



# Te Matau a Māui project update

## Interim report

### August 2017

*Native species thrive where we live, work and play*



Senior students of Tamatea primary school presenting their knowledge gained through the Bush Education programme to junior students. *Photo: Madeline Staff*

This report provides project status information from 1 January to 30 June 2017

Prepared by the Te Matau a Māui Project Management Team



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## 1. Executive summary

Te Matau a Māui is now halfway through the contract. Over the last two and a half years the national and regional context has significantly changed. This has been partly due to the success of Te Matau a Māui, but also to an increase in other projects and policies nationally, creating a shift towards increased funding and awareness of biodiversity. The project team needs to be able to respond to these changes effectively and so is reviewing its priorities.

In the last 6 months the project team has been working under a slightly new structure. This has been a smooth transition due to effective leadership, the project team's open way of working, and its close working relationships. Two new Hapū members and two new DOC staff members have just joined the project team. Two Governance team members changed.

We are halfway through the 2017 milestones. All are tracking well to be completed by the end of the year, if they have not already been completed.

Some of the highlights have been:

- Developing pest Density Impact Functions; by the end of the project we will have a much better understanding of the level of pest control needed for the desired biodiversity outcomes in a primary productive landscape.
- Te Matau a Māui and Eastern Institute of Technology have signed an Memorandum of Understanding to formalise integration of Te Matau a Māui education principles of using the environment as the context for learning throughout the curriculum, into teacher training.
- A successful crowd-funding project was run through Million-Metres Streams Project, Cape to City and Maraetotara Tree Trust partnership.
- With considerable community and iwi involvement, 97 kōruru/mottled petrel (100%) fledged from two translocations.
- The Para-aminopropiophenone (PAPP) trial accomplished a 50% reduction in detected feral cats at Toronui station.

The next 6 months will see a number of advancements, including signing the next Landcare Research contract, the Transforming Biodiversity conference, another kākā translocation, protecting whitebait spawning sites and refining the wireless trials.

## **2. Project management update**

The project continues to be managed well, with milestones and the budget substantially on track. The new team leader role was established to ensure project milestones are met, while freeing up the project team chairperson to manage the project's high profile and engage with the national context effectively. This change in structure is working well.

We are now halfway through the project, and the project team will review the milestones in July and August 2017 to assess the priorities of the workplan moving forward. Due to the success of the habitat workstream partnering with other initiatives, the 5-year planting programme will be completed this year. This will free up most of the habitat restoration budget over the next 2 years to be re-allocated to other priority areas.

### **2.1 Project structure update**

The project team is in the process of expanding (Figure 1). Two new Hapū representatives have joined. They are Hawea Moananui from Matahiwi Marae, and Koreene Henry from Pakipaki Marae. Both marae whakapapa to the Cape to City area. Kellie Mayo and Alan Lee from the Department of Conservation (DOC) have joined to provide better integration of workstreams that cover both Hawke's Bay Regional Council (HBRC) and DOC work.

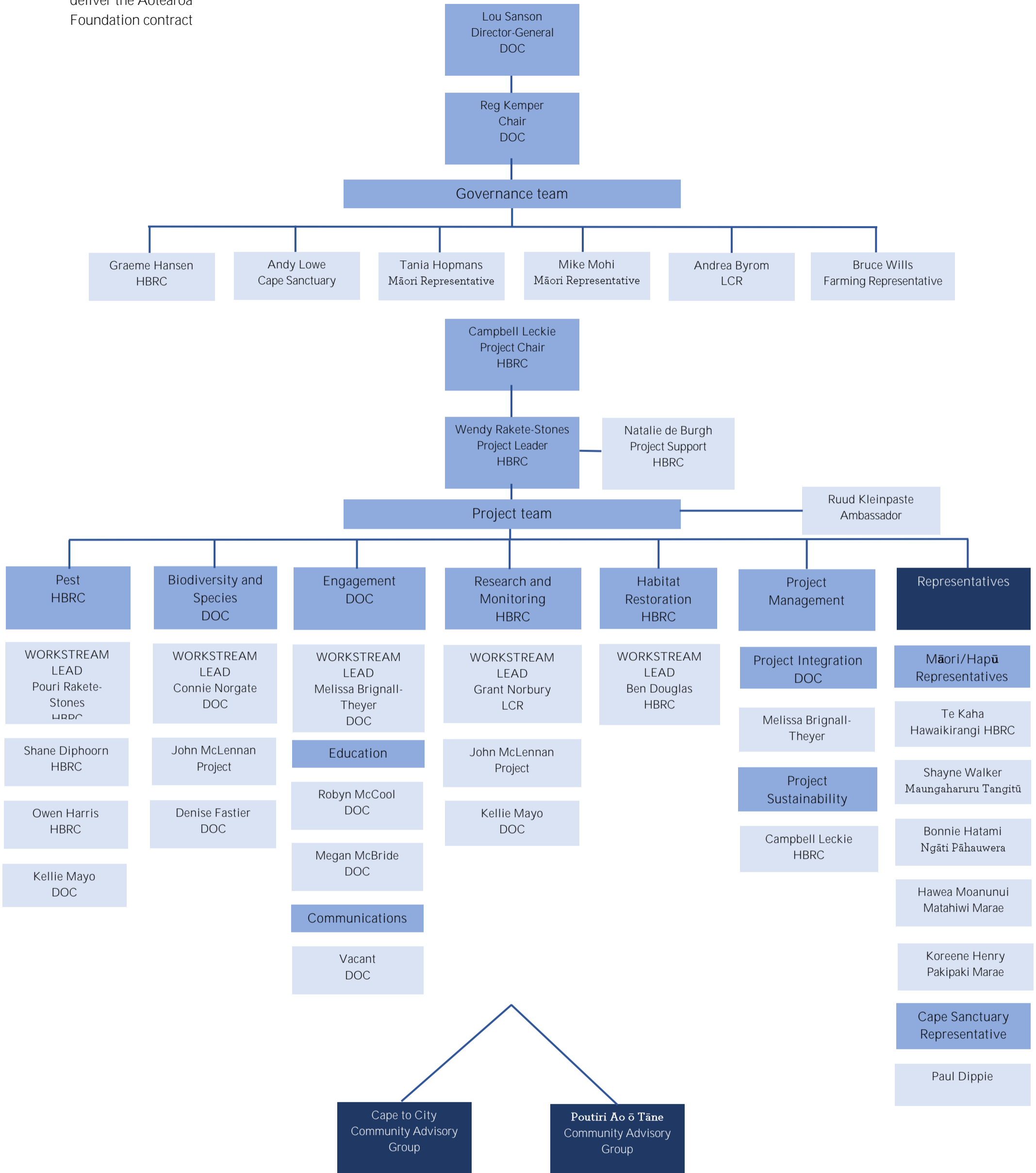
Pouri Rakete-Stones has taken over the pest control workstream lead role, which has allowed Rod to work more effectively on his community pest-control work with HBRC.

### **2.2 Governance update**

Mike Adye has retired, and had a farewell in April. Graham Hansen has replaced Mike in his role at HBRC and as representative of the Te Matau a Māui governance team. Richard Gordon has signalled his need to step down to focus on national priorities. Andrea Byrom (Director of the Biological Heritage National Science Challenge) has been recommended as his replacement, and will join the team in July this year.

# Cape to City and Poutiri Ao ō Tāne Project structure

Figure 1. Project structure to deliver the Aotearoa Foundation contract



## 2.3 Community advisory group update

The Poutiri Ao ō Tāne Community Advisory Group (CAG) has met a couple of times so far this year. The group continues to develop the Maunga to Moana (mountain to sea) vision, and just received a draft report on biodiversity connectivity that contains existing habitat maps within the mountain-to-sea area identified. The Cape to City CAG has met once this year, the meeting predominantly focussed on updating the group. The CAG has two further meetings scheduled in the second part of the year.

