp. Moderate/high nature exp.	2.3 16.1	1 34	Chi sq. = 5.890; Sig. = 0.015
Obstructing factors				
Theme	**Category**	**%**	**N**	**Chi-square**
Would not feed	Under 30 years 30 years and older	41.8 51.3	46 58	Chi sq. = 7.867; Sig. = 0.005
Would not feed	Urban Rural	64.9 43.0	80 24	Chi sq. = 5.92; Sig. = 0.015
Would not feed	High knowledge Moderate/low knowledge	73.5 52.3	16 78	Chi sq. = 5.278; Sig. = 0.022
Risk for themselves	Under 30 years 30 years and older	10.9 1.8	12 2	Chi sq. = 7.913; Sig. = 0.005

The facilitating factors had significant differences between subgroups on the theme; *Kea in need* (Table 13). The results showed that more men than women would be more likely to feed Kea if they thought it was *in need*. All but one of the respondents who would be more likely to feed Kea if it was *in need* of help or care had moderate or a lot of nature experience.

The obstructing factors had significant differences between subgroups on the themes: *wouldn't feed* and *risk for themselves,* (Table 13). Between the two age-groups, there were significantly more of those 30 years and older who stated that *nothing would* make it less likely to feed Kea, than those below 30 years. The urban residents had a higher response rate than the rural residents on the same

theme. That was also the case for those with moderate or low knowledge of Kea, over those with high knowledge of Kea. The younger group were less likely to feed Kea if it would *put themselves at risk* than the older. There were no significant differences between international and domestic visitors in any of the themes.

5.4 Relations between feeding behaviour and attitudes/beliefs

Beliefs and attitudes towards a behaviour affect the behaviour of the individual, according to the TPB (Ajzen, 1991). This means that the visitors' beliefs and attitude towards feeding affect whether they will feed Kea or not. This chapter will first compare the questions about attitudes towards different interactions with Kea to the feeding behaviour of the respondent to see if there is a connection. Subsequently, it will look for connections between feeding behaviour and the three beliefs.

The socio-demographic variables of the non-compliers describes that most of them were New Zealanders (68.8%) from urban areas (87.5%) with no children (87.5%) and high nature experience (68.8%). The largest age group of the non-compliers were 20-29 years (37.5%). Most of the compliers were internationals (71.0%) from urban areas (82.6%) with no children (92.2%) and low nature experience (52.5%). The largest age group were exactly the same as the non-compliers, 20-29 years (37.5%).

Table 14: Average score on the seven-point scale measuring attitudes towards human-Kea interactions. The results are presented for both feeders and non-feeders. A low score means perceiving the interaction as negative and a high score as positive

Theme	Feeder	Average	Std. Deviation
Attitudes about watching Kea	Yes	6.44	1.094
	No	5.64	1.394
Attitudes about photographing Kea	Yes	6.38	1.147
	No	5.56	1.576
Attitudes about playing with Kea	Yes	3.56	1.548
	No	2.99	1.926
Attitudes about feeding Kea	Yes	2.94	2.016
	No	2.07	1.744

The non-compliant respondents had an average higher score on the attitude-scales towards the human-Kea interactions than the compliers (Table 15), indicating that they are more positive towards the behaviours. The analysis gave no significant differences (Table 14). If there were more non-compliers, the results might have been more trustworthy. However, the response rate to the endpoints 1 (negative) and 2 (positive) show the same tendencies; that the non-compliers are more positive towards feeding than the compliers. The attitudes get increasingly more negative closer the interaction with Kea is. Feeding is the interaction the respondents are most negative to, even among those who have fed Kea.

Table 15: Relations between attitudes and feeding Kea. The response rate of 1 (negative) and 7 (positive) on the seven-point scale is described in number (N) and percent (%) for feeders and non-feeders

Theme	Feeder	Negative (%)	N	Positive (%)	N	Chi-square
Attitudes about watching Kea	Yes	0.0	0	75.0	12	Chi sq. = 9.314; Sig. = 0.157
	No	1.8	5	37.4	102	
Attitudes about photographing Kea	Yes	0.0	9	75.0	12	Chi sq. = 9.947; Sig. = 0.127
	No	4.1	11	38.4	104	
Attitudes about playing with Kea	Yes	18.8	3	0.0	0	Chi sq. = 9.890; Sig. = 0.129
	No	33.0	88	7.9	21	
Attitudes about feeding Kea	Yes	37.5	6	6.3	1	Chi sq. = 3.679; Sig. = 0.056
	No	64.3	169	5.0	14	

Similar results were found on the scales measuring normative beliefs. On the seven-point scale, the average score is higher for the non-compliers compared to the compliers (Table 16). This means that those who have fed Kea think people approve of feeding to a larger degree than those who never have fed Kea. The only exception is with the managers at Arthur's Pass, where the compliers and non-compliers agree on managers being disapproval of feeding.

Table 16: Average score on the seven-point scale measuring perceived disapproval/approval from different peers for feeders and non-feeders. A low score means disapproval and a high score means approval.

Theme	Feeder	Average	Std. Deviation
Spouse	Yes	4.22	1.641
	No	2.29	1.841
Friends	Yes	4.22	1.563
	No	2.50	1.724
Family	Yes	3.44	1.944
	No	2.55	1.736
Other people in their travel group	Yes	3.44	1.590
	No	2.56	1.761

Other visitors to Arthur's Pass	Yes	3.22	1.202
	No	3.11	1.721
Managers at Arthur's Pass	Yes	1.78	1.302
	No	1.80	1.570

The same challenges as in Table 15 occurred at the analysis comparing normative beliefs and feeding of Kea (Table 17). The difference between the compliers and non-compliers were found to be significant on *spouse* and *friends.* They also had the highest score on perceived approval of feeding from the respondents. This might suggest that these two are the most important peers influencing whether the visitors start to feed Kea.

Table 17: Relations between normative beliefs and feeding of Kea. The response rate is described in percent (%) and number of counts (N), for the endpoints 1 (disapproval) and 7 (approval)

Theme	Feeder	Disapproval (%)	N	Approval (%)	N	Chi-square
Spouse	Yes	23.1	3	15.4	2	Chi sq. = 23.201; Sig. = 0.001
	No	57.6	136	5.5	13	
Friends	Yes	20.0	3	13.2	2	Chi sq. = 18.186; Sig. = 0.006
	No	40.4	108	4.5	12	
Family	Yes	35.7	5	7.1	1	Chi sq. = 5.013; Sig. = 0.542
	No	44.1	116	4.6	12	
Other people in their travel group	Yes	27.3	3	9.1	1	Chi sq. = 7.625; Sig. = 0.267
	No	43.0	99	5.2	12	
Other visitors to Arthur's Pass	Yes	13.3	2	6.7	1	Chi sq. = 2.927; Sig. = 0.818
	No	26.3	66	4.0	10	
Managers at Arthur's Pass	Yes	68.8	11	0.0	0	Chi sq. = 5.518; Sig. = 0.479
	No	73.7	191	3.1	8	

Don't see any advantages of feeding Kea and *feeding will harm Kea* are by far the behavioural beliefs with most total answers*. Behavioural beliefs* are connected to attitude towards behaviour, according to the TPB (Ham, Hughes & Brown, 2009). The attitudes towards feeding were largely evaluated as negative. Additionally, the majority of the respondents had never fed Kea. This behavioural belief-attitude-behaviour relation indicates that most of the respondents in this study are against feeding Kea and will not perform this behaviour. Most respondents thought people would disapprove of them feeding Kea, which means that they think peers will disapprove of them performing the behaviour.

The most stated answers on *control beliefs* were that they wouldn't feed anyway, for both the facilitating and obstructing factors. Even if they have the opportunity, knowledge, skill, ability and resources to do it, they will not feed Kea. A quite large part of the sample might feed Kea if they get the opportunity (84 out of 278). This opportunity might still change their intentions to perform the behaviour, according to the control beliefs in TPB (Hughes, Ham & Brown, 2009). The results showed that those who might feed if given the opportunity were mostly New Zealanders from urban areas, younger than 30 years with low nature experience and little knowledge of Kea. The age group is younger than the average of the compliers, otherwise it reflects that group.

