

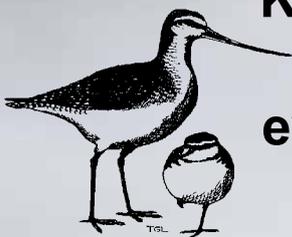
Pūkorokoro Miranda **News**

Journal of the Pūkorokoro Miranda Naturalists' Trust

November 2018 Issue 110

Godwit weather forecasters

How Bar-tailed Godwits work out the best time to start their epic journeys



**Keith Woodley
on PMNT's
evolution over
25 years**

**New summer
shoreguide
entranced by
waders**

**How to make
your own
Pacific Golden
Plover**

Shoreguide has a passion for shorebirds

Amanda Hunt still remembers ‘the incredible experience of observing the huge flocks of migratory birds at Miranda for the first time’ and is delighted to have the chance to help others do the same as this season’s summer shore guide.

She is extremely well qualified, having a master’s degree in environmental science, has huge experience dealing with the public, including at the Department of Conservation and the Rainbow Springs tourist attraction, and is a published poet.

But what stood out in her application was her passion for shorebirds which, she says, ‘started at an early age’ and has led her to do both the Miranda Field Course and the New Zealand Dotterel Course at the Shorebird Centre.

That passion has also seen her do volunteer work protecting dotterels at Little Waihi estuary; monitoring Shore Plovers, Chatham Island Oystercatchers and Chatham Petrels on the Chathams; and caring for and translocating captive-reared Shore Plovers on Portland Island.

But what she really likes is ‘speaking with visitors and helping enhance their knowledge of the natural world,’ she says. ‘In particular, I love to share my passion for New Zealand birds.

It’s so rewarding to see people’s interest grow as they learn more about our birds and threats they face, and the importance of conservation. I’m really looking forward to the opportunity to share my passion for shorebirds with the public, and particularly to help them observe these species up close, in the wild, at Miranda.’



BEST FRIENDS: Amanda Hunt at Pukorokoro with a Wrybill.

Amanda started work as shore guide on Welcome to the Birds day. She will be joined at the hides by returning volunteers Dai Stacey from Wales, and JoJo Doyle from the US.

Rehabilitating the coast

The long-awaited plan to restore habitat along the coastal strip is really starting to get some momentum.

Shortly after the working bee which saw 332 native trees and shrubs planted along the front of the Shorebird Centre grounds, the Trust joined in a much larger planting exercise on the Department of Conservation land over the road.

Over a two-week period volunteers and DOC staff – greatly helped by the use of an auger to bore the holes – put in over 4000 plants. The placement of the plants was based on advice by translocation expert Kevin Parker and was aimed at creating blocks of dense vegetation, with protruding shrubs and trees, which would be suitable habitat for native species like Fernbirds. Keith Woodley said Kevin ‘saw amazing potential for the area’ and ‘there

could be room for 20 pairs of Fernbirds.’

Ken Brown, from DOC’s Thames office, is keen to maintain momentum by propagating plants himself as well as buying some. As a result, the Trust is looking at creating a native plant nursery in the area behind the Centre.

Gillian Vaughan suggested the nursery could also raise plants for the coastal strip and the block of land across the East Coast Rd the Trust owns and at present leases out for grazing. Gillian said she would like to see ponds and wetlands developed on this block, then for it to be extensively planted, to create habitat for a range of species. The Council agreed that Gillian should investigate the idea.

Meanwhile work is continuing on creating a better system of drainage for the Stilt Ponds. This will require a Resource Consent and is likely to take at least a year to be finalised and consent obtained.

Cleaning up

In spite of all the other recent working bees there was a good turnout for the traditional Centre spring clean on the morn-

Morning

For the Bar-tailed Godwit

Little heart beating in a feather cape
she steps carefully over the sand
in high heels and black eyeliner
touch of pink lipstick
pausing for a moment
behind the glasswort
to adjust her new coat
returned once more from the
edge of the world
she turns her back on the tundra
inclines her delicate slender nose and
tilts towards breakfast.

Amanda Hunt

Cover: Photo of Bar-tailed Godwits in flight by Tony Whitehead.



CHAMPIONS: The Pukeko team proudly hold the trophy they collected for winning the PMNT Birding Trivia Quiz. Photo / Jim Eagles

ing of the Mid-Winter Potluck Dinner.

The Centre got a thorough cleaning - including cupboards, fridges, stoves and display cases - cobwebs were removed from the high spots above the rafters and under the eaves, faulty smoke alarm batteries and halogen lights were replaced, and cutlery, crockery, pots and pans were sorted out. Outside jobs included filling the potholes in the drive, building a new platform aimed at protecting the pumps from future floods, putting overhangs on the windows of accommodation units and installing a new bootcleaner.

One of the biggest tasks was getting rid of the huge pile of dead plants and debris from the flood clean-up, which resulted in two impressive bonfires.

Slim pickings

Adrian Riegen, Rob Schuckard and David Melville, spent two days trying to catch Southern New Zealand Dotterels in the sand dunes of Mason Bay Stewart Island in the middle of winter. Conditions were harsh with very strong winds and only two birds were caught. Still that was enough to make it the southernmost cannon netting site on the Flyway. Other strategies for catching them will be investigated.

Birding trivia

The Birding Trivia Quiz held after the potluck dinner produced a highly competitive contest between evenly matched teams - Team New Zealand, Southenders, Millennial Falcons and Pukekos - with the lead changing several times.

Quizmasters Keith Woodley and Jim Eagles asked an eclectic mix of questions ranging from the number of states and territories in the East Asian-Australasian Flyway to the author of the poem To a Skylark, and from the opening line of the great conservation song of the seventies,

Damn the Dam, to the various names of the largest eagle of all time. At the end the Millennial Falcons and the Pukekos were tied for first. The Pukekos (above) were declared the winners because more of them had bought copies of our Shorebird Calendar and, as Jim pointed out, 'Buy our calendars and you're a winner.'

Musical godwits

PMNT has been presented with the proceeds of the world premier of a musical

version of Jenny Patrick's much-loved children's book *The Very Important Godwit*, based on the story of E7. The musical was written by Jenny Patrick with music by Laughton Patrick and performed by the St James Lower Hutt Youth Choir (below).

Conductor Helen Willberg said the performance got a hugely enthusiastic reception. 'We put out a donation box for the Miranda Trust and received \$340, mainly from parents, who found the story very moving. It has an environmental message, a science message, a gender equality message and is altogether wonderful!'

The book is out of print at the moment but Jenny Patrick has given PMNT permission to use it for educational purposes.

New eNewsletter

There's always a huge amount going on at the Shorebird Centre, especially now with all the Arctic migrants arriving, but the magazine only comes out four times a year. So PMNT's new marketing sub-committee has come up with the idea of an email newsletter in between magazines.

The first one, which went out on 13 October, was put together by Ann Buck-



BIRDSONG: Members of St James Lower Hutt Youth Choir sing of godwits.

What's on at the Shorebird Centre

21 November, Community Open Day

9.30am Morning tea and a chance for locals to learn about the Centre.

23-24 November, Wader ID Course

30 November-2 December, Water Colour Techniques Course

With Sandra Morris. Course details from the Centre.

24 February, Special Event

2pm Speaker Wally Johnson, leading authority on Pacific Golden Plover, who is here for our PGP tracking project.

10 March, Farewell to the Birds and launch of the Year of the Wrybill

Speaker Nick Ledgard, of BRaid, which cares for the South Island's braided rivers, breeding ground for many endemic birds including the Wrybill. Performance by two ensembles from the Auckland Philharmonia Orchestra Young Achievers including the world premier of the specially composed *A Flung Scarf of Wrybills*.