## 2.4 Big picture update

Zero invasive Predators/NEXT Foundation

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, Devon Mclean and Jan Hania of the NEXT Foundation around the possibility of a trial on farmland within Cape to City to demonstrate the eradication of possums. The Cape to City team have also been sharing with ZIP\NEXT their work that relates to the use of the Regional Pest Management Plan as a policy tool to secure large scale investment in predator control on farmland. Conceptually this work is of interest to NEXT because of its ability to underpin large scale transformational change.

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 context. This post-doc has already started and visited the Te Matau a Māui project team to discuss the focus of her research and how it can be relevant to large scale change on the ground.
- The project team were also grateful for the opportunity for Te Matau a Māui to have a significant presence at the “Crazy Ambitious” BHNSC conference at Te Papa in Wellington in May 2017.
- The BHNSC director Andrea Byrom has agreed to be on the Te Matau a Māui governance group. The team are fortunate to have Andrea on the Governance group. The role of the BHNSC director is very connected and is influential at a national level around research and science.
- The BHNSC has also picked up key ongoing science work started in Te Matau a Māui on long life pest lures that the team would have been unable to progress.
- They have also agreed to be platinum sponsors for the upcoming national conference with a direct cash contribution to support that of \$10,000.

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 Te Matau a Māui 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”. Andy Lowe has recently contacted the newly appointed CEO of Predator Free 2050 - Ed Chignall and invited him to speak at the “Transforming Biodiversity – Challenging the Boundaries” conference and visit Te Matau a Māui. Ed has indicated he is happy to do both.

## 2.5 Māori engagement

The second Cape to City Māori engagement hui was held at Matahiwi Marae. About 30 people participated and discussion was constructive. The discussion related to the different areas and levels at which Māori can connect with the project, what kaitiakitanga meant for the participants, and ideas around how to engage most effectively.



Participants of the Cape to City Kaitiakitanga hui at Matahiwi Marae. *Photo: Natalie de Burgh*

## The projects from a Māori perspective

### Maungaharuru Tangitū update:

Maungaharuru-Tangitū Trust Kaumātua and Hapū continue to lead and support the translocation of kōruru on to Maungaharuru through karakia, manaaki and volunteering to feed the chicks. Maungaharuru-Tangitū Trust are excited to see the return of Kōruru to their mountain and hope to see the sea birds return to their indigenous nesting site.

Maungaharuru-Tangitū Trust are implementing a restoration project of Lake Tūtira. The removal of pest plant and planting of 40,000 native plants, the benefits will not only be community collaboration, beautification of the lake and water quality improvement but the increased habitat for native birds to the lake. Lake Tūtira is a significant resource in the aspirations of connecting

the mountains to the sea as it is the mid-point in the wider Poutiri Ao ō Tāne foot print and is a significant cultural taonga for Maungaharuru-Tangitū Trust.

The trust also undertook a research project – Taku Wao in conjunction with LCR. This was led and written by Dr Hayley Lawrence who is the environmental manager of the Trust. The report provides insight to the native species within the Maungaharuru-Tangitū Trust area, the practical and economic values to the Hapū.

The trust continues to promote Cape to City and Poutiri Ao ō Tāne through their communication channels including Hui-a-Hapū and the recent Ngāti Kahungunu Iwi Fish Hook Summit



Charmaine Butler, Matua Bevan Taylor from Maungaharuru-Tangitū Trust and Jo Harawira from DOC discussing the Mere pounamu gifted to Maungaharuru-Tangitū Trust from DOC as part of the Tuku whenua week. *Photo: Lauren Buchholz*

In January, the Maungaharuru Tangitū Trust organised a ‘gift-back’ week. This was very significant one for Maungaharuru Tangitū. This was part of their Treaty settlement which acknowledged the wrongful confiscation of land 150 years ago. Below is the media release that was published in the Hawke’s Bay Today newspaper, January 2017:

#### *Tuku Whenua – gifting of treasured lands*

*This summer, the people of Aotearoa New Zealand will receive a generous gift.*

*Four DOC reserves in northern Hawke’s Bay will be returned to the rightful owners – the Hapū represented by the Maungaharuru-Tangitū Trust. The Hapū will then gift the reserves to all the people of Aotearoa, 1 week later.*

*The sites include Boundary Stream Scenic Reserve, Bellbird Bush Scenic Reserve, and the balance of Opouahi Scenic Reserve in the Maungaharuru Range, as well as the coastal Whakaari Landing Place Reserve.*

*The return of the reserves in recognition of Hapū rangatiratanga goes some way to redress grievances that arose a century and a half ago. On 12 January 1867, 150 years ago today, the Crown unjustly confiscated the majority of the Hapū takiwā (traditional area), including the reserves.*

*In the Maungaharuru-Tangitū Hapū Deed of Settlement, the Crown apologised for “the immense prejudice it inflicted on the Hapū by the proclamation of a confiscation district.” Among other things, the Crown also apologised for its acts and omissions which impacted on Hapū lands, fisheries and other taonga.*

*The reserves that will be vested back to the Hapū represent a glimpse of the native bush and wildlife that flourished in Hawke’s Bay in the 1800’s and hopefully a vision for what it could once more look like in the future.*

*Boundary Stream Mainland Island, Bellbird Bush, and the Opouahi Scenic Reserve are encompassed by the ground-breaking Poutiri Ao ō Tāne project, an ecological and social project that began in 2011 to ‘restore the cloak of Papa-tū-ā-nuku’”*

*Poutiri Ao ō Tāne aims to protect and restore the landscape through intensive pest control and habitat restoration. Species such as kiwi, kākā, kererū, and kōkako have regained a foothold in this area, which also provides critical habitat for a wide range of native insects and plants.*

*Ngāti Kurumōkihi are the kaitiaki (guardians) of these reserves and have cultural, spiritual, traditional, and historic associations with the environs, waters, associated land and flora and fauna.*

*Whakaari Landing Place Reserve contains Whakaari, an iconic and significant pā of Ngāti Marangatūhetaua (Ngāti Tū), including Ngāti Whakaari, and Ngāi Te Ruruku (ki Tangoio). Whakaari is recognised as an outstanding natural feature.*

*The four reserves and their environs are integral to the distinct identity and mana of the Hapū. More information on the significance of the reserves can be found on the Maungaharuru-Tangitū Trust website at [www.tangoio.maori.nz/gifted-lands](http://www.tangoio.maori.nz/gifted-lands)*

*“This koha of reserves to the people of Aotearoa is not only an acknowledgement of the traditional Hapū ownership and the illegal confiscation by the Crown, it also signifies the preparedness and generosity of the Hapū to the Hawke’s Bay community and our ecosystem. This week’s Hapū celebrations are an opportunity to enhance our kaitiakitanga through sharing history and stories, enjoying each other’s company in our environment and further evolving our Hapū aspirations.” Shayne Walker, Kaiwhakahaere Matua – General Manager of Maungaharuru-Tangitū Trust.*

*The reserves are taonga (treasures) of the Hapū and through this generous gift on 18 January 2017 will be shared with the people of Aotearoa New Zealand forever.*

## Ngāti Pāhauwera update:

### Poutiri Ao ō Tāne:

- A karanga wānanga was held on 21 January 2017. Over 35 Ngāti Pāhauwera whanau members of all ages came up to Maungaharuru to reconnect, learn about the good work going on from DOC, and karanga to the maunga. It was part of a Marae Ātea wānanga run between four marae through Te Whare Wānanga o Awanuiarangi, and supported by Ngāti Pāhauwera Development Trust.



Ngāti Pāhauwera whanau members at karanga wānanga at Maungaharuru. *Photo Bonny Hatami*

- Four members attended the kōrure/mottled petrel translocation and spent the entire Easter weekend (mid-April) feeding the chicks.
- Bonny Hatami was a speaker at the Ngāti Kahungunu Fish Hook Summit on 24 May. He spoke to most marae, Hapū and iwi of Hawke's Bay (and others from the Wairarapa and Tuwharetoa) on the overall picture of what Ngāti Pāhauwera are doing on land to mitigate what goes out to sea. The Karanga wānanga and the kōrure relocation, the native nursery, and acknowledgment of those doing the mahi were all part of this kōrero.

