Pūkorokoro Miranda NEWS

Journal of the Pūkorokoro Miranda Naturalists' Trust

May 2026 Issue 140

Editorial

Right through the summer season the Shorebird Centre was humming. This was reflected in both shop takings and visitor numbers. A recent trend continued as each month we posted an all-time record for visitors. Where were they all from? Many were Kiwis out and about. Many were from overseas, especially Australia, the US, UK/Europe and Canada. We sensed there was a spike in Canadian visitors, and in conversation learned New Zealand and Australia had become attractive alternatives to crossing the US border. Several Australians indicated they too had crossed the Tasman instead of heading to the US.

A steady stream of cyclists revealed another factor. While the Hauraki Rail Trail has been around for nearly ten years now, it has been regularly subject to section closures, sometimes for extended periods. The Waitakaruru to Kopu sector was closed for over a year. The trail network has now been fully open for some time and now not a day goes by without people dismounting outside the Centre.

It was also a summer that underlined the immense support we receive from out volunteers. Looking back, Chelsea, Trudy and I cannot figure out how we would have coped without the tremendous assistance of Wendy and Alan Pilkington. Resident in Australia, they have been regular summer volunteers for a few years now, parking their motor home outside and taking care of business; the shop and Centre operations for Wendy, guiding for Alan. This year they arrived in mid-December and departed in early March. Once again, we also had the invaluable services of Peter Fryer as summer shore guide, among many other contributions he made to the Centre and Reserve.

EVENTS CALENDAR

Sunday 24 May: PMNT AGM 10.00 am, High Tide 1.35pm.
Speaker Dr Jenny Hillman, University of Auckland –
The journey to restoring New Zealand's lost shellfish reefs

Moving round the world while growing up, mainly in North and East Africa and the Middle East, Jen was always going to work with animals, and has always been happiest underwater! She has worked around the world ever since, running marine conservation projects as an environmental consultant in Africa, the Middle East, and South-east Asia, and studying in Australia and Papua New Guinea.

Jen moved to New Zealand to do her PhD on how different soft-sediment habitats influence how our coastal areas work, and continued on to her current work as a senior lecturer of coastal restoration. This role focuses on how we can make our oceans better for everything and everyone, with the main efforts being in shellfish restoration both across the Hauraki Gulf and the top of the South Island.

Saturday 8 August:
Working Bee and Potluck Dinner

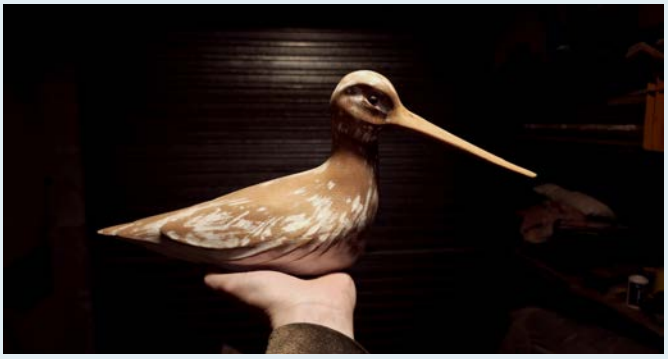
11-13 September:
Printmaking Course with Sandra Morris

Sunday 4 October:
Welcome to the Birds 10.00 am

COVER: Convolvulus Hawk Moth on Convolvulus. TANSY BLISS

SNIPPETS

Under the provisions of the Ngāti Paoa Treaty Settlement Act 2025, the New Zealand Geographic Board has gazetted new names for land areas including two reserves on the Pūkorokoro Coast. These are now Pūkorokoro Miranda Wildlife Reserve, and the Pūkorokoro Miranda Taramaire Government Purpose Wildlife Management Area.



Those extraordinary godwits continue to inspire art and literature. Here is an example by artist John Ward Knox.

citygallery.org.nz/human-godwits-on-john-ward-knox/

For information about Wrybill see article on page 10.

Two new birds on display at the Centre

Chelsea Ralls reports on a piece of serendipity.

On Friday 13 March two beautiful birds were fittingly welcomed to the Shorebird Centre by mana whenua.

Storms and injuries can sometimes bring the life of a bird to an early end. The Department of Conservation, bird rescue operators and Zoos put in an enormous amount of care and effort, but despite their dedicated mahi, not every bird can be saved. There are protocols in place for these situations and cultural connections to be respected. In special cases a beautiful specimen may be taxidermized and start a new life, educating the many people who will never get to see these magnificent manu up close.

This was the case for two birds - a Toroa Pango Light-mantled Sooty Albatross that was wrecked after a storm along part of the Hauraki Rail Trail, and a Kōtuku White Heron that was struck by a vehicle near the Holiday Park just 7km south of the Shorebird Centre. Permission was granted for these birds to be preserved for educational purposes, and the Shorebird Centre will be sharing their display alongside the DOC Visitors Centre in the Kauaeranga Valley.

The story took a serendipitous turn for their arrival. The week before, a casual mention about bringing the manu to the Shorebird Centre resulted in a plan for the birds to arrive that week with DOC staff who were planning to do work nearby. That morning mana whenua Tipa Compain and nephew Michael Phillips (Ngāti Paoa) dropped into the Centre with a group of work colleagues from Tamaki after taking a wrong turn. We were happily discussing Kuaka departures that week and their journey ahead, when Ken Brown from DOC just happened to arrive early, waiting for better conditions for the drone work scheduled that day.

Michael kindly agreed and led the group in a karakia welcoming these manu to the Centre, speaking of the journeys taken by these manu and mana whenua on their migration to Aotearoa. A very special moment for everyone present that could not have been planned any better.

We are working to create a display for these manu and look forward to sharing them with all our visitors.

Light-mantled Sooty Albatross CHELSEA RALLS


Kotuku CHELSEA RALLS


Welcoming the birds PMNT.


Mangrove clearance Pukorokoro Stream KEITH WOODLEY


Upstream KEITH WOODLEY

Pūkorokoro Stream

Waikato Regional Council (WRC) and Waikato District Council (WDC) recently completed work improving the flow of Pūkorokoro Stream. Years of sediment buildup and encroaching mangroves had reduced the channel to a narrow strip at the East Coast Road bridge. This seriously impeded drainage from areas upstream, especially after major weather events.

The work is expected to provide benefits for multiple stakeholders including PMNT. WDC had responsibility for the area fifty metres either side of the bridge, while WRC worked on a large section downstream, which included the outlet from the Stilt Pools. We shall monitor whether increased flow has any effect where the stream mouth meets the end of the shell spit.

Recent sightings at Pūkorokoro

730 Bar-tailed Godwit

40 Red Knot

2 Sharp-tailed Sandpiper

7,000 Pied Oystercatcher

c.2,100 Wrybill

NZ Dotterel

Banded Dotterel

Royal Spoonbill

Moths take off in the Findlay Reserve

Tansy Bliss reports on her mothing activities, and how her efforts continue to put the Robert Findlay Wildlife Reserve on the map.

LepiLED light TANSY BLISS

Simple trap TANSY BLISS

It is dusk in Mid-March and the wind has dropped. I check the forecast - no rain and an evening temperature of around 17-18°C. It is a perfect moth monitoring night. I quickly gather together the necessary equipment: two battery powered light traps, two white sheets, a kneeling mat, a selection of egg cartons, head torch, notebook and pencil, specimen holding vials of different sizes, phone camera, migrant moth identification chart, warm clothes, x2.5 magnification glasses, magnifying hand lens, flask of coffee and half a packet of biscuits. I load up the Kaitiaki Ranger vehicle and then I'm off.

The Reserve is beautiful at this hour. Muted tones settle on the saltmarsh, the tall dying grasses become gold, and the darkening sky is studded with incoming birds. The sound of wings, contact calls and the smell of marsh are all around me as I set up the light traps. One is a simple LED strip light curled around a toilet roll holder and suspended above a small square trap box full of egg cartons which I place in the shelter of our native plantings. The other is more sophisticated, a German made LepiLED light that sits over a funnel emptying into a 20-litre bucket, also filled with egg cartons. The light emitted corresponds to the three sensitivity peaks of most nocturnal insects (UV, blue and green in the electromagnetic spectrum). I place this one up against the back wall of the Stilt Hide where it is sheltered and the wall makes a good landing spot for moths less inclined to go down the funnel.

Even before I have finished setting up, moths start arriving, drawn to the multi spectrum light arcing out into the night. I start my list: *Ptyomaxia trigonogramma* -a specialist native moth whose larvae/caterpillars feed on mangrove flowers and flower buds. I am happy it is here and have been amazed by the variety of different colour forms I can see in one night, ranging from such bold markings to more subtle tones. What makes that happen I wonder?

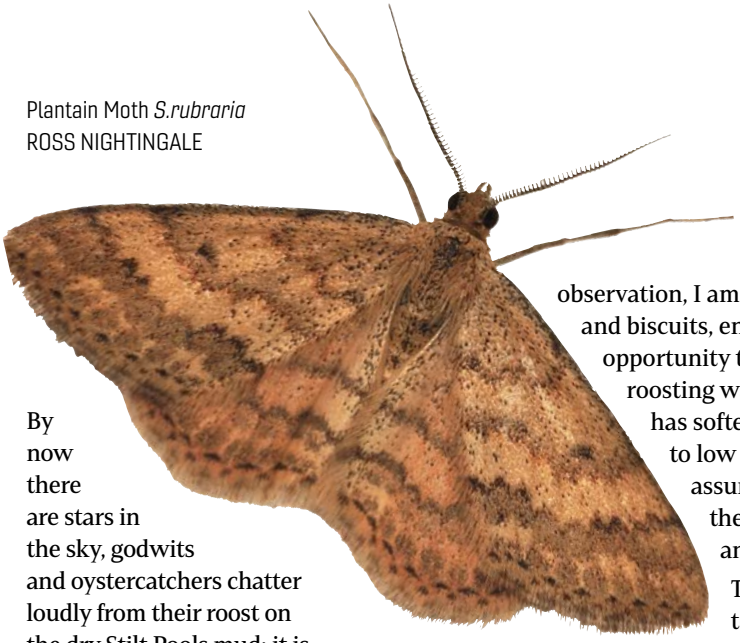
Two examples of *Ptyomaxia*.

