

Environmental News

Issue 47 | Summer 2023



**20 years of Environmental advocacy for Aotea |
Cetaceans around Aotea | Toropapa | Rare
plants at Awana | Predator control for
Oruawharo Bay | Rat pilot trials on Waiheke
Island**



Aotea Great Barrier
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EDITORIAL: Twenty years of gaining knowledge: the ever-changing ecosystems of Aotea

John Ogden

John Ogden is the founding Chair and current Science Advisor, and committee member of the OME project. He is the author of Birds of Aotea, a twenty year study of the island's avifauna. He was editor of Environmental News from 2012 to 2015 He was formerly Associate Professor of Ecology at the University of Auckland and has lived on Aotea since 1990.

Reflecting on 20 years of writing for the *Environmental News* it is the 'bird' issues that stand out for me, so I'll try to summarise for you the Environmental Trust's 20 years of information gathering and spreading awareness of Aotea's birds, from bitterns to black petrels, and what all this data tells us about the future.

About the birds: getting specific

Between 2006 and 2008 the Trust first began 5-minute bird counts at six locations, spread over different seasons. Fenella Christian, Judy Gilbert and Sue Daly organised the teams and their instructions. I wrote five detailed reports

for the Department of Conservation (DoC) and accounts in *Environmental News*¹. The transect lines (where people counted birds) were similar or identical to those set up for the longer-term Aotea Bird Count beginning in 2019, allowing comparisons of bird species that were 'conspicuous' over more than a decade².

We also organised monitoring (with Amelia Geary, then at DoC)³, of the rare Australasian bittern and undertook Boxing Day kākā counts. These surveys established that part of the kākā population moved seasonally from Aotea to the Auckland Isthmus (and elsewhere) and provided the first supportable estimates of kākā numbers on the Island⁴. A strong seasonal migration pattern for kōtare/kingfisher was also established as well as information on nest-hole sites⁵. A colony of grey-faced petrel/ōi was located nesting in burrows above the cliffs at Awana, and subsequent monitoring and protection – most recently by Barry Scott – indicates increasing numbers, probably spill-

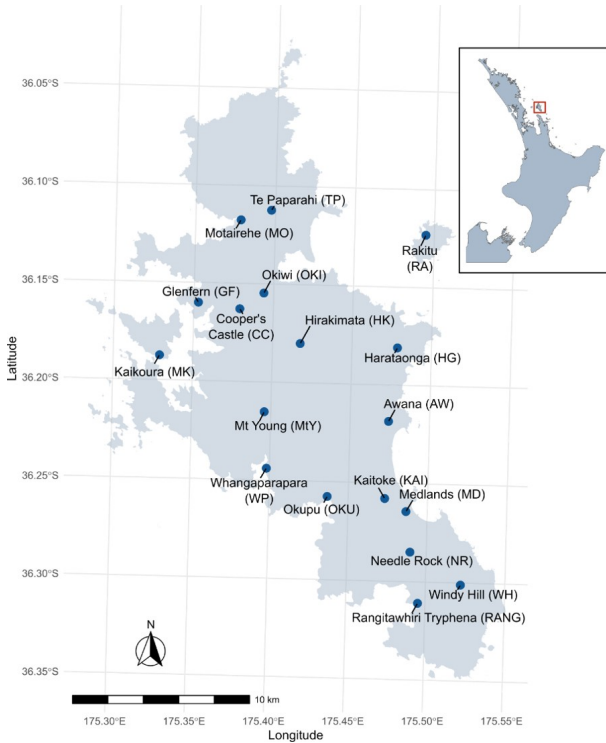


Awana Bay

Photo: Chris Morton

Cover: *Rhabdothamnus solandri/tawapou* (New Zealand *Gloxinia*). Photo: Barry Scott.

Back cover: *Ahie off Aotea*. Photo: Hannah Smith.



Map of Aotea Bird Count Transects

international migrants, was first emphasised by Colin Ogle in 1980⁷. I set up annual Aotea-wide NZ dotterel monitoring and published the first account of the population size and movements of this species on Aotea⁸. It was clear that dotterels, variable oystercatchers, wrybill, banded dotterel, bar-tailed godwit and Pacific golden plover, spend some of their non-breeding period feeding on the mudflats of the Whangapoua estuary and hang out on the Okiwi spit at high tide, when they can be counted (annual counts were made by Environmental Trust members during the 2000 – 2010 period).

Photo: George Perry

Trustees were involved in DoC's annual pāteke monitoring and restoration programme⁹. Although

over from the growing colony on rat-free Cuvier Island. The Trust has also participated in monitoring black petrel on Hiramakata and advocated for their protection⁶.

The importance of the Whangapoua estuary, both for local Aotea waders, and for

pāteke have continued to decline on Aotea, there are some signs of recent improvement at Oruawharo, where a community group was formed as a result of the Local Board's Ecology Vision (Oruawharo Medlands EcoVision, or OME). Wetland restoration is underway to

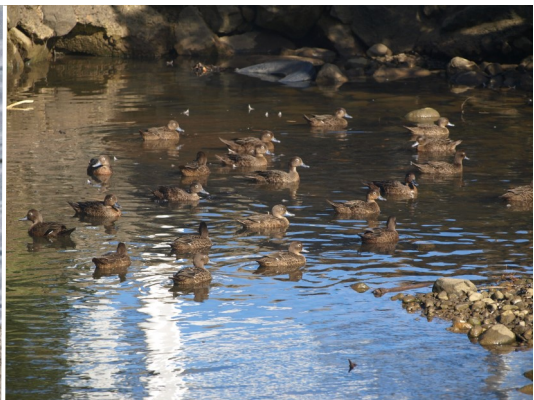


Photo left - Rebecca Bowater; right: Fenella Christian

Left: Bar-tailed godwits/kuaka. Foreground is male developing breeding plumage. Right: Pāteke at Pa Beach, Tryphena, 2017.

provide better habitat for them, and flock numbers of up to 40 have been seen this year.

Windy Hill proof of damage being done by rats to Aotea's birds

In parallel, an enormous amount of work was being carried out by the team at Windy Hill Sanctuary, managed by founding AGBET

trustee, Judy Gilbert. The Windy Hill bird counts were done every December at up to 46 points in the sanctuary (where there was rat control) and at 12 points in the unmanaged area with six replicate counts at each site, spread over a week. Spreading them out like that allows for the occasional wet or windy day when the smaller birds are reluctant to sit up and sing –

Conclusions from a review of Windy Hill data collected over a ten year period.