### Cape to City:

- Bonny Hatami attends and contributes to project team meetings.
- Members attended the second Kaitiakitanga Hui, held at Matahiwi Marae on 3 May 2017.

- Jaz Thornton attended the Volunteer Health and Safety course on 20 April; Theresa Thornton attended the Crazy and Ambitious – Biological Heritage National Science Challenge conference (8–10 May 2017), in Wellington.
- Nga mihi ki a koutou for the support by the project team – it is very much appreciated by Ngāti Pāhauwera.

### 3. Workstream update: 1 July – 31 December 2016

This section outlines progress on the activities and objectives outlined in Attachment 1 of the Aotearoa Foundation contract. An updated version of these is in Appendix 3. These are separated into five workstreams: research and monitoring; community engagement and education; biodiversity and species; habitat restoration and pest control. Table 1 summarises progress in each workstream.

Table 1: Progress on 2017 activities

Workstream	Number of activities	% complete
Research and monitoring	7	93
Community engagement and education	6	60
Biodiversity and species	6	57
Habitat restoration	3	100
Pest control	7	57

Ninety three percent of research and monitoring milestones have been completed. This is because the Landcare Research (LCR) contract with Hawke's Bay Regional Council (HBRC) is based on the financial year 1 July – 30 June financial year. This workstream is therefore always ahead of others.

Significant risks and opportunities are reported under each workstream. These have been kept the same as 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



Installing predator monitoring camera at Cape to City. *Photo AI Glen*

#### Highlights

- One of the big questions for Cape to City and Poutiri Ao ō Tāne is understanding the level of pest control required to get the biodiversity gains we want. LCR is starting research into Density Impacts Functions (DIFs). DIFs provide a framework for assessing the control effort needed to achieve the required level of environmental and economic benefits. The data collected in the Cape to City and Poutiri Ao ō Tāne projects have the potential to generate DIFs for invertebrates, lizards, birds and toxoplasmosis, provided they are:
  - interpreted in light of other potential influences
  - collected over a reasonable amount of time.
- Perverse outcomes research has identified that mice will likely increase as rat and predator control is increased. Mice can have negative impacts on biodiversity, particularly on lizards. Other perverse outcomes identified were:
  - weed seed dispersal due to increased exotic bird numbers
  - change in behaviour of prey to top predator removal, eg rat behavioural change due to an absence of stoats.
- The case study looking at the social development and project management of Te Matau a Māui shows that most aspects of transformation governance are present and well developed within Te Matau a Māui. A few areas could be strengthened:
  - Strategic awareness of context
  - Long-term thinking and planning
  - Investing in leadership diversity
  - Engagement with iwi
  - Diversify and integrate monitoring and evaluation activities to show intermediate and long-term outcomes.

Table 2. Progress on research and monitoring milestones

Milestone	2017 activity	Update	% complete
Research outputs.	A minimum of three research outputs, two of which are submitted to peer-reviewed journals.	<p>Research outputs so far:</p> <ul style="list-style-type: none"> <li>• 9 publications in science journals</li> <li>• 4 manuscripts (either submitted or drafted)</li> <li>• 10 conference presentations</li> <li>• 27 unpublished reports</li> <li>• 3 public lectures</li> <li>• 5 newsletter articles</li> </ul>	100
Methods of monitoring introduced mammalian predators before and after control.	Gather sub-sample camera trapping data to determine optimal number of cameras per unit area.	<p>Maggie Nichols (Lincoln University PhD student) sub-sampled data from 40 camera traps over a 600ha area in Poutiri Ao ō Tāne. She found that using 20 cameras gave similar results to using 40 cameras. The optimum method was a 'hollow grid' of cameras, where only the 22 cameras around the perimeter of the area were used.</p> <p>Motion-sensitive cameras continue to be used for monitoring predator abundance.</p>	100
Decision analysis models for predicting the most cost-effective trapping configurations for managing introduced predators over large areas.	Refine population model further using real trapping data.	<p>LCR have developed an online decision-support tool called TrapSim to simulate trapping of target predators. TrapSim is a useful tool to explore the effects of various trapping regimes on potential trap capture rates – providing a guide for management decisions.</p> <p><a href="https://landcare.shinyapps.io/TrapSim_C2C/">https://landcare.shinyapps.io/TrapSim_C2C/</a></p>	100



Milestone	2017 activity	Update	% complete
<p>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.</p>	<p>Continue Poutiri Ao ō Tāne and Cape to City monitoring (Poutiri Ao ō Tāne monitoring times may be extended).</p>	<p>Native skink detections have increased strongly in Poutiri Ao ō Tāne since predator control began. If a similar trend is observed on Toronui station following the recent extension of predator control, this will give great confidence that the recovery of skinks is a result of predator removal.</p> <p>Monitoring lizards and invertebrates is progressing well in Cape to City; all monitoring methods are detecting species of interest. There is no evidence of any strong pre-existing differences between the treatment and non-treatment areas in terms of lizard or invertebrate populations.</p>	<p>50</p>
<p>Analysis and reports on the integrated economic benefits of Te Matau a Māui.</p>	<p>Produce a scoping report on integrated ecosystem services analysis.</p>	<p>The report produced at the end of last year recommended further monitoring and research to better understand economic analysis of ecosystem services.</p> <p>The project team is assessing the best options for continued research in this area.</p>	<p>100</p>

Milestone	2017 activity	Update	% complete
<p>Decrease of toxoplasmosis-related lamb abortion rates. Because of research and reduction in cat numbers, vaccinations will no longer be necessary, leading to significant economic benefits to the region and nation.</p>	<p>No 2017 milestone</p>	<p>Blood samples will be taken from three sites within the footprint, and three outside the footprint.</p>	
<p>Use of restored habitat by native wildlife.</p>	<p>Produce midpoint review on habitat connectivity and outcomes.</p>	<p>There is quite a lot of high-quality habitat in the footprint for forest birds like toutouwai. However, the habitat is fragmented; as these birds have limited gap-crossing ability, the large distances between patches means they cannot use much of the potential habitat.</p> <p>Tūī and kākārīki can access habitat across the landscape, but are likely to be limited by a lack of high-quality habitat.</p> <p>Exotic forest plantations are a substantial portion of bird habitat in the footprint. If these forests were harvested at around the same time, this would greatly reduce total bird habitat and connectivity within the footprint.</p>	<p>100</p>

Milestone	2017 activity	Update	% complete
Student participation.	Engage two tertiary students in the project per annum.	Rachel Sagar continues her PhD on kōrure.  Maggie Nichols will be submitting her PhD later this year on camera monitoring of predators.  Two Massey University international undergraduate students worked with DOC on various parts of both Cape to City and Poutiri Ao ō Tāne.	100
Increasing the participation in pest management and ecological restoration by landowners and the community.	No 2017 milestone.		

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 Research is being developed into pest DIFs. See comments in ‘Highlights’ section above.

### 3.1.3 Significant opportunities update

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

Update Campbell Leckie and Andy Lowe both presented at the in BHNSC conference in May 2017. Project team members went to the conference and there was a lot of interest from participants in the projects. See <https://youtu.be/-PuagoEK7xM>.

Original LCR is considering aligning another of its core research portfolios (‘Enhancing biodiversity’) to Te Matau a Māui. This work is in progress.

Update Research from the Enhancing Biodiversity portfolio continues to be aligned with the project through the 2016/17 LCR contract, bringing the total LCR contribution to around \$500,000 for this year.

## 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. The workstream has three strands: education (school and curriculum-based), communications, and community engagement in general.

### 3.2.1 Progress towards outcomes



Tamatea Primary school students at White Pine Bush as part of the Bush education programme

*Photo: Megan McBride*

Highlights:

- A Memorandum of Understanding (MOU) has been signed between the Eastern Institute of Technology (EIT) and Te Matau a Māui to formalise Te Matau a Māui's education goals in its relationship with EIT.
- Schools are working more and more with syndicates (groups of classes). This has created a demand for education programmes to be delivered to many classes, rather than just one. Programmes have been adjusted to meet this need; an adjusted programme has just been trialled with Clive School with the fresh water programme.
- This year we have offered a prize for a student film that highlights our vision under the 'Outlook for Someday' programme.
- Cape to City and Tumbleweed Ts have partnered. Tumbleweed Ts is a t-shirt company with a conservation focus. Five dollars of every adult t-shirt sold goes to a conservation project.

