



Te Matau a Māui project update: interim report February 2017

Native species thrive where we live, work and play



Juvenile kiwi being released at the Cape Sanctuary during a Cape to City education programme. *Photo: Robyn McCool*

This report provides project status information from 1 July to 31 December 2016

Prepared by the Te Matau a Māui Project Management Team

Contents

1. Executive summary	5
2. Project management update	7
2.1 Project structure update.....	7
2.2 Governance update.....	7
2.3 Community advisory group update.....	9
2.4 Project sustainability.....	9
2.5 Māori engagement	10
3. Workstream update: 1 July – 31 December 2016.....	15
3.1 Research and monitoring	15
3.1.1 Progress towards outcomes	16
3.1.2 Significant risks update.....	20
3.1.3 Significant opportunities update.....	20
3.2 Community engagement.....	20
3.2.1 Progress towards outcomes	21
3.2.2 Significant risks update.....	23
3.2.3 Significant opportunities update.....	24
3.3 Biodiversity and species	24
3.3.1 Progress towards outcomes	25
3.3.2 Significant risks update.....	27
3.3.3 Significant opportunities update.....	28
3.4 Habitat restoration.....	28
3.4.1 Progress towards outcomes	28
3.4.2 Significant risks update.....	30
3.4.3 Significant opportunities update.....	30
3.5 Pest control.....	31
3.5.1 Progress towards outcomes	31
3.5.2 Significant risks update.....	33
3.5.3 Significant opportunities update.....	34
4. Work planned for 1 January – 30 June 2017.....	35
4.1 Research and monitoring	35
4.2 Community engagement and education.....	35
4.3 Biodiversity and species	35
4.4 Habitat restoration.....	36

4.5	Predator control.....	36
5.	Conclusion.....	36
	Appendix 3: Te Matau a Māui milestone review	38
	Appendix 4: Landcare Research Contract for Services	54
	Appendix 5. Project outputs so far	58

1. Executive summary

The project is continuing to gain momentum as a successful predator management story and is tracking substantively to targets. Since the last report there have been some changes in the project structure. Wendy Rakete-Stones has been appointed to the Project Lead role allowing Campbell Leckie to focus on the national context of predator control. Bonny Hatami has joined the project team to represent Ngāti Pāhauwera. There have also been some workstream leader personnel changes due to maternity leave and staffing changes.

Ninety five percent of the milestones have been completed. Incomplete milestones will be resolved in 2017, and are a result of several factors – from technical issues to re-prioritisation. These are discussed in the main body of the report. The project budgets are on track and delivering well against the milestones.

Both Community Advisory Groups are functioning well and adding value, ideas and perspective to the projects.

Māori representation on the Project team has increased, and both Maungaharuru Tangitū and Ngāti Pāhauwera have contributed to the report and projects on many levels.

Some of the highlights in the last 6 months have been:

- The Landcare Research contract for 2016-17 has been signed. It includes 18 projects, with a mixture of new work and building on previous research.
- The education coordinators ran two successful workshops with Eastern Institute of Technology trainee teachers.
- The Cape to City website has been remodelled to be a lot more useful, interactive and easy to update.
- The first Cape to City Māori engagement hui was held in September at the Waimarama Marae. There were about 80 attendees representing most of the hapū groups within the Cape to City footprint.
- 30 Toutouwai (robin) and 28 miromiro (tomtit) have been released into 100-acre bush. These birds were released under a karakia (blessing) by Trevor Taurima (Maungaharuru Tangitū Kaumatua).
- The Clifton County Cricket Club and Cape to City held a successful planting day with about 80 volunteers. This is a community group within the Cape to City footprint who are successful recipients of the Department of Conservation (DOC) community fund.
- With the conclusion of Phase One of the Cape to City predator control there have been a couple of important things learned, which will inform Phase Two:
 1. This work has shown that feral cat control requires significantly more resources for effective control than previously thought.
 2. The best use of resources is to employ contractors for permanent maintenance layout and control, using the Cape to City pest control team for the specialised control.

One of the biggest highlights for New Zealand and the project has been the announcement of Predator Free 2050. Cape to City and Poutiri Ao ō Tāne significantly influenced this decision

through their scale, results and vision. This year will see this announcement coming to fruition, and hopefully Cape to City and Poutiri Ao ō Tāne will benefit. The next 6 months will also see much of the research projects in the latest Landcare Research contract completed; more species translocations; engaged schools through programmes and teacher workshops; 2017 restoration milestones underway, and the next phase of Cape to City predator control started.

2. Project management update

The systems to support project management are still working well and providing clarity for managing the project. Interest in the mechanisms behind managing this complex, multi-stakeholder project continues, and we will include a project management page on the new Cape to City website so that external parties can easily see how the project is run.

2.1 Project structure update

The governance team and the Aotearoa Foundation agreed to establishing a new Project Leader role. This role is jointly funded by DOC, Hawke's Bay Regional Council (HBRC) and the Aotearoa Foundation (**Figure 1**). The role was externally advertised, interviews undertaken and preferred candidate appointed. Wendy Rakete-Stones was the successful candidate and took up the role in November 2016. The role was established to manage the increasing profile of the project and ensure milestones are met, while freeing Campbell Leckie to engage with the increasing national interest and awareness around integrated wide-scale predator control and biodiversity benefits.

Dave Carlton (DOC) is leaving the Hawke's Bay to take up the position of Operations Manager on the Chatham Islands. Connie Norgate (DOC) is taking up the role of Operations Manager for Hawke's Bay. She will take over all of Dave's project roles (**Figure 1**).

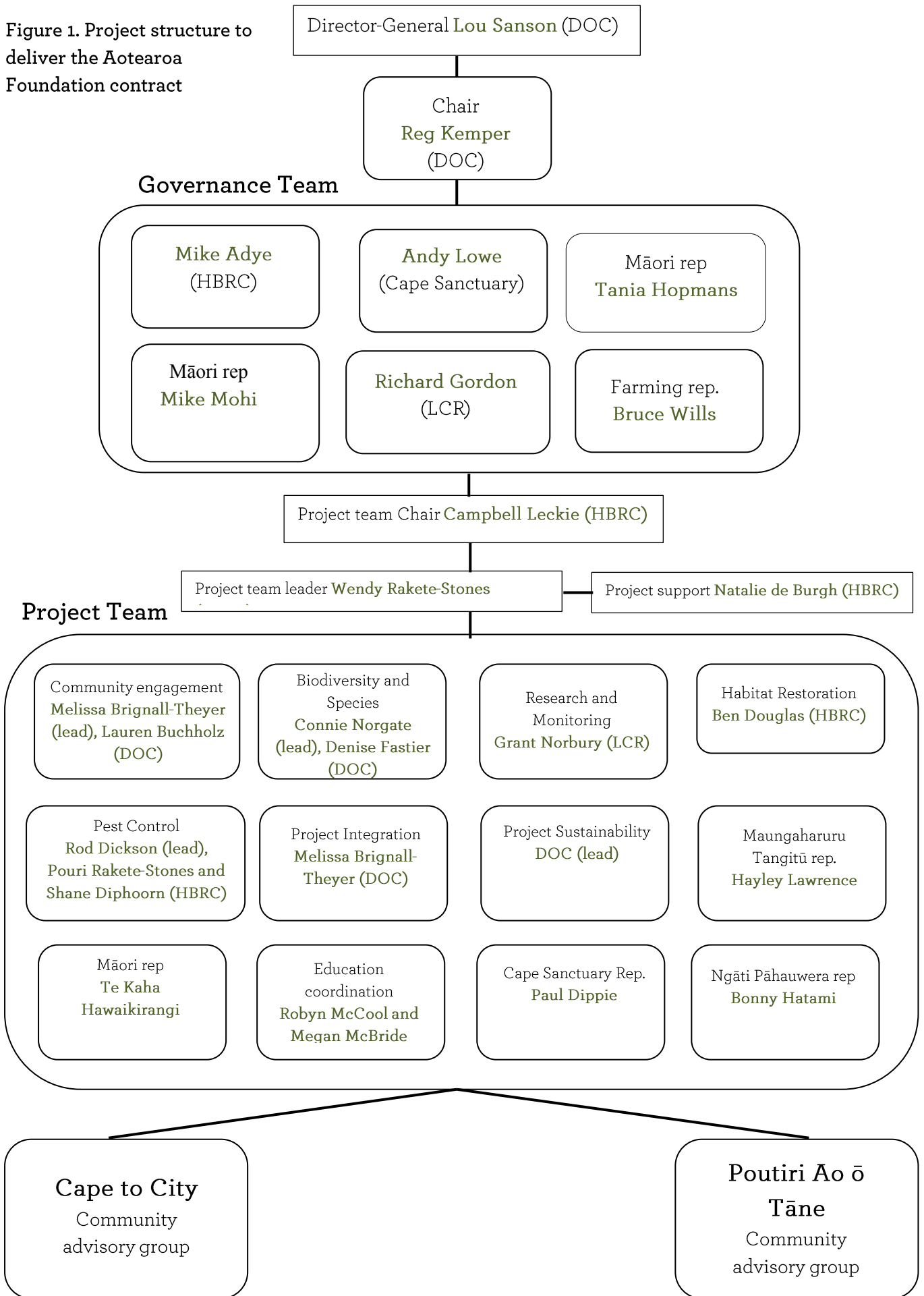
Two new members have joined the project team: Bonny Hatami is representing Ngāti Pāhauwera (see below for background on Ngāti Pāhauwera) and Ben Douglas is leading the Habitat Restoration while Hetty McLennan is on maternity leave. The Engagement Lead role will transition from Wendy Rakete-Stones to Melissa Brignall-Theyer in early 2017.

2.2 Governance update

The main decisions of the Governance team over the last 6 months were:

- The governance team approved the establishment of a Project Lead role, and for Campbell to remain project chair.
- The governance team accepted that, based on current investment in wireless trap monitoring for farmland and the rate at which challenges are being solved, large-scale use of wireless is now at least 2 if not 3 years away. This changes the potential timeline and approach for large-scale farmland rollout.

Figure 1. Project structure to deliver the Aotearoa Foundation contract



2.3 Community advisory group update

Both Community advisory groups (CAGs) are working well and providing advice and extra value for the projects. The Cape to City CAG has had three meetings in total and is settling into thinking about how its networks can contribute to the project and vice versa. The Poutiri Ao ō Tāne CAG is focussing on how to connect the community to reach its longer-term goals of providing biodiversity corridors and connectivity from mountain to sea.

2.4 Project sustainability

Campbell Leckie and the project team have been building a number of relationships to ensure sustainability of the project. These relationships are updated below.

Zero invasive Predators

The Project team have engaged with the Zero Invasive Predators (ZIP) team over the last six months at two levels. Firstly, both teams met and had a day discussing current research that each team was doing relevant to our joint predator control goals. Secondly, the Te Matau a Māui project chair has worked with the Chief Executive of ZIP in helping build stakeholder support for the Ministry for Primary Industries (MPI) decision to allow wireless trap monitoring to meet the requirements of the National Animal Welfare Act. This was successful with MPI approving (with certain criteria) wireless trap monitoring as meeting the requirements of the Act.

Biological Heritage National Science Challenge (BHNSC)

This partnership has also progressed well with the project team undertaking a range of complementary initiatives with the BHNSC. The first of these includes gaining support for a post doctorate student to work on the pan regional predator control proposal for up to ten regions in NZ with Hawke's Bay and Cape to City being a trial or case study. This post doctorate student will begin working with the project team in the next few months. The second includes the opportunity for the Project team to have a significant speaking presence at the upcoming BHNSC conference at Te Papa in Wellington in May 2017.

NEXT Foundation

The project team has been engaging with the NEXT Foundation to establish if there is an opportunity for a partnership that can drive additional value in integrating large scale predator control on farmland and what is being learned from Cape to City. A meeting took place late December 2016 between Bill Kermod and Devon McLean of the NEXT foundation and key Chief Executives from Regional Councils. The project team will continue to discuss with NEXT over the coming months how a partnership with Regional Councils on private farmland predator control can integrate urban, public conservation and private farmland to drive the vision of Te Matau a Māui and Predator Free 2050.

Predator Free - 2050

The project team have been engaging with DOC staff who have been tasked with assisting the Predator Free 2050 company to be set up. This principally has been around participating in providing information on the Matau a Māui project as part of a national stocktake of predator

control projects that can help drive the vision of Predator Free 2050. The project team see Predator Free 2050 as a significant partner in achieving the vision “Native species thrive where we live work and play”.

2.5 Māori engagement

The first Cape to City Māori engagement hui was held in September at the Waimarama Marae. There were about 80 attendees, representing most of the hapū groups within the Cape to City footprint. Trevor Taurima (Maungaharuru Tangitū kaumatua) gave a lovely presentation about Poutiri Ao ō Tāne, providing background and context for the following presentations about Cape to City. There was a lot of robust discussion about the role of Māori and how they would like to engage with the project. The main request was for similar hui to be held at other marae. The next hui will be held in the first half of 2017.