P. trigonogramma ROSS NIGHTINGALE

P. trigonogramma ROSS NIGHTINGALE

Apple looper *Phrissogonus laticostatus* – is an introduced moth from Australia, whose caterpillars 'loop' when walking, and feed on the flowers and leaves of the abundant wild carrot that is growing in the Reserve. I am not surprised to see it here in good numbers. The male has additional protruding tufts of hairlike scales on its forewing that may be for detecting or sending out pheromones related to courtship. See *PMNT News* 128

A larger moths flies in, Sugarcane Army Worm *Leucania stenographa* – another Australian import, whose caterpillars feed on a wide range of plants and grasses. It is gracefully followed by a delicate native, Plantain Moth *Scopula rubraria*. With at least three species of plantain in the Reserve, there is abundant food for the caterpillars. Small Thistle Moth *Tebenna micalis*, a charming little nugget of a moth catches my eye as it glistens in the light crawling around the funnel before dropping into the bucket. Its caterpillars are leaf miners for the early part of their life, feeding on plants in the daisy family, eating the inner tissues of the leaf while leaving the outer epidermal layer virtually intact. Later they feed from a loose web of silk on the underside of the leaves. Small clear feeding windows show where they have been.



Plantain Moth *S.rubraria*
ROSS NIGHTINGALE

By now there are stars in the sky, godwits and oystercatchers chatter loudly from their roost on the dry Stilt Pools mud; it is wonderful background noise and makes it an absolute pleasure to be out at night.

My list lengthens: New Zealand Looper *Epyaxa rosearia*, an endemic species, yet its caterpillars happily feed on introduced plants in the cabbage, pea and plantain families. A yet to be named coastal species in the Genus *Eudonia*, whose caterpillars feed on mosses, comes to the light.

I scan the wall for diminutive micro-moths and scoop up a 6mm specimen into one of the glass vials for close inspection under the hand lens. I now recognise it as *Elachista gerasmia*, one of our endemic species whose caterpillars feed on rushes, so well placed in the Reserve. A larger but odd-looking moth arrives on the wall. It has distinctive thick labial palps (specialised chemical detecting apparatus) projecting frontwards from its face. I am not familiar with this moth, so it goes into a slightly larger glass vial for further examination.

I write a brief description and attempt some night photography. It still has me puzzling even after close scrutiny, so I hold onto it to check and photograph in the morning. I will pore over the Micro Moth Guide on iNaturalist, put together by Tony Steer and hopefully find a good match before releasing the moth back in the Reserve. Once I have worked out a possible identification, I post the observation with a photograph on iNaturalist tagged to the Pūkorokoro Miranda Naturalists' Trust Wildlife Project and wait for it to be verified or rejected by the expert moth identifiers.*

*The unknown moth is identified as Alligator Weed Moth *Marcrorrhinia endonephele*, introduced successfully in 1987 as a biocontrol for the invasive Alligator Weed. ***https://www.landcareresearch.co.nz/discover-our-research/managing-invasive-species/weed-biocontrol/projects-agents/biocontrol-agents/alligator-weed-moth***

After a couple of hours of observation, I am ready for coffee and biscuits, enjoying the opportunity to listen to the roosting wader flock which has softened its calls to low murmurings. I assume this means they are content and resting.

Then it is back to the moth trap to see who has flown in. Due to the recent westerly winds, I am looking for any migrant moths that may have been swept up in westerly airflows from Australia and been transported to us via, what the researchers studying migrant moth movement, call an 'airbridge'.

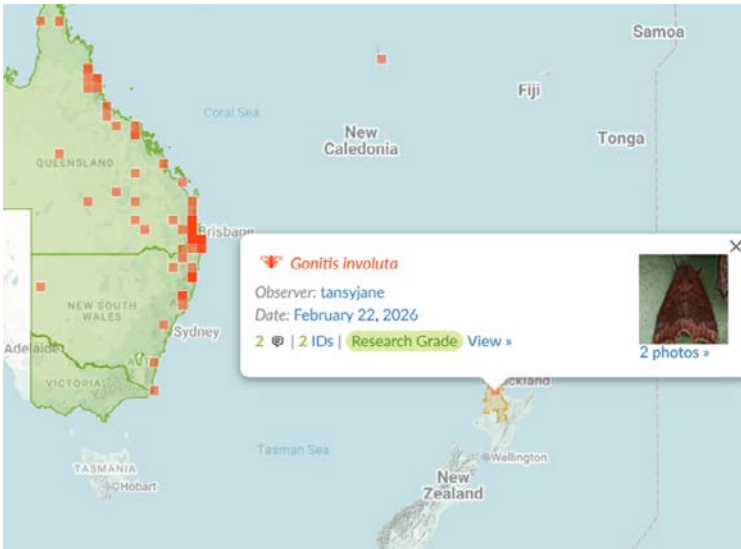
Dr Toni Withers, Senior Entomologist with the Bioeconomy Science Institute, Scion Group, based in Rotorua, is the lead for this Protecting Aotearoa Programme. It is a 5-year Research Programme, specifically looking at modelling atmospheric patterns to predict the probability of pests and pathogens arriving from Australia transported by the wind.

The research uses information relating to moths and butterflies that arrive from Australia in predominantly westerly airflows, to examine under what atmospheric conditions they arrived, where they came from in Australia or New Caledonia, and where they were first intercepted in New Zealand. Toni contacted me to ask whether I would be prepared to look out for these migrant moths and contribute to the research programme by collecting specimens. The research involves using mass spectroscopy to examine chemical traces in the moth's chiton exoskeleton. The chemicals have come from the plants eaten by the caterpillar and can be traced back to specific countries and possibly regions, thus giving a departure location for the migrant moth. Totally amazing! All this information goes into the complex modelling which should allow predictions of airborne biosecurity risks under certain weather patterns.

Alligator weed moth with scale TANSY BLISS

As one of the citizen scientists contributing to this programme, I receive alerts when favourable conditions are predicted and am asked to have my moth traps at the ready. It is normally a consistent westerly weather pattern that brings the migrant moths. A cold frontal system sweeps over southern Australia and undercuts warmer air, lifting moths up into the atmosphere. This, followed by the westerlies associated with a revolving low, then carries those moths ahead of the front across the Tasman to Aotearoa New Zealand. Miraculously, some end up in my light trap at Pūkorokoro! My most recent exciting Australian migrant, was a Jute Moth *Gonitis involuta*, the first recorded observation in New Zealand. I shall look forward to finding out, later in the Research project, where that moth came from in Australia.

Map 1: Migrant moth record Jute Moth *Gonitis involuta*
www.inaturalist.nz/observations/339655236



As if to bring me back to the here and now, a lovely Reserve special, *Horisme suppressaria* makes an appearance, wings spread wide and flat, displaying a beautiful delicate band of pale across the middle of the forewing, complimented by an equally pale apical streak. Ross Nightingale, a citizen scientist from Rotorua and his wife Sarah, regularly visit Pūkorokoro and contribute to our moth monitoring and to the wider PMNT Wildlife Project on iNaturalist. Ross and Sarah are currently enjoying finding and photographing as many of New Zealand's moths as possible. While at Pūkorokoro, he captured the essence of *Horisme suppressaria* perfectly.

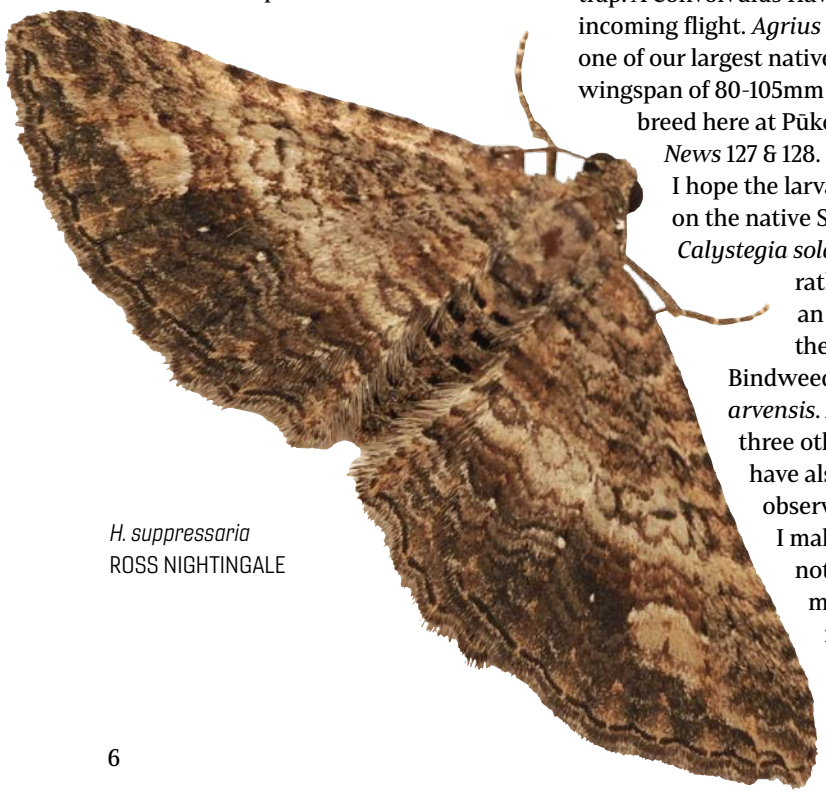
The moth monitoring project in the Reserve and at the Shorebird Centre is a way of illustrating and examining the increased biodiversity that comes with on-going habitat restoration. When Ray and Ann Buckmaster started planting native trees and shrubs in the Reserve in 2019, they estimated that over 80% of the existing vegetation was exotic. They set out to change that and now with the addition of fourteen different native salt tolerant species and increased habitat for self-colonising native herbs and shrubs, the Reserve is certainly a different place. Despite all our planting, the base vegetation is still predominantly exotic herbaceous plants, and the composition of the moths I observe in the Reserve reflects that. However, some of our native moths have adapted and their caterpillars now also feed on introduced plants.

