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Executive Summary

In 2015 the five-year Cape to City (Cape to City) project was set up in Te Matau a Māui/Hawke's Bay to examine whether efforts to control invasive predator species could be extended from areas of high biodiversity to surrounding private land, thereby enhancing the extent of biodiversity gains. This project is a collaborative venture between Hawke's Bay Regional Council (HBRC), Department of Conservation (DoC), Cape Sanctuary, Manaaki Whenua – Landcare Research, Aotearoa Foundation, landowners, and local businesses.

An initial survey of landowner perceptions of predator control was undertaken in 2015 to understand the impacts on landowners and the community, including what motivates them to become involved in pest control and conservation. The survey identified a willingness from landowners to be involved in the Cape to City initiative and to continue to maintain a control programme on their land. The present report pertains to a follow-up survey and series of interviews in 2020 exploring landowners' perceptions after five years of predator control on their land.

In this follow-up online survey, 44 responses were obtained and seven interviews were carried out. A summary of the key findings is presented here.

1. Rural landholders surveyed believe that conservation and predator control are important. The importance of these activities is often linked with normative values including the uniqueness of NZ's wildlife and the responsibility landholders have to following generations.
2. Despite not being a motivating factor, economic concerns can be a prohibitive factor.
3. The collective benefit of predator control is well understood by participants.
4. While recognising that collective action is important, participants' responses to this survey suggest that motivation impacts at an individual or personal level to participate in predator control and, what is more, are, for the most part, already doing so.
5. There is a notable sentiment among participants that key agencies such as the HBRC need to be doing more in support of landowners in predator control activities. More communication, engagement and education was requested.
6. Participants also sense a need to work smarter, not harder. Priorities must be set in terms of which predator species to reduce, and to identify what the ecological consequences of doing so would be (e.g. the potential flourishing of rabbits).

The summary report of the 2015 survey called for greater communication with landowners. The present 2020 survey findings reinforce this recommendation while acknowledging limitations. Greater effort needs to be made to inform landowners of ongoing work and success stories and to engage with them. Perceptions that predator control is ongoing, successful and participated in by peers and key agencies is likely to lead others to participate and form a virtuous cycle of increased participating followed by increased success in predator control efforts.

Landowners continue to express a duty of care for the environment in which they live and an awareness of the state of predator populations on their land. Most are active to some extent in predator control measures. Several specific foci for enhancement were identified that would strengthen the likelihood that predator control measures would be sustained:

- Improve communication about predator control initiatives – regular and accurate communication was seen as lacking which meant that a number of people expressed uncertainty about the current situation. Target the communication based on landholders’ motivations (preserving the uniqueness of flora and fauna in Aotearoa).
- In particular, improve the communication around the impact of predator control efforts to continue to educate both landholders as well as urban dwellers, providing advice for both.
- Improve the monitoring and maintenance of predator control equipment so that landowners can feel confident that external support is reliable.
- Improve the quality of predator control equipment to address doubts about the effectiveness of some control methods.
- Adopt a more collaborative approach that recognises the expertise and local knowledge of landowners in making decisions about predator control measures as this is likely to considerably enhance the prospect of success.
- Continue to explore and better understand landholders’ motivations so that actions and communication can be targeted. For example, Kaine et al.’s (2010) I₃ framework indicates that self-identity was not a major motivation for survey respondents to reduce the number of feral cats or to trap them. This suggests that attempts to encourage participation in a programme of trapping by emphasising the participation of neighbours or friends are unlikely to be successful.
- Promoting the efficacy of predator control and educating the public about the effects of predators on the unique flora and fauna of Aotearoa was identified by interviewees as a good way to motivate people to participate in collaborative efforts.

1 Introduction

Collaboration by multiple and different stakeholders is a key component in improving conservation outcomes; however, insufficient consideration of stakeholders' interests has often contributed to failed conservation projects (Omondiagbe, Towns, Wood, & Bollard-Breen, 2020). In the context of predator control initiatives to protect biodiversity in New Zealand, most initiatives are conducted on reserves and crown land. However, the majority of land in New Zealand is owned privately and is not controlled which means that there is a substantial area that can act as a location for predator population growth and thus as a source of predator re-infestation of controlled areas.

In 2015 the five-year Cape to City (Cape to City) project was set up to examine whether efforts to control invasive predator species could be extended from areas of high biodiversity to surrounding private land, thereby enhancing the extent of biodiversity gains. The project was located in Te Matau a Māui/Hawke's Bay, adjacent to the Cape Sanctuary reserve with the overarching goal of extending increases in biodiversity, particularly of endemic species, from the Cape area to the Napier and Hastings urban areas. The project is a collaborative venture between Hawke's Bay Regional Council, Department of Conservation, Cape Sanctuary, Manaaki Whenua – Landcare Research, Aotearoa Foundation, landowners, and local businesses.

As the initiative got under way, an initial survey of landowner perceptions of predator control generally was undertaken (Niemic, 2015) to understand the impacts on landowners and the community, including what motivates them to become involved in pest control and conservation. The survey identified a willingness from landowners to be involved in the Cape to City initiative and to continue to maintain a control programme on their land. Recommendations emerging from the survey focused primarily on improving communication and setting up support processes to ensure that predator control was sustained beyond the life of the project.

With the project nearing completion, in early 2020 the Hawke's Bay Regional Council and collaborators within the Cape to City programme surveyed landowners in the region to explore landowner perceptions of the Cape to City project and whether any of their views had changed significantly since the first survey. This work extends the insights gathered from the research report and associated academic journal article (Niemic, Pech, Norbury, & Byrom, 2017), exploring landowners' perceptions after five years of predator control on their land.

The broadest aim of the survey was to elicit information on how predator control in the region could be improved. Therefore, the survey contained a series of questions pertaining to respondents' attitudes towards predators and predator control, participation in predator control activities and relationships with other predator control bodies. Whereas possum control was the focus in 2015, a specific focus of the 2020 survey was rural landholders' attitudes to control of feral cats. The I₃ Framework (Kaine, Murdoch, Lourey, & Bewsell, 2010) was used to predict the likely interest of rural landholders to a policy of using traps to reduce the feral cat population in the region. Discussion of the findings are the subject of a companion report (Kaine, June 2020).

This report offers a quantitative and thematic summary of survey responses and interviews. It builds on analysis of the first iteration of this survey, which was conducted in 2015. The report is divided into seven sections. Following this introduction, Section 2 discusses the survey methods and response rate. In Section 3, both quantitative data (such as average property size) and qualitative data (such as respondent perceptions of what it means to be a steward or kaitiaki of the land) were gathered. Conservation activities that respondents were involved in at the time of being surveyed are also highlighted and a thematic discussion of respondent attitudes and norms concerning conservation and predator control activities is offered. Section three finishes reporting on respondents' participation in, and perceptions of, the Cape to City predator control programme, including suggested improvements for the future. Finally, the fourth section provides quantitative analysis of whether respondent attitudes and perceptions have changed significantly in the five years since the 2015 iteration of this survey.

2 Methods

Eastern Institute of Technology (EIT) was commissioned by Manaaki Whenua-Landcare Research on behalf of the Cape-to-City (Cape to City) programme to conduct a survey of rural landholders in Hawke's Bay to explore their attitudes about current and potential approaches to predator control within and outside of the Cape to City area of activity – the 'Cape to City footprint'.

The survey included a mix of Likert scale type questions and short answer questions. Several questions were derived from the 2015 survey, allowing comparison of responses from the two surveys. See Appendix A for a full list of questions. Some questions from the 2015 survey were considered no longer relevant and were not included. Some new questions were added to reflect current interests, including a set of questions focusing on control of feral cats. The 2020 survey was distributed by postal mail in late 2019 to the same set of 300 landowners as used for the 2015 survey. In some cases, land had changed hands so the survey was addressed to the current owner. The survey was also available on Survey Monkey via a link provided in the letter sent to landowners. Due to a low response rate, a follow-up letter was mailed to the same set of landowners two months after the first mailout. In total, 44 surveys were completed, giving a response rate of 15%. Of these 44 responses, thirteen were completed digitally.

Seven semi-structured interviews were carried out in person or over the phone with respondents who indicated willingness to take part in a follow-up interview. The interviews focused on exploring in more depth the responses given in the survey to obtain a more granulated/fine-grained understanding of the survey responses. The guiding questions related to problems with predators and changes over time, views on controlling predators and the efficacy of the Cape to City Programme (see Appendix B for a full list of questions). Interviews were 30- 50 minutes in length. They were audio-recorded and subsequently analysed thematically.