Māori engagement hui at the Waimarama Marae. *Photo: Lauren Buchholz*

The projects from a Māori perspective

Maungaharuru Tangitū update: Trevor Taurima of Maungaharuru Tangitū is a Kaumātua (Māori elder held in high esteem). He is very active in promoting and taking part in Poutiri Ao ō Tāne. Below are a couple of activities he has led in the past 6 months for Poutiri Ao ō Tāne.



In August 2016, Trevor Taurima, Maungaharuru-Tangitū, presented to Ngāti Kahungunu Kaumātua (elders) about Poutiri Ao o Tāne.



Trevor Taurima, Maungaharuru-Tangitū, blessed the toutouwai (robin) translocation with karakia (prayers) - he also caught the first bird! *Photo: Paul Taylor, Hawke's Bay Today*

Ngāti Pāhauwera:

Ngāti Pāhauwera have now joined the Project Management team. Below is background information about the iwi. There will be more specific information about their involvement with the projects in following reports.



*Ko Tawhirirangi te maunga
Ko Mohaka te awa
Ko Te Kahu o Te Rangi te tangata
Ko Paikea te taniwha
Harara Taupunga Opunga
Te Huki, Hiruharama nga urupa
Ko Rongomaiwahine te whare porotiti
Ko Ngāti Pāhauwera te iwi e*



Waipapa A Iwi Marae - Mohaka

Ngāti Pāhauwera iwi is a confederation of approximately 80 hapū located between Napier and Wairoa. We are a coastal iwi centred around our three awa, the Mohaka, Waihua and Waikare rivers. The traditional communities of Ngāti Pāhauwera are Raupunga, Mohaka, Putere, Kotemaori, Waihua and Waikare. We have active marae in Mohaka, Raupunga, Putere and Waihua, and the Te Huki rebuild is still to be completed. The Ngāti Pāhauwera Development Trust is the settlement entity that manages the resources returned in redress. We currently have over 7,000 members; many live in Hawke's Bay, but others live all over Aotearoa and internationally.

Ngā Tikanga – our guiding principles

Ko taku rekereke ko taku tūrangawaewae
Wherever I live, I stand as Ngāti Pāhauwera

Mōhaka harara taupunga opunga
United in our diversity

Ko te Amorangi ki mua ko te hapai o ki muri
Let Io be the spearhead and achievement will follow

Kia ū ki te pā harakeke
Cherish your whanau, hapū, iwi

Ko au te awa, ko te awa ko au
I am the river and the river is me. The river is integral to my identity

Pakatō i te ata, Pakatō i te ahiahi, Maurī mahi Mauri ora
Planning and preparation are critical to health and prosperity

Mahia nga māhi o Kahukura
Imagine and create a better future

We have always been clear in our aim for ‘Te Oranganui o Ngāti Pāhauwera’ – the health of Ngāti Pāhauwera. Ngāti Pāhauwera are leaders in our rohe, in that we were the first in Hawke’s Bay to settle our Treaty claim. It has always been about the protection of and looking after our natural resources and people. The ‘reti board’ is an innovative Ngāti Pāhauwera creation still used today to catch the world-famous Mohaka kahawai – which is why we use it in our logo. Our intention is to grow our people and our assets using collaboration and innovation.



Staff and Whanau at Mohaka River Mouth. *Photo: [insert photo credit if available, in italics]*

Ngāti Pāhauwera Development Trust assets include:

- 15,500 ha pine forest (leased to Pan Pac)
- 2,600 ha native reserves
- 3,500 ha of farm land
- Cash, deposits and investments

The main office for the Ngāti Pāhauwera Development Trust is in Wairoa; we have another office in Napier. The Trust has a subsidiary company, Ngāti Pāhauwera Commercial Development Ltd, which has a contractual management agreement with the Trust to manage its commercial assets including the five farms. The Trust is actively working on the following environmental activities in 2016/2017:

- Environmental: Iwi/hapū management plan to be completed:
 - Putere Lakes Restoration – fencing, planting, pest and aquatic weed control.
 - Mohaka, Waikare and Waihua River Restoration – (fenced over 40 km in the previous 2 years), fencing, planting, nursery.
 - Land Environment planning, Riparian fencing and planting on farms.
 - Stance against aerial drop of 1080, looking at ground-based pest control.
 - Marine and Coastal Area (Takutai Moana) Act 2011 – application in progress – we are first to test the new Act.

- Member of Tiaki Taiao Rōpu which advocates for Māori environmental issues in HB, Tuwharetoa and Tairāwhiti, preparing submissions on freshwater, Conservation Management Strategy, electricity and other issues.
- Ngāti Pāhauwera Development Trust (NPDT) legislation-initiated Joint Planning Committee in HBRC – the purpose of which is to allow local iwi and hapū to contribute to regional planning and the development and review of a regional policy statement. It gives effect to government commitments made in Treaty settlements to allow for input.

3. Workstream update: 1 July – 31 December 2016

This section outlines the progress on the activities and objectives outlined in Attachment 1 of the Aotearoa Foundation contract. An updated version of these is in **Appendix 4**. These have been separated into five workstreams: research and monitoring; community engagement; biodiversity and species; habitat restoration; and pest control. **Table 1** provides a summary of progress on activity by each workstream. One milestone in the research and monitoring has not been completed due to technical difficulties. This will be completed in 2017. The incomplete milestones in the biodiversity and species workstream are the result of different issues. These are described in more detail below in the milestones updates.

Table 1: Progress on 2016 activities

Workstream	Number of activities	% complete
Research and monitoring	8	99
Community engagement and education	5	100
Biodiversity and species	7	74
Habitat restoration	2	100
Pest control	7	100

Significant risks and opportunities are reported under each workstream. These have been kept the same as those in the August 2015 interim report, so that progress can be measured against them. New risks and opportunities have been added as appropriate. The full list of risks and opportunities (as provided in the August 2015 interim report) can be viewed if required.

3.1 Research and monitoring

The research and monitoring workstream is led by Landcare Research (LCR). There are four strands to this research: pests, indigenous biodiversity, social research and economic research. This work is substantially delivered through milestones described in two contracts: one between LCR and HBRC, the other between HBRC and John McLennan (private consultant).

3.1.1 Progress towards outcomes



LCR staff during biodiversity monitoring field trip. *Photo: Lauren Buchholz*

Highlights

The LCR contract for 2016-17 has been signed. It includes 18 projects, with a mixture of new work and building on previous research (Appendix 4). New research topics include reviewing the education programmes and researching perverse ecological outcomes of the predator control. An example of this would be increased weed dispersal through increased birds and seed dispersal.

The invertebrate research conducted over the last year has produced the following recommendations:

- Invertebrates provide important ecosystem services; they need to be considered as part of Cape to City's goal of enabling indigenous taxa to co-exist with human habitation, food production and recreation at large scales in an agricultural landscape.
- We recommend monitoring large-bodied taxa, such as the Hawke's Bay tree weta, because of their known responsiveness to mammal control. As this iconic tree weta species is restricted to the Hawke's Bay, it could stimulate public participation and ownership. LCR is monitoring Hawke's Bay tree weta with artificial retreats, focussing on sites with rat control.

- We also recommend a survey for rare and threatened species within the Cape to City footprint and to determine whether host-specific threatened invertebrate species are habitat or predator-limited. This could be achieved through trial restoration plantings, including the host plant taxa in areas with or without predator control.
- Environmental DNA (eDNA) can provide an unprecedented level of detail on entire invertebrate communities for similar cost to conventional monitoring, which typically targets well-known groups such as beetles or weta. Areas for methodological improvement have been identified (eg more reference data, optimised bioinformatics pipelines, further comparisons with conventional data); these methodological issues need to be addressed before eDNA can be rolled out as an established monitoring technique for invertebrates within Cape to City.

Table 2. Progress on research and monitoring milestones

Milestone	2016 activity	Update	% complete
Research outputs	A minimum of three research outputs, two of which are submitted to peer-reviewed journals.	A total number of research outputs so far: 6 publications in science journals 8 manuscripts either submitted or drafted 9 conference presentations 13 unpublished reports 3 public lectures 4 newsletter articles	100
Methods of monitoring introduced mammalian predators before and after control	Compare precision of various methods to estimate predator abundance from camera trapping data (e.g. occupancy modelling, mark-recapture modelling).	Camera trapping to monitor the results of predator removal on Waitere Station) found that both occupancy modelling and Bayesian spatial presence-absence (SPA) modelling successfully detected a reduction in cat numbers following control. The SPA model estimated that control reduced cat numbers from 24 to 3; however, 95% confidence intervals were wide. Ongoing work will compare these results with conventional mark-recapture modelling, using coat patterns to identify individual cats. Report drafted on use of camera traps to underpin compliance monitoring of predator control.	100

Milestone	2016 activity	Update	% complete
Decision analysis models for predicting the most cost-effective trapping configurations for managing introduced predators over large areas.	Refine predator population model to predict outcomes of different trap configurations and frequency of checking.	<p>A draft manuscript is underway, but due to technological difficulties with the wireless nodes the data was compromised. The trial will be re-run in the first half of 2017 and analysis will follow.</p> <p>An on-line trap maintenance tool to predict percentage kill of trapped predators using various trap configurations and trap-check intervals has been refined for testing</p>	90
Increase in skinks, geckos, and native invertebrates in the Cape to City area; continued increase in skinks, geckos, and native invertebrates in the Poutiri Ao ō Tāne area.	Continue Poutiri Ao ō Tāne and Cape to City monitoring (Poutiri Ao ō Tāne monitoring times may be extended).	<p>Spring surveys in Cape to City have been completed. Data will be analysed in the new year. Poutiri Ao ō Tāne surveys will be done in February 2017 as per the schedule.</p> <p>Paper on Poutiri Ao ō Tāne data has been submitted for publication.</p>	100
Analysis and reports on the integrated economic benefits of Te Matau a Māui.	Produce a scoping report on integrated economic analysis (toxoplasmosis/green credentials/rabbit forage etc.).	<p>Literature and web searches were undertaken to identify information about the economic costs and benefits of the control of possums, feral cats, stoats and ferrets. Economic costs and benefits were identified at a regional level where possible, but were mostly extrapolated from national data related to TB eradication.</p> <p>Recommendations for further work in this area are provided in the report.</p>	100

Milestone	2016 activity	Update	% complete
Decrease of toxoplasmosis-related lamb abortion rates. As a result of research and reduction in cat numbers, vaccinations will no longer be necessary, leading to significant economic benefits to the region and nation.	Produce an annual review of the research programme.	An annual review has been completed. The trial sites have been modified as one treatment site is no longer part of the Cape to City footprint, due to proximity to urban areas. However, the site will remain in the Toxoplasmosis trial and pest control will be simulated for that site. The next lot of samples will be taken in Sept-Oct 2017.	100
Use of restored habitat by native wildlife.	Complete pre and post-habitat meta-connectivity study for the project, to determine benefits of habitat to key species.	Report completed on comparing invertebrate monitoring methods. It highlights that environmental DNA (eDNA) can provide high detail data on entire invertebrate communities for a similar cost to conventional monitoring, which typically targets well known groups such as beetles or weta. Areas for methodological improvement have been identified.	100
Student participation	Engage two tertiary students in the project per annum.	There have been three PhD students involved in the project.	100
Increasing the participation in pest management and ecological restoration by landowners and the community	No 2016 activity		N/A

Note: Research progress is also reported in other workstream updates.

3.1.2 Significant risks update

Original *Insufficient pest control intensity to achieve desirable biodiversity outcomes is a potential risk that will be mitigated by monitoring and adaptive management.*

Update This risk is still largely unquantifiable at Cape to City until after a couple of years of predator control and biodiversity monitoring. What is clear from early camera monitoring of Cape to City Phase One of predator control, is that control will need to be intensive over a 10 to 12 month period and will in particular need to deal effectively with buffers on non-treated areas. *No change to this update for this report.*

3.1.3 Significant opportunities update

Original *Working closely with the Biological Heritage National Science Challenge (BHNSC).*

Update Cape to City will feature prominently in the BHNSC conference in May 2017.

Original *LCR is currently considering aligning another of its core research portfolios (Enhancing biodiversity) to the Cape to City project. This work is in progress.*

Update Research from the Enhancing Biodiversity portfolio has been aligned with Cape to City and specific projects are part of the 2015/16 LCR contract, bringing the total LCR contribution to around \$500,000. This level of funding will continue in the next contract covering the 2016/2017 financial year. *No change to this update for this report.*

3.2 Community engagement

This workstream is led by DOC, but because it is intimately linked to all the other workstreams there is significant input from other project partners. This workstream has three strands: education (school and curriculum-based), communications, and community engagement in general.

3.2.1 Progress towards outcomes



Taikura Rudolf Steiner school students during a Cape to City education programme.