- (1) *There was a consistent statistically significant difference in bird abundance between the managed and unmanaged areas.* This could be attributed to greater breeding success for most species in the managed area – where rat numbers were demonstrably reduced compared to the unmanaged areas. Alternatively one could say that more birds (eggs or nestlings) were being predated in the unmanaged area. **The loss amounted to 4 or 5 birds for every hectare. This might not seem like much, but it amounts to saving c. 3500 birds every year in the 770 ha. Sanctuary. This has huge implications for the remainder of the island's (unmanaged) forest cover. An extrapolation of the data obtained from the Windy Hill monitoring would suggest that c. 85,000 birds are lost to rat predation every year across the Island¹¹!** Even assuming, arbitrarily, that these mortality figures are 10' too high, we still get 8500 birds lost per annum. The true figure must be far higher, and this explains why birds 'bounce back' so quickly when rats are eradicated from islands.
- (2) *There was a gradual increase in abundance in the 5-minute count data for most bird species in the rat managed area (or no decrease).* Not only were the larger and more conspicuous birds such as tūi increasing in the Sanctuary, they were also increasing in the unmanaged sites and even outside the area. This suggests that the extra birds are moving from the protected area to the rest of the island. The potential movement of birds about the island, and a justification for re-introductions of lost species, is exemplified by the movement of two banded toutouwai/robins, one from Windy Hill, and another from Glenfern, to Hirakimatā, where there is now a small breeding population.

for it is their songs and calls that mainly identify their presence. A consequence has been that it is no longer necessary to keep monitoring but if done it should be every few years rather than annually. A week's work for a field team are now resources which can be spent on other conservation activities.

Big money may be required to achieve final island-wide eradication of pests, but the benefits are clear from eradications on many islands worldwide, and from 20-plus years of work at Windy Hill. The Tū Mai Taonga project has secured some big money for feral cat and rodent eradication and is now underway in Te Paparahi. As it expands southwards, it will eventually link up with the Oruawhoro Medlands Ecovision (OME) project and Windy Hill Sanctuary, so putting resources into the



Male dotterel in breeding plumage.

Photo: John Ogden

linking of OME and Windy Hill Sanctuary now, represents a logical step in resource allocation.

But what about the forest? Changes are also occurring in the Aotea forest. At Windy Hill and Glenfern, change in forest composition is mainly due to native conifers and broadleaf species spreading out from the remnant patches that

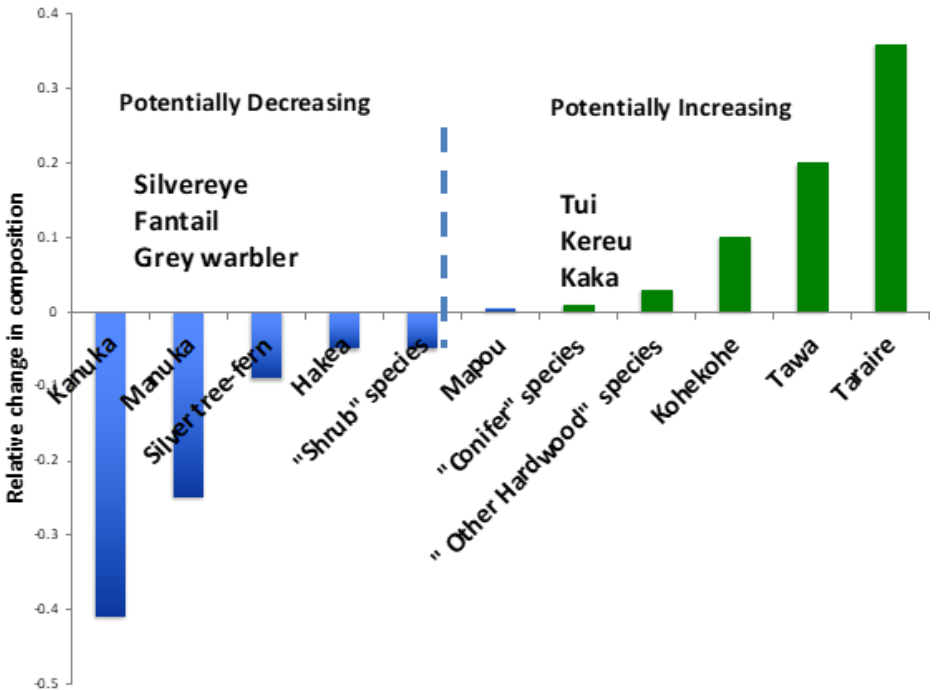


Photo: John Ogden

Successional kānuka forest at Windy Hill Sanctuary.

survived in gullies or damp south-facing slopes and which are establishing seedlings under the tall, dying kānuka. In 2010¹² and 2015¹³ work by AGBET trustee George Perry and others, demonstrated

that the future vegetation cover could be predicted by identifying the potential replacement of any tree species by counting



Changes in avifauna associated with changes in forest composition. As kānuka and mānuka decrease (left) species such as tawa and taraire are likely to increase

the established seedlings of all tree species close to it. So, some tree species will decrease in abundance, while others will increase.

Moreover, modelling showed that this successional forest process is speeded up if rats (important consumers of tree seed and seedlings) are reduced.

From the 2006 – 2008 five-minute bird counts, we know that the kākū forest is preferred habitat for mainly insectivorous birds, such as fantail and grey warbler, while the broadleaf forest is preferred by the larger frugivorous species such as tūi and kererū. So, looking to the longer term, and assuming that fire can be excluded from most of the forest, the bird fauna will potentially shift as the forest changes. Introduced species, such as finches and thrushes, are not likely to invade the native

forest much, but will become more restricted to the exotic vegetation of gardens and farmland.



Photo: Barry Scott

John hazing grey faced petrel/ōi burrow at Awana, 2020.

Conclusion

Both the vegetation and the birds – and by inference, all components of the native forest ecosystems – are changing. They will shift to become more stable and predictable than at present, but with the ever-changing climate we should not strive for some primaevial ideal, because there never was one. Our goal should be simply to create areas of Aotea where native species of plants and animals flourish in the absence of alien competitors and predators. That is not a remarkable conclusion, but it is based on two decades of work by many people, not least the Aotea Great Barrier Environmental Trust and their supporters, and the dedicated field-workers at Windy Hill.

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- ⁹See, for example, Ogden, J. 2016. Pateke population trends and the impact of predator control, Great Barrier Island, Environmental News #35: 11-14.
- ¹⁰<https://www.omeaotea.co.nz>
- ¹¹Note that using logic and data published by Innes et.al. (2010) in New Zealand Journal of Ecology 34(1):86-114. I reached a numerically similar conclusion
- ¹²Perry, G.L. W., Ogden, J., Enright, N. J. & Davy, L. V. 2010. Vegetation patterns and trajectories in disturbed landscapes, Great Barrier Island, Northern New Zealand. New Zealand Journal of Ecology 34(3):311-323.
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Purpose and People: 20 years of Environmental advocacy for Aotea

KATE WATERHOUSE (Chair of AGBET)

A little over twenty years ago, on the 11th of November 2002, the Great Barrier Island Charitable Trust was established. The founding trustees were Windy Hill's Judy Gilbert, Glenfern's Tony Bouzaid, ecologist John Ogden and Okiwi's original David Speir. It is now the Aotea Great Barrier Environmental Trust. The purpose is the same, but the people and the process have changed.



Tony Bouzaid (1940-2011) at Glenfern Sanctuary overlooking his beloved Port Fitzroy.

Photo: Korotuku Peninsula Charitable Trust

In 2012, after ten years of “running the gauntlet” of opposition to eradication through the use of traditional aerial methods, there was a change in direction. The trust actively moved away from “how” eradication might be achieved and began to focus on what was so special about Aotea and why those birds, reptiles and ecosystems should be protected. There was also much more focus on “who” – the community, iwi and stakeholders within Auckland Council, the Department of Conservation and the funders of conservation.