Kōtuku joins in holiday programme



COOPERATIVE KŌTUKU: The Mangatangi Whanau Holiday Programme Group visited the Shorebird Centre for a session with new educator Alex Eagles-Tully and was fortunate to have a Kōtuku, which decided to rest on a bridge beside Widgery lake, on which to practice bird-watching skills. As well as running a holiday programme, Alex has been busy up-dating and producing new teaching resources in readiness for a busy term four of school visits. Contacting schools in the greater area has been a priority, especially those that have not been to Pūkoro Miranda before, with the objective of encouraging them to include our shorebird education programme in their planning for 2019. Alex is also developing a programme to have a 2019 Flock in areas that haven't been able to experience it before and is working on ways to use the Pacific Golden Plover Project to share the marvellous stories of our migratory birds with children. She is working with fundraiser Alister Harlow to seek funding to support visits by low decile schools. Photo / Jim Eagles

master with technical help from Chelsea Ralls and Trudy Lane, and editorial assistance from lots of people but particularly husband Ray. It was packed with news and Ann said the aim was for 'all our members, supporters and friends to feel included, know what is happening and to join in.'

There has been immediate support for the idea. Typical comments were:

'This is a great newsletter. It was so informative and enjoyable to read. Well done.' - Pat Taylor

'Well done to everyone involved. It's a really good newsletter, engaging.' - Brigid Glass

'Great newsletter. I particularly like the yellow ducklings among the rest. Also the heap of spoonbills. Must get to Miranda soon.' - Stuart & Alison Chambers

The plan is to build the mailout list - and get more people involved in what the Centre does - by asking members to invite their friends and family to opt in and giving visitors to the Centre or our Facebook page the chance to sign up. The newsletter team wants people to send in photos, drawings or bits of news to enews@shorebirds.org.nz.

Thawing out

If you've ever thought that during winter the Shorebird Centre offers a warm welcome but a cold climate then your concerns have been noted. Two heat pumps have been installed in the Sibson Room and do a great job of making it cosy.

Birding diplomacy

The plan to build on PMNT's work in the Democratic People's Republic of Korea by bringing four representatives of the National Conservation Union of Korea to New Zealand to attend the annual Miranda Field Course looks like going ahead. The East Asian-Australasian Flyway Partnership has granted US\$5000 towards the cost. And Adrian Riegen reported to the recent Council meeting that the NCUK was happy with the proposed itinerary and had asked for an official invitation.

Cycle Trail

The Kopu to Kaiua leg of the Hauraki Cycle Trail is now scheduled to be open next year. Hauraki District Council has obtained funding to repair the Waitakaruru-Pūkoro Miranda section, which was damaged by the 5 January storm, and to build the final Pūkoro Miranda-Kaiua section, which will run past the Shorebird Centre. Part of the work will include replacing the old single-lane bridge over the Pūkoro Miranda Stream.



NEW HOME: A flock of godwits arrives to join the spoonbills at the new Piako River roost.
Photo / Jim Eagles

Spectacular new roost

A Piako River stopbank breached in the huge 5 January sea surge has proved disastrous for a local farmer but provided a spectacular new roost for waders (above).

Because of the breach a significant part of a small dairy farm is now regularly flooded, covered in silt and young mangroves, forcing the farmer to sell his herd.

The area where the cows once grazed is now occupied by birds. In the June census there were 950 Wrybill, 134 Bar-tailed Godwits and 39 Royal Spoonbill. There have also been reported sightings of a Glossy Ibis and Cattle Egrets. During a recent visit only a handful of Wrybill remained but godwit numbers had grown to 800, there were 26 spoonbills preening themselves on the frame of an old barn and lots of ducks, stilts and pukeko.

To reach the site take SH25 towards Thames, a few km after crossing the Piako River turn left into Campbell Rd, turn left at Shelly Beach Rd and a few km down turn right on to the K to K cycleway at the sign for Pipiroa.

Poster Competition

As part of its events to celebrate 2018 as the Year of the Knots - both Great and Red - the EAAFP is running a knot poster competition. It's open to anyone living along the flyway, there are lots of prizes and entries close on 3 January. For further details visit <https://eaaflyway.net/2018-knots-art-competition/>.

Speaking for the birds

'Please keep giving your voice to the birds and other remarkable creatures that inhabit these shores,' Hauraki District



Mayor John Tregidga (at left), who was also chair of the Hauraki Gulf Forum for 11 years, told the annual Welcome to the Birds. 'You need to keep doing this

because the pressure on the Hauraki Gulf is increasing . . . The environmental harm caused by our impact is not acceptable. We must make changes.'

Mayor Tregidga said the stories of our 'remarkable and precious' migratory birds could serve to get across important messages. For instance, the birds remind us 'how connected our planet is - that it's one massive, connected ecosystem.'

'Our borders and societal structures are illogical to our birds. The birds know no borders. They have no passports. They don't know when they're inside the mean high-water mark and therefore in the Hauraki District Council's jurisdiction. They don't pay rates!

'But although these boundaries are not known to these birds, the impact of our borders, our structures, and our activities are significant, and have a huge impact on the birds' habitat. So I urge you to keep telling their stories.'

Recent sightings at Pūkorokoro

ARCTIC MIGRANTS

4970	Bar-tailed Godwit
2500	Red Knot
4	Ruddy Turnstone
44	Pacific Golden Plover
2	Curlew Sandpiper
1	Red-necked Stint
2	Sharp-tailed Sandpiper
1	Pectoral Sandpiper

NEW ZEALAND MIGRANTS

113	Wrybill
12	Banded Dotterel
740	SI Pied Oystercatcher
6	Royal Spoonbill
1	White Heron

LOCALS

150	Black-billed Gull
8	Variable Oystercatcher
130	Caspian Tern
	Australasian Bittern
	Banded Rail
	Australasian Shoveler
	Hybrid Black Stilt
	New Zealand Dotterel
	Pied Stilt
	Spur-winged Plover
7	Grey/Brown Teal



CELEBRATING GODWITS: This season's Bar-tailed Godwits (219 of which can be seen in the background) are welcomed to Devonport and the Shoal and Ngataranga Bay estuaries by (from right) Devonport Druid Chris Mullane, organiser Philip Moll and local kaumatua Danny Watson. Photo / Jim Eagles

IWSG Conference

PMNT took the stage at this year's International Wader Study Group Conference at Workum in the Netherlands. Adrian Riegen and Keith Woodley were both there for a presentation on PMNT's wader survey of the Democratic People's Republic of Korea. The two also did lots of networking which will be useful for future projects.

Devonport welcomes Godwits

Around 200 Bar-tailed Godwits sat on a shellbank in Ngataranga Bay (above) and watched with obvious interest as the people of Devonport gave them a formal welcome.

The ceremony involved an interesting cultural mix with greetings from radio personality and Bayswater kaumatua Danny Watson, Devonport Druid Chris Mullane and local birder and photographer Philip Moll. There was a good turnout from local residents and Philip, who keeps a close eye on waders in Ngataranga Bay and Shoal Bay, reported that 219 arrived in time for the ceremony and predicted the numbers should reach close to 300 over the next few days.

The aim of the welcome is to raise awareness of the godwits and get more protection for the area, which is recognised as a Site of Significant Wildlife Interest, in the face of intensive development plans for the area. As Philip told the gathering, unfortunately more development

will mean a risk of sediment being washed into the estuaries and the likelihood of more watercraft, dogs, cats and people near the high tide roosts.