2.1 Statistical approaches

Survey results are presented with descriptive statistics, percentages, counts, means and medians for Likert scales. To compare data across the two survey iterations from 2015 and 2020, Wilcoxon Rank Sum tests for non-normal distributions were utilised for the

21 common questions. Given the multiple comparisons across the same group of participants, the Bonforonni correction was applied to the values for statistical significance. The R statistical analysis software was used for these analyses. The quantitative survey responses were triangulated with the qualitative short-ended question survey responses and the individual interviews to obtain deeper understanding of landholders' views. Thematic analysis of the survey responses was deductive in nature, completed by an independent analyst. The interviews allowed an opportunity to search for new and emerging themes and to gain greater detail on existing themes.

3 Results

3.1 Survey Respondents

While Niemiec et al. (2017) obtained a 23% response rate to the initial round of this survey, the response rate for the 2020 survey was 15% (n=44). Although this is lower than the overall response rate obtained by Niemiec et al., it is similar to the response rate they obtained after excluding respondents who completed the questionnaire while being interviewed (19%). Given the COVID-19 pandemic and ensuing lockdown that interrupted data collection, it was not possible to take this approach in the 2020 data collection. Kaine (2020) suggests that, based on involvement theory, respondents to the survey may have been the more engaged landholders – see Kaine's report for a more detailed discussion of the likely representativeness of this sample.

3.2 Landholder Characteristics

As Table 1 shows, respondents have varying relationships with their land, in terms of ownership and management. Nearly three-quarters (73%) of respondents reported identified as landowners who also manage their land. A small percentage (11%) of respondents own the land in question, but do not manage it. Slightly fewer (9%) manage land they do not own. One respondent who selected "other" in response to this question, stated that they were a lessee of land. The second participant who selected "other" reported that they were the owner of a lifestyle block. The second of these respondents seems to have excluded themselves from the landowner and land-manager category based on the size of their property. This is discussed below.

Table 1 - Survey Respondents' Land Ownership Status

Relationship to Land	Number (%)
Land manager who does not own land	4 (9)
Landowner and land-manager	32 (73)
Landowner not involved in day to day management	5 (11)
Landowner and manager (retired)	1 (2)
Other (lifestyle block owner / leasee)	2 (5)

Property size varied significantly between participants. The smallest property was 1.56 hectares, while the largest were two 4800-hectare properties. The average property size was 583 hectares.

3.3 Relationships with Key Agencies and Stakeholders

As this is a follow-up survey, a key aim was to explore respondents' relationships with key statutory agencies and other stakeholders. Table 2 reports the degree of satisfaction with five different agencies or stakeholders. As not all 44 survey respondents answered every question in the survey, the percentages reported in Table 2 reflect the proportion of those who answered each question.

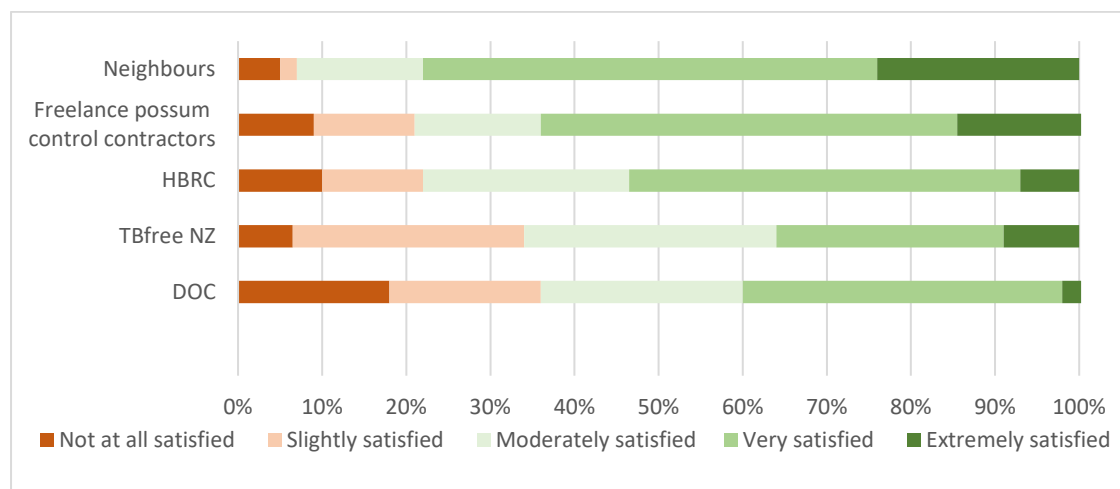


Figure 1 - Satisfaction with Key Agencies and Stakeholders

Figure 1 shows that the majority of respondents are at least moderately satisfied with all of the listed entities. Neighbours (Median = 3), the HBRC (median = 3) and freelance contractors (median = 3) perform particularly well, with more than 50% of respondents reporting to be either very or extremely satisfied by past interactions with them. TBfree NZ has moderate satisfaction with a median value of 2 and just over 65% moderately to extremely satisfied with interactions. Strong satisfaction with freelance contractors and comparatively low levels of satisfaction with the Department of Conservation (median = 2) reflect findings from the 2015 survey of landowners. There was not a statistically significant difference in these satisfaction rates between those within the Cape to City footprint and those outside of the footprint.

3.4 Definitions of stewardship/kaitiakitanga

Respondents were asked to give their views on what the word 'steward' or 'kaitiaki' meant to them. Perhaps indicating respondents' commitment to care of the land, only five responses were left blank. There are clear themes among participants' understanding of what it means to be a steward or kaitiaki of the land. In answering this question, participants typically spoke of the normative basis of stewardship/kaitiaki, rather than the material practices involved. Table 2 summarises key themes from the surveys and provides illustrative quotes.

Table 2 - Understandings of Stewardship/Kaitiakitanga

Theme	Illustrative Quotes
By far the most frequent concept cited was that of care for the land.	<p>“Caretaker.”</p> <p>“Caring for our land.”</p> <p>“Caring for the land, water, soil.”</p> <p>“Looking after the land.”</p> <p>“Care of the land and animals.”</p> <p>“Taking good care - looking after - nurturing - learning best practices continually and implementing them.”</p> <p>“To look after the land in your care.”</p>
A similar notion is that of protection or guardianship of the land.	<p>“To be the guardian of the land or environment.”</p> <p>“Applying the philosophy of looking after the land, don't own it. Looking after it implies protecting and improving it.”</p> <p>“Protecting and looking after the environment.”</p> <p>“Guardianship, protector, and preserver.”</p> <p>“Guardian during one's watch.”</p> <p>“Protectors of the land.”</p> <p>“Protecting and improving the environment.”</p>
There was a strong sense of responsibility among participants, particularly as it pertains to future generations .	<p>“Kaitiaki means to me that we have responsibilities in taking care of the land, so that it will be in a much better state when we leave it.”</p> <p>“Care, pride. How we care for and leave our farm better for the next generation.”</p> <p>“Ensuring the land is held and looked after for generations to come.”</p> <p>“Preserving the environment for the next generation.”</p> <p>“Taking care for future generations.”</p> <p>“Guardianship of land to ensure it is in better shape for future generations.”</p>
The point of reference for participants was often the land or environment generally. However, soil, water, flora and fauna were mentioned to a lesser extent.	<p>“Caring for the land. Planting trees, putting in dams”</p> <p>“Caring for the land, water, soil.”</p> <p>“Care, responsibility and guardianship for the health of the flora and fauna soils and water.”</p> <p>Care of the land and animals.”</p>
Surprisingly, perhaps, only two participants made comments that could be construed as motivated by economic self-interest .	<p>“Maintain / improve your land to the best of your ability to meet all the important environmental and ecological standards whilst keeping high livestock health and performance - within economic constraints”</p> <p>“Care for the land in the realist concept.”</p>

The responses cited above suggest that there is, for the most part, a shared understanding of stewardship or kaitiaki among participants. Only one participant professed a lack of understanding or care for these concepts, stating, “Not much”.

3.5 Present Conservation Activities

Respondents were asked what type of conservation activities they had participated in, both on their land and in the greater Hawke’s Bay area. The vast majority of respondents reported participating in some type or conservation activity on their own property. While 89% participated in activities on their own property, only 32% of respondents reported participating in a conservation activity within the wider Hawke’s Bay area. Table 3 outlines the most commonly cited conservation activities on their (owned or managed) property.

