



# MAKETU ONGATORO WETLAND SOCIETY

## ANNUAL REPORT 2022



**TECT**  
**COMMUNITY**  
**AWARDS 2022**

Maketū Ōngātoro Wetland Society  
Sustainable Future Winner

# Chair Report

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Any business, any organisation, is only as strong as its people and MOWS is no exception. I am really pleased at how well we have progressed this year, our team of Jenn Sheppard, Laura Rae, Awhina Awhimate and Raven Nicholas, with Janie Stevenson running our education programme has worked wonders. Any concerns I might have had that things would turn to custard as I pulled back from my operational role have been well and truly dismissed. Thank you team!

Last year I outlined how we had grown and now had four full-time employees plus Janie Stevenson running education. While I have enjoyed stepping back, I was also surprised at how much administration still landed on my desk. The big surprise of the year was Jenn announcing that she was expecting a second child and would be taking maternity leave from August 1st. While our workforce is fully capable of the work that needs to be done, there is still the need for a bit of direction.

At the end of the summer, we decided that we needed to bring someone else on board, at least during Jenn's absence. In July we brought in someone to help, who already knew quite a lot about our projects. Sadly, it did not work out, so we are back at the drawing board. We are now essentially treading water until Jenn returns in February. Not an ideal situation, but this is a very long-term project, and we have to expect hiccups along the way. I have no doubt that we will find the right solution.

You can read in this report how well all of our projects are going, while I think the jewel in our crown is the colony of tarapunga, or red-billed gulls on Maketū Spit. This has increased in size every year since 2012 and is now probably the largest contiguous colony of this species in the North Island. This is particularly significant when the species is classified as 'At risk – declining'. Other success stories are the Waihi Harbour Wetland where we have matuku or bittern, banded rail, spotless crane, fernbird and a great flock of royal spoonbill; the Te Huauri o te Kawa Wetland on the Kaituna which is developing into a really good educational facility, and our latest quite modest project, the Pukehina Esplanade Reserve which was previously weed-infested and impassable but is now cleared and starting to become an important ecological part of the Waihi Harbour.

As I said last year, the rescuing of our environment is a hugely important, varied and challenging job. While we use volunteers wherever we can, and while much of the administration is done on a voluntary basis; the task is simply too large and complex to be done by volunteers alone, committed and skilled though many of them are. The fact that our work team are all tangata whenua means that we have a lot of support and respect in the community. While we love our volunteers, we really value our team. They are what makes MOWS special, and they will ensure that we continue to grow and that our local environment continues to improve.

Thank you to everyone involved, it is a privilege to work with you and to see the progress that we are making together.

Julian Fitter – Chair  
9 Sept 2022

**Cover photo: Little Waihi Estuary and Dotterel Point sand spit**  
**Credit: Andy Belcher - Legend Photography. [www.andybelcher.com](http://www.andybelcher.com)**



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# About Us

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## Our Mission

*To protect, preserve and enhance the natural environment*

Maketū Ongatoro Wetland Society (MOWS) was established in 2008 when members of the local community came together to protect the colony of New Zealand dotterel<sup>1</sup> that breed on the distal end of Maketū Spit.

Since then, MOWS has expanded and now the Society focuses on biosecurity and restoration at several ecologically significant areas in the western Bay of Plenty that extends from the lower Kaituna River to Waihi Estuary, including Maketū Spit, Newdicks Beach, Dotterel Point Pukehina, Waihi wetland, the Waihi Estuary Wildlife Management Reserve, and adjacent Pukehina Esplanade Reserve.

MOWS is comprised of four branches:

1. A biosecurity and restoration team of full-time employees and occasional contractors that carry out the Environmental Programme work and biodiversity monitoring at our key areas, as well as several contracts in the area and beyond. Volunteers assist with conservation efforts when needed.
2. A successful education program that is run by an education team of employees, contractors, and volunteers to deliver a range of ecology and conservation related topics to local schools.
3. A contract department that handles contract work on non-core projects which helps to provide additional funding for maintenance and other expenses.
4. A support team of committee members and volunteers who continue to guide the efforts of MOWS and assist with events and working bees.



**Some of our team (from left to right: Claire Hartley and daughter Arwen, Gary Williams, Maureen Burgess, Laura Rae, Julian Fitter, Awhina Awhimate, Raven Nicholas and a very hapū Jenn Sheppard)**

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<sup>1</sup> See Table 1 in the Appendix for English, Māori, and Scientific names and conservation status of birds

## **Our Aims**

***To support and encourage the conservation and restoration of the Lower Kaituna River, Maketū and Waihi Estuaries and their associated wetlands***

## **Our Objectives**

In alignment with our mission of protecting, preserving, and enhancing the natural environment, the primary objectives of the Maketū Ongatoro Wetland Society are as follows:

1. Protect, monitor, and ensure the breeding success of NZ dotterel<sup>2</sup>, red-billed gull, black-billed gull, variable oystercatcher and other native species on Maketū Spit.
2. Protect, monitor, and ensure the breeding success of NZ dotterel and variable oystercatcher on Dotterel Point, Pukehina.
3. Protect and monitor populations of migrant arctic and NZ shorebirds that use both estuaries, notably bar-tailed godwit, red knot, pacific golden plover, banded dotterel and royal spoonbill.
4. Enhance and improve visitor experience and sustainability of Newdicks Beach and Okurei Point, Maketū through dune protection, pest plant and animal control and planting natives.
5. Restore the natural biodiversity of the Waihi Estuary Wildlife Management Reserve with particular focus on critically endangered Australasian bittern, and at-risk spotless crane, marsh crane, banded rail, and fernbird.
6. Develop, organise, and execute a comprehensive mammalian pest and alien plant control program for our areas of interest.
7. Establish a comprehensive survey of the ecology of the region together with ongoing monitoring.
8. Expand our education programme to include as many local schools as possible.
9. Work with other local community groups to establish Bay Conservation Alliance with the intent of supporting, expanding and ensuring the sustainability of our conservation and restoration work.
10. Develop our science and monitoring programme to make best use of the data that we collect as a tool for developing improved management plans in the future.

## **Our Services**

We offer a range of services in environmental conservation, delivered by friendly, reliable, qualified, and experienced staff. Our services include:

1. Animal pest control
2. Pest plant control
3. Planting and plant maintenance
4. Ecological monitoring
5. Infrastructure, fencing and site maintenance
6. Community and school education

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<sup>2</sup> See Table 1 in the Appendix for English, Māori and Scientific names and conservation status of birds

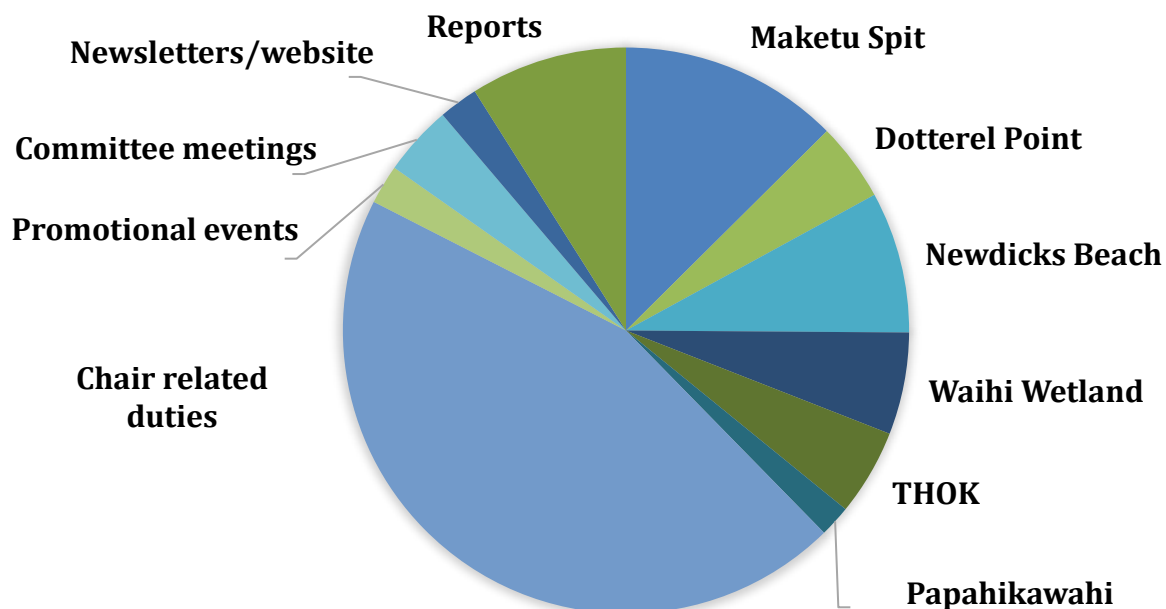
# Our Volunteers

We love our volunteers and acknowledge that without them, we would never accomplish as much as we do. They are integral to the Society and going forward we anticipate that volunteer hours will increase now that Covid-19 distributions have subsided.

Like most of the world, Covid-19 disrupted several of our planned volunteer days and community events, but over the past financial year, we still managed to host a few events when weather was favourable. Over the past financial year, we have some successful volunteer working bees including:

- 1 planting bee and 2 rubbish clean ups at Maketu Spit, which resulted in planting 875 natives and removing around 120 kg of rubbish
- 2 planting bees at Dotterel Point, which resulted in planting nearly 800 natives
- 1 planting bee at Newdicks Beach, which resulted in 50 natives planted

But our volunteers don't stop there. We have people who are eager to get out into the field to also assist with our ecological monitoring programme, undertake our animal pest control programme and participate in occasional workdays when required. Behind the scenes we have regular meetings with our volunteer-based committee as well as tons of administrative, reporting, and financial work. Where possible, our team attends promotional and educational-based events. Finally, we have all the other backend volunteer work undertaken by Julian, Gary and the rest of the MOWS teams. Combined, this past year we have clocked over 2400 hours of voluntary work – this equates to 60 weeks of full-time work!



**A breakdown of the 2405 volunteer hours accrued over the past financial year by MOWS staff and volunteers. Site-specific work includes working bees and other works related to the Environmental Programmes or site-specific projects.**

This year, a large Matariki event was hosted in Te Puke and our team members were more than eager to volunteer their time to attend the two-day event to promote MOWS so we co-hosted a display table with Coast Care. The first day was devoted to education and school groups. The focus was on sand dunes, with students learning about the birds that nest on the dunes, the mammals that threaten them and the plants that protect them. Then, students used sand and artifacts from the beach to create their own Matariki Star artwork. The second day was held for the public and the team was on site to provide information about our wonderful organization. We look forward to attending again in 2023.



**Awhina teaching youth about birds and their predators (top left); Laura and Awhina at public display (top right); MOWS display table (bottom left); Star artwork prepared by students using sand (bottom right).**

# Our Work

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The bulk of our work focuses on delivering four Environmental Programmes or EPs (previously referred to as Biodiversity Monitoring Plans; BMPs) supported by the Bay of Plenty Regional Council, Western Bay of Plenty District Council and the Department of Conservation. We also manage a fifth EP with Maketū Taiapure. Through these EPs, MOWS is mandated to deliver animal and pest plant control and ecological restoration and monitoring.

## **Maketū Spit**

Maketū Spit comprises 45 ha of coastal duneland that extends 3.5 km from the end of Ford Road/Kaituna Cut to the mouth of the Maketū estuary. The EP aims to restore the ecological integrity of the Spit as habitat for threatened species and to maintain its important coastal ecosystem function. The main objectives are to: i) maintain rodent populations to less than 5% detection rate via tacking tunnel index; ii) maintain mustelid and hedgehog density to zero around the breeding colony; iii) reduce pest plants to very low levels or zero densities; iv) continue environmental education programmes.



MOWS has undertaken biosecurity and restoration work at Maketū Spit for 11 years now! This past year, we erected a 4<sup>th</sup> predator fence located between the car park and the bridge to Papahikahawai Island. This fence will serve as the first defence for any mustelid, rodent, cat, or hedgehog that dares to venture down from Ford Road or the car park. We know from contract work at Te Pa Ika and Ford Island that rodent populations are still high in those areas and cats are regularly observed at both sites as well as the Spit car park (likely dropped off by members of the public who fail to understand the impact feral cats can have on our native birds and reptiles).

Over the past year, 950 workforce hours and 280 volunteer hours were spent working on Maketū Spit.

**Newly installed 4<sup>th</sup> predator fence at Maketū Spit (left)**

## **Flora**

Our battle on weeds will never end, but the team has been doing a fantastic job controlling pest plants at Maketū Spit, so you'll be hard pressed to find a weed that has survived long enough to flower. Tree lupin, purple and gravel groundsel, and dimorphotheca are the most abundant herbaceous weeds that occasional slip through our control, but they usually don't last too long.

This past year, we noted that lucerne has become very widespread in Area 1, which is problematic as it's a nitrogen-fixing plant that has potential to change the chemistry of the dunes themselves. The team spent several days hand pulling the weed and the Bay Conservation Cadets also assisted, but our impact felt minimal. Hopefully, we can tackle it earlier this year before it spreads too far. Also, we found Cape Smilax while doing vegetation surveys, another invasive vine-weed which we quickly removed.

In September, MOWS hosted a working bee alongside Coast Care and planed 875 additional plants along the estuary margin.



## Fauna

Birds continue to thrive and while the gull population has reached an all-time high, we do have concerns about the number of NZ dotterel that were observed this year. Check out the section on Ecological Monitoring for more in-depth discussions on avifauna.

Unfortunately, during construction of the new fence, the team spotted two rainbow/plague skink (*Lampropholis delicata*) – an introduced pest from Australia that had previously been brought to the Spit in pot plants but was thought to have been controlled and removed. Work is ongoing to rid this invasive pest from the area before they outcompete our native shore skinks.

For several years, we've had 18 DOC200's located along the three predator fences which transverse the Spit, but we added an additional 8 DOC200's to our fourth fence. During 784 trap checks, we captured 32 rats, 2 mice, 2 stoats, 2 weasels, and 2 cats. In addition to targeting rats, hedgehogs and mesocarnivores, we also target mice using bait stations which are set out consecutively for three weeks through each area of Maketū Spit during the winter. Tracking tunnel detection rates of mice dropped dramatically over the operation, and only 1 rat was detected during pre-bait operations in Area 1 (Table 1).