Photo: Robyn McCool

Highlights

- The education coordinators ran two workshops with Eastern Institute of Technology (EIT) trainee teachers. The first was run as part of curriculum and pedagogy and social science modules for Bachelor of Teaching Primary teachers; the second was for Bachelor of Teaching Early Childhood teachers. Both groups were inspired by the workshops and reported the intention to use what they learned; for example, promoting interactions with bugs, animal tracks and plants.
- A couple of teachers involved in a Cape to City education programme gave the example of the change in behaviour these programmes provide: students were in the creek as part of a school camp using their new skills to test the water with clarity tubes (borrowed from their new friends at HBRC) when a small eel came out from the shelter of the bank and began swimming among their legs. The teachers said that prior to the Cape to City Freshwater programme this would have caused consternation and a mass exodus from the water. However, only one child got out of the water. The others (around 64 children) all just stood and marvelled at beauty of the eel, willing it to come and swim between *their* legs and excitedly pointing it out to their friends!

- The Cape to City website has been remodelled to be a lot more useful, interactive and easy to update. Feedback so far has been very positive. We will be updating the Poutiri Ao ō Tāne website in 2017.
- Cape to City and Poutiri Ao ō Tāne were showcased at the Hawke’s Bay Agricultural and Pastoral Show (A&P show). The themes were strong and we received very good feedback. Some even felt it was the best exhibit at the show.
- The Poutiri Ao ō Tāne Facebook page has gone from 505 to 545 ‘Likes’ in the last 6 months, with approximately two new posts a week. Since June, posts were read by at least 55% of followers or others on Facebook. We’ve reached over 1,500 Facebook accounts in the last month.
- The Cape to City Facebook page has gone from 251 to 287 ‘Likes’ in the last 6 months, with approximately two new posts a week. Since June, posts were read by at least 87% of followers or others on Facebook. We’ve reached just under 3,000 Facebook accounts in the last month.

Table 3. Progress on community engagement and education milestones

Milestone	2016 activity	Update	% complete									
A marked increase in the number of volunteers participating in the programmes over the next 5 years.	A measured increase in volunteer hours trending upward.	<p>There was significant volunteer effort put into a planting day at the Clifton County Cricket Club, and some very dedicated volunteers helped at the A&P show.</p> <p>Volunteer effort at Poutiri Ao ō Tāne continues to be strong.</p> <p>Volunteer hours (to Dec 2016)</p> <table border="1"> <thead> <tr> <th></th> <th>2015</th> <th>2016</th> </tr> </thead> <tbody> <tr> <td>Poutiri Ao ō Tāne</td> <td>1,062</td> <td>2,601</td> </tr> <tr> <td>Cape to City</td> <td>192</td> <td>416</td> </tr> </tbody> </table>		2015	2016	Poutiri Ao ō Tāne	1,062	2,601	Cape to City	192	416	100
	2015	2016										
Poutiri Ao ō Tāne	1,062	2,601										
Cape to City	192	416										
Increased involvement of schools in the various conservation initiatives.	Engage a total of six schools in the Cape to City project.	<p>In the last 6 months, two schools have been engaged in ‘Backyard Biodiversity’ programmes and one in the ‘Fresh Water’ programme.</p> <p>Two workshops were run with EIT trainee teachers. One was with Bachelor of Teaching early childhood teacher trainees; the other was a second workshop for Bachelor of Teaching primary teacher trainees.</p>	100									

Milestone	2016 activity	Update	% complete
Communications strategy	Implement communications strategy.	The new Cape to City website is now live. Work has begun on the next Cape to City and Poutiri Ao ō Tāne newsletter. (See Appendix 5 for media outputs)	100
Through the social engagement strategy and communication plan, the Hawke's Bay community will value the importance of biodiversity and act accordingly so that sustainability behaviours become part of the social norm.	Approach other investors in a prioritised way.	The project team have been involved with Predator Free 2050 on several levels. Campbell Leckie has been working with the NEXT foundation. See the Project Sustainability section for more detail.	100
	Review and implement community engagement strategy.	The first Kaitiakitanga hui was held for Cape to City at Waimarama Marae in September. Cape to City and Poutiri Ao ō Tāne were showcased at the A&P Show. Cape to City was invited to have a stall at the Haumoana school Tropicana day (fair). This school has engaged in both education and teacher development programmes through Cape to City and have consequently set up their own projects.	100
	No 2016 citizen science activity.		N/A

3.2.2 Significant risks update

Original *If we do not engage iwi in a meaningful way we risk losing a key partner and jeopardising the success of the project. We therefore need to formalise engagement with iwi at a communication and participation level and make sure engagement is genuine and visible in all our communications. A Māori engagement strategy is being developed.*

- Update** A Māori engagement day was held for Cape to City at Waimarama Marae during Conservation Week in September 2016. Bonny Hatami has joined the project team representing Ngāti Pāhauwera.
- Original** *There is a lot of interest and excitement about the education programmes. This has created many opportunities for links and involvement outside the project milestones. The risk is that the project team starts working in areas outside the project's deliverables, and is unable to meet the contracted deliverables due to resource and time constraints. This risk is being mitigated by assessing all opportunities as a team.*
- Update** All staff involved in the community workstream are now very good at working within scope. All opportunities are discussed by the whole project team so opportunities can be prioritised. *No change to this update.*
- New (January report)** *Delivering the education milestones would be at risk if, for some reason, the project lost the education coordinator. This risk will be mitigated by setting up systems to make it easy for someone to take over in the coordinator's absence, and by teaching other team members some of the necessary skills.*
- Update** A part-time coordinator has been employed to support Robyn McCool. *No change to this update.*

3.2.3 Significant opportunities update

- Original** *An initial presentation and meeting with EIT teacher training faculty staff and students has provided an opportunity to link the teacher training programme with Cape to City. This is a significant step towards the 2017 milestone 'Engage a minimum of six schools in the Cape to City project plus at least one tertiary institute initiative'.*
- Update** Two further trials with EIT trainee teachers were held, continuing to deepen the relationship with EIT.
- Original** *The Community Conservation Partnerships Fund (\$26 million over 4 years), administered by DOC, is a significant opportunity for community groups to receive funding and align themselves to. Proposals are being considered.*
- Update** Projects already funded are continuing.

3.3 Biodiversity and species

This workstream is led by DOC, but has significant input by John McLennan and LCR. There are two main strands: species reintroductions and biodiversity monitoring.

3.3.1 Progress towards outcomes



Toutouwai release into 100 Acre Bush.
Photo: Lauren Buchholz

Highlights

- 30 Toutouwai (robin) and 28 miromiro (tomtit) were released into '100 acre bush'. These birds were released under a karakia (blessing) by Trevor Taurima (Maungaharuru Tangitū Kaumatua). Both species were still present in the bush at the last monitor.
- The baseline bird counts show clearly that Cape Sanctuary currently has a richer and more abundant community of native birds than the Cape to City footprint, but differences between the Cape to City footprint and Cape to City non-treatment area are currently small and inconsequential. Some species of Cape Sanctuary origin were found in the Cape to City footprint during baseline measurements, but traffic rates are currently low and most of the dispersers appear to be unable to successfully establish. A primary aim of the Cape to City programme is to make the footprint safe for endangered native birds, to gradually reduce and then eventually eliminate the differences that exist now between the bird community in the footprint and the one in neighbouring Cape Sanctuary. The baseline counts have quantified the differences that exist at the start of the programme, while the subsequent counts, in the years to come, will hopefully document their gradual disappearance.
- Cape to City's profile was raised again, and is a 'spotlight' article in the national document [New Zealand Biodiversity Action Plan - 2016-2020](#)

Table 4. Progress on biodiversity and species milestones

Milestone	2016 activity	Update	% complete
Reintroduction and re-establishment of mottled petrels.	Continue with Cook's petrel and mottled petrel translocations. Measure survival rates and patterns of weight loss through to fledging.	Kōrure (mottled) and titi (Cook's) petrels were translocated in March–April. Planning is underway for 2017 translocations.	100
Increase in the abundance of introduced and native birds that are already present in the area	Carry out bird monitoring, including questionnaire surveys, to determine bird abundance in rural and urban gardens.	Autumn and spring bird monitoring at Cape to City has been completed. NZ Garden bird survey data for the Cape to City area has been compiled for comparison at the end of the project.	100
Reintroduction and establishment of several threatened bird species into the Cape to City area, some species will spread from Cape Sanctuary; others will be reintroduced and actively managed until self-sustaining.	Monitor species currently overflowing from Cape Sanctuary (pāteke, red-crowned kākāriki, etc.). Translocate robins and tomtits to Mohi Bush to assist spread of native insectivores through Cape to City area.	30 Toutouwai (robin) and 28 miromiro (tomtit) have been released into '100-acre bush'.	100
Successful re-establishment of North Island brown kiwi onto the Maraetotara plateau in the Cape to City footprint.	Complete kiwi translocation proposal.	Draft proposal completed. Consultation on the proposal will be undertaken in the new year.	100

Milestone	2016 activity	Update	% complete
Successful re-establishment of whio/blue duck on the Maraetotara River (subject to risk analysis and resourcing). Successful colonisation of ponds and wetlands by pāteke in the Cape to City and Poutiri Ao o Tāne areas	Scope a detailed technical analysis of risk around habitat and gradients, by looking at other New Zealand examples.	Whio will not be translocated for at least 2 years. We are therefore recommending re-prioritising this milestone to 2017 (Appendix 3).	15
Improvement in the numbers of long-tailed bats inhabiting Mohi Bush	Implement measures that will improve conditions for a population increase. Implement long-tailed bat monitoring programme.	Rat control continues in Mohi Bush. Indications are that the level of monitoring required is too expensive. The Project team are having ongoing discussions about this. If it goes ahead it will be re-prioritised to 2017.	50
Reintroduction and re-establishment of mottled petrels, Cook's petrels, kākā, kākārīki, and pāteke in the Poutiri Ao o Tāne area	Transfer and successfully fledge petrels. Kākā and kākārīki populations have established and are self-sustaining.	Rat tracking rates were not brought down low enough in time for translocations in 2016. The last two tracking rates were 3%. If the next one in February 2017 is also below 5%, a kākārīki translocation could occur in 2017.	50

3.3.2 Significant risks update

Original *It is yet unknown what level of predator control is sufficient for survival of pāteke and whio; there is therefore a risk that control cannot be achieved to levels supporting the survivability of these species. This will be managed through monitoring and adaptive management.*

Update After review, it was concluded that it would be unwise to release more pāteke while the current level of predator control is in place. Increasing predator control at this stage would interfere with the Wide scale predator control experimental design.

Original *If adequately-sized founder populations cannot be achieved due to limited numbers of source birds, the project is at risk of not reaching sustainable populations in the release area.*

Update This is a long-term risk and can be planned for.

3.3.3 Significant opportunities update

Original *Techniques developed for petrel translocations will enable further populations to be established elsewhere in New Zealand.*

Update Rachael Sagar's PhD, which will inform this opportunity, is still to be completed. *No change to this update.*

3.4 Habitat restoration

This workstream is led by HBRC and is focussed on restoring native habitat and water quality through planting.

3.4.1 Progress towards outcomes



Planting day at the Clifton County Cricket Club. *Photo Lauren Buchholz*

Highlights

- The Clifton County Cricket Club and Cape to City held a successful planting day with about 80 volunteers. This is a community group within the Cape to City footprint that is a successful recipient of the DOC community fund.
- Of the four whitebait spawning sites already identified, only one, on the Waipuka Stream, is in any need of protection from stock. We are currently working through how to best protect this site. Once a plan is confirmed we are aiming to trial the 'Million Metres Streams' crowd funding project as a funding mechanism.
- During winter 2016, Waimarama Marae, the local school and community, with the support of the Cape to City project, fenced off a section of the stream and planted a mixture of 2,500 natives. This will be an ongoing restoration programme with additional fencing and planting already planned for winter 2017.
- The Ministry for Primary Industries accepted four applications for its Afforestation Grant Scheme. One of these landowners is proceeding with establishing 106 ha (approximately another 106,000 plants) of mānuka and supporting species for honey production.

Table 5. Progress on habitat restoration milestones

Milestone	2016 activity	Update	% complete
Improved water quality in the Maraetotara River following stock exclusion and riparian re-vegetation.	Confirm and implement water monitoring programme.	HBRC currently carries out water quality monitoring at three sites along the River. Data from the lagoon site is reported monthly via the HBRC website, and the state and trends are reported every 5 years via written report.	100
Increase in native habitat in the Cape to City area.	Ensure a minimum of 50,000 plants planted within project footprint by partners or community groups.	Planting completed over the winter months along the Maratotara river, Clifton County Cricket Club and at Waimarama Marae. Manuka trial sites have been confirmed. Working with landowners including the Hastings District Council around restoration and signage for identified whitebait	100

Milestone	2016 activity	Update	% complete
		<p>spawning sites in the Cape to City footprint.</p> <p>Policy for willow removal prior to riparian planting is under review.</p>	
Enhancement of DOC's efforts on public land through landscape-scale ecological restoration on private land	No 2016 activity.		N/A

3.4.2 Significant risks update

Original *Not delivering maintenance after planting is a risk that often turns into a reality due to lack of resources for weeding, watering and other maintenance. This is being managed with effective planning and resource allocation.*

Update Release spraying was completed on all 2016 plants.