Table 3. Progress on community engagement and education milestones

Milestone	2017 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 in the kōruru translocation at Poutiri Ao ō Tāne. Due to volunteer work planned in the second half of the year, we expect volunteer hours will increase in Cape to City then.</p> <p>Volunteer effort at Poutiri Ao ō Tāne continues to be strong.</p> <p>Volunteer hours (to June 2017)</p> <table border="1"> <thead> <tr> <th></th> <th>2016</th> <th>2017</th> </tr> </thead> <tbody> <tr> <td>Poutiri Ao ō Tāne</td> <td>2,601</td> <td>1606</td> </tr> <tr> <td>Cape to City</td> <td>416</td> <td>38</td> </tr> </tbody> </table>		2016	2017	Poutiri Ao ō Tāne	2,601	1606	Cape to City	416	38	50
	2016	2017										
Poutiri Ao ō Tāne	2,601	1606										
Cape to City	416	38										
Increased involvement of schools in the various conservation initiatives.	Engage a minimum of six schools in the Cape to City project and at least one tertiary institute initiative.	<p>Two schools have completed education programmes. Two whole-school teacher workshops have been run, and two EIT teacher trainee workshops were completed.</p> <p>The Te Matau a Māui team has signed an MOU with EIT. This will be launched in the second half of the year.</p> <p>LCR is conducting research to evaluate outcomes of the education programmes.</p>	70									

Milestone	2017 activity	Update	% complete
Communications strategy.	Implement communications strategy, and review strategy.	A review is planned for the second half of the year. Since January 2017 there have been four media releases, and facebook articles are posted regularly on both sites. The Cape to City website is updated regularly with articles and announcements, and the Poutiri Āo ō Tāne website upgrade has started.	50
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.	Continue to attract other investors; target minimum \$300,000.	Relationships with ZIP, NEXT and Predator Free 2050 (PF2050) are progressing.	50
	Review and implement community engagement strategy. Review education initiative at Poutiri Āo ō Tāne.	A review is planned for the second half of the year. Implementation continues through hui, presentations to a variety of audiences, Outlook for Someday prize, and Tumbleweed Ts (see highlights above for more detail).	40
	Review the use of citizen science in Te Matau a Māui.	Citizen science was reviewed as a potential tool in an LCR report in 2016. This highlighted some of the difficulties of using citizen science as a measuring/monitoring tool.  However, the project team is using the New Zealand garden bird survey to complement bird monitoring data. This is a national citizen science project.	100

### **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 Matahiwi Marae in May 2017. Hawea Moananui from Matahiwi Marae, and Koreene Henry from Pakipaki Marae have joined the project team.
- 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, deepening 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 continue.

### 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



Jaz Thornton and Kathy Mitchell feeding a kōruru chick. *Photo: Theresa Thornton*

#### Highlights

- The kōruru translocation was the most successful for the species so far: a total of 97 chicks were translocated in two trips, with a 100% fledge rate. Many tangata whenua and community members participated in the translocation and in looking after the chicks until they fledged.
- A bird-monitoring report for Cape to City was completed, and describes the baseline bird monitoring results for three areas: Cape Sanctuary, Cape to City treatment and the non-treatment areas. The results show that the abundance of forest birds in the three counting areas is mainly influenced by forest type and predator management. In general, native birds were most abundant in native forests while introduced birds were most abundant in exotic forests. Counts in wetlands showed pāteke/brown teal are currently much more abundant in Cape Sanctuary than elsewhere, but there were otherwise few differences in waterfowl and shorebird abundance in the counting areas. The counts along roads in



open country revealed no differences in game bird abundance in the footprint and non-treatment areas.

Table 4. Progress on biodiversity and species milestones

Milestone	2017 activity	Update	% complete
Reintroduction and re-establishment of mottled petrels.	Continue translocations of kōruru and tītī (Cooks petrel), and refine feeding regimes, if necessary, to improve fledging rates.	97 kōruru were translocated successfully in two operations. They all fledged.  Monitoring so far has not identified any returning birds.  A seabird expert advised the team to not continue with tītī translocation until we are confident they are returning. The team accepted this recommendation.	100
Increase in the abundance of introduced and native birds that are already present in the area.	Continue bird monitoring with annual data analysis.	A baseline report was completed and monitoring continues.	50
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.	Monitoring of outflow from Cape Sanctuary, and translocated robins and tomtits continues.	Some species of Cape Sanctuary origin are already attempting to establish in the Cape to City footprint. Pāteke/brown teal and kākārīki have been identified as key indicator species.  Toutouwai (robin) and miromiro (tomtit) translocation is scheduled for July-August.	50
Successful re-establishment of North Island brown kiwi onto the Maraetotara plateau in the Cape to City footprint.	No milestone in 2017	The kiwi translocation proposal has been sent to the kiwi recovery group with additional information on the Cape to City trapping regime. We are waiting to hear back from them.	

Milestone	2017 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 ō Tāne areas.	Gain clarity of long-term landowner commitment along the Maraetotara.  Scope a detailed technical analysis of risk around habitat and gradients, by looking at other New Zealand examples.	A scoping report has been completed. The report recommended bringing a whio expert to assess the habitat suitability. He is scheduled for a visit in the second half of the year.	50
Improvement in the numbers of long-tailed bats inhabiting Mohi Bush.	Monitor bat population.	The project team have been given advice and costing of establishing a monitoring programme. The team is currently discussing resourcing this programme.	40
Reintroduction and re-establishment of mottled petrels, Cook's petrels, kākā, kākārīki, and pāteke in the Poutiri Ao ō Tāne area.	Transfer and successfully fledge petrels. Transfer pāteke successfully.	Kōrure were translocated and fledged successfully. Five kākā will be translocated to Boundary Stream enclosures in September.	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. *No change to this update*

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 Waimarama. *Photo Bayden Barber*

#### Highlights

- The first mānuka trial has been planted in the Cape to City footprint. This project, in partnership with Trees for Bees, ensures a sustainable food supply for the bees year-round.

- The Maraetotara Tree Trust, Million Metres Streams Project and Cape to City partnered and started a crowdfunding project for the Maraetotara River. The goal was \$25,000. This was achieved within 2 months. <https://millionmetres.org.nz/funded-project/2018-maraetotara-river-planting>. Another project will be listed soon to fund 3,000 plants in a fenced-off inanga (whitebait) spawning site in the Cape to City footprint.
- The habitat workstream has been very successful at bringing in extra resources through other funding sources. This success means that the full planting program for Te Matau a Māui is already complete.

Table 5. Progress on habitat restoration milestones

Milestone	2017 activity	Update	% complete
Improved water quality in the Maraetotara River following stock exclusion and riparian re-vegetation.	Confirm and implement water-monitoring programme.	<p>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.</p> <p>Water monitoring is showing an increase in quality with macro community increasing. HBRC science team has agreed to add annual electric fishing to a site in the middle of Cape to City plantings, allowing changes in river communities to be tracked over time.</p>	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.	<p>More than 50,000 plants have already been planted due to the mānuka trial at Taurapa Station going ahead.</p> <p>The previous plantings were assessed this year; on average about 20% were lost due to a very dry summer. A need was identified to infill older plantings with a variety of new species to increase diversity. Infill planting has occurred and drought-</p>	100

Milestone	2017 activity	Update	% complete
		tolerant species have been included in this year's plantings.	
Enhancement of DOC's efforts on public land through landscape-scale ecological restoration on private land.	Conduct mid-term analysis of benefits to conservation programmes in terms of conservation outcomes and operational savings.	An LCR report was completed to see if the wide-scale predator control at Poutiri Ao o Tāne benefited Boundary Stream. The results were compounded by lack of comparable data, as Boundary Stream was not set up to answer this question. This has been valuable to show comparable data is critical and the need for good design. The team will continue to look at how best to answer the question around benefits to public conservation land.	100

### 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 DOC Dirty Dozen funding is delivering \$30,000 for old man's beard and banana passionfruit control to the Maraetōtara. The Maraetōtara Tree Trust has applied for funding to infill past plantings.
- 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 Landowner support is growing with the results of the Maraetotara Tree Trust and Cape to City plantings becoming very visible. Likelihood of being required to fence off due to HBRC plan changes is also contributing to landowners wanting to be involved in programme.
- New (Aug 2017 report) The myrtle rust incursion has the potential to restrict new and existing plantings of mānuka. Scion and Plant and Food Research have launched a research programme, but effects are unclear at this stage.