Vinicia ROSS NIGHTINGALE

One specialist moth associated with salt marsh and mangroves is *Vinicia*, still not named to species level. There are only 20 observations on iNaturalist for New Zealand and all but four of those come from Pūkorokoro. It is also found around the east coast of Australia, presumably in similar habitat. Not much is known about this moth, but I am always pleased to see it, with its elongated wings rolled in a tube-like fashion, patterned in delicate fawny orange and white.

Having crouched beside the light on my padded mat for the last hour, I stretch my legs and check nearby vegetation for moths. Some moths come to the light but keep their distance from the sheet, funnel and bucket. I find another Sugarcane Army Worm clinging to a dead wild carrot seed head and a Slender Burnished Brass *Thysanoplusia orichalcea* hiding amongst some Knobby Club Rush.

Suddenly there is an audible whirling of wings and significant shadow on the white sheet spread out beneath my trap. A Convolvulus Hawk Moth on an incoming flight. *Agrius convolvuli* is one of our largest native moths with a wingspan of 80-105mm and is known to breed here at Pūkorokoro. See *PM News* 127 & 128. In the Reserve I hope the larvae are feeding on the native Shore Bindweed *Calystegia soldanella*, rather than on an infestation of the invasive Field Bindweed, *Calystegia arvensis*. Aware that three other bindweeds have also been observed in the area, I make a mental note to update myself on what is currently present in the Reserve.



H. suppressaria ROSS NIGHTINGALE

Slender Burnished Brass TANSY BLISS

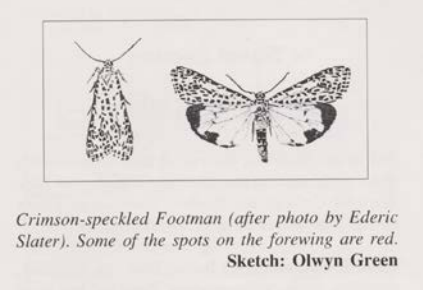
The Hawkmoth lands on the hide wall and I take a record shot, marvelling how, with its wings closed, this magnificent creature ceases to look like a moth and could be a woody protuberance, or something else entirely. With wings held aloft, when preparing for take-off or in flight, especially if hovering in front of a tubular flower, with its long proboscis extended to reach the nectar source, the stunning white-pink-black striped abdomen is revealed. (See front cover.)

I hear the birds beginning to depart from the Stilt Pools with their reassuring contact calls falling out of the darkness. It is almost midnight and I have 42 different moth species on my list. That is just under a third of all the 135 species I have recorded to date for the Reserve, with 187 recorded at the Shorebird Centre. There is a good mix of species, some endemic, some native, others introduced accidently or specifically for biocontrol of invasive plant species. I still have my small trap to check and empty on my way out, so after checking the Stilt Hide wall and sheet one last time, I turn off the light, leaving the moths to return to their nightly business, having only their names recorded in my notebook.

Adding a bit of colour

On the evening of 9 March 1997, Chris and Olwyn Green and Michael Taylor were out with their powerful lamp and white sheet, trapping moths at the Pūkorokoro Shorebird Centre. Among their observations were 'two species wind-blown from Australia – the Hawaiian Beet Moth *Hymenia recurvalis* and the Crimson-speckled Footman *Utetheisa pulchelloides*'.

The Crimson-speckled Footman lives up to its name, with beautiful pale pink and black spots visible on its forewing and dark blotches and spots on the pale hindwing. A simple sketch by Olywn illustrated the distinctive pattern, but readers of *Pūkorokororo News* had to imagine the striking colours of this moth.



Crimson-speckled Footman (after photo by Ederic Slater). Some of the spots on the forewing are red.
Sketch: Olwyn Green

Footman sketch *PM News* 26 August 1997

Just over 29 years later, on 27 March 2026, I am out monitoring the moths in the Robert Findlay Reserve on a clear cool night, like the one back in 1997. Incredibly, the Crimson Speckled Footman makes an appearance.

My first for 2026. This time, the moth being a suspected migrant, was quickly scooped up into a sterile plastic vial, destined for the Protecting Aotearoa Research Programme (PARP). However, like many things in the moth world, there are various considerations. Could this moth be breeding in New Zealand?

Crimson Speckled Footman INAT STEVIAKIWI

Neville Hudson, a well-respected moth identifier on iNaturalist commented that every summer in the late 70's, he had observed the Crimson-speckled Footman associated with Vipers Bugloss, a known food plant for the caterpillars of this moth. Vipers Bugloss used to be prevalent at Pūkorokoro in the fields opposite the Centre and along the outer shell banks. Now with the ability to test where the caterpillars of this moth munched on their food plant - thanks to the mass spectroscopy used by PARP - we should have an answer.

Another consideration is whether the moth I scooped into the vial, is actually *Utetheisa pulchelloides* or *Utetheisa lotrix* which has also been observed in New Zealand, although much less frequently.

To the amateur observer, *U. lotrix* looks almost identical, just lacking a pink dot at the tornus (end of the inner margin of the forewing). To see this detail, one needs to handle the moth and subject it to close examination, which is not possible prior to collecting for PARP. Thankfully, the researchers will do a DNA test on the moth to be sure exactly which species it is.

Finally, I need to note that since 1997, the Crimson Speckled Footman found here at Pūkorokoro, has had an addition to its species name and is now known as *Utetheisa pulchelloides* ssp *vaga*. Grappling with the complexities of scientific nomenclature, I am yet to find out exactly why this is.

However, I was reassured by a well titled article in *The Guardian* on 20 March 2026, 'Forget birdwatching: I'm into moth watching' by Helen Pilcher.

www.theguardian.com/commentisfree/2026/mar/29/birdwatching-mothwatching-uk-nature-cognitive-decline?CMP=Share_iOSApp_Other

Apparently, struggling with these moth identification and naming issues, is good for my brain health! Test yours and spot the difference between the two moths illustrated side by side.

U. pulchelloides ssp vaga3 TONY STEER

U.lotrix TONY STEER

Extra Information

LepiLED light ***www.gunnarbrehm.de/en/lepi-led***

Bioeconomy Science Institute, Scion Group - Protecting Aotearoa Programme Interview with Dr Toni Withers
Finding a moth in a haystack - The important role of citizen scientists · Plant & Food Research www.youtube.com/watch?v=8CXy_lFyrIU

PMNT News 128 Apple looper moth
shorebirds.org.nz/wp-content/uploads/2023/05/PMNews128_digital.pdf

PMNT News 127 Convolvulus Hawkmoth:
shorebirds.org.nz/wp-content/uploads/2023/02/PMNews127_digital.pdf

Adding an Australian moth to the New Zealand List:

This was not something I ever imagined I would be doing, let alone after struggling to identify a dark, very jumpy 7mm micro-moth collected in the Robert Findlay Wildlife Reserve in late January 2026. I had put it in a small glass vial, in the fridge to slow it down so I could look at it properly and compare with those listed in the iNaturalist Micro-moth Identification Guide.

Nothing matched. I tried taking photos of it so I could spend longer observing it in one position as the fridge treatment did little to slow down this very active moth. Luckily Dr Robert Hoare from Bioeconomy Science Institute, Manaaki Whenua – Landcare Research, was visiting the Shorebird Centre the following evening, tutoring at the annual Field Course. Immediately he recognised it as NOT one of New Zealand's moths and asked to take it for setting and formal identification.

The next day I received the following from Robert: 'Your little moth from the night before last is a species of Stegasta (Gelechiidae), most likely *Stegasta variana* from Australia

Map 2.2 iNaturalist Stegasta
Stegasta variana - Wikipedia I.D. Guide to Micro-Moths of NZ's Kauri Kingdom

(it also occurs more widely in SE Asia and the Pacific). Larvae on Fabaceae and relatives. ***Stegasta variana - Wikipedia***. Great record, never recorded in New Zealand before'.

I suspect Robert was more excited than me, it being just another micro-moth I couldn't identify, whereas for him, it was adding a new moth to the New Zealand list.

Stegasta variana INAT RICH FULLER

Male godwit Y-9771 at Kaiaua TONY HABRAKEN

Revised and updated edition of Godwits book

When *Godwits: long-haul champions* appeared in 2009, it contained most of what was then known about our godwit population. While there were data that had yet to be published in science journals so could not be included, the essential story and its wider context remain unchanged, so the book has not dated to any great extent.