A particular concern is that the very

shellbank on which the godwits roosted to watch the ceremony has been missed off the Auckland Unitary Plan overlays and locals have asked Auckland Council to give it appropriate status.



A WINNING IDEA: Grace Maglio celebrates with part of The Flock Oz - Broome which has won first prize in in the community section of the local Shinju Matsuri, View to Asia, sculpture competition. For the past three years Grace has been researching the 80,000 migratory birds which assemble annually in Roebuck Bay and she has been looking for ways to tell their stories to locals. Then she attended the 2016 Australasian Wader Studies Group Conference in Auckland. 'I was inspired by a project run by Pukorokoro Miranda Shorebird Centre called Flock NZ, a simple artistic concept encouraging schools and other community groups to make their own flock of shorebird sculptures. I have worked since to bring Flock Oz to our Broome community as Australia's shorebird capital.' The first prize was \$5000 and, Grace says, 'I will be using it to continue to run shorebird community projects here in Broome.'



WORLD FAMOUS: David Lawrie uses a picture of Kaiuia School's Flock to show an EAAFP workshop just how successful The Flock concept can be. Photo / David Lawrie

Flyway workshop shares lessons from The Flock

The lessons learned from the successful Flock NZ project will be spread across the East Asian-Australasian Flyway following a workshop held recently in Manila, Philippines.

PMNT's international liaison representative David Lawrie was one of nine people invited to make presentations on activities which might inspire a project to be adopted by the entire Flyway in the coming year.

David was the first speaker and in his 15-minute slot he particularly focussed on The Flock's easy portability and low cost as well as its ability to involve children and its suitability for a wide range of outcomes.

Other presentations came from:

- Peel-Harvey Ramsar Site, just south of Perth in Australia, which has produced and implemented a highly successful action plan with a wide range of excellent publicity material.

- Daursky National Reserve in Russia which is running a programme to reduce the electrocution of birds – including many endangered migratory raptors – on power lines.

- Hong Kong Bird Watching Society which produced an excellent animated video promoting the preservation of Spoon-billed Sandpipers by collating 1200 paintings prepared by children.

- Japan Wildbird Society has established a green holiday programme which allows young people to volunteer to do practical conservation work, such as clearing weeds from a wetland, with the

society.

- Sungei Buloh Wetland Reserve in Singapore has developed a sister wetland programme, so far involving four other wetlands spread across South East Asia, which allows collaboration, cross-learning and sharing of good practices between centres.

- The US Bureau of Land Management in Alaska worked with native people to create a plan for an area managed by the Bureau but used by local people aimed at protecting traditional values and uses while at the same time preserving it as an important flyway site.

- The Philippines Society for the Conservation of Wetlands trained rice farmers at the Candaba Wetlands as birdwatching guides. The aim is to show the farmers that migratory birds are not a threat to their crops and to give them an additional source of income.

- The Biodiversity and Nature Conservation Association in Myanmar gave a presentation on a successful programme to retrain bird catchers in the Gulf of Mottama into other occupations to protect the Spoon-billed Sandpiper.

- The final presentation came from the Muraviovka Park in Russia, a very important breeding area for cranes but also a number of passerines, where since 2011 a banding and tracking programme has enabled researchers to determine the wintering grounds and change in population of the Yellow-breasted Bunting which is in very steep decline.

Other participants in the workshop

were Lew Young, the chief executive of the EAAFP and the chair of the CEPA Working Group Sandra Hails, Kim Jon Ok and Kim Ji Hyang from the Democratic People's Republic of Korea, Bernhard Seliger from the Hanns Seidel Foundation based in Seoul, Jay Lee the executive director of the National Geographic Foundation for the Asian region and Suh Seung Oh the executive director of the Ramsar Regional Office in East Asia.

The second day of the workshop involved group discussions to arrive at a suitable project for the whole of the Flyway for the coming year. David said 'the suggestions were many and varied and these will be worked on to produce a suggestion to go to the meeting of partners in December for adoption.'

There was also room on the programme for visits to the Las Pinas-Paranaque Wetland Park which is a Ramsar site located on the shores of Manila Bay near the international airport; the Candaba Wetlands to see the habitat being protected by local farmers; and up Mt Arayat to check out some high altitude forest where, once again, farmers are being encouraged to train as guides and to integrate their farming operation into regenerating the native forest.

David said the workshop was extremely interesting but also served to underline that PMNT 'is one of the key organisations in the Flyway and the work undertaken by our volunteers is world class.' 



INTERNATIONAL TEAM: (from left) Researchers Wally Johnson and Diane Smith from Montana State University, Mike Weber, associate professor of physics, Roger Goodwill, professor emeritus of biology, (opposite page) Dave Bybee, assistant professor of biology, and biology students Errika Smith and Emma Houghton, all from Brigham Young University - Hawaii.

All set to track our Pacific Golden Plovers

With Pacific Golden Plovers once again in residence at the Robert Findlay Wildlife Reserve, PMNT has raised enough money to buy 10 tiny satellite tags and assembled an expert team to fit them, so we can find out more about these mysterious visitors, reports **Jim Eagles**.

All the pieces are now fitting nicely together for PMNT's Pacific Golden Plover Project to find out where these beautiful birds that visit us from the Arctic each summer come from, what route they follow on their 27,000km migratory roundtrip and, ultimately, why their numbers are declining.

- Funding is in place to buy 10 satellite tags. We have received grants of \$5000 from the Ron and Edna Greenwood Environmental Trust, \$5000 from the Mazda Foundation and \$4600 from Birds NZ's Project Assistance Fund. Members of PMNT, most notably John C Black and Jeanne Kleyn from Washington State, USA, have given a total of \$7500. Further applications for grants are in the pipeline but, in the meantime, other members and Brigham Young University – Hawaii have provided guarantees of sufficient funding to cover the \$25,000 cost if required.

- The order to buy the satellite tags was placed with Sirtrack earlier this month. In January they will be delivered to Lee Tibbits of the US Geological Survey in Alaska to be programmed. Lee, who tracked our star Bar-tailed Godwit E7 on her famous flight from Alaska to the Firth of Thames in 2007, will also be tracking the Pacific Golden Plovers for us. Once she has set them up they will be forwarded to New Zealand.

- The necessary ethics and wildlife per-

mits to catch PGP's and fit 10 with satellite tags are on track. Massey University's Animal Ethics Committee has given approval in principal subject to tidying up some details. The Department of Conservation's permissions team is currently processing the application for a wildlife permit.

- A team of volunteers has already started observing the PGP's which have arrived at the Findlay Reserve – 44 at last count – to record their movements and particularly where they roost so we know where best to catch them. This monitoring, which is being coordinated by JoJo Doyle, will be stepped up as the time to fit the trackers gets closer.

- The leading authority on PGP's, Wally Johnson from Montana State University and his assistant, plus his team of five scientists and students from Brigham



COMFORTABLE: A Pacific Golden Plover fitted with a satellite tag.

Photo / Wally Johnson

Young University – Hawaii, who have caught dozens of PGP's in many parts of the Pacific and fitted them with satellite tags, will join us at the Shorebird Centre 17-26 February next year to catch, band and tag the birds. They'll be working with our own team of expert netters and banders led by Adrian Riegen and including Gillian Vaughan and Tony Habraken plus associate professor Phil Battley from Massey University.