Reflecting on the 20-year life of this trust, Judy Gilbert takes a breath. She is out and out a national treasure, receiving a Queen’s Service Medal for Conservation in the Queen’s Birthday Honours List in 2017. She is a member of the Sanctuaries New Zealand board and served for three years on the Aotea Great Barrier Local Board from 2013-2016, and now she is a member of the Technical Advisory Group for Tū Mai Taonga. There is, quite simply, no-one in the world more attuned to the behaviour and control of ship rats and kiore in the forest

ecology of Aotea, or anywhere for that matter. She has run Windy Hill Sanctuary for 22 years, employing dozens of islanders and shared her learning with everyone in the conservation community. Judy has a relentless focus on measurement and understands what works and doesn’t work, borne out of two decades of experience on how to make the funding dollar go as far as it possibly can.



photo: Judy Gilbert

Judy Gilbert trapping on Tryphena Ridge, Windy Hill Sanctuary.

I ask her to reflect on the last 20 years and the first thing she says is that she's surprised that our original vision is still so far in front of us. "Over all the years that we have done the pest management work here, there are no better tools that are affordable that make significant difference to pest management than when I started. A person on the ground with rat traps and bait. We have not yet got an improvement, despite the enormous investment." We agree we're both looking forward to some results from that investment in the next few years to remove rats over landscape scale in habitat like Aotea's.

Judy notes one of the big pluses over time is how korero from the trust and the sanctuaries has helped, and the big shifts in community attitudes and expectations. "We have more trapping and baiting happening than ever and we are seeing an increase in birds even though the area (being managed) is relatively tiny – that's very cool." We believe no community in New Zealand is doing more than Aotea to manage pests.

Looking ahead Judy says: "The key is private land - if it doesn't disturb people's sense of privacy and doesn't cost them much they're happy to have the work done – but they haven't had skin in the game." There's no doubt landowners are key to the next phase as we move towards a predator free Aotea. In particular they are key to the long term funding of control and eradication and what people consider is "an ok amount to contribute to

that— because it can't depend on the ability of a few committed individuals to get public funding."

Of the trust in the last ten years Judy says: "It's been fantastic ... the quality of the newsletters, commitment to the projects and the backing from funders – it has been really solid. We have not really waived in those 20 years, even through Rakitū, there is a real belief and faith that we can lift quality of this motu to where it should be."

When iwi and DOC proposed the eradication of rats from Rakitū, the trust publicly backed the plan and actively shared the facts about the methods and outcomes with the community. Rakitū is a seabird island – like the Mokohinau, Cuvier and the Mercury group, each of which are home to between 5 and 7 species of burrowing seabirds, and it is of great significance to Ngāti Rehua people. It was a difficult time because conversations were being driven by fear and a lack of information, and divisions were created which have taken years to mend. The operation was completed and Rakitū is slowly recovering from 160 years of ecological damage from the largest and most dense population of ship rats ever recorded by the University of Auckland's pre-eradication monitoring team¹.

Relationships between the community, agencies, iwi and conservation groups were shaken, and needed to be rebuilt. So the trust took on the role of facilitating this, and the Aotea Conservation Workshops, the Aotea Trap



Photo left: Kate Waterhouse; right: AGBET

Left: Aotea Trap Library Coordinator Lotte McIntyre. Right: Emma Waterhouse looking after stall at Fitzroy Fun Day 2017.

Library and the Aotea Bird Count were the results of this process. Fast forward 5 years and Aotea has more households trapping rats than any other community in the country.

In those five years as Chair of this trust, I've observed a dramatic increase in momentum and support for conservation. We're not alone – all over Aotearoa the Predator Free concept has gained support and we see iwi leading the restoration in their rohe. It is so good to see this happening here on Aotea with the establishment of Tū Mai Taonga, under the leadership of Opo Ngawaka, of Ngāti Rehua Ngātiwai ki Aotea. It has been a long road but the way ahead is clear.

The reasons are more compelling now than ever as our climate warms, and people appreciate our connection and obligation to nature. On Aotea, the feeling never leaves you – petrels calling overhead as they come in from the sea at night, schools of fish glistening in the piddies in your bucket, the pāteke fossicking in the paddocks at night, and if you're old enough, a memory of kōkako calling in a valley clustered with rātā and rimu.

Judy Gilbert is conscious of the need for a changing of the guard, for new people to take up the baton. Many of those who started the journey are no longer with us, or are unable to contribute as they once did. But she notes the

growth of iwi involvement and of new groups – in Oruawharo Medlands, Okiwi, Cecilia Sudden Bay, Okupu and Schooner Bay; and the amount of community engagement in projects like the annual Aotea Bird Count. “But maintaining the advocacy for the whole island to be pest free is crucial,” she says. “And the State of Environment Report for Aotea, and Birds of Aotea— there isn't another community conservation group that's done that – it's powerful to have that data.”

Birds of Aotea will be launched on 11th February 2023 and is a comprehensive survey of the birdlife of our islands, by our Science Advisor, John Ogden. John was founding chair of this trust and has spent his life observing and recording nature, specifically, in this case, the birds of Aotea. He describes some of his insights in his guest editorial of this 20th anniversary newsletter. Ten years ago, in the 10th anniversary edition, he graphically spelt out the more than 80,000 birds “slaughtered” each year on Aotea by an estimated quarter of a million rats and a thousand feral cats. While we're still grappling with that reality ten years on, most people are now on board with the vision. And it has broadened, beyond birds – to encompass the forests, freshwater, estuarine and marine ecosystems of Aotea; the connected whole. Ki uta ki tai.



Photo: Lotte McIntyre

OME open day at Oruawharo Wetland, January 2023.

There have been other learnings too. For example it's clear, in 2023, that conversations about the future start on the island and will be led from the island. We are the ones who need to come up with the solutions to environmental problems, with the support of agencies and under the guiding vision of Ngāti Rehua Ngātiwai ki Aotea as mana whenua.

We've learned that facts are key. Conversations, and eventually decisions, need to be informed by a fact base, which is shared widely and openly debated. Mātauranga adds to this science base, informed by intergenerational knowledge of Aotea as a connected system.

And it's becoming clear that we all want the same thing. Regardless of background, the community holds very similar values in relation to the environment of the island. There is broad support for the end goal – a return to abundance and a desire to care for nature so that our children's children may benefit. In times of challenge, returning to these shared values can resolve issues and support progress to be made.

Everyone plays a part. So whether you, fence, plant, weed, trap, hunt, monitor, count birds, share knowledge or volunteer your time in other ways, it is a contribution to the future of this island and a statement about what is important.

Above all, Aotea needs advocates. The island is over the horizon –out of sight, out of mind and we quite like it that way. But conservation costs, and when competition for funding is tight, a lack of public awareness of the Aotea's taonga species and ecosystems, or worse, an erroneous perception in parts of government that the community is not supportive, could limit investment here, just when momentum is greater than it has ever been. That is why this trust will continue to raise understanding of the national significance of Aotea's biodiversity and ecosystems, for as long as is necessary to protect them.

