

Pukorokoro Miranda **News**

Journal of the Pukorokoro Miranda Naturalists' Trust

November 2017 Issue 106

Plenty of places to hide

Volunteers erect two new birdwatching hides including one on the Stilt Ponds



**The forces
that created
the Firth of
Thames**

**Northern
Shoveler
makes a rare
appearance**

**Big plans for
Pukorokoro-
Kaiaua
coastal strip**





A TRIO OF HIDES: (clockwise from top left) The replacement for the old hide, now named the Wrybill Hide; the new hide on the Stilt Ponds, to be called the Stilt Hide, which still awaits its wings; the hide formerly called the new hide, now the Godwit Hide.

Photos / Jim Eagles

Three hides from which to view the birds

There are now three hides at the Findlay Reserve from which to watch the birds, including a fine new one on the Stilt Ponds which offers a great additional viewing perspective.

A working bee at the end of October also built a replacement for the old hide which was blown over yet again in a storm some months ago back and this time couldn't just be rolled back into position. Fortunately, the main hide, which had extensive renovations after the same storm, is still going strong.

However, to simplify which hide is which it has been decided to call the big hide opposite the shellbank the Godwit Hide, the replacement hide at the foot of the shellbank the Wrybill Hide and

the brand new hide on the Stilt Ponds the Stilt Hide.

Their arrival followed a huge effort by a small team of volunteers. The components of the two new hides were

Much thought was given to an appropriate collective noun for the hammerhands. Suggestions included a board, a claw and a tattoo. But the final choice was a clamour of hammerhands.

cut out on Friday by a team of builders led by Adrian Riegen, Ian Higgins and Ralph Kast assisted by labourers Ray Buckmaster and Jim Eagles.

On Saturday that group was joined by nine hammerhands – plus two cooks

– who shrugged off the constant drizzle, fastened the bits together and put up the new hides outside the Shorebird Centre to make sure it all worked.

Then on Sunday, as the sun came out, the remaining 10-strong team borrowed a tractor and trailer from neighbouring farmer Andrew Davis, took the prefabricated sections down to the Findlay Reserve, where sites had been prepared, and fitted them together.

The whole exercise took a bit longer than expected so the Wrybill Hide is still awaiting its windows and seats, and the Stilt Hide needs its viewing wings as well as windows and seats, but all three hides can now be used for

Cover: The new Stilt Hide, on the shores of the Stilt Ponds, is put together. Photo / Jim Eagles

TEAMWORK: (from top) Hammerhands in action; a test run to ensure it all fits; the construction team check out a new hide; the components head down to the Findlay Reserve; erecting the new Wrybill Hide. Photos / Jim Eagles

viewing. As a tired but happy Adrian said over a beer as darkness fell, ‘Fantastic effort.’

Working bees

There have been several other working bees in recent weeks. The Centre got its annual spring clean from the effort traditionally held before the mid-winter potluck dinner. There was a great turnout of helpers and, as well as a much-needed tidy up, several significant improvements were made.

Peter Fryer fixed the problem of the shell at the base of the ramp into the Centre constantly being worn away, leaving a steep lip. The base of the ramp is now boxed in and filled with compacted shell which should ensure longer-term stability. Peter also organised replacing worn roofing over the front deck which sometimes saw an unwary visitor catch water down the neck. Gerry Romley cleaned out most of the guttering around the building.

Meanwhile, Adrian fixed up the Warren Viscoe godwit sculpture, which marks the start of the trail to the hides, by restoring its base.

A couple of weeks later a band of intrepid workers turned out for the annual mangrove-clearing exercise at the hides. Thanks to the huge effort put in last year, and the stormy winter which discouraged seeds from getting established, there weren't too many mangroves to deal to. But it still

provided an opportunity for a few enthusiasts to get themselves covered in mud (as shown in Ann Buckmaster's cartoon).

Another group spent several hours weeding the area round the hides and keeping the shellbank free from undergrowth. At the same time, down at the Centre Adrian, assisted by John and Stella Rowe, fixed a design flaw in the guttering and drainage in the central courtyard.

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YOUNG BIRDERS: Participants at the Birds NZ youth banding camp based in the Shorebird Centre find out about mist-netting and handling birds. Photos / Joe Dillon

Shorebird snippets

Training the next generation of birders

The Shorebird Centre is putting a lot of effort into educating the next generation of bird conservationists.

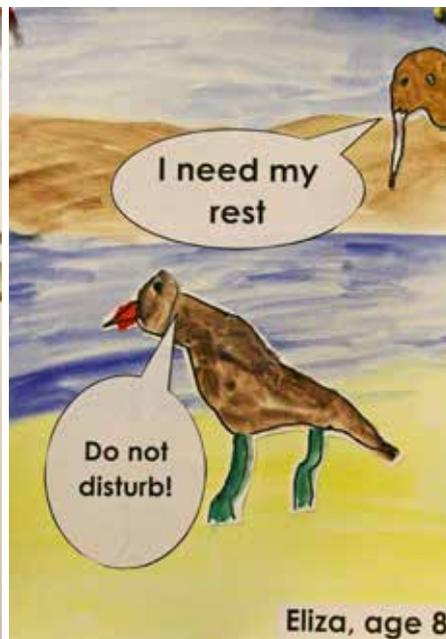
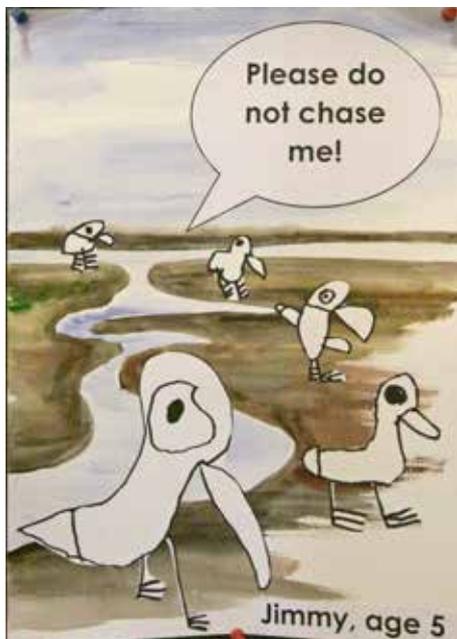
Krystal Glen has resumed work as the Centre educator, following the birth of her baby, working one day a

week. She and Keith were involved in a recent highly successful EnviroSchools event involving 80 students from Hauraki, Coromandel and Hamilton.

As well as resuming her school visits, Krystal also ran a children's

programme on two days of the recent school holidays which attracted 19 enthusiastic youngsters. Participants produced some wonderfully colourful signs asking people to look after our birds which are now on display in the Centre.

Last month Ian Southey organised a highly successful youth banding camp for Birds New Zealand which was held at the Centre. This saw 12 young people get some great hands-on experience in catching and banding birds under the expert eyes of tutors like Gillian Vaughan and Adrian Riegen.



Transported to the Himalaya

Guest speaker at the potluck dinner, Sonam Tashi Lama (below), transported members to the mystical world of the Himalaya and the



Another new face at the Shorebird Centre

Chelsea Ralls (at right) has started working three days a week as the new assistant at the Shorebird Centre. She takes over from Caitlin Speedy who had only been there for a short time when she was offered a fulltime position with an Auckland consultancy that was too good to turn down.

Chelsea grew up in Paeroa, spending many hours soaking in the Miranda Hot Pools, fishing from Kaiuaa and swimming or floundering along the coast. She hopes having a local knowledge will be a good base for helping visitors at the Centre but is also looking forward to re-exploring the area and finding new favourite spots.

Chelsea has always had a passion for the natural world. She studied biology, chemistry, earth and environmental sciences and then had 'a pretty diverse career ranging from environmental water testing and quality systems through to information technology and project management' that took her across the globe

Later she took a year off for a



road trip round New Zealand's great outdoors which started with a day at Shakespear Regional Park learning about the endangered Dotterel and North Island Robin. 'After that,' she says, 'birds became a really strong theme of the trip, so when this position became available I jumped at the

chance. The people, the location and the purpose of this organization really check all the boxes in what I was looking for in my next job. I really couldn't be more excited. I'm lucky to have the opportunity to learn here and I hope that some of my skills will come in useful.'

cute red fuzzball that is the Red Panda.