So, when we sold the last copies late last year, and set out to investigate a fourth slightly updated printing, I thought a few minor alterations and additions would suffice.

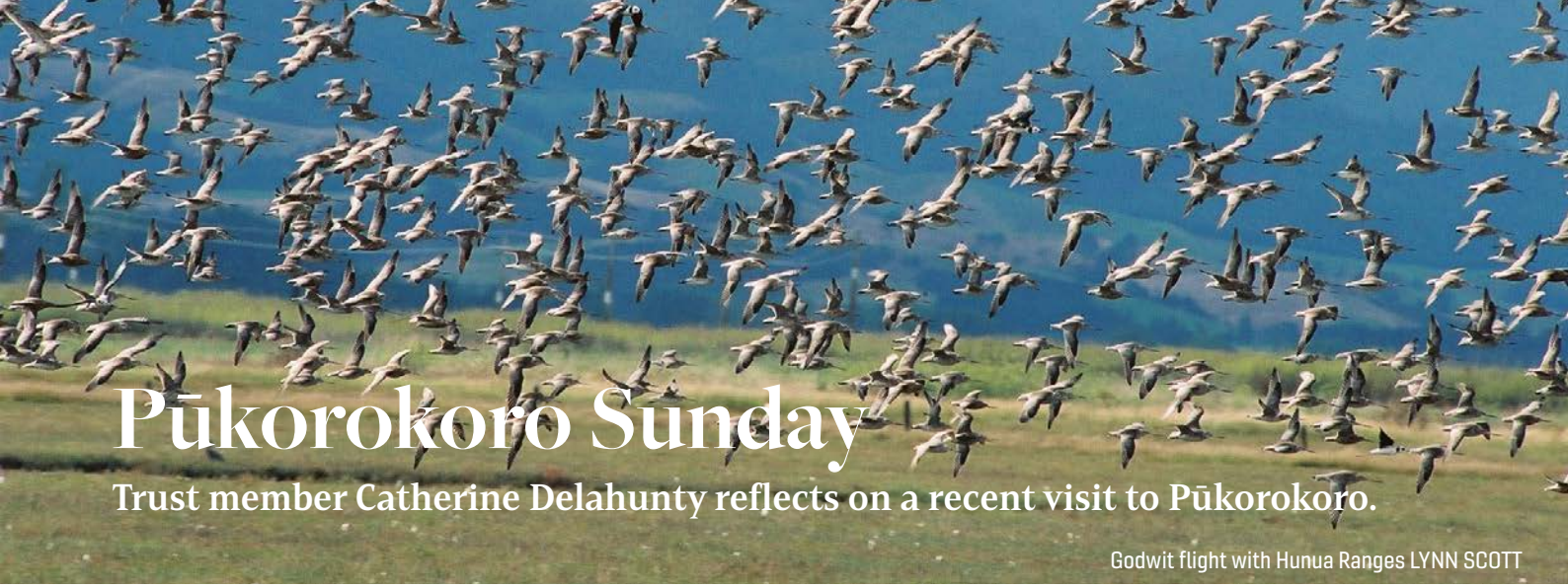
But once I considered all that had been learnt over the last 17 years, it became clear that such a minimal approach would not do.

The work of Jesse Conklin and others on these extraordinary birds has been prodigious. Tracking studies alone have revealed so much more about them and captivated a global audience in the process. Genetic studies have revealed new structures within godwit populations, revealing more about the possible origins of those populations and their migration strategies. A lot of work has examined likely impacts of climate change on migratory birds. There have been substantial changes in the Yellow Sea region, both negative and positive. Then there is new information coming in from marked birds, some of which helps answer one question we are often asked: how long do these birds live?

On 14 February Tony Habraken recorded a male godwit at Kaiaua with a plain white flag and a metal band. Being Tony, he managed to read most of the band number. As Adrian Riegen writes: 'Luckily this can only be Y-9771 banded and flagged on 14.02.2002 at Rangipo, halfway between Pūkorokoro and Kaiaua. It was banded as a 3+ male which makes it at least 27.6 years old, only slightly behind our oldest godwit which when last seen in 2020 was 28.4 years old. The flag is holding up very well as is the bird by the looks of things.'

The net result of all this? I am now working on a completely revised and updated edition of the book.

Keith Woodley



Pūkorokoro Sunday

Trust member Catherine Delahunty reflects on a recent visit to Pūkorokoro.

Godwit flight with Hunua Ranges LYNN SCOTT

We had not been across the water to the shell banks of Pūkorokoro for some time. We knew the Kuaka were starting their northward migration, so it seemed a good day to visit and wave goodbye. It was also a good day to stop desperately watching the oppressive global and national news and breathe in something powerful and natural that rises above chaos. Living high in the Kauaeranga Valley we cannot see the Ngāti Pāoa whenua or Tikapa Moana (Hauraki Gulf) but we are directly opposite this remarkable place. It's a short drive from the winding river valley to the broad reach of water, shells and tidal flats, the home of the shorebirds. How lucky to be so close.

We parked near the bike trail and wandered along the white shell pathway. We admired the new signs, the information updates and the accessibility, and were moved by the gorgeous crimson patches amid the green salt marsh reeds, a changing carpet of wild and subtle colours, How rare to see this biodiversity untouched or restored on the coast of a country where 90 per cent of wetlands have been drained dry. The colonial project at its worst.

I felt a lifting of my spirits as further out close to the tide a small group of Kuaka began to rise on a warm wind and move inland to their next roost. It was an incoming tide and for the next hour we followed the rising wings. From a blurred huddle on the mud, groups skimmed upwards hanging together or flowing apart. When they passed directly above me, I heard the silk beat of their feathers meeting the wind. They were only moving to the Stilt Pools roost, but it could have been the start of the great annual mission. At one point, a larger group suddenly rose up in alarm as a dark Kahu cruised in close. The whole group formed an intense murmuration over our heads. The wing beats, the sensation of being inside their dancing flight, we were within their song in a blue sky, within collective intent expressed through each individual bird. Uplifted. It's hard to capture this in photographs or words, it's amazing to feel it and feel life is beautiful again.

We walked to where many birds were gathered on the ground, mainly the Kuaka, plump and ready for the next imperative, to fly to Alaska stopping over in Asia, needing a fair wind. There were a range of older and younger people with fancy cameras; quiet words were exchanged on the beauty of the day.

We don't often talk about the healing that places like Pūkorokoro so freely shared with us. Clearly birds need safe places and rich pickings to live out their wild lives, but there is another dimension we need to recognise at Pūkorokoro, and it is more than healing the soul through the joyous flight of birds. It is more than the responsibility we have to protect the shell banks and the waters of Tikapa Moana so tainted with sediment, nitrates and other waste products. This healing is historical and contemporary and it's about the quality of relationships.

One of the reasons I feel inspired by the shorebird sanctuary is the leadership of Pūkorokoro Miranda Naturalists' Trust in their recognition of being on tangata whenua lands, and the relationships that are being built to express the ancestral and current authority of tangata whenua in relation to the work to protect the birds. The Kuaka have been leaving and returning to their takutai moana (foreshore and coast) over endless seasons. By recognising Te Tiriti issues we can heal more than the sea and bird habitat, we can begin to heal the damage of colonialism which always has a local past, a local present. Peace is not only the salty marsh and the ever-moving sea, it's the salty work to rebuild relationships by owning how the name "Miranda" attempted to eradicate Pūkorokoro.

All of this rattled in my head as the birds rose above the tide. We were feeling the privilege of access, a privilege people without cars, without leisure time and without money, cannot enjoy. We dropped in on Keith Woodley for a cup of tea and state of the world conversation, noting how well kept the sanctuary looks from many people's hard work, especially the efforts of Kaitiaki Ranger Tansy Bliss. He told us about the impact of climate change, how it will effect migratory birds throughout their annual cycle. How warming temperatures in some parts of the tundra regions mean insect emergence - the peak food supply for young shorebirds - is now weeks earlier, leaving less food for the chicks of birds following their usual timetable. All these issues are affecting their access to food, their very evolution.

Everything is connected, from the rising seas to the shifting seasons and the birds must adapt or die. There is so much we cannot do to fix the violence of the current era, but Pūkorokoro shows how much can be done by staying in place. Its connected by bird migration to other communities, and the relationships of bird lovers. It contributes to all who come for a moment of peace. Sunday was a day of gratitude to the tangata whenua, the bird sanctuary and the takutai moana. Hearts almost light as a feather we returned to the hills.

What do we know about the Wrybill population?

Adrian Riegen reports on past catching efforts, more recent attempts, and what is learned from banding.

With Wrybill failing to be crowned Bird of the Year in 2025 the campaign is in full swing to get this bird across the line in 2026. The word unique is used too freely these days with the addition of 'almost' unique or 'fairly' unique. Something is either unique of it isn't, and the Wrybill is definitely unique in that it is the only bird out of around 11,000 species in the world to have an asymmetric bill. For that reason alone, should it not be bird of the year and millennium come to think of it? After all we seem to love quirky birds in New Zealand. Perhaps if we knew a little more about the Wrybill that would help the cause.

The Miranda Banders with Dick Veitch at the helm, banded 1,620 between 1979 and 1982, mostly at Pūkorokoro, and since January 1987 at least a further 7,700 have been banded by the New Zealand Wader Study Group (NZWSG), again mostly at Pūkorokoro, particularly in the early 1990s and early 2000s. The purpose was largely to look for movements within the Auckland region where around 90% of non-breeding birds are found each year, and to gather data on survival rates and longevity. We were not banding Wrybill to track their migration as we have with Bar-tailed Godwit and Red Knot as their migration is more straightforward, from the South Island braided rivers, mostly to the Firth of Thames and Manukau Harbour and back again, a journey that can be accomplished in less than twenty-four hours if they so desire. A godwit or knot may double their lean weight before departing, whereas Wrybill may only add 10-20% to their lean weight for their migration.