### 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 The Maraetotara Tree Trust in partnership with HBRC and Cape to City started a Million Metres Streams crowdfunding project in April to raise \$25,000 for planting along the river. This target was met by the end of June.  
<https://millionmetres.org.nz/open-project/2018-maraetotara-river-planting>  
Another project will be listed soon to fund 3,000 plants in a fenced off inanga (whitebait) spawning site in the Cape to City footprint.
- New (Feb 2017 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 Planting has been completed at the trial site in Cape to City.

### 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 on a trap during the PAPP trial at Toronui station. *Photo: Al Glen*

## Highlights

- Phase two Cape to City knockdown trapping has been completed on 6,000 ha. This is live capture trapping, mainly targeting feral cats and ferrets. Roughly eight feral cats for every mustelid have been caught. The maintenance kill trap network has been mostly completed, which covers about 14,000 ha. There are two remaining properties to be completed by mid-September. Servicing by contractors will be carried out over the next 12 months.
- Research into economic benefits of wireless trap monitoring shows savings can be made, but are sensitive to trap-checking frequency. The largest benefits are from using live-capture – which are currently checked daily. Benefits are small for kill traps, and benefits are greatest with low pest numbers. It is also important to minimise non-target species to maximise benefits.
- Monitoring results show that wide-scale predator control at Poutiri Ao ō Tāne has significantly reduced predator numbers relative to an adjacent non-treatment area. There has been some fluctuation in predator numbers since 2014. This could be related to the reduced trap checking frequency since 2014; however, a similar trend in the non-treatment area suggests the increase simply represents natural variation. Rabbits have been abundant in the area since 2015, which may be leading to increased predator numbers.
- The ferret odour lure trial showed that stoats were three times more likely to be attracted to a ferret odour and rabbit bait than just rabbit. LCR are doing trials to produce ferret odour synthetically.

Table 6. Progress on pest-control milestones

Milestone	2017 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.	Conduct feasibility report (go/no go) on whether wide-scale predator control maintenance ability to deliver outcomes.	Landowner support continues to be strong. Landowners in phases one and two are kept well-informed. Feasibility report will be completed by December 2017.	50

Milestone	2017 activity	Update	% complete
A marked reduction in introduced predators in the Cape to City area.	Establish minimum of 14,000 ha of predator control infrastructure; continue initial predator control.	Phase two live capture knockdown trapping has been completed on 6,000 ha. The maintenance kill trap network has nearly been completed over 14,000 ha by contractors.	50
Use of wireless trap networks to optimise control.	No 2017 milestone	Wireless trials continue and is being trialled on two Cape to City property's Te Awanga Downs and Okahu to measure the usability and effectiveness of wireless in a maintenance phase on farmland.	
Examination of the long-term effectiveness and reliability of self-resetting traps for rat control in Boundary Stream mainland island	Reduce checking frequency to three times per year and monitor rat density.	The rat tracking rate has now been kept below 5% for a whole year. With the control area ranging from 20–30%. Tracking tunnels are monitored 4 times per year.  All traps are now only checked twice a year, for lure and gas replacement, plus one small check of a sub-sample of traps part way through to check the lure is still effective.	50
Sustained suppression of introduced predators at low densities in the Poutiri Ao ō Tāne pest control area.	Continue contractor control at reduced control intensity.	There are four checks per year. Based on monitoring results, indications are that this level of maintenance is not compromising the network.  A single application of PAPP baits reduced the relative abundance of feral cats by about 50% at Toronui station (part of Poutiri Ao ō Tāne). A second trial, with two applications, is planned on a different property.	50



Milestone	2017 activity	Update	% complete
Demonstration that effective ongoing predator control in the Cape to City area can be undertaken for less than ~\$3/ha.	Analyse initial control costs.	Costs are continually recorded. Analysis will be done at the end of this year once the maintenance mode has been in place and carried out for a few months by contractors.	50
Demonstration that the cost of predator control can be met by transferring resources from possum control programmes, while still maintaining possums at low densities.	Assess risk of chew card concept failing and possum numbers recovering is made based on past 2 years of data.	Chew card analysis carried out by LCR previously showed that we can with confidence accept chew card results as an accurate indication of possum numbers.	100
Operational monitoring for predator control.	Undertake monitoring.	Monitoring using motion-sensitive cameras continues.	50

### 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 with high rabbit numbers. 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; these properties are being considered for a new calici-virus trial in 2017. *This will be 2018 now because the virus was not permitted in time for release 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 (eg 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

- The project team and ZIP have been working on a joint programme to eradicate possums from part of Cape to City. A draft proposal has been sent to ZIP for comment.
- The BHNSC conference was in May 2017. Some of the project team attended and Campbell Leckie and Andy Lowe gave presentations.
- The BHNSC is the platinum sponsor for the Cape to City and Poutiri Ao ō Tāne conference in November.

New (Feb 2017 report)

Update In July 2016 PF2050 was announced. Cape to City was used as an example in the announcement and has a very good chance of benefitting from PF2050.

Update The board has now been formed and the organisation's structure and management is being developed. The board has just appointed a CEO, Ed Chignell. Announcements about where funding will be directed are expected before the end of 2017.

## **4. Work planned for 1 July – 31 December 2017**

### **4.1 Research and monitoring**

- Modelling Cape to City trap data to optimise use of wireless technology
- Ferret odour longevity trial continuation
- National predator monitoring protocol development
- Socially-acceptable compliance monitoring of predators
- Deriving pest density-impact functions, and developing a national framework for pest density-impact functions
- Biodiversity and predator response monitoring at Poutiri Ao ō Tāne and Cape to City
- Baseline eDNA surveys of invertebrates
- Review of threatened and iconic species in Cape to City
- Toxoplasmosis monitoring continuation
- Setting appropriate restoration goals to achieve biodiversity and cultural aspirations for the Maungaharuru ki Tangitu Hapū
- Impact of education programme assessed
- Te Matau a Māui case study research continuation
- Social networks for socio-ecological modelling
- Intervention logic model as part of Te Matau a Māui review

### **4.2 Community engagement and education**

- Hikoi Tutuki – journey of achievement (walks and talks) are being organised in both Poutiri Ao ō Tāne and Cape to City. Their main purpose is to connect Hapū members back to their land. They start in November and continue to the end of 2019.
- Cape to City and Poutiri Ao ō Tāne exhibit at the A&P show in October
- Pakipaki School will do the Freshwater Education Programme. Te Mata school will do the Backyard Biodiversity Programme and will hold another ‘bioblitz’.
- Trainee teacher workshop will be held with early childhood EIT trainee teachers.
- Poutiri Ao ō Tāne website updated
- Media and Facebook continuation
- Transforming Biodiversity Conference will be held in November  
<http://www.capetocity.co.nz/conference/>

### **4.3 Biodiversity and species**

- Kākā translocation to Poutiri Ao ō Tāne
- Toutouwai and miromiro translocation to Cape to City
- Whio habitat suitability assessed for the Maraetotara by technical expert
- Bird monitoring in Cape to City continuation

### **4.4 Habitat restoration**

- Trial of low-cost planting technique
- Infill planting of 500 native plants on a Cape to City property

- 2016/2017 planting audits
- Fascinating mānuka (placing branches carrying seed on exposed ground – when the seeds drop they are protected by the branches, which also act as mulch) and broadcasting seed on exposed slip faces of planting sites
- Investigate partnership agreement with HDC/MSD youth scheme Rangatahi mā
- Investigate partnership with QEII Stephenson Fund
- Releasing of all Cape to City plantings
- Begin \$30,000 DOC Dirty Dozen funded intensive old man's beard and banana passionfruit control in upper Maraetōtara. Willow regrowth controlled at same time.
- List Waipuka inanga (whitebait) spawning sites with Million Metres Streams crowdfunding
- Fencing and blackberry control of Waipuka inanga spawning site
- Confirm 2018 planting sites and plans. Confirm plant orders for HBRC tender.