Original *Lack of landowner cooperation is another risk and will be managed through landowner/council agreements and forming solid relationships with landowners and community groups.*

Update Landowners are, on the whole, cooperative. Esplanade strip agreements are being signed by landowners for next year's planting.

3.4.3 Significant opportunities update

Original *HBRC is working on a partnership with Million Metres Streams for Maraetotara River as part of the project. This organisation raises money for riparian restoration through sponsorship.*

Update Three projects have been put up by HBRC including one in the Cape to City footprint.

New (January Report) *There is an opportunity to establish mānuka for honey production on highly erodible land (classes 6 and 7) within the footprint. Among other things, planting mānuka will provide important habitat and erosion control. This is a partnership between HBRC, Comvita, AGS (afforestation grant scheme) and landowners.*

Update As stated above, establishment of 106 ha of mānuka within the footprint is proceeding for the 2017 planting year, with a further 100 ha in the 2018 planting year still to be confirmed.

3.5 Pest control

Although led by HBRC, this workstream has substantial input from LCR. It covers wide-scale suppression of predators within Poutiri Ao ō Tāne and Cape to City.

3.5.1 Progress towards outcomes



Cat entering a trap during the PAPP trial at Toronui station. *Photo Rod Dickson*

Highlights

- With the conclusion of Phase One of the Cape to City predator control, there have been a couple of important things learned that will inform Phase two: 1. this work has shown that cat control requires significantly more resources for effective control than previously thought; 2. the best use of resources is to employ contractors for mop-up or maintenance control, and to use the Cape to City pest control team for all specialised control.
- When functioning well, wireless technology is a game changer, but the present instability of the system in a rural/farm-based landscape is still a barrier to upscaling. It is predicted it will still take 2-3 years of trials and technological advances before upscaling is possible.
- After much debate, the National Animal Welfare Advisory Committee is allowing the use of wireless trapping (with caveats) under the National Animal Welfare Wireless Guidelines.

Table 6. Progress on pest control milestones

Milestone	2016 activity	Update	% complete
High-level landowner participation in pest control in the Cape to City area. 'In principle' agreement among participating landowners to continue predator control beyond timeframe of the programme.	Obtain agreement in principle from 75% of land owners across sufficient land area to be likely to deliver wide-scale predator control outcomes.	Landowner support continues to be strong. Landowners in Phase One are kept well-informed.	100
A marked reduction in introduced predators in the Cape to City area.	Establish 4,000 ha of predator control infrastructure.	Trap network for phase is complete. Live trapping completed and followed up with kill trapping and night shooting.	100
Use of wireless trap networks to optimise control.	Install additional wireless trap networks within the Cape to City project footprint.	Wireless nodes have been installed in the Cape to City footprint and continue to be trialled. The software has been upgraded to make checking and re-setting of traps easier.	100
Examination of the long-term effectiveness and reliability of self-resetting traps for rat control in Boundary Stream mainland island.	Reduce checking frequency to four times per year and monitor rat density.	Self-dispensing lure has been installed in all the self-resetting rat traps, with the aim of dropping the trap checking schedule to once every 6 months. Monitoring using tracking tunnels will continue to be done four times. Rat tracking tunnel rate at Boundary Stream for the last two monitors was 3%.	100

Milestone	2016 activity	Update	% complete
Sustained suppression of introduced predators at low densities in the Poutiri Ao ō Tāne pest control area.	Continue contractor control at reduced control intensity.	Scheduled network check and specialist trapping was completed in November. A PAPP trial was undertaken on Toronui station (part of Poutiri Ao ō Tāne) targeting feral cats. Pre and post-trial monitoring was done using cameras; initial results show a 53% reduction in cat activity.	100
Demonstration that effective ongoing predator control in the Cape to City area can be undertaken for less than ~\$3/ha.	No 2016 activity.		N/A
Demonstration that the cost of predator control can be met by transferring resources from possum control programmes, while still maintaining possums at low densities.	Optimise large-scale delivery of chew cards for possums based on research by LCR.	No change from the August 2016 report.	100
Operational monitoring for predator control.	Undertake monitoring.	Camera traps were deployed in November and retrieved in December. Data will be analysed in the new year.	100

3.5.2 Significant risks update

Original *The perception that rabbits increase after predator control is a risk that will be mitigated with good communications and research. LCR has published a scientifically-credible review that demonstrates rabbit numbers are driven by*

bottom-up influences such as climate, disease and pasture growth, rather than by predators.

Update There are two landowners who have high levels of rabbits. The project and governance teams decided to not do predator control on the two properties, but to maintain a cat trapping buffer around the properties to control reinvasion into the treated area. Monitoring of rabbits will continue and these properties are being considered for new calici-virus trial in 2017.

Original *To get biodiversity and economic gains (through reduction in toxoplasmosis) we need to control feral cats. This is an emotive subject in New Zealand and there is the risk that a farm or domestic cat gets caught, prompting negative media coverage. To manage this risk, we have a communications plan in place and traps will be placed where they are least likely to trap farm or domestic cats. Where the risk of catching cats is high (ie around urban areas) live-capture cage traps will be used.*

Update Buffer zones for kill-traps have been created around landowner dwellings. As part of the roll-out, vets and the SPCA were consulted and landowners were offered the chance to have their domestic cats photographed and/or micro-chipped. If landowners are particularly concerned, they can put their cats in a cattery. *No change to this update.*

3.5.3 Significant opportunities update

Original *Initial meetings have been held with Zero Invasive Predators (ZIP) and the Biological Heritage National Science Challenge (BHNSC) to align appropriate parts of each project, or learn from the work these groups are doing.*

Update

- Some project team members went to Wellington to meet with ZIP for a day of shared learning. This was useful to understand areas of commonality and to strengthen the relationship.
- The BHNSC is holding a conference in May 2017 and have invited the team to present Cape to City as an example of what they are trying to achieve.

New (Dec 2016 report) *In July 2016 Predator Free 2050 (PFNZ-2050) was announced. Cape to City was used as an example in the announcement and has a very good chance of benefitting from PFNZ-2050.*

4. Work planned for 1 January – 30 June 2017

4.1 Research and monitoring

- Optimise pest control by modelling wireless trap catch data, estimating effectiveness of PAPP toxin, measuring longevity of the ferret body odour lure, examining effect of control at Boundary Stream in neighbouring areas, and reviewing HBRC's cost estimates for rolling out control at a regional scale
- Measure predator and biodiversity responses to pest control in Cape to City
- Review how camera trap monitoring of predator abundance can be linked to biodiversity and economic outcomes
- Review how the current Hawke's Bay farming landscape could contribute to national bird conservation objectives for given levels of pest control and habitat improvement
- Develop and optimise bioinformatics and data analysis tools for the interpretation of invertebrate eDNA datasets within Cape to City
- Improve bird and cultural connectivity in the Maungaharuru ki Tangitu hapū by planning appropriate restoration methods, and identify best options for increasing habitat connectivity in the Cape to City footprint
- Evaluate changes resulting from the Cape to City and Poutiri Ao ō Tāne education programmes, and complete a report on the first 2 years of the case study on the Cape to City programme

4.2 Community engagement and education

- CAG meetings Poutiri Ao ō Tāne and Cape to City
- Kaitiakitanga hui to further engage local hapū in Cape to City project
- Engage with new schools with education programmes
- Support schools previously worked with
- Refine programmes and develop an MOU with EIT
- Deliver full-staff Nature Time Teaching Workshop (one school)
- Develop collaboration opportunities with the Hawke's Bay Environmental Education forum run by EIT
- Explore Māori initiative opportunities

4.3 Biodiversity and species

- Complete second round of 2016/17 bird counts (March/April/May 2017)
- Establish a new bird count transect in the Cape to City footprint to replace one lost to logging (March)
- Maintain rat control and monitoring programme in '100 acre Bush', 'Winirana forest' and Maraetotara Scenic Reserve (Jan to June inclusive)
- Undertake second round of toutouwai (robin) and miromiro (tomtit) translocations to the Maraetotara plateau (March/April/May/June)
- Complete Iwi, hapū and landowner consultation for the proposed kiwi translocation to the Maraetotara plateau (February/March) and submit full kiwi translocation proposal to DOC when consultation is finished (April).

- Korūre (mottled petrel) translocation into Poutiri Ao ō Tāne. Expert technical advice has recommended that the 2017 translocation of tītī (Cooks petrel) does not occur. The advice is to hold off until we confirm some released tītī are returning. The project team will discuss this early in 2017 to make a final decision.

4.4 Habitat restoration

- Hastings District Council funded old man's beard removal in Maraetotara around the Maraetotara falls
- Control of willow regrowth at Waingongoa Estuary and willow control at the Maraetotara
- Ensuring targeted landowners are aware of the Regional Land Services application process
- Ongoing discussion with landowners for 2018 planting year – esplanade strip agreements and Regional Land Services application process, plus assisting targeted landowners with funding applications
- Pre-spraying areas to be planted that have been grazed
- Planting and audit planting (June)

4.5 Predator control

- Carry on trialling wireless on Cape to City mustelid kill-trap network
- Transition a landowner to trial running the wireless traps on their property (Te Awanga downs)
- Poutiri Ao ō Tāne maintenance trap checks in January, April and June 2017
- Servicing of Cape to City kill traps that have already been deployed by HBRC staff across the first 6,000 ha
- Conduct predator control monitoring via the use of camera traps
- Initial knock-down trapping targeting feral cats by HBRC staff is planned to commence March 2017.
- Deployment and Maintenance of mustelid kill traps – to be delivered in two 8,000 ha contract areas by contractors; to commence March 2017.
- Conduct mop-up trapping by HBRC staff and night shooting by contractors following the initial control phase, if required.

5. Conclusion

Thanks to the flexibility and support of the Aotearoa Foundation we have been able to develop the project's structure to meet its needs. Since the previous report Wendy Rakete-Stones has been appointed to the Project Lead role, allowing Campbell Leckie to focus on the national context of predator control and halting the decline in biodiversity. Bonny Hatami has joined the project team to represent Ngāti Pāhauwera. Ben Douglas is standing in as the habitat restoration workstream lead while Hetty McLennan is on maternity leave, and Melissa Brignall-Theyer has replaced Wendy as the community engagement workstream lead.

Ninety-five percent of the milestones have been completed. One milestone in the research and monitoring has not been completed, due to technical difficulties. This will be completed in 2017. The incomplete milestones in the biodiversity and species workstream are the result of different issues, from re-prioritisation to ecology. These are described in more detail in the milestones updates.

Some of the highlights in the last 6 months have been:

- The LCR contract for 2016-17 has been signed. It includes 18 projects, with a mixture of new work and building on previous research.
- The education coordinators ran two successful workshops with Eastern Institute of Technology (EIT) trainee teachers.
- The Cape to City website has been remodelled to be a lot more useful, interactive and easy to update.
- The first Cape to City Māori engagement hui was held in September at the Waimarama Marae. There were about 80 attendees representing most of the hapū groups within the Cape to City footprint.
- 30 Toutouwai (robin) and 28 miromiro (tomtit) have been released into '100-acre bush'. These birds were released under a karakia (blessing) by Trevor Taurima (Maungaharuru Tangitū Kaumatua).
- The Clifton County Cricket Club and Cape to City held a successful planting day with about 80 volunteers. This is a community group within the Cape to City footprint who are successful recipients of the DOC community fund.
- With the conclusion of Phase One of the Cape to City predator control, there have been a couple of important things learned that will inform Phase Two: 1. this work has shown that cat control requires significantly more resources for effective control than previously thought; 2. the best use of resources is to employ contractors for mop-up or maintenance control and use the Cape to City pest control team for all specialised control.

Nationally there has been a groundswell of commitment to halting the decline of biodiversity. Cape to City and Poutiri Ao ō Tāne have significantly influenced this increase in commitment. The investment from the Aotearoa Foundation has been a critical driver of this change. These projects have shown that, through collaboration and vision, large-scale restoration is achievable.

In the next 6 months, many of the research projects in the latest LCR contract will be completed; korūre will have been translocated to Poutiri Ao ō Tāne; more schools will be engaged through programmes and teacher training workshops; Cape to City and Poutiri Ao ō Tāne will also be part of the Biological Heritage National Science Challenge conference; planning for 2017 planting will be complete and the next phase of Cape to City predator control will be well underway.