Table 3 - Present Conservation Activities

Most Commonly reported Conservation Activities on Property	Illustrative Quotes
Retiring/fencing waterways	"Retiring waterways for natives..." "...fencing waterways." "Riparian fencing..."
Planting both native and foreign tree species.	"Tree planting (poplars and willows mainly)." "Native planting, extensive pine planting." "Planting locally sourced native trees."
Predator/Pest animal control	"Rabbit and turkey control." "Pest control, shooting hares." "Possum and wasp control, rabbit and hare control..." "cat trapping"
Weed/noxious plant control	"Noxious weed control." "...spraying blackberry, old man's beard, thistles." "Blackberry clearing..."
Other examples cited	Soil regeneration, carbon sequestration, tree planting, education, and trash removal

It should be noted that the end goal of these activities was not always mentioned, but some respondents did note aims such as supporting birdlife or bees through habitat enhancement, the reestablishment of wetlands and carbon sequestration. Two respondents reported working with the QEII National Trust to achieve this.

Activities in the wider community are, appear very similar to those being carried out on private property. Beach clean-ups (mentioned by two participants) and preventing deforestation through fighting bush fires (mentioned by one) were exceptions. Instead of citing different general activities as such, respondents often mentioned specific community groups or projects in which they were involved. For example, two respondents mentioned participating in the Te Mata Peak Park Association. Another mentioned the Elsthorpe Reserve Volunteer Service. Two respondents mentioned pursuing conservation activities through professional bodies. A further two reported participating in, or financially supporting, numerous groups that were unspecified.

3.6 Attitudes and Norms Concerning Conservation and Predator Control

The previous section demonstrated that the vast majority of survey respondents are involved in conservation efforts, including predator control activities. To better understand the personal attitudes or beliefs, as well as social norms, that inform participation in conservation activities (or lack thereof), participants were asked to express their level of agreement/disagreement with 16 Likert-type items. Table 4 presents these items arranged by themes, along with the percentage of participants that selected each possible response. Taking into account the small sample size and multiple comparisons, there were no statistically significant differences, in terms of the data presented in Table 4 between those in the Cape to City footprint and those outside of it.

Table 4 - Attitudes, Beliefs and Norms Concerning Predator control

Theme	Item#	Item	Strongly disagree (1)	Moderately disagree (2)	Slightly disagree (3)	Neither agree nor disagree (4)	Slightly agree (5)	Moderately agree (6)	Strongly agree (7)	Mean	Median
Perceived Benefit of Conservation Activity	1	Reducing the number of feral cats in the region will provide economic benefits to me	7%	12%	7%	28%	23%	5%	19%	4.37	4
	2	Reducing the number of feral cats in the region will provide economic benefits to Hawke's Bay farmers	2%	12%	5%	23%	28%	14%	16%	4.70	5
	12	I often wish there were more native birds and other native fauna on or near my property	2%	0%	0%	7%	11%	11%	68%	6.32	7
	15	New Zealand's native birds and other fauna are very special to me	5%	0%	0%	0%	14%	9%	73%	6.36	7
Perceived Barriers to Conservation Activity	5	I don't have the time to get involved with any efforts to reduce predators	30%	25%	7%	11%	20%	7%	0%	2.89	2
	6	The removal of predators will allow rabbits to flourish	9%	9%	14%	14%	30%	16%	9%	4.30	5
	16	I am concerned about my household pets being harmed by any widespread predator control efforts	25%	9%	9%	16%	9%	25%	7%	3.77	4
The Threat of inaction	3	Stoats, ferrets, and feral cats in the region pose a significant threat to native birds and other fauna	0%	0%	0%	0%	9%	7%	84%	6.74	7
	7	Toxoplasmosis is not a major concern for me	14%	16%	5%	19%	19%	14%	14%	4.10	4
Social Motivators and Inhibitors	4	Many landowners in the Hawke's Bay region come to me for advice	42%	9%	9%	33%	7%	0%	0%	2.53	2
	8	People I know care about whether I do predator control on my property	7%	5%	12%	23%	14%	23%	16%	4.67	5
	9	Most people talk to each other about predator control	9%	5%	12%	28%	19%	21%	7%	4.32	4
	10	I share information with groups of landholders who would not otherwise communicate with each other	19%	14%	7%	33%	16%	12%	0%	3.49	4
	11	Most landholders I know are involved in predator control on their property	9%	12%	0%	16%	14%	40%	9%	4.70	5
Investment	13	New Zealand should invest more resources into predator control	2%	0%	0%	7%	11%	16%	64%	6.27	7
Efficacy of conservation activities	14	My decisions to engage in predator control on my property in the next year will make a difference to New Zealand's native birds and fauna	2%	2%	0%	11%	16%	11%	57%	5.98	7

The 16 items in Table 4 can be discussed in relation to five broad themes:

- Perceived benefits of conservation activity.
- Perceived challenges to conservation activities.
- Perceived threats of inaction on matters of conservation.
- Social norms that may motivate or inhibit conservation activity.
- Efficacy of conservation activities.

3.6.1 Perceived Benefits of Conservation Activity (Items 1, 2, 12 & 15)

Items 1, 2, 12 and 15, in one way or another, elicit information on the extent to which participants believe conservation activities benefit themselves or others. Responses to items 1 and 2 suggest that participants are relatively undecided as to whether reducing the number of feral cats in the region will be of economic benefit to themselves or others. Most of those who did agree that there would be economic benefit from reducing feral cat numbers were only in slight agreement.

Items 12 and 15, on the other hand, make clear that participants would see great benefit in protecting and enhancing native wildlife. While not explicit within item 12, responses to item 15 suggest that the importance of native wildlife is in terms of an inherent, rather than economic, value. Items ascertaining the importance of native wildlife to participants received some of the highest levels of agreement. Item 12 has mean and median values of 6.32 and 7, while item 15 has similar values of 6.36 and 7.

3.6.2 Perceived Barriers to Conservation Activity (Items 5, 6 & 16)

Items 5, 6 and 16 talk to perceptions of potential barriers to conservation activities. The potential barrier raised in item 5 appears to be of little concern to participants. Certainly, the mean and median values (2.89 and 2) values make clear that few participants see themselves as having too little time to involve themselves in predator control activities. Concern over potential harm to household pets via predator control activities was raised in analysing the earlier iteration of this survey. Item 16 highlights that a majority of participants either disagree that this is a concern, or at least do not agree that it is of concern to them. Yet, around one third of participants are either in moderate or strong agreement with the sentiment that this is of concern to them. Thus, this issue should not be dismissed lightly. The greatest barrier to conservation activities, and predator control activities specifically, may be a concern that the reduction of predator species will lead to an increase in rabbit numbers. More than 50% of participants agree to some extent that increasing rabbit numbers would be a consequence of reducing predator species.

3.6.3 The Threat of Inaction on Conservation Activity (Items 3 & 7)

Items 3 and 7 deal with specific conservation challenges. Item 3 receives the highest level of agreement of any of the 16 items (mean of 6.74, median of 7), demonstrating consensus that predator species such as cats and stoats pose a threat to native wildlife. Item 7 indicates that 47% of participants disagree that they are personally concerned by Toxoplasmosis. A further 19% neither agree nor disagree that the disease is of concern to them. Yet, 30% of participants

either moderately or strongly disagree that they are not concerned.¹ Note that items 3 and 7 should not be compared in a way such that predator species are presented as a perceived bigger threat than toxoplasmosis. Item 3 concerns the threat of predator species to *native fauna*. Item 7 concerns the threat of toxoplasmosis to the *participant*.

3.6.4 Social Motivators and Inhibitors (Items 4, 8, 9, 10, 11)

As identified in analysis of the 2015 iteration of this survey, conservation activities may suffer from collective action challenges. The success or failure of one's own conservation work, and predator control specifically, on one's own property depends, at least in part, on other landowners/managers also undertaking such activities on their property. A sense that other landowners/managers take conservation and predator control seriously may not only increase a sense of "peer-pressure" to participate in these types of activities, it may also create a feeling that the benefits of conservation activities are more attainable.

For these reasons, items 4, 8, 9, 10, & 11 help to identify the level of communication or information exchange regarding predator control that exists between landowners/managers in the region, as well as the extent to which participants perceive their peers as participating in predator control activities. Item 4 was widely disagreed to by participants. Only 7% of respondents agreed, even slightly, that people came to them for advice on predator control. Similarly, responses to item 10 suggest it is uncommon that participants share information with groups of landowners who otherwise would not communicate about predator control. 40% disagreed with this statement, most often strongly. Just over a quarter, 28% agreed with the statement, most often only slightly so. Item 9 suggests, however, that there is discussion between many landowners/managers about predator control. Almost half (47%) of respondents agreed, to one extent or another, that most people spoke about predator control. Just over a quarter (26%), disagreed to one extent or another. It could be worth considering that perceptions of how frequently predator control is discussed in the community may be inaccurate and overestimate this frequency. Taken together, the responses to items 4, 10 and 9 may suggest that individuals rarely participate in information exchange about predator control activities, yet perceive that others are doing so more frequently. This is speculative, however.