#### **4.5 Predator control**

- Continuation of:
  - Initial control/live capture at Cape to City
  - Servicing of Poutiri Ao ō Tāne and Cape to City permanent networks
  - Wireless traps trial in Cape to City
  - SSRT trial at Poutiri Ao ō Tāne

## 5. Conclusion

Te Matau a Māui has now been functioning under a slightly new structure for about 6 months. Due to the open and close working relationship of the project team, this transition has been relatively smooth. Two new Hapū members and two new DOC staff members have just joined the project team. Two Governance team members changed.

We are halfway through the 2017 milestones and all are tracking well to be completed by the end of the year, if they have not already been completed.

Over the last 6 months the projects have advanced well and some of the highlights have been:

- Developing pest DIFs – so that by the end of the project we will be able to quantify the level of pest control needed for the desired biodiversity outcomes in a primary productive landscape.
- Te Matau a Māui and EIT have signed an MOU to formalise integration of Te Matau a Māui education principles (of using the environment as the context for learning throughout the curriculum) into teacher training.
- A successful crowdfunding project was run through the Million Metres Stream Project, Cape to City and Maraetotara Tree Trust partnership.
- With considerable community and iwi involvement, 97 Kōruru (100%) fledged from two translocations.
- The PAPP trial accomplished a 50% reduction in cats at Toronui station.

Te Matau a Māui project is halfway through. In the coming months the project team will be reviewing its achievements so far and prioritising the work coming up – taking into account the changing national and regional context. This includes a review of the original logic model, to make sure we are on track to achieve our desired outcomes and to decide if those outcomes need to change.

The next 6 months will see many advancements – including signing the next LCR contract, the Transforming Biodiversity conference, another kākā translocation, protecting whitebait spawning sites and refining the wireless trials.

### Appendix 3: Te Matau a Māui updated milestones

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 (e.g. 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 (if available).

Research and monitoring						
		2015	2016	2017	2018	2019
3	Decision analysis models for predicting the most cost-effective trapping configurations for managing introduced predators over large areas	Model effectiveness of predator control with varying levels of landholder participation.	Refine predator population model to predict outcomes of different trap configurations and frequency of checking.	Refine population model further using real trapping data.	Gather sub-sample predator movement data (from 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	Continue Poutiri Ao ō Tāne monitoring (monitoring times may be extended out).  Specific Cape to City invertebrate monitoring is set up.	Continue Poutiri Ao ō Tāne and Cape to City monitoring (Poutiri Ao ō Tāne monitoring times may be extended).	Continue Poutiri Ao ō Tāne and Cape to City monitoring (Poutiri Ao ō Tāne monitoring times may be extended).	Continue Poutiri Ao ō Tāne and Cape to City monitoring (Poutiri Ao ō Tāne monitoring times may be extended).	Continue Poutiri Ao ō Tāne and Cape to City monitoring (Poutiri Ao ō Tāne 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/gre	Produce a scoping report on integrated		Produce and promote economic benefits report.

Research and monitoring						
		2015	2016	2017	2018	2019
			en credentials/rabbit forage etc).	ecosystem services analysis.		
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 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.



Research and monitoring						
		2015	2016	2017	2018	2019
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.
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

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 Aotearoa Foundation.	Continue to attract other investors; target minimum \$300,000
5		Review and implement Gibling 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	

\* 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 be made up 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 in the future.

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 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.
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	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

Biodiversity/species						
		2015	2016	2017	2018	2019
			abundance in rural and urban gardens.			in rural and urban landscapes.
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 McLennan-led species monitoring programme for birds/invertebrates overflowing into broader project area outside of Cape Sanctuary.  Prepare translocation plans for robins and tomtits.	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	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 sufficient levels for kiwi survival	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.		Gain clarity of long-term landowner commitment along the Maraetotara.  Scope a detailed technical analysis of risk around habitat and gradients, by looking at other NZ examples.	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	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 and Poutiri Ao ō Tāne areas

Biodiversity/species						
		2015	2016	2017	2018	2019
6	Improvement in the numbers of long-tailed bats inhabiting Mohi Bush	Complete initial design of monitoring programme. Assess the impact of potential threats to the bat population.	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.

Biodiversity/species						
		2015	2016	2017	2018	2019
7	Reintroduction and re-establishment of mottled petrels, Cook's petrels, kākā, kākārīki, and pāteke in the Poutiri Ao ō Tāne area	Kākā and kākārīki have been released and a founder population establishes at the location. Transfer pāteke successfully.	***Transfer and successfully fledge petrels. Kākā and kākārīki populations have established and are self-sustaining.	***Transfer and successfully fledge petrels. Transfer pāteke successfully.	***Transfer and successfully fledge petrels. Transfer pāteke successfully.	***Transfer and successfully fledge petrels. Petrels from previous releases are returning to breed. 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 who 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 with regard to pāteke and kākārīki involved in these deliverables and so in the next review these may alter slightly.

+ 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.



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	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	Conduct HBRC GIS scoping study to identify where habitat would be best placed (including bush remnants that could be fenced).  15,000 plants planted within project footprint by partners or community groups.	Ensure a minimum of 50,000 plants planted within project footprint by partners or community groups.	Ensure a minimum of 50,000 plants planted within project footprint by partners or community groups.	Ensure a minimum of 50,000 plants planted within project footprint by partners or community groups.	Ensure a minimum of 50,000 plants planted within project footprint by partners or community groups.
3	Enhancement of DOC's efforts on public land through landscape-scale ecological restoration on private land	Conduct operational assessment of how integration of public and private land within Cape to City project is best achieved and impacts monitored.		Conduct midterm analysis of benefits to conservation programmes in terms of conservation		Conduct 5-year analysis of benefits to conservation programmes in terms of conservation

Habitat protection and enhancement/restoration (primarily fencing, planting, maintenance, weed control)						
	2015		2016	2017	2018	2019
				outcomes and operational savings.		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 land owners across sufficient land area to be likely to deliver wide scale predator control outcomes.	Obtain agreement in principle from 75% of land owners across 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.
2	A marked reduction in introduced predators in the Cape to City area		Establish 4,000 ha of predator control infrastructure.	Establish minimum of 14,000 ha of predator control infrastructure;	Begin graduating 30% of farmers to maintenance of predator control	Graduate 50% of farmers to maintenance of predator control.

Pest control (contractor delivery, predator initial control and infrastructure set up and maintenance)						
		2015	2016	2017	2018	2019
				continue initial predator control.	and continue initial 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
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.