**Table 1 – Percent detection of mice as determined from tracking tunnels deployed before and after a three-week bait station operation at Areas 1-3 on Maketū Spit during July-Sept 2021.**

	% Detection of mice	
	Pre-bait	Post-bait
Area 1	90%	3%
Area 2	41%	0%
Area 3	16%	3%

## Dune Profiling

Each year, in conjunction with the Regional Council, we measure the profile (slope and shape) of the dune at its narrowest point. Work is done quarterly and has been on-going since 2015. In May 2022, Darryn Hitchcock (Environmental Data Officer, BOPRC) reported that volumes remained the same as previous surveys, but the estuary edge has retreated 0.25 m compared to last year. Photopoints taken this year at our vegetation transects certainly highlight the estuary erosion over the last few years.



**Photo point illustrating erosion on Maketū Spit since Dec 2015 (left photo) and Apr 2022 (right photo).**

## **Dotterel Point**

Dotterel Point, Pukehina is a coastal dune that extends from the surf club at the end of Pukehina Parade to the mouth of the Waihi Estuary entrance. The EP aims to restore the ecological integrity of Dotterel Point as habitat for threatened species and to maintain its important coastal ecosystem function. The two main objectives are to: i) promote indigenous vegetation and control and eradicate pest plant species; and, ii) provide ongoing breeding success of the native plants and animals including NZ dotterel, variable oystercatcher and shore skink.

2021/2022 was the 8<sup>th</sup> year of work under this EP. The biggest challenge with this area over the past year was erosion and fencing. Frequent large storms continuously battered the semi-permanent fence in the breeding area to the point where repairing it was futile until the erosion ceased. Thus, we fixed what we could in November, erected some temporary fencing and waited until March before we repaired and re-positioned the semi-permanent fence once again.

Over the past year, approximately 400 workforce hours and 100 volunteer hours were spent on Dotterel Point undertaking biosecurity, restoration, monitoring, and planting.

### **Flora**

The floral situation has changed very little since last year. African ice plant, montbretia, tree lupin, yucca, oxalis, sea couch, inkweed, moth plant, wattle, Indian doab, and pampas continue to present problems in the area and the team constantly battles these weeds.

MOWS and Coast Care teamed up to undertake two planting working bees. The first was in July 2021 with the Bay Conservation Cadets who planted 300 plants in the breeding area and the other in June 2022 where volunteers planted 480 plans along the estuary margin.

### **Fauna**

Similar to reports from Maketū Spit, we do have concerns about the number of NZ dotterel that were observed this year and the section on Ecological Monitoring details this information further.

This was the first year where animal pest control was carried out throughout the entire year. In past years, mammalian presence hasn't been high enough to warrant an ongoing control programme, but decreasing skink populations detected in 2020/2021 promoted us to revisit control efforts and install 24 permanent DOC 200's which have been checked fortnightly for the past 16-18 months.

Percent detection of mice on tracking tunnel cards was 36% in October. During 559 trap checks, we captured 39 mammals (9 hedgehogs, 21 rats, 6 mice, 1 stoat, 1 cat, 1 rabbit).



**Sand depth pole from 2008 that was uncovered during erosion this past year (top left); the resultant dune profile following erosion (top right); the team uncovering the fence following erosion (bottom left); overlooking Dotterel Point (middle right); working bee volunteers (bottom right).**

## **Newdicks Beach**

Newdicks Beach is an area of coastal cliffs, dune and beach located east of Okurei Point, Maketū. The protection area runs from the Newdicks Beach car park along the cliff bay to the mouth of Waihi Estuary. 2021/2022 was the 7<sup>th</sup> year of the EP for Newdicks Beach. Specific objectives of this EP include: i) protecting indigenous vegetation on the dune system through control and eradication of pest plants and addition of native plants; ii) involving the Maketū community via education, awareness campaigns and volunteer days; and, iii) securing the native biodiversity contained within the site from extinction.

During this past year, approximately 300 workforce hours and 180 volunteer hours was spent at Newdicks Beach.

### **Flora**

Boneseed has been the biggest issue in regard to pest plant control for the past few years now, and this is often our main focus. However, moth plant, blackberry, gorse, dimorphotheca, pines, cactus and a range of grasses are also our primary targets.

MOWS and Coast Care teamed up to undertake a working bee this past May and planted approximately 500 plants along the edge of the dunes and coastal cliffs. A seal was basking in the dunes at the time, so we had to adjust our positioning and plans to accommodate the visitor.

### **Fauna**

Thanks to volunteer Tiffany Randall, this was the first year that a comprehensive breeding bird survey was carried out at Newdicks Beach. Results can be found in the Ecological Monitoring section but suffice to say that no breeding dotterel or oystercatchers were observed.

Mammalian control continued under the watchful eye of Carolyn Symmans who undertook around 630 trap checks over the year and captured 35 animals (27 rats, 4 hedgehogs, 2 weasels and 1 cat).



**Volunteers working hard at a recent planting working bee at Newdicks Beach.**

## **Waihi Wetland**

The Waihi Estuary Wildlife Management Reserve is a 45 ha DOC wetland located on the south side of Waihi Estuary. It is identified as an Indigenous Biodiversity Area A, which is the highest status available in the BOP, and also a Significant Ecological Feature for Western Bay. Our main objectives here are to: i) maintain or increase native bird populations in the saltmarsh area through animal pest control; ii) facilitate regeneration of indigenous vegetation through pest plant control; iii) maintain indigenous dominance of vegetation in the saltmarsh; iv) restore riparian and white spawning habitat within the Wharere Canal marginal strip.

The reserve is divided in two by the Pongakawa Stream. The eastern section is a saltmarsh backed by a stopbank, while the western section has a freshwater wetland to the south separated by a low causeway for the saltmarsh to the north, with stopbanks on either side.

MOWS has been undertaking restoration work at Waihi Wetland since 2015. This past March, the team undertook a massive rubbish removal that was predominately focused on the estuary margins of Waihi East. Using two punts, they collected nearly 300kg including several families of decoy ducks, swans and two chairs! We also found time this year to erect an information sign at the wetland, this is something that was commission back in 2018, but has taken us a bit of time to sort and finally print and place out in the wetland. It will serve to provide future visitors with information of the site for years to come. Finally, in June, Waihi Wetland was the subject of a site visit by numerous local MPs who visited the MOWS team in the field to learn about the hard work and mahi that has occurred over the years.

During 2021/2022, employees and volunteers spent around 725 and 130 hours, respectively, working at the wetland to maintain biodiversity through pest control and maintenance.



**The newly erected information sign (top left); a recently repaired predator fence (top right); one punt load of rubbish (bottom left) and a bittern in the middle of the causeway at Waihi West (bottom right).**

## Flora

Pest plant control continued as usual this year and the team focused most of their time on removing gorse, bramble, wattle, pampas, inkweed, lupin, cow cress, hemlock, glyceria and honeysuckle. We are pleased that the *Bolbochnesus* planting we undertook during the past few years appears to have been successful, particularly following the removal of sea couch.

Most recently, our focus has shifted to successional planting as the plants that were planted in 2015 and 2016 are now well-established and time has come to move to the next phase of the project. With advice and guidance from Wayne O’Keefe from Bay Conservation Alliance, the team planted karaka, puriri, kahikatea, and manono in the light windows of the now, well-established, nāgio.

## Fauna

Thanks to funding provided by Western Bay Community Matching Fund and volunteer Reuben Aikman, MOWS was able to carry out the first breeding bird survey at the wetland this year (results in the ecological monitoring section). The team also volunteered to participate in bittern monitoring alongside DOC in November and this year will coordinate the bittern monitoring programme so DOC can focus their efforts on other nearby wetlands.

As explained in the Ecological Monitoring section, we were disheartened to discover rainbow/plague skink had managed to invade the western side of the wetland. At present, it appears their population is not well established and still sparse, but it’s only a matter of time before their numbers increase and we see them regularly, as is already the case on the eastern side. However, we were more than ecstatic to discover the presence of copper skink during our annual skink monitoring programme (more details in ecological monitoring section)!!

The wetland is a hotspot for predators and during 862 trap checks over the year, we captured 179 animals including 1 cat, 2 ferrets, 16 stoats, 9 weasel, 28 hedgehogs, 9 possums, 1 rabbit, 89 rats and 22 mice



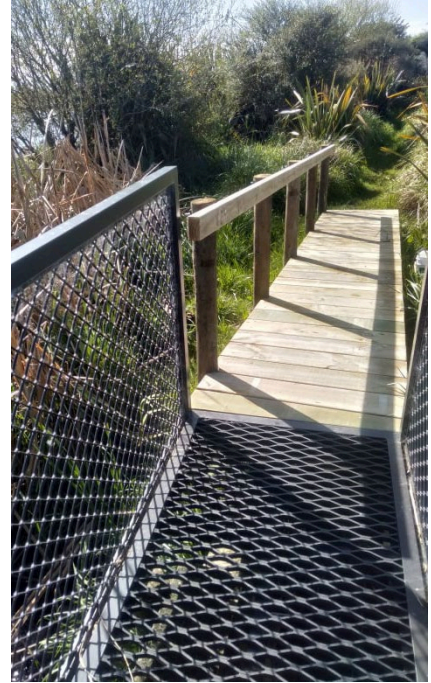
**MOWS team with local MPs during a recent visit to the wetland in June. Left to right: Raven (MOWS), Dr Liz Craig, Jo Luxton, Julian (MOWS), Laura (MOWS), Liz Craig, and Angie Warren-Clark.**

## **Te Huauri o Te Kawa**

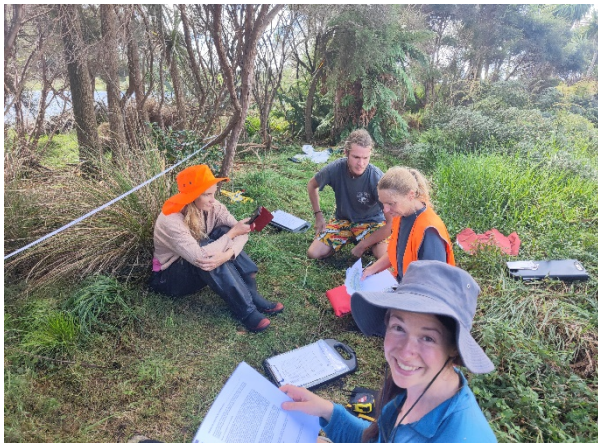
This is a Maketū Taiapure project developed by one of our longest serving members, Peter Ellery. We are in the third year of the EP at Te Huauri o te Kawa (formerly the Borrow Pits and By de Lay). The 7.5 ha wetland is a priority 2 biodiversity site due to inanga spawning habitat. The primary objectives of this EP is to: i) protect and enhance the inanga (*Galaxius maculatus*) population by maintaining and enhancing spawning and rearing habitat; and ii) protect and enhance the surrounding wetland habitat for broader ecological values by undertaking terrestrial and aquatic weed control, predator control and planting.

Works from the Environmental Enhancement Fund project that was approved by BOPRC last February continued into this year and the team finished laying rockings and scalplings to upgrade the main track along the river in August. However, there was still much work that needed to be done and the current EP was simply inefficient to combat the vast array of glyceria and honeysuckle that had taken over the site. The main issue of course was that we needed access to combat these plants, which required additional trail maintenance. So, we put together another restoration proposal that would allow us to improve current tracks, increase access, heavily target remaining weeds and begin an ecological monitoring programme.

The Community Matching Fund provided by Western Bay allowed us to undertake the first ever breeding bird survey at the site (see results in Ecological Monitoring section). We also set out skink traps but have yet to trap anything other than introduced rainbow/plague skinks. In March, the Bay Conservation Cadets undertook a large bioblitz at the wetland, where they assessed water quality through physical and biological means including macroinvertebrate sampling, trapped fish, and conducted wetland vegetation surveys to evaluate wetland condition index. We are eagerly awaiting the final results from that report.



**Results of recent track upgrades thanks to Western Bay (left and centre) as well as the former Environmental Enhancement Fund granted in February 2021, which saw the installation of three new bridge crossings (right).**



**Bay Conservation Cadets undertaking a large bioblitz at Te Hauri o Te kawa in March 2022 to access biological and chemical water quality parameters, including fish presence and macroinvertebrate abundance indices, as well as assessing wetland condition index via vegetation surveys.**

Most recently, Western Bay of Plenty District Council granted us a nice pot of money to aid our restoration proposal and this has allowed us to install a new access gate, widen and upgrade the track between the gate and the first bridge crossing, and install two additional bridge crossings that will make our work safer and more efficient as the gate, track and bridges can now accommodate an LUV/ATV which will greatly aid in weed control efforts in the interior of the site and allow for much better pest plant control. An added bonus is that we are now able to bring school groups through in a much safer manner. Another Environmental Enhancement Fund grant is under consideration to help offset costs of additional work.



**Newly installed gate thanks to funding from Western Bay of Plenty District Council**



Overall, nearly 500 workforce hours and 110 volunteer hours were spent at Te Huauri o Te Kawa this past year. The work crew spent 150 hours controlling pest plants mainly focusing on Japanese honeysuckle, glyceria, pampas, gorse, brambles and aquatic weeds. The trap grid was again increased from 9 to 12 double DOC 200's and two possum traps (AT12s). Following only 182 checks, 56 predators were captured including 1 cat, 1 rabbit, 1 mouse, 3 ferrets, 5 weasels, 6 hedgehogs, 14 stoats and 24 rats. Our increasing trap effort is paying off as we note a huge increase in stoat and rat catches from the last financial year, as well as the presence of weasels and a cat which weren't reported in the traps last year.

Peter Ellery spent time observing the known inanga spawning site next to the bridge beside "our" whitebait stand, over the spring tides from February to June. Inanga were seen in spawning aggregations from February to May, but the only actual spawning event recorded was in April. In the other months spawning would have occurred somewhere in the surrounding area but just where was not identified.