Items 8 and 11 speak to the perceived prevalence of predator control activities within the region, and the degree to which there exists a perceived social expectation that members of region will participate in these endeavours. Responses to item 8 reveal that people do feel others expect them to undertake predator control activities. More than half (53%) agreed with the statement *people I know care about whether I do predator control on my property*. Just under 40% of participants agreed either moderately or strongly, contributing to mean and median values of 4.67 and 5, respectively. Responses to item 11 demonstrate that most participants perceive landholders they know to be participating in predator control. Nearly half (49%) of respondents moderately or strongly agree that *most landholders I know are involved in predator control on their property*.

¹ A subsequent question in the survey asked a subset of respondents (sheep farmers who had participated in the Cape to City programme) to comment on whether they had noticed a change in the frequency of toxoplasmosis. Only one respondent felt that the disease was appearing more frequently. This may partly explain the high number of participants that are unconcerned by the disease.

3.6.5 Efficacy of Conservation Activities

Given the potential collective action issue described above, item 14 provides interesting information on the perceived efficacy of individuals' predator control efforts. Pleasingly, perhaps, in response to the statement, *my decisions to engage in predator control on my property in the next year will make a difference to New Zealand's native birds and fauna*, 84% of participants agree. Over half (57%) agree strongly, contributing to mean and median values of 5.98 and 7. There also appears to be a sentiment that additional resources would benefit the efficacy of predator control efforts. When responding to whether NZ should invest more in predator control, 64% of participants strongly agreed. This may also concern the matter of who carries the costs of such predator control, not only efficacy of such activities.

3.7 Participation in, and Perceptions of, Cape to City

Sixteen of the 44 respondents reported that they had participated in the Cape to City ecological restoration initiative by allowing a pest control contractor to control the above-mentioned predators on their property, amounting to 36% of the respondents. These respondents were asked to answer a series of questions regarding both the Cape to City programme and views on conservation more broadly. Those who stated that they had not participated with Cape to City in this way were excluded from these questions.²

Those who stated that that they had participated in the Cape to City programme were asked about their current and potential future activities concerning predator trapping. In the first instance, participants were asked how frequently they had checked predator traps on their property in the last six months. Responses are summarised in Table 6. Forty per cent of respondents check their traps more than once a month. A large majority (85%) of respondents check traps at least every few months.

Table 5 - Present Frequency of Checking Traps

Once a year or less	Every few months	Several times a month	Several times a week
15%	45%	30%	10%

Participants were also asked how likely they were to check traps regularly (defined as at least every three months) over the coming years. Table 7 summarises the responses.

Table 6 - Estimated Frequency of Future Trap Checking

Not at all likely	Slightly Likely	Moderately Likely	Very Likely
16%	16%	8%	60%

3.7.1 Perceptions of Cape to City

3.7.1.1 Best Thing About Cape to City Predator Control Efforts

Respondents were asked to describe the best thing about predator control efforts happening through Cape to City. Two strong themes emerged from responses to this question. The first

² Note that more than 16 people answered some of the questions dealt with here, presumably due to returning surveys in which they had declined to progress to a later section on the basis of answering "No" to question 11.

concerns reduction in predator or pest species numbers. Where specified, possums were almost always the species cited as having been reduced.

Killing the predators.

There are less pests & it has raised awareness of pests & the necessity for pest management.

Destruction of possums.

Reduction in numbers of cats. Huge reduction in possum numbers.

In my district (east of Waipawa) possums are rare.

Furthermore, the return of native birdlife pleased respondents.

Birds are returning.

Return of more native birds to the area.

Increased native bird life.

We had our first wood pigeon on our property this year.

It is contributing to increased bird populations being seen. We have recently seen kakapo for the first time and seeing tui more often.

A lesser theme was that some people professed to not know if there had been positive change stemming from the programme. Others questioned whether there had been change.

Not sure what the results are.

Not much.

You're trying.

3.7.1.2 Concerns Regarding Predator Control Efforts Happening Through Cape to City

Some respondents stated that they had no concerns stemming from Cape to City's predator control. This constitutes a theme of responses to this question. For those who did have concerns, main themes and illustrative quotes are highlighted in Table 8.

Table 7 - Main Concerns Stemming from Cape to City Predator Control

Theme	Illustrative Quotes
Sporadic effort/communication.	<p>“Feel a little sporadic - feel we would have better results if it was a more constant approach.”</p> <p>“Sporadic, no communication, no follow up pretty hopeless.”</p> <p>“Concerned that the efforts are tapering off & that land managers in the area are not maintaining the traps. The contractors have not visited our traps for nearly a year, & many traps near the roadside in the area do not appear to have been checked either.”</p>
Ineffective/Dangerous practices, as it applies to methods employed.	<p>“Inhumane traps, indiscriminate killing if household pets.”</p> <p>“I do not support widespread use of aerial baits, but the use of traps to kill mustelids and rats is appropriate. Live trapping of cats is also acceptable.”</p> <p>“Occasional killing of domestic pets.”</p> <p>“No concerns about predator control but concerns about the methods especially poison. A gun would work well.”</p> <p>“Shit traps put in shit spots that aren't getting checked or reset. Only hedgehogs being caught.”</p> <p>“Having to kill rabbits with 1080, Rabbits are the problem”</p>
Ecological imbalance.	<p>“The possible imbalance in nature although possum eradication was good, blackberry has had an extreme takeover and is creating a very real issue and cost.”</p> <p>“I am uncertain whether feral cats are providing a rabbit control benefit that may be lost. I am noticing significantly more rabbits.”</p> <p>“Rabbits - more now than ever”</p>

3.7.2 Perceived Efficacy of Cape to City Predator Control

Participants were asked how effective the Cape to City programme had been in reducing predator population numbers. The percentage of respondents that selected each option is presented in Table 8. Just over half (55%) of respondents believe the programme has been moderately or very effective, with only 10% believing the programme has had zero impact.

Table 8 - Perceived Efficacy of Cape to City Programme

Not at all effective (1)	Somewhat effective (2)	Moderately effective (3)	Very effective (4)	Mean	Median
10%	35%	45%	10%	2.55	3

Respondents were invited to explain their response via an open ended question in the survey. Moreover, participants were asked a separate question about what, if any, changes they had seen on their property or in the community since Cape to City began in 2015. Comments closely mirrored those discussed in the preceding sections of this report which dealt with both positive views and concerns regarding the Cape to City programme. Those who saw the programme as effective tended to cite **returning birdlife and decreasing predator sightings**. Those who felt the programme was having minimal or no impact stated that they **continued to see predator species often and questioned the degree of sustained commitment Council** had demonstrated. One responded stated, “Seems possums are the main target which are not the main predators.” Indeed, those comments that highlight ongoing predator sightings typically refer to stoats, ferrets or feral cats.

3.7.3 Increasing Efficacy in the future

This survey posed multiple questions concerning ways of improving Cape to City programme delivery in the future, and what challenges remain to achieving the overall aim of a predator-free Hawke’s Bay. As to this first point, participants were asked, *What could HBRC do to work better with landowners through the Cape to City programme?* Table 10 presents the main themes in response to this question.

Table 9 - Keys to Ensuring Efficacy of Cape to City Programme

Theme	Illustrative Quotes
As foreshadowed above, respondents state that a more consistent effort is required not only in conducting trapping, but also in informing stakeholders and engaging with them.	<p>“They could show the landowners that they are still actively trapping & monitoring pests in the area.”</p> <p>“A more constant approach would be more effective; a bit more engagement.”</p> <p>“Be more proactive in making traps and information available for people.”</p> <p>“more engagement”</p> <p>“I don’t recall any communication on this”</p>
Relating to the need to keep people informed, respondents were keen that as many people as possible be brought into the programme.	<p>“Landowners not currently in the program could be re-contacted, & perhaps address their fears of future costs & dangers to their pets.”</p> <p>“Get everyone involved, even organic farms.”</p> <p>“Get the cat numbers down by getting all farms involved.”</p>
Cats and rabbits were of primary concern to many respondents. Unfortunately, increases in the former may lead to increases in the latter.	<p>“Help us catch the cats on our property.”</p> <p>“Don’t worry about cats, get rabbits under control.”</p> <p>“I am not sure if the predator control programme is affecting the rabbit population.”</p>
Participants highlighted that additional financial resources were required.	<p>“Continue to subsidise the cost of traps and baits.”</p> <p>“More subsidy and help.”</p> <p>“Work out some kind of cost-share programme for cat traps.”</p>



Figure 2. Word cloud presenting basic themes to increase efficacy of Cape to City programme

Naturally, the themes presented in Table 10 correspond with what respondents see as the challenges to achieving a predator free Hawke’s Bay. In particular, feral cats and buy-in to the Cape to City programme were seen as important. Note that the particular attitudes to control of feral cats were the subject of another companion report from this same survey (Kaine 2020). Financial costs were again highlighted insofar as financial concern may suppress buy-in. Notably, there was a sense that buy-in was also required from those in urban areas or living on lifestyle blocks. A small number of respondents were of the mind that the removal of all predators was unrealistic. Table 10 summarises these views.