5.5 Effectiveness of the signs in Arthur's Pass

One goal of this study was to find out how effective the current interpretation in Arthur's Pass is in preventing feeding of Kea. Most of the respondents (64%) had seen signs about Kea in Arthur's Pass, while 34% had not. Those who answered yes were asked to explain the key messages of the signs to find out what they remember and if they have read that they shouldn't feed Kea. The answers from this open-ended question were categorized into 8 themes (Table 16). Theme 1 includes answers that feeding Kea is wrong, like *«Don't feed Kea»* or *«A fed Kea is a dead Kea».* This is the target behaviour of the study, and it is important for the analysis to know whether they have seen these signs or not. There are a lot of these signs in Arthurs Pass (personal observation). Theme 2 was about not interacting with Kea at all. Don't touch it or harm it and respect its privacy. Theme 3 includes answers about how Kea is an endangered and protected

species, the issues of predation on Kea and what we can do to help Kea. The respondents mentioned keeping food and rubbish away from Kea and not leaving it unattended and that sightings of Kea can be reported to the Kea Database.

Theme 4 was about Kea as a problem, that Kea is a begging, destructive thief and that you should protect your food and things from them. Theme 5 includes visitors who remember places where there are signs about Kea, like the KeaKiosk, the Visitor Centre and KeaCafé, but not what the signs said. Some wrote that they saw signboards and sightseeing signs with info or an intro to Kea, without explaining it further. Some noticed the Road sign with a warning to look out for Kea the next 5 km, when entering the town from the West Coast. Theme 6 had answers like how Kea can damage and eat your car and that you should watch out for Keas when driving and at carparks.

In theme 7 they showed increased knowledge about Kea. They mentioned characteristics of Kea, like it being clever, curious, cheeky, inquisitive and mischievous. Some knew that it was the Bird of the Year 2017, a competition where the public votes for the most popular bird of New Zealand (Forest & Bird, n.d.). These signs were apparent around the Visitor Centre. Other things mentioned were that Kea is the only alpine parrot and the largest parrot in the world, that it is a native bird, local to Arthurs Pass area and found around here, that it visits cabins in the mountains and facts about its habitat. The last theme was for the visitors that misunderstood the question, stated hearing or seeing a Kea, did not read the signs or couldn't remember what it said.

Table 18: What the visitors remembered from the signs categorized into themes. The response rate is explained in percent (%) and number (N). Percentages may not add up to 100% because multiple themes were reported per visitor

Theme	Description of theme	%	N	Citations from theme
THEME 1	Don't feed Kea	37.3	114	*«Don't feed Kea»*
THEME 2	Don't interact with Kea	2.3	7	*«Respect its privacy»*
THEME 3	Protection and conservation of Kea	13.2	26	*«Protected species», «they suffer from lead poisoning»*
THEME 4	Kea as a problem	11.6	23	*«Warning they will steal food», «protect your things»*
THEME 5	Where they saw signs, didn't state what it said	17.2	34	*«Boards and brochures in visitor centre», «Kea Kiosk»*
THEME 6	Cars as a danger to Kea/Kea being a danger to cars	5.1	10	*«Slow down/be careful when driving», «they eat your car»*
THEME 7	Increased knowledge of Kea after reading signs	23.4	46	*«Kea are found in alpine regions, including Arthurs Pass & the Fiordlands», «Bird of the year»*
THEME 8	Misunderstood	11.6	23	*«One of was them standing right in front of me. And I hear them all the time»*

The most stated answer was that the signs said *you shouldn't feed Kea*, the target behaviour of the study (Table 18). There were also many respondents that showed *increased knowledge* about Kea after reading the signs, by describing facts displayed on the signs they had read. Many respondents remembered *where they saw the signs* but not what they said. Not everyone notices the signs even though there are many of them, or they need to spend more time there to notice them: *«I just turned around and saw all the boards & info about Kea, including 'don't feed me, ever' and why. The why is so important».*

Table 19: Analysis of differences between subgroups in the themes created from remembered messages on Kea-signs in Arthur's Pass, explained in percent (%) and number (N).

Themes	Category	%	N	Chi-square
Don't feed Kea	Lower education Higher education	45.8 63.9	27 85	Chi sq. = 5.537; Sig. = 0.019
Saw signs	Lower education Higher education	8.5 20.7	5 28	Chi sq. = 4.376; Sig. = 0.036
Increased knowledge	Lower education Higher education	13.6 26.9	8 36	Chi sq. = 4.121; Sig; = 0.042
Don't interact with Kea	High nature exp. Moderate/low nature exp.	7.0 0.9	6 1	Chi sq. = 4,920; Sig. = 0.027

The results only showed significant differences between education level and nature experience on the themes: *Don't feed Kea, saw signs, increased knowledge* and *don't interact with Kea* (Table 19). Level of formal education showed a significant difference on the theme *don't feed Kea*, where the majority that remembered seeing signs with this message had studied at university. The university group were also the ones with most answers showing *increased knowledge* of Kea after reading signs. At the same time, more respondents from the university-group didn't state what the signs said, only where they *saw signs*. Between the groups having high and low nature experience, the only significant difference was with the theme *don't interact with Kea*, where 7% of the respondents' answers included in this theme had high nature experience. None of the other subgroups (international/domestic, under/over 30 years, urban/rural and little/a lot of knowledge) had any significant differences.

The comments showed that many respondents were pleased of the interpretation about Kea: *«While travelling around New Zealand I have seen lots of signs, displays and information about the Keas and their conservation and threats. Good displays and information at several visitor information centres».* Interpretation was indicated being the reason behind successful protection of species: *«New Zealand is very good at highlighting animals at risk and protecting them - I believe this due to the information signs I have read near Kea areas and also from visiting conservation centres».*

6.0 Discussion

This chapter will discuss the findings of the study towards the theory and case description. It starts with answering the first research question: *«How do the visitors interact with Kea?»* with a focus on feeding of Kea. Secondly, the differing characteristics between compliers and non-compliers will be discussed. The next sections answer the three remaining research questions: *«What are the visitors attitudes towards human-Kea interactions?», «What beliefs do the visitors have about feeding Kea?»* and *«How effective is the signs in Arthur's Pass in preventing feeding of Kea?».* After this, it will be argued what implications the results could have for the management, following the limitations of the study. The chapter ends with proposals for further research.

6.1 Interactions with Kea

Kea has become a tourist attraction in New Zealand, as with many of the other endangered species in the world (Shackley, 1996; Newsome & Rodger, 2008). The first part of the study examined how the visitors interact with Kea in Arthur's Pass. Those who had seen Kea had been of close distance to it, which illustrates the lack of fear and the attraction that Kea has for humans (Diamond & Bond, 1999), which makes it easy for people to interact with it. While Kea were abundant in Arthur's Pass before, there has been a dramatic decline in a short time (G. Kates, pers comm, October 14, 2017). That means that it is less likely to encounter them now. The results showed that it was almost 50/50 between those who had and those who had not seen Kea at this visit to Arthur's Pass. Though the majority spent little time on the visit, it could suggest that the number of human-Kea interactions have rapidly declined together with the population.

Observations of the numerous *«Don't feed Kea»* signs suggested that feeding was an interaction that was particularly problematic for the management. This was therefore considered the target behaviour of the study. Feeding of wildlife is an increasingly popular tourist activity (Shackley, 1996; Newsome & Rodger, 2008), but has negative impacts on the fed animals, especially species that are already vulnerable (Higginbottom, 2004; Green & Giese, 2004). The information presented in the current study suggested that feeding of Kea is a continuous problem (G. Kates, pers comm, October 14, 2017; L. Young, pers comm, November

22, 2017; Roberts, 2012) and that it creates problems for both humans and Kea. One of the park managers in Arthur's Pass expressed that the endangered status of the Kea has turned them into celebrities (G. Kates, pers comm, October 14, 2017). Several respondents mentioned seeing other tourists feeding Kea, and some had tried to stop them. They commented for example: *«I have seen tourists feeding birds right by the sign, and they were English speaking», «when I see people feeding wild birds, I explain to them that it's not good»,* «*I have had to stop tourists feeding the Kea, including sweet foods»* and *«German tourists were feeding profusely and continued to do so when we told them to stop».*

Based on these statements, it would be expected to get many respondents who had fed Kea. However, most of the respondents in this study that had encountered Kea had only watched or photographed it, while few had actively engaged with it by playing with it or feeding it. Only 18 of the sample were non-compliers and most of the respondents were against feeding Kea and not willing to perform this behaviour. This could suggest that the problem is not as big as the managers think, or that they do not want to state having fed it.

An important aspect is that only a few interactions could affect the whole species (Reid et al. 2012). Only the few non-compliers in this study might be large enough to cause big problems for the bird. With the rapid decline and slow reproductivity, only a few dead Kea can put the whole species at a high risk (Reid et al., 2012; Birdlife International, 2018). Therefore, one Kea killed on the road or poisoned by lead or chocolate poses a big problem.