Appendix 3: Te Matau a Māui milestone review

Research and monitoring						
		2015	2016	2017	2018	2019
1	Research outputs	A minimum of three research outputs, two of which are submitted to peer-reviewed journals.	A minimum of three research outputs, two of which are submitted to peer-reviewed journals.	A minimum of three research outputs, two of which are submitted to peer-reviewed journals.	A minimum of three research outputs, two of which are submitted to peer-reviewed journals.	A minimum of three research outputs, two of which are submitted to peer-reviewed journals.
2	Methods of monitoring introduced mammalian predators before and after control	Compare camera traps, predator detection dogs and predator tracking tunnels in terms of sensitivity and cost-effectiveness.	Compare precision of various methods to estimate predator abundance from camera trapping data (eg occupancy modelling, mark-recapture modelling).	Gather sub-sample camera trapping data to determine optimal number of cameras per unit area.		Compare camera traps with electronic tracking pads being developed by Connovation Ltd (if available).
3	Decision analysis models for predicting the most cost-effective trapping configurations for managing	Model effectiveness of predator control with	Refine predator population model to predict outcomes of different trap	Refine population model further	Gather sub-sample predator movement data (from	

Research and monitoring						
		2015	2016	2017	2018	2019
	introduced predators over large areas	varying levels of landholder participation.	configurations and frequency of checking.	using real trapping data.	trapping/telemetry) to determine optimal trap spacing.	
4	Increase in skinks, geckos, and native invertebrates in the Cape to City area; continued increase in skinks, geckos, and native invertebrates in the Poutiri Ao ō Tāne area	<ul style="list-style-type: none"> Continue Poutiri monitoring (monitoring times may be extended out). Specific Cape to City invertebrate monitoring is set up. 	Continue Poutiri and Cape to City monitoring (Poutiri monitoring times may be extended).	Continue Poutiri and Cape to City monitoring (Poutiri monitoring times may be extended).	Continue Poutiri and Cape to City monitoring (Poutiri monitoring times may be extended).	<ul style="list-style-type: none"> Continue Poutiri and Cape to City monitoring (Poutiri monitoring times may be extended). Data analysed to determine changes in abundance.
5	Analysis and reports on the integrated economic benefits of Te Matau a Māui		Produce a scoping report on integrated economic analysis (toxoplasmosis/green credentials/rabbit forage etc.).	Produce a scoping report on integrated ecosystem services analysis.		Produce and promote economic benefits report.

Research and monitoring						
		2015	2016	2017	2018	2019
6	Decrease of toxoplasmosis-related lamb abortion rates. as a result of research and reduction in cats, vaccinations will no longer be necessary, leading to significant economic benefit to the region and nation	Design a detailed toxoplasmosis research programme, with key stakeholders engaged, and necessary baseline data gathered.	Produce an annual review of the research programme.	Produce a detailed mid-programme research review.	Produce an annual review of the research programme.	Produce final programme review – including detailed economic assessment, and assessment of toxoplasmosis disease in the landscape.
7	Use of restored habitat by native wildlife	Design research for occupancy assessment of key indicator species.	Complete pre and post-habitat meta-connectivity study for the project to determine benefits of habitat to key species.	Produce midpoint review on habitat connectivity and outcomes.	Conduct occupancy assessment of key indicator species.	Develop template for future projects on optimising habitat connectivity between private and public land.
8	Student participation	Engage two tertiary students in the project per annum.	Engage two tertiary students in the project per annum.	Engage two tertiary students in the project per annum.	Engage two tertiary students in the project per annum.	Engage two tertiary students in the project per annum.

Research and monitoring						
		2015	2016	2017	2018	2019
9	Increasing the participation in pest management and ecological restoration by landowners and the community	Complete baseline surveys on attitudes and barriers to participation.				Complete surveys on attitudes and barriers to participation to determine changes over the project.

Review of research and monitoring:

- Milestone 6: Replace 2018 milestone with 2017 wording and remove 2017 milestone. This year (2017) will be too early in this trial to produce useful information for a mid-term analysis.

Community/social engagement and education						
		2015	2016	2017	2018	2019
1	A marked increase in the number of volunteers participating in the programmes over the next 5 years.	Review needs for volunteer management systems and how the project best builds on existing Cape Sanctuary and DOC systems.	A measured increase in volunteer hours trending upward.	A measured increase in volunteer hours trending upward.	A measured increase in volunteer hours trending upward.	A 25% increase on baseline in the number of volunteers participating in the programmes

Community/social engagement and education						
		2015	2016	2017	2018	2019
		Measure baseline for volunteer hours for Cape to City and Poutiri Ao ō Tāne.				over the previous 5 years.
2	Increased involvement of schools in the various conservation initiatives	Engage a total of three schools in the Cape to City project.	*Engage a total of six schools in the Cape to City project.	Engage a minimum of six schools in the Cape to City project and at least one tertiary institute initiative.	Develop a forum or process, in conjunction with schools, to transition school support from Cape to City from being actively managed to being self-sustaining in the long term.	Ensure process is in place with strong commitment from schools to continue their investment.
3	Communications strategy	Finalise communications strategy.	Implement communications strategy.	Implement communications strategy and review strategy.	Implement communications strategy.	Implement communications strategy.

Community/social engagement and education						
		2015	2016	2017	2018	2019
4	Through the social engagement strategy and communication plan, the Hawke's Bay community will value the importance of biodiversity and act accordingly so that sustainability behaviours become part of the social norm.	Review all other potential stakeholders including philanthropists.	Approach other investors in a prioritised way.	Continue to attract other investors; target minimum \$300,000.	Secure a minimum of \$400,000 to match the final year's investment by the Aotearoa Foundation.	Continue to attract other investors; target minimum \$300,000.
5		Review and implement Giblin Group community engagement strategy and scope further education opportunities at Poutiri Ao ō Tāne.	Review and implement community engagement strategy.	Review and implement community engagement strategy. Review education initiative at Poutiri Ao ō Tāne.	Review and implement community engagement strategy.	Review and implement community engagement strategy.
6		Develop citizen science biodiversity monitoring programme, begun to tie into current national programmes.		Review the use of citizen science in Te Matau a Māui.		Review the use of citizen science in Te Matau a Māui.

*Definition of Milestone 2: ‘Engage a total of six schools in the Cape to City project’ has been interpreted as: six schools will be engaged, and will consist of recruiting three to four new schools and doing at least two full-school, outdoor-nature teacher training workshops with schools who have already been part of our education programme, to ensure schools can be less reliant on external coordination for environmental education.

Review of Community Engagement:

- Milestone 2: We are not suggesting a change to this milestone this year, but just want to signal that we may propose a slight change in the future to better accommodate a transition for schools.

Biodiversity/species						
	2015		2016	2017	2018	2019
1	Reintroduction and re-establishment of mottled petrels	Initiate the 5-year translocation programme of mottled petrel juveniles from Codfish Island/Whenua Hou to the Maungaharuru Range following the successful trial in 2014.	Continue with Cook’s petrel and mottled petrel translocations. Measure survival rates and patterns of weight loss through to fledging.	Continue translocations of mottled and Cook’s petrels, and refine feeding regimes, if necessary, to improve fledging rates.	Translocations with systematic refinements of husbandry techniques continue. Camera monitoring initiated at Maungaharuru to detect returning adults.	Continue same work as 2018. Prepare report describing best methodology for seabird translocations.

Biodiversity/species						
	2015		2016	2017	2018	2019
2	Increase in the abundance of introduced and native birds that are already present in the area	Establish a bird monitoring programme and complete baseline estimates.	Carry out bird monitoring, including questionnaire surveys, to determine bird abundance in rural and urban gardens.	Continue bird monitoring with annual data analysis.	Continue bird monitoring with annual data analysis.	Continue bird monitoring; analyse data to determine changes in abundance over preceding 4 years.
3	Reintroduction and establishment of several threatened bird species into the Cape to City area; some species will spread from Cape Sanctuary, others will be reintroduced and actively managed until self-sustaining.	Design John Mclelland species monitoring programme for birds/invertebrates overflowing into broader project area outside of Cape Sanctuary. Prepare translocation plans for robins and tomtits.	<ul style="list-style-type: none"> • Monitor species currently overflowing from Cape Sanctuary (pāteke, red-crowned kākārīki, etc.). • Translocate robins and tomtits to Mohi Bush to assist spread of native insectivores through Cape to City area 	Monitoring of outflow from Cape Sanctuary and translocated robins and tomtits continues	<ul style="list-style-type: none"> • Continue monitoring of outflow from Cape Sanctuary. • Analyse species data to determine extent of spread through wider landscape. 	Prepare publication for a peer-reviewed journal describing the halo effect of Cape Sanctuary and its influence on wildlife communities in the surrounding hinterland.

Biodiversity/species						
	2015		2016	2017	2018	2019
4	Successful re-establishment of North island brown kiwi onto the Maraetotara plateau in the Cape to City footprint.		Complete kiwi translocation proposal.	Translocate kiwi to Maraetotara plateau after predator levels are reduced to levels sufficient for kiwi survival.	Continue kiwi translocation to Maraetotara plateau and monitor to determine if kiwi are becoming established there.	Continue kiwi translocation to Maraetotara plateau and monitor to determine if kiwi are becoming established there.
**5	Successful re-establishment of whio/blue duck on the Maraetotara River (subject to risk analysis and resourcing). Successful colonisation of ponds and wetlands by pāteke in the Cape to City and Poutiri Ao ō Tāne areas.	Develop DOC/John Mclennan whio Maraetotara translocation plan.	Scope a detailed technical analysis of risk around habitat and gradients, by looking at other New Zealand examples.	Gain clarity of long-term landowner commitment along the Maraetotara.	If funding is sourced and in-depth analysis provides recommendation to proceed, catch and radio-tag wild whio adults to identify nest locations. Collect whio eggs to be hatched and raised to fledging age in captivity.	<ul style="list-style-type: none"> • Introduce first whio juveniles into the Maraetotara River. • Continue egg collection from wild pairs. • Successful colonisation of ponds and wetlands by pāteke in the Cape to City

Biodiversity/species						
		2015	2016	2017	2018	2019
						and Poutiri Ao ō Tāne areas.
6	Improvement in the numbers of long-tailed bats inhabiting Mohi Bush	<ul style="list-style-type: none"> • Complete initial design of monitoring programme. • Assess the impact of potential threats to the bat population. 	<ul style="list-style-type: none"> • Implement measures that will improve conditions for a population increase. • Implement long-tailed bat monitoring programme. 	Monitor bat population.	Monitor bat population.	Monitor bat population and review success.
7	Reintroduction and re-establishment of mottled petrels, Cook's petrels, kākā, kākārīki, and pāteke in the Poutiri Ao ō Tāne area	<ul style="list-style-type: none"> • Kākā and kākārīki have been released and a founder population establishes at the location. • Transfer pāteke successfully. 	<ul style="list-style-type: none"> • ***Transfer and successfully fledge petrels. • Kākā and kākārīki populations have established and 	<ul style="list-style-type: none"> • ***Transfer and successfully fledge petrels. • Transfer pāteke successfully. 	<ul style="list-style-type: none"> • ***Transfer and successfully fledge petrels. • Transfer pāteke successfully. 	<ul style="list-style-type: none"> • ***Transfer and successfully fledge petrels. • Petrels from previous releases are returning to breed.

Biodiversity/species						
	2015		2016	2017	2018	2019
			are self-sustaining.			<ul style="list-style-type: none"> Self-sustaining population of pāteke has been established.

Note:

* Milestone 4 is a new milestone endorsed by the Aotearoa Foundation and the governance team in 2016.

** Milestone 5 has significantly changed as the whio translocation will need more scoping research and funding to proceed. The kiwi translocation (Milestone 4) is now the priority, due to increased benefits and reduced risk of re-introducing kiwi.

*** Milestone 7: 2016-2019 – there are some unknown factors regarding pāteke and kākārīki involved in these deliverables. Therefore, in the next review these may alter slightly. *(December 2016 comment: Rat tracking rates are looking promising for a kākārīki release in 2017. This will be determined by the February 2017 tracking rate).*

Review of Biodiversity and Species:

- Milestone 1: Expert technical advice has recommended that the 2017 translocation of tītī (Cooks petrel) does not occur. The advice is to hold off until we confirm some released tītī are returning. The project team will discuss this early in 2017 to make a final decision.
- Milestone 2: In 2019 we suggest re wording: *‘Continue bird monitoring; analyse data to determine changes in abundance over preceding 4 years in rural and urban landscapes.’*
- Milestone 4: We now suggest moving the 2017 milestone to 2018. This will allow enough time to monitor the success of the predator control and consequently a safe translocation of kiwi.
- Milestone 5: We suggest moving the 2016 milestone to 2017 because the actual translocation will not occur for at least 2 years.