**'Our' whitebait stand and portion of Te Huauri o te Kawa from the Kaituna River.**



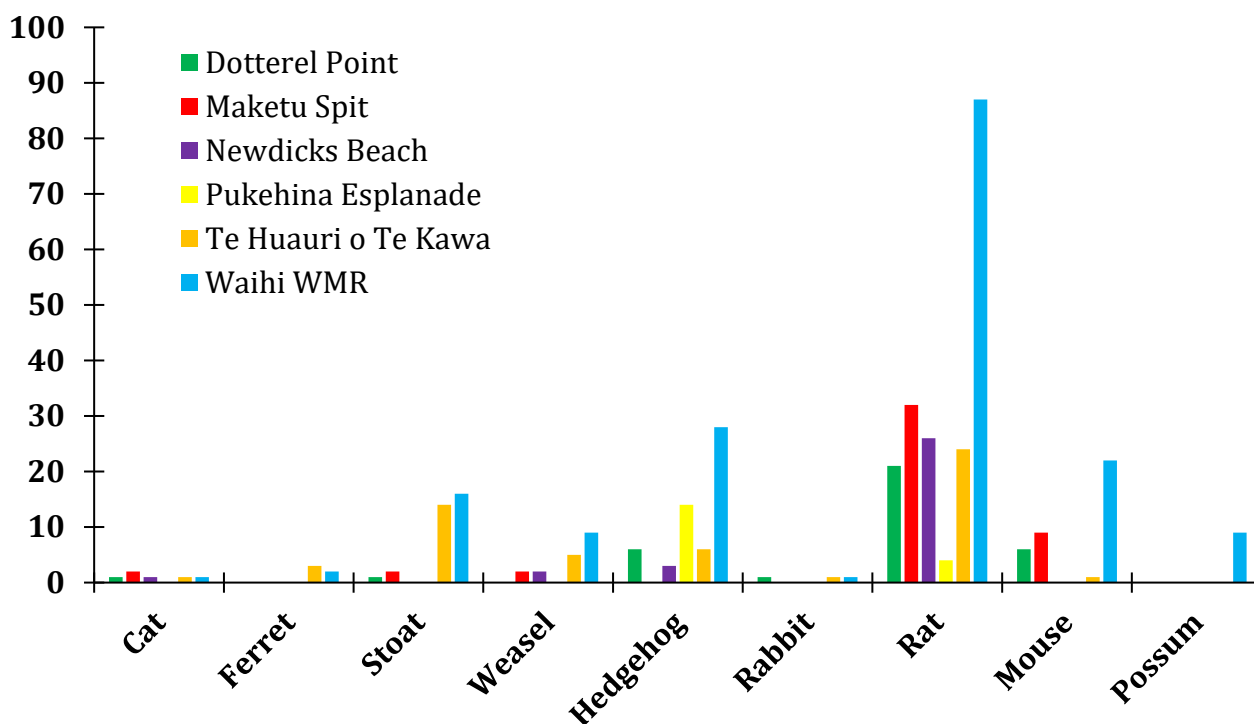
**Inanga spawning in April.**

# Animal Pest Control

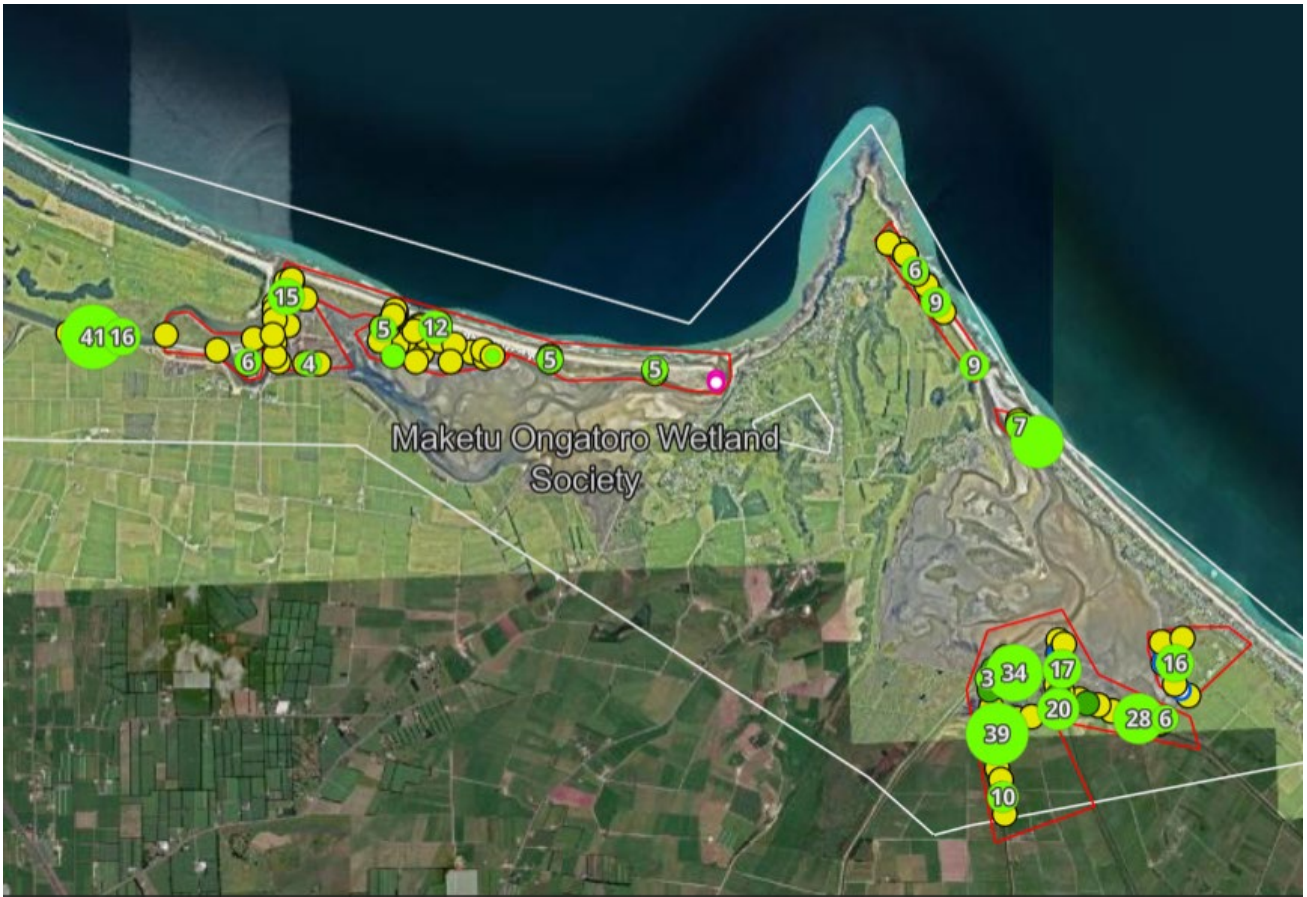
Over the past year, all our trap records were recorded using the BOPRC Care Group App that was designed to report animal pest control efforts. The great thing about this system is that it makes reporting very easy and displays a wonderful map to show any hot spot locations where high numbers of mammals have been captured over the last year (or time period of interest).

This past year, we increased our network to 167 traps. At our focal sites this includes 114 DOC 200's, six AT220's, two A24's and two A12's. However, two of our traps at Newdicks Beach have been stolen in the past few months decreasing the traps in that area from 9 to 7. We also started predator control at a new location – Pukehina Esplanade Reserve, where we have been monitoring five DOC200's and two A12's since March 2022, and as previously mentioned, we've added 8 traps at the new fence on Maketū Spit and 4 additional traps at Te Huauri or Te Kawa. From July 2020 - June 2021, 352 hours were spent checking or re-baiting these traps and an additional 183 hours was spent deploying and checking a network of around 700 bait stations at Maketū Spit and 12 rabbit bait stations at Maketū Spit and Dotterel Point.

Rats were the most common predator across all our sites, followed by hedgehogs, mice and weasel. The wetland areas are the hot spots for predators, particularly mustelids. Since July, we recorded 369 catches throughout our 6 main focal areas (and 40 catches at Te Pa Ika and Ford and Papahikahawai Islands as part of an external contract where our remaining 43 DOC200s are located). Unfortunately, we didn't start properly reporting the AT220's catches of possum and cat until March 2022, so our possum and cat counts are under-estimated. Further, the A12's and A24's are not linked with a reporting app, so catches from these traps remain unaccounted for, but we hope to equip them with chips and link them to an app in the near future.



Number of mammalian predators captured at our six main areas from 1 July 2021 – 30 June 2020.



Screenshot from the dashboard of the BOPRC Care Group App displaying the hot spots (large green dots) for mammal trapping at Waihi Wetland, Te Huauri o Te Kawa and Dotterel Point.



Our most commonly caught predator, rat (left), and two menacing mustelids – stoat (middle) and weasel (left) captured in our DOC 200's throughout the past year.

# Ecological Monitoring

This past year, we have done more ecological monitoring than ever before. Support from Western Bay of Plenty District Council's Community Matching Fund enabled us to conduct bird, reptile and terrestrial invertebrate surveys at some of our sites for the first time. A combination of staff and volunteers conducted five-minute bird counts and call playback surveys at our wetlands (Waihi Wetland and Te Huauri o Te Kawa) and Papahikahwai Island. Volunteers also conducted harbour surveys at Te Pa Ika, fortnightly bird counts at Newdicks Beach, and measured terrestrial invertebrate diversity at Te Huauri o Te Kawa. With our new DOC permit, we also monitored reptiles at Waihi Wetland, Papahikahawai Island and Te Huauri o Te Kawa.

In addition to the new monitoring, MOWS continued with its existing monitoring programme which includes conducting fortnightly counts of breeding birds at Maketū Spit and Dotterel Point each breeding season, monitoring skinks at each of our dune sites through a mark-recapture programme each November and March, vegetation surveys every two years and terrestrial invertebrate surveys at each site every five years.

## **Fortnightly Bird Surveys**

Fortnightly counts of breeding birds have occurred at Maketū Spit since 2009 and Dotterel Point since 2011. Surveys are conducted from late August to late January during high tide, whereby all bird species observed are counted but the primary focus is on northern NZ dotterel and variable oystercatchers<sup>3</sup>. At Maketū Spit, nesting red-billed gulls, black-billed gulls and white-fronted terns are also counted.

## **Dotterels and Oystercatchers**

This year, Jenn and Awhina conducted monitoring at Maketū Spit. During 2 September – 1 February, 10 different counts were carried out over the season, but unfortunately data from one of the surveys was lost. On average, 14 NZ dotterel (7 breeding pairs) and 51 variable oystercatcher (25 breeding pairs), were observed over the season (Table 2). For dotterel, this is the lowest number of breeding pairs reported in the last decade, whereas for oystercatchers, it is the highest average ever reported!

Julian conducted most surveys at Dotterel Point, although on occasion he was accompanied by Awhina. Between 4 September and 16 January, 10 surveys were conducted. During the season, an average of 22 NZ dotterel (11 breeding pairs) and 43 variable oystercatcher (21 breeding pairs) were observed (Table 2). Similar to results from Maketū Spit, this was the lowest average count of NZ dotterel reported since 2013, and although the average number of oystercatchers was less than the 47 individuals reported last year, this is still the second highest count reported for that site.



**NZ Dotterel nesting in the middle of the beach at Dotterel Point**

This year was the first time we conducted fortnightly counts at Newdicks Beach. Previously, it wasn't necessary because birds do not appear to nest there but given increasing numbers over the past few years at both Maketū Spit and Dotterel Point, we wanted to investigate whether some breeding pairs had decided to settle on Newdicks Beach. Tiffany Randall volunteered to conduct 6 counts between 9 September and 23 November. During her surveys, she observed 0 dotterel and an average of 8 variable oystercatchers (Table 2). None of the oystercatchers were suspected of nesting as all were observed feeding or foraging along the beach. In November, Jenn observed several dotterel feeding along Newdicks Beach at low tide, but we suspect they were breeders from nearby sites foraging on the abundance of food in the area.

Last year we were concerned that population growth of NZ dotterel may have stalled and results from this year support these concerns and suggest that the population of NZ dotterels may have also declined. Jenn reported 23 dotterels on 10 September and 22 dotterels on 5 October, but these were the two highest counts of the season. Over the past three years, the maximum number of dotterels observed ranged from 47-49 individuals. Similar low counts were also observed at nearby Dotterel Point, which resulted in the lowest average since 2013, however the maximum of 22 birds observed this year was similar to maximum counts reported since 2016 which ranged from 24-29 individuals (Table 2).

**Table 2 – The maximum count and average number of NZ dotterel and variable oystercatcher and associated standard deviation (SD) as determined from fortnightly counts collected during the breeding season at Maketū Spit, Dotterel Point and Newdicks Beach. Maximum counts likely include non-breeders, and/or juveniles seen roosting in the area as well as breeding pairs.**

	Year	# of counts	NZ Dotterel			Variable Oystercatcher		
			Max	Average	SD	Max	Average	SD
Maketū Spit	2009	13	26	11	8.0	31	19	7.6
	2010	11	30	19	7.7	38	30	7.8
	2011	17	25	15	7.4	41	23	8.9
	2012	15	26	19	7.1	63	30	13.1
	2013	11	38	27	6.4	41	31	8.5
	2014	17	35	22	8.2	40	26	9.2
	2015	10	38	26	8.1	53	44	6.9
	2016	10	34	26	4.	52	42	6.2
	2017	7	40	28	9.4	57	49	4.0
	2018	11	47	30	12.6	65	41	10.5
	2019	8	49	28	12.9	56 <sup>a</sup>	26	7.4
2020	10	47	29	8.5	55	39	10.1	
2021	9	23	14	5.7	88	51	18.1	
Dotterel Point	2012	12	16	12	3.1	21	13	4.3
	2013	10	22	15	3.2	24	16	5.6
	2014	12	23	16	4.5	28	21	3.2
	2015	12	37	20	6.4	34	28	3.8
	2016	9	24	18	3.5	31	26	3.1
	2017	9	29	21	3.7	34	27	4.8
	2018	6	24	20	3.1	37	30	3.3
	2019	7	26	18	4.9	36	28	5.8
	2020	7	26	23	2.5	47	35	6.8
	2021	10	22	15	4.0	43	33	5.0
<b>Newdicks Beach</b>								
	2021	6	0	0	0	16	8	4.9

<sup>a</sup> 108 variable oystercatchers were observed in mid-January but omitted from analysis.