To ascertain survival and longevity, banded birds need to re-recaptured from time to time so the unique numbers on the metal band can be recorded and the band changed, if need be. Excessively worn bands were a major problem with birds banded in the 1980s and 1990s.

At the time the Bird Banding Office insisted that we use B sized bands and put them on the tarsus, the lower part of the leg. The thinking was that if people found dead birds, they were more likely to see a band on the lower leg than the upper leg and so report it to the banding office. But out of the 9,300+ Wrybills banded none have been found dead and reported by the public away from the Firth of Thames, or the breeding grounds where researchers found some nesting, or dead in Stoat dens. By comparison NZWSG has recaptured over 2,100 previously banded Wrybills from which survival and longevity rates can perhaps be obtained. I say perhaps because interpreting the data in a meaningful way requires a fair bit of number crunching, not a forte of mine I should add.

Wrybill CHELSEA RALLS

Wrybill flock CHELSEA RALLS

We could have had much more data to work with had the bands not worn so badly. This arose partly because the B bands were a fraction small and so did not rotate on the leg as freely as they should, and as birds spend much of their lives in the abrasive glacial waters of the South Island braided rivers a band not freely rotating will tend to get worn more on one side than the other, thus erasing some band numbers. After only five years some bands were becoming difficult to read. We were forever replacing bands on recaptured birds or adding new bands when we could not remove the existing ones. One Wrybill went through six bands in its life.

We requested a move to the slightly bigger C sized band and that it be put on the tibia, upper leg, but this request was turned down. However, one day when we recaptured two birds with B bands that were so tight on the legs they would not move at all we decided we had to use C bands and put them on the tibia from that moment on. Since then, the wear on bands has been much reduced. I should note that recent banding officers have been much more open to experienced banders making sensible decisions about what bands to use.

We now have bands that last but to continue to chart survival rates, we do need to recapture a good number of birds every two or three years to record data. But in recent years the Wrybill have not been very cooperative. Most waders used to roost on the shell banks where they were easy to catch but since improvements to the Stilt Pools most now choose to roost there, with the Wrybill often at the northern end. If the mud is dry, it is possible to catch birds there with cannon nets, but twice this year when the ponds have been dry and we made plans for a catch, heavy rain events flooded the pools making catching impossible. Some days they will roost on the shell beach at Taramaire, but the days are chosen at random and so trying to catch there is rather hit and miss, mostly miss! We need to be patient and hope we can catch soon and add to our knowledge.

Making sense of the data we have gathered over the past 45 years is best left to people with number crunching skills. Nevertheless, here are a few statistics that may be of interest. We have banded over 9,300 Wrybills (world population c5,000), in the Auckland area mostly on the Firth of Thames and Kaipara Harbour. At least 2,087 different birds have been recaptured. Of these, seven reached at least 20 years of age. Of those, one went on to 21 years, two to 22 years, one to 23 years, and the oldest known Wrybill reached at least 26 years of age. This one was banded at Taramaire on 25.07.1993 but was unaged. It was recaptured on 29.01.2005, the band was just readable and was replaced; it was recaptured again on 19.02.2019. A further 48 recaptured birds were aged 15 to 20 years.

Until the data is properly analysed it is difficult to say much more but about 12% of the recaptured birds reached at least 7 years and about 5% made it to at least 14 years old. The percentage living beyond 15 years drops to less than 1%. A little bird 26 years old, and with an asymmetrical bill, is surely worthy of a Bird of the Year vote, so please support the Wrybill when the time comes later in 2026.


Wrybill MIKE VINCENT

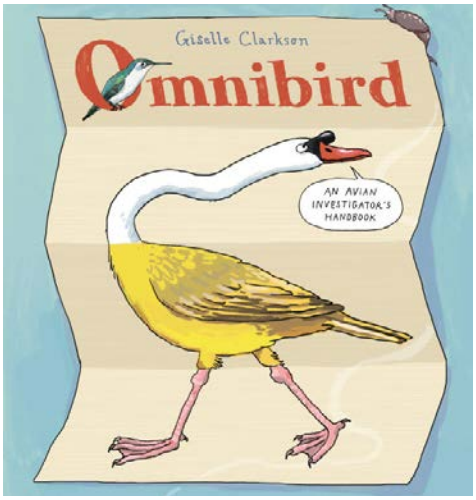

Wrybill catch
KEITH WOODLEY


Banded Wrybill PMNT

BOOK REVIEW

Omnibird: An Avian Investigator's Handbook

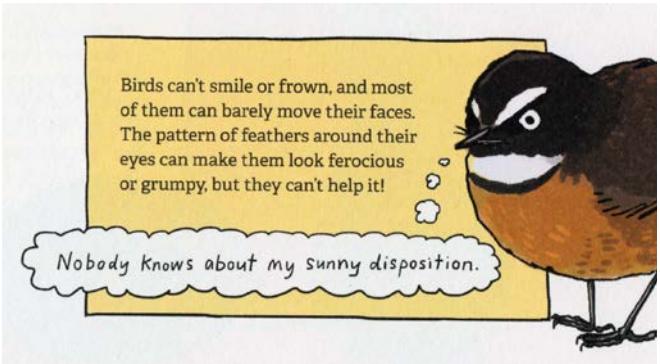
Reviewed by Chelsea Ralls



Perhaps you are familiar with the work of kiwi illustrator Giselle Clarkson? You have likely come across it in many forms; she has wide reach nationally with her unique and engaging artwork and her latest book is also making waves internationally. I look forward to her clever, and often hilarious, illustrations accompanying articles in New Zealand Geographic and have been given a series of conservation info sheets she has created for the Northern NZ Seabird Trust that I find myself picking up again and again. Just last night I pulled out a Joy Cowley book *(The Gobledegook Book)* for the bedtime read and found Giselle's name.

She now has two books of her own, *The Observologist* (2023) and *Omnibird: An Avian Investigator's Handbook* (2025). You can clearly see a naturalist and conservationist outlined across the pages.

The Observologist introduced readers to finding something new to see in the world around us. It's not complicated, you don't need to spend money or travel far, we are surrounded by fascinating things. And Aotearoa New Zealand is still looking for a mate for Ned, the anticlockwise curling snail. (See link below). In Omnibird there is a sidestep to focus on the aves.



As you know, we are easily sold on a book on birds here at the Shorebird Centre, but any book where Wrybill get a mention is quick to the top of our 'must read' list. As you turn the pages and dive in, the list of reasons to read this book keeps growing.

Meeting birders, and the wonderful kind of people who visit nature reserves and visitor centres, means you talk constantly about what people have noticed while travelling here, or in comparison to something back home. It's part of the job. You would think we would have covered most topics. I have even had more than one conversation about the artistic nature of bird poo on the mud, compared photos too. But as you browse the beautiful pages of this book, you're gifted fresh inspiration to look again, through a new lens.

I have found myself using this new perspective to watch birds in flight from the deck at home, noting the pattern of their wing beats and the paths they trace. Or dusting off the old dissection kit to investigate the diet of our local Ruru from the pellets it has kindly left on the deck. It was a great season for Huhu Beetles apparently.

'Mistaking the world for ordinary is a terrible habit that you should always struggle against. It's much worse than even picking your nose.' Giselle writes. I know I am guilty of referring to 'just a mallard' out on the pond. But she reminds us of how much there is to appreciate and learn about a drake in breeding plumage - with its 'bill as yellow as a marigold' or that the tip of the bill is called a nail.

Clarkson's style is approachable and inspiring, inviting readers of all ages and interests to engage with the natural world and even get creative themselves. It mixes avian science with playful observations - a new kind of naturalist's guide.

For the story of Ned, the anticlockwise snail: *snail:www.rnz.co.nz/news/icymi/571026/nationwide-campaign-launched-to-help-left-spiralling-snail-find-a-mate*

Field Centre, Research Facilitator and Disseminator: The Shorebird Centre and science

Keith Woodley reviews the Shorebird Centre's long connection with scientific research, and its role in cicrculating the outcomes.

The female godwit E7 after the operation to implant a satellite transmitter. Note the antenna protruding from beneath her tail. For months after this bird became a global media star, this was the only photo of her. Of mediocre quality at best, it has appeared in presentations and publications all over the world.

Below: The moment that photo was taken on Saturday night 6 February 2007. From left: Tony Habraken, Keith Woodley, Gillian Vaughan, Adrian Riegen, and – holding the bird – wildlife vet Dan Mulcahy BOB GILL

Two of its early founders each had a vision for Pūkorokoro Miranda Naturalists' Trust. While he was primarily an ornithologist, with a particular interest in shorebirds, Dick Sibson envisaged a broad church. The word 'Naturalist', he said, was carefully chosen. The aim of the organisation was to 'specifically include all aspects of natural history. We would welcome members wishing to study botany, zoology or any other natural history subject, particularly if it can be related to the conservation of the Miranda area or our total Environment.'

Ronald Lockley too, had a broad interest in the natural world, although he wanted a bird observatory. He envisaged a building at Pūkorokoro that would provide overnight accommodation and living quarters for eight people, including a resident naturalist, and an upper storey with observation windows for the study of birds. The observatory and field study centre would provide a base for research workers, and a field study centre for students, school parties and amateur naturalists. The Trust would issue regular reports resulting from these studies and would archive records of daily observations. How does all that look fifty years on?