Sonam provided a rare glimpse into the work of the Red Panda Network (RPN) in Nepal, the only organisation worldwide working on Red Panda conservation.

What RPN accomplishes on a tiny budget is astonishing. It has engaged with local communities, educated children, created nurseries to replant forests, done forest fire management, improved rural cook stoves and herding sheds, installed camera traps and caught poachers, monitored Red Panda populations and organised eco-trips to show them to wowed tourists. Those who go on its adventures not only have a marvellous experience but also know that every penny goes into the local community and Red Panda conservation. If you are inspired to support this grass roots organisation or go see a real wild Red Panda check out <https://redpandnetwork.org>. It's true magic!

A flock of shore guides

There should be no shortage of Summer Shore Guides this season. When the usual fulltime paid position was advertised there were 10 applications. The Trust subsequently appointed

sisters Wendi Lane (who did the job extremely well last year) and Trudy (a member of the Council) to share the job. However, it's likely that Trudy

will do most of the work because Wendi subsequently realised an ambition to get a job driving the train at the Driving Creek Railway which is much



THE GUIDE SISTERS: Wendi and Trudy Lane practice their guiding.

What's on at the Shorebird Centre

15-21 January, Miranda Field Course

4 March, Farewell to the Birds

11am University researcher Jesse Conklin gives an update on godwit genetics including some fascinating revelations on population genetics.

20 May, Annual General Meeting

11am Guest speaker Bruce McKinlay outlines his work as New Zealand representative to the East Asian-Australasian Flyway Partnership.

7 May, Drawing Techniques Course with Sandra Morris

Details from the Centre.

The small world of knots and birders

On 1 July 2011 Pavel Tomkovich banded a male Red Knot, CKT, at Meinypilgyno in Siberia. CKT has been seen on the Kaipara Harbour each year since 2012 by Tony Habraken.

CKT paired with a female, DAW, (shown at right) who was banded by Pavel on 4 June 2017. On 1 and 7 October 2017 Tony saw DAW at Pukorokoro

On 6 July 2017 a chick the pair raised was also banded (the picture at right shows the chick being held in the fingers with CKT looking on). For anyone who wants to know where it was banded, Adrian Riegen has provided the GPS plot: 62.53°N 177.05°E



leg of the hugely popular trail – which already has branches running from Thames to Waihi, Paeroa and Te Aroha – has been completed as far as the Pukorokoro Stream Bridge a short distance away.

The final stage, from Pukorokoro Stream to Kaiaua, past the reserve and the Shorebird Centre, will be completed when funding is available.

But the Hauraki Rail Trail Charitable Trust has signalled how important it thinks the shorebirds will be to its success by putting a sign outside the reserve anyway. The birds and the Centre also take pride of place on the rail trail's website advertising things to do.

The trail is due to be officially opened on 18 November but for some weeks now cyclists have been using the route and visiting the hides and a lot more are expected this summer.

Unfortunately, one result is that while the latest in a series of signs warning about the carpark thieves has stayed in place for now, a newish sign asking cyclists not to ride their bikes down to the hides was ripped off the fence. However, Adrian has come up with what he hopes will prove a vandal-resistant sign.

Online profile

The Shorebird Centre's online profile continues to grow slowly. At the time of the latest Council meeting we had 1877 likes on Facebook, 515 Twitter followers and 191 Instagram followers.

Top security?

PMNT will be trying out several security measures this summer in the hope of reducing the number of break-ins at the hide car park. The gate to the car park will be locked overnight. An

closer to her home on the Coromandel Peninsula.

Dai Stacy, a birder from Wales who has been a volunteer guide for the past two seasons, is returning again. And another international volunteer, Emilia Lai, who recently spent a year working at the Broome Bird Observatory, will

be here for a month from mid-November. Plus, of course, there will be the usual Trust members helping out.

On your bike

There is now a cycle trail ending right outside the Findlay Reserve. That is because the Kopu to Kaiaua

CYCLISTS THIS WAY: The route map and marker post at the entrance to the Findlay Reserve indicate that it is a major stopping point on the partially completed Kopu to Kaiaua Cycle Trail.



experiment of asking visitors to close the gate behind them, to inhibit the thieves from swooping into the car park, grabbing loot and swooping out again, has been operating reasonably smoothly. Where possible volunteers will be stationed in the car park on busy days. There are also some secret measures being trialled which won't be publicised at this stage.

A friend in high places

PMNT has high hopes of a good relationship with the new Minister of Conservation in the Labour-led Government.

The Minister, Eugenie Sage, worked for many years in the conservation movement before entering Parliament as a Green Party MP. She was, of course, guest-speaker at this year's annual meeting. And since then she has frequently 'liked' or commented on posts on our Facebook page.

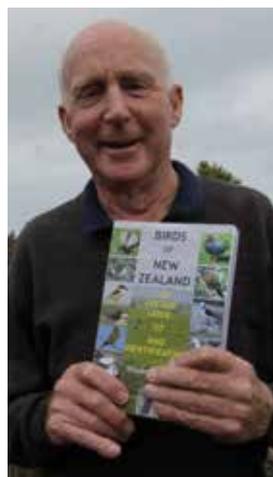
The gentle and noble art

Stuart Chambers (below) has used the wonders of modern technology to print an updated edition of his 2007 book, *BIRDS OF NEW ZEALAND: the colour guide to bird identification*, originally produced by Reed.

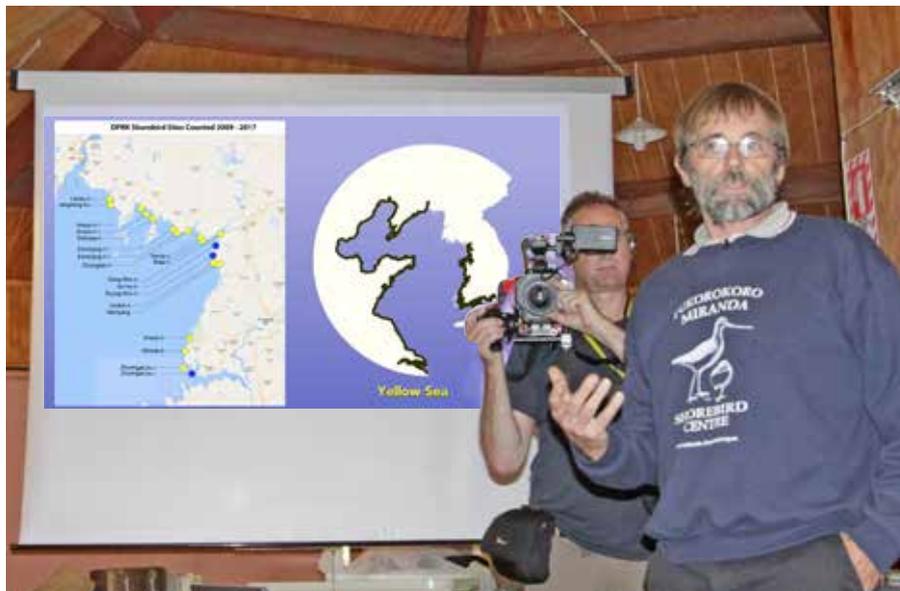
The book sold out and was never reprinted. But Stuart has now had copies produced through www.createspace.com. As a result it is available through Amazon (where an e-version can also be downloaded), the Shoreboard Centre or Stuart.

A particular feature of this guide is that the page edges of the various sections have different colours to make it easier and quicker to use.

Stuart says his aim in updating and republishing it is to encourage people in what his mentor – and PMNT founder – Dick Sibson called the 'gentle and noble art of birdwatching'.