Conversely, the average number of oystercatchers reported was at an all-time high (although it's likely that several birds were non-breeders). Possibly, oystercatchers and gulls are out-competing dotterels although food supplies or other environmental factors may also attribute to the perceived decline; hypothesis we hope to investigate in the relatively near future. Newdicks Beach is heavily used by public members and dogs and vehicles are often abundant. We do not suspect birds will nest here anytime soon, but with decreasing numbers of dotterels at both Maketū Spit and Dotterel Point, we may erect a fence in the area during this breeding season to see if we can attract a few breeding pairs. Hopefully, dog owners will keep their furry friends on a leash if birds begin nesting in the area.

### Black-billed and Red-billed Gulls

The gull colony has continued to grow and once again, we commissioned local photographer Andy Belcher to take three sets of drone photos during October to enable us to better count the nests. Unlike last year when we used ArcGIS to count the nests, this year BCA Cadets and MOWS staff combed through prints of the imagery and counted all nests and birds by hand. The average number of red-billed gull nests was 3235 which is around 500 nests more than last year's October/November imagery (Table 3). Overall, we counted approximately 4000 gulls on the ground during each count in October (including nesters and non-nesters), which is an impressive number of birds!

Ground-based counts estimated approximately 3444 red-billed gulls and 1530 nests over 7 visits, but with so many birds on the ground it's understandable that observers have difficulty counting the birds. From ground-based counts we did confirm 40 black-billed gull nests and no white-fronted tern nests.

**Table 3 – Number of red-billed gull nests identified from drone imagery in last year compared to this year**

Last year		This year	
Date	Nests	Date	Nests
2 Oct 2020	2765	3 Oct 2021	3109
21 Oct 2020	2790	10 Oct 2021	3310
4 Nov 2020	2652	27 Oct 2021	3285
<b>Average ± SD</b>	<b>2736 ± 60</b>		<b>3235 ± 89</b>



**Nesting black-billed gulls (foreground) and red-billed gulls (background) at Maketū Spit**



**Red-billed gulls and chicks at Maketū Spit**

### **Other Birds**

We counted all other birds observed during our fortnightly counts as well. Other highlights from this year include:

- 7 wrybill at Dotterel Point in September 2021
- Bar-tailed godwits on Maketū Spit during 4 surveys from Sept-Dec, ranging from 150-800 in number. Of note, around 2000 godwits and 50 red knot were counted at Breakfast with the Gulls in Nov
- 15 banded dotterel and 1000 bar-tailed godwits at Dotterel Point in January 2022
- At Maketū Spit, maximum counts of pied and little pied shags was 44 and 3, respectively
- At Dotterel Point, maximum counts of pied and little pied shags were 10 and 6, respectively
- At Newdicks Beach, a maximum count of 34 pied shags and 4 white-fronted terns were observed
- 30 geese at Maketū Spit in January; they appeared to be a dominant brood preparing for autumn/winter
- Not avian, but 1-2 seals (usually pups) were seen on the beach at Newdicks during every bird count



**A small portion of the large flock of ~2000 bar-tailed godwit (largest flock ever observed by MOWS staff) and around 50 red knot that decided to make an appearance during the annual Breakfast with the Gull event in November**

## **Wetland Birds**

Staff and volunteers carried out wetland bird surveys. Awhina participated in at least one round of surveys at all four sites but did all surveys at Waihi East. Jenn conducted a round of surveys at Te Huauri or Te Kawa and Waihi West alongside volunteer Reuben Aikmans. Volunteers Fran Van Alphen and Claire Jones surveyed Papahikahawai Island and Jack Preston did a round of surveys at Te Huauri o Te Kawa.

To monitor our wetland birds, we established 5–13 survey locations, spaced 200 m apart at each of our sites. At each location, 5-minute silent bird counts were conducted, followed by call playback surveys for spotless crane, fernbird, banded rail and marsh crane. Although Papahikahawai Island isn't a wetland per se, it has several suitable areas of nesting habitat for wetland birds. Three repeated surveys were conducted in the morning or evening throughout October and November. From the results, we calculated relative abundance which averages the number of each species seen or heard at a given survey location during the three visits, and then further averages that species across all survey locations in the wetland. Loosely, relative abundance equates to the average number of birds detected per 200 m<sup>2</sup>.

### **Papahikahawai Island**

At Papahikahawai Island, 23 different species were detected during surveys, which was the lowest species richness at any of our surveyed sites. Pied stilt, which nest on the island, were the most abundant species detected (Table 4). Black-backed gulls and Canada geese were also present in high numbers and also observed nesting. We had hoped to detect NZ and banded dotterel, as we had expected they might also nest in the area after seeing them the previous breeding season, but since BOPRC planted additional plants throughout the site last year, it appears these birds have now stopped visiting the area. Although not observed during surveys, harrier hawks can also be quite common in the area at times. Secretive wetland birds were not detected during surveys, although a single bittern spooked Awhina when she was checking DOC 200's in January, so we know they occur in the area on occasion.

### **Te Huauri o Te Kawa**

Twenty-eight species were observed at Te Huauri o Te Kawa during breeding bird surveys. Pūkeko were the most abundant bird detected (Table 4). Kotare, kotuku, chaffinch and goldfinch were not detected during surveys but have all been observed at the wetland in the past year. Spotless and marsh crane have reportedly been observed during previous bird surveys in past years but were undetected this year. Laura and Jenn observed a bittern in September 2021, but the species isn't frequenting the wetland just yet.



**Kotare at Waihi Wetland West. Photo credit: Jack Preston.**



## **Waihi Wetland East**

As illustrated in Table 4, 31 bird species were detected during surveys at Waihi East. In late October, a large flock of 700 bar-tailed godwits were observed within 200 m of one of the survey locations in late October, which accounted for a very high abundance value. Otherwise, welcome swallow, geese and red-billed and black-billed gulls were the most abundant species detected. Black-backed gulls tended to nest along the old stopbank and red-billed gulls frequent the area, mostly feeding in the estuary. Fernbird abundance was also high and up to 3-4 birds were seen and heard at a single survey site. Banded rail were also detected during call playback surveys and later in the season, family groups of up to 3 individuals were observed, confirming survey results. Although they weren't detected during surveys, marsh crane had been observed in the past and we suspect spotless crane may also be present.

Bittern were observed in low numbers during surveys, but are regularly seen at this site, sometimes in groups as large as 4. Most of the team participated in a three-night bittern boom survey in November alongside DOC and other volunteers and detected over 12 booming males through Waihi East, West and adjacent Waewaetutuki wetland. During these surveys, male bitterns were booming within 50 m of the work team and a female was seen only 30 m away. DOC later discovered a bittern nest at in the area, near where the female was observed.

## **Waihi Wetland West**

Waihi West had the highest species richness of 37 species (Table 4). A flock of 200 and 320 godwit were seen on two occasions in the estuary within 200 m of one of the survey sites in October, which resulted in large abundance values for this species. Otherwise, welcome swallow, black-backed and red-billed gull, mallard duck, and royal spoonbill were the most abundant species detected. The gulls were mainly detected in the estuary, whereas swallows and mallards were seen throughout the site. Around 40 royal spoonbills regularly occur at the wetland, and you are nearly guaranteed to see them there at any given time.

Both fernbird and banded rail were present during surveys, as well as during regular work. Fernbirds seem to be all over the wetland area and will quickly let you know when you are in their territory. The team also saw banded rail in the area, confirming survey results of their playback response. Although spotless crane and bittern weren't detected during surveys, crane had previously responded to call playback surveys conducted throughout the year and are most certainly present and bittern are regularly observed year-round at the wetland by all team members. During drone surveys, DOC also found a bittern nest at Waihi West.

The BCA cadets have participated in surveys 1-2 times during each intake and since January 2021 they have reported Australian shoveler, bittern, chaffinch, grey duck, grey teal, grey warbler, magpie, and spotless crane. Jenn also observed a morepork in late June. These observations would raise the species richness of the area to 46, but it is most certainly higher still.



**Royal spoonbills at Waihi Wetland West. Photo credit: Jack Preston.**

**Table 4 – Relative abundance ± standard error of bird species detected during point count surveys at our wetland sites during October – November 2021.**

	Species <sup>2</sup>	Papahikahawai	Te Huauri	Waihi East	Waihi West	
<b>Focal species</b>	Australasian bittern	0	0	0.05 ± 0.04	0	
	Banded rail	0	0.07 ± 0.06	0.19 ± 0.13	0.24 ± 0.08	
	Fernbird	0	0.07 ± 0.06	1.24 ± 0.30	0.83 ± 0.21	
	Marsh crake	0	0	0	0	
	Spotless crake	0	0	0	0	
<b>Non-focal native species</b>	Bar-tailed godwit	0.05 ± 0.04	0	33.33 ± 30.86	13.30 ± 12.80	
	Black shag	0	0.07 ± 0.06	0.29 ± 0.27	0.13 ± 0.06	
	Black swan	0.48 ± 0.29	0	0.57 ± 0.53	1.00 ± 0.71	
	Black-backed gull	2.53 ± 0.77	0	2.38 ± 1.50	3.23 ± 2.34	
	Caspian tern	0	0	0	0.05 ± 0.05	
	Fantail	0	0.47 ± 0.18	0.05 ± 0.04	0	
	Grey warbler	0	0.47 ± 0.22	0.33 ± 0.07	0.13 ± 0.08	
	Harrier hawk	0	0.13 ± 0.07	0.19 ± 0.13	0.28 ± 0.12	
	Little pied shag	0	0.07 ± 0.06	0.05 ± 0.04	0.14 ± 0.06	
	Kotare	0.05 ± 0.04	0	0.05 ± 0.04	0.17 ± 0.05	
	Paradise shelduck	0.05 ± 0.04	0	0	1.32 ± 0.59	
	Pied shag	0	0.20 ± 0.12	0.48 ± 0.29	2.45 ± 1.89	
	Pied stilt	5.52 ± 2.98	0.07 ± 0.06	0.48 ± 0.29	2.45 ± 1.89	
	Pūkeko	0.52 ± 0.16	1.07 ± 0.22	0.29 ± 0.17	1.19 ± 0.55	
	Red-billed gull	1.52 ± 0.48	0	2.38 ± 2.20	3.83 ± 3.05	
	Royal spoonbill	0.33 ± 0.31	0	0	3.09 ± 2.07	
	Silvereye	0.05 ± 0.04	0.80 ± 0.24	0	0.12 ± 0.08	
	SI Pied Oystercatcher	0	0	2.00 ± 1.85	0.54 ± 0.52	
	Spur-winged plover	0	0.60 ± 0.29	0.14 ± 0.09	0.87 ± 0.31	
	Tui	0	0.13 ± 0.07	0	0	
	Variable oystercatcher	0.38 ± 0.18	0	0.14 ± 0.13	0.10 ± 0.10	
	Welcome swallow	0.67 ± 0.27	0.93 ± 0.30	2.67 ± 0.58	3.30 ± 0.56	
	White-faced heron	0.29 ± 0.14	0.13 ± 0.07	0.19 ± 0.18	0.05 ± 0.05	
	<b>Introduced species</b>	Australian magpie	0	0.40 ± 0.11	0.19 ± 0.11	0
		Blackbird	0.10 ± 0.06	0.33 ± 0.09	0.52 ± 0.32	0.10 ± 0.06
Canada goose		2.76 ± 1.12	0.27 ± 0.17	2.52 ± 1.36	1.30 ± 0.93	
Chaffinch		0.14 ± 0.09	0	0	0	
Dunnock		0	0.27 ± 0.15	0	0.04 ± 0.04	
House sparrow		0.86 ± 0.29	0.33 ± 0.09	0.14 ± 0.09	0.87 ± 0.31	
Goldfinch		0.33 ± 0.14	0	0.29 ± 0.14	0.13 ± 0.08	
Greenfinch		0	0	0.10 ± 0.06	0.05 ± 0.05	
Mallard		0.71 ± 0.05	0.47 ± 0.22	0.57 ± 0.31	3.64 ± 1.45	
Myna		0.05 ± 0.04	0.20 ± 0.12	1.00 ± 0.41	0.10 ± 0.07	
Pheasant		0	0.27 ± 0.11	0	0.30 ± 0.12	
Skylark		1.86 ± 0.29	0.67 ± 0.09	0.52 ± 0.19	0.22 ± 0.08	
Song thrush		0.14 ± 0.13	0.07 ± 0.06	0	0.03 ± 0.03	
Spotted dove		0	0.07 ± 0.06	0	0	
Starling		0	0.13 ± 0.07	0	0.13 ± 0.09	
Yellowhammer		0.10 ± 0.09	0.73 ± 0.11	0.48 ± 0.13	0.15 ± 0.09	

## **Estuarine Birds**

We have continued to monitor the eBird data reported throughout Maketū Estuary and have also found time to enter data from Little Waihi Harbour as well. Since 1955, 105 species have been reported in Maketū Estuary and 99 species have been reported in Waihi Estuary (Table 5). This includes some rare and vagrant birds such as Far-eastern curlew, Hudsonian godwit, whimbrel, sharp-tailed sandpiper, pectoral sandpiper, terek sandpipers, black-fronted dotterel, black-fronted tern, white-winged black terns, Australian ibis, and brown and chestnut teal. Below we have summarised results for both Estuaries over the last year and have compared these counts to historic high counts reported through eBird.