- PMNT's new marketing committee, led by Trudy Lane, is working on a plan to use the project to publicise the story of the Pacific Golden Plovers, the wider threat to all migratory birds and the work the Trust does in this area. We have already set up a PGP Project webpage, which can be reached through the Pūkorokoro Miranda Shorebird Centre website, containing information about the birds. Once information starts being received from the trackers it will be reported on this page so anyone interested can share the thrill of discovery.

- Educator Alex-Eagles Tully is also intending to use the appeal of the project in her school programme and is encouraging children to follow the birds' progress across the Pacific. Alex has designed a cut out Pacific Golden Plover which can be made by children – or anyone interested – to help celebrate the project. You can find it on pages 10-11 of this issue. 



Follow-up indicates PGP's cope well with wearing tags

Just how well Pacific Golden Plovers cope with carrying a GPS PinPoint after being tagged in Alaska is illustrated in a new report to the Alaska Shorebird Group by Wally Johnson and his team.

In 2017 the team attached satellite trackers to eight male and three female Pacific Golden Plovers at their nests near Nome in Alaska, using the same GPS Pin-Point and harness combination as will be used on the birds in New Zealand.

Five birds were successfully tracked to wintering grounds at Midway Atoll, northwest Hawaiian Islands; Mili Atoll, Marshall Islands; Maiana Atoll, Kiribati; New Britain Island, Papua New Guinea; and Woolley Lagoon, Queensland. Signals from one other bird revealed a partial southward track before the tag's battery apparently failed. None of the other five birds were heard from after release.

In 2018, the team returned to Nome to try to recapture some of the tagged birds to see how they had been affected by the need to carry a harness and backpack.

As expected, no females were found, because females have low site-fidelity on nesting grounds; but four of the eight males were recaptured, all in the same breeding territories they occupied in 2017.

'Each bird was still wearing the GPS tag that had been attached a year earlier, each was incubating a clutch of eggs, and each displayed normal behaviours associated with nesting and foraging,' the report says. 'All were recaptured and released after removal of GPS tags.'

The four recaptured males were the partial track bird, the Mili Atoll bird, the New Britain Island bird, and the Queensland bird. Other tagged birds could have been missed 'because some searches were hampered by strong winds, and we were unable to find a banded male (possibly one which had lost its tag) that had been reported to us.'

The researchers were delighted to find that after a year of wearing the harness 'there was no apparent damage to feathering (except for slight disarray) or skin. Body weights were almost exactly the same as those recorded when the birds were initially captured. . . Clearly,' the report concludes, 'Pacific Golden-Plovers are capable of carrying GPS tags roundtrip on long transpacific flights between Alaska and distant wintering grounds.'

Where will the birds go?



As the map above indicates, there are plenty of possibilities for where any Pacific Golden Plovers tagged in New Zealand may go.

The most likely option is that they will head northwest and, like birds from several other Pacific Islands, have a stopover in Japan or somewhere nearby.

From there they may, like birds from Samoa, Fiji or Moorea, head for Alaska. But, possibly, as with birds from Saipan or northern Australia, they may go to Siberia.

Other PGP's which have been tracked have flown south by a direct route so, if the batteries last long enough, that's probably what we will see. But, since New Zealand is at the extreme edge of their range, it is conceivable that they may return here via somewhere like Hawaii which is an important centre for PGP's.

GODWIT TIMES

Kia ora e hoa

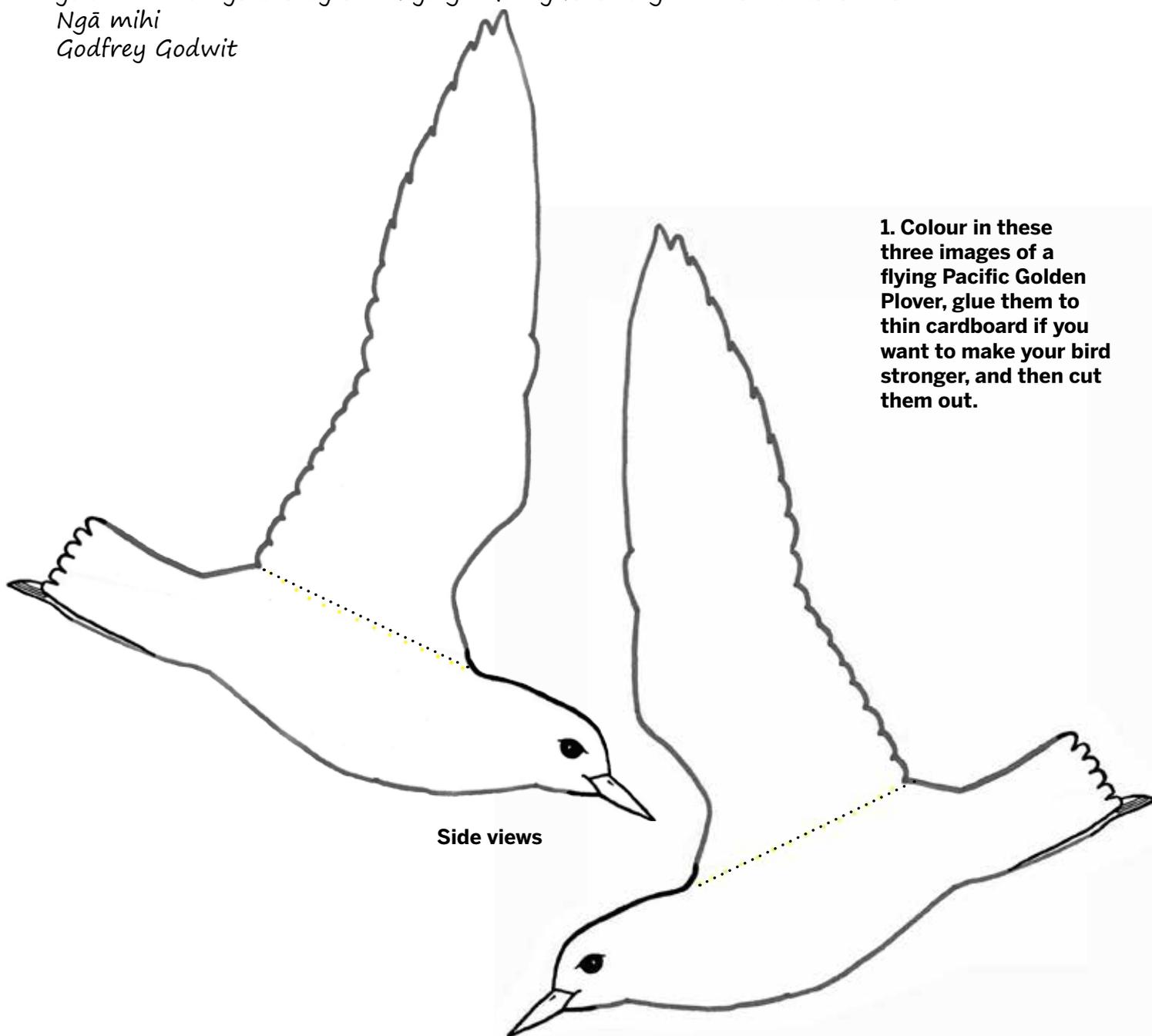
As well as the thousands of Bar-tailed Godwits and Red Knots at Pūkorokoro Miranda at the moment there is also a flock of beautiful Pacific Golden Plover (PGP) which Maori call Kuriri.

Where these PGP come from and where they go nobody knows! So next year experts are going to put satellite tracking tags on 10 of them and follow their journey as they fly from New Zealand to their nesting place in Siberia or Alaska (probably stopping for a rest in Japan or maybe Hawaii).