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art's books,
BIRDS OF
NEW ZEA-
L A N D :
the locality
guide, which
a d v i s e s
where best
to find differ-
ent species,
is also avail-
able at the
Centre.** 



LIGHTS, CAMERA, ACTION: Television cameras were at the Centre for Adrian Riegen's talk on PMNT's survey of migratory waders in North Korea. TVNZ's Sunday programme is interested in doing a documentary on the project. As well as reporting on the results so far, Adrian was able to advise that although the original programme negotiated with the Nature Conservation Union of Korea has now been completed, indications are that it will be allowed to continue. Next year the PMNT team hopes to survey the coastline adjacent to the border with China, just opposite Yalu Jiang, where there is a huge number of waders. The year after that we may be allowed to survey the coastline close to the border with South Korea.

Winston Peters, North Korea, nuclear weapons . . . and us

Last time Winston Peters was Minister of Foreign Affairs one of his proudest achievements was to negotiate access for a PMNT team to survey waders along the coast of the Democratic People's Republic of Korea.

Of course you might expect us to say that. But Winston seems to feel that way too. According to the South Korean Ambassador to New Zealand, Winston recently told him that getting New Zealand birders to this little-known land was one of his greatest conservation achievements. And he said something similar during a televised election debate.

Then, in his first interview with the *NZ Herald* after being appointed Foreign Minister once again, Winston again turned to his success on our behalf to illustrate what he hopes to achieve.

Under the heading 'From Pyongyang to Miranda: Winston Peters' bird-watching diplomacy' the *Herald* reported: 'When Winston Peters was last in North Korea he tried to get the country to give up its nuclear aspirations but instead came away with a bird-watching agreement.'

'Peters was named as Foreign Minister again today and told media: "There are a number of things internationally which I think New Zealand has a capability of having a strong voice on. Even to the extent of we do not think that North Korea is an utterly hopeless case. . . We need to better understand that region and make our contribution. Albeit as a small country, but as an informed one."

'Peters said in 2007 he went to North Korea as Foreign Minister, part of a group that believed it might be possible to persuade the country to abandon its nuclear development programme in exchange for substantial economic development aid. "We didn't succeed, but it was worth trying. We did though, funnily enough, get some success and ensured that 97,000 birds that transit North Korea to New Zealand – to Miranda – continue to get safe harbour because of those efforts. It was an unusual outcome, but maybe we can shoot higher this time and might possibly be successful."' 



WELCOME VISITORS: (from left) A Sanderling and a Curlew Sandpiper.

Photos / JJ Harrison, John Woods

Arctic migrants arrive for their summer holiday

Recent sightings at Pukorokoro

Arctic Migrants

5600	<i>Bar-tailed Godwit</i>
70+	<i>Juvenile godwits</i>
1100	<i>Red Knot</i>
1	<i>Eastern Curlew</i>
12	<i>Pacific Golden Plover</i>
2	<i>Whimbrel</i>
4	<i>Sharp-tailed Sandpiper</i>
1	<i>Curlew Sandpiper</i>
1	<i>Marsh Sandpiper</i>
1	<i>Red-necked Stint</i>

New Zealand species

	<i>Wrybill</i>
	<i>Banded Dotterel</i>
	<i>SI Pied Oystercatcher</i>
71	<i>Royal Spoonbill</i>
1	<i>White Heron</i>
	<i>Black-billed Gull</i>
	<i>Caspian Tern</i>
	<i>White-fronted Tern</i>
	<i>Pied Stilt</i>
	<i>Hybrid Black Stilt</i>
	<i>New Zealand Dotterel</i>
	<i>Variable Oystercatcher</i>
	<i>NZ Dabchick</i>
	<i>Shore Plover</i>

The weather forecasts for the southern Yukon Kuskokwim Delta in late August were favourable for godwit departures. Sure enough a few days later on 4 September there were new birds at Pukorokoro Miranda. That evening there were 770 in front of the hide, up from the 250 or so that had been here through the winter.

Among the flock were many birds with marginal wing droop – evidence of tired flight muscles and recent arrival. However, as it is not uncommon to see extreme cases of this among birds that have only just arrived, it seems likely these may have been here a day or so. Certainly that would fit with evidence from elsewhere in the country such as Nelson, where over 150 new birds had been reported the day before.

Interestingly, a scan of the Pukorokoro flock revealed a heavy preponderance of females – perhaps 80% of the new arrivals.

The next morning the total flock had increased to over 900. On 9 September there were 1540 and by the end of the month 4200. Among the 4800 birds counted on 3 October were 40 birds with pronounced wing droop, three of them juveniles. By 7 October the flock had increased again, to 5500 and 6 juveniles. And so another season was underway, reassuring us that the system is still working and these extraordinary birds are still finding the means to perform these epic migrations.

Other birds to appear since early September include 1100 Red Knot, 14 Pacific Golden Plovers, four Sharp-tailed Sandpipers, one Curlew Sandpiper and one Red-necked Stint.

A Marsh Sandpiper has also been recorded regularly.

Of particular interest was the single Sanderling – a very rare species for Pukorokoro, reported near Kaiaua by Graham Brind. Also the cause of considerable excitement was a cameo appearance in front of the hide on the Sunday evening of Labour Weekend. Taking a break from mist-netting and banding training we had a group of Young Birders engaged in a flag and band spotting session. As dusk settled over the bay, and most of us were packing up to leave, young George spotted a Shore Plover. While it was too dark to get its band combination, it is almost certainly a wandering bird from Motutapu Island in the inner Hauraki Gulf.

Meanwhile closer to home it has been the year of the Dabchick. From being an extremely rare species in this area, it has become at times almost a commonplace. Starting with a juvenile bird on Widgery Lake for about three weeks in late summer, to four birds on the Bittern Ponds across the road, to the two adults present in front of the Centre through most of September. Then it became one bird, leaving us with the tantalising possibility the other one was nesting.

However no birds were seen through most of October until one turned up during the hide-building weekend. It may be that falling water levels and/or depleted food supply induces them to move on. We hope they continue to be a regular presence for these diminutive birds are a charming showpiece for visitors.

Keith Woodley



GOOD SPOTTING: Janie Vaughan and her photo of the Northern Shoveler on the Stilt Ponds.

Northern Shoveler pays a surprise visit

There was a flurry of excitement in the birding world when word got out that **Janie Vaughan** had spotted, and photographed, a rarely seen Northern Shoveler on the Stilt Ponds. Here's her story of that sighting.

You too could find a vagrant to New Zealand, particularly if it's as obvious as a male Northern Shoveler.

Kevin and I had a little time to spare, needed a walk and decided a visit to the shell banks, where we might see the returned Marsh Sandpiper would fill the bill. But as the mud in front of the hide was empty of birds we turned our attention to the Stilt Ponds. (Later Gillian asked us, 'What were you doing there so long after hide tide?' 'Finding a rare bird,' is the correct answer.)

After scanning the dozy ducks in the still water I said to Kevin, 'It's a Northern Shoveler,' and let him look through his scope. 'Well it's certainly a queer shoveler,' was his reply.

We watched the beautiful male for

a while. I was pretty sure that's what it was having seen a number of them in our northern travels. We are not birders who peer at tertials, coverts or carpels, just bird appreciators. Also there are only four species of shoveler – ie those who have that beak – the northern, the Australasian (some of which were also on the pond to make comparison easy) plus others in South America and Africa.

As the Australasian Shovelers were moving the stranger around, it swam south to feed by itself, head in the water. We checked that the Panasonic Lumix had taken some OK photos. At the extent of its 400mm zoom the results can be a little fuzzy but it is lighter than the big guns and that suits me.

We wanted others to enjoy the

bird, but first we wanted to confirm we were right, so first we went to the Shorebird Centre to check our find in a field guide and tell Keith Woodley (who wasn't there).

A call to Gillian went unanswered but we did reach Ian Southey. Ian asked some searching questions to which I responded that it was definitely a shoveler, with white in the front and white in the back, and, yes, it did have a green head. Then we drove to Auckland while Gillian and Ian came down to to view the bird.