Results from eBird data reported the following highlights in the Estuaries:

- In Maketū Estuary:
  - new all-time highs were reported for: bar-tailed godwit (1300), pacific golden plover (52), red knot (200), sharp-tailed sandpiper (23), variable oystercatcher (206), wrybill (38), reef heron (2) and black-backed gull (212)
  - Grey teal continue to be at an historic high of 400 birds since 2020
  - Pectoral sandpiper were reported for the first time since 1970
- In Little Waihi Estuary:
  - new all-time highs were reported for: wrybill (140), kotare (30) and matata (10)



**Sharp-tailed sandpiper at Little Waihi Estuary in March (photo credit: Tim Barnard)**



**Cattle egrets mixed with royal spoonbills in Maketū Estuary in August (photo credit: Pauline and Ray Priest).**

**Table 5 – Maximum number of each species<sup>1</sup> reported in Maketū and Little Waihi Estuary through eBird by members of the public during July 2021-June 2022, including historic high counts and associated years.**

Species	Maketū Estuary		Little Waihi Estuary	
	2021/22	Historic high (year)	2021/22	Historic high (year)
<b>Waterfowl</b>				
Australasian shoveler	49	100 (2007)	35	100 (2018)
Black swan	50	500 (2019)	35	500 (2017)
Brown teal	—	—	—	1 (2016)
Canada goose	178	400 (2017)	45	400 (2017)
Chestnut teal	—	—	—	1 (2016)
Grey duck	1	4 (1975)	—	4 (2015)
Grey teal	400	400 (2021*)	500	1500 (2015)
Mallard	200	200 (2016)	82	250 (2017)
Mallard x grey duck hybrid	67	100 (2018)	60	200 (2019*)
NZ Scaup	—	2 (2015)	—	1 (2020)
Paradise shelduck	31	56 (2016)	80	390 (2018)
<b>Rails</b>				
Australian coot	—	1 (2011)	—	—
Banded rail	—	4 (2017)	2	3 (2015*)
Pūkeko	18	34 (2015)	6	16 (2015)
Spotless crake	—	1 (2019)	—	1 (2017)
<b>Small/medium Waders (plovers, dotterels, godwits, sandpipers)</b>				
American golden plover	—	—	—	1 (2011)
Banded dotterel	90	121 (2015)	140	189 (2018)
Bar-tailed godwit	<b>1300</b>	850 (2018)	786	900 (2017)
Black-fronted dotterel	—	6 (1977)	—	—
Black-tailed godwit	—	1 (2014)	—	—
Far-eastern curlew	—	2 (2021)	—	—
Great knot	—	—	—	1 (2013)
Greater sand dotterel	—	—	—	1 (2017)
Grey-tailed tattler	—	1 (2017*)	—	1 (2017*)
Hudsonian godwit	—	1 (2017)	—	1 (2016*)
Lesser sand dotterel	—	—	—	1 (2018)
Marsh sandpiper	—	4 (1970)	—	2 (2018)
NZ dotterel	17	45 (2018)	11	32 (2014)
Pacific golden plover	<b>52</b>	47 (2020)	55	90 (2018)
Pectoral sandpiper	<b>1</b>	1 (1970)	1	3 (2013)
Pied stilt	147	350 (2020)	240	580 (2015)
Pied x Black Stilt hybrid	1	1 (2022*)	—	2 (2016)
Red knot	<b>200</b>	95 (2017)	92	202 (2017)
Red-necked stint	—	4 (2000)	—	4 (2011)
Red phalarope	—	1 (1977)	—	—
Ruddy turnstone	2	13 (1970)	1	5 (2016)
Sanderling	—	1 (2011)	—	1 (2013)
Sharp-tailed sandpiper	<b>23</b>	4 (2021*)	2	4 (2021*)

**Table 5 – continued**

Species	Maketū Estuary		Little Waihi Estuary	
	2021/22	Historic high (year)	2021/22	Historic high (year)
SI Pied oystercatcher	120	403 (2020)	302	400 (2014)
Spur-winged plover	76	150 (2016)	21	65 (2018)
Terek sandpiper	—	—	—	1 (2003)
Variable oystercatcher	<b>206</b>	113 (2020)	110	120 (2020)
Whimbrel	—	2 (2017*)	—	3 (2016)
Wrybill	<b>38</b>	17 (2021)	<b>140</b>	48 (2016)
<b>Large waders (Bitterns, egrets, herons, ibises, spoonbills)</b>				
Australasian bittern	—	1 (2015)	—	1 (2020)
Australian ibis	—	1 (1975)	—	—
Cattle egret	11	14 (1999)	—	26 (2015)
Glossy Ibis	—	—	—	2 (2016)
Kotuku/great egret	—	20 (2005)	—	2 (2017)
Reef heron	<b>2</b>	1 (2021*)	—	1 (2015)
Royal spoonbill	60	84 (2014)	34	80 (2021)
White-faced heron	12	50 (2020*)	200	300 (2015)
<b>Gulls and terns</b>				
Arctic tern	—	1 (2015)	—	—
Black-backed gull	<b>212</b>	212 (2021)	76	200 (2016)
Black-billed gull	40	50 (2015)	8	40 (2015)
Black-fronted tern	1	1 (2019*)	—	1 (2018)
Caspian tern	5	12 (2021)	9	25 (2018)
Common tern	1	1 (2020*)	—	—
Crested tern	—	1 (2015)	—	—
Fairy tern	—	2 (2004)	—	—
Little tern	1	8 (2005)	1	4 (2017)
Red-billed gull	1651	1684 (2021)	120	400 (2017)
White-fronted tern	300	600 (2015)	58	500 (2018)
White-winged black tern	—	3 (2014)	—	—
<b>Shags</b>				
Black shag	16	24 (2020)	18	23 (2016*)
Little black shag	4	25 (2015)	10	20 (2018)
Little pied shag	30	35 (2015)	12	34 (2017)
Pied shag	15	55 (2012)	22	37 (2015)
<b>Raptors</b>				
Falcon	—	1 (2018)	—	—
Harrier hawk	4	5 (2018)	3	4 (2018*)
<b>Kingfishers</b>				
Kotare	5	30 (2018)	<b>30</b>	25 (2020)
<b>Passerines</b>				
Fernbird	—	5 (2020)	<b>10</b>	1 (2021*)

<sup>1</sup>Table excludes: 21 passerines, 2 parrots, 5 upland fowl, 4 pigeon/doves, 12 seabirds and 2 domestic waterfowl.

## Reptiles

Our reptile monitoring permit was due for renewal this year, so as part of the application process we sought to include Waihi Wetland, Papahikahawai Island, Te Huauri o te Kawa and Te Pa Ika as additional sites. With funding from Western Bay's Community Matching Fund, we were able to monitor skinks at Waihi Wetland and Papahikahawai for the first time! Hopefully, we'll find funding to monitor the remaining sites next year.

In November, monitoring focused only on Maketū Spit, Dotterel Point Pukehina and Newdicks beach because we were still awaiting the new DOC permits. In March/April, we re-trapped those sites and trapped Papahikahawai Island, Waihi East and Waihi West. In total, 100 shore skinks were captured, including 5 recaptures (Table 6). We still haven't crunched the numbers to see how this compares to previous years, but a thorough report is in the works.

**Table 6 – Number of skinks captured at each site during the past calendar year as reported to DOC.**

Site	# Shore skink	# Plague skink	# Copper skink
Maketū Spit	64 (4 recaps)	0	0
Dotterel Point Pukehina	17	0	0
Newdicks Beach	10 (1 recap)	0	0
Papahikahawai Island	3	0	0
Waihi East	1	2	0
Waihi West	5	1	1

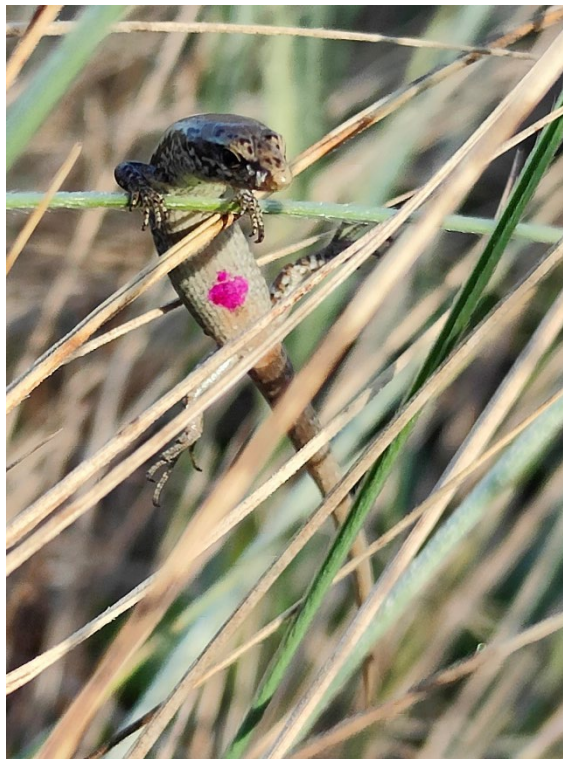
The highlight of the year was our discovery of copper skinks at Waihi Wetland. The species caught us so off guard, as we didn't expect to find them, that its likely we mis-identified a few skinks and assumed they were shore skinks before realising we had an entirely different species! So, we've brushed up on our ID skills and will be triple checking all individuals next year.

On the contrary, the most disappointing discovery was learning that rainbow/plague skinks (an introduced pest) had spread not only to Waihi West but also to Maketū Spit. The species had previously been brought in via a pot plant several years ago but was thought to have been contained. However, since our first confirmed sighting early in 2022, the number of plague skink sightings has greatly increased and in July 2022 the team found 16 plague skinks hanging out under a piece of onduline near the carpark!



**Copper skink (left) and rainbow/plague skink nest with eggs hatching upon disturbance (right)**

The discovery of plague skinks at Maketū Spit is hugely unfortunate. Little information is known about native shore skinks and there is much research potential at Maketū Spit to understand various habitat requirements and breeding ecology. Our observed increases in reptile and invertebrate abundance over the past 5-10 years suggests that Maketū Spit may have one of the healthiest shore skink populations in the country. Unfortunately, once plague skinks become well established, we expect these numbers to decrease. We are limited by our ability to eradicate and remove them as they are notoriously difficult to trap, so they will most likely continue to spread and outcompete our native skinks. Hopefully we'll receive support from our partners soon and find a way to successfully combat this new threat.



**Shore skinks at Maketū Spit: skink being weighted (top left), skink following release and marking (top right) and skink travelling along the new 4<sup>th</sup> predator fence (bottom – photo credit: Hamish Dean)**

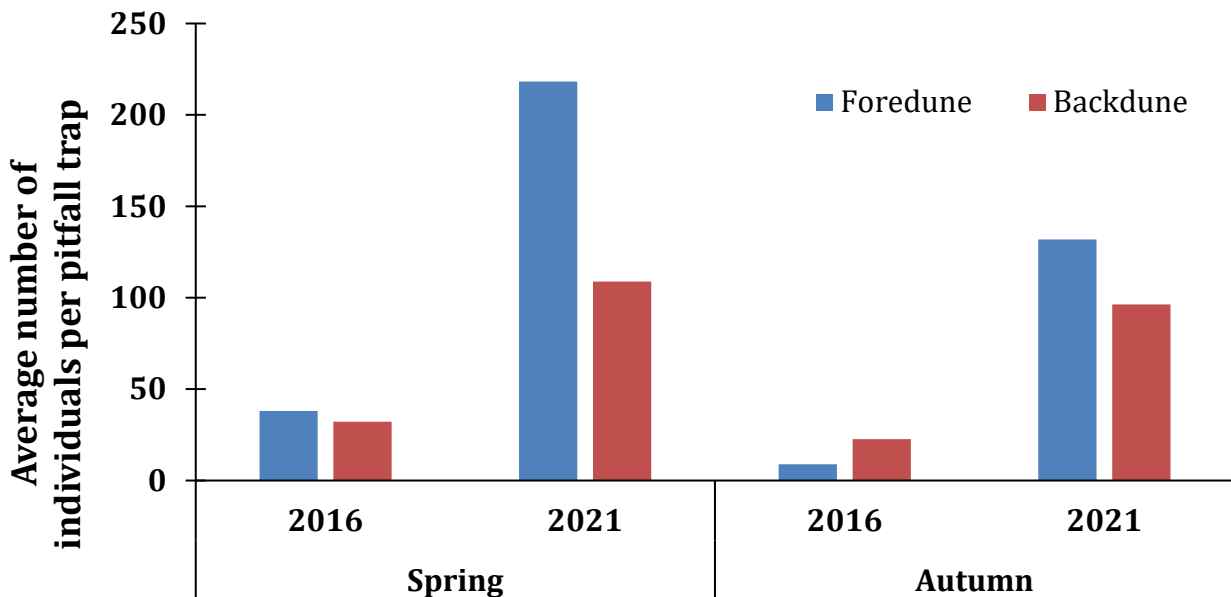
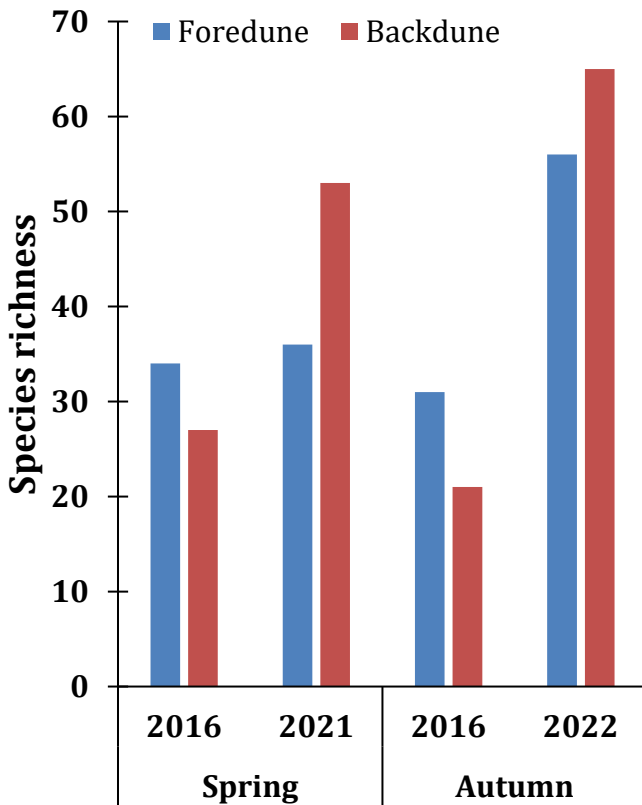
## Invertebrates

Terrestrial invertebrates are sampled twice yearly (spring and autumn) using pitfall traps. These traps are 500 mL and are set in two transects of 15 traps spaced 10 m apart (30 traps total). Transects are positioned in different microhabitats (often foredune and back dune). Traps are left for 14 days then retrieved, during which time invertebrates are preserved in propylene glycol and then identified to a representative

taxonomic unit or RTU, such that although we have no idea what species of ants we may have, we know that Ant1 and Ant2 are different based on physical characteristics (size, colour, shape, antenna, hairs, etc).

Maketū Spit was the focus of terrestrial invertebrate surveys this past year. This site was last surveyed in 2016 by Moniqua Nelson-Tunley. This past year, the BCA cadets assisted with sorting and identifying nearly half of the samples and Fran Van Alphen (former BCA cadets and now the MOWS terrestrial invertebrate ecologist) quantified the remaining samples.