The last word. I'd like to leave it to Izzy Fordham, who began her fifth term as a member of the Aotea Great Barrier Local Board, in November 2022, much of that as the Chair. Izzy is an inspiration to the island in so

many ways. She had this to say to editor Barry Scott about the trust on our 20th birthday.

"As an organization, the trust have worked tirelessly to ensure there is a voice that wasn't previously present to encourage us all as a community to pay attention to what we have, what we have lost and what needs our help to protect our special place against threats.

It's been a pleasure to see this trust develop over the years to become one of Aotea's mainstay environmental groups and an appropriate quote from their website that I feel sums them up: If not us, then who? If not now, then when?

All the very best for the next 20 years."

Thank you to all past and current trustees, coordinators, contractors, members, funders, partners and friends, on this, our 20th anniversary.

For a chronology of major activities/events of AGBET over last 20 years go to <https://www.gbiet.org/trust-history-and-achievements>

To volunteer: contact us on contact.gbiet@gmail.com

To donate: email us your name, address and phone contact details to contact.gbiet@gmail.com and deposit your donation to ASB 12-3110-0058231-00.



Photo: Jenni Ogden

AGBET patron Dame Anne Salmond with the late Jeremy Salmond at Whare Kotare, Awana, 2014.

Acknowledgements in a box

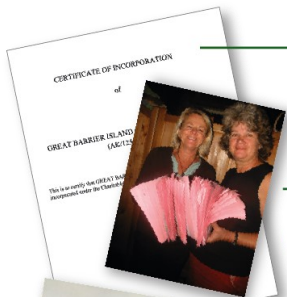
A big thank you to our major funders: Auckland Council, Aotea Great Barrier Local Board, Foundation North, DOC, Lotteries Commission and Natural Habitats.

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2002 - GBICT

Established



2006 -

The 'Referendum'!

2004 - First Environmental News

2007 - First

Rat Attack Workshops

2011 -

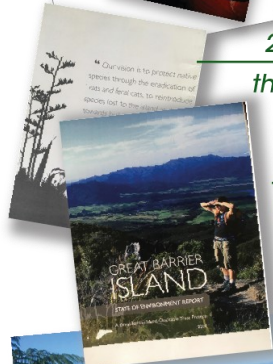
Kōkako Hui

2010 - State of the Environment Report

2012 - First

Bush Telegraph

2016



2017



Great Barrier Island ENVIRONMENTAL TRUST

2018 -

Aotea Trap Libray



Aotea Great Barrier ENVIRONMENTAL TRUST

2019 - First Aotea

Conservation Workshop, OME & ABC



Aotea Bird Count



Aotea Conservation Workshop



2020 - Tū

Mai Taonga & Sea Change Submission



2022 -

PESTIVAL



2023 -



Cetaceans around Aotea/Great Barrier Island

BARRY SCOTT interviews SARAH DWYER and KIRSTY PRIOR (Department of Conservation, Aotea Great Barrier Island)

Can you give us some background on how you got involved with the conservation of cetaceans?

Sarah

While I've had a passion for ecology since a young age, I got more seriously involved in marine conservation during my PhD study on "The Spatial Ecology and Conservation of Cetaceans in the Hauraki Gulf". Initially my work was confined to the inner Gulf but later included the outer Gulf around Aotea/Great Barrier Island where to my surprise no cetacean surveys had been previously carried out. Weather permitting, I spent 3-4 days each month during 2011 and 2012 off the west coast of Aotea constantly scanning the ocean. By the end of a 3-year survey period I had clocked up over 20,000 km of survey effort in Tikapa Moana/Te Moananui ā Toi/Hauraki Gulf studying whales and dolphins. My most exciting find was the discovery of a 'semi-permanent' population of bottlenose dolphin/terehu (*Tursiops truncatus*) around Aotea. I used a technique called photo-identification where I collected photos of the unique dorsal fins to track individuals. All of the ~ 170 dolphins recorded at Aotea were also sighted in neighbouring regions such as the Bay of Islands or Bay of Plenty, so while they appear to spend a lot of time around Aotea, they do also move a lot up and down the coast. Olivia Hamilton discusses the importance of Aotea for North Island bottlenose dolphins in Issue 46 of *Environmental News*. In contrast to the common dolphin/popokanua (*Delphinus delphis*), which spend most of their time in deeper waters but come closer to shore in the colder months, the bottlenose dolphins spend most of their time close to the coast. Here on Aotea we are super lucky that we can spot several cetaceans species from many places around the coast without stepping off dry land!

Kirsty

Like Sarah I am also passionate about the marine environment and I love the ocean. One of my key roles in my current position as Operations Manager for DOC on Aotea is to bring the right minds together and pull out the information we need to make robust decisions. The

Department receives applications for a host of activities under various legislation. In relation to cetaceans, the most common applications come from researchers, film makers and occasionally tourism operators. The activities range from approaching species closely on vessels, in water interactions, or aerial photography. Each permit is considered carefully. Scientific advice and iwi consultation are important parts of the decision making process.



Photos: Sarah Dwyer.

Bottlenose dolphins around Aotea. A. Bottlenose dolphin in Blind Bay. B. Bottlenose dolphin with neonate off Whangaparapara.

Are you (Sarah) still involved in studying cetaceans since moving to full-time employment with DOC on Aotea since 2017?

Sarah

Since taking up employment with DOC my work has become much more general, but I do maintain links with colleagues at Massey University and am a Trustee with the Far Out Ocean Research Collective¹. We are a group of scientists passionate about the marine environment and in particular learning more about whales and dolphins offshore where few people go. As a

group we have carried out several deep-water surveys around sea canyons and seamounts. One of our most interesting findings is the cooperative hunting among false killer whales (*Pseudorca crassidens*), pelagic bottlenose dolphins/terehu (*Tursiops truncatus*) and black petrels/tāiko (*Procellaria parkinsoni*). Bottlenose dolphins appear to lead the hunt when the prey is kahawai/kōukauka (*Arripis trutta*) whereas the false killer whales take that lead role when schools of kingfish/haku (*Seriola lalandi*) are present. Black petrels feed on the leftovers of these 'hunts'. We have camera footage of this very interesting cooperative behaviour from cameras mounted on suction cups on the backs of the whales (despite the name, false killer whales are actually dolphins). There is also some wonderful footage of false killer whales off the back of Aotea that featured on Blue Planet 2². I feel privileged to be involved in the DOC work that supports the black petrels when they are land-based here on Aotea and then observe their behaviours while they are at sea interacting with cetaceans. I've also set up a citizen science project on iNaturalist called Maha taonga o Aotea to try to connect people with the amazing marine mammals around our shores³. Like Kirsty I'm interested in all things marine and can often be found down at Whangapoua estuary with my kids searching for marine critters!

What are your favourite marine mammals?

Sarah

If I had to choose only one species (which is very difficult as they are all amazing!), probably

the false killer whales (*Pseudorca crassidens*) that are so unique and to this day we still don't know where they go when they are not in New Zealand coastal waters between June and November so if you see them please call 0800 FAR OUT. There are other fascinating less frequent visitors to the oceans and bays around Aotea such as the killer whale/orca (*Orcinus orca*), humpback whale/paikea (*Megaptera novaeangliae*), and blue whale (*Balaenoptera musculus*). Whenever I hear that one of these species is in the vicinity, I race down to Port Fitzroy to observe from shore or boat out to sea to watch and record the behaviour of these wonderful creatures of the ocean. Of course, for their safety (and ours) we need to know, and stick to, the rules and regulations⁴.