Table 10 - Challenges to Predator-Free Status

Theme	Illustrative Quotes
Feral Cats	<p>“Huge population of feral cats and many ppl tolerating them. Many domestic cats.”</p> <p>“Cats from urban areas.”</p> <p>“Catch the cats.”</p> <p>“Large challenges with neighbour over cat infestation.”</p>
Buy-in and financial barriers	<p>“Getting more participation, particularly of life-style block owners as they are increasing steadily.”</p> <p>“Pets and town folk - how do you get them on board?”</p> <p>“Population uptake in the programme, financial cost to individuals.”</p> <p>“Financial cost of the time required to constantly manage it.”</p> <p>“A significant reduction in predator numbers is achievable provided landowners 'buy into' the concept.”</p>

4 Quantitative Comparison of the 2015 and 2020 Surveys

To understand whether perspectives on conservation and predator control among Hawke's Bay rural landholders are changing over time, quantitative analysis was conducted to determine whether there are statistically significant differences between responses to the 2015 and 2020 iterations of this survey. There were 21 quantitative questions that were present in both iterations of the survey. These pertained to:

1. Participant perspectives on conservation and predator-control bodies, as discussed in section 3.3 above.
2. The perceived effectiveness of the Cape to City programme, as discussed in section 3.7 above.
3. Participant perceptions and attitudes concerning conservation and predator control broadly, as discussed in section 3.6 above.³

Table 11 - Results of Wilcoxon Sum Rank Tests across 2015 and 2020 surveys

Variable	2015 median score [§]	2020 median score [§]	W statistic	P value
DOC Satisfaction	2	2	751	0.315
Neighbour Satisfaction	3	3	1064	0.881
HBRC Satisfaction	3	3	1302	0.019
TBfree NZ Satisfaction	3	2	968.5	0.001**
Contractor Satisfaction	3	3	930.5	0.072
Effectiveness of Cape to City	4	3	788.5	0.00002***
Item 1: Reducing the number of feral cats in the region will provide economic benefits to me	5	4	1323	0.492
Item 2: Reducing the number of feral cats in the region will provide economic benefits to Hawke's Bay farmers	6	5	1438.5	0.182
Item 3: Stoats, ferrets, and feral cats in the region pose a significant threat to native birds and other fauna	7	7	1130	0.267
Item 4: Many landowners in the Hawke's Bay region come to me for advice	1	2	866.5	0.006
Item 5: I don't have the time to get involved with any efforts to reduce predators.	3	2	1324.5	0.515
Item 6: The removal of predators will allow rabbits to flourish	4	5	1067.5	0.154
Item 7: Toxoplasmosis is not a major concern for me	4	4	1125.5	0.576
Item 8: People I know care about whether I do predator control on my property	4	5	1089.5	0.273
Item 9: Most people talk to each other about predator control	4	4	1147.5	0.488
Item 10: I share information with groups of landholders who would not otherwise communicate with each other	3	4	1065.5	0.258
Item 11: Most landholders I know are involved in predator control on their property	4	5	1076	0.291
Item 12: I often wish there were more native birds and other native fauna on or near my property	7	7	1094.5	0.168
Item 14: My decisions to engage in predator control on my property in the next year will make a difference to New Zealand's native birds and fauna	6	7	1045.5	0.101
Item 15: New Zealand's native birds and other fauna are very special to me	7	7	1213	0.606
Item 16: I am concerned about my household pets being harmed by any widespread predator control efforts	5	4	1507	0.114
Note: * $P < 0.005$; ** $P < 0.002$; *** $P < 0.0005$, [§] Likert scale 1= strongly disagree, 7= strongly agree				

³ Note that item 13 in Table 4 above was not included in the 2015 iteration of the survey and, thus is not present in Table 11. In Table 11 the item numbering from Table 5 is maintained.

All quantitative data was collected utilising Likert-type items. Table 11 reports the results of Wilcoxon Rank Sum⁴ tests used to compare the data in two different conditions (i.e. from the two different surveys). We see that only the perceived effectiveness of the Cape to City programme, as well as satisfaction with TBfree NZ, has changed over time such that we can be appropriately confident that such changes are not the product of random variation. The perceived effectiveness of the Cape to City programme decreased between 2015 and 2020, with median values of 4 and 3 respectively. Similarly, satisfaction with TBfree NZ has decreased, with median values of 3 and 2 respectively. Note that the alpha levels required to indicate statistical significance (as reported in the note at the bottom of Table 12) are produced using a Bonferroni Correction to account for multiple comparisons. As such, these can be considered conservative estimates of statistical significance and the mean satisfaction with the HBRC that has declined from 2.78 in 2015 to 2.29 in 2020 with a *P* value of 0.019 should be noted.

5 Interviewee Perceptions of Predator Control and the Cape to City Programme

The following section of the report offers an analysis of seven interviewees conducted with landowners who had responded to the survey and agreed to be contacted for an interview. The interviews were carried out to further our understanding of participant involvement in, and views on, predator control. Moreover, participant views of the Cape to City programme were also sought. Interviews were conducted in September 2020 over the phone or in person and lasted 30-50 minutes. All interviews followed the same set of questions (see Appendix B). These questions serve as the basis for the following sections of this report.

5.1 Impact of predators on property / in this region

Interviewees, to one extent or another, all agreed that predators species were having a detrimental impact on the ecology of the region or farming productivity. The primary concerns for participants appear to be cats, possums and rabbits, with species such as stoats, ferrets and deer being less common (and thus problematic), and rats being somewhat seasonally determined.

“The biggest issue I’ve seen is actually the cats” [Interviewee 7].

“When we bought out here... we never used to see possum kill on the road, at first... increasingly they seem to be travelling up from Waimarama Rd to out place” [Interviewee 6].

“People dump, occasionally, I’ve seen a dumped litter of kittens... which is frustrating.” [Interviewee 6].

⁴ Wilcoxon Rank Sum tests were utilised due to the data being non-normally distributed.

“Now it’s rabbits. Rabbits are the biggest problem we have” [Interviewee 5].

“You are starting to see more possums, dead possums. And even here, the occasional possum. It worries me that those numbers are on the increase again after the great success of the Regional Council’s programme over the last 20 years” [Interviewee 4].

“We probably trap and shoot, or just shoot, ten to 12 cats on the farm, feral cats, every year. And I’m sure there are a lot more we don’t get” [Interview 3].

“We do have quite a few feral cats. I haven’t trapped, but I’ve seen, I’ve trapped a few ferrets and stoats.”

The effects of predator species are numerous. Damage to plants and trees, reduction of native birds and potential harm to stock or property (and, thus, profits) were the major concerns noted.

“Eating birds, I guess, is the impact I would expect to see” [Interviewee 3].

“The impacts on birds in the area are quite huge” [Interviewee 2].

“The rats...quite clearly they eat native birds, or bird eggs or chicks... I haven’t really noticed any damage from rats to vegetation. The main one we suffer from is they get into the building and chew wiring... So, they cause damage to the buildings.... I know when we get on top of the rats the birds certainly seem to boost in number quite quickly” [Interviewee 6].

“They’ve [cats] been attacking our ducks quite a lot... [Interviewee 7].

“Hares, rabbits and deer, not so much rabbits. Hares rabbits and deer are bad for trees” [Interviewee 4].

“We’ve currently got a problem with deer on the farm here, which would have been feral deer from the large forestry crop further up the road that has been harvested, so the deer are looking for other places where they can hide up. ... they are doing damage to young trees we have planted..... [Interviewee 4]

5.2 Changes in predator impact over time

Interviewees were generally of the view that there had been gradual increases in predator or pest species over the last few years, particularly cats and possums, within the region.

“...I think it’s just gradually getting worse, but slowly... I’d like to think that we’re making progress but I’m not totally sure” [Interviewee 2]

While many thought that possum control started by the Regional Council around 20 years ago had been extremely effective in reducing numbers initially, possum numbers are beginning to climb again. One interviewee suggested that lacking council efforts had been a cause of this.

"...across the river is a bloc of pine trees. And in the last two weeks his [a neighbour's] dogs have got seven possums out of the pine trees, which shocked me because the Council is supposed to be taking care of possum baiting along the river."

Yet, another interviewee believes that landowners too have become complacent.

"We let our guard down with possums, and I suspect a lot of people in the programme also did ... which is why I think they've sort of increased in numbers." [Interviewee 4].