Habitat protection and enhancement/restoration (primarily fencing, planting, maintenance, weed control)						
	2015		2016	2017	2018	2019
1	Improved water quality in the Maraetotara River following stock exclusion and riparian re-vegetation.	<ul style="list-style-type: none"> Establish water quality monitoring programme and monitoring sites. Integrate existing HBRC water quality monitoring. 	Confirm and implement water monitoring programme.	Confirm and implement water monitoring programme.	Confirm and implement water monitoring programme.	Complete detailed 5-year review of water quality trend data.
2	Increase in native habitat in the Cape to City area.	<ul style="list-style-type: none"> Conduct HBRC GIS scoping study to identify where habitat would be best placed (including bush remnants that could be fenced). 15,000 plants are planted within project footprint by partners or community groups. 	Ensure a minimum of 50,000 plants are planted within project footprint by partners or community groups.	Ensure a minimum of 50,000 plants are planted within project footprint by partners or community groups.	Ensure a minimum of 50,000 plants are planted within project footprint by partners or community groups.	Ensure a minimum of 50,000 plants are planted within project footprint by partners or community groups.
3	Enhancement of DOC's efforts on public land, through landscape-scale	Conduct operational assessment of how integration of public and private land within Cape		Conduct mid-term analysis of benefits to conservation		Conduct 5-year analysis of benefits to conservation

Habitat protection and enhancement/restoration (primarily fencing, planting, maintenance, weed control)						
	2015		2016	2017	2018	2019
	ecological restoration on private land.	to City project is best achieved and impacts monitored.		programmes in terms of conservation outcomes and operational savings.		programmes in terms of conservation outcomes and operational savings.

Pest control (contractor delivery, predator initial control and infrastructure set up and maintenance)						
	2015		2016	2017	2018	2019
1	High-level landowner participation in pest control in the Cape to City area. 'In principle' agreement among participating landowners to continue predator control beyond timeframe of the programme.	Obtain agreement in principle from 50% of landowners, across a sufficient land area to be likely to deliver wide-scale predator control outcomes.	Obtain agreement in principle from 75% of landowners, across a sufficient land area to be likely to deliver wide-scale predator control outcomes.	Conduct feasibility report (go/no go) on whether wide-scale predator control maintenance ability to deliver outcomes.	Obtain voluntary agreements.	Obtain voluntary agreements; review landowner commitment.

Pest control (contractor delivery, predator initial control and infrastructure set up and maintenance)						
	2015		2016	2017	2018	2019
2	A marked reduction in introduced predators in the Cape to City area		Establish 4,000 ha of predator control infrastructure.	<ul style="list-style-type: none"> Establish minimum of 14,000 ha of predator control infrastructure; Continue initial predator control. 	Graduate 30% of farmers to maintenance of predator control.	Graduate 50% of farmers to maintenance of predator control.
3	Use of wireless trap networks to optimise control	Complete small scale operational trials of wireless trap networks.	Install additional wireless trap networks within the Cape to City project footprint.		Optimise wireless trap networks within Cape to City as a template for very large-scale use.	Review wireless trapping trials.
4	Examination of the long-term effectiveness and reliability of self-resetting traps for rat control in Boundary Stream mainland island	Install trap network over 800 ha, check six times per year and monitor rat population density.	Reduce checking frequency to four times per year, and monitor rat density.	Reduce checking frequency to three times per year, and monitor rat density.	Reduce checking frequency to two times per year, and monitor rat density.	Review effectiveness and reliability of self-resetting rat traps

Pest control (contractor delivery, predator initial control and infrastructure set up and maintenance)						
	2015		2016	2017	2018	2019
5	Sustained suppression of introduced predators at low densities in the Poutiri Ao ō Tāne pest control area	Continue contractor control at reduced control intensity.	Continue contractor control at reduced control intensity.	Continue contractor control at reduced control intensity.	Continue contractor control at reduced control intensity.	Continue contractor control at reduced control intensity.
6	Demonstration that effective ongoing predator control in the Cape to City area can be undertaken for less than ~\$3/ha	Establish systems to analyse control costs.		Analyse initial control costs.		Analyse final maintenance control costs across programme.
7	Demonstration that the cost of predator control can be met by transferring resources from possum control programmes, while still maintaining possums at low densities	Complete chew carding on 20,000 ha, with follow-up compliance where necessary for possums.	Optimise large-scale delivery of chew cards for possums based on research by LCR.	Assess risk of chew card concept failing and possum numbers recovering is made based on past 2 years of data.		Monitor project possum programme to establish if there are any early trends for possum numbers increasing due to more-targeted control.

Pest control (contractor delivery, predator initial control and infrastructure set up and maintenance)						
	2015		2016	2017	2018	2019
8	Operational monitoring for predator control	Complete operational monitoring plan for control.	Undertake monitoring.	Undertake monitoring.	Undertake monitoring.	<ul style="list-style-type: none"> • Undertake monitoring. • Analyse data to determine changes over the preceding 4 years.

Review of Pest Control:

- Milestone 2: We suggest re-wording the 2018 milestone to: *'Begin graduating 30% of farmers to maintenance of predator control and continue initial control.'*

Appendix 4: Landcare Research Contract for Services

<p>CLIENT: (“the Client”): Hawke’s Bay Regional Council Private Bag 6006 Napier 4142 Tel: (06) 835 9200 Fax: (06) 835 3601</p>	<p>CONTRACTOR: (“Landcare Research”): Landcare Research New Zealand Limited, PO Box 69040 Lincoln 7640 Tel: (03) 321 9999 Fax: (03) 321 9998</p>
<p>CLIENT PROJECT MANAGER: Campbell Leckie Campbell@hbrc.govt.nz</p>	<p>LCR PROJECT MANAGER: Grant Norbury NorburyG@LandcareResearch.co.nz</p>
<p>PROJECT TITLE: Te Matau a Maui Hawke’s Bay Project: research workstream</p>	<p>LCR CONTRACT ADMIN.: Lynn Booth BoothL@LandcareResearch.co.nz</p>

SCOPE AND NATURE OF THE SERVICES:

Background

New Zealand is seeking a credible pathway towards the vision of being predator-free by 2050. This is a significant aspirational vision that will take both time and progressive steps to achieve. The Cape to City project on Hawke’s Bay is on the pathway to this vision. The Hawke’s Bay context is not necessarily unique; there are sufficiently similar opportunities in many other parts of the country for the concept to be considered in other regions. Within the Hawke’s Bay, large areas (around 500,000 ha) are currently under long-term sustained possum control with the farming community responsible for ongoing maintenance. There is now the opportunity to trial the integration of feral cat, stoat and ferret control into large-scale possum control with minimal or no increase to maintenance control costs. This will be achieved by targeting possum control more effectively, and by shifting resources from possums to the wider suite of pests. Conceptually this resource shift is possible because current monitoring of possums indicates residual trap catch rates are generally <2%. There are significant outcome gains (particularly biodiversity) from integration of the additional pests.

This contract is for the third year of this work, and focuses on optimising the cost-effectiveness of pest control, monitoring of pest and biodiversity responses, social research, and economic outcomes of pest control. The work is jointly funded through HBRC (\$200k) and Landcare Research (CORE ‘Invasive Mammals’ funding \$400k, and CORE ‘Enhancing Biodiversity’ funding \$100k). The milestones are grouped according to the Aotearoa Foundation objectives and milestones:

Aotearoa Foundation Objectives:

1. Pest control
 - a. Sustained suppression of introduced predators at low densities in the Poutiri Ao ō Tāne pest control area.
 - b. Decision analysis models for predicting the most cost-effective trapping configurations for managing introduced predators over large areas.
 - c. Use of wireless trap networks to optimise control.
 - d. Demonstration that effective ongoing predator control in the C2C area can be undertaken for less than ~\$3 per ha.
 - e. Methods of monitoring introduced mammalian predators before and after control.

Milestone	Output	Due date
1.1	Provide on-line trap maintenance tool to predict percentage kill of trapped predators using various trap configurations and trap-check intervals. Produce on-line tool by Dec 30, 2016.	
1.2	Apply the wireless trap model to the C2C footprint to optimise use of wireless technology, including statistical confidence around proportion of traps from wireless to trigger field visits to trapping network. Provide short report on quality of data collected to date for modelling by Nov 30, 2016. Final report on modelling by March 2017, subject to high-quality data.	
1.3	Review HBRC’s cost estimates and timelines for rolling out initial predator control and maintenance control at a regional scale across Hawke’s Bay. Report by April 30, 2017.	
1.4	Estimate effectiveness of cat population reduction on Toronui Station (PAPP trial) using camera trap data collected and collated by HBRC. Report describing the results of feral cat control by Feb 28, 2017.	
1.5	Conduct a ferret body odour longevity trial to determine how long odour lasts, and therefore how often it needs to be refreshed in the field. Report by June 30, 2017.	

Aotearoa Foundation Objectives:

- 2. Pest monitoring
 - a. Methods of monitoring introduced mammalian predators before and after control
 - b. A marked reduction in introduced predators in the Cape to City area

Milestone	Output	Due date
2.1	Predator response monitoring at Poutiri Ao ō Tāne and Cape to City. Report on pest and biodiversity responses (combined with 3.1 below) by June 30, 2017.	
2.2	Use of camera traps to underpin compliance monitoring of predator control. Prepare scoping report that outlines the benefits and potential pitfalls, including recommendations for development of a compliance system based on cameras. Report by Oct 30, 2016.	

Aotearoa Foundation Objectives:

- 3. Achieving outcomes
 - a. Increase in skinks, geckos, and native invertebrates in the C2C area, and continued increase in skinks, geckos, and native invertebrates in the Poutiri Ao ō Tāne area.
 - b. Use of restored habitat by native wildlife
 - c. Analysis and reports on the integrated economic benefits of Te Matau a Maui

Milestone	Output	Due date
3.1	Biodiversity response monitoring at Poutiri Ao ō Tāne and Cape to City. Report on pest and biodiversity responses (combined with 2.1 above) by June 30, 2017.	
3.2	Review integrated economic outcomes of pest control by building on existing work already completed, identifying conditions that may need to change to optimise outcomes, and outlining knowledge gaps. Scoping report by Dec 2016.	
3.3	Review how camera trap monitoring of predator abundance can be linked to biodiversity and economic outcomes. Scoping report by Feb 28, 2017.	
3.4	Review potential for perverse ecological outcomes of the Cape to City programme. Draft manuscript by June 30, 2017.	
3.5	Conduct mid-term analysis of benefits to Boundary Stream mainland island in terms of predator abundance indices resulting from predator control at Poutiri Ao ō Tāne. Report on utility of DOC data by Dec, 2016. If data of insufficient quality, provide report by June 30 2017 on modelling the contribution that immigration poses for BSMI, and the effects of using different control buffer widths and control intensities in buffers.	
3.6	Review how the current Hawke's Bay farming landscape could contribute to national bird conservation objectives for given levels of pest control and habitat improvement. Review bird species that would benefit most from pest control and other management effort. Submit paper for publication in science journal by 30 June 2017. Also update the bird infographic according to PMT comments by 30 June 2017.	
3.7	Develop and optimise bioinformatics and data analysis tools for the interpretation of invertebrate eDNA datasets within Cape to City. Optimise bioinformatics pipeline and develop tools for ecological data interpretation. Interim report by Jan 31, 2017. Draft manuscript prepared for a peer-reviewed journal by June 30, 2017.	

Aotearoa Foundation Objectives:

- 4. Habitat enhancement
 - a. An increase in native habitat in the Cape to City area
 - b. Enhancement of DOC's efforts on public land through landscape-scale ecological restoration on private land.

Milestone	Output	Due date
4.1	Set appropriate restoration goals to achieve biodiversity and cultural aspirations. Improve bird and cultural connectivity in the Maungaharuru ki Tangitu hapū by planning appropriate restoration methods. Report outcomes of hui with Maungaharuru ki Tangitu hapū by June 30, 2017, and provide written biodiversity inventory and restoration recommendations in conjunction with LCR's MBIE-funded Vision Matauranga project after June 2017.	
4.2	Identify best options for increasing habitat connectivity in the C2C footprint. Map existing woody vegetation, identify benign approaches for enhancing woody vegetation cover on private land, and review the economic benefits of restoration plantings. Submit by June 30, 2017.	

Aotearoa Foundation Objectives:

- 5. Educating and understanding people
 - a. Through the social engagement strategy and communication plan, the Hawke's Bay community will value the importance of biodiversity and act accordingly so that sustainability behaviours become part of the social norm

Milestone	Output	Due date
5.1	Evaluate changes resulting from the Cape to City and Poutiri Ao ō Tāne education programmes. Design a system to assess changes and gather initial data. Report on methodological approach by Dec 30, 2016. Report on initial data analysis by June 30, 2017.	
5.2	Complete case study of Cape to City programme. Analyse last round of interviews, and interview 3-5 people from community advisory groups. Final report by June 30, 2017.	