The feeding of Kea happens both unintentionally and intentionally. According to one of the managers at DOC, people mostly accidently fed Kea, since it is clever at stealing food if they do not pay attention (G. Kates, pers comm, October 14, 2017). Only three of the non-compliers had got their food stolen, a lower number than expected from this statement. Others might also have got their food stolen but don't consider it feeding, and therefore don't include it.

The rest of the non-compliers had intentionally fed Kea. An expert on Kea said that many thinks they do Kea a favour by feeding them and just do not know that it can harm them, while others feed Kea knowing that it is wrong (L. Young, November 22, 2017). Most of the non-compliers had fed Kea before they knew it was wrong or because it had begged for food.

The non-compliers do not however illustrate the whole picture. Though there were few feeders, many of the other respondents were considered being potentially future feeders. Out of the 288 compliers (non-feeders), 84 of them might feed if they get the opportunity. This suggests that there is a group of visitors who might have an intention to feed Kea, which is an important aspect to investigate for the managers.

6.2 The characteristics of the compliers and non-compliers

The analysis of the characteristics of the visitors in this study provided a background to separate the non-compliers from the compliers and get a picture of who they are. This can be used to target management measures towards certain groups to prevent depreciative behaviour.

There were some differences found between the two groups. One of the respondents wrote: *«as an NZ'er who spends time in the alpine it is known not to feed them».* It has been stated in research that having direct experiences with nature can make people care about nature and therefore want to protect it (Kals, Schumacker & Montada, 1999). However, the findings of this study contradict this statement. The non-compliers are both New Zealanders and experienced with nature, while the compliers are mostly internationals with low nature experience. They might not have been exposed to education as part of these nature experiences, that could have made them support conservation measures (Green & Giese, 2004; Kim, Airey & Szivas, 2011; Ludwig, 2015), or might have been taught false information.

Those who fed Kea reported having a lot of knowledge about Kea, while the respondents in general had a very low score. New Zealanders stated having more knowledge of Kea than international visitors. This has a connection to most of the non-compliers being domestic visitors. Those who perceive themselves to have knowledge about Kea but still feed it, might have an attitude to *«know better»* than the people working with the conservation of Kea. This had been experienced with domestic visitors especially, where trying to reason with them often turned into heated arguments (G. Kates, pers comm October 14, 2017). Though they might think Kea are a *«pest that should be killed*» (G. Kates, pers comm, October 14, 2017), the answers of the non-compliers could be interpreted as favourable

towards Kea and that none of them wanted to cause it any harm. This could suggest that the domestic visitors who feed Kea might just not believe that feeding harm Kea, even though they probably have been told that it does. Using education to change their behaviour might thus be challenging.

The characteristics of the group that might feed if they get the opportunity were similar to the rest of the compliers, except that they were younger. This suggests that interpretation should try targeting the younger group to prevent them from feeding in the future. They also had little knowledge of Kea, which could be interpreted that more knowledge of the threats of feeding could change their intention to feed Kea.

6.3 Attitudes towards human-Kea interactions

The intentions of performing and in turn the performance of a behaviour, is affected by the attitudes towards the same behaviour (Ajzen, 1991). The study measured the visitors' attitudes towards four types of interactions between humans and Kea: watching, photographing, playing with and feeding Kea. The non-compliers were more positive towards the interactions with Kea, while the compliers had a stronger objection towards human-Kea interactions. Maybe they had a good experience feeding it or do not see interacting with it as wrong since they have done it themselves. This suggests that there is a connection between attitudes towards the behaviour and behaviour in this study, supporting the use of TPB as a method.

The rural visitors with a lot of knowledge of Kea were more positive towards watching Kea than the urban visitors. Even though they might have had experiences with Kea causing trouble in some way, they are clearly not among the farmers and backcountry people being against Kea because of its history of attacking sheep (L. Young, November 22, 2017). Highly educated visitors with a lot of nature experience were more positive towards both watching and photographing Kea. It therefore appears to be a correlation between a high level of education and curiosity for seeing Kea. Other than this, the analysis of differences in attitudes between different visitors had marginal results. This could mean that many had the similar attitudes towards the interactions.

A tendency was that the attitudes got increasingly more negative the closer and more impact the interaction has. Even those who had fed Kea themselves were negative towards feeding. The fact that several respondents had tried stopping others from feeding supports the negative attitude towards feeding. The common negative attitude towards feeding could have roots in feeding of wildlife being a controversial part of wildlife tourism (Orams, 2002). They might be aware of others perceive feeding of Kea as wrong. That does not necessarily stop them from feeding Kea if they get the opportunity in the future. Targeting the common attitudes and what the visitors agree on could probably be easier for the management than targeting all the different perceptions. However, more research on this subject is needed to get into a deeper discussion.

6.4 Beliefs about feeding Kea

The study found a large range of beliefs related to feeding of Kea, which is interesting because that means the visitors to Arthur's Pass have very varied perceptions of feeding Kea. The most frequently mentioned beliefs were coloured by a negative perception of feeding Kea and show an awareness of what this behaviour leads to amongst visitors.

The attitude towards a behaviour is a result of three types of beliefs: the evaluation of the outcome of the behaviour (behavioural), whether some peers think they should do it (normative) and whether they perceive themselves able to perform the behaviour (control) (Ajzen, 1991; Hughes, Ham & Brown, 2009). The reason behind examining the beliefs towards feeding of Kea is that it can enhance the ability to influence it (Hughes, Ham & Brown, 2009). The belief elicitation of this study provided a view into how the visitors perceive Kea and human interactions with the bird. The use of this method was supported by other studies that have used the TPB and belief elicitations to research feeding of wild birds (Ballantyne & Hughes, 2006; Ham et al., 2008).

6.4.1 Behavioural beliefs

Behavioural beliefs were measured through asking what good and bad things the visitors thought could occur by feeding Kea. The results showed that most respondents saw no advantages in feeding Kea and perceived feeding as bad

for Kea, while the second most frequently mentioned advantage was that feeding could help in the survival of Kea. This is a strange disagreement and identifies two large groups with completely opposite perceptions of feeding. The respondents who stated it could help its survival were mostly young, domestic visitors with a lot of knowledge of Kea. Conservationists sometimes feed animals that are injured (Orams, 2012). It could be that this is the reason why the young, domestic visitors think that feeding could help the survival of Kea. People who are not part of the conservation should not feed Kea, because it will decrease their chance of survival rather than help it (Diamond & Bond, 1999; Huber & Gajdon, 2006; Gajdon, Fijn & Huber, 2004; Orr-Walker, 2010; Orr-Walker, 2012; Charteris, 2012; GrrlScientist, 2018; BirdLife International, 2018). For the management, this indicates that there are many who think feeding is beneficial for Kea. Often this is caused by a lack of knowledge, and not a non-compliant attitude (L. Young, pers comm, November 22, 2017). This means that education could be a simple, yet powerful solution.

Many also thought feeding would make Kea more friendly and approachable towards humans, and that it would be a unique and enjoyable experience. This supports the reported growing interest for watching free-ranging wildlife and feeding to get close encounters (Higginbottom, 2004; Newsome & Rodger, 2008). Since it was especially young respondents with little nature experience that answered this, maybe it could indicate that not having previous experience means having a higher curiosity for encountering wildlife. One of the target outcomes to DOC is facilitating great outdoor experiences for visitors (Department of Conservation, n.d.2). As part of wildlife tourism, it often includes providing opportunities to encounter unusual wildlife, while at the same time protecting the species from negative impacts (Sorice, Shafer & Ditton, 2006). This requires clear strategies to protect the interests of both tourists and nature.

The second most mentioned disadvantage was that feeding make Kea become a pest for humans. When Kea are being fed they have more time to do mischief (G. Kates pers comm, October 14, 2017). The third most stated disadvantage with feeding Kea was that it would interfere with what's natural and that it is unsustainable. The origin of this belief could be that people have become increasingly concerned about nature, as environmental issues have an increasing impact on people's lives (UNESCO, 2010).

6.4.2 Normative beliefs

Normative beliefs were measured through asking to what degree visitors thought different people or groups would approve or disapprove if they fed Kea. The results showed that the majority of the respondents thought people would disapprove. This adds to the general negative perception that most visitors have which is that feeding is bad for Keas' health and behaviour and increases the negative stigma associated with feeding Kea.

There were clear differences in the beliefs of the different categories of respondents. The results suggest that the younger visitors are more likely to think people will approve of feeding Kea. This is contrasted by those 30 years and older being more likely to think friends, family and managers would disapprove.

Many of the respondents thought their spouse, family or other people in the travel group would disapprove of them feeding, which might imply that they are the most important peers influencing whether they start to feed Kea in the future. Family was also found to be important for the introduction to use of the Park (Espiner, 1995).