Cats were also seen as increasingly impactful. As cited in a quotation above, the fact that they are a pet species as well as a predatory species complicates matters. Urban dwellers release kittens they cannot care for.

"I caught a person from town the other day out this way and they were releasing cats" [Interviewee 7].

Moreover, multiple interviewees suggested that there was not enough political will to treat cats as a predator species due to public backlash that would come from doing so.

Furthermore, issues of ecological balance were raised by multiple interviewees who stated that they or people they spoke with were concerned with an increase in rabbit numbers that were associated with predator control. One interviewee spoke strongly of the challenges posed by rabbits and, contrary to all other participants who cited problems with wild cats (even if acknowledging that they suppress rabbit numbers), this interview went so far as to suggest releasing cats into the wild.

"You've taken away the other predators like cats... it's mainly cats... They're [rabbits] eating all our grass. We used to be able to run, probably, in that area, 1500, 1600, hundred stock units. We now could only run, probably, 100... We're seriously thinking, between us and Cape Kidnappers, we're seriously thinking about letting the predator fence down or introducing cats" [Interviewee 5].

It is important to note that despite perceptions of general increases in predators in the region, participants did feel that they had seen successes in their personal efforts to deal with predator species (or at least prevent the negative consequences of their presence). Two interviewees specifically linked returning birdlife to their own tree-planting efforts (as well as predator control, to a lesser extent).

“The bird number change that I see at home I put down specifically to what we’re doing, ‘cause we’ve planted thousands [of trees]...”
[Interviewee 7].

Another noted that birdlife had returned as a result of a nearby conservation sanctuary.

...the birdlife has been returning... I think it’s mostly booming out of the Elsthorpe, what do you call it? The wee sanctuary down there... it’s cool to see” [Interviewee 7].

In relation to this immediately preceding quotation, a number of interviewees noted that the location of their property presented unique factors. Those close to urban areas were more likely to see cats. Those who lived near pine plantations were more likely to see possums in large numbers, and deer following tree-felling. Those near waterways which are under the management of council have less autonomy in controlling certain parts of their property. The participant most vocal about challenges presented by rabbits had a property dissected by the Cape to City footprint and believed the reduction of predators therein was responsible for a huge growth in rabbits. Thus, while there seems to be a theme of gradually increasing predator numbers, there is also a high degree of variation in the exact dynamics at play.

5.3 Interviewees’ views on how best to control predators

Participants were quick to point out that the best methods of predator control are based on what one hopes to achieve. In particular, different methods should be employed for different species. Some prioritisation of predator species is required. As the foregoing suggests, cats, possums and rabbits are priorities for many landowners. Another general point made was that any method requires thorough implementation to be successful.

Trapping, poisoning and shooting were the most commonly discussed methods of predator control. Certainly, as it pertains to widely implementable, collaborative programmes, shooting and poisoning were the most widely discussed. Shooting is an individual pursuit. One participant also discussed the spread of diseases that are lethal to predator species, although stated that there had been few recent developments in this technique that made it viable.

Concerning poison and trapping, participants were divided. Generally speaking, poison was seen as effective.

“I will admit I do put poison out” [Interviewee 2].

“I think rather than trapping probably poisoning is the best” [Interviewee 3].

“...the best way is by poisoning” [Interviewee 4].

One participant suggested that poisoning required less skill than trapping, making it more accessible. Another interviewee stated livestock such as cattle often disrupted traps, rendering them ineffective.

Yet, another interviewee stated preferring trapping due to the risks of pets being poisoned.

“I personally prefer the humane traps... I don’t like poison. I used to use it, but I’ve got dogs that hunt and eat [the rats which are poisoned]”
[Interviewee 6].

Moreover, the same interviewee suggested that trapping gave a better idea of how successful one’s efforts were, as, unlike with poison, predators that had been killed remained in/near the trap and could be counted. Developments in technology, such as gas-powered traps that reset themselves, may make trapping more viable.

Insofar as traps are utilised, there was general agreement that they should be humane. Other than this, few interviewees spoke of any ethical dimension to the methods they preferred. One interviewee stated that they justified killing predators on the basis of saving the lives of other animals by doing so. This same interviewee suggested that many lifestyle block owners may be somewhat ‘squeamish’ with regard to the realities of predator control, and that this might suppress their participation.

5.4 Responsibility for predator control

As mentioned in the preceding section, there is awareness among participants that the methods utilised are only as effective as the standard of implementation. A key part of this relates to a joint responsibility for, and participation in, predator control activities. Successful predator control requires action on the part of all stakeholders. Accordingly, most interviewees believed partnership between the Regional Council (and other government agencies such as MPI) and landowners was required. There was, however, often a sentiment that, ultimately, responsibility lay with the landowner. Long-term change would be impossible to achieve without landowner buy-in. In this way, interviewees had clear expectations of regional and national agencies, yet also acknowledged their limitations.

Interviewees envisage a relationship between the Regional Council and landowners in which the Council leads by providing coordination, information/education and resources, while also respecting and supporting autonomous landholder efforts and encouraging responsibility of pet owners (urban residents). While participants clearly did not want a heavy-handed approach (which may alienate landowners), it was acknowledged that sanctions for those not participating may be required.

“Working with private landowners. Encouraging, providing some financial incentive is probably good... and I think there should probably be some sanctions for people who don’t do it” [Interviewee 3].

“It really is the landowners, but I think the Regional Council has a role to play in using carrots and sticks... bulk buying and subsidising...”
[Interviewee 4].

“I’d say it’s a joint responsibility between, I mean I have had dealings with people in the past from Regional Council that their very title suggests that it’s their job... I think there has to be a balance. I don’t think someone, like an agency like that, should have sole responsibility. It’s too big for them anyway, but also I’m quite particular about who comes onto my property...”
[Interviewee 6].

“...the guys that keep it going are the locals... You need someone that has purpose [within council bodies]... they’re doing it out of passion for the job, rather than that’s what I’m paid to do” [Interview 7].

I am much more of the mindset that people, through government education, publicising the issue, the government needs to lead people into that direction [of predator control and environmentalism] more than they do.... [Interviewee 3].

“I think there’s a lot of people in the farming community... who probably see that possum numbers are starting to increase again. I think it would be useful for the Regional Council to address that... doing some testing and monitoring... and then went back to the community and said, whatever. ‘Yes. No. These are the results and this is what we’re getting.’ And I think it would be useful if they went around, if there were more visibility of them... if they were visiting farmers, lifestyle block owners and following up. Basically saying, you know, “You’re part of this programme, are you doing your part in it?” [Interviewee 4].

One interviewee advocated for more education and communication from the government with regard to feral cats.

“Politicians need to be more clear, more direct in saying what problems cats pose. They need to say ‘we need to kill them’. They need to go on record and they need to do it and stop talking about other predators.” [Interviewee 3]

Only one interviewee was of a clear mind that predator control was largely a Regional Council responsibility. This was based on rates payments for these services.

“The expertise needs to come from people in the Regional Council...” [Interview 5].

Another interviewee suggested the Regional Council should have greater involvement, as it would be easier.

“It would be easier, I think, if it just came in our rates and we just paid, rather than, I don’t want to employ somebody and be responsible for somebody. That’s why I just muddle along by myself” [Interviewee 2].

Such an approach would not remove the need to work with landowners, however.

“I think both councils need to work together, and I think they are now... I think a lot more education... the councils need to employ people that have the knowledge to support the local property owners on managing traps on their property and develop those relationships with the property owner...” [Interviewee 2].

5.5 Efficacy of Cape to City programme in controlling predators.

Many interviewees had little to no knowledge of the Cape to City programme. Consequently, many were reluctant to discuss what changes the programme might have achieved. This question usually evolved into discussing changes in predator numbers and predator control techniques as discussed above.

“I’ve seen a little bit, but I haven’t seen enough regularly to have, um, I don’t have a huge amount of knowledge about it... even though I’ve heard about it over the years, I don’t know how it works... and I don’t think we’ve actually had anybody come and talk about it [to my ecology group] directly [Interviewee 2].

“I have no idea. I really can’t comment on that” [Interviewee 3].

“I don’t know what’s been done. I just wouldn’t have a clue” [Interviewee 4].

“Can you just explain to me what was the Cape to City programme?” [Interviewee 7].

5.6 How do you think your views on predator control have changed over the last four years?

Most interviewees indicated that their views on predator control had not significantly changed and, where they had, this was not typically attributed to programmes such as Cape to City but, rather, for example, greater awareness of the detrimental impacts of predators (on the environment or business), or greater predator numbers being present.

“My purpose now [that I’m a farmer, rather than working for DOC] is to make sure I won’t get TB...” [Interviewee 7].