The original site for the proposed observatory is where the carpark of the Robert Findlay Wildlife Reserve is today. Land availability and planning restrictions meant Lockley's vision of daily observations from the building could not be realised. Nevertheless, in its present location the Centre has witnessed a lot of shorebird research and monitoring, and recording of bird sightings. It is the base for summer and winter shorebird censuses of the Firth of Thames and, since its formation, many Trust members have participated in this Birds New Zealand project. Another longterm achievement is the work of the New Zealand Wader Study Group, who have been catching and banding birds at Pūkorokoro since the late 1980s. Data from both projects, band resighting records and shorebird population trends, would surely meet the expectations of Lockley and Sibson. While they could not have foreseen the Trust's subsequent extensive work in East Asia – conducting shorebird surveys in China and both Koreas – it seems likely they would have approved.

Providing a field base for bird tracking projects is another legacy for the Centre. The most outstanding example of course, certainly the most resonant and enduring, is the story of that global media star of 2007 – E7. This stellar bird, one of several caught on the Stilt Pools, received a satellite transmitter in the Centre's library, which had been transformed into an operating theatre. The following year, and several times subsequently, further birds were caught at Pūkorokoro and fitted with satellite trackers. The overall outcome of these projects, became a kind of virtuous circle for the Trust: we help facilitate the research, then get to tell the resulting stories, and so attract even more visitors.

Those projects were focused on shorebirds, but how are we doing regarding the wider natural world? The Trust has always had close links with tertiary institutions. We have hosted numerous day vists and overnight field camps. Most years since the late 1990s Auckland University animal behaviour students have stayed several nights while carrying out field work. Keith Thompson, then at Waikato University, had strong connections with Pūkorokoro. He regularly brought students on wetland ecology field trips, served on the PMNT council for five years, and tutored sessions at our field courses. Chris Hendy, also from Waikato, annually brought students to study earth chemistry. More recently students from Bay of Plenty's Toi Ohomai have become annual visitors.

But interest in Pūkorokoro is not confined to New Zealand institutions. In the 1990s we hosted several visits by Principia College, Illinois, and more recently have developed longterm relationships with Wildlands. Under this program, affiliated with Washington State University, each year several groups of students stay for three or four nights, learning about the ecology of Pūkorokoro. And as mentioned elsewhere in this issue, we have a longstanding relationship with EcoQuest, affiliated with the University of New Hampshire.

The Centre has provided a base for students – from undergraduates to Masters to PhDs. And yes, some of those research projects involved shorebirds - Michael Anderson on shorebird ecology; Rachel Withington on Wrybill foraging, and Jimmy Choi staying here for sevral weeks while wriitng his PHD thesis on Bar-tailed Godwits and Great Knots staging at Yalu Jiang during northward migration. But others included Dougal Strahan on plant ecology and restoration options at Pukorokoro; and Molly McGraw from the University of New Orleans studying the Wharekawa coast chenier formations.

In 2013 Peter Maddison coordinated a 24 hour bioblitz of the Pūkorokoro Coast, establishing a species list for the area. After the Trust purchased what is now the Findlay Reserve, Ray Buckmaster initiated several projects including monitoring water quality, and establishing vegetation transects. A more recent example is the moth monitoring work of Kaitiaki Ranger Tansy Bliss, featured once more in this issue.

Of course, being a visitor centre is a core purpose of the building. While it was not a function specified by Lockley, I am sure he would have been impressed by the range of speakers and subjects covered at our annnual events. These include Jack Grant-Mackie on the New Zealand bird fossil record; Michael Walker on magnetic sense in migratory birds; Theunis Piersma, Bob Gill, Phil Battley, Jesse Conklin, Lee Tibbitts, Pavel Tomkovich, Clive Minton and Dan Ruthrauff on various migratory bird ecology and tracking studies; Richard Fuller on monitoring bird populations in the East Asian Australasian Flyway; John Dowding on both Wrybill and New Zealand Dotterel; Brian Gill on cuckoos; Emma Williams on remote tracking of Bitterns and Pied Oystercatchers; Steve O'Shea on giant squid; and Bruce Hayward on the geology of Pūkorokoro. Several talks have canvassed issues relating to the Hauraki Gulf, including Dr Rochelle Constantine on marine mammals and Bill Brownell on the state of the Gulf. At our 2026 AGM Dr Jenny Hillman will talk about about restoring shellfish reefs.

Circulating stories revealed by research projects is another core function of the Centre. Countless talks have been given at the Centre and elsewhere all over the country. We are often approached for comment or advice about shorebirds: many of the answers are informed by that research. Since its inception *Pūkorokoro News* has regularly featured articles on a broad range of natural history subjects.

Netting and Banding

Setting up mist nest for HPAIsampling CHELSEA RALLS

Cannon netting KEITH WOODLEY

Releasing a godwit after banding at Pūkorokoro KEITH WOODLEY

EcoQuest Research at the Robert Findlay Wildlife Reserve

PMNT has had a close relationship with EcoQuest since its inception 25 years ago. Lecturer Thomas Everth reports on recent research projects by EcoQuest students.

All photos and graphics EcoQuest

Not far north from the Pūkorokoro Shorebird Centre, in Whakatiwai, is the field base of EcoQuest, Centre for Indigeneity, Ecology, and Creativity. EcoQuest is a tertiary education provider teaching undergraduate courses in Ecology in Action semester programs for international students. The 15-week study programme includes a five-week directed research component, during which the students undertake longitudinal field research at locations in our area. Since the beginning of 2024, our students have undertaken research at the Robert Findlay Wildlife Reserve at Pūkorokoro, with a variety of focus areas.

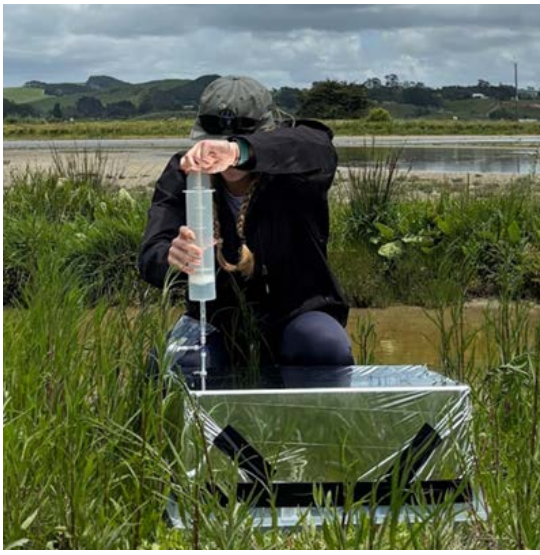
The geomorphology of the Chenier ridge formations that shaped the reserve over the last centuries is of special interest. The environment is changing rapidly, driven by the interplay between the transport of shells from the extensive mudflats of the intertidal zone of Tīkapa Moana and the inflow of sediments from the land, forming successions of Chenier ridges that built up the coastal plain. One of the key features of the reserve is the Stilt Pools where thousands of shorebirds find a safe roosting space during high tide. The Stilt Pools is a managed area where a semi-automatic flood gate controls tidal water levels.

The impacts of climate change challenge coastal wetlands such as the Robert Findlay Reserve. Future sea level rise will alter the site and eventually lead to tidal flooding of the reserve's lagoons. Amplifications of storms and sediment flows triggered by the warming atmosphere will compound these effects. Higher temperatures may challenge the health of benthic life in the adjacent mudflats, affect the food source for wading birds, and alter the availability of shells from which the protective Chenier ridges are formed. Wetlands are also important ecosystems linked to climate change due to the exchange of gases between the atmosphere and the wetlands. A healthy wetland can sequester carbon dioxide from the atmosphere. However, wetlands are also strong emitters of methane from organic decomposition. Therefore, coastal scientists are researching gas exchange between wetlands and the atmosphere to determine which conditions may enhance wetlands' ability to mitigate climate change.

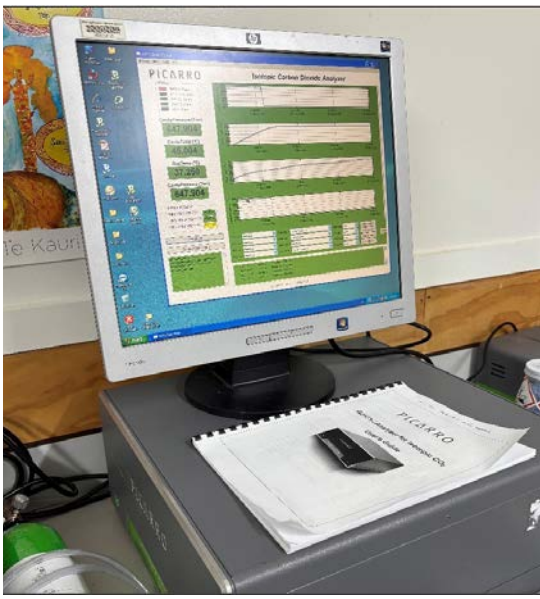
In April 2024, EcoQuest students conducted our initial research into several aspects of the reserve's geomorphology. We undertook a detailed differential GPS survey of the position of the very active Chenier ridge that extends along the front of he reserve to where the Pūkorokoro Stream meets the sea. We undertook a vegetation survey along several transects, analysed benthic invertebrate communities in the reserve's mudflats, and mapped methane flux across over 100 measurement sites, using custom-built methane fluxmeters developed at EcoQuest.