An interesting finding was that if the visitors had fed Kea, they thought people would approve of feeding to a larger degree than if they had never fed Kea. This indicates that the approval/disapproval of others have an effect on whether the visitors feed Kea or not.

The respondents considered other visitors to Arthur's Pass to be more neutral to feeding compared to the other peer groups. Some of them wrote *«I don't know»* next to the scale, which suggests that they might have found it difficult to answer what the attitudes of other visitors were towards feeding Kea. The strongest perceived disapproval was from the managers in Arthur's Pass, which could suggest that the respondents know that feeding Kea is wrong.

6.4.3 Control beliefs

Control beliefs were measured through asking what circumstances would make the visitors more or less likely to feed Kea. To both questions relating to control beliefs, most respondents answered that they wouldn't feed anyway. Those who answered negatively to feeding differed from the average respondent

by having a relatively high amount of knowledge about Kea, which indicates a relation between knowledge of Kea and the participants' behaviour.

The second most answered factor that would make it more likely to feed Kea was if it seemed harmed or hurt. These respondents were primarily men with a lot of nature experience. This could be interpreted as a contradiction to the general perception that the more familiar people are with nature, the larger is their basis for wanting to take care of it. As the ecophilosopher Faarlund (1993) believes, an understanding of nature will foster a friendship with nature. Tilden (1957, p.38) described it as part of the interpretation theory: *«…through understanding, appreciation; through appreciation, protection».* It is therefore an interesting finding that those who are most experienced with nature in this study are the same who want to feed Kea. Perhaps this mindset could be explained by them having more experience and thus more self-assurance when it comes to relating to nature, while less experienced visitors are more likely to be careful in their interaction with nature. Maybe this is a problem that is distinctively happening in New Zealand and should be included in further research.

The second most effective preventative measure according to the results was *«Don't feed Kea»*-signs, followed by gaining more knowledge. Both results support these types of preventative measures, which will be further described in the next section of this chapter.

6.5 Effectiveness of the signs targeting feeding of Kea

Signs and education was perceived as important to stop feeding of Kea in the current study. The results from this study also showed that signs were the second most important source where visitors got information about Kea. Additionally, many did not feed Kea because other people or signs had told them not to. This correlates with surveys conducted in New Zealand and Australia where signs and education were the most common visitor suggestion to improve wildlife interpretation (Moscardo, Woods & Saltzer, 2004).

Interpretation can take many forms; the personal type, like guiding, or the non-personal communicative type, like signs (Ham & Weiler, 2002). Signs is the most noticeable type of interpretation that target feeding of Kea in Arthur's Pass and became therefore also the focus of the study.

The signs use elements from different approaches to prevent this behaviour. A typical misunderstanding about Kea is that it is not endangered, because it could seem like they are thriving since they congregate in social groups (G. Kates, pers comm, November 14, 2017). A constructivist approach would try to clarify these misunderstandings (Ballantyne, Packer & Hughes, 2009). One example of this method being used for some signs is explaining that Keas are endangered and that not feeding them will help protect them.

The Protection Motivation Theory describes an approach where fear is used as a tool to change behaviour (Boer & Seydel, 1996). The nuisance behaviour of Kea increases with feeding, which the signs typically describe with the goal of showing readers the potential negative consequences feeding could cause for them personally.

Using the Theory of Planned Behaviour as an approach focuses on communicating the long-term impacts of the behaviour to readers (Ballantyne, Packer & Hughes, 2009). The long-term impacts of feeding Kea is especially communicated by pointing out that *«a fed Kea is a dead Kea»* and that you can help the survival of the species by not feeding it. This proved to be an important approach, since the most important reason to not feed Kea was the negative impacts it caused to Kea.

Another evidently effective approach proved to be an authority-based approach, where signs, managers and other people telling the visitors to not feed Kea was a much-stated reason to not do it. The protected status of the Kea which is written in law may also deter people from feeding and potentially killing Kea, if they are aware of the law and penalties for killing a protected species. When asked which message they remembered from the signs, *«Don't feed Kea»* was the most frequent answer. This message provides no explanation for why people shouldn't feed but relies solely on the authority of the sign to influence people's behaviour. This is a common message in Arthur's Pass, where several signs with this message are often placed in vicinity to each other.

The second largest theme which the respondents remembered from the signs were messages that increased their knowledge about Kea. The majority of the respondents who answered within these two largest themes had studied at university. Level of education is in other research often revealed to be related to a

person's knowledge about the environment, which in turn influences pro-environmental behaviour (Vicente-Molina, Fernández-Sáinz & Izagirre-Olaizola, 2013). This is supported by their answers to reasons of not feeding Kea, where more from the university group thought it would cause problems for Kea than those of lower education. However, on the seven-point scale that measured the respondents' knowledge about Kea contradicted this theory, where there were no significant differences between higher and lower education level.

The results from the current study suggests that there is a need for more education to prevent people from feeding Kea. The majority of the respondents considered themselves to have little knowledge of Kea. Essentially, this was also the case for the group who might feed if given the opportunity. Previous research stated that visitors have been observed feeding Kea right in front of the very signs telling them not to (Roberts, 2012). This emphasizes the importance of effective signs and education.

There is potential to improve the interpretation at Arthur's Pass to make it more effective in preventing feeding of Kea. The majority of the visitors just pass through Arthur's Pass or only stay there for a short period of time. Many of them do not notice the signs, even if they are everywhere (L. Young, pers comm, November 22, 2017). Having signs that focus on a specific message might make it easier to catch the visitors' attention. Focusing the communication has been an effective measure in making the society more concerned about environmental issues (UNESCO, 2010). Since the *«Don't feed Kea»* signs and the road sign (Figure 7) have been effective, maybe the format of a warning sign could be used to a larger degree. These signs have an appearance of authority, expressing that feeding Kea is forbidden by law. This might make people afraid of possible punishments or uncomfortable reprimands. It could still be difficult to reach out to those who do not respect authority or those who believe that feeding is not harmful for Kea. The authority-based approach does not seek to get people to care about Kea or wanting to protect it. It will not give them an emotional or intellectual connection as a successful interpretation has the potential to achieve (Tilden, 1957).

A successful interpretation is thematically organised with enjoyable information that personally relates to the reader (Kuo, 2002; Ham, 2013). The

signs in Arthur's Pass could be further developed by using these principles. The design of the newest signs at the public toilets, Otira Viaduct and the Kea Kiosk are appealing and awaken the curiosity of people who pass them (Figure 7 and Figure 9). Though there is a lot of information, the most important points in the text are emphasised. The four rules on the signs help clarifying the parts that relate to the behaviour of the reader. The negative impacts it could cause to the reader personally could have been more highlighted, other than the risk of getting their belongings stolen by Kea. This has to feel important to the reader, without it negatively affecting their attitude and feelings towards Kea. Most Keas are not aggressive, but it has happened that it has bitten to get food (G. Kates, pers comm, October 14, 2017). Though having a picture of a biting Kea probably would make people more careful of approaching them, it could also result in a decreased desire to protect them.

The previously identified visitor beliefs towards feeding of Kea have helped explain the successfulness of specific interpretation measures in Arthur's Pass. This supports the use of TPB in this type of research (Ballantyne & Hughes, 2006; Ham et al., 2008; Hughes, Ham & Brown, 2009). However, since the strengths of the beliefs were not measured, it could only explain the successfulness to a certain degree. More research is needed to evaluate the effectiveness of the signs on a higher level.

6.6 Management implications

The signs in Arthur's Pass were perceived as successful in the specific message of *«Don't feed Kea».* This could be used as a tool by other wildlife managers working with the conservation of Kea in other places in New Zealand or other similar cases.

The visitors who stated having fed in this study were predominantly New Zealanders with a lot of nature experience. One of the managers had experienced domestic visitors to *«know better»* and not receptive to being reproved (G. Kates, pers comm, October 14, 2017). If this is the case, there is a need to investigate how this attitude could be changed. The managers had experienced an *«anti-DOC feeling»* among a minority of New Zealanders (G. Kates, pers comm, October 14, 2017), which understandably makes it problematic to stop them from feeding.

They should build up their reputation, correct the misunderstandings and enhance the importance of their work with saving the species of New Zealand. Maybe they could get partnerships with organisations and people that are highly respected in the community and get them to openly discourage feeding.

This study has different results than what the managers' observations implied, which suggest that the managers need more information about the extensiveness of the feeding issue. It would be useful for them to know whether the few non-compliers in this study is connected to the rapid decline of the Kea population or if there generally are few visitors who feed Kea. If later research finds a higher number of non-compliers it could indicate that there were respondents in the current study who refrained from answering having fed Kea.