“If anything, I’ve got more ruthless on it [due to understanding the resources required when left unchecked]” [Interviewee 6].

“No, they haven’t really [changed]. I would say that I do have a little bit more concern that possum numbers are on the increase now than I did four years ago” [Interviewee 4].

“...my interests in the environment has continued to increase and with that my sense of what can be detrimental to it. So, I would say, ‘yes, I am more aware’. And I think I’m seeing more cats...” [Interviewee 3].

“...I’ve become a lot more educated. A little more educated, shall I say. Not a lot more. Yeah, I still probably feel the same. I still need, if I’m going to set traps on my property, I need help... you need a little bit more support than just being left to work it out on your own” [Interviewee 2].

5.7 Future efficacy, further interview comments and conclusions

Discussions with landholder interviewees clearly describe the complexity of predator control. There is recognition that in a world of finite resources the approach that the Regional Council and other organisations should take is not always clear.

“...there’s always a role for education, but it’s an age-old thing isn’t it?... the question is how much do you put into education and how much do you put into killing the predators?” [Interviewee 4].

Moreover, some landowners may simply never be motivated to join predator control efforts, at least not by normative concerns for the environment. More so than in the short survey responses, the economic determinants of predator control efforts are apparent here.

.. “Most people respond to cost versus gain... Reducing the costs of control would increase the buy-in” [Interviewee 6].

...I think there are some property owners that are not going to want to put any time into it whatsoever, but they’re quite happy for traps to be set [by Council] on their property” [Interviewee 2].

In this regard, in order to undertake the time and effort of predator control people need to see that it can be effective.

“People are aware of the issue, it’s whether they know the possible outcome on the other side with whatever effort they would put in. Is it a hopeless task? Have areas showed marked improvement and what does that mean?” [Interviewee 3].

Fortunately, there is precedent of the council organisations being seen as effective in the realm of predator control.

“I don’t feel qualified to answer that. Certainly what the Regional Council did with the possum programme over fairly big swathes of Hawkes Bay was extraordinarily successful, and if that were modified for other predators or pests then I think that would make a very big difference” [Interviewee 4].

“...they’re [the Regional Council] close enough [to getting it right] with the possum work” [Interviewee 7].

6 Overall limits and considerations

Several limitations should be considered when interpreting these results. As mentioned in the methodology we obtained a relatively small sample size for the survey and there may be a potential bias to respondents who were more involved in predator control. This low response bias is not uncommon, and may be further explained by the unexpected events in 2020 relating to the COVID-19 pandemic that meant that follow-up to landholders was interrupted during the national lockdown in March 2020. Further, it should be noted that the survey was sent to landholders during an historical drought in the region seriously affecting farmers’ livelihoods which may have further decreased responses.

It should be noted that self-selection bias in the survey respondents and particularly the interviewees is likely to be present as previously discussed. The views represented here probably represent some of the most pro-environmental or engaged and involved landholder views and this should be taken into account, particularly when considering their level of knowledge and engagement with the Cape to City programme.

7 Overall conclusions

The 2020 survey findings (and the comparison with the earlier survey results) provide timely insights into attitudes and perspectives concerning conservation and predator control among Hawke's Bay landowners in the vicinity of the Cape to City project. Moreover, these findings recount information as to whether and how these landowners are participating in such activities. The report also offers analysis of whether perspectives concerning conservation, predator control and agencies involved in this work might be changing over time. By way of conclusion, a summary of key findings is listed below.

1. Rural landholders surveyed believe that conservation and predator control are important. The importance of these activities is often linked with normative values including the uniqueness of NZ's wildlife and the responsibility landholders have to following generations. Economic factors were rarely cited as motivation to participate in conservation activities.
2. Despite not being a motivating factor, economic concerns can be a prohibitive factor. The qualitative data collected by the 2020 survey suggests that greater buy-in to predator control activities could be achieved by decreasing the economic cost carried by landholders or by ensuring that any additional cost is not prohibitive.
3. The collective benefit of predator control is well understood by participants. Respondents felt that their peers cared if they undertook predator control activities on their property. Moreover, buy-in (including from in urban residents) was seen as a key determinant of whether predator control efforts would be successful.
4. While recognising that collective action is important, participants' responses to this survey suggest that motivation impacts at an individual or personal level to participate in predator control and, what is more, are, for the most part, already doing so.
5. There is a notable sentiment among participants that key agencies such as the HBRC need to be doing more in support of landowners in predator control activities. The summary report of the 2015 survey called for greater communication with landowners. The 2020 survey findings reinforce this recommendation. Greater effort needs to be made to inform landowners of ongoing work and success stories and to engage with them. Perceptions that predator control is ongoing, successful and participated in by peers and key agencies is likely to lead others to participate and form a virtuous cycle of increased participating followed by increased success in predator control efforts.
6. Participants also sense a need to work smarter, not harder. Numerous comments suggest that there is a need to set priorities in terms of which predator species to reduce, and to identify what the ecological consequences of doing so would be (e.g. the potential flourishing of rabbits).

These findings align with the conclusions of Niemiec et al. (2017) Kaine et al. (2010) who found widespread support among rural landowners in, or near, the Cape-to-City programme

area for trapping to reduce feral cat populations. As indicated above and reported by Kaine (2020), support for reducing predator populations was primarily motivated by landowners' concerns for the potential for predators and feral cats to have damaging effects on native birds and fauna. While perceived effectiveness of the Cape to City programme amongst participants had decreased over survey periods, it should be noted that perceived effectiveness was high with 55% of the 2020 respondents indicating that Cape to City was moderate to very effective.

Landowners continue to express a duty of care for the environment in which they live and an awareness of the state of predator populations on their land. Most landholders participating here are active to some extent in predator control measures. The interviews investigated their views on responsibility for predator control more deeply, describing the complexity around this.

Several specific foci for enhancement were identified that would strengthen the likelihood that predator control measures would be sustained:

- Improve communication about predator control initiatives – regular and accurate communication was seen as lacking which meant that a number of people expressed uncertainty about the current situation. Target the communication based on landholders' motivations (preserving the uniqueness of flora and fauna in Aotearoa).
- In particular, improve the communication around the impact of predator control efforts to continue to educate both landholders as well as urban dwellers, providing advice for both.
- Improve the monitoring and maintenance of predator control equipment so that landowners can feel confident that external support is reliable.
- Improve the quality of predator control equipment to address doubts about the effectiveness of some control methods.
- Adopt a more collaborative approach that recognises the expertise and local knowledge of landowners in making decisions about predator control measures as this is likely to considerably enhance the prospect of success.

While the above recommendations promote greater, more targeted communications, the efforts to increase communication with landholders over the last few years through quarterly newsletters for example must be acknowledged. Further, the request for greater communication must be balanced with the resources available and landholders' ability to engage with the communications proposed. In the interviews it was clear that concepts were commonly confused; for example, the actions of Cape to City were confused with the Cape Sanctuary and predator-control actions were not always identified as HBRC actions as opposed to other organisations working in predator control (OSPRI and DoC).

A final recommendation is to continue to investigate and understand landholders' motivations so that actions and communication can be targeted. For example, Kaine et al.'s (2010) I₃ framework indicates that self-identity was not a major motivation for survey respondents to reduce the number of feral cats or to trap them. This suggests that attempts to encourage participation in a programme of trapping by emphasising the participation of

neighbours or friends are unlikely to be successful. Interviewees identified promoting the efficacy of predator control and educating the public about the effects of predators on the unique flora and fauna of Aotearoa as a good way to motivate people to participate in collaborative efforts. Interview participants all spoke highly of the HBRC's efforts to eradicate possums prior to the introduction of the Cape to City programme, so these strengths could be built on.

As the Cape to City programme transitions to Predator-free 2050, a survey of a larger sample of landholders across the region, together with research using focus groups, would be worthwhile to confirm the conclusions made here concerning the motivations of landholders and their views on the use of traps and other control methods for feral cats and other predators.

8 Acknowledgements

We gratefully acknowledge support from the following people for collaboration on research methodology, questionnaire design, report drafting, analysis and operational support for collecting the survey data:

- Manaaki Whenua – Grant Norbury and Geoff Kaine (project sponsors, questionnaire development and comments on the report)
- Cape to City – Melissa Brignall-Theyer (project design)
- Natalie de Burgh, HBRC (operational support for data collection)
- Rebecca Niemeic (project design and questionnaire development)
- Griffin Leonard (data analysis)
- Richard Edwards (survey data collection and interviews)
- Christine Cheyne (review of the report)

We acknowledge the time and effort that landholders put into this project completing the survey and agreeing to the interviews. We thank them for their time and their greater efforts in encouraging biodiversity in the region. This project was funded by Predator Free Hawke's Bay and Manaaki Whenua – Landcare Research.