Appendix 5. Project outputs so far

Workstream	Title	Status	Description	Interim report date
Community engagement	<i>Backyard Biodiversity</i> teachers resource for primary and intermediate school students (years 5-8)	Published	Teacher resource that is part of the Backyard Biodiversity education programme.	August 2015
	Cape to City on Nature Watch naturewatch.org.nz/projects/cape-to-city	Published	Cape to City has been set up as a project on the Nature Watch website.	August 2015
	Project pledges \$6 m for conservation	Published	<i>Hawke's Bay Today</i> 18 December 2014 article about Te Matau a Māui signing.	August 2015
	Redressing human impact	Published	<i>Hawke's Bay Today</i> 18 December 2014 Editorial about Te Matau a Māui signing.	August 2015
	Hawke's Bay TV presentation	Published	Campbell Leckie gave a presentation on Hawke's Bay TV in June 2015 about Cape to City.	August 2015
	Nature corridor	Published	Short article on Cape to City in May 2015 issue of Bay Buzz magazine.	August 2015
	Back to the way it was	Published	Article on Cape to City in the <i>Profit Magazine</i> May 2015 issue.	August 2015
	Cape to City on Facebook www.facebook.com/capetocity	Active	Cape to City Facebook page was set up.	August 2015

Workstream	Title	Status	Description	Interim report date
Community engagement cont.	Trustworthy Biodiversity measures www.landcareresearch.co.nz/science/plants-animals-fungi/animals/birds/biodiversity-measures/research-updates	Published	Highlights the results from the Building Trustworthy Biodiversity Measures focus groups.	August 2015
	Andy Lowe gave a speech at the Deer Industry Conference www.youtube.com/watch?v=tARC D82ACy8 (4 hr 14 min)	Published	Link to Andy Lowe's speech at the Deer Industry Conference in May 2015.	August 2015
	Sir Jerry visits Sanctuary	Published	<i>Hawke's Bay Today</i> , 11 June 2015, p 5. Governor-General visited Cape Sanctuary with Andy Lowe and Ruud Kleinpaste; a small part of the article is about Cape to City.	August 2015
	Hawke's Bay DOC update	Completed	Dave Carlton gave a talk to the Napier branch of Forest & Bird about DOC, but focussed on Te Matau a Māui.	August 2015
	Pushing for a predator-free NZ	Published	<i>Hawke's Bay Today</i> , 4 July 2015, pp 12-13. Double page spread of articles about Cape to City.	February 2016
	Cape to City website	Active	http://capetocity.co.nz/	February 2016
	Radio article - Rod Dickson interviewed	Published	RNZ article on morning rural news, 5 November 2015, about Cape to City (forward to Minute 1.28). http://www.radionz.co.nz/audio/player/20177443	February 2016
	Te Matau a Māui: Māori Communications & Engagement Strategy (Draft)	Draft	Draft Māori Communications and Engagement Strategy	February 2016

Workstream	Title	Status	Description	Interim report date
Community engagement cont.	Pair bring skills to work in Cape to City project	Published	Article in Hawke's Bay Today, 6 th January 2016, p4 about the Sir Peter Blake Ambassadors	August 2016
	Cape to City and Poutiri Ao ō Tāne: Education for our future	Published	An information brochure on the Te Matau a Māui Education programmes, to be distributed to parents and whanau, via schools engaged in the programmes	August 2016
	Project document templates	Completed	A set of templates - Powerpoint, letter, factsheet and banners, designed by DOC's Publishing team - to give all project documents across Te Matau a Māui (Cape to City and Poutiri Ao ō Tāne) a common "branding" look that transcends those of individual projects and related agencies.	August 2016
	Backyard Biodiversity Teachers' Resource for Primary and intermediate school students (Years 5-8)	Published	DOC blog story about school programme done with Te Mata Primary school.	August 2016
	Bugman helps in nature push	Published	Hawke's Bay Today article 5 th March, 2016, p9. About education programmes.	August 2016
	Poutiri Ao ō Tāne and Cape to City overview talk	Presentation	Melissa Brignall-Theyer gave an overview talk to lower North Island Bio-security Institute meeting - April 14 th 2016	August 2016
	Cape to City Newsletter (winter 2016)	Published	Articles include: Info from the rural survey, education programmes, Mānuka, habitat restoration, cat trapping, toxoplasmosis and bringing nature back into peoples' lives	August 2016
	Digging deep to create a better world	Published	Article in <i>Hawke's Bay Today</i> , July, advertising the Clifton County Cricket Club planting day	February 2017
	Release returns robin's song to former homes	Published	Article in <i>Hawke's Bay Today</i> 9 July 2016, regarding the toutouwai (robin) release to Cape to City	February 2017

Workstream	Title	Status	Description	Interim report date
Community engagement cont.	Planting for the future	Published	Article in <i>Hawke's Bay Today</i> 25 July 2016, regarding the Clifton County Cricket club planting day.	February 2017
	Project overview talk	Completed	NETS conference presentation by Campbell, July 2016.	February 2017
	Project overview talk	Completed	Campbell and Wendy gave a talk at the BHNSC general meeting in August 2016.	February 2017
	Cape to City was included in Lou Sanson speech for Conservation Week 2016	Completed	Cape to City was included in Lou Sanson speech for Conservation Week 2016.	February 2017
	Poutiri Ao ō Tāne endorsed in Maungaharuru Tangitū newsletter Parikaranga, August 2016	Completed	Poutiri Ao ō Tāne endorsed in Maungaharuru Tangitū newsletter 'Parikaranga', August 2016.	February 2017
	Kaitiakitanga hui at Waimarama	Completed	Hui held at Waimarama Marae 14 September 2016 to gauge how local hapū want to be involved in Cape to City.	February 2017
	Kaitiakitanga hui mentioned in <i>Hawke's Bay today</i>	Completed	Small piece on page 2 in the "what you need to know" section of <i>Hawke's Bay Today</i> , Thursday 15 September.	February 2017
	Submission on the draft National Strategy for Environmental Education for Sustainability	Completed	Cape to City submission on the draft National Strategy for Environmental Education for Sustainability.	February 2017
	Cape to City and Poutiri Ao ō Tāne Brochure	Brochure	Brochure which has an overview of the projects to be used at events, etc.	February 2017
	Painting helps restore natives	Published	<i>Hastings Leader</i> page 5. Oct 19. Article promoting Cape to City and Poutiri Ao ō Tāne involvement in the Hawke's Bay A&P show and prints of 'Boundary Stream' by local artist John Staniford.	February 2017
A closer look at Cape to City	Published	A DOC blog/DOC intranet story providing an introduction and overview of the Cape to City project. https://blog.doc.govt.nz/2016/10/31/cape-to-city/	February 2017	

Workstream	Title	Status	Description	Interim report date
Community engagement cont.	Hawke's Bay A&P show exhibit	Completed	Cape to City and Poutiri Ao ō Tāne exhibit at the Hawke's Bay A&P show.	February 2017
	New Cape to City website	Completed	A revamp of the original Cape to City website to improve efficiency, design and user friendliness. Server relocated to HBRC (December 2016).	February 2017
	Cape to City overview talk	Completed	Campbell gave a talk at the New Zealand Association of Resource Managers conference (Napier). audience of around 150.	February 2017
	Cape to City overview talk	Completed	Campbell gave a talk at the Ecological Resilience Conference in Hamilton in November.	February 2017
	Spotlight: Cape to City, in: New Zealand Biodiversity Action Plan 2016-2020	Published	Spotlight: Cape to City, in: New Zealand Biodiversity Action Plan 2016-2020. There is an overview of Cape to City on page 35 of the action plan.	February 2017
Pest Control	Trapped pests will trigger text message	Published	<i>Hawke's Bay Today</i> article 30 April 2015 about the launch; article syndicated by the <i>Dominion Post</i> and <i>Farmers Weekly</i>	August 2015
	Hi-tech traps target possums	Published	<i>Hawke's Bay Today</i> , 5 November 2015, p.17 article about Wireless predator traps – not possums (that was a mistake in the title).	February 2016
	Farmer War on Feral Cats	Published	<i>Hawke's Bay Today</i> , 19 November 2015, p.7 article about the toxoplasmosis trial.	February 2016
	Cape to City: Next phase – predator control goes wireless	Published	Article in <i>Our Place</i> newsletter, November 2015 issue, p 8 (HBRC publication).	February 2016
	Cat hunt after toxoplasmosis found	Published	<i>Hastings Mail</i> , 2 December 2015, p 15. Newspaper article about the toxoplasmosis trial.	February 2016
	Traps Target feral cats	Published	<i>Hastings Mail</i> , 13th April, 2016, p 8 – Newspaper article about cat trapping in Cape to City	August 2016

Workstream	Title	Status	Description	Interim report date
	Catching more rats using run-through tunnel traps	Published	ZIP article about trapping at Poutiri Ao ō Tāne. http://zip.org.nz/findings/2016/2/catching-more-rats-run-through-vs-single-entry-traps	August 2016
Biodiversity and Species	Pāteke fly home after time away	Published	<i>Hastings Leader</i> , 27 May 2015, p.6. Article about the pāteke release.	August 2015
	Norbury, G; McLennan, J. (2015) Biodiversity and predator monitoring for Cape to City, Hawke's Bay Project. Report (LC2237) prepared for Hawke's Bay Regional Council	Completed	Biodiversity monitoring plan for Cape to City.	February 2016
	Mohi Bush rodent control operation 15/16	Completed	Report on the rat control and monitoring at Mohi Bush for the Robin and Tomtit translocation	August 2016
	Kōrure settling into new home	Published	<i>Hawke's Bay Today</i> article on kōrure (mottled petrel) translocation, 18 April, p.6	August 2016
	Massive Effort to Restore Maungaharuru for endangered Kōrure	Published	Te Kaea, Māori TV article, 17 April 2016, on kōrure translocation http://www.maoritelevison.com/news/regional/massive-effort-restore-maungaharuru-endangered-korure	August 2016
Research and monitoring	Milestones 1.1 and 1.2 report on integrated research workstream of Te Matau a Māui activities	Completed	The report summarises the main activities within the research workstream, including aligned components that are not directly related to this contract.	August 2015

Workstream	Title	Status	Description	Interim report date
Research and monitoring (cont.)	Optimising translocation efforts of mottled petrels (<i>Pterodroma inexpectata</i>): growth, provisioning, meal size and the efficacy of an artificial diet for chicks	Published	Link to Rachael Sagar's presentation at inaugural world seabird twitter conference: storify.com/Seabirders/wstc1	August 2015
	MacLeod, L.; Dickson, R.; Leckie, C.; Stevenson, B.; Glen, A.S. 2015: Possum control and bird recovery in an urban landscape, New Zealand. <i>Conservation Evidence</i> 12: 44-47.	Published	Bird recovery in an urban landscape.	August 2015
	Glen, A; Dickson, R. 2015: Wide-scale predator control for biodiversity in Hawke's Bay. <i>Kararehe Kino/Vertebrate Pest Research</i> 25: 6-7.	Published	Newsletter article on wide-scale predator control.	August 2015
	Jones, C; Norbury, G; Glen, A; Dickson, R. 2015: Predator control benefits native species but not rabbits. <i>Kararehe Kino/Vertebrate Pest Research</i> 25: 14-15.	Published	Newsletter article on the effects of predator control on native birds and rabbits.	August 2015

Workstream	Title	Status	Description	Interim report date
Research and monitoring (cont.)	Glen, A; Perry, M; Ruscoe, W. 2014: Wide-scale trapping suppresses predators and promotes biodiversity in Hawke's Bay. Proceedings of the 28 th Australasian Wildlife Management Society Conference. Brisbane, AWMS.	Conference	Effects of wide-scale predator control on biodiversity.	August 2015
	Ruscoe, W; Glen, A.S; Perry, M; Forrester, G. (In prep): Impacts of rabbit grazing on pasture in Hawke's Bay, New Zealand. <i>Wildlife Research</i>	Submitted	Rabbit grazing impacts on pasture production.	August 2015 updated Aug 2016
	Norbury, G; Jones, C 2015: Pests controlling pests: does predator control lead to greater European rabbit abundance in Australasia? <i>Mammal Review</i> 45: 79-87.	Published	Predator and rabbit interactions.	August 2015
	Glen, A.S; Anderson, D; Veltman, C.J; Garvey, P.M; Nichols, M. 2016 Wildlife detector dogs and camera traps: a comparison of techniques for detecting feral cats. <i>New Zealand Journal of Zoology</i> .	Published	Comparing techniques for detecting cats.	August 2015 updated Aug 2016

Workstream	Title	Status	Description	Interim report date
Research and monitoring (cont.)	Nichols, M.; Garvey, P; Glen, A.S.; Ross, J. (In prep): Influence of camera trap orientation on detection rates of invasive predators. <i>New Zealand Journal of Ecology</i> .	Submitted	Camera-trap orientation and predator detection.	August 2015 updated Aug 2016
	Nichols, M.; Gormley, A.; Garvey, P.; Glen, A.S.; Ross, J. (In prep): Estimating abundance of feral cats: a comparison of techniques. <i>Methods in Ecology and Evolution</i> .	In prep	Feral cat abundance estimates.	August 2015
	Garvey, P.; Nichols, M.; Glen, A.S.; Pech, R.P.; Clout, M.N. (In prep): Response of mesopredators to removal of feral cats. <i>Journal of Applied Ecology</i> .	In prep	Response of mesopredators to the removal of feral cats.	August 2015
	Glen, A.; Dickson, R.; Leckie, C. 2015: Wide-scale predator control and fauna recovery: Lessons from Hawke's Bay. NETS conference.	Conference	Biodiversity recovery following predator control.	August 2015
	Glen, A. 2014: Camera traps for monitoring pest animals. In: <i>Abstracts, NETS Conference</i> . NPCA, New Plymouth.	Conference	Camera traps.	August 2015