You never know what you will find when you have time for a short walk. We never did see that Marsh Sandpiper. And my suggestion to you, if you see a rare bird, is: pay more attention to the detail than we did. 

A bird more often seen in New Zealand dead than alive

The Northern Shoveler (*Spatula clypeata*) has the unfortunate distinction of being as likely to be identified in New Zealand by a duck hunter – after being shot – as by a birder.

Until the latest appearance there had been only 11 accepted records of the bird in this country – just one female, probably because they are very similar to the Australasian Shoveler, and 10 of the more distinctive males – plus a few other sightings that were not assessed.

There also seem to be no really good photos of them in New Zealand, as witness the fact that all the pictures used on NZ Birds Online were taken in their native Northern Hemisphere, apart from a photo of a skin held by Te Papa. That particular bird, shot at Lake Ngakawau, Horowhenua, in 1969, was the second New Zealand record.

The fact that the museum holds five other skins is indicative of the manner in which they mostly get noticed, as does the preponderance of reports having occurred during

the shooting season. Yet, ironically, they are apparently not regarded as good eating.

Northern Shovelers breed in temperate wetland regions throughout the northern hemisphere but in winter they migrate south to warmer climes near the equator. However, vagrants have been reported in much of the southern hemisphere including South Africa and Australia as well as New Zealand.

The name of its genus, *Spatula* or spoon, and the popular name shoveler obviously refer to the distinctive bill, wider at the tip than at the base, is lined with small, comb-like structures on the edge of the bill that act like sieves, allowing the birds to skim crustaceans and plankton from the water's surface.

Their conservation status is *of Least Concern* but, like most waterbirds, they are probably suffering from loss of habitat in Asia.

Jim Eagles



IN RECOVERY MODE: The coastal strip from Pukorokoro all the way up to Taramaire and possibly as far as Kaiaua may be restored as habitat for native species. Photo / Living Water

Pukorokoro coastal strip could become a mosaic of different habitats

Birds like the Banded Rail, Bittern and Fernbird, reptiles such as the Shore Skink, insects like the Giant Dragonfly and plants such as mimulus could all become more common along the coastal strip, and there could also be more roosts for waders, if restoration plans are able to go ahead, writes **Jim Eagles**.

The long-held vision of restoring the coastal strip from the Pukorokoro Stream at least as far as Taramaire and possibly beyond continues to move closer to reality for the Pukorokoro Miranda Naturalists' Trust.

That vision was beautifully spelled out in a paper written by the Trust in 2013, and the subsequent *Evaluation of Restoration Management Requirements at Miranda-Pukorokoro* by Wildlands Consultants, as, 'In various appropriate areas between the Taramaire and Miranda roosts, establish or enhance a mosaic of habitats that will encourage wader breeding, increase habitat for Banded Rail and Bittern, lizards, invertebrates, and the reintroduction of Fernbird and any other appropriate indigenous bird species.'

Now several developments have brought that closer to reality. First is the fact that the Robert Findlay Wildlife Reserve is now owned by the Trust. Added to that, most of the other land on the seaward side of the East Coast Rd as far as Kaiaua – apart from the Dalton land immediately to the north

of the Findlay Reserve – is in about a dozen blocks administered by the Department of Conservation, Nature Heritage Fund and Hauraki District.

There are also several small reserves on the landward side of the road, including the small block at Pukorokoro owned by PMNT, plus the possible purchase of 23.5ha of the Coxhead farm by the proposed Pukorokoro Living Memorial Trust.

In recent months there has been increasing coordination over management of these blocks. For instance, the Living Water Partnership has provided funding for pest trapping and fennel control on the Findlay Reserve to be carried out by the contractors who also do the DOC land.

In addition, the DOC land is poised for some redevelopment anyway when the Pukorokoro-Kaiaua leg of the extended Hauraki Cycle Trail is completed. At that point DOC plans to plant the area to screen the trail, remove fences and cease grazing by cattle on several blocks.

A trust team led by council member

and entomologist Peter Maddison, manager Keith Woodley and chair Gillian Vaughan has already scoped the planting options for the Findlay Reserve.

But Keith says talks with staff from DOC and Living Water have indicated it would be worthwhile seeking to extend the exercise to cover all the publicly owned land along the coastal strip. 'It is expected we could get substantial buy-in and support from government, local government, etc.'

As a result the trust has produced a paper looking at specific development proposals for the Taramaire Wildlife Management Reserve which acts as a key connection between the shorebird roosts at the Taramaire Stream mouth and the Findlay reserve.

Chair Gillian Vaughan says the aim is to develop the Taramaire block 'to create ponds and a largely woody/rush block to reintroduce a wetland habitat that is currently missing from the Pukorokoro-Miranda area'.

In the northern part of the block, around the Taramaire Stream mouth,



LOOKING FOR A HOME: Threatened species like Bittern, Shore Skinks and Fernbirds could find a home along a rehabilitated coastal strip. Photos / Ray Buckmaster, Dylan van Winkel, Mary-Ann Rowland.

which is already a shorebird roost, where NZ Dotterel and White-fronted Terns regularly attempt to breed with limited success, the Trust's paper suggests measures to enhance breeding and roosting opportunities. This could be done by increasing predator control in the area, enhancing the salt marsh round the wader roost and seeking to make conditions more suitable for *Mimulus repens*.

In the central portion of the block, which is mostly in rough pasture, the Trust would like to investigate restoration of the original habitat by:

- Seeing if there is any ability to restore the chenier plains.
- Planting the likes of Saltmarsh Ribbonwood on the higher points and rushes such as Oioi in the wetter areas and encouraging mistletoe to spread.
- Enhancing saltmarsh communities in the low pan areas.

- If possible restoring some of the natural drainage, by having water channels along the roadside of the block and possibly also alongside the cycle trail, as well as opening the low stopbank at the coast to allow tidal input on very high tides.

In the southern part of the Tara-maire block, closest to the Shorebird Centre, there are already ponds with planting around them where Bittern bred in 2012, and the aim would be to extend the network of ponds, expand the plantings and seek to find a reliable water source.

Gillian said if all this could be done it would 'create a system that would support both species currently in the area and potentially allow new species to be reintroduced. The key aspirational species for the project is Fernbird. If they can be established it would be a clear mark of success, as it would mean not only had habitat for them been created, but that predators would be under control.'

Existing inhabitants that would benefit include rare plants like mimulus and ileostylus, native lizards such as Shore Skink, birds such as Bittern, Banded Rail, Grey Warblers, Shining Cuckoo, Silvereye and Fantail, and native insects like dragonflies.

In addition the Trust would like to investigate the introduction of more rare species such as crakes and other native lizards. It also wants consideration given to establishing a walking track through the area to the coast.

Initial discussions with DOC staff indicate strong support for redevelopment of the coastal strip and a project manager is likely to be appointed to co-ordinate the work. Three manageable areas opposite and to the north of the Shorebird Centre have been identified for initial planting in stages over the next three years. The time lag is so that *Carex divisa*, the most significant weed species, can be eradicated prior to planting. It will also give time for funding to be arranged and sufficient plants propagated.

Meanwhile other developments on the Findlay Reserve are moving ahead. The culvert draining the Stilt Ponds has been cleared, which has increased tidal flow slightly, but silting of the stream below the culvert is inhibiting optimal drainage.

Consequently the Trust is now investigating creation of a second outlet from the ponds, probably reaching the sea close to the site of the old hide and managed by a sluice gate, in order to improve its water management options.

Initial discussions with Waikato Regional Council about getting a resource consent for the new outlet have indicated there should be no great difficulties getting approval. Water from it could be used to periodically flood adjacent low-lying areas.

If a second outlet is created the fill from this could be used to create an additional raised roosting area on the eastern side of the ponds or, alternatively, material could be taken from the raised area at the northern end of the reserve.

Meanwhile, as reported elsewhere, two new hides have been built, one replacing the old hide, the other overlooking the new roost on the ponds, meaning there are now three shelters from which to watch the birds.