In November 2024, students undertook another GPS survey of the position of the very active shell spit and mapped significant movements of the edge compared to the April survey that year. We also analysed theoretically how sea level rise will affect the size of the mudflats available for shorebirds for foraging during low tide, and for how long these areas are available to them.

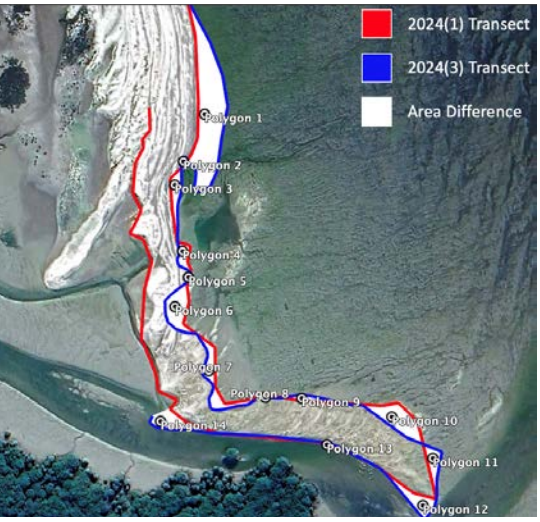
Methane monitoring using the EcoQuest methane flux meter ECOQUEST



Taking gas samples in the reserve from a chamber set on to the substrate.ECOQUEST



Our PICARRO ringdown spectrometer and isotopic gas analyser



The shifting position of the Chenier ridge between April (red) and November (blue) of 2024


Our differential GPS antenna providing cm level accuracy in position and altitude

Temperature Datalogger embedded in shellfish that was installed in the mudflats

It turned out that sea level rise will shorten the time birds can feed in a non-linear fashion, raising concerns about the long-term viability of the area to support migratory birds.

We again mapped the reserve's methane emissions to analyse seasonal differences. We also started two new research sub-projects. One of them looked at the daily temperature variations that shellfish experience in the mudflats adjacent to the outer Chenier ridge using temperature data loggers. Our results showed that shellfish regularly experience temperatures during low tide in midday that exceed 30 degrees C, at the edge of their survivability. In future climate change scenarios, temperatures experienced on the mudflats may well trigger mass mortality events with flow-on consequences for the ecosystem's food chain. Another avenue of research this semester looked at the chemical properties of water in the inner parts of the lagoon and the tidal channels that connect them to the ocean.

In April 2025, EcoQuest decided to explore the temporal dimension of key variables in the reserve such as water quality and methane emissions. In four-hour shifts, eight students worked 24 hours a day for five days, measuring key parameters every two hours. Part of this work was assisted by a custom-built water quality monitoring system that automatically logged pH, conductivity, dissolved oxygen, oxygen reduction potential, temperature, and turbidity every 10 minutes in a collection pond in the reserve, adjacent to the flood gate that regulates water levels in the lagoon. The students also collected water samples every two hours, which were analysed for nitrates, phosphates, and bacterial contamination in our lab. We also used precision differential GPS technology to measure water levels inside and outside of the floodgate.

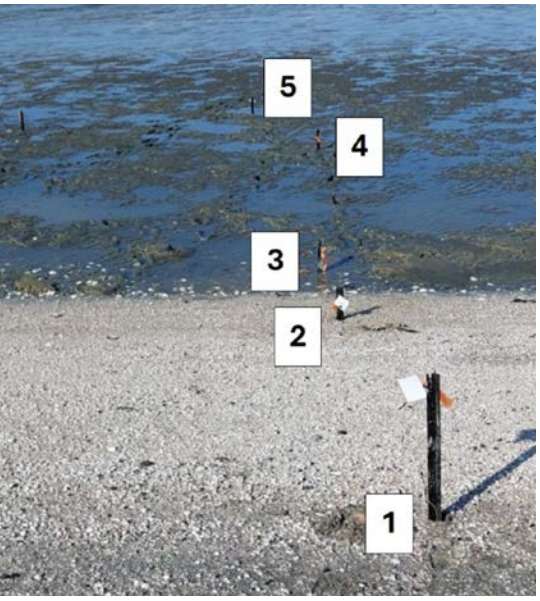
The results showed that the water draining from the lagoon was hyper-saline due to an extensive dry period preceding the research, during which evaporation of water in the lagoon would have led to hypersaline conditions. This was accentuated by the rich phosphate concentration from bird droppings.

These conditions were favourable for extensive algal growth during the days and for hypertoxic conditions in the water, followed by strong decay and respiration at night, when oxygen levels frequently dropped to zero. These conditions are conducive to the growth of pathogenic bacteria.

We found high levels of coliform and E. coli bacteria in the water, which correlated with daily fluctuations in oxygen levels. Before the fieldwork, we sent a water sample from this location to Wilderlab in Wellington for E-DNA analysis. The analysis confirmed that over 70% of the taxa in the water are bacteria, many of which could not be individually identified by the E-DNA reference database. Migratory birds are known to be intercontinental vectors of pathogens, and the mixing of thousands of birds from several species in the lagoons contributes to a large variation in bacterial populations in the lagoon waters.

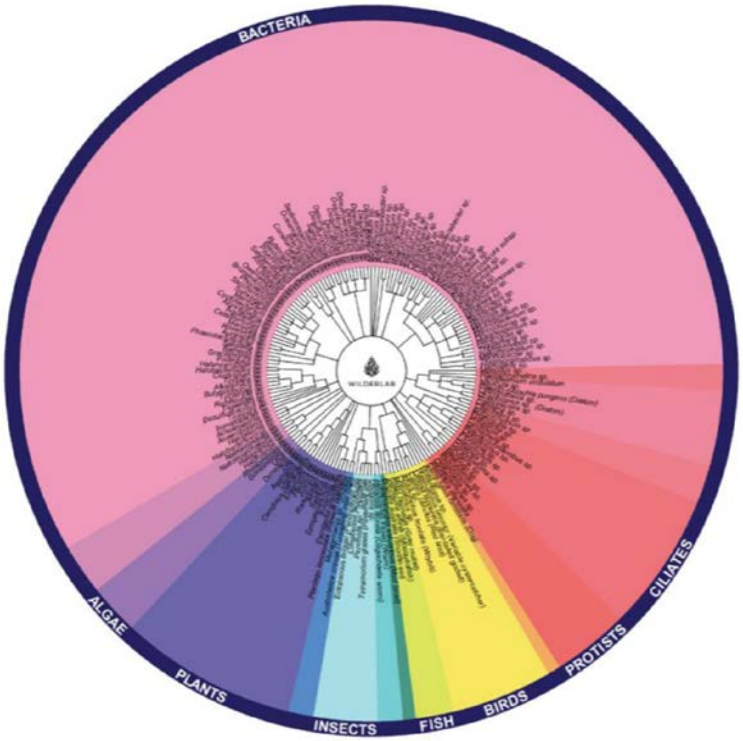
In parallel with water testing, we also observed methane emissions every two hours at three nearby locations. We found that emissions were highly ebullitive, with long periods of zero or low emissions followed by occasional bursts of significant amounts. The timing of these bursts suggested a weak correlation with the daily variations in soil temperature, which varied by over 10 degrees between early afternoon and early morning, about 10cm below the surface of the mud. The ebullitive nature of methane emissions from the reserve, as shown by time-series measurements, made us rethink the spatial distribution of methane emissions recorded in earlier semesters. Gas emissions from wetlands are both spatially and temporally variable, making it difficult to compare emissions across different parts of the wetland without automated systems that monitor them over time.

During the same semester, we also analysed shellfish temperatures from the mudflats, collected over the summer by automated temperature loggers. The results deepened concerns about future heatwaves, when the mudflats may experience temperatures that could trigger mass die-offs of shellfish and perhaps other invertebrates in the top layers of the flats.

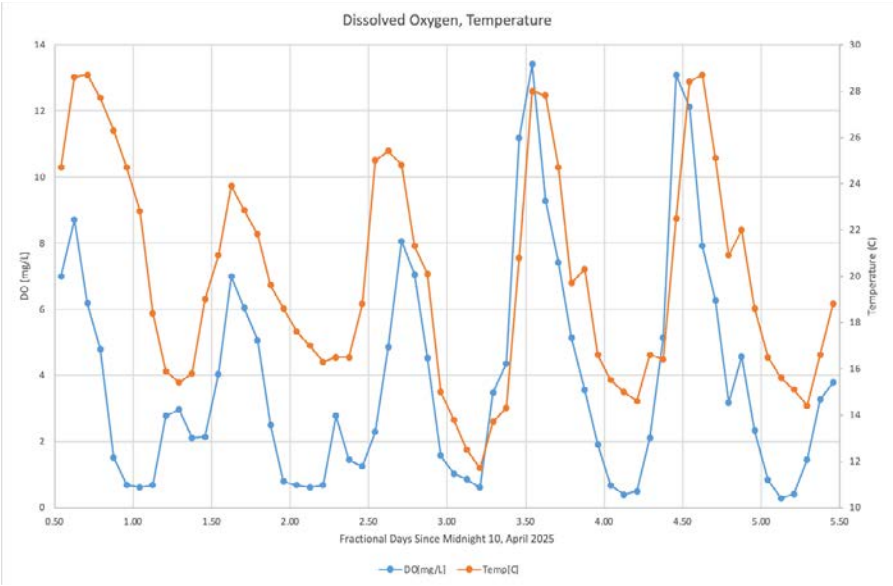


Installation of shellfish temperature loggers in the mudflats adjacent to the beach


Floating automated water data logger, April 2025



The "wheel of life" E-DNA sample from the pond inside of the floodgate. Single cell organisms make up over 70% of the taxa seen in the sample with Bacteria (pink) being the dominant taxa



Dissolved oxygen (blue) follows a diurnal cycle and is here plotted together with the water temperature (orange) that also follows a diurnal cycle

In November 2025, we pivoted our research towards the use of the Stilt Pools roosting site by shorebirds. A team of six students took detailed species counts and behaviour statistics of the birds, with a focus on the Bar-tailed Godwits and the Red Knots. The student teams also used our differential GPS system to conduct a detailed survey of the Stilt Pools' depth profile across ten transects. This allowed us to compare the tide heights in the lagoon with the shapes of the depth profiles. Combined with detailed maps of where the birds roost and which water levels they tolerate, we can predict the conditions under which the Stilt Pools is too flooded to allow the birds to roost. This information is important for the management of the floodgate, which allows partial shielding of the Stilt Pools from the high-tide water level outside the lagoon.