Workstream	Title	Status	Description	Interim report date
Research and monitoring (cont.)	Perry, M.; Glen, A.; Ruscoe, W. 2014: Quantifying rabbit damage to pasture in Hawke's Bay, New Zealand. <i>Proceedings of the 16th Australasian Vertebrate Pest Conference</i> (ed. M. Gentle). VPC, Brisbane, p. 115.	Conference	Rabbit damage to pasture.	August 2015
	Milestone 2.1 (LCR contract)	Completed	Proposed strategy for radio-tagging possums in the Cape to City footprint that will generate detection probability data used for identifying areas of low, medium, and high possum numbers. This will enable forecasting where and when control should be applied.	August 2015
	Milestone 2.3 (LCR contract)	Completed	The feasibility of the 'Ramsey' model (which uses occupancy data to estimate population density) for use in analysis of Poutiri Ao ō Tāne camera trap data to generate go and sigma values for feral cats is determined.	August 2015
	Milestone 2.4 (LCR contract)	Completed	A scoping report on optimising a monitoring design for Cape to City using cameras. Includes a critical review of potential gaps that should be addressed, using initial data from the Poutiri Ao ō Tāne camera trap work to date, to minimise risks associated with the use of this method.	August 2015
	Milestone 3.1 (LCR contract)	Completed	Identifies four or five possible scenarios for predator control to test based on the actual property footprint for Cape to City. Includes the implications of 'friction surfaces' (eg poorly accessible areas) for contractors (in consultation with contractors in the project).	August 2015

Workstream	Title	Status	Description	Interim report date
Research and monitoring (cont.)	Milestone 4.4 (LCR contract)	Completed	Based on learnings from the Poutiri Ao ō Tāne project and other wide-scale predator control initiatives (eg the Aorangi proposal being developed by LCR for OSPRI), a 10-page scoping document was produced (linking to the high-level milestones developed for the Aotearoa Foundation) outlining the design for biodiversity monitoring in the Cape to City footprint.	August 2015
	Glen, A.S.; Latham, M.C.; Anderson, D.; Leckie, C.; Niemiec, R.; Pech, R.P.; Byrom, A.E. 2015: Landholder participation rate in regional-scale control of invasive predators: a spatial model for an agro-ecosystem	Submitted	This research models a range of landowner participation rates on the success of predator control.	February 2016 Updated Aug 2016
	Milestone 4.2 (LCR Contract)	Completed	Brief options paper that scopes the development of coupled social-ecological models for the Cape-to-City footprint in tandem with the Biological Heritage National Science Challenge.	February 2016
	Milestone 2.5 (LCR Contract)	Completed	Review of the wireless trial results (Feb/March 2015) from the perspective of operational delivery of wireless technology into the field, and analysis of the ability of wireless technology to reduce operational costs.	February 2016
	Milestone 2.6 and 2.7 (LCR Contract)	Completed	Determined how the Poutiri Ao ō Tāne trap network might be optimised for the maintenance control phase by using existing Poutiri Ao ō Tāne trap data in a simulation model, including three or four scenarios for optimal trap spacing and frequency of checks.	February 2016

Workstream	Title	Status	Description	Interim report date
Research and monitoring (cont.)	Milestone 4.3 (LCR Contract)	Completed	Report on the findings of the Biodiversity Trustworthy indicators focus groups.	February 2016
	Jones, C.; Warburton, B.; Carver, J.; Carver, D., 2015. Potential applications of wireless sensor networks for wildlife trapping and monitoring programs. <i>Wildlife Society Bulletin</i> 39: 341-348.	Published	Potential applications of wireless sensor networks for wildlife trapping and monitoring programmes.	February 2016
	Ozarski, J. 2015: Cooperation for Mutual Benefit: Opportunities for Primary Industry and the New Zealand Department of Conservation.	Published	Report by Jill Ozarski (Fulbright fellow), who use Poutiri Ao ō Tāne as a case study. http://www.fulbright.org.nz/publications/cooperation-for-mutual-benefit-opportunities-for-primary-industry-and-the-new-zealand-department-of-conservation-to-operate-public-private-partnerships/ Her presentation is at: http://www.fulbright.org.nz/news/video-ian-axford-new-zealand-fellowship-seminar-jill-ozarski/	February 2016
	Nichols, M.; Glen, A 2015: Camera trapping to monitor the results of predator removal on Waitere Station	Completed	This report assessed the ability of camera traps as a non-invasive method for monitoring the presence of feral cats. Another objective was to determine the optimal statistical approach to estimate cat abundance from the camera trapping data.	February 2016

Workstream	Title	Status	Description	Interim report date
Research and monitoring (cont.)	Landcare Research. 2015: Predator busters: Hawke's Bay predator control project. <i>Discovery</i> 40.	Published	Article in <i>Discovery</i> (issue 40, Nov 2015) about Cape to City, includes a video. This is a Landcare Research publication: http://www.landcareresearch.co.nz/publications/newsletters/discovery/discovery-issue-40/Predator-busters	February 2016
	Lowe, A. 2015: Cape Sanctuary. <i>NZES 2015 Talk Abstracts</i> . Talk during plenary symposium 'Non-government conservation initiatives'. New Zealand Ecological Society Conference, Christchurch, November 2015: p 60.	Conference	Andy Lowe's talk at the Ecological Society conference.	February 2016
	Sagar, R.L.; Leseberg, A.; Hunt, K.; Nakagawa, K.; Dunphy, B.; Rayner M.J. 2015: Optimising translocation efforts of mottled petrels (<i>Pterodroma inexpectata</i>): growth, provisioning, meal size and the efficacy of an artificial diet for chicks. <i>Emu</i> 115 (2): 137-145.	Published	Paper on optimising translocation efforts of Mottled Petrels	February 2016
	Sagar, R.L. 2015: Cumulative impact of handling on chick physiology, growth. World Seabird Conference 2015.	Conference	Results of the study of the cumulative impact of handling on chick physiology, growth and condition were presented at the Second World Seabird Conference, Cape Town, in October 2015.	February 2016
	Milestone 7.1 Community Survey Brief report	Completed	Brief report by Pike Brown on the Cape to City community survey done end 2015	August 2016

Workstream	Title	Status	Description	Interim report date
Research and monitoring (cont.)	Shiny App	Completed	Prototype “shiny app” has been developed to allow managers to predict trap catch by altering trap configurations online.	August 2016
	Pech, R; Maitland, M. 2016: Conservation of native fauna in highly invaded systems: managing mammalian predators in New Zealand. <i>Restoration Ecology</i> (online early).	Published	Conservation of native fauna in highly-invaded systems	August 2016
	Niemiec, R.M.; Pech, R.; Norbury, G.; Byrom, A.E. (submitted): Landowners' Perspectives on Coordinated, Landscape-Level Invasive Species Control: the Role of Social and Ecological Context. <i>Environmental Management</i> .	Published	This paper utilises the data from the Cape to City rural survey.	August 2016 Updated February 2017
	Garvey, P.M; Glen, A.S.; Clout, M.N.; Wyse, S.V.; Nichols, M.; Pech, R.P. (submitted). Exploiting interspecific olfactory communication to monitor predators. <i>Ecological Applications</i>	Published	This paper looks at using sense of smell as communication between species as a way of monitoring predators.	August 2016 Updated February 2017

Workstream	Title	Status	Description	Interim report date
Research and monitoring (cont.)	Gormley, A.M.; Warburton, B. (in prep). Optimising a kill-trap network for cost-effective predator control.	In Prep	Optimising a kill-trap network for cost-effective predator control.	August 2016
	Glen, A.S.; Perry, M.; Yockney, I.; Cave, S.; Gormley, A.M.; Leckie, C.; Dickson, R.; Rakete-Stones, W.; Rakete-Stones, P.; Norbury, G.L.; Ruscoe, W.A. (in prep). Wide-scale predator control for biodiversity conservation: a case study from Hawke's Bay, New Zealand.	Submitted	A look at wide-scale predator control for biodiversity, using Cape to City as a case study.	August 2016 Updated February 2017
	Byrom, A.; Brignall-Theyer, M.; Brown, P.; Dickson, R.; Glen, A.; Leckie, C.; Millard, P.; Norbury, G.; Pech, R.; Warburton, B. 2015: Managing pest mammals in a whole-of-system context: a case study from Hawke's Bay. NETS conference	Conference	Managing pest mammals in a whole-of-system context: a case study from Hawke's Bay.	August 2016

Workstream	Title	Status	Description	Interim report date
Research and monitoring (cont.)	Cowan, P.; Glen, A.; Norbury, G.; Byrom, A.; Dickson, R.; Leckie, C. 2015: Scaling up: From Island to Mainland Eradication. Proceedings of Vth International Wildlife Management Congress. Sapporo, Japan.	Conference	Scaling up: From Island to Mainland Eradication.	August 2016
	Glen, A.; Anderson, D.; Veltman, C.; Garvey, P.; Nichols, M. 2015: Canine vs camera: comparing camera traps with sniffer dogs for detecting feral cats. p. 43 in: <i>Abstracts of the 28th Australasian Wildlife Management Society Conference</i> . Australasian Wildlife Management Society, Perth.	Conference	Comparing camera traps with sniffer dogs for detecting feral cats.	August 2016
	Innes, J.; Fitzgerald, N. 2016: Possible bird-related research in the Hawke's Bay Cape-to-City project. Unpublished report to Hawke's Bay Regional Council, June 2016.	Completed	Possible bird-related research in the Hawke's Bay Cape to City project	August 2016

Workstream	Title	Status	Description	Interim report date
Research and monitoring (cont.)	Brown, S.J.; Latham, C.; Warburton, B. 2016: Cape to City Chew Card Analysis. Unpublished Landcare Research Contract Report LC2582, prepared for Hawke's Bay Regional Council.	Completed	Cape to City chew card analysis	August 2016
	Gormley, A.M.; MacLeod, C.J. 2016: Assessment of data sources for monitoring birds in Cape to City. Unpublished Landcare Research Contract Report LC2622, prepared for Hawke's Bay Regional Council.	Completed	Assessment of data sources for monitoring birds in Cape to City	August 2016
	Watts, C.; Holdaway, R.; Davis, C.; Wood, J.; Dickie, I.; Thomson, F.; Thornburrow, D. 2016: Novel invertebrate monitoring opportunities within Cape to City: Research Synthesis 2015/2016. Unpublished Landcare Research Contract Report LCxxxx, prepared for Hawke's Bay Regional Council.	Completed	Invertebrate monitoring opportunities within Cape to City.	August 2016

Workstream	Title	Status	Description	Interim report date
Research and monitoring (cont.)	Byrom, A.E. 2016: The Cape to City project and its relationship to NZ's Biological Heritage National Science Challenge. Invited presentation, Hawke's Bay branch of the Royal Society of New Zealand, June 2016.	Presentation	Public lecture on Cape to City	August 2016
	Innes, J.; Fitzgerald, N. 2016: Restoring birds in Cape to City. 4 page. Infographic for Hawke's Bay Regional Council, June 2016.	Completed	Infographics on restoring birds in Cape to City	August 2016
	Glen, A. 2016: Cape to City predator monitoring: initial knockdown. Unpublished Landcare Research Contract Report, prepared for Hawke's Bay Regional Council.	Completed	Report on initial knockdown phase of Cape to City	February 2017
	Glen, A.; Norbury, G. 2016: Biodiversity monitoring in Cape to City: lizards and invertebrates. Unpublished Landcare Research Contract Report, prepared for Hawke's Bay Regional Council.	Completed	Lizard and invertebrate monitoring in Cape to City	February 2017
	Cape to City: Pest management and restoration science at scale	Lecture	LINK Seminar in Wellington, by Campbell and Grant in July 2016. http://www.landcareresearch.co.nz/about/news/events/link-seminars	February 2017

Workstream	Title	Status	Description	Interim report date
Research and monitoring (cont.)	Nichols, M.; Garvey, P.; Glen, A.S.; Ross, J. (in press). Influence of camera trap orientation on detection rates of invasive predators.	In Press	Paper on the influence of camera trap orientation on detection rates of invasive predators.	February 2017
	Norbury, G.; Leckie, C.; Dickson, R.; Glen, A.; Byrom, A.; Pech, R. 2016: Regional-scale biodiversity restoration: towards a Predator-Free New Zealand. In: Conference Programme and Abstracts of the 2016 Australasian Wildlife Management Society Conference, Auckland. 29 Nov – 1 Dec, 2016.	Conference	Regional-scale biodiversity restoration using Cape to City and Poutiri Ao ō Tāne as examples.	February 2017
	Norbury, G.; Glen, A.; Pech, R.; Byrom, A.; Leckie, C.; Dickson, R. 2016: Regional-scale biodiversity restoration in Hawke's Bay: towards a Predator-Free New Zealand. Kararehe Kino Vertebrate Pest Research Newsletter, Issue 28, pp 7-8.	Newsletter	Regional-scale biodiversity restoration in Hawke's Bay using Cape to City and Poutiri Ao ō Tāne as examples.	February 2017