Those with little knowledge of Kea were primarily young, international visitors with little nature experience. This group was more likely to feed if they get the opportunity. The managers could try focus on increasing their knowledge by using signs to target these groups especially. Another group that could be targeted are those who think feeding can help the survival of Kea. It could be that there is a need for different approaches depending on whether the visitors are domestic or international, and whether they have little or a lot of nature experience. This proves the importance of successful interpretation that target the different type of visitors and how difficult that is. For the design of successful interpretation, it would help to know what approaches are effective with the different type of visitors (Jacobson, 1991). To identify this, further research need to use another method than what is used in this study.

6.7 Study limitations

While the results of this study provide an empirical basis for supporting visitor education and information strategies to manage visitors feeding wildlife, the study has limitations that should be noted. The relation between beliefs, attitudes and behaviour is imprecise when measuring recreation behaviour (Ballantyne & Hughes, 2006). The answers from the questionnaire identified common knowledge and beliefs related to feeding of Kea.

The TPB proved to be a useful model for understanding visitor beliefs and behaviour towards feeding Kea in Arthur's Pass and for evaluating the efficacy of

persuasive messages designed to discourage visitors from feeding Kea. The belief strengths should have been tested to be able to draw lines towards subjective norm and perceived behavioural control. That would have made the questionnaire too extensive, but it makes it more difficult to show how these beliefs are connected to present and future behaviour. The respondents' beliefs about feeding Kea reflects Arthur's Pass as a low-impact tourist destination in pact with nature (Kapelle, 2001). A different result could be found at another site in New Zealand, at a different site or with a different sample.

The non-compliers were too few to compare with the compliers, which resulted in limitations to the analysis. The results therefore did not have enough data to portray the perceptions of the feeders with significant results. With a sample over 300, it still gave answers to how many visitors think about feeding Kea and gave indications on whether they might feed in the future. There was one observation of a feeder who was not willing to participate in the study when later asked, which means that more could have fed while the researcher was not present. Some of the participating visitors could also have refrained from answering positively to having fed because of a fear of being judged. If that is the case, it would mean that the frequency of feeding is bigger than the results indicate. It's therefore difficult to say if the sample is representative to the population and is therefore potentially biased. For further research, alternative methods like observation should be used to more accurately find out the expanse of the feeding behaviour. One challenge is that the presence of a researcher at the site might prevent people from feeding. The data-collection had a time-limitation of one week. Considered it was a master thesis (30 Norwegian credits), the resources were also limited.

The questionnaire relied on self-reported attitudes, beliefs and behaviour, and were therefore subject to a range of biases (Ballantyne & Hughes, 2006). Though the sample stated having little knowledge of Kea, their answers on the open-ended questions suggests otherwise. They might have said they had little knowledge because they were scared to score themselves too high and get proven otherwise.

The rate of non-responses was quite high on the open-ended questions about behavioural and control beliefs. The reason could be that if they did not feed

Kea anyway, nothing would make them more or less likely to do it. It might have been avoided if the questions were more clarifying, but they were asked the same way as the method from TPB, since this was the applied model. There were also a few respondents that failed to see that the questionnaire was two-sided. This could have been prevented by monitoring them while they wrote, but as there were five boards of questionnaires given to different visitors at the same time that was not possible.

On the normative belief-scale, it was possible to choose *«not applicable»* on all of the peers, which several did (47 on spouse, 16 on friends, 19 on family, 52 on other people in travel group, 24 on other visitors and 15 on managers). This was meant to be an alternative for those who did not have a partner or travelled alone. It should not have been an alternative on all of them, especially not *«Other visitors»* and *«Managers in Arthur's Pass».*

The potential influence of on-site signage targeting feeding Kea could also have affected the answers of the respondents by whether they had the opportunity to encounter signs about Kea before completing the questionnaire. Which location they were surveyed influenced what signs they had seen, if any, and whether they had met Kea. These factors may have influenced the reliability and validity of the study, which need to be taken to consideration if the results are to be further researched.

6.8 Further research

Since there might be more feeders of Kea than the results show, it could mean that it is difficult to get them to participate. A solution could be to do observational research. The researcher can try finding a way where those seen feeding Kea are accessible to participate in a belief elicitation. They might need to be approached later to not be frightened. Investigating if tourists have seen or experienced others feeding Kea can also be a solution. This was not part of this study, but many respondents commented having seen others feed. Unintentional feeding was not either a part of this study. Although a few respondents answered they had gotten their food stolen of Kea, others might also have experienced this. To further examine human-Kea interactions, surveys could include these elements in their research.

The belief elicitation is only the first step in a TPB approached visitor study. The next step is to measure the strengths of these beliefs (Hughes, Ham & Brown, 2009). The other factors in the TPB that were examined as part of the study was knowledge, attitudes towards the behaviour and whether they had performed the behaviour before. Further research should identify the other factors in the TPB not included in the current study; subjective norm, perceived behavioural control and behavioural intention. Through including open-ended questions in the questionnaire, it was discovered that the visitors have a wide range of different perceptions on feeding of Kea. The disadvantage of having a lot of these questions was that they are time-consuming, resulting in many refraining to answer them. Further research could have interviews with the visitors to get a more in-depth view of their perceptions on feeding, which might increase the response and length of the answers.

Depreciative visitor behaviour towards endangered species needs more attention in scientific research to find out how to manage it. One type of management measure might work at a specific site, with a specific type of visitors or wildlife species, but does not necessarily transfer to other scenarios. Having more studies with examples of management measures proven to be effective gives a broader collection for the conservation to find what might apply to their situation. To test whether the signs targeting feeding of Kea in Arthur's Pass reached out with their messages, it was asked what the visitors remembered from them. To test the effectiveness of specific signs, pre- and post-surveys can be used to examine whether the visitors get a more appropriate behaviour as a result of the interpretation.

7.0 Conclusion

The aim of this study was to examine the perceptions of feeding Kea among the visitors to Arthur's Pass, a mountain village in New Zealand. The research was conducted through a visitor questionnaire based on the belief elicitation measurement method from the Theory of Planned Behaviour.

The TPB proved to be a useful method to answer the research questions about the interactions, attitudes and beliefs the visitors had towards feeding of Kea. The results showed that there were relations between the steps of the model. The attitudes of those who had fed Kea were more positive towards interactions with Kea than those who never had fed Kea, hence suggesting a relation between both the attitudes towards and the behaviour of feeding Kea.

The approval or disapproval of others had an effect on whether the visitors fed Kea or not, and non-compliers thought the peers would approve to a larger degree than the compliers. This shows a connection between normative beliefs and the behaviour of feeding Kea. Most respondents stated not having fed Kea, and most answered that nothing would make it either more likely or less likely to feed Kea, which suggests a connection also between control beliefs and feeding of Kea. The relation between feeding and behavioural beliefs was unclear, as most saw feeding as bad for Kea, while second most thought it could be beneficial to Kea.

Findings of the study show that most of the visitors perceived feeding of Kea as wrong and few stated having fed it. At the same time, only a few people feeding Kea can have a negative effect on the whole species. Those who stated having fed in this study were mainly New Zealanders with a lot of nature experience. Most had fed it intentionally, but not with the purpose to harm it. They stated having a lot of knowledge about Kea, while the average respondent reported having little knowledge about Kea.

Many visitors thought feeding would help the survival of Kea or would feed it if they thought it was in need, which is the opposite of what the conservation recommends and would only make the problem worse. Those working with the conservation of Kea expressed that feeding is a continuous issue and many visitors had seen others feeding Kea.

The results of the study could suggest that feeding is not an issue as big as the managers think, or that the visitors who participated in this study was not

being entirely honest. Another explanation is that the interpretation in Arthur's Pass targeting this behaviour has been successful. Many increased their knowledge about Kea after reading signs. Still, the majority stated having little knowledge of Kea, which indicates that there is a need for more education.

The fourth research question was about the effectiveness of the signs in Arthur's Pass in preventing the targeted behaviour. The results showed that signs were proven to be a successful education measure, as many visitors increased their knowledge about Kea after reading them. *«Don't feed Kea»* was the most memorable message, in spite of providing no explanation for why feeding is depreciative. To further examine the effectiveness of signs, visitors could be surveyed pre and post the exposure to signs.

Implications from this study suggested that the management has some challenges in preventing feeding Kea among visitors. Identifying who the non-compliers are is one, but there is also a larger group who has intentions of feeding if they get the opportunity. Though the population of Kea now is dramatically decreasing, if successful management increases the population of Kea, there will also be an increase in human-Kea interactions. This will again provide more opportunities to feed Kea. The managers need to establish that feeding Kea is an unwanted behaviour and that this common knowledge before it again becomes a problem. The results of the study support the use of visitor education and interpretation in managing feeding of Kea, but the range of different type of visitors poses difficulties in designing successful interpretation that target them all. Finding approaches for management measures that reach out to them is therefore an important subject for further research. More research is required on how to manage depreciative visitor behaviour towards endangered species, with different types of visitors and sites.