The student's effort paid off in the development of maps of the roosting areas used by birds, which, together with the census data, allowed the students to calculate bird density during roosting in the Stilt Pools. This density ranged from 0.5 to 2.5 birds per square meter and was significantly correlated with the time of high tide. Evening high tides led to birds roosting in very dense flocks, while morning and midday high tides were associated with the lowest flock density. The tidal rhythm forces the birds into twice-daily roost and rest periods, and undisturbed roosting is important for conserving energy as they build up fat reserves for the long flight home to Alaska and Far Eastern Russia at the end of our summer. The students analysed the frequency and reasons for disturbances that prompted alert flights and found that noisy vehicular traffic on the adjacent road was the most prominent cause. The findings suggest that speed limits should be enforced on the coast road for the section parallel to the Stilt Pools roosting site.

Godwits and some Red Knots in the foreground roosting with Oystercatchers in the back

During the same semester, the student team again analysed gas samples from the reserve, drawn from sampling boxes placed on different soil substrates. Samples were taken before the box was placed in the soil and at 10-minute intervals thereafter for up to one hour. We then analysed the samples in our lab ringdown gas analyser, which can measure Carbon Dioxide and distinguish between C12 and C13 Carbon isotopes, as well as methane. We found that, surprisingly, in many of our samples, the soil was emitting CO2 with an isotope signature indicating a biogenic origin. This meant that during the times of our sampling, organic decay and respiration were dominant over photosynthesis. The highest methane concentrations were found in deep, wet mud in the channels draining the Stilt Pools, where a thin layer of oxygenated brown mud covers deeper layers of anoxic, putrid mud, where methane is produced by organic decay and methanogen bacteria.

In January 2026, EcoQuest installed two automated cameras in the Stilt Pools that take time-lapse photos of the roosting sites in the reserve every 10 minutes. These images allow us to observe the birds' roosting habits 24 hours a day and will add to the valuable data on bird roosting behaviour.

In April 2026, during the current semester, our students will continue the bird monitoring research from prior semesters and hope to observe immature godwits and knots that remain in New Zealand over our winter season. Students will also remeasure the position of the Chenier ridge at its southern end, where it is moving and growing rapidly and is now in a "battle" with the Pūkorokoro Stream, threatening to close off the river flow to the sea.

We will also travel along the entire Chenier ridge from Kaiaua to Pūkorokoro and analyse the shell composition and profile dimensions of the ridge to identify changes in shell composition, which may allow us to draw conclusions about shellfish communities in the adjacent mudflats. We will also repeat the vegetation transects we undertook in April 2024 in the reserve to document the development of the flora within the area.

EcoQuest is grateful for the welcome and support for our students from PMNT and the Shorebird Centre, and from Ngāti Paoa. Special thanks to Keith Woodley, Chelsea Ralls, and Tansy Bliss for their support.

Nighttime photo of roosting Oystercatchers

Pūkorokoro Miranda Naturalists' Trust

The Shorebird Centre

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Kaitiaki Ranger: **Tansy Bliss**

Pūkorokoro Miranda Naturalists' Trust Council

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Council members: **Wendy Hare, Trudy Lane, David Lawrie, Bob Rigter, Olga Brochner, Jennifer Glenn and Emma Salmon**

Magazine

Pūkorokoro Miranda Naturalists' Trust publishes Pūkorokoro Miranda News four times a year, in print and digital editions, to keep members in touch and provide news of events at the Shorebird Centre, the Hauraki Gulf and the East Asian-Australasian Flyway. No material may be reproduced without permission.

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Layout and production: **Bernie Cornford**

See the birds

Situated on the Firth of Thames south of Kaiaua, the Pūkorokoro Shorebird Centre provides a base for birders right where the birds are. The best time to see the birds is two to three hours either side of high tide, especially around new and full moons.The Pūkorokoro high tide is 30 minutes before the Auckland (Waitematā) tide. Drop in to investigate, or come and stay a night or two.

Budget accommodation

The Shorebird Centre has bunkrooms for hire and two self-contained units: Bunks cost $20 per night for members and $35 for non-members.

Self-contained units are $90 for members and $135 for non-members. For further information contact the Shorebird Centre.

Become a member

Membership of the Trust costs $50 a year for individuals, $60 for families and $75 for those living overseas.

As well as supporting the work of the Trust, members get four issues of PMNT News a year, discounts on accommodation, invitations to events and the opportunity to join in decision making through the annual meeting.

You can join at the Centre, pay via our webpage (www.shorebirds.org.nz), by direct credit to bank account 02-0290-0056853-00 or call the Centre with your credit card details. Contact admin@shorebirds.org.nz for further information.

Bequests

Remember the Pūkorokoro Miranda Naturalists' Trust in your will and assist its vital work for migratory shorebirds. For further information contact the Shorebird Centre.

Become a Volunteer

There's always a need for volunteers to do a variety of jobs including helping in the shop, guiding school groups, meeting visitors at the hide, working in the Centre garden, joining in the restoration project at the Findlay Reserve, helping with the Shorebird Census and lots more. If you're interested chat with the team at the Centre to see what will best suit you.

PMNT's work is made possible by the generous support of our sponsors

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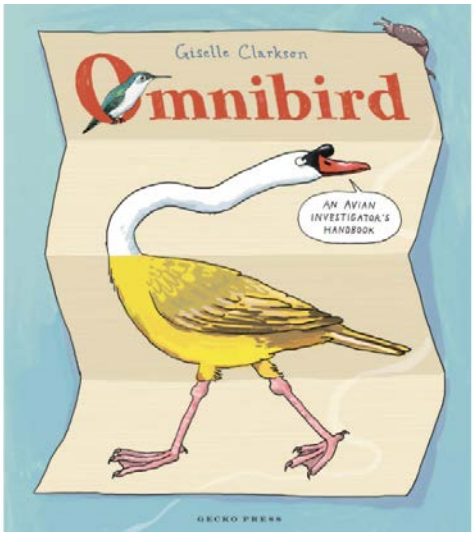
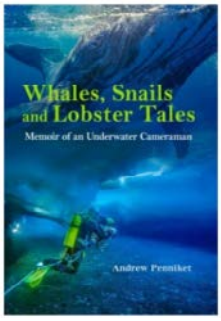
Gifts from the Shop



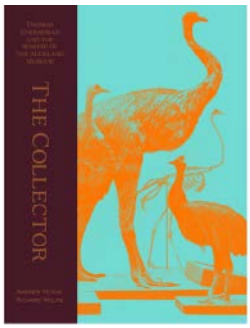
Omnibird
An Avian Investigator's Handbook
Giselle Clarkson – $45

Wrybill T-Shirts
Men's & Women's T-shirts
shop.shorebirds.org.nz/?s=wrybill&post_type=product

Newest Books from the Shorebird Centre Shop



Whales, Snails & Lobster Tales
Andrew Penniket
$45



The Collector
Andrew McKay and Richard Wolfe
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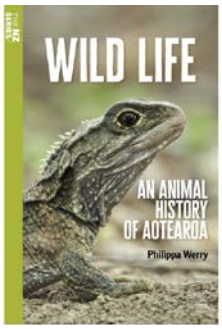

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Philippa Werry
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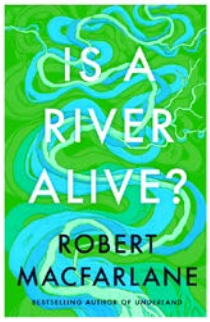

Is a River Alive?
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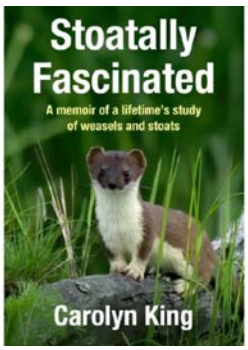

Stoatally Fascinated
Carolyn King
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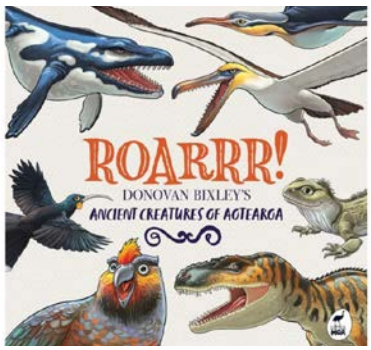

Roarrr
Donovan Bixley
$25

New Stickers
$3

If you can't make it to the Shorebird Centre shop, visit our amazing online shop at www.shop.shorebirds.org.nz/ Send an email to shop@shorebirds.org.nz. Ring 09 232 2781 and chat to the friendly team. **We'll be happy to help**

Published by Pūkorokoro Miranda Naturalists' Trust, 283 East Coast Rd, RD3, Pokeno, New Zealand 2473