The coastal orcas are constantly on the move and often cover up to 150 km per day feeding on rays and sharks. The humpbacks that pass by Aotea are usually moving between their summer feeding grounds in Antarctica and the winter calving and breeding grounds in tropical waters. Most pass through Cook Strait but some travel along the east coast. The blue whale is a less frequent visitor but is occasionally sighted in the Gulf in the triangle circumscribed by Te Hauturu-ō-Toi/Little Barrier Island, Mokohinau Islands and Aotea/Great Barrier, which is a productivity hot spot in the outer Gulf⁵. There is also the pygmy blue whale (*Balaenoptera musculus brevicauda*), which is a smaller sub-species of the blue whale but looks almost identical. It has a distinctive sound that distinguishes it from the blue whale. We know



Photo: Sarah Dwyer

False killer whale with fish in Doubtless Bay, Northland.

very little about their population numbers and what they feed on while in the Gulf.

Kirsty

I agree with Sarah that all marine mammals are incredible. While it's a bit mainstream, I do love dolphins. They're such excitable, intelligent and social creatures that you can't help but scream with excitement and smile when you see them. As a surfer of 30 years, I've had some amazing interactions over the years and I can certainly see why you need to keep a respectful distance, as a one tonne blubber bullet flying through the air can cause some serious damage!

Near Aotea's shores we also see Brydes (pronounced broo-dus) whales, which I always think of as elusive, private types. The Hauraki Gulf is home to a resident population of these ocean giants with about 50 individuals that almost exclusively use the Gulf, and about another 100 that pop in and out. Last summer we had a Bryde's whale blow a bubble curtain underwater which brought up a wall of bubbles to the surface. This is a technique they use to disorientate and manoeuvre prey during feeding. While not a cetacean or mammal, just off the west coast of Aotea is Aotearoa's oceanic manta ray hotspot. Searching for mantas and accidentally finding marine mammals makes for epic summer days.

New technologies must be having a big impact on your ability to study the behaviour of cetaceans?

Sarah & Kirsty

Probably the biggest technological advancement that has helped study behaviour has come from the use of drones. These have been

a game changer world-wide in studying the behaviour of marine mammals. While drones can provide a terrific visual perspective of population behaviour, you can only ID individuals by being on boats to capture images of dorsal fins. There are also some amazing AI tools that can be employed through drones to identify with high probability the species in the ocean. Internationally, researchers are using drones, affectionately named 'Snotbots' to collect samples from a whale's blow. So there is some terrific technology that has dramatically improved our knowledge of these marine species.

These new technologies can also be a new threat or risk that needs to be managed, and the legislation is often unable to keep up with the rate of change with technology. For example, drone use around marine mammals is regulated as per other aircraft and a permit is required to deviate from that. The current regulations require drones to be 150 m from any marine mammal. More guidance can be found on the DOC website⁶.

What is the role of DOC in protecting cetaceans?

Kirsty

While there are several bodies, including Auckland Council and Ministry for Primary Industries (MPI), involved in protecting the habitat and marine fauna in the Gulf, DOC has a very specific regulatory role under the Marine Mammals Protection Act (1978), which provides for the conservation, protection, and management of marine mammals⁷. A permit is required for anyone to 'take' (kill, injure, harass, disturb etc) a marine mammal but this regulation also ap-



Photo: Sarah Dwyer

Orca tailing at Port Fitzroy, Aotea.



Photo: Sarah Dwyer

Blue whale off Miners Head, Aotea .

plies to any 'intervention' such as might be involved with marine research. The Act also provides for the establishment of marine mammal sanctuaries, of which there are just seven in New Zealand, with none in the greater Gulf area. We also administer the Marine Mammals Protection Regulations (1992), which were developed to manage whale and dolphin watching tourism⁷. Commercial tourism of this kind is not large in the Gulf but it may grow. However, there is quite a lot of commercial filming (e.g. BBC) where a permit is also required. Once issued it is our job to ensure there is compliance with those permits. Moratoriums can be placed on marine mammal tourism in certain areas to restrict the number of commercial operators with permits and keep the impact on the animals lower.

The Marine Mammal Regulations also provide rules on how the general public should behave around marine mammals when on the water to reduce the risk of stress or injury. For example, you should slow down to five knots within 300 m of any marine mammal and there should only be three boats in this vicinity at one time. The rules are stricter for whales (including orca and pilot whales) which keeps both us and the animals safe. In these cases, you must not approach within 50 m or swim with the animals. Other regulations to know about when on the water can be found on the DOC website⁸, or contact marine@doc.govt.nz for a brochure, poster, or sticker.

Voluntary protocols are also a great way to protect the marine fauna. Scientific research by

the University of Auckland showed that Brydes whales spend 90% of their time within 12 m of the surface making them vulnerable to vessel strike from ships entering and leaving the Gulf. Research overseas had shown that ship strikes on the Northern Atlantic Right Whale off the eastern seaboard of the USA and Canada was successfully reduced through establishment of speed restrictions and establishment of vessel avoidance areas. The latter was not seen as a practical solution in the Gulf as the small population of Brydes whales, estimated at less than 200 individuals, are distributed throughout. So the most effective means of reducing strikes was identified as being a reduction in the speed of vessels. With the cooperation of several bodies a Voluntary Protocol was established in 2013 with three key elements⁹: (i) a reduction of vessel speed to 10 knots whilst in the Gulf, (ii) keeping a watch for whales with binoculars and (iii) reporting any sightings of whales to the Harbour master. There have been no known whale strikes within the Gulf since that time. This is a great example of the importance of research informing specific protective measures and collaboration.

Sarah

We are also responsible for dealing with beached whales. We work closely with Project Jonah and at least 30 people on the island are trained on how to respond to marine mammal strandings. Given marine mammals are precious taonga there is very close engagement with mana whenua to ensure all strandings follow strict tikanga protocols. There are different protocols for different species so it is really

important to have that close relationship with iwi. There have been three major mass stranding events in recent times, including ~13 sperm whales at Okupu in 1972¹⁰, ~400 pilot whales at Kawa in 1985¹¹ and nine Gray's beaked whales at Whangaparapara in 2020. But there have also been a number of single whale beachings, including a pygmy sperm whale at Okupu in 2017, a Brydes whale at Awana in 2003 and a Brydes whale at Okupu in 1986. We hear a lot about the dire state of the ecological health of the Hauraki Gulf.

What are the major threats to Cetaceans in the Gulf?

Kirsty & Sarah

Probably the biggest threat to cetaceans in the Gulf are humans and their activities. Availability of sufficient food is crucial for maintaining viable whale and dolphin populations even if the Gulf is just a stopover point for mammals passing through. While we have a lot of information on what species they eat and where they occur¹², there are some major knowledge gaps on population levels of species such as anchovies and pilchards, which are the staple of many of these cetaceans¹³. Talk to any old fishermen around the Gulf and they will tell you there has been a dramatic decline. Climate change is one of the biggest threats with a lot of uncertainty as to what the future will look like. The warmer seas will not be favourable for some of the current species, but we may see increased numbers of species that favour these warmer temperatures. Microplastics are a relatively

new but very important issue for marine mammals. One study has shown that there were four times the levels of microplastics in the whale gut compared to the sea environment because of the accumulation effect of the different trophic levels of feeding¹⁴.