Based on the counts and assigned Representative Taxonomic Units of observed species, it is apparent that species richness (number of different RTU's) and the average number of individuals per pitfall trap has greatly increased in the foredune and back dune habitats since 2016. Results from the past year suggest that while the back dune has a larger diversity of species, the foredune has greater abundance.



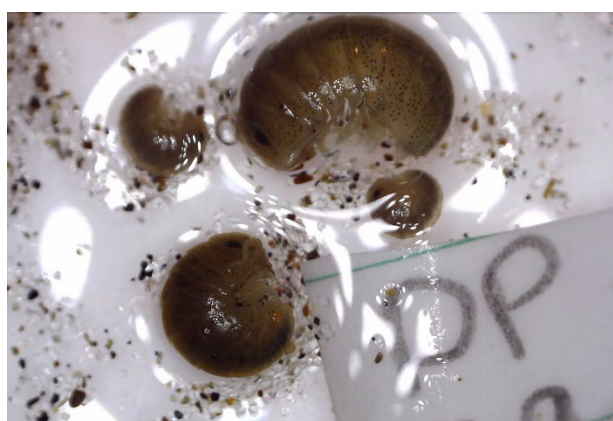
Species richness (top graph) and the total number of terrestrial invertebrates per pitfall trap (bottom graph) in the fore dune (blue) and back dune (red) at Maketū Spit in Spring and Autumn 2016 and 2021/2022.



In 2016, garden snails (*Cornu aspersum*), Slater2 and slugs (impossible to ID to RTU once in glycol, so unknown if these individuals are different species) were the three most abundant invertebrates detected in the back dunes during both spring and autumn sampling, whereas Slater2, Ant1 and Slater1 were the most abundant invertebrates detected in March 2022. In fact, the abundance of garden snails decreased from most detected in 2016 when their presence was noted 165 times to the 8<sup>th</sup> most detected RTU in 2022, occurring only 45 times throughout the samples. Conversely, Ant1, which was reported 21 times in April 2016 and 26 times in Dec 2016, was counted 267 times in March 2022.

Unlike the back dunes, the most detected species in the fore dunes varied each season and year. The three most common invertebrates found in the fore dunes were garden snails, Ant3 and Centipede1 in April 2016, Slater1, Springtail1 and Weevil1 in Dec 2016, and Mite2, Slater1 and Bettle2 in March 2022.

Thanks to the Community Matching Fund, we were also able to assess terrestrial invertebrates at Te Huauri o te Kawa for the very first time! From our 15 pitfall traps, we counted 1155 individual organisms consisting of 67 Representative Taxonomic Units and 20 orders. This included the following RTU's: 5 mites, 1 tick, 5 spiders, 2 isopods, 3 amphipods, 2 worms, 1 centipede, 2 millipede, 1 flatworm, 1 slug, 2 snails, 3 springtails, 1 flea, 1 earwig, 7 Dipteran flies, 15 Hymenoptera (12 ants and 3 wasps), 1 cricket, 2 true bugs (Hemiptera), 1 moth and 10 different beetles (4 unidentified taxa, 1 longhorn, 2 weevils, 1 scarab and 2 rove beetles).



**Slater1 (top left), Slater2 (top right), Ant1 (bottom left) and Weevil1 (bottom left), collected from invertebrate pitfall traps.**

# Education Programme

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The MOWS Education Programme has seen another successful year over 2021-22. Our core schools (Maketū Kura, Paengaroa Primary, Te Puke Primary, Te Puke Intermediate, Te Puke High School) have continued to participate in the education programme. We have also continued to include other local schools (Rangiuru, Pukehina, Fairhaven, Whakamarama, Otamarakau and Pongakawa) thanks to funding from Western Bay of Plenty District Council, BayTrust and TECT.

The MOWS education programme expanded in January to cover 8x units over two years so that each term covered a new ecosystem and we covered all habitats from mountains to sea. This was important for us to ensure that our students learnt about the impact of what happens further up the catchment on habitats downstream and also means that our two-year rotation keeps things exciting and new for our schools.

## **Term Four 2021**

During term 4 2021, we focused on the Maketū estuarine environment and ran kaimoana surveys in the Maketū estuary with the Taiapure Trust. Students from five schools received an in-class presentation on estuarine bird adaptation and marine species, including species that pose a biosecurity risk if introduced to Maketū. We used models of pest crabs and starfish that were made by Weta workshops, loaned to us by the Wellington NIWA office, to show students how to identify these species in our waterways over summer.

During the field trips to the estuary, the students dug deep along a transect line and recorded the numbers of different kaimoana they found, guided by Elaine Tapsell from the Maketū Taiapure Trust and the MOWS team. They enjoyed a walk along the estuary edge to spot rare and endangered nesting on Maketū Spit with MOWS volunteer, Maureen Binns. We also had local historians Niven Rae and Liam Tapsell join us to show the students what the estuary used to be like in the past. These activities were followed by a BBQ and prizegiving for the year.

For two of the field trips and classroom visits we had Waikato University lecturers Shari Gallop and Joanne Ellis, and technical advisor Elizabeth Copeland along to provide ocean biosecurity and estuarine salinity activities. The activities were well received by the students. We were also able to involve Megan Ranapia, a local marine studies doctorate student who specialises in sea stars.

Maketū School were unable to partake in the MOWS programme during Term 4 due to COVID-19 restrictions. Instead, the students painted cut out shorebirds provided by Te Puke Menz Shed. The birds will be used to replace the broken birds on the Maketū murals at the park and surf lifesaving club.

MOWS sponsored an environmental award for all local schools to give out to a student who shows outstanding respect for the environment. The recycled totara trophy will be given out and collected again each year along with a rimu medal and book for the student to keep.



**MOWS awards (left) for each school given out at the end of the year. Students from Te Puke Intermediate School (middle) conducting a kaimoana survey. Students from Ranguru School try to mix the salt and fresh water in the estuarine water model with local Waikato University doctorate student Akuhata Bailey-Winiata.**

MOWS also ran a community colouring competition in collaboration with Elaine Tapsell from the Maketū Taiapure Trust for the Maketū community prior to Christmas. The competition was one of several designed to lift the spirits of the community after a particularly hard year. The colouring images depicted the local species and environments in Maketū, including the freshwater, estuary and coastal environments and were generously donated by the University of Otago Marine Studies Centre and Zealandia.



**Skye Bramley with her prizes, (left) winner of the junior colouring competition. Harper Wirangi, (middle) winner of the intermediate colouring competition. Completed intermediate colouring competition (right) by Bradley Hopping.**

## Term One 2022

Term 1 this year started with a roar in the forest as we focused on our beautiful New Zealand ngāhere and based our field trips at Ōtanewainuku with support from Bay Conservation Alliance and Ōtanewainuku Kiwi Trust. Students from 7 schools enjoyed an in-class lesson that explored pest animals, pest control techniques and species monitoring. We then hosted field trips for six schools into the forest to explore our unique birds, invertebrates, and reptiles. The students also had a go at identifying bird names based on the bird bands. We were very fortunate to have Denise and Carole from Ōtanewainuku Kiwi Trust to help with the activities on the field trip.



Luckily, COVID-19 and the weather didn't disrupt our term too much. However, Te Puke Primary School were unable to carry out the fieldtrip, so Janie went into their school for a day to make and set out chew cards and set up traps around their school. After learning how to use the victor rat traps and mice traps during the in-class lessons, all schools received traps to set up around their school thanks to Predator Free BOP. Schools have since had great success trapping rats and mice in their school grounds.

Te Puke High School had a busy term with several classes involved with our education programme. The Year 12 Earth Space Science class looked at the trends they could find from tracking card monitoring data over two years from Te Whakakaha Trust. During the in-class lesson, the students checked out pest animal taxidermy and learnt how to set a DOC 200 and victor trap. The field trip in the Ottawa forest included checking new tracking cards, learning about the important species being protected in the area and running a trapline in the forest. The students then wrote a report comparing data from two years of tracking tunnel data and discussed reasons for changes in the data.

**Left - Students from Te Kura o Maketū under a 540 year old, fallen Rimu tree.**



**Students from Otamarakau hug a very old Rimu tree at Ōtanewainuku Forest.**

We hosted three classes from the Te Puke High School Year 11 Science cohort to conduct an estuary and rocky shore survey to help with their NCEA assessment on survey and monitoring techniques. We also hosted a Year 12 Bio class to do a complete rocky shore survey. This class then wrote a report on two species their adaptations and their distribution across the rocky shore zones. We had support from Elaine Tapsell, Maketū Taiapure Trust and also brought on some expert contractors to help with the surveys.



**Janie and students from Te Puke High School conducting a rocky shore survey in Maketū.**



**Te Puke High Students identifying the tracks on tracking cards at Ottawa forest.**

## **Term Two 2022**

Term 2 was all about diving into our freshwater theme and learning about our beautiful streams, rivers and lakes and the life that lives in them. During our in-class lessons, we covered the importance of our freshwater habitats and showed native and pest fish models and preserved freshwater invertebrates.

Our field trips with four schools were based at Redwood Valley Farm, on the Outeheuheu Stream. The students walked up the stream to our activity site and rotated around activities that assessed the water quality of the stream. Students identified and sorted freshwater invertebrates collected from the stream and assessed freshwater quality by looking at the habitat, temperature, clarity and flow of the stream. After enjoying lunch under the large redwood trees, eel traps were checked and students were able to briefly touch and look at both shortfin and longfin eels before they were released back into their stream.

We were lucky to be joined by Meredith Davis, the freshwater scientist from local catchment group, Wai Kōkopu Inc. Meredith helped with the macro-invertebrate activity. Unfortunately, Maketū kura missed out on the freshwater field trip to the Kaituna Stream due to weather but we hope to reschedule the trip later in the year.

During Term 2, we also collaborated with Coast Care BOP to run dune restoration in-class lessons and field trips. Chris Ward helped to lead the in-class lessons, teaching students about the importance of the dune systems and the functions of the native sand-binding plants that live there. We also discussed shorebirds and invertebrates that nest and live in the dunes. During the field trips along Pukehina, Newdicks and Rogers Road beaches, students carried out dune planting of spinifex and pingao and explored the beach for sea treasures and rubbish.

The follow-up activity was a poster competition. Students from all schools were invited to create posters that shared some of the messages they had learnt. The best posters were turned into signs and put up along dune fences in Pukehina and Maketū to promote good behaviours to protect the habitat. Winning students received eco-prizes. Finally, during May-June, a display of native bird artwork was displayed in the Te Puke library. Schools were invited to contribute artwork to the display and those schools received a native bird poster for their classroom as a thank you.



**Students from Te Puke Primary School enjoying a walk along the Outeheuheu Stream at Redwood Valley Farm during a MOWS field trip.**



**Students from Te Kura o Maketū planting kawhangatara (spinifex) into gaps in the dunes at Newdicks beach, Maketū.**

## **Term Three 2022**

Term 3 is always our wetlands month but this year we added a new focus on soil to ensure we had new and exciting activities each term. Again, we collaborated with Ngati Whakaue, Tapuika, BOP Regional Council, Department of Conservation and Wai Kokopu Inc. on the delivery of our field trip. Our in-class lesson focused on soil types and invertebrates and our field trip involved a planting, soil assessment and wetland soil activity. We also included a guided walk around the Kaituna Wetland prior to the activity rotation so students experienced being in the largest wetland in the Bay of Plenty. The follow-up activity involved the students carrying out the great NZ earthworm survey in their school.

Te Puke High School students were involved in two MOWS programme this term. The Earth Space Science class carried out a wetland restoration plan. This included; an in-class lesson on the wetland habitat, birds and fish species; a pre-visit to assess the current quality of the wetland and map out their wetland space; a second in-class lesson to help with the planning of the wetland; and a second field trip to plant out their wetland areas. The students then wrote up a report that investigated a wetland species and how their wetland restoration project will improve the habitat and population of that species.

During term 3, students from Te Puke High School also studied the Maketū Spit and NZ Dotterel. Julian Fitter presented to the students on the importance of the spit as a nesting ground for shore birds, in particular the NZ Dotterel. The students then helped erect the Dotterel fence on Maketū Spit and carried out a rubbish clean-up of the area. The highlight of the trip was the boat ride over with Skipper Julian Fitter.

# External Contracts

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External contracts are valuable additions to our operation and provide some extra cash to cover some of the basic costs of running the Society.

## **Ford Island, Papahikahawai, Te Pa Ika - Animal Pest Control**

This is the 3<sup>rd</sup> year that we have been undertaking pest control at Papahikahawai and Te Pa Ika. This past year, we also started animal pest control at Ford Island and Otaiapure Wetland which is located at the mouth of the Kaituna River, just west of Ford Road. Combined with Papahikahawai Island (17 ha) and Te Pa Ika (24 ha), this contract now covers 55 ha and most of the area from the re-diversion to Maketū Spit. In total, we monitor 43 DOC 200's at these sites and deploy a network of around 100 bait stations three times a year to keep the rodent population low. Unfortunately, several of our traps were stolen over the year and had to be replaced.

A few additional contracts have popped up at these areas over the past 12 months, including planting and fixing/repairing the Coir Logs at Ford Island and repairing the fence at Te Pa Ika. We were never invited to tender for pest control at Papahikahawai and we lost the bid for pest plant control at Ford Island, but we remain hopeful that someday we will be granted these contracts.



**The team undertaking some hard mahi to repair the coir logs at Ford Island in an attempt to prevent erosion (Left – Raven and Awhina; Right – Peter).**

## **Te Arawa Lakes Trust - Mowing and Property Maintenance**

This contract started off with just 12 properties, but over the years has grown to 23, with new ones added as buildings Little Waihi are removed. We also do maintenance and clearing work on other Te Arawa properties as required. We have recently taken over the mowing of the Fishing Club grounds, which are part of the same plot that our shed is located on.



## **Pukehina Esplanade Reserve – Site Restoration**

This reserve is the stopbank that runs around the eastern end of Waihi Harbour. It is owned by WBOPDC and prior to our starting work there was heavily infested with gorse, pampas, broom, boneseed, sea couch etc. There are also several large mature eucalypts and pine trees which have seeded producing many rapidly growing saplings. In previous seasons we had cleared the track and removed several smaller trees.