An elicitation makes it possible to firstly identify the beliefs which later can be used to measure the strength of the beliefs and to find connections to behaviour. The questionnaire was more comprehensive than the usual belief elicitation, including attitudes and behaviour. This made it possible to discover the large variety of beliefs among the visitors and to look for connections in the different parts of the TPB model. Hence, it provided an extensive basis for further

and deeper investigations on attitudes and beliefs towards feeding of Kea and the effectiveness of signs targeting the behaviour.

The most frequently mentioned beliefs were coloured by a negative perception of feeding Kea and show an awareness of what this behaviour leads to amongst visitors. At the same time, there were indications of a negative stigma associated with feeding Kea. This might make some respondents refrain from answering that they had fed Kea. Observational research and questioning visitors about whether they have experienced other people feeding might be better methods for examining the span of the issue. This should also specify the including of unintentional feeding.

The questionnaire discovered that visitors have a range of different perceptions on feeding of Kea, but it did not explain it in depth. Though the quantitative study can show the overall opinions of the visitors as a population, a qualitative study could further examine the deeper beliefs of the visitors. The lack of research on human-Kea interactions limited the deeper understanding of the subject. A lot of people have close encounters with Kea, and these interactions have negative impacts for both parts. It is therefore an issue for both tourism and wildlife management that needs more attention.

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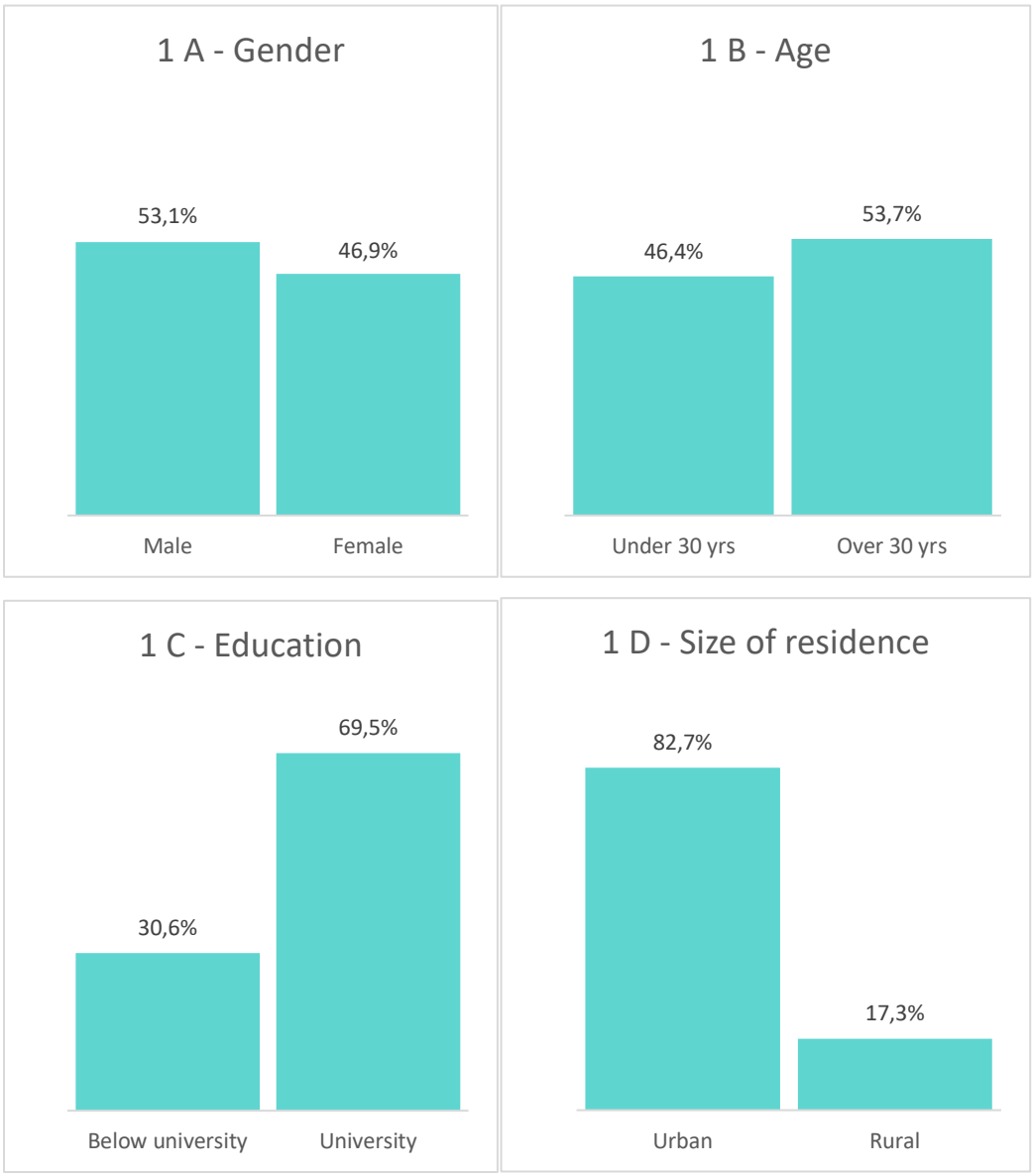
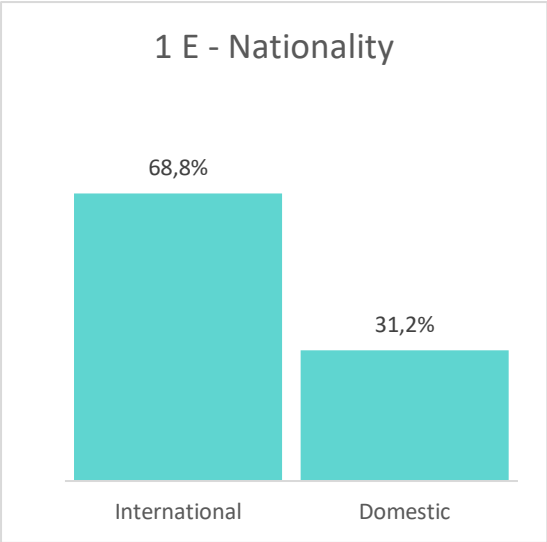
APPENDICES