Another issue we are just beginning to understand is the disruption to the behaviour of marine fauna in response to noise. There is a growing body of evidence showing that vessel noise is highly invasive and audible to nearly all marine animals including fish. The two-month nation-wide lockdown provided scientists with a unique opportunity to study how human activity may affect wildlife. Dr Craig Radford (University of Auckland) and colleague Matthew Pine (University of Victoria, Canada), used this 'silent' window of opportunity to investigate the impact of vessel noise on the behaviour of bottlenose dolphins in the Gulf¹⁵. This study generated strong evidence that small vessels, where there are so many of them in the Gulf, directly affect sound levels in the ocean, and have an impact on dolphin behaviour¹⁶. The quieter noise levels meant that the communication range for dolphins more than doubled. There is also the problem of boate behaviour such as bringing their boats too close to marine mammals or engaging in reckless behaviour such as driving their boats through a pod of dolphins^{17,18}. While we need a licence to drive a car that is not the case with a boat so a lot more work needs to be done educating boaties about how they can minimize their impact on marine fauna, especially within the



Photo: Sarah Dwyer

Bryde's whale mother and calf off SW coast of Aotea.

Gulf, and how they might help to protect it. A lot of different tools are needed to protect the marine environment and sometimes it just takes time for the appropriate legislation or regulations to be enacted by Parliament. Greater education of the public and self-regulation are important ways we can help.

How do you think AGBET can help?

Sarah

One of the key ways you can help is to promote the use of iNaturalist. This is much better than reporting on the Barrier Chit Chat Facebook site. In iNaturalist you immediately become connected with experts throughout the world and the post becomes a permanent record for others to refer to. It can serve as a one stop shop or clearing house for information on our local environment. Two good examples of postings recently that generated quick responses were the reports of myrtle rust on pohutakawa in Tryphena and *Caulerpa brachypus* in the sea at Okupu. If the community posts observations of cetaceans on iNaturalist, such as a photo of a fin, there will be fast feedback of what

the species is and possibly even which population it belongs to. This citizen science is so important for conservation. Many of the locals on the island are well connected with the environment and are very observant. Tapping into that local knowledge would help fill many of the gaps that we (DOC) are unable to cover.

It's also great to see the increased focus on the plight of our marine waters as so often what is out of sight is out of mind. Keep up the good coverage in your newsletters of what's happening in our marine environments.

Kirsty

Becoming familiar with the marine mammal regulations and sharing our coasts responsibly will allow us all to enjoy our waters safely and thrive. Let marine mammals choose how they want to interact with you, rather than forcing it on them which can interrupt important behaviours such as socializing, feeding, and resting. Share the message to let others know the rules and report anyone seen harassing animals. **Call 0800DOCHOT to report harassment or injured or stranded animals.**

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Toropapa - the fragrant delight hidden in the forest

LARA SHEPHERD (Museum of New Zealand Te Papa Tongarewa)

Have you ever been walking through the forest and been delighted by a strong floral perfume? You may have walked near a flowering toropapa bush. Toropapa is a genus of small shrubs found in New Zealand. Their flowers are among the most fragrant of any New Zealand plant and their scientific name (*Alseuosmia*) means 'perfumed grove', which is very apt! Unfortunately, they are very difficult to cultivate; otherwise, I'm sure they would be a popular plant for the home garden.

Five species of toropapa are currently recognised¹. However, several of the species have extremely variable leaves. This has made it difficult to determine both the number of species and the boundaries between them, and is currently being researched by botanists at Te Papa.



Top: The stunning flowers of *Alseuosmia macrophylla*. They not only look beautiful but are also very fragrant. Bottom: Typical *Alseuosmia quercifolia*. The red leaf stems and white central vein of the leaf is distinctive for this species.

Perhaps, the most interesting feature of toropapa is that the leaves of some forms appear to mimic unrelated plant species, such as horopito, ramarama and red matipo². The leaves of toropapa are palatable to browsers but some of the species they appear to mimic produce anti-browse chemicals. By resembling plants that taste awful, did toropapa gain protection from browsing by animals like moa, tricking them into thinking they were inedible?

Mimicry has been demonstrated in many animals but appears to be rare in plants. An elegant study by a student from Victoria University of Wellington^{3,4} recently provided the first direct evidence of this type of mimicry (defensive mimicry) in plants – using the toropapa species *Alseuosmia pusilla* and horopito, which it closely resembles. The student set up browsing experiments that showed farmed deer would quite happily eat toropapa if it was the only species present. But once

Photo top: Jaqui Geux; bottom: Lara Shepherd

the deer had eaten horopito, with its peppery taste, they were less likely to eat toropapa.

Three species of toropapa occur on Aotea: *Alseuosmia macrophylla*, *A. quercifolia* and *A.*

banksii. Toropapa prefers to grow under a forest canopy in shady, moist habitats so keep an eye out for them on your next bush walk (or follow your nose during late winter and spring, when they are flowering).



Photo top: Lara Shepherd; bottom left : Peter de Lange; bottom right: Lara Shepherd

Top: This form of *Alseuosmia banksii* resembles *ramarama* (*Lophomyrtus bullata*). Bottom left: This form of *Alseuosmia banksii* resembles *red matipo* (*Myrsine australis*). Bottom right: This form of *Alseuosmia banksii* resembles *tawheowheo* (*Quintina serrata*).

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Rare Plants at Awana, Great Barrier Island

BARRY SCOTT

As you travel north past the entrance to the Awana campground you drive alongside a road edge that is covered with an unstriking mixture of mānuka, *Coprosma propinqua*, swamp ribbon wood, rushes and sedges, kikuyu and a range of other weeds. So you could be forgiven for not realizing this small esplanade strip is a special habitat for two rare New Zealand native plants. If you stop and walk along the road edge you will find the rare dwarf mistletoe (*Korthalsella salicornioides*) growing on the exposed branches and branchlets of the mānuka. If you climb over the fence and look among the manuka you will find small patches of the rare ground plant, *Leptinella tenella*. But tread carefully! Although a relatively neglected area, in the words of Jeremy Warden “This is an ecologically significant site that needs considerably more protection and restoration.” Both plants are at risk primarily because of habitat destruction.

Korthalsella salicornioides is one of three endemic species of *Korthalsella*, also known as Pygmy Mistletoes, found in New Zealand¹. It is classified as ‘Threatened – Nationally Critical’ by the New Zealand Plant Conservation Network (NZPCN). The Māori name for this mistletoe is piritā². All are hemiparasitic as they still have chlorophyll so can photosynthesize even though they extract nutrients from their host. They colonise their host by way of haustoria (modified roots) that encircle the stele of the host. They break out through the bark to form the visible aerial tissues. *K. salicornioides* is distinguished from *K. clavata* and *K. lindsayi* by its highly segmented, circular aerial tissue. It forms a dense mass of green to reddish-yellow beaded succulent stems and lacks true leaves. The genus is named after the Dutch botanist, Pieter Willem Korthals, and the species by the resemblance to the common glasswort (*Salicornia europaea*), a segmented succulent dicot that grows in salt marshes and on beaches. Although *K. salicornioides* has been reported on up to 26 taxa, 96% of the total records are from mānuka (*Leptospermum scoparium*) and kānuka (*Kunzea ericoides*)³, suggesting it is highly host specific. Flowers are borne at the tip of the internodes in the axils of rudimentary leaves and are just 0.4 to 0.7 mm across in size.