All of that is in addition to other recent improvements including the upgrading and fencing of the car park at the reserve, installation of a special

gate with a keypad lock which will allow wheelchair access and the completion of the new path to the main hide.

In addition, the Living Water Partnership, funded by Fonterra, has started work to rehabilitate the wider catchment area, including:

- Considering pest management in the Upper Taramaire Catchment.
- Completing perimeter fencing of the Te Kama or Thompson Block forest remnant and commence fencing of the Taramaire and Rangipo Streams.
- Doing a water quality survey as a base for on-going monitoring.
- Identifying freshwater mussel and fish spawning sites.

Recently a meeting has been held to set up a trust involving local landowners to run a catchment care group to oversee stream planting, upper catchment protect and water quality enhancement for the area. 

No decision yet about wetland on Coxhead farm

PMNT is still considering whether to be involved in a proposal to develop and run an area of wetland on the present Coxhead farm over the road from the Findlay Reserve. As well as the wetland the project would include a building to serve as a memorial to the attack on Pukorokoro village in 1863, a training centre for young people and an information centre on local wildlife.

If it goes ahead the proposal (which was outlined in detail in PM News 103) would involve PMNT, Ngati Paoa, the Dalton Family Trust, Te Whangai Trust and local landowners (at present represented by Council member Trudy Lane).

Since it was unveiled at the start of the year the idea has been the subject of much discussion but the formation of the body to run it has not progressed.

Now, to bring things to a head one way or another, it has been decided to create a Pukorokoro Living Memorial Development Trust, including all the parties, to seek funding for a detailed investigation into the idea.

Chair Gillian Vaughan, who represents PMNT at talks on the proposal, said the aim was to 'see if all the parties can work together and to clarify the longterm aims so we can each decide whether we want to be part of it'. 



THE WONDER OF SCIENCE: Bruce Hayward in discussion with an eager young scientist at the Thousand-species Bioblitz. Photo / Jim Eagles

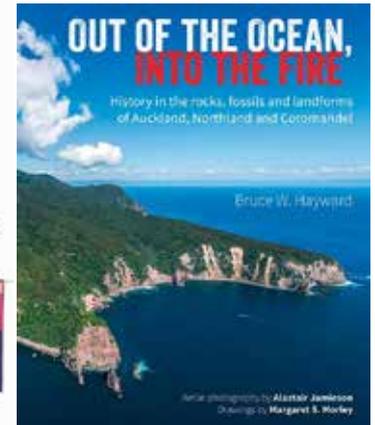
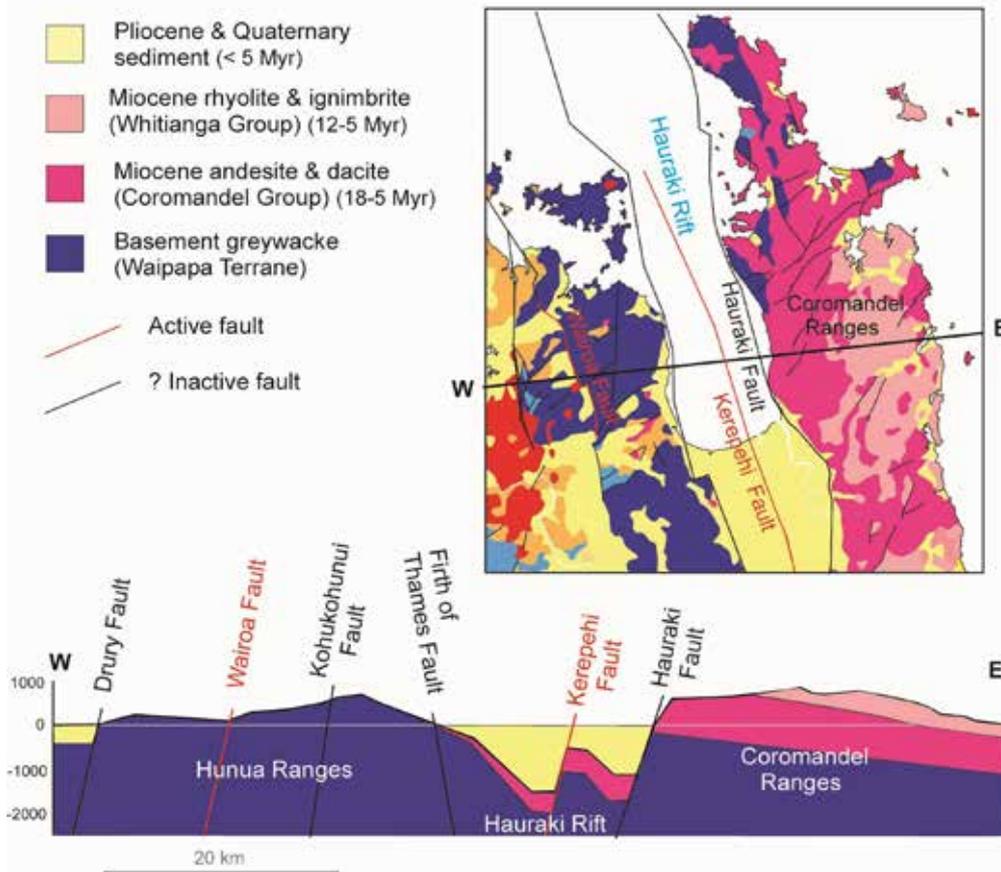
Discovering the extraordinary

OUT OF THE OCEAN, INTO THE FIRE: History in the rocks, fossils and landforms of Auckland, Northland and Coromandel, by Bruce W Hayward. Geoscience Society of NZ, \$49.50

Over the years geologist, marine ecologist and paleontologist Bruce Hayward has played a big part in efforts to show that the area around the Shorebird Centre is special for lots of reasons besides its birdlife. In issue 87 of *PM News* he wrote an article explaining why our chenier plain attracts global interest. When PMNT held its hugely successful Thousand-species Bioblitz, Bruce was one of the scientists who came along to identify the species found. And when the interpretative signs around the Findlay Reserve were put up he helped Keith Woodley create the panel describing the ancient origins of this arm of the Firth of Thames. Now, in the latest of his many books, he explains for the general public, for the first time, what is currently known about the 300-million-years of powerful geological forces which

have shaped the northern part of New Zealand including the little corner where the Centre stands. It's an amazing story full of volcanic eruptions and earthquakes, of mighty but long-vanished rivers and of tectonic movements which even today are tearing the Firth apart and pushing its floor even deeper. Hayward says Northland, Auckland and Coromandel Peninsula have the most diverse and complex geology in New Zealand. The region has been uplifted three times, pulled down once, tilted westward, eroded down to a coastal plain twice and torn apart by the geologically recent foundering of the Hauraki Gulf and plains. The region has also been transformed by a greater diversity of volcanic activity than any area of similar size in the world. This northern region exists as it is today primarily as a result of tectonic uplift that has occurred in the last 5 million years or so. The uplift has been described as 'block faulting' because a number of huge blocks, tens of kilometres across, have been uplifted or downthrown to different