Appendix 1: Characteristics of visitors to Arthur's Pass

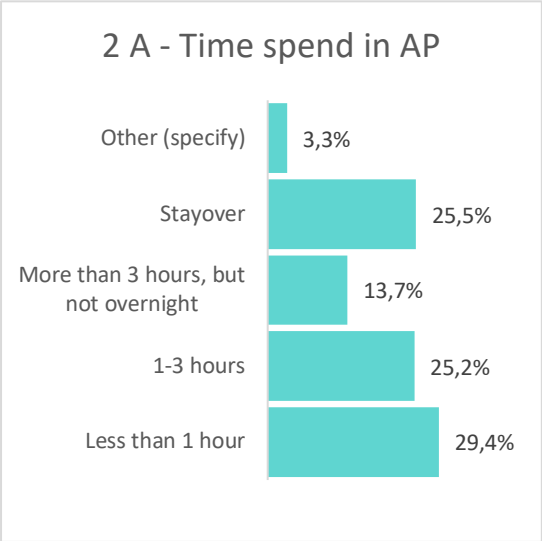


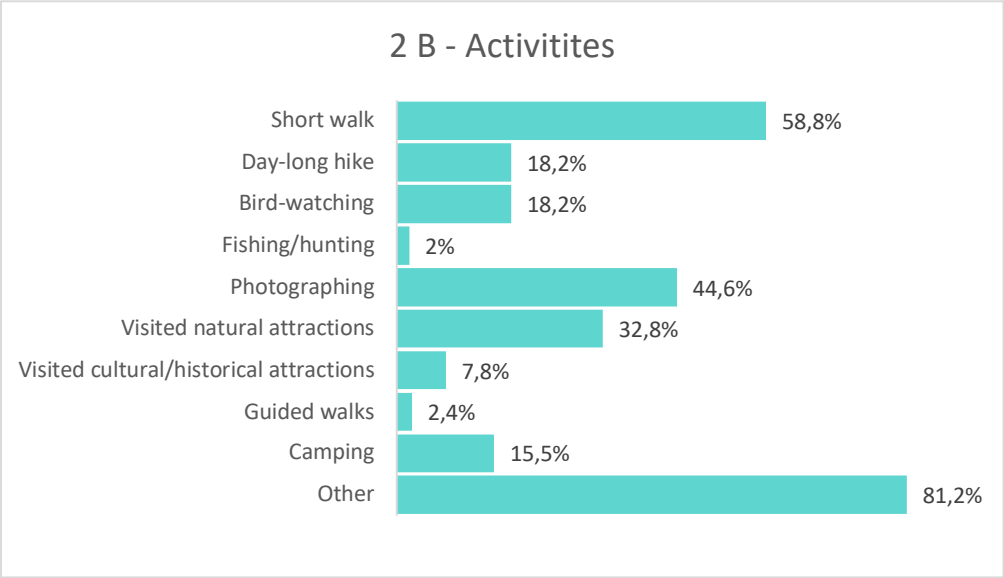


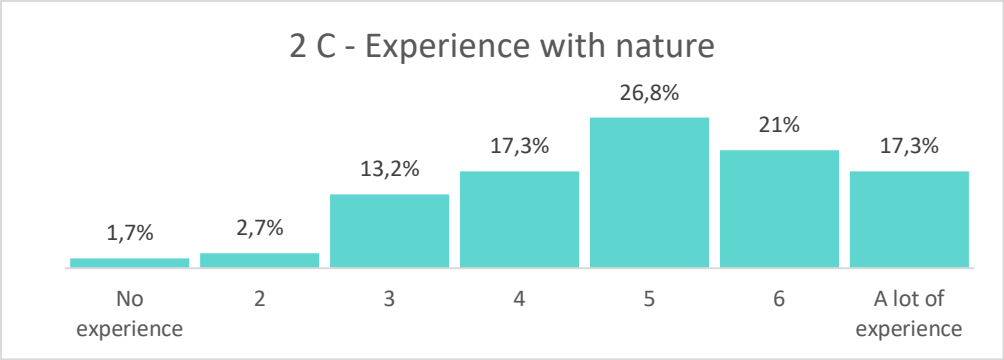
1 F - Distribution of visitors based on country of residence

Country of residence	**%**	Japan	1
New Zealand	31,2	Norway	0,7
USA	13,3	Scotland	0,7
Australia	9,6	South-Korea	0,7
UK	9	Malaysia	0,7
Germany	5	Denmark	0,7
France	3,7	Italy	0,7
Canada	3,3	India	0,7
Switzerland	2,7	Austria	0,7
China	2,3	Slovenia	0,3
Spain	2	Netherlands	0,3
Singapore	1,7	Poland	0,3
Sweden	1,7	Nepal	0,3
Taiwan	1,7	Argentina	0,3
Ireland	1,3	Israel	0,3
Czech Republic	1,3	Oman	0,3
Belgium	1,3	United Arab Emirates	0,3

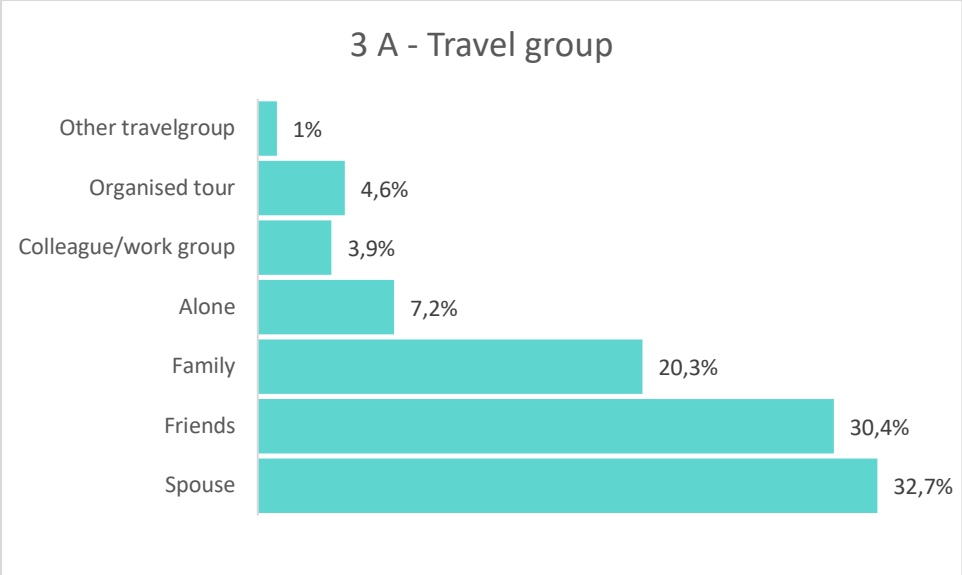
Appendix 2: Characteristics of the visit

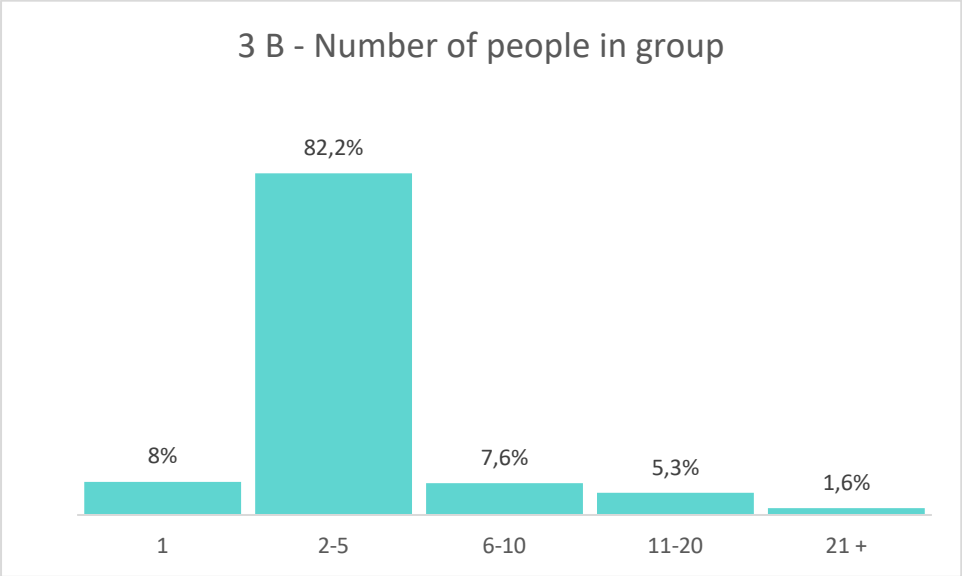






Appendix 3: Characteristics of the travel group

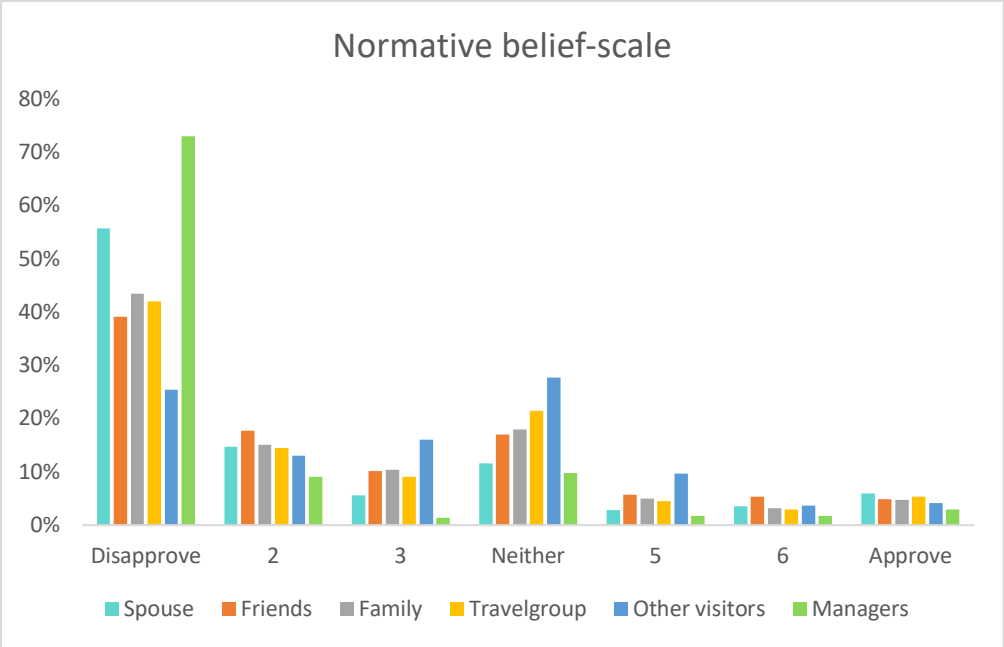




3 C - Number of children (under 15 years) in group

Children in group	%
No children	92
1-2 children	5,9
Over 2 children	1,9

Appendix 4: Normative beliefs



Appendix 5: Questionnaire

Section 1 - About your visit

Q 1 **How many times have you visited Arthur's Pass?** Please check **one** box only.