Korthalsella salicornioides growing on mānuka at DoC managed land at Awana, September 2022.

They form tiny transparent oval berries that contain a sticky seed that is forcibly ejected once mature.

Leptinella tenella/delicate button daisy (Asteraceae) is a small creeping herb that usually grows on stream margins where they enter estuaries⁴. Growth of this ‘Threatened – Nationally Vulnerable’ species is favoured on sites that are kept open through periodic disturbance

Photos: Barry Scott

from high tides and flooding⁴. It is intolerant of too much shading and competition from grasses such as kikuyu. The open mānuka/rush/sedge vegetation of the Awana stream margin is therefore ideal for the growth of this rare plant. The bright green finely toothed leaves are a very distinctive feature of this herb. The plant is monoecious (separate male and female flowers on the same plant). In order to protect the habitat of this species a section of the Awana esplanade reserve land was fenced off in 2014 by Council to prevent livestock access to the stream⁵. A program of weed control was also carried out, especially control of kikuyu which is highly invasive and will readily out compete most native plant regrowth. A survey of the fenced off area with Jeremy Warden (Auckland Council) and Thomas Daly (Envirokiwi) in September of 2022 found that *L. tenella* was flourishing in large patches of growth among the twig rushes, *Machaerina juncea* and *M. articulata*, that were surrounded by a sparse canopy of manuka, *Coprosma propinqua* and swamp ribbonwood (*Plagianthus divaricatus*), highlighting the value of the fencing and weed control. However, there are still large fenced off areas at this site in need of further weed control and plant restoration to protect this rare herb and the dwarf mistletoe.

To further protect and help restore this site, this last winter I initiated a project of weed control and native planting on the Council esplanade strips at the northern and southern end of this site. Mexican devil and a number of other weeds have been removed and seedlings of mānuka, cabbage trees and flax planted. Enrichment of these sites with *Coprosma propinqua* and swamp ribbonwood (*Plagianthus divaricatus*) is needed so seed of both have been collected and sown with the hope they germinate this year. It is surprising that neither species is available on the island given how important they are in the estuaries across the island. However, there is still one large area of land that is DoC managed that would significantly add to the area under protection. Up until this last winter the site has been regularly

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Photos: Barry Scott



Leptinella tenella growing at Auckland Council esplanade at Awana, September 2022 and December 2020.

grazed with cattle but I now have agreement from the owners of the cattle to cease grazing to allow restoration of this site. A survey of this site identified large patches of *L. tenella*, although significantly trodden and weedy, as well as some of the finest specimens of *K. salicornioides* (see photographs) on the remnant mānuka. Planting of this paddock will hopefully help protect these two rare plant species and maybe provide additional habitat for the threatened pāteke.

Phase two predator control for Oruawharo Bay

RAOUL STUART (Chair of Oruawharo Medlands Ecovision committee)

Aotea/Great Barrier Island is home to a number of taonga bird species that need protection from introduced predators. In the Oruawharo Medlands area these include pāteke/brown teal, mātātā/fernbird, matuku hūrepo/Australasian bittern and moho pererū/banded rail. In addition, there are numerous other bird species, lizards and freshwater fish species whose habitat is in need of improvement or restoration.

Oruawharo Medlands Ecovision (OME) is a local volunteer community group formed in late 2018 to restore and protect the ecology and biodiversity of the Oruawharo Bay area of Aotea/Great Barrier Island. (Go to <https://www.omeaotea.co.nz> for their new web page) In 2019 they received funding from the Aotea Local Board to commence a Phase 1 project to trap predators in the Medlands beach area and to begin a replanting programme as outlined in their project plan and feasibility assessment¹.

The key objectives were to:

- Reduce rat numbers
- Increase bird numbers
- Seek visible community engagement

Following the initial feasibility study, OME was successful in securing three-year funding from

the DoC Community Conservation Fund to restore the Medlands Wildlife Management Reserve, which consists of the wetland between the main road (Medland Road) and the houses of Sandhills Road to the north as well as the riparian, DoC managed strip along Oruawharo Creek, to the south.

This resulted in the project area covering the catchments of both streams that flow into Oruawharo Bay. Since award of those grants, OME has been busy trapping rats, mice and feral cats, monitoring and controlling introduced pest plant species in the wetland, replanting as well as undertaking quarterly Waicare monitoring of the water quality in both creeks. The ongoing Phase One project involves extensive trapping throughout the dunes, reserves and wetlands of Oruawharo Bay, employing snap traps in protective wooden boxes to catch rodents, and larger wire traps to live-catch feral cats.

Since initiating the project there has been very good community engagement. A regular group of volunteers turns up for a weekly working bee in the wetland and there has been good uptake of rodent traps from the Aotea Trap Library by residents on private properties around Medlands. When the first survey was carried



Photo: Lotte McIntyre

Pāteke in Oruawharo/Medlands wetland pond.



Photo: Lotte McIntyre

Oruawharo/Medlands wetland looking west toward Medland Road and the ridgeline.

out in 2019, 31 properties were recorded as carrying out pest control but now, in 2022, 80 properties are involved. But the downside of private trapping is traps are only checked when people are in residence.

However, use of tracking tunnels to assess the presence of rodents has revealed that localised household trapping has not had sufficient impact on local rodent populations to provide good protection for the local bird life². Results showed that although over 4,000 rodents have been caught since trapping started there were still relatively high rodent densities. The study also highlighted that mice are a bigger problem than was initially considered, especially in the Muehlenbeckia covered dune systems. The overall conclusion was that rodent numbers followed seasonal trends rather than any obvious decline from regular trapping. One likely cause for the low impact is the current pest management area is confined to a long and narrow area that has a large boundary for re-invasion from outside.

OME are therefore proposing that the current trapping area be extended to try to reduce reinvasion into the current Phase 1 area with the prospect of greater biodiversity gains, including more birds, insects and reptiles, and better seedling survival in the regenerating bush. By joining up to the Windy Hill Sanctuary to the south of Oruawharo, where positive

biodiversity gains have been demonstrated, extending up to the western ridgeline and to the northern end of the beach towards Sugarloaf, we aim to create a bigger corridor of safer breeding sites and broader dispersal areas for fledged birds.

In line with those goals OME submitted a grant proposal this year to fund a feasibility study for Phase 2. This application was successful in receiving funding of \$26,880 in August 2022 from the Auckland Council's Community Coordination and Facilitation grant. This has meant we can begin a community engagement and project planning phase, looking to expand our pest management project to include private properties as well as more DoC and Auckland Council managed land in the valleys, growing the project area to cover an area of approximately 1,750ha. There are 235 separate titles in the project area of which 63 are over a hectare and will be the initial focus for Phase 2. The project will be overseen by a Phase 2 Working Group with specialist knowledge input from a group of Advisors.