Pest control (contractor delivery, predator initial control and infrastructure set up and maintenance)						
	2015		2016	2017	2018	2019
6	Demonstration that effective ongoing predator control in the Cape to City area can be undertaken for less than ~\$3 per 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 Landcare Research.	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 as a result of more targeted control.
8	Operational monitoring for predator control	Complete operational monitoring plan for control.	Undertake monitoring.	Undertake monitoring.	Undertake monitoring.	Undertake monitoring. Analyse data to determine changes over the preceding 4 years

## Appendix 4. 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 <a href="http://naturewatch.org.nz/projects/cape-to-city">naturewatch.org.nz/projects/cape-to-city</a>	Published	Cape to City 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</i> Magazine – May 2015 issue.	August 2015
	Cape to City on Facebook <a href="http://www.facebook.com/capetocity">www.facebook.com/capetocity</a>	Active	Cape to City Facebook page set up.	August 2015
	Trustworthy Biodiversity measures <a href="http://www.landcareresearch.co.nz/science/plants-animals-fungi/animals/birds/biodiversity-measures/research-updates">www.landcareresearch.co.nz/science/plants-animals-fungi/animals/birds/biodiversity-measures/research-updates</a>	Published	Highlights the results from the Building Trustworthy Biodiversity Measures focus groups.	August 2015

Workstream	Title	Status	Description	Interim report date
Community engagement cont.	Andy Lowe gave a speech at the Deer Industry Conference <a href="http://www.youtube.com/watch?v=tARC D82ACy8">www.youtube.com/watch?v=tARC D82ACy8</a> (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 New Zealand	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	<a href="http://capetocity.co.nz/">http://capetocity.co.nz/</a>	February 2016
	Radio article – Rod Dickson interviewed	Published	Radio New Zealand article on morning rural news, 5 November 2015, about Cape to City (forward to minute 1.28). <a href="http://www.radionz.co.nz/audio/player/201777443">http://www.radionz.co.nz/audio/player/201777443</a>	February 2016
	Te Matau a Māui: Māori Communications and Engagement Strategy (Draft)	Draft	Draft Māori Communications and Engagement Strategy.	February 2016
	Pair bring skills to work in Cape to City project	Published	Article in <i>Hawke's Bay Today</i> , 6 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

Workstream	Title	Status	Description	Interim report date
Community engagement cont.	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 School.	August 2016
	Bugman helps in nature push	Published	Hawke’s Bay Today article, 5 March 2016, p.9, 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 Biosecurity Institute meeting – April 14 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 2016, 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 release to Cape to City.	February 2017
	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

Workstream	Title	Status	Description	Interim report date
Community engagement cont.	Cape to City was included in Lou Sanson speech for Conservation Week 2016	Completed	Cape to City was included in Lou Sanson's 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 Hawke's Bay today	Completed	Small piece on page 2 in the "what you need to know" section of <i>Hawke's Bay Today</i> , Thursday 15 September 2016.	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 with an overview of the projects to be used at events, etc.	February 2017
	Painting helps restore natives	Published	<i>Hastings Leader</i> p.5. Oct 19 2016. 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/ intranet story providing an introduction and overview of the Cape to City project. <a href="https://blog.doc.govt.nz/2016/10/31/cape-to-city/">https://blog.doc.govt.nz/2016/10/31/cape-to-city/</a>	February 2017
	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	



Workstream	Title	Status	Description	Interim report date
Community engagement cont.	Cape to City overview talk	Completed	Campbell gave a talk at the Ecological Resilience Conference in Hamilton in November 2016.	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 p.35 of the action plan.	February 2017
	Tuku Whenua - gifting of treasured lands	Published	Media release about Maungaharuru Tangitu giftback week in Jan 2017, which included Poutiri Ao ō Tāne, <a href="http://community.scoop.co.nz/2017/01/tuku-whenua-gifting-of-treasured-lands/">http://community.scoop.co.nz/2017/01/tuku-whenua-gifting-of-treasured-lands/</a> Also on: <a href="https://blog.doc.govt.nz/2017/01/31/tuku-whenua/">https://blog.doc.govt.nz/2017/01/31/tuku-whenua/</a>	Aug 2017
	Re-establishing mottled petrels in the Bay	Published	Media release about the korure release in HB Today, page 7, 12th April 2017	Aug 2017
	Conservation at heart of community hui at Matahiwi Marae	Published	<a href="http://www.nzherald.co.nz/hawkes-bay-today/news/article.cfm?c_id=1503462&amp;objectid=11850278">http://www.nzherald.co.nz/hawkes-bay-today/news/article.cfm?c_id=1503462&amp;objectid=11850278</a>	Aug 2017
	National bird survey starts today	Published	Media article about the NZ Garden bird survey: <a href="http://www.nzherald.co.nz/hawkes-bay-today/news/article.cfm?c_id=1503462&amp;objectid=11881274">http://www.nzherald.co.nz/hawkes-bay-today/news/article.cfm?c_id=1503462&amp;objectid=11881274</a>	Aug 2017
	Cape to City overview talks by Campbell Leckie and Andy Lowe at the Crazy and Ambitious - biological Heritage National Science Challenge conference. May 2017	Completed	<a href="https://youtu.be/-PuaqoEK7xM">https://youtu.be/-PuaqoEK7xM</a>	Aug 2017

Workstream	Title	Status	Description	Interim report date
Community engagement cont.	Cape to City overview talks by Campbell Leckie to various audiences		<ul style="list-style-type: none"> <li>• Parliamentary Commissioner for the Environment staff visit 13th December 2016 – Napier</li> <li>• Business and innovation function 2nd March 2017 - Napier</li> <li>• Environment and services committee (HBRC) 15 March - Napier</li> <li>• Corporate services group (HBRC) 17 May - Napier</li> <li>• Zero Invasive Predators 18th May – Wellington</li> <li>• OMV Group 7th June – Wellington</li> <li>• Minister for Research and Technology Paul Goldsmith 15th June - Napier</li> <li>• Regional biodiversity Implementation group 15th June – Napier</li> <li>• Annual pest contractors meeting 16th June – Napier</li> </ul>	Aug 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> , 13 April, 2016, p.8. Newspaper article about cat trapping in Cape to City.	August 2016
	Catching more rats using run-through tunnel traps	Published	ZIP article about trapping at Poutiri Ao ō Tāne. <a href="http://zip.org.nz/findings/2016/2/catching-more-rats-run-through-vs-single-entry-traps">http://zip.org.nz/findings/2016/2/catching-more-rats-run-through-vs-single-entry-traps</a>	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

Workstream	Title	Status	Description	Interim report date
Biodiversity and Species	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 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. <a href="http://www.maoritelevision.com/news/regional/massive-effort-restore-maungaharuru-endangered-korure">http://www.maoritelevision.com/news/regional/massive-effort-restore-maungaharuru-endangered-korure</a>	August 2016
	<b>The Cape to City Project: Baseline bird counts in treatment and in non-treatment area. Unpublished report by John McLennan. March 2017</b>	Completed	Baseline report on initial bird survey data	Aug 2017
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
	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: <a href="http://storify.com/Seabirders/wstc1">storify.com/Seabirders/wstc1</a> .	August 2015

Workstream	Title	Status	Description	Interim report date
Research and monitoring (cont.)	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
	Glen, A.; Perry, M.; Ruscoe, W. 2014: Wide-scale trapping suppresses predators and promotes biodiversity in Hawke's Bay. Proceedings of the 28 <sup>th</sup> 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

Workstream	Title	Status	Description	Interim report date
Research and monitoring (cont.)	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> , 43, 127-137	Published	Comparing techniques for detecting cats.	August 2015 – updated Aug 2016
	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> . 41, 145-150	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

Workstream	Title	Status	Description	Interim report date
Research and monitoring (cont.)	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
	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 to generate detection probability data used for identifying areas of low, medium, and high possum numbers. This will enable forecasting of 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 g0 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

Workstream	Title	Status	Description	Interim report date
Research and monitoring (cont.)	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
	Milestone 4.4 (LCR contract)	Completed	Based on lessons 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 AS, Latham MC, Anderson D, Leckie C, Niemiec R, Pech RP, Byrom AE (2016). Landholder participation in regional-scale control of invasive predators: an adaptable landscape model. <i>Biological Invasions</i> 19, 329-338.	Published	This research models a range of landowner participation rates on the success of predator control.	February 2016 Updated August 2017
	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