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10 Appendices

10.1 Appendix A. Survey questions



How can predator control be improved in Hawke's Bay?

The Hawke's Bay Regional Council (HBRC) and collaborators in the Cape to City programme seek to understand landowners' views about current and potential approaches to predator control. **Please take 15-20 minutes to complete this survey and return it in the stamped envelope provided.** Or alternatively, complete the survey online by typing this url into your browser: <https://www.surveymonkey.com/r/C2CLandownersurvey2019> .

Q1 Which best describes you?

- Land owner and land manager
- Land owner not involved in day to day management
- Land manager who does not own the land
- Other (please state role) _____

Q2 How satisfied are you with your interactions with the following individuals and agencies?

	Not at all satisfied	Slightly satisfied	Moderately satisfied	Very satisfied	Extremely satisfied
Department of Conservation	0	1	2	3	4
Neighbours	0	1	2	3	4
HBRC	0	1	2	3	4
TB-free NZ	0	1	2	3	4
Freelance possum control contractors	0	1	2	3	4

Q3 How large is your property? _____ (ha)

Q4 What does the word, 'stewardship' or Kaitiaki mean to you?

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Q5 Over the last 12 months, what conservation activities have you participated in... ..on your land?

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....in the greater Hawke's Bay Community?

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How can predator control be improved in Hawke's Bay?

NOTE FOLLOWING QUESTIONS SUBJECT OF COMPANION REPORT

Q6 We are interested in how you feel about reducing the number of feral cats. In the next section, you will be asked to indicate your level of agreement with each of the statements. Please tick the space that indicates your level of agreement using the following scale:

Item	<i>strongly disagree</i>	<i>moderately disagree</i>	<i>slightly disagree,</i>	<i>neither agree nor disagree</i>	<i>slightly agree</i>	<i>moderately agree</i>	<i>strongly agree</i>
I think reducing the number of feral cats is rewarding							
The consequences are serious if we don't reduce the number of feral cats							
Reducing the number of feral cats is something I am passionate about							
It would be a big deal if mistakes were made in trying to reduce the number of feral cats							
My position on reducing the number of feral cats tells others something about me							
Reducing the number of feral cats is important to me							
Making decisions about how to reduce the number of feral cats is complicated							
What others think about reducing the number of feral cats tells me something about them							
I care a lot about reducing the number of feral cats							
The consequences are serious if we don't reduce the number of feral cats							

Q7 We are also interested in how you feel about using traps to reduce feral cat numbers. Please indicate your level of agreement with each of the statements. Please tick the space that indicates your level of agreement using the following scale:

Item	<i>strongly disagree</i>	<i>moderately disagree</i>	<i>slightly disagree,</i>	<i>neither agree nor disagree</i>	<i>slightly agree</i>	<i>moderately agree</i>	<i>strongly agree</i>
Using traps to reduce the number of feral cats would be rewarding							
The consequences are serious if mistakes are made using traps to reduce the number of feral cats							
Using traps to reduce the number of feral cats is something I am passionate about							

How can predator control be improved in Hawke's Bay?

It would be a big deal if a mistake was made with using traps to reduce the number of feral cats							
My position on using traps to reduce the number of feral cats tells others something about me							
Using traps to reduce the number of feral cats is important to me							
Making decisions about using traps to reduce the number of feral cats is complicated							
What others think about using traps to reduce the number of feral cats tells me something about them							
I care a lot about using traps to reduce the number of feral cats							
Making decisions about using traps to reduce the number of feral cats is difficult							

Q8 Attitude towards trapping of cats: How strongly do you agree or disagree with the following statements about using traps to reduce cat numbers?

Item	<i>strongly disagree</i>	<i>moderately disagree</i>	<i>slightly disagree,</i>	<i>neither agree nor disagree</i>	<i>slightly agree</i>	<i>moderately agree</i>	<i>strongly agree</i>
I think traps should be used to reduce the number of feral cats							
I think using traps to reduce the number of feral cats is the right thing to do							
I believe it is wrong to use traps to reduce feral cat numbers							
I think it would be good to use traps to reduce the number of feral cats							

Q9 When it comes to using traps to control feral cats which of the following statements best describes you?

Item	Describes me
I really think using traps to reduce the number of feral cats is the right thing to do	<input type="checkbox"/>
It doesn't really matter to me whether or not traps are used to reduce the number of feral cats	<input type="checkbox"/>
I am not really sure if using traps to reduce the number of feral cats is the best way to go	<input type="checkbox"/>
I haven't put much thought into using traps to reduce the number of feral cats	<input type="checkbox"/>

How can predator control be improved in Hawke's Bay?

I strongly believe that using traps to reduce the number of feral cats is a bad thing to do

Q10 In the next section of questions, you will be asked to indicate your level of agreement with each of the statements relating to predator control in general. Please tick the space that indicates your level of agreement using the following scale:

Item	<i>strongly disagree</i>	<i>moderately disagree</i>	<i>slightly disagree,</i>	<i>neither agree nor disagree</i>	<i>slightly agree</i>	<i>moderately agree</i>	<i>strongly agree</i>
Reducing the number of feral cats in the region will provide economic benefits to me							
Reducing the number of feral cats in the region will provide economic benefits to Hawke's Bay farmers							
Stoats, ferrets, and feral cats in the region pose a significant threat to native birds and other fauna							
Many landowners in the Hawke's Bay region come to me for advice							
I don't have the time to get involved with any efforts to reduce predators							
The removal of predators will allow rabbits to flourish							
Toxoplasmosis is not a major concern for me							
People I know care about whether I do predator control on my property							
Most people talk to each other about predator control							
I share information with groups of landholders who would not otherwise communicate with each other							
Most landholders I know are involved in predator control on their property							
I often wish there were more native birds and other native fauna on or near my property							
New Zealand should invest more resources into predator control							



How can predator control be improved in Hawke's Bay?

My decisions to engage in predator control on my property in the next year will make a difference to New Zealand's native birds and fauna							
New Zealand's native birds and other fauna are very special to me							
I am concerned about my household pets being harmed by any widespread predator control efforts							

As part of the Cape to City ecological restoration initiative, HBRC began trapping invasive predators (such as cats, stoats, , and ferrets) on private and public lands in April 2016.

Q11 Have you participated in the Cape to City ecological restoration initiative by allowing a pest control contractor to control the above-mentioned predators on your property?

Yes / No

If 'No', please skip to Q21 on page 7.

Q12 What is the best thing about predator control efforts happening through Cape to City?

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Q13 What concerns, if any, do you have about predator control efforts happening through Cape to City?

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Q14 How effective has the Cape to City programme been at reducing predator (stoat, ferret, cat) populations?

- Very effective
- Moderately effective
- Somewhat effective
- Not at all effective

Please explain your response:

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Q15 What changes, if any, have you noticed on your property or in your community, since the Cape to City predator control programme began in 2016?

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How can predator control be improved in Hawke's Bay?

Q16 What could HBRC do to work better with landowners through the Cape to City program?

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Q17 What challenges do you believe still remain for achieving a predator-free Hawke's Bay?

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Q18 If you are a sheep farmer, over the past several years, have you noticed any changes in the frequency of toxoplasmosis infection in your flock?

- Yes, toxoplasmosis is *increasing*
- Yes, toxoplasmosis is *decreasing*
- No
- Don't know/ Not applicable

If you selected 'Yes' above, please explain:

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Q19 In the past 6 months, have you checked predator traps on your property?

- Several times a week
- Several times a month
- Every few months
- Once a year or less



How can predator control be improved in Hawke's Bay?

Q20 Over the next few years, how likely are you to check traps on your property regularly i.e. at least every three months?

- Not at all likely
- Slightly likely
- Moderately likely
- Very likely

Q21 **Additional comments:**

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Please provide some form of contact information below if you would like to be entered into the draw for the prize, one of 2 \$150 gift cards for dinner at Mission Estate Winery. All of the following information is optional.

Name

Address

Phone

Email

Can our researcher contact you for an interview to learn more about your views on predator control? Yes No

Thank you for your participation!

10.2 Appendix B. Interview questions

- 1) Tell me a bit about yourself – your role, how long you've been here, the nature of the property you're on.
- 2) How much of a problem are predators on your property / in this region?
 - a) What impact do these predators have?
 - b) How has this changed over the years?
- 3) What are your views on how best to control predators?
 - a) Whose responsibility is it?
 - b) What involvement do you personally have?
- 4) How effective has the Cape to City programme been in controlling predators? Have you noticed any changes since it began?
- 5) How do you think your views on predator control have changed over the last four years?