You can follow the progress of the tagged birds by clicking on the link found on the Pūkorokoro Miranda Shorebird Centre homepage at shorebirds.org.nz. And in the meantime you can make your very own flying PGP by following the instructions below.

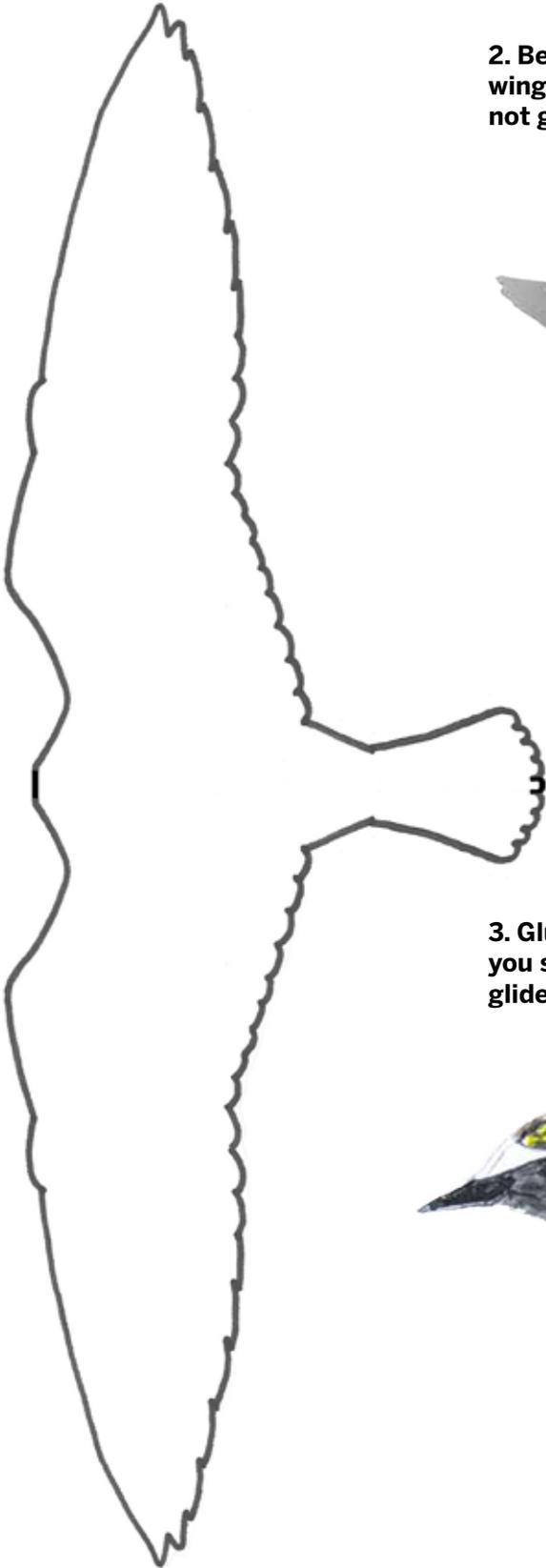
Ngā mihi

Godfrey Godwit



1. Colour in these three images of a flying Pacific Golden Plover, glue them to thin cardboard if you want to make your bird stronger, and then cut them out.

Top view



2. Bend the two side view images along the dotted line so that the wings fold outwards. Glue the two body outlines together but do not glue the folded wings above the dotted lines.



3. Glue the top view image of the bird to the folded out wings and you should have a bird like the one below which you can fly like a glider or hang from the ceiling on a piece of cotton or string.



4. Send the editor a photo of your completed bird and you could win a prize.



RIDING THE WIND: Bar-tailed Godwits skimming the surface of the ocean.

Photo / Phil Battley

How do godwits read the wind?

The more we find out about the Bar-tailed Godwits the more amazing they seem, writes **Jim Eagles**. Not only is their non-stop journey from Alaska to New Zealand the longest recorded flight by any bird. Scientists have also found that they time the departures of their migratory flights to get maximum wind assistance, adjust course in mid-journey to make the best of changing weather conditions, and are able to navigate across the world.

Late last August the Shorebird Centre got a message that weather forecasts for the Yukon-Kuskokwim Delta in Alaska were predicting a change to winds favourable to migrating birds. Sure enough, 8-9 days later the first Bar-tailed Godwits of the season arrived at Pūkorokoro Miranda.

Because it happens like clockwork every year it is easy to take this feat for granted. But the more we learn about the godwits' annual 12,000km non-stop flight from Alaska to New Zealand, not to mention the 17,000km flight home via the Yellow Sea, the more remarkable it becomes.

Can these birds really forecast winds out of Alaska as accurately as the US Government's meteorologists? Is the speed with which they travel due to an ability to predict weather patterns during their flights and change course to take advantage of them? And how do they manage to navigate so accurately across the vast Pacific Ocean.

The best answers to those questions so far come from a paper entitled Hemispheric-scale wind selection facilitates Bar-tailed Godwit circum-migration of the Pacific, published online by the *Journal of Animal Behaviour*, and



RESEARCHER: Bob Gill and friends.

produced by a team led by Bob Gill, emeritus scientist at the Alaska Science Centre of the US Geological Service.

Gill is well-known to us as the biologist who fitted E7 with a satellite transmitter and confirmed his theory – rejected by most of his colleagues – that godwits flew non-stop from Alaska to New Zealand. But as a student his passion was meteorology and, until one of his university professors persuaded him that his future lay in biology, he wanted to make study of weather his life's work.

That made him the ideal person to lead an investigation into how birds like E7 use the wind to make those extraordinary flights.

Just how remarkable those flights are was underlined by the introduction to their paper which pointed out: 'The annual 29,000km long migration of the Bar-tailed Godwit (*Limosa lapponica baueri*) around the Pacific Ocean traverses what is arguably the most complex and seasonally structured atmospheric setting on Earth.

Faced with marked variation in wind regimes and storm conditions across oceanic migration corridors, individuals must make critical decisions about when and where to fly during nonstop flights of a week's duration or longer.

At a minimum, their decisions will affect wind profitability and thus reduce energetic costs of migration. In the extreme, poor decisions or unpredictable weather events will risk survival.'

For the study the scientists fitted a total of 24 Bar-tailed Godwits with transmitters and tracked the three legs of the annual round trip between nonbreeding grounds in New Zealand and breeding grounds in Alaska.

They also used the global meteorological network to record weather patterns a week either side of the flights and analysed the Air to Ground Ratios (AGR) – which reflect the degree to which winds either assisted or impeded the flight trajectories - to measure the birds' flight efficiency.

The conclusion was unequivocal: 'Birds selected departure dates when atmospheric conditions conferred the greatest wind assistance both at departure and throughout their flights. This behaviour suggests that there exists a cognitive mechanism, heretofore unknown among migratory birds, that allows godwits to assess changes in weather conditions that are linked across widely separated atmospheric regions.

'Godwits also showed adaptive flexibility in their response not only to cues related to seasonal changes in macrometeorology, such as spatial shifting of storm tracks and the formation of cyclones, but also to cues associated with unpredictable events, especially at departure sites.'