FAULTS ON ALL SIDES: (At left) An illustration from *Out of the Ocean* showing the Hauraki Rift in which the Hauraki Gulf sits; (below) the cover of the book which is now on sale at the Shorebird Centre



forces which created the Firth of Thames

levels in the Auckland region. Turning to PMNT's primary area of interest in the Firth of Thames, his book explains that the Hunua Ranges on the western side are a west-tilted block rising to a height of 688m at the Kohukohunui peak. The block is underlain by basement greywacke which has been exposed by the erosion of as much as 800m of soft Waitemata Sandstone. On the eastern side of the Firth, the Coromandel Peninsula and Great Barrier Island are formed from eastward tilted uplifted blocks that include the three highest peaks in northern New Zealand, Moehau (892m), Table Mt (846m) and Camels Back (822m). Part of this elevation is the result of volcanic cones which erupted there between 12 and 7 million years ago. But the indications are that the western side of the range was uplifted by perhaps 400-500m by the tectonic movement. The top of the Moehau Range is made of basement greywacke which has had the early Miocene volcanic rocks stripped off. Similar developments have occurred to

varying degrees in the rest of the peninsula. Between those two ranges, the Firth of Thames and the Hauraki Plains beyond lie in the Hauraki Rift, a 250km-long depression stretching as far north as Whangarei, with the Hauraki Fault to the east and the Firth of Thames Fault to the west. One and in some places two faults – most notably the Kerepehi Fault - run up the middle of the rift and divide it into 2-3 grabens. Over the past 3 million years these have subsided by up to 2.5km with the greatest movement along the eastern Firth. Some of the faults are still active and are a likely source of infrequent earthquakes. The Hauraki Rift is believed to have been formed as a result of the Pacific Plate being pushed under the Australian Plate at an oblique angle which is also causing rifting in the Taupo Volcanic Zone. This has created a deep-seated extension which is slowly pulling the two sides apart. As a result the rifts' floor is subsiding along the faults. Hayward explains that the start of

the Hauraki rifting about 3 million years ago was preceded by upward arching of the earth's crust along the same north-south oriented belt. The rocks that underly the rift today are surprisingly hot compared with the surrounding areas, suggesting that a bulge of the hot mantle may have pushed up the crust. The hot springs at places like Miranda and Te Aroha have been caused by warm water flowing rapidly to the surface through fractures in the rock along block-related faults. As the rift sank it was progressively filled up with sediment which flowed in from the southern end as it does today. Vast amounts of this came from the huge rhyolite eruptions in the Taupo Volcanic Zone, especially prior to 22,000 years ago when the Waikato River flowed into the Firth through the Hinuera Valley. More recently, of course, vast quantities of shell have come into play and created the chenier plains on which the Shorebird Centre sits . . . but that is another story which has already been told. **Jim Eagles**



NEEDING A SILVER BULLET: Parliamentary Commissioner for the Environment Jan Wright releases her report on the state of our native birds which are gravely threatened by, among others, possums and Norway Rats.

Silver bullets or genocidal genes?

Ray Buckmaster considers some of the genetic solutions being considered as solutions to the plight of our native birds and warns that we need to be careful that the cure isn't worse than the disease.

Predator Free NZ 2050 set out a vision for our country. How we are to achieve it is not exactly certain. But a major part of that vision was 'to develop a breakthrough science solution that could eradicate at least one small mammalian predator from the mainland'.

The urgency is obvious. Earlier this year, Parliamentary Commissioner for the Environment Jan Wright, released *TAONGA OF AN ISLAND NATION: Saving New Zealand's birds* which notes that 32% of native birds are in serious trouble and a further 48% are in some trouble. Only two of the 16 shorebirds are of no concern.

The report mentions a rapidly developing area of genetic research that is known widely as Lifecode. This had its origins in 1953 when a New Zealand born scientist, Maurice Wilkins, was part of a team that worked out the structure of DNA, the core component of chromosomes, and revealed how it could store and pass on all the information, that is the Lifecode, for a living organism.

Then in 1990 a start was made on determining the entire human Lifecode through the human Genome Project

which cost \$US 2.7 billion and was completed by 2003. The technology developed in this project gives us the ability to modify the genomes of any organism. Those modifications are able to be passed on to future generations.

Moore's Law suggests that things technological become rapidly more efficient and less costly as time passes. When it comes to sequencing genomes, human or otherwise, this is certainly true. In 2016 it became possible to determine an individual genome in a single day for around \$US1000.

So far there is only one case of permission being given for a human inheritable genetic modification to correct a genetic error. Otherwise playing God, with the possibility of determining human evolution remains taboo.

But genetic manipulation of crops and farm animals is more widely accepted. In the pharmaceutical industry, eight out of the 10 most important products come from genetically modified organisms. There are even GM organisms available as pets: a mini-pig was developed in China; there are fluorescent zebra fish for your aquarium

due to bioluminescent gene transfer from jellyfish.

The approaches developed in the human genome project are transferable to the conservation arena without recourse to genetic engineering. There is, for instance, a unique portion of rats' genome that makes them very susceptible to a poison called PAPP. This is a species-specific poison which does not harm other animals (removing a major objection to the use of 1080).

The genomes of other pest species are being mined to locate parts of the genome that are both unique to the species and connected to an important life function. A poison can then be developed that targets that species. Such a substance could be available for possum control around 2019. It is not all plain sailing though. PAPP is 100% effective against Norway Rats but they find it unpalatable. Research to resolve this challenge is underway.

When it comes to modifying the genome of bird species at risk of extinction, suggestions have been made but not acted upon. Species on the brink of extinction often have little genetic variability, making them less capable

of adapting to change. The Californian Condor is an overseas example. It was at one stage reduced to a captive population of 14 and an inherited condition, a lethal form of dwarfism, caused 9% of the eggs to fail.

A similar bottle-neck is found in New Zealand Black Robins. All members of the two robin populations are very closely related and beak deformities sometimes turn up. For both condor and robin, more genetic diversity and a cut and paste operation involving the replacement of a deficient gene by a functional one, could be beneficial to species' survival.

On the other side of that coin, the technology is now developing that could lead to the complete eradication of a pest species from an island, even the large islands that make up the New Zealand mainland, maybe ultimately the permanent extinction of a target species from the planet

In 2012 CRISPR/Cas9 was developed. It is a two-part technology which allows an original form of a gene to be replaced with another. In the case of the rat you might replace a standard gene with one that could result in decreased fertility, a distorted sex ratio or sensitivity to a chemical control agent.

In the normal course of events bad forms of a gene decrease in a population as the bearers of them have a lesser chance of survival. But this is where the second part of the process comes in and it is known as a 'gene drive'. This ensures that an individual organism modified by a gene drive will transfer the bad gene to all its progeny and when their turn comes to reproduce they will pass on the bad gene to all their progeny.

The approach to eradicating a target species in this way is to initially build up a laboratory population carrying these genetic modifications. When introduced to the much larger population of pest species they will interbreed and, generations later, the entire population will have the bad gene. The population will have been shrinking during this time and, theoretically, will crash into local extinction. Of course it is possible that nature might find a way to nullify the gene drive though this will be much less likely if not one but two or even three bad genes are installed.

Currently gene drives have only been successfully installed in insects and yeasts and have not been released

into the wild but there is some urgency to apply the technology in the Hawaiian islands. Avian malaria was introduced into the islands when its carrier mosquito arrived along with whalers in the 19th century. Since that time the number of endemic bird species has fallen from 100 to just 42 because the endemic species evolved in the absence of avian malaria and had no resistance to it.

The CRISPR/Cas9 technology is very powerful, extremely cost effective and doesn't require elaborate equipment. A supernerd could probably install it with stuff he would find in the kitchen.

There seems to be little doubt that we will before long be capable of eliminating invasive mammalian predators from the planet. The real question to be answered is: should we do so? Kevin Esselt of Massachusetts Institute of Technology makes the point that the release of a gene drive anywhere is like a release everywhere. Because of this the implementation of gene drive anywhere in the world requires a global consensus. As example, koi carp are major disrupters of New Zealand ecology but in Asia they are a significant food source.

The scientific community has come up with suggestions as to how unintended outcomes of this nature could be avoided. Theoretically, daisy chain drives can be developed that breakdown after several generations have passed. It is also possible to create reverse gene drives which could be used to restore the original genetic situation should things get out of hand. It should also be noted that there is out-and-out opposition to the use of gene drives. Jane Goodall, primate researcher, and David Suzuki, environmentalist and broadcaster, in a joint letter called gene drives 'genocidal genes'.

We do have some time to think and consult over this issue. Professor Neil Gemmill of Otago University believes that 'it is possible that New Zealand might entertain the release of a gene drive by 2025'.

A similar situation has arisen in the past with the use of introduced species as biological control agents. Initially this was an uncontrolled and ill-considered process with significant off target impacts. We wouldn't be having problems with stoats if they hadn't been introduced to control rabbits. Today, however, introduction of species

In need of a silver bullet?