- ☐ (1) First time
- ☐ (2) 2-5 times
- ☐ (3) 6-10 times
- ☐ (4) 11-20 times
- ☐ (5) Over 20 times

Q 2 **How much time will you spend in Arthur's Pass?** Please check **one** box only.

- ☐ (1) Less than 1 hour
- ☐ (2) 1-3 hours
- ☐ (3) More than 3 hours, but not overnight.
- ☐ (4) Stayover
- ☐ (5) Other (specify)

Q 3 **Which of the following activities did you engage in during your visit to Arthur's Pass?** Please check **any** that apply

- ☐ Short walk (1-3 hours)
- ☐ Day-long hike
- ☐ Bird-watching
- ☐ Fishing or hunting
- ☐ Photography
- ☐ Visiting natural attractions
- ☐ Visiting cultural/historical attractions
- ☐ Guided walks
- ☐ Camping
- ☐ Other (specify) _____

Q 4 **How much experience do you have with being in nature?** Please circle **one** number.

1	2	3	4	5	6	7
No experience						A lot of experience

Section 2 - About your knowledge of Kea

Q 5 **Have you heard about the native alpine parrot, Kea?** Please check one box only.

☐ (1) Yes
☐ (2) No **(go to Q 8)**

Q 6 **How much knowledge do you have of Kea?** Please circle **one** number.

1	2	3	4	5	6	7
No knowledge						A lot of knowledge

Q 7 **From what sources have you learned about Kea?** Please check **any** that apply.

☐ Visitor centres before arrival
☐ Brochures before arrival
☐ Online before arrival
☐ From locals in New Zealand
☐ From other tourists
☐ Visitor centre in Arthur's Pass
☐ Signs in Arthur's Pass
☐ Other (specify) _____

Q 8 **Have you noticed any signs about Kea in Arthur's Pass?** Please check **one** box only.

☐ (1) Yes
☐ (2) No **(go to Q 10)**

Q 9 **Please explain in short the key messages of the signs**

Section 3 - About interactions with Kea

Q 10 **Before you arrived, did you expect to see Kea in Arthur's Pass?**
Please check **one** box only.

- ☐ (1) Yes
- ☐ (2) No

Q 11 **On this visit to Arthur's Pass, have you seen Kea?** Please check **one** box only.

- ☐ (1) Yes
- ☐ (2) No **(go to Q15)**

Q 12 **Where in Arthur's Pass did you see Kea?** Please check **any** that apply.

- ☐ The Wobbly Kea Café and Bar
- ☐ Challenge Arthur's Pass Café and Store
- ☐ Arthur's Pass bus stop and carpark
- ☐ Otira Viaduct Lookout
- ☐ Scott's Track to Avalanche Peak
- ☐ Bealey Valley
- ☐ Alongside the road
- ☐ Other (specify) _____

Q 13 **How close were you to the Kea?** Please check **one** box only.

- ☐ (1) I touched it (or tried to)
- ☐ (2) If I reached out I could have touched it
- ☐ (3) Under 10 meters (less than 30 feet)
- ☐ (4) Over 10 meters (more than 30 feet)

Q 14 **How did you interact with Kea?** Please check **any** that apply

- ☐ Looked at it
- ☐ Photographed it
- ☐ Played with it
- ☐ Fed it

...What did you feed it? _____

- ☐ Other interaction (specify) _____

Q 15 **What do you think about the following interactions with Kea?**
Please circle **one** number

Watching Kea

1	2	3	4	5	6	7
Negative			Neutral			Positive

Photographing Kea

1	2	3	4	5	6	7
Negative			Neutral			Positive

Playing with Kea

1	2	3	4	5	6	7
Negative			Neutral			Positive

Feeding Kea

1	2	3	4	5	6	7
Negative			Neutral			Positive

Section 4 - About feeding Kea

Q 16 **Have you ever fed Kea?** Please check **any** that apply

- ☐ (1) Yes
- ☐ (2) No

Q 17 Please explain in short why/why not

Q 18 **What do you see as the advantages or good things that could occur by feeding the Kea?** Please explain in short

Q 19 **What do you see as disadvantages or bad things that could occur by feeding the Kea?** Please explain in short

Q 20 **To what extent do you think the following people would approve or disapprove you feeding Kea?**
Please circle **one** number or not applicable

Spouse/partner

1	2	3	4	5	6	7
Disapprove			Neither			Approve

☐ Not applicable

Friends

1	2	3	4	5	6	7
Disapprove			Neither			Approve

☐ Not applicable

Family

1	2	3	4	5	6	7
Disapprove			Neither			Approve

☐ Not applicable

Other people in the group I'm travelling with

1	2	3	4	5	6	7
Disapprove			Neither			Approve

☐ Not applicable

Other people visiting Arthur's Pass (not part of my group)

1	2	3	4	5	6	7
Disapprove			Neither			Approve

☐ Not applicable

Managers working at Arthur's Pass

1	2	3	4	5	6	7
Disapprove			Neither			Approve

☐ Not applicable

Q 21 **Are there circumstances that would make it more likely for you to feed Kea?**
Please explain in short

Q 22 **Are there circumstances that would make it less likely for you to feed Kea?**
Please explain in short

Section 4 - About you and your travel group

Q 23 **Which of the following best describes your travelling group?**
Please check **one** box only.

- ☐ (1) I'm alone **(go to Q 26)**
- ☐ (2) I come with my spouse/partner
- ☐ (3) I come with my friends
- ☐ (4) I come with my family
- ☐ (5) I come with my school/university group
- ☐ (6) I come with my colleague/work group
- ☐ (7) I come with a club
- ☐ (8) I come with an organised tour
- ☐ (9) Other (specify) _____

Q 24 **How many people, including you, are in your group on this visit?**
_____ people

Q 25 **How many children (under 15 years) are in your group?**
_____ children

Q 26 **Are you:**
Please check one box only.

- ☐ (1) Female
- ☐ (2) Male
- ☐ (3) Other

Q 27 **What age group do you belong to?** Please check **one** box only.

- ☐ (1) 18-19
- ☐ (2) 20-29
- ☐ (3) 30-39
- ☐ (4) 40-49
- ☐ (5) 50-59
- ☐ (6) 60-69
- ☐ (7) 70-79
- ☐ (8) 80 yrs +

Q 28 **What is your highest level of formal education?** Please check **one** box only.

- ☐ (1) Primary school
- ☐ (2) Lower Secondary School
- ☐ (3) Upper Secondary School
- ☐ (4) Certificate of Vocotional Education
- ☐ (5) Diploma in Vocotional Education
- ☐ (6) University - Bachelor degree
- ☐ (7) University - Master degree
- ☐ (8) University - Doctorate degree
- ☐ (9) Other (specify) _____

Q 29 **What is the size of your place of residence?** Please check **one** box only.

- ☐ (1) City with over 200,000 inhabitants (including suburbs)
- ☐ (2) Town with 20,001 – 200,000 inhabitants
- ☐ (3) Town/village with 2,001 – 20,000 inhabitants
- ☐ (4) Village with 2,000 or fewer inhabitants
- ☐ (5) Rural area

Q 30 **In what country do you permanently live?**

Appendix 6: Interview guide

Interviews with the Kea Conservation Trust and the Department of Conservation

1. What is the KCT/DOC and what do you work with?

2. Could you tell me about Kea? Why is it special/vulnerable?

3. Could you tell me about the issue of visitors feeding Kea?

4. What do you perceive as positive/negative impacts that visitors have on Kea?

5. How big a problem is this?

6. What is the status of the Kea now?
    a. What are the biggest threats?

7. After your experience, how do visitors interact with Kea?

8. How should visitors behave towards the Kea?

9. How does KCT/DOC work with dealing with the feeding-problem?
    a. What have you tried before? What results did you get?
    b. What are the current projects?

10. Where do most of the Kea/visitor interactions occur? (Where might be sensible places to do the surveys)

Appendix 7: Results showing different human-kea interactions when searching the hashtag #kea on Instagram

51 liker

#purenewzealand #kea #homertunnel #milfordsound #besttime #travel #allblackscap

48 liker

Naughty but friendly Kea on our way to Milford Sound today

19 visninger

#lupines #eglintonvalley #kea #thechasm #homertunnel #milfordsoundlodge #milfordsound

3 liker

#kea #robber #bird

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