This year we obtained additional funding from WBOPDC and BOPRC to finish spraying the gorse and pampas and to mulch the dead material to prepare it for planting (planned for September 2022). The intention is to leave the harbourside grassed, for better access as there is still work to be done. We also removed and chipped the small pines and some branches from the larger pines. There are still several medium sized trees to remove, as well as a row of willows on the northern section of the reserve. We have started pest control and will include weed control in our regular work. Being the harbour margin, it is important to have this under control if we are to clean up the whole harbour.

## **Other Contracts**

You might recall the upgrades and maintenance of the groin/mole/wharf at the Maketū Spit car park which were ongoing from July-Dec last year. In response to this work and its disturbance to the nearby dune, we undertook a large skink salvage operation at Maketū Spit to trap and relocated 11 shore skinks from the work area and placed them further along Maketū Spit. We also undertook the annual Spartina Spray and associated benthic invertebrate monitoring throughout Maketū Harbour. Otherwise, we also did a couple of small contracts for private properties in Maketū, mainly controlling gorse and other weeds, and picked up the end of a planting contract at Tumu Kawa which was a result of Covid impacting the schools and cancelling field trips resulting in leftover plants that still required planting.



**Pukehina Esplanade Reserve work (top left);  
Awhina undertaking epifaunal monitoring  
following spartina control (bottom left);  
relocating shore skink along Maketū Spit  
(right)**

# Other Matters of Interest

## Iwi Engagement

This report is very much about our field work, however the last couple of years has seen a huge growth in the appreciation of and engagement with Māori culture. The word co-governance has become a common feature of many discussions. MOWS is very aware of the need to engage with our local iwi, the fact that we have eight here in Maketū, makes it just a bit more complex. We have though started on the journey, but it is not one that can be hurried. MOWS is very much about working together, we are a community group, and as such part of the community. We are here to listen and to help. We have been successful in many areas, now we have another challenge.

## Wai Kokopu

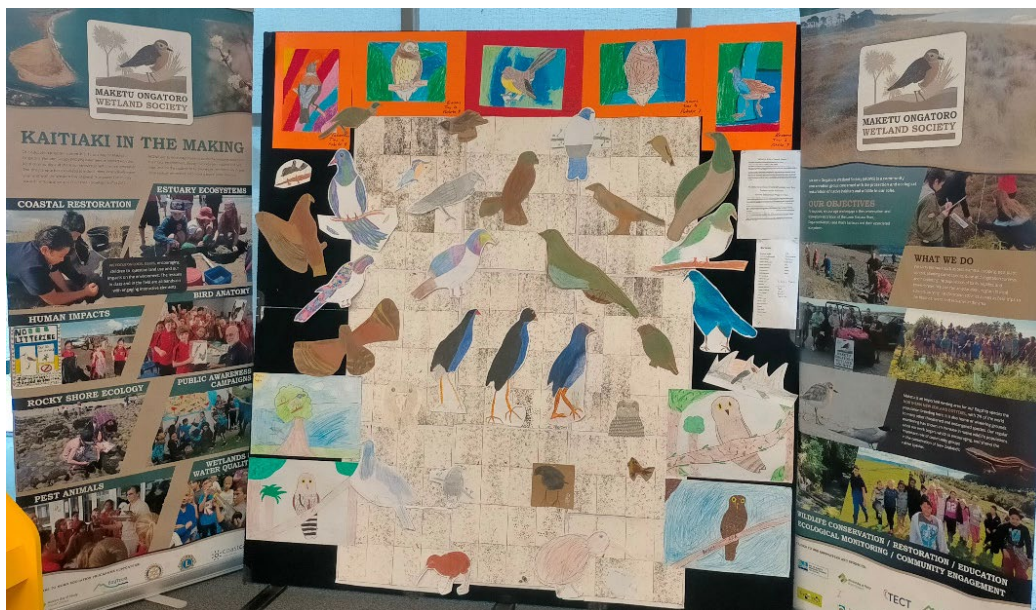
A couple of years ago, a new organisation, Wai Kokopu, was established with the intention of cleaning up the catchments of the streams (Pongakawa, Wharere and Kaikokupu) that flow into Waihi Harbour. The harbour is seriously polluted and filling up with silt from the poor farming practices up-catchment. MOWS is currently responsible for most of the south-eastern end of the harbour, and we are well aware of how it is deteriorating. Over time we have developed a good working relationship with Wai Kokopu and we look forward to working closely with them in the future.

## Te Wahapu o Waihi

More extremely good news, five local iwi have come together to create a new iwi forum with a view to improving the mauri of Waihi Harbour. MOWS has already reached out to them to see where we may be able to work with them, or help them achieve their objectives. Watch this space.

## Awards

This past year, MOWS was nominated for and awarded the TECT Community Award! Great job team!



The MOWS forest display at the Te Puke library in May.

# A Sad Year on the Membership Front

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## Chris Haverkort

We were hugely saddened the death of Chris Haverkort, the father of one of our key members Tania Bramley. Chris has been involved with a number of our projects over the years, and we had been discussing him taking on some of Julian's responsibilities on the #8 wire front. This is sadly not to be, we send our deepest condolences and best wishes to Tania and her family.

## Christian Jensen

The Grim Reaper has also deprived us of another valued member. Christian was our 'cat man', dedicated to getting rid of unwanted feral cats wherever they might appear in our rohe. Cats are possibly the most damaging pest species we deal with, so having Christian do this so effectively was immensely valuable. Go well Christian, your mojo is still with us. Our condolences to Christine and the rest of your family.

## Sheelagh Leary

It is with great sadness that we share the news that we recently lost lifetime member and Julian's partner Sheelagh. She has been a long-time supporter of MOWS, contributing in so many ways with a huge amount of her time, kind donations, and not least of all her support of Julian in all his endeavours. Sheelagh was a fierce advocate for New Zealand native species, passionate about the work of MOWS and other conservation projects. Never afraid to get stuck into some hard mahi, Sheelagh also had a few projects of her own. She worked hard to remove pest plants behind her and Julian's house, even using a rope to climb down a steep bank to get to those hard-to-reach areas! Sheelagh was also a keen and successful artist, filling any free time she had with creating beautiful pieces of weaving work. Sheelagh will be greatly missed and always remembered.



Chris Haverkort



Christian Jensen



Sheelagh Leary

# Acknowledgements and Supporters

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We would like to acknowledge the hard work and dedication of our committee, our biosecurity and restoration team, our monitoring team, educators, and numerous volunteers. We would like to extend a huge thank you for the 400 school kids that we've had the privilege to teach this year and their associated teachers and schools.

We collaborate with several organisations and would like to express our gratitude to: Chris Ward (Coast Care); Rusty Knuston, Michael Tyler, Pim de Monchy and Steph Bathgate (BOPRC); Glenn Ayo, Peter Watson and Sue Hammond (WBOPDC); Karl McCarthy and Emma Woods (DOC); Michelle Elborn, Wayne O'Keefe, Remedy Emtage and Emma Richardson (BCA); and John Miekle (Eastern Fish and Game).

Numerous people volunteered their day to assist with rubbish clean-ups or planting during our working bees this past year, and we would like to also acknowledge their efforts: Reuben Aikman, Louis Allard, Simon Allard, Murray Birkett, Jayda Bramley, Skye Bramley, Kirsty Brown, Anika Burgess, Ayana Burgess, Francis Burgess, Todd Burgess, Colleen Christensen, Lance Dodd and associates, Danny Edmonds, Hana Edmonds, Maria Elliott, Chantelle Gauld, Vicki Herdman, Dei-Jahna Hingston, Ranger Hingston, Rob Holland, Carole Long, Deidre Maxwell, Alison McGrath, Wayne McGrath, Courtney McNish, Kay Mulqueen, Bev Nairn, Manaia Nicholas, Opal Nilsen, Alison Odey, Linda Peacock, Richard Peters, Fabian Pukeroa, Harmony Pukeora, Rocky Pukeroa, Ian Shaw, Morianne Shaw, Janie Stevenson, Roanne Sutherland, Carolyn Symmans, Breanna Rae, Emily Underwood, Kyle Valentine, Tyla Van Alphen, Carol Veale, Nigel Veale, Emma Woods as well as Cam and Jenn, Simon, and Qionna. Apologies to anyone who we've missed, sometimes our sign-up sheet is overlooked in the midst of our busy volunteering.

Our voluntary-based committee works hard to ensure our operations continue to run smoothly and includes: Julian Fitter (Chair), Gary Williams (Treasurer), Janie Stevenson (Secretary), Maureen Burgees, Laura Rae, Claire Hartley, Peter Ellery, Awhina Awhimate and Jenn Sheppard. Peter Jackson volunteered for our committee for several years but stepped down at the end of 2021 – thank you for your devotion and time.

Our hard work would not be possible without the support of our funders and sponsors.



# Our Team



**Julian Fitter**  
Chairman

Julian is a naturalist, conservationist, writer, and lecturer with a particular interest in New Zealand wildlife and island ecosystems. Educated in the UK, Julian spent 15 years in the Galapagos Islands where he established and ran the first yacht charter operation. Since moving to New Zealand Julian has become an ambassador for native wildlife, being involved in many aspects of conservation in the country and the driving force behind Maketu Ongatoro Wetland Society. He was instrumental in establishing Bay Conservation Alliance, an organisation which supports and links conservation groups with a view to developing more effective landscape-scale projects.



**Jenn Sheppard**  
Operations Manager

Jenn is a skilled ecologist with 10 years of experience leading and planning ecological projects and conducting robust ecological statistical analyses. Jenn has conducted field research over the past 15 years in a range of habitats and on a variety of species, particularly on waterfowl and shorebirds. As Operations Manager she manages and coordinates biosecurity and ecological restoration activities. Previous to this role, Jenn was the Biodiversity Officer for MOWS and still carries out monitoring of dotterels and other nesting birds, conducting skink and invertebrate surveys, and measuring vegetation throughout the dunes.



**Laura Rae**  
Biosecurity and  
Restoration Team Leader

Laura is an avid conservationist who is very passionate about the environment. She has lived in Maketu for over 30 years and began working for MOWS in 2018 after completing a certificate in Horticulture at Toi Ohomai. Laura is highly experienced in pest plant and animal control and is the site manager of Te Huaauri o Te Kawa; a whitebait spawning wetland that hosts up to 6 species of whitebait. Laura also serves as a MOWS committee member and education officer and enjoys teaching local kids about nature and conservation practices.



**Awhina Awhimate**  
Biodiversity and  
Conservation Ranger

Awhina joined MOWS in 2020 and works alongside Laura to assist with our wetland and dune restoration projects across all our sites. Awhina's background is in administration, however, a passion for ecological restoration and a keen interest in biodiversity led her to study Conservation Operations at Toi Ohomai in 2020. Awhina is a descendant of the Te Arawa waka and has strong whakapapa connections to Ngāti Makino, Ngāti Pikiao, Te Awhe and Ngāti Whakahemo.



**Raven Nicholas**  
Biosecurity and Restoration  
Ranger

Raven began volunteering for MOWS in early 2021 and found her passion for the restoration of our native flora and fauna. In July 2021 she completed the cadetship with Bay Conservation Alliance where she gained many skills and certifications. As MOWS newest employee, she is excited to be working to restore the Mauri of the whenua and waterways around Maketu. Raven is married with 4 tamariki and lives in Maketu. She has whakapapa links to Te Arawa as Ngāti Whakaue and Ngāti Pikiao, just to name a few. Her hobbies include netball, swimming, and whatever her children need to grow.



**Gary Williams**  
Treasurer

Gary has been a member of MOWS since 2011 and, as a Chartered Accountant, is also our Treasurer. Gary kindly donates his time to MOWS and takes care of vital tasks like paying the wages and bills and preparing our financial reports. When not working hard in the office Gary also likes getting into the outdoors to help the MOWS work team when an extra pair of hands are required. In his free time Gary enjoys time with family, the great NZ outdoors, fishing, cycling, and fun in the sun at Maketu. His hope for the future is to see the implementation of a noxious plant and pest free strategy for Maketu village and surrounds.



**Janie Stevenson**  
Secretary and  
Education Officer

Janie grew up in Mount Maunganui and currently resides in Maketu with her young whānau. Janie has a background in environmental education, community engagement and facilitation, and has worked in education roles with BOP Regional Council and NZ Landcare Trust. Janie is the MOWS Secretary and Education Officer, coordinating and delivering school visits and field trips to our local, natural environments. Janie also works for Bay Conservation Alliance as the Education and Engagement Manager. In the weekend, Janie is often found in the garden or at one of Maketu's beautiful beaches with her kids, falling off a surfboard.



**Carolyn Symmans**  
Pest Control Officer

Carolyn is the most active person in the Maketu community! She is involved with Predator Free NZ, Maketu Kaumatua Group, and St Pauls Maori Anglican Church Te Pamu, as well dog showing, judging dog shows, and coaching dog owners about showing. Carolyn is passionate about wildlife, and as well as her involvement with MOWS, she also helps with restoration and predator control in Kotukutuku Gully, rescues and rehabilitates native birds, and is always picking up litter. As well as being Pest Control Officer for MOWS Carolyn is also a member of the MOWS education team and teaches the children about the importance of controlling pest mammals in order to



**Peter Ellery**  
Wetland Restoration  
Ecologist

Peter has a graduate diploma in applied science and has had a long involvement with sea fisheries management, which led him to embark on the restoration of an inanga spawning site on the Kaituna River known as the Borrow Pits. This has become an extremely successful project, now known as the Te Huauri o Te Kawa Wetland (THOTK). Peter is also involved with Wai-kokopu, Kaituna Ongatoro/Maketu Estuary Strategy, the MOWS Education Program, and is currently participating in the Freshwater Futures, Kaituna, Community Group.



**Maureen Binns**  
Educator

A born and bred Wellingtonian, Maureen moved to Maketu 17 years ago. She trained as a teacher and a librarian and was a Chair of the National Executive for Forest and Bird. Maureen was the founding chairperson of Matiu Somes Island Charitable Trust which is a 50-50 partnership with Wellington Tenth Trust. In Maketu Maureen was appointed to the East Coast Bay of Plenty Conservation Board, and is one of the founding members of MOWS, helping to set it up in 2008. Her main interest and passion is native birds, as well as working in the education team. Maureen now grows truffles in Paengaroa at Te Puke Truffles.