Black Robin. Photo / Wikimedia



Shore Plover. Photo / Adrian Riegen



Wrybill. Photo / Jim Eagles

for biological control is well regulated. It is a framework that we might use for guidance when considering protocols around the introduction of gene drive technology.

Certainly, the prospect of a pest free New Zealand has considerable allure. Imagine all those species pushed close to extinction being able to rebound and reclaim the mainland. Predator Free New Zealand 2050 gave us the vision and it is one well worth working toward. If not by this means, perhaps by some other. 

Annual Accounts for 2016 have been finalised and audited

New Treasurer **Kevin Vaughan** has sorted out the accounts for 2016, completed them in accordance with the complex new rules required of charities and they have been approved – with the usual caveats - by PMNT's auditors. Here is his report.

Members will be well aware that we are very late getting the annual accounts for 2016 completed.

A change in finance personnel and new reporting requirements set by the Charities Commission have given us a few road bumps in our timetable. At last the accounts are done and the audit is finished. Our thanks to the auditors Staples Rodway for their help in getting things completed.

The complete set of accounts now runs to 28 pages – regulations are a wonderful thing – so the numbers presented here are a brief summary. A full copy of the annual accounts can be accessed via our website.

Financial highlights for the year include the fund raising for the purchase of the Robert Findlay Wildlife Reserve (donations and grants of \$400,000 thanks to Waikato Regional Council, Foundation North and members) and land and building revaluations of \$621,341.

All of this has given us a big bounce-up on our fixed asset investment from \$804,184 to \$1,813,949.

With some ups and downs, operational items (subs, accommodation, courses, magazine) are broadly in line with the prior year.

We are a little disconcerted by the drop in the net shop revenue. To what extent this is related to our accounting shuffle will be identified in the 2017 accounts.

Part time employment of an Educator added to our employee costs and we incurred expense in further development of our Education Kit. Flyway costs for the North Korean work were sponsored by Living Water and as a result came to a net expense of only \$2674.

Our retiring treasurer Charles Gao has done the job for the last five years. Our thanks to him for his work over that time. 

Income & Expenses	2017	2016
Donations	251,979	16,217
Grants	189,111	16,981
Bequests	35,785	25,829
Flyway	28,896	32,914
Accommodation	24,661	23,800
Sales - Net	22,004	30,342
Subs	18,957	15,436
Field Courses & Talks	16,249	19,209
Interest	11,879	5,508
Land Lease	4,800	4,800
Total Income	604,321	191,036
Employees	108,648	91,183
Flyway	31,570	19,239
Magazine	18,324	15,887
Depreciation	14,980	19,107
Aust Shorebird Conf - Net	8,136	
Field courses	5,975	8,487
Ed Kit Development	5,356	3,391
Auditors	5,225	3,785
Repairs & Maintenance	4,251	15,654
Other	32,584	35,496
Total Expenses	235,049	212,229
Surplus	369,272	-21,193
Balance Sheet		
Cash & Bank	38,456	83,501
Term Deposits	218,221	257,004
Inventories	42,968	24,085
Receivables	16,837	19,662
Fixed Assets	1,813,949	804,184
Liabilities	-78,127	-126,746
Net Assets	2,052,304	1,061,690
Revaluation Reserves	932,591	311,250
Accumulated Funds	1,119,713	750,440
Total Funds	2,052,304	1,061,690



From the Chair

The web of conservation work

Chair **Gillian Vaughan** reflects on the extensive web of individuals and organisations which links together on many levels to make up the conservation movement.

One of the things you find in the conservation community is that we all wear many hats, and I'm not just talking about David Lawrie and his bonnet.

Many members of Pukorokoro Miranda Naturalists' Trust will be members of other organisations, and will be active in different conservation communities, groups like Supporters of Tiritiri Matangi, Birds New Zealand, Forest & Bird, or communities like Weka Watch Kawakawa Bay, Friends of Kirks Bush or the National Wetlands Trust.

Listening to Adrian Riegen's talk about the wader survey work in the Democratic Peoples Republic of Korea at the recent open day, I was struck by the sheer effort that goes into conservation, not just from Adrian at the front of the room, but all the others present.

Looking around caused me me to realise how many organisations, both small and large, would have been represented in that room, and from that I began considering the sheer number of hours that are put into the volunteer work that we do.

It's one of the reasons that

collaboration between different groups is becoming so important. With so many organisations pulling towards broadly similar goals, working together can make the best use of all of the hours, and all of the effort, that we as individuals put in.

Each group has its own goals, its own mission, and that's where the broad impact comes from.

It's important that PMNT runs its own advocacy and education programmes, that we work to keep the birds coming. It's also important that we do things like collaborate with Birds New Zealand on the recent youth banding camp, working together to instil both skills and a sense of our joint community to the next generation.

How far should collaboration go? It's an interesting question. The Trust's Council is currently working towards holding a strategy meeting, starting to think about what the next 10 years looks like and how that might be different from the last 10. My feeling is the issue of how far we should go in collaborating with others is going to be one of the key questions we will have to consider.

Looking at the people connections,

and all of the groups they belong to, seems a bit like spiders' webs, or a more appropriate analogy might be a migration map. Each group is like a stopover site, connected by the people who are involved in more than one of them. And we need all of those groups to be healthy to have a healthy conservation community in New Zealand.

The recent change of government will hopefully bring a renewed focus on conservation in New Zealand, but as a volunteer I don't think this is the time to step back and let government take on the work.

I'm hoping it's a time to consolidate the work that's been done, make some of the gains we've achieved recently just part of business as usual, then refocus, work at a higher level, take the chance to put all of those hours, all of that effort, into pushing towards greater goals.

The greater the goals, the more we are going to need to work together. The story of the effort to keep the godwits coming is the story of connections, between huge numbers of different people, organisations and countries, at a lot of levels. 



THE CONSERVATION NETWORK: Conservationists belonging to many organisations come together for projects like netting and banding birds. Photo / Jim Eagles

GODWIT TIMES

Kia ora e hoa (Hello my friend)

I recently arrived back from raising chicks in Alaska to enjoy the summer of my second home. While in New Zealand I am known by a unique name that no one else in the world calls me - Kuaka. This is the te reo Maori name given to the Bar-tailed Godwit. I particularly like using it during Maori language month which has just finished.

We Kuaka have an important role in Maori history. The saying 'Ko te kaupapa waka ki te moana hoe ai, ko te kahui atua ki te rangi rere ai' - 'As the fleet of canoes paddle the ocean, the flocks of gods fly overhead' is thought to mean that ancestors of the Maori followed the godwit migration, as they travelled south to Aotearoa.

Although it is doubtful that they knew just how far north us godwits flew, early Maori knew that Kuaka travelled somewhere else to breed. This knowledge led to Maori proverbs used when talking about something that was unlikely to happen. 'Kua kite te kohanga kuaka?' - 'Who has seen the nest of the godwit?' Mother used to say this when I asked if I would ever sing like the Kokako. Now I realise she meant 'Not likely.' And she was right.

Talking of Kokako, there are lots of birds that you know by their Maori names. The iconic bird of Aotearoa, the Kiwi, is a prime example. Other manu (birds) found at Pukorokoro also have uniquely New Zealand names:

Australasian bittern - Matuku

Black billed gull - Tarapuka

NZ dabchick - Weweia

White-faced heron - Matuku-moana

Royal spoonbill - Kotuku-ngutupapa

Southern black-backed gull - Karoro

South Island pied oystercatcher - Torea

Variable oystercatcher - Toreapango

Banded dotterel - Pohowera

Caspian tern - Taranui

NZ dotterel - Tuturiwhatu

Red knot - Huahou

Pied still - Poaka

White heron - Kotuku

Wrybill - Ngutu parore

White fronted tern - Tara

Although they are protected today, Kuaka were a source of food for early New Zealanders. Hunters would set traps on the sandbanks where the godwits roosted at high tide. They would then dig a hole to hide in while waiting for the tide to come in and darkness to fall.