Community engagement will occur in a step-by-step manner, that will gauge people's interest in being involved, through a face-to-face conversation based on a short questionnaire supported by an outline of the plan and how it might proceed. Once this work has been completed we expect to have a clearer picture

of how many properties will be included and where there might be any large gaps in pest management.



Photo: Jennifer Neads

A matuku hūrepo/Australasian bittern at Medlands wetland.

Using only snap traps in an area the size OME is proposing is neither cost effective nor feasible, as had been shown in the past from trials by Windy Hill Sanctuary. We will therefore need to deploy bait stations containing first generation

toxins such as diphacinone, in accordance with the best practice standards as is currently done in Windy Hill³. However, preferences of private landowners will have to be taken into account in our choice of tools that will be deployed. Another important issue will be access to private land. Some property owners might prefer to undertake their own pest management, which would be acceptable as long as trapping data is collected so that there are records for the whole of the Phase 2 area.

Given the tools for pest control are constantly evolving we will work closely with Windy Hill Sanctuary and with the Tū Mai Taonga project⁴ to trial or deploy new pest control methodologies. One exciting development is the AT220 self-resetting trap from NZ Autotraps that can be used at landscape scale⁵. These could prove to be a good option for bach owners who might wish to be involved in the project but prefer not to use toxins.

To enhance our engagement with the community we will soon be setting up a community hub in Medlands near the community garden. Funding for the hub building has been secured from the Aotea Great Barrier local board and will soon be installed. This will give OME a physical presence



Photo: Lotte McIntyre

An OME volunteer group: Kim Bannister, Raoul Stuart, Jennifer Neads, John Ogden, Frances McClure and Margaret Jemmett .

in

the area to store tools and equipment, and be a one-stop-shop for the community to visit and hear first-hand about current restoration projects, why they are being carried out and how they might be involved.

Outcomes

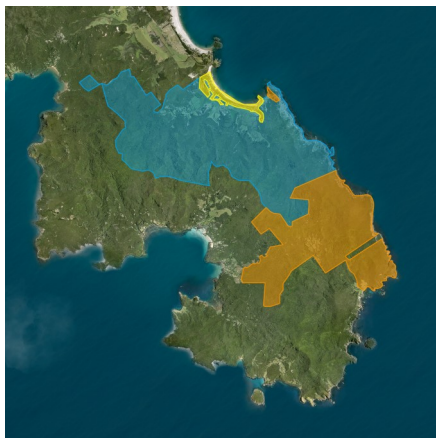


Photo: Hannah Smith and Shaun Lee

Map showing current phase 1 at Oruawharo Medlands Wetland (shaded in yellow) and proposed phase 2 (shaded in turquoise) areas, together with Windy Hill Sanctuary and 'satellite' region (shaded in orange). Base map by Shaun Lee using data captured for Auckland Council by AAM NZ Ltd.

The desired outcomes for OME Phase 2 are the same as those determined from the outset of OME's first feasibility report for Phase 1 i.e. reduced rat numbers, increased bird numbers and visible community engagement, at the top of the list. The difference with the current Phase 2 project is one of scale and increased participation of landowners and other conservation groups, moving the project from working only on public land to also include private property. In November 2022 we started baseline rat monitoring and will continue to monitor quarterly in synchrony with the other sanctuaries and projects on Aotea. We hope to

show that the anticipated reduction in rodent densities over time will be the direct result of the work being carried out.

We see OME Phase 2 as a collaboration with Tū Mai Taonga who have major funding from PF2050 and DoC Jobs for Nature to eradicate feral cats and significantly reduce rats in the northern blocks of land that comprise Te Paparahi with a long-term plan to eventually roll their programme further south. It will be several years before they reach Oruawharo Bay and beyond. By starting the landowner engagement phase and baseline monitoring now, followed by pilot trials and more extensive predator control in the Oruawharo Bay area, we hope to have laid a lot of the ground work to seamlessly merge with Tū Mai Taonga as it extends to the southern end of the island.

Conclusion

The Phase 2 project proposal is born out of a desire to help Aotea become predator free sooner rather than later. We see this as possible through collaboration between all organisations and individuals involved, Tū Mai Taonga, Iwi, DoC, Auckland Council, sanctuaries, community groups and the wider community. Having this very visible pest control project operating in a residential area and along walking tracks is a window into the conservation process and will help promote the benefits of intensive pest management as a pathway to eventual eradication.

Acknowledgements

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Rat pilot trials on Waiheke Island

STEVE COOK (Communications Manager, Te Korowai o Waiheke)

The Korowai o Waiheke is a charitable trust established by the local community with the aim of making Waiheke the first predator-free urban island in the world. An island-wide stoat eradication has been running since February 2020 and there are strong indicators that the programme is already making a difference to the island's ecosystem, with exploding kākā numbers and recent sightings of kākāriki.

The second phase began in 2022 with rat pilot operational trials taking place at three different island locations. Waiheke is a diverse island - from the residential west to the rural east, and everything in between. It is therefore crucial that technical and social factors are tested across a wide range of different environments and habitats to develop a plan to eradicate rats from the whole island.

The first trial completed was in Rocky Bay, in collaboration with the local rat control group 'Rocky Bay Ratbusters'. The objective was to gain a deeper understanding of rat behaviour around bait stations and the effectiveness of servicing the bait stations at different intervals. Over 275,000 images were collected from the 86 trail cameras during the trial. It was found that community rat control was able to

dramatically reduce rat numbers within just two weeks of deploying bait and that weekly servicing does not further improve control outcomes compared with a quarterly pulse.

The next trial was in Ostend - a complex urban area including a Resource Recovery Park, storage facilities, cafés, a primary school, industrial businesses, wetlands, and mangroves. The main objectives were to determine at what scale and density eradication tools would have to be deployed and to develop tools that could be used in wetlands and mangroves. The trial was successful in completely removing rats from the area, using a 25 m x 25 m grid of bait stations. It also resulted in a new innovative floating bait station to use in mangroves, thanks to team leader Phil Salisbury. This proved effective for the duration of the trial.

The last trial was in the residential area of the Kennedy Point peninsula. It covered 30 ha and contained a network of 500 traps. The main objective was to test whether rats could be completely removed using traps alone. Over the trial period, there were 12,300 trap services and 650 rats were caught. However, tracking tools and traps showed that some rats remained and there was evidence of breeding



Photo: Te Korowai o Waiheke



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Floating bait station used in mangroves.

all year round, demonstrating that although traps can control rat populations, they are not an eradication tool.

All rat trials as well as the stoat eradication project demonstrated a clear need for community engagement and support. This ranged from the willingness to host traps and

bait stations on private property to the practical help of volunteers. The community has also been the eyes and ears of the project with the majority of recent stoat catches resulting from people reporting sightings.

It takes a village to protect our wildlife.



Photos: Te Korowai o Waiheke

Top: Kennedy Point Team Leader Owain Tanner (left) demonstrates trap setting to Chris Anderson and Horst Meyer ahead of the operational trials. Bottom: Markus Gronwald talks to community group about trapping operations on Waiheke.



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