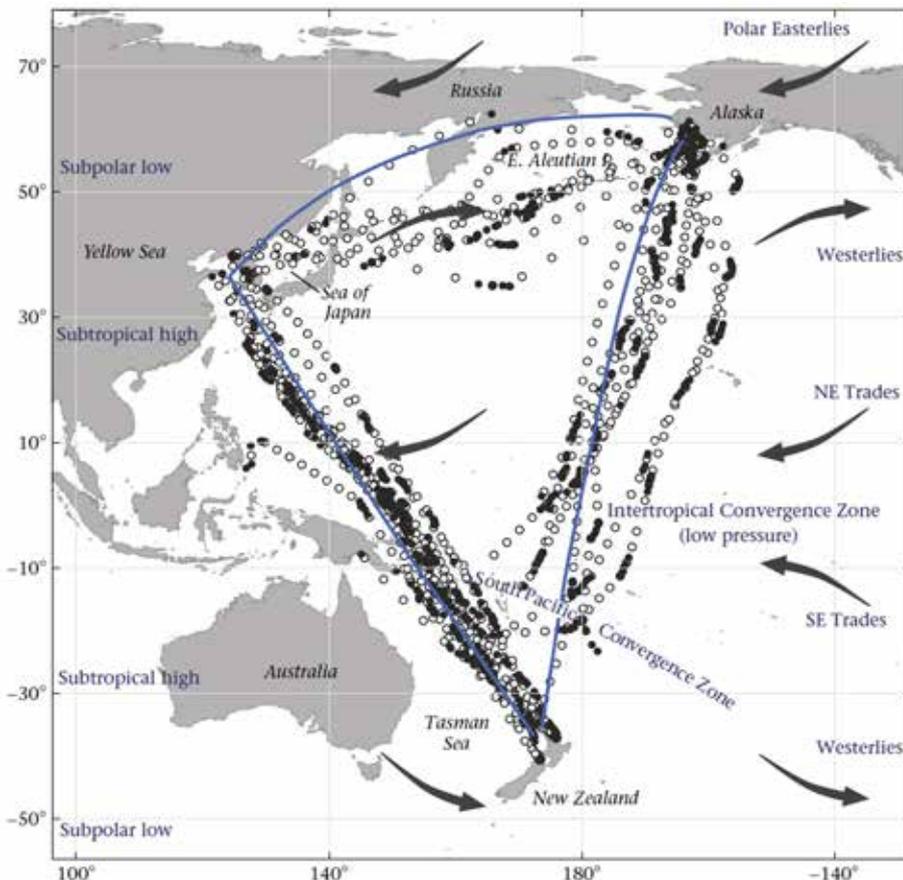
In addition, the researchers noted that making the most of the winds would depend significantly upon altitude and they hypothesized that godwits also varied the height they flew to optimise wind assistance. But they were unable to test this because their transmitters did not show altitude.

Analysing the three legs of the birds' annual journey, the paper noted that the northward migration between New Zealand and the major staging areas in the Yellow Sea was very direct, involving a great-circle flight of about 10,000km. The 10 birds the scientists were able to track departed New Zealand on 13 different days between mid-March and early April.

A comparison of AGR during the 15-day window studied showed that 'birds would have received the greatest wind assistance throughout the air column on the actual departure dates and up to 4 days after departure.' A comparison of AGR along the entire flight track also revealed that the birds consistently chose the most favourable departure dates for the whole journey.

Discussing these findings, the authors note that for birds on this leg winds during the departure period were generally benign and selectivity was not critical, 'yet birds still chose the best day, or the start of a series of good days, on which to depart.'

In the process the study corroborated the findings of Massey University scientist Phil Battley and his American colleague



FLIGHT PATHS; Migration tracks of Bar-tailed Godwits obtained by satellite telemetry (black filled circles) and interpolated to 6 hour intervals (open circles). Zones of global high and low pressure are shown on the left and wind zones on the right. Thin blue lines depict great-circle routes.

Jesse Conklin who reported in their 2011 paper that some birds did alter individual migration schedules (ie leaving earlier or later than their usual recorded dates) to maximize initial wind assistance from their study site on the Manawatu Estuary.

After reaching the Yellow Sea, the godwits refuelled on intertidal habitats for 5-7 weeks before they departed for their breeding grounds in Alaska in May. Nine marked birds departed the Yellow Sea on 8 different days between early May and early June. Once again, a comparison of AGR along the flight track showed the departure dates chosen by the birds would have achieved the maximum wind assistance.

On this leg the choice of departure date was more important because the Yellow and Japan Seas are in a region noted for the formation of storms that provide elements of variability and unpredictability. All but one bird selected departure dates offering significant wind assistance and they attained this by departing on the first day following a marked change in winds that produced favourable AGR.

The third leg, the autumn migration from Alaska to New Zealand and Eastern

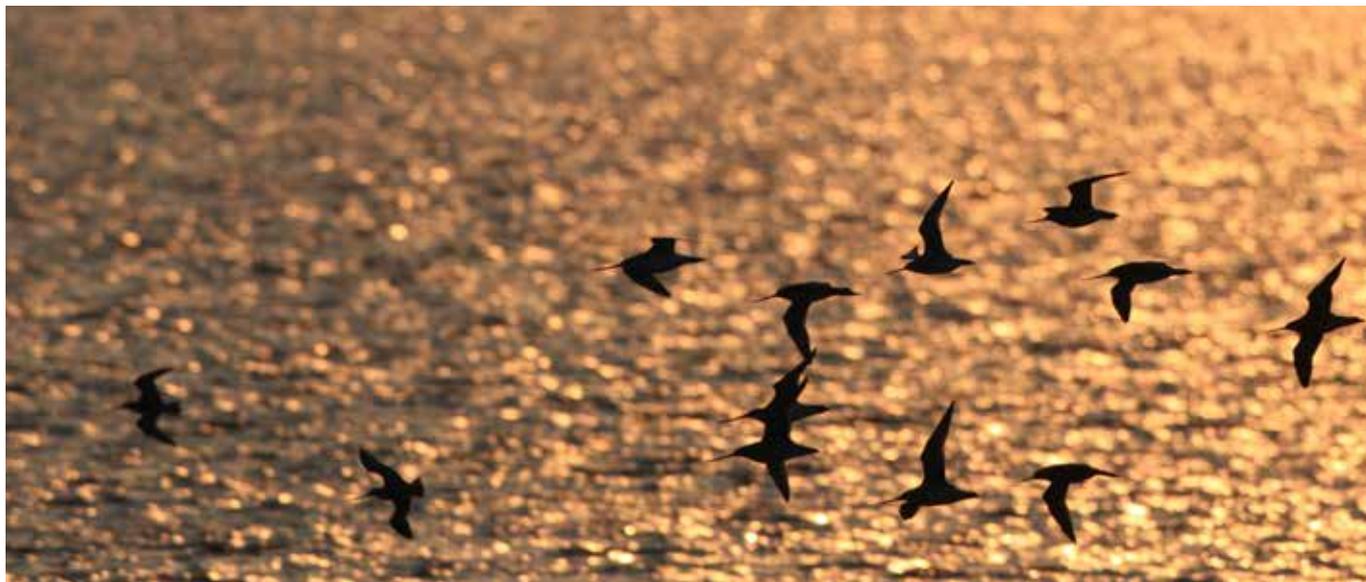
Australia, required the longest of the three nonstop journeys, involving largely direct southward flights across the central Pacific. Ten birds were tracked following departure on 10 different days between late August and early October.

Departure conditions on this leg differed markedly from those of the two other legs because there was generally only a relatively narrow 48 hour window with weak to moderate wind assistance bounded on either side by periods of strong wind resistance.

Nevertheless, 9 of the 10 birds either selected the optimal departure date within the surrounding 2-week period or left within 1-2 days of the optimal date and at the start of a narrow window of stable or improving wind conditions. The 10th individual left the day after the optimum departure date but in the face of a week of worsening conditions.

'Our results,' the scientists concluded, 'suggest that birds have evolved a sensory mechanism to assess departure conditions as storms repeatedly form and pass through these regions.'