Workstream	Title	Status	Description	Interim report date
Research and monitoring (cont.)	Milestone 2.6 and 2.7 (LCR Contract)	Completed	Determined how the Poutiri Āo ō Tāne trap network might be optimised for the maintenance control phase by using existing Poutiri Āo ō Tāne trap data in a simulation model, including three or four scenarios for optimal trap spacing and frequency of checks.	February 2016
	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 programmes. <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 uses Poutiri Āo ō Tāne as a case study. <a href="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/">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/</a> . Her presentation is at: <a href="http://www.fulbright.org.nz/news/video-ian-axford-new-zealand-fellowship-seminar-jill-ozarski/">http://www.fulbright.org.nz/news/video-ian-axford-new-zealand-fellowship-seminar-jill-ozarski/</a> .	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 estimating 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 40</i> .	Published	Article in <i>Discovery</i> (issue 40, Nov 2015) about Cape to City, includes a video. This is an LCR publication: <a href="http://www.landcareresearch.co.nz/publications/newsletters/discovery/discovery-issue-40/Predator-busters">http://www.landcareresearch.co.nz/publications/newsletters/discovery/discovery-issue-40/Predator-busters</a>	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 115 (2)</i> : 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
	Shiny App	Completed	Prototype 'shiny app' has been developed to allow managers to predict trap catch by altering trap configurations online.	August 2016

Workstream	Title	Status	Description	Interim report date
Research and monitoring (cont.)	Pech R and Maitland M (2016) Conservation of native fauna in highly invaded systems: managing mammalian predators in New Zealand. <i>Restoration Ecology</i> 24, 816-820.	Published	Conservation of native fauna in highly invaded systems.	August 2016
	Niemiec, R.M., Pech, R., Norbury, G., Byrom, AE. (2017). Landowners' Perspectives on Coordinated, Landscape-Level Invasive Species Control: the Role of Social and Ecological Context. <i>Environmental Management</i> 59, 477-489.	Published	This paper uses 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., (2017). Exploiting interspecific olfactory communication to monitor predators. <i>Ecological Applications</i> 27, 389-402.	Published	This paper looks at using sense of smell as communication between species as a way of monitoring predators.	August 2016 Updated February 2017
	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

Workstream	Title	Status	Description	Interim report date
Research and monitoring (cont.)	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
	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

Workstream	Title	Status	Description	Interim report date
Research and monitoring (cont.)	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
	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

Workstream	Title	Status	Description	Interim report date
Research and monitoring (cont.)	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 LC2541, prepared for Hawke's Bay Regional Council.	Completed	Invertebrate monitoring opportunities within Cape to City.	August 2016
	Byrom, A.E. 2016: The Cape to City project and its relationship to New Zealand'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. Four-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

Workstream	Title	Status	Description	Interim report date
Research and monitoring (cont.)	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. <a href="http://www.landcareresearch.co.nz/about/news/events/link-seminars">http://www.landcareresearch.co.nz/about/news/events/link-seminars</a>	February 2017
	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

Workstream	Title	Status	Description	Interim report date
Research and monitoring (cont.)	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
	Warburton B, Leckie C, Rakete-Stones W. 2017. Remote monitoring traps using wireless networks. 17th Australasian Vertebrate Pest Conference. Canberra. May 1-4.	Conference	Remote monitoring traps using wireless networks	Aug 2017
	Warburton B, Jones C, Ekanayake J (2017). The economics of using wireless networks for monitoring traps. Kararehe Kino - Vertebrate Pest Research 29.	Newsletter	The economics of using wireless networks for monitoring traps	Aug 2017
	Glen A, Norbury G, Warburton B, Pech R. 2016. Predator monitoring for compliance in Cape to City: Discussion paper. Unpublished Landcare Research Contract Report, prepared for Hawke's Bay Regional Council.	Completed	Predator monitoring for compliance in Cape to City	Aug 2017

Workstream	Title	Status	Description	Interim report date
Research and monitoring (cont.)	Glen A, Norbury G, Garvey P, Dickson R. 2017. Effectiveness of feral cat control using para-aminopropiophenone (PAPP) on Toronui Station, Hawke's Bay. Unpublished Landcare Research Contract Report LC2743, prepared for Hawke's Bay Regional Council.	Completed	Effectiveness of feral cat control using para-aminopropiophenone (PAPP) on Toronui Station, Hawke's Bay	Aug 2017
	White, D. (2016). <i>Toxoplasma gondii</i> screening in cats and mice using PCR as part of the Cape to City Initiative. Unpublished Landcare Research Report, prepared for Hawke's Bay Regional Council.	Completed	<i>Toxoplasma gondii</i> screening in cats and mice using PCR as part of the Cape to City Initiative.	Aug 2017
	Flood S. 2017. Education review for TMAM – Cape-to-City and Poutiri Ao ō Tāne. Project discussion document. Unpublished Landcare Research Report prepared for Hawke's Bay Regional Council.	Completed	Education review for TMAM – Cape-to-City and Poutiri Ao ō Tāne.	Aug 2017



Workstream	Title	Status	Description	Interim report date
Research and monitoring (cont.)	Norbury G, Glen A, Pech R. 2017. Linking predator camera trap monitoring to biodiversity and economic benefits: density-impact functions in principle. Unpublished Landcare Research Scoping Report, prepared for Hawke's Bay Regional Council.	Completed	Linking predator camera trap monitoring to biodiversity and economic benefits: density-impact functions in principle.	Aug 2017
	Norbury G, Pech R, Glen A. 2017. Linking predator camera trap monitoring to biodiversity and economic benefits: how to derive density-impact functions for Cape-to-City. Unpublished Landcare Research Follow-Up Report, prepared for Hawke's Bay Regional Council.	Completed	Linking predator camera trap monitoring to biodiversity and economic benefits: how to derive density-impact functions for Cape-to-City	Aug 2017
	Cowan P, Warburton B. 2016. Economic outcomes of broadscale predator control in the Hawke's Bay region. Unpublished Landcare Research Contract Report LC2738, prepared for Hawke's Bay Regional Council.	Completed	Economic outcomes of broadscale predator control in the Hawke's Bay region	Aug 2017

Workstream	Title	Status	Description	Interim report date
Research and monitoring (cont.)	Niemiec, R.M., Pech, R., Norbury, G. and Byrom, A. 2017. Policy recommendations based on landholder's perspectives on coordinated pest control. Hawkes Bay Regional Council Policy Brief 2_1_2017.	Completed	Policy recommendations based on landholder's perspectives on coordinated pest control	Aug 2017
	Glen A & Norbury G 2017. Cape to City and Poutiri Ao ō Tāne: pest and biodiversity responses. Unpublished Landcare Research Progress Report, prepared for Hawke's Bay Regional Council.	Completed	Cape to City and Poutiri Ao ō Tāne: pest and biodiversity responses.	Aug 2017
	Norbury G, Campion M, Brown S, Garvey P. 2017. Milestone 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. Unpublished Landcare Research Progress Report, prepared for Hawke's Bay Regional Council.	Completed	Ferret body odour longevity trial to determine how long odour lasts, and therefore how often it needs to be refreshed in the field.	Aug 2017
	Latham ADM, Latham MC, Warburton B 2017. Effect of predator control at Poutiri Ao ō Tāne on Boundary Stream Mainland Island.	Completed	Effect of predator control at Poutiri Ao ō Tāne on Boundary Stream Mainland Island.	Aug 2017

Workstream	Title	Status	Description	Interim report date
Research and monitoring (cont.)	Burge OR, Innes J, Fitzgerald N, Richardson SJ 2017. Habitat availability for native New Zealand bird species within the Cape-to-City footprint – a preliminary assessment.	Completed	Habitat availability for native New Zealand bird species within the Cape-to-City footprint	Aug 2017
	Gormley AM, Warburton B. 2017. TrapSim: A decision-support tool for simulating predator trapping. Unpublished Landcare Research Contract Report LCxxxx, prepared for Hawke's Bay Regional Council.	Completed	TrapSim: A decision-support tool for simulating predator trapping.	Aug 2017
	Flood S 2017. HBRC Aotearoa PFNZ: Project 5.1: Education review for TMAM – Cape to City and Poutiri Ao ō Tāne: Report on initial data analysis. Unpublished Landcare Research Contract Report, prepared for Hawke's Bay Regional Council.	Completed	Education review for TMAM – Cape to City and Poutiri Ao ō Tāne: Report on initial data analysis.	Aug 2017