**Claire Hartley**  
Membership Secretary and  
Website Manager

A UK expat with a degree in Zoological Conservation and a background in animal care, Claire is an avid conservationist. Back in the UK she had a varied career including being a zookeeper, a farm park worker, and managing an exotic pet shop. Claire was previously a field team member for MOWS assisting with ecological restoration and has since retrained in website administration, completing a Certificate in Web Design and Writing in order to manage the MOWS website. She also works for Bay Conservation Alliance. When not busy keeping her toddler entertained, Claire can be normally be found painting, horse riding,



**Fran van Alphen**  
Avian and Invertebrate  
Surveyor

Fran has a BSc in ecology but has spent many years working in horticulture. Keen to get back into ecology she completed the BCA Cadetship to help her upskill for a role in conservation work. She has spent the past 12 years with the Manawahe EcoTrust doing governance and predator control, and has carried out forest bird monitoring for the past four years. Fran has now stepped into the role of our terrestrial invertebrate ecologist. She also volunteers to conduct bird surveys for MOWS as well as working part-time as a junior ecologist for River Lake Ltd. and as a casual contractor for ATS Environmental focusing on fish passage.



**Tiffany Randell**  
Volunteer Bird Monitor

Tiffany is extremely passionate about te taiao and was fortunate enough to be put through the Bay Conservation Alliance cadetship after having completed Te Reo Rangatira and Rongoā Māori courses at Te Wānanga o Aotearoa. Finding she particularly enjoyed bird identification and surveys Tiffany went on to volunteer with the MOWS team, planting and doing fortnightly bird surveys. An enjoyable exercise where she would often bring her husband and their 3 children to walk the length of this beautiful beach and learn to identify all the different shorebirds by sight, sound and behaviours. Tiffany is also on the Ōtanewainuku kōkako team and is helping catalogue a significant native plant collection through BCA.



**Reuben Aikman**  
Volunteer Bird Monitor

Born and raised in Opotiki in the sunny Eastern Bay of Plenty, and with a keen passion for New Zealand's native flora and fauna, Reuben has a keen interest in particular for our birdlife here in Aotearoa. Having completed the first Intake of the Bay Conservation Alliance cadetship in 2021, Reuben has been stoked to have met with like minded people in the conservation space and connected with various BCA member groups such as MOWS. In his free time Reuben likes to do activities such as birdwatching, bushwalking, bike riding and volunteering in the conservation space.



**Chris Haverkort**  
Contractor

Chris is Tania Bramley's father and has been a long time supporter of MOWS. He was a No.8 wire kind of man who could fix anything and create solutions for any problem. Chris was passionate about looking after the environment and getting out in nature, even taking dips at Little Waihi in the middle of winter. He was often found with a trailer load of plants, a spade in his hand at a working bee or elbow deep in the motor of one of MOWS' many tools. Chris was looking forward to doing a bit more work for MOWS when he retired but he passed away suddenly in July, before he could realise his retirement dreams. We miss his energy and ability to look at the positives in all situations. You will always be remembered, Chris.

# Financial Report

## Statement of Profit or Loss

### Maketu Ongatoro Wetland Society Incorporated For the year ended 30 June 2022

	NOTES	2022
<b>Income</b>		
Bank Interest		170.15
BOP Regional Council		179,537.68
Donations		14,200.40
Insurance Claims Received		675.70
Membership Subscriptions.		356.55
TALM Revenue		13,082.26
TECT Revenue		40,000.00
WBOPDC Revenue		72,270.00
MSD - Covid Funds Received		2,518.00
Other Contracts & Revenue		70,671.15
<b>Total Income</b>		<b>393,481.89</b>
<b>Cost of Services - Expenses</b>		
Operational Costs		183,399.35
Training		3,105.80
Wages & Salaries		170,470.87
<b>Total Cost of Services - Expenses</b>		<b>356,976.02</b>
<b>Overhead Expenses</b>		
ACC Levies		371.70
Accounting & Audit		810.20
Bank Fees		187.20
Electricity		476.29
Event Expenses.		198.05
Health & Safety		1,752.39
Interest Expense		94.20
Insurance		8,385.84
Office Expenses		866.86
Phone & Internet		1,058.00
Rents & Leases		5,037.48
Security & Surveillance		784.07
Subscriptions		296.61
Tools & Equipment Purchases		22,078.81
Website & CRM		689.40
<b>Total Overhead Expenses</b>		<b>43,087.10</b>
<b>Surplus (Deficit)</b>		<b>(6,581.23)</b>

# Balance Sheet

## Maketu Ongatoro Wetland Society Incorporated As at 30 June 2022

NOTES 30 JUN 2022

### Assets

#### Current Assets

##### Cash and Bank

0 - 00-CUR Maketu Ongatoro Wetland	82.00
01 MAIN - 01-SAV Maketu Ongatoro Wetland	25,600.77
<b>Total Cash and Bank</b>	<b>25,682.77</b>

Trade and Other Receivables	7,364.11
GST Receivable	6,225.88
611 - Reimbursements & Recoveries	(285.76)
<b>Total Current Assets</b>	<b>38,987.00</b>

#### Non-Current Assets

Property, Plant and Equipment	152,494.52
<b>Total Non-Current Assets</b>	<b>152,494.52</b>

<b>Total Assets</b>	<b>191,481.52</b>
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### Liabilities

#### Current Liabilities

Trade and Other Payables	1,380.00
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##### PAYE

825 - PAYE Payable	4,113.52
816 - Wages Deductions Payable	2,137.73
<b>Total PAYE</b>	<b>6,251.25</b>

#### Income Tax Payable

##### Income tax

625 - Withholding Tax Payable	30.00
<b>Total Income tax</b>	<b>30.00</b>

<b>Total Income Tax Payable</b>	<b>30.00</b>
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<b>Total Current Liabilities</b>	<b>7,661.25</b>
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<b>Total Liabilities</b>	<b>7,661.25</b>
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<b>Net Assets</b>	<b>183,820.27</b>
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### Equity

Retained Earnings	183,820.27
<b>Total Equity</b>	<b>183,820.27</b>



## Appendix - Bird and Plant Names

English, scientific and Māori name and associated conservation status of all bird species mentioned throughout this report.

English name	Scientific name	Māori name	Conservation Status
Australasian bittern	<i>Botaurus poiciloptilus</i>	Matuku hūrepo	Nationally critical
Australian ibis	<i>Threskiornis molucca</i>		Vagrant – least concern
Australasian shoveler	<i>Anas rhynchotis</i>	Kuruwhengi	Not threatened
Banded dotterel*	<i>Charadrius bicinctus</i>	Tūturiwhatu	Nationally vulnerable
Banded rail	<i>Gallirallus philippensis</i>	Mioweka	Declining
Bar-tailed godwit	<i>Limosa lapponica</i>	Kuaka	Declining
Bellbird	<i>Anthornis melanura</i>	Korimako	Not threatened
Black-backed gull	<i>Larus dominicanus</i>	Karoro	Not threatened
Black-billed gull*	<i>Larus bulleri</i>		Nationally critical
Black-fronted dotterel	<i>Elseyornis melanops</i>		Naturally uncommon
Black-fronted tern*	<i>Chlidonias albostrigatus</i>	Tarapirohe	Nationally endangered
Black shag	<i>Phalacrocorax carbo</i>	Kawau	Naturally uncommon
Black swan	<i>Cygnus atrats</i>	Kākānau	Not threatened
Brown teal*	<i>Anas chlorotis</i>	Pāteke	Recovering
Canada goose	<i>Branta canadensis</i>		Introduced
Caspian tern	<i>Hydroprogne caspia</i>	Taranui	Nationally vulnerable
Cattle egret	<i>Adrea ibis</i>		Migrant – least concern
Chestnut teal	<i>Anas castanea</i>		Vagrant – least concern
Common tern	<i>Stern hirundo</i>		Vagrant – least concern
Dabchick*	<i>Poliiocephalus rufopectus</i>	Weweia	Recovering
Far eastern curlew	<i>Numenius madagascariensis</i>		Vagrant – endangered
Fernbird*	<i>Bowdleria punctata</i>	Mātātā	Declining
Grey-tailed tattler	<i>Tringa brevipes</i>		Vagrant – near threatened
Grey teal	<i>Anas gracilis</i>	Tētē	Not threatened
Harrier hawk	<i>Circus approximans</i>	Kāhu	Not threatened
Hudsonian godwit	<i>Limosa haemastica</i>		Vagrant – least concern
Kingfisher (scared)	<i>Todiramphus sanctus</i>	Kōtare*	Not threatened
Little black shag	<i>Phalacrocorax sulcirostris</i>	Kawau tūi	Naturally uncommon
Little penguin	<i>Eudyptula minor</i>	Kororā	Declining
Little pied shag	<i>P. melanoleucos</i>	Kawau paka	Not threatened
Little tern	<i>Sternula albifrons</i>		Migrant – least concern
Marsh crake	<i>Porzana pusilla</i>	Koitareke	Declining
Marsh sandpiper	<i>Tringa stagnatilis</i>		Vagrant – least concern
Mallard duck	<i>Anas platyrhynchos</i>		Introduced
NZ Dotterel*	<i>Charadrius obscurus</i>	Tūturiwhatu pukunui	Recovering
Pacific golden plover	<i>Pluvialis fulva</i>		Migrant – least concern
Paradise shelduck	<i>Tadorna variegata</i>	Pūtangitangi	Not threatened
Pectoral sandpiper	<i>Calidris melanotos</i>		Vagrant – least concern
Pied shag	<i>Phalacrocorax varius</i>	Kāruhiruhi	Recovering
Pied stilt	<i>Himantopus himantopus</i>	Poaka	Not threatened
Purple swamphen	<i>Porphyrio melanotus</i>	Pūkeko	Not threatened
Red-billed gull	<i>Larus novaehollandiae</i>	Tarāpunga	Declining
Red knot	<i>Calidris canutus</i>	Huahou	Nationally vulnerable
Red-necked stint	<i>Calidris ruficollis</i>		Migrant – near threatened
Reef heron	<i>Egretta sacra</i>	Matuku moana	Nationally endangered
Royal spoonbill	<i>Platalea regia</i>	Kōtuku ngutupapa	Naturally uncommon
Ruddy turnstone	<i>Arenaria interpres</i>		Migrant – least concern

Sharp-tailed sandpiper	<i>Calidris acuminata</i>		Migrant – Least concern
SI Pied oystercatcher*	<i>Haematopus finschi</i>	Tōrea	Declining
Spotless crake	<i>Porzana tabuensis</i>	Pūweto	Declining
Spur-winged plover	<i>Vanellus miles</i>	—	Not threatened
Variable oystercatcher*	<i>Haematopus unicolor</i>	Tōrea pango	Recovering
Whimbrel	<i>Numenius phaeopus</i>		Migrant – least concern
White-faced heron	<i>Egretta novahollandiae</i>	Matuku	Not threatened
White-fronted tern	<i>Sterna striata</i>	Tara	Declining
White heron	<i>Ardea modesta</i>	Kōtuku	Nationally critical
White-winged tern	<i>Chlidonias leucopterus</i>		Migrant – least concern
Wrybill*	<i>Anarhynchus frontalis</i>	Ngutuparore	Nationally vulnerable

\* Endemic to New Zealand

English, scientific and Māori name and associated conservation status of all plant species mentioned throughout this report.

English name	Scientific name	Māori name	Conservation Status
African ice plant	<i>Carpobrotus edulis</i>		Exotic
Bolboschoenus	<i>Bolboschoenus fluviatilis</i>	Kukuraho	Not threatened
Boneseed	<i>Chrysanthemoides monilifera</i>		Exotic
Bramble	<i>Rubus fruticosus</i>		Exotic
Brown pine	<i>Pectinopitys ferruginea</i>	Miro	Not threatened
Cabbage tree	<i>Cordyline australis</i>	Ti kouka	Not threatened
Cactus	<i>Opuntia sp.</i>		Exotic
Cape daisy	<i>Arctotheca calendula</i>		Exotic
Cape smilax	<i>Asparagus asparagoides</i>		Exotic
Dimorphotheca	<i>Dimorphotheca fruticosa</i>		Exotic
Flax	<i>Phormium tenax</i>	Harakeke	Not threatened
Golden sand sedge	<i>Ficinia spiralis</i>	Pingao	At risk - declining
Gorse	<i>Ulex europaeus</i>		Exotic
Gravel groundsel	<i>Senecio skirrhodon</i>		Exotic
Inkweed	<i>Phytolacca octandra</i>		Exotic
Italian buckthorn	<i>Rhamnus alaternus</i>		Exotic
Japanese honeysuckle	<i>Lonicera japonica</i>		Exotic
Kikuyu	<i>Cenchrus clandestinus</i>		Exotic
Knobby club rush	<i>Ficinia nodosa</i>	Wiwi	Not threatened
Lucerne (alfalfa)	<i>Medicago sativa</i>		Exotic
Montbretia	<i>Crocsmia x crocomiiflora</i>		Exotic
Moth plant	<i>Araujia hortorum</i>		Exotic
Native musk	<i>Thyridia repends</i>		At risk – naturally uncommon
Oxalis	<i>Oxalis sp.</i>		Exotic
Pampas	<i>Cortaderia selloana</i>		Exotic
Purple groundsel	<i>Senecio elegans</i>		Exotic
Reed sweet grass	<i>Glyceria maxima</i>		Exotic
Sea couch	<i>Elytrigia pycnantha</i>		Exotic
Spinifex	<i>Spinifex sericeus</i>	Kowhangatara	Not threatened
Tree lupin	<i>Lupinus arboreus</i>		Exotic
Wattle	<i>Acacia mearnsii</i>		Exotic
White pine	<i>Dacrycarpus dacrydioides</i>	Kahikatea	Not threatened
Wildling pine	<i>Pinus radiata</i>		Exotic
Willow	<i>Senecio elegans</i>	Exotic	
Yucca	<i>Agave americana</i>		Exotic



**WILDLIFE CONSERVATION / RESTORATION / EDUCATION  
ECOLOGICAL MONITORING / COMMUNITY ENGAGEMENT**