'At departure sites, godwits are likely well situated to predict the position, proximity and quality of developing or



FLYING NON-STOP: Godwits heading into the sunset.

Photo / Phil Battley

transiting cyclones.

‘We believe the most likely cue signalling a departure window at such sites is a change in barometric pressure and an associated change in wind direction as cyclones form near or pass by departure sites. There is mounting evidence that baroreception is highly refined in most birds.’ (See sidebar below.)

But, as well as being able to pick the best departure dates for the flights, the study also found that godwits were able to change direction ‘to maximize wind

profitability and hence minimize the cost of transport.’

The tracking data revealed two segments of the flights where birds deviated from otherwise mostly great-circle routes, both associated with the North Pacific storm track.

The first saw most of the birds en route from the Yellow Sea to Alaska changing course far south of a direct route to align with the principal storm tracks in the North Pacific.

As a result ‘birds received significant

wind assistance throughout most of the flight by flying in association with the southern periphery of rapidly moving west-to-east cyclones. At both the Sea of Japan and south of the Aleutian Islands, where systems often deepen and wind speeds increase, we found the track speed of birds increased by about 25%.’

The second example of lateral deviation along a flight corridor involved birds shortly after departing Alaska for New Zealand. Flying southward across the North Pacific required them to cross the zone of Westerlies where they sometimes encountered significant wind resistance.

‘Faced with prevailing southwest winds, godwits chose to drift east of a direct route and then, when they were farther south and into the southeast-flowing Trade Winds, they reoriented towards New Zealand and compensated their earlier drift under conditions of wind assistance. Thus, this regular course deviation reflects consistent behavioural choice in orientation to capitalize on wind drift through predictable alternating zones of winds.’

Favourable conditions at departure did not always translate into predictable winds. For example, godwit E8 departed the Yellow Sea under very favourable conditions but was overtaken by a cyclone that rapidly deepened when it merged with a resurging extratropical typhoon.

‘Although E8 eventually reached Alaska she did not breed,’ the scientists said, ‘likely because after fighting prolonged headwinds she arrived on the breeding grounds having depleted not only the nutrient stores carried for arrival and reproduction but also the “last resort” reserves.’

Such cases, the study noted, showed

Birds with built-in barometers

The ability of Bar-tailed Godwits to choose departure times for their flights that give them optimum wind assistance clearly indicates that they are excellent meteorologists. But how do they do it?

A study at the Advanced Facility for Avian Research, at the Western University in Ontario, Canada, reported in *Animal Behaviour*, has shown that birds can predict changes in the weather by reading the rise and fall of barometric pressure.

For the study researchers used the pressure chamber of a hypobaric climatic wind tunnel to test the responses of migratory white-throated sparrows (*Zonotrichia albicollis*) to experimental changes in air pressure alone, or air pressure and temperature in combination.

‘For the wintering condition, we would start very early in the morning, before the lights come on, and simulate a storm,’ explains team leader Chris Guglielmo. ‘Normally, when a bird wakes up, it preens its feathers and hops around a bit before fueling up for the day.’

In this study, we dropped the pressure, just before simulated dawn, and as soon as the lights came on, the birds immediately started eating. Similarly, when we simulated high pressure and cold weather associated with winds out of the north in the spring, the birds decreased their nocturnal migratory flight behaviour.’

In other words, according to AFAR acting-director Scott MacDougall-Shackleton, ‘We have now clearly demonstrated that birds, both when wintering and migrating, have their own internal barometer, which helps them make decisions about everything from flight to feeding.’

‘This has been hypothesized for a long time, and there is a large body of evidence that animals in the wild behave differently when weather changes, but we now have an experimental demonstration where we held everything else constant except for barometric pressure proving definitively this long-held belief.’ 



DEPARTURE TIME: Godwits know the best time to begin their migratory flights.

Photo / Phil Battley

that birds facing difficult conditions were able to change course and instead drift with the prevailing winds, demonstrating ‘the flexibility in reaction to wind that many authors have proffered as necessary in order for individuals to take advantage of [changing] atmospheric conditions.’

In conclusion, the scientists said their study had provided evidence that ‘birds are able to assess both the predictability and variability of atmospheric conditions, particularly wind.

‘Indeed, the days on which godwits departed the three staging sites conferred the greatest overall wind assistance not only immediately after departure but also throughout their long-distance flights, suggesting a level of behavioural cognition related to atmospheric teleconnections heretofore unknown among migratory birds.’

In addition, the results provided ‘new insights into the highly adaptive orientation performance of extreme endurance migratory birds, which likely involves some form of position-fixing mechanism that may allow birds to avail of winds and compensate for wind drift.’

Bob Gill’s team acknowledged it was still unknown what mechanisms godwits used for orientation. But they did note that it had recently been shown that the geomagnetic bicoordinate map used elsewhere was not present over most of the Pacific Basin and so was unlikely to be the mechanism by which the godwits navigated.

Instead, it was suggested there should be further study of the theory that ‘prevailing winds and oceanwaves may create cues in the form of an infrasonic map’ which the birds used to find their way. (See sidebar at right.)

Navigating with a sound map

Tracking of migratory flights by Bar-tailed Godwits shows that they often depart from the shortest route to their destination in order to maximise wind-assistance. But how are they able later to get back on course?

Over the years there has been considerable debate over whether birds navigate by detecting the earth’s magnetic field, following scents, or using infrasound – the ultralow frequency sounds generated by deep ocean wave patterns – to know where they are.

Now experimental work by California-based US Geological Survey geophysicist Jonathan Hagstrom has given a clearer picture of the importance of infrasound to notable navigators like homing pigeons (*Columba livia domestica*).

Hagstrom became interested in the topic after reading about a trans-Atlantic pigeon race being disrupted when the sonic boom from a Concord aircraft confused the birds. He was further intrigued by a lecture on how homing pigeons in a Cornell University study got lost when released from a particular site.

It could be, he thought, that the pigeons were navigating by infrasound – ‘They’re using sound to image the terrain surrounding their loft. It’s like us visually recognizing our house using our eyes.’ – but getting lost when something disrupted the sound waves.

Infrasound consists of long, slow sound waves which move across vast distances. Although humans can’t hear them, birds and other animals can.

Hagstrom was aware that when sound moves through the atmosphere, the waves get bounced upward by steep-sided terrain and bent downward by wind and cold air, so he theorised that topography and prevailing weather conditions give places a sound signature that animals can use to work out where they are.

Cornell’s pigeon study involved birds being released from three sites near their home, but for some reason they got lost every time they were released from one of them, except on one day when they all returned.

To see what was going on, he modelled atmospheric infrasound around the three release sites. The programme factored in the effects of terrain and atmospheric conditions to create three-dimensional diagrams of sound waves bouncing through the atmosphere and back to the ground.

The analysis, published in *The Journal of Experimental Biology*, showed that the topography around the problem release site interfered with the infrasound waves. ‘It was a bad spot for Cornell birds,’ Hagstrom says. ‘The geometry of the area conspired to create a sound shadow.’ On the one day the birds made it home, there was a temperature inversion that bounced sound back to the release site, allowing the pigeons to navigate.

That research seems to indicate that infrasound is the primary navigational device used by homing pigeons and it may well also play an important role in helping godwits navigate.



KAITIAKI: Gillian Vaughan and Keith Woodley at Wharekawa Marae with Tipa Compain from Ngāti Whanaunga and Morehu Wilson from Ngāti Paoa. Photo / Jim Eagles

Changing its name and spreading its wings

Looking back on his 25 years as manager of the Pūkorokoro Miranda Naturalists' Trust, **Keith Woodley** reflects on how the organisation has widened its focus, taken its place on the international stage and changed its name to reflect its strengthening relationship with tangata whenua.