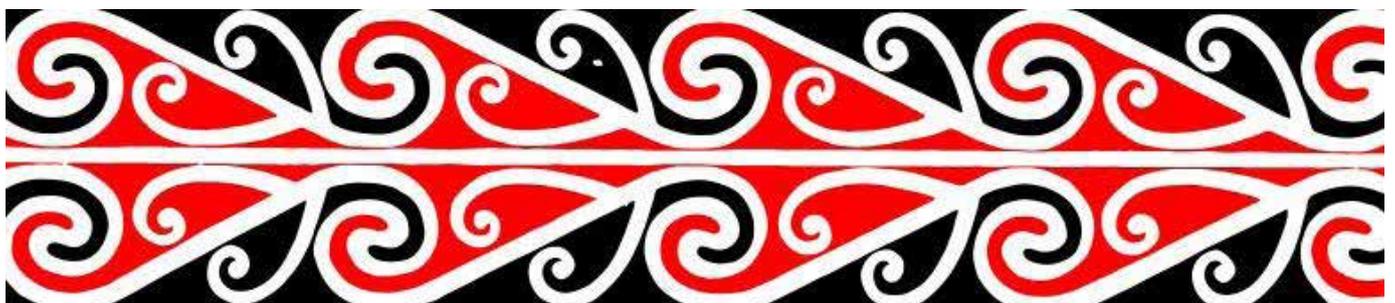
I will leave you today with a terrible joke.

How do you catch a godwit?

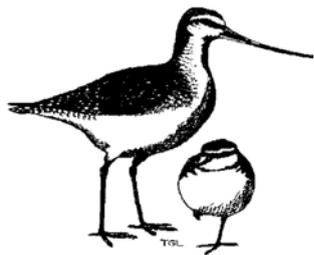
Eat a marine worm and wait on the shellbank with baited breath! I must ask Adrian Riegen if he uses the fishy-breath technique ...

Ka kite ano (See you again)

Godfrey Godwit (aka Kiwa Kuaka)



PUKOROKORO MIRANDA NATURALISTS' TRUST



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Manager: Keith Woodley
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Educator: Krystal Glen

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09 298 2500

Deputy Chair and Banding
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riegen@xtra.co.nz
09 814 9741

Secretary: Will Perry
home 09 525 2771
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Treasurer: Kevin Vaughan
kevinv@clear.net.nz
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Council members: David Lawrie
(Immediate Past Chair), Estella
Lee, Wendy Hare, Bruce Postill,
Trudy Lane, Peter Maddison,
Ann and Ray Buckmaster, Jim
Eagles.

Magazine

Pukorokoro Miranda Naturalists' Trust publishes *Pukorokoro Miranda News* four times a year 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.

Editor: Jim Eagles
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(09) 445 2444 or 021 0231 6033

See the birds

Situated on the Firth of Thames between Kaiaua and the Miranda Hot Pools, the Pukorokoro Miranda 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 Miranda high tide is 30 minutes before the Auckland (Waitemata) tide. Drop in to investigate, or come and stay a night or two.

Low cost accommodation

The Shorebird Centre has bunkrooms for hire and two self-contained units: Beds cost \$20 per night for members and \$25 for non-members. Self-contained units are \$70 for members and \$95 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 \$65 for those living overseas. Life memberships are \$1500 for those under 50 and \$850 for those 50 and over. 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 decisionmaking through the annual meeting. You can join at the Centre or by going to our webpage (www.miranda-shorebird.org.nz) and pay a subscription via Paypal, by direct credit or by posting a cheque.

Bequests

Remember the Pukorokoro Miranda Naturalists' Trust in your will and assist its vital work for migratory shorebirds. For further information and a copy of our legacy letter contact the Shorebird Centre.

Want to be involved?

Friends of Pukorokoro Miranda

This is a volunteer group which helps look after the Shorebird Centre. That can include assisting with the shop, guiding school groups or meeting people down at the hide. Regular days for volunteer training are held. Contact the Centre for details.

Long term Volunteers

Spend four weeks or more on the shoreline at Miranda. If you are interested in staffing the Shorebird Centre, helping with school groups or talking to people on the shellbank for a few weeks contact Keith Woodley to discuss options. You can have free accommodation in one of the bunkrooms and use of a bicycle.

Firth of Thames Census

Run by Birds NZ (OSNZ) and held twice a year, the census days are a good chance to get involved with field work and research. This year's are on June 18 and November 12. Ask at the centre for details.

Contribute to the Magazine

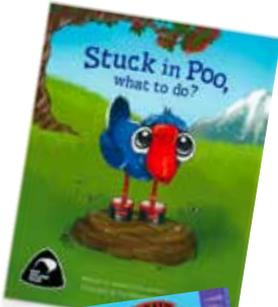
If you've got something you've written, a piece of research, a poem or a photo send it in to *Pukorokoro Miranda News*. If you want to discuss your ideas contact Jim Eagles at eagles@clear.net.nz.

Help in the Shorebird Centre Garden

We can always use extra hands in the Miranda Garden, be it a half hours weeding or more ambitious projects. If you do have some spare time please ask at the centre for ideas, adopt a patch or feel free to take up any garden maintenance you can see needs doing.

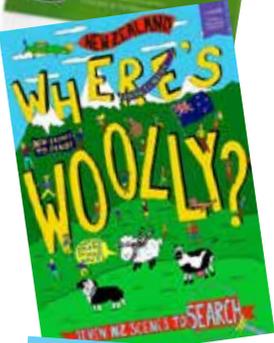
Perfect Christmas gifts for nature lovers

Fantastic new children's books

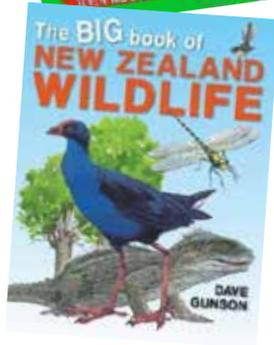


Share the great thrill of reading our own stories in books like these (just a few of what the Shorebird Centre shop has on offer)

The latest in the delightful Look the Pook series: *Stuck in Poo, what to do?* by Samantha Laugesen \$18.90



Learn about New Zealand by following Woolly the sheep through six special regions. *Where's Woolly?* by Alistair King, Poppi Burke and James Perham \$19.90



Discover the beauty of our native species in Dave Gunson's fascinating *The Big Book of New Zealand Wildlife* \$29.90



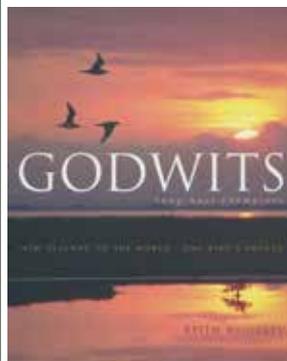
Something new in waterbottles
Stainless steel by Voyadore
Featuring seabirds, sea creatures and pohutukawa \$34.90



Enjoy nature's own glorious fragrances with this range of six creme perfumes celebrating our birds by Millstream Gardens \$11.90 each

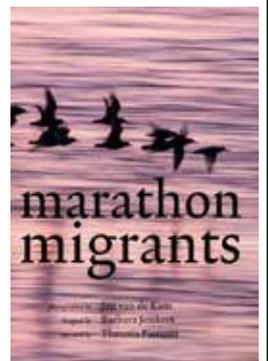


Don't miss these two superb books on our amazing long-distance migrant birds



Keith Woodley's classic, *Godwits: long-haul champions*, recently reprinted by PMNT and on sale for only \$49.90

A great new book celebrating the birds that connect people and places across our planet, *Marathon Migrants*, written by Theunis Piersma, at \$74.99



The Shorebird Centre is always worth a visit to see the birds, enjoy the displays and chat with Keith or Chelsea. But if you can't find the time to call in just go to our online shop at <https://shop.miranda-shorebird.org.nz/> or ring 09 232 2781 and ask.