In issue 89 of our magazine I reflected on my 20 years as Shorebird Centre manager. Now that this has extended to a quarter of a century, an update for the last few years seems appropriate.

The most visible change is to our name. Incorporating Pūkorokoro was a response to us becoming aware of a long standing grievance of Ngati Paoa. Once briefed on the issue the Trust council was fully supportive of amending our constitution, subject to approval at a general meeting. That the motion was passed unanimously at that meeting was an excellent outcome. Pronouncing Pūkorokoro can be initially daunting for many non-speakers of te reo, but the name is now firmly established as part of who we are. For me, the outcome of the general meeting reflected the growing bi-cultural maturity in this country. Of course it was the second significant change to our identity during my tenure. In response to the evident confusion among many people over the meaning of Miranda *Naturalists'* Trust centre we evolved in the late 1990s to become the Miranda Shorebird Centre, at which point such confusion seemed to dissolve.

The public profile of PMNT gradu-

ally grew during my early years but has since risen sharply. As visitor numbers steadily increased, ongoing science research contributed more detail to the stories we could tell. But two interlinked developments can each be credited with an exponential spurt in public awareness and interest, so that our profile is now at an unprecedented level. The first was a female godwit known as E7, the gift that has kept on giving. The stellar tale of that individual bird, along with all the others of her kind, continues to resonate. It is directly linked to the second, our growing



TRAILBLAZER: E7 living in retirement at Maketu. Photo / Paul Gibson

engagement with the flyway culminating in our work in the Democratic People's Republic of Korea (DPRK). The TVNZ *Sunday* programme on that work, which screened in May this year, produced a massive response which also continues to resonate within New Zealand and abroad. It was, for example, a subject of much interest and discussion at the recent International Wader Study Group conference in the Netherlands. These are things that the Trust and all its members and supporters can be justly proud of.

But that exposure for PMNT came in the wake of important developments several years earlier. The Trust's engagement with the flyway dates from the early 1990s, but an exponential growth in that connection has occurred since 2011. That was when the New Zealand government finally joined the Flyway Partnership, with DOC designated as the official agency. With that came the appointment of Bruce McKinlay as Flyway Officer, a role in which he has been most effective. For us, this development essentially meant a step-change, in that we now had access to more senior levels of government. Tangible results were not long in coming.

In 2014 our report based on ten



BREAKTHROUGH: (left) David Lawrie signs an agreement with DPRK conservationists; (right) Keith Woodley tells Chinese Ambassador Wang Lutong about the plight of the Red Knot.
Photos / Adrian Riegen, Jim Eagles

years of count data which documented Yalu Jiang as the most important staging site in the entire flyway was launched at Dandong. That we had New Zealand's Ambassador to China Carl Worker along to launch it raised the event to a level we could not have dreamed of back in 2004. Following this came visits by his successor, John McKinnon, to the Red Knot staging site on Luannan Coast as well as Yalu Jiang. Such visits by our senior diplomats meant an elevated level of engagement with Chinese officials, all of which has helped raise awareness of shorebirds.

Perhaps an even more significant example was the visit to Pūkoro Miranda in 2015, of Wang Lutong, Ambassador of China. This in itself was remarkable but even more so was a second visit six months later, specifically in response to issues we raised with him concerning that Red Knot staging site in Bohai Bay. Helpfully, this site was in Mr Wang's home province of Hebei which sparked his interest. The culmination of this came in March 2016 with the signing of an agreement between New Zealand and China to work towards protecting key shorebird sites in China. The signing ceremony held outside the centre that day was deeply satisfying for PMNT.

We also had direct government assistance in building our relationship with the DPRK. As the TVNZ programme outlined, an approach to then Foreign Minister Winston Peters resulted in him

talking with the DPRK authorities and led to an initial visit to Mundok Reserve by three PMNT members in 2009. For various reasons no follow up visits to look at other sites were possible at the time. But in 2014 two DOC staff, including the Flyway Officer, accompanied us to Pyongyang where an agreement with Nature Conservation Union of Korea was signed and our survey of shorebirds on the DPRK's Yellow Sea coastline was able to commence. Cumulatively this heightened exposure underlines a key role the Trust now has: advocacy was implied in the original aims of the Trust, but now it is specifically front and centre.

I am not sure many of the early founders and supporters of the Trust would have considered themselves conservationists in the sense we now understand that term. If

the Trust had been founded today it could not avoid being just that. Anywhere you look within the world of shorebirds there are sombre trends, with declining populations in response to widespread loss of habitat, and persistent degradation of much that remains. Working on my book, *Shorebirds of New Zealand: Sharing the Margins*, brought home to me just how diverse these shorebirds are, occupying spaces everywhere from a coastal strip to an alpine valley, and linking habitats throughout the Asia Pacific region and the Arctic. Collectively the annual cycles of our shorebirds leave virtually no part of the country out of the equation. No less diverse are the stressors impacting many of those habitats. Of course the big ticket item in this scenario is the Yellow Sea region, where critical stopover habitat



BIRDING DIPLOMACY: The PMNT and TVNZ teams in the heart of North Korea.
Photo / Sunday programme



STEPS FORWARD: (left) China’s Vice Minister for the Environment Chen Fengxue and DOC’s director-general Lou Sanson sign an agreement to protect shorebird habitat; (right) Paul Graves from Fonterra, David Speirs from DOC and Hauraki Mayor John Tregidga try out the new walkway to the hides funded by the Living Water partnership.

has been lost or damaged on a massive scale. But it applies no less closer to home, where the current health of the Firth of Thames is cause for concern, as are the much degraded river systems of the eastern South Island.

Revenue from our daily operations and membership base generally cover running expenses of the Centre and publication of *PM News*. But over and above that we are, like any other community group, heavily dependent on outside sources of funding. One such source is Living Water, the DOC/Fonterra partnership established as an initiative to mitigate the impacts of dairying by restoring and enhancing wetland habitats. Our relationship with Living Water has been very beneficial: the walkway from the carpark, our much-used spotting scopes, contributions to our work in East Asia are all hugely important to us. Yet questions have been raised about this relationship, especially given the impacts of intensive dairying on shorebird habitats. They are valid questions. Council has thought very carefully about this, aware there could be perceptions that we are somehow compromised by this connection. I have also thought carefully about it. But I must say I have never at any time felt constrained in what I say publicly about any issues impacting shorebirds. During countless talks I have given I have not avoided mentioning the excess sediments and nutrients pouring into the firth off the Hauraki Plains, nor the mas-

sive damage to river and aquifer systems in Canterbury and the Mackenzie Basin, breeding strongholds of Wrybill and Black Stilt and other shorebird species. We are now clearly established as advocates for shorebirds and their habitats. It is what we do, and must continue doing.

Meanwhile, the Shorebird Centre over the last five years has become even busier. Visitor numbers, including significant numbers of return visitors, continue to grow. Our increased profile, and the arrival of the Hauraki Cycle Trail past our door, will likely maintain this trend. The operation I remember as sole manager back in the 1990s is now quite transformed. A succession of assistants – Jenni Hensley, Maria Staples-Page, Louisa Chase, Kristelle Wi, Caitlin Speedy and now Chelsea Ralls – have all made significant contributions to managing our



MĀTĀTĀ: Fernbirds may return to Pūkoro. Photo / Oscar Thomas

daily operations, in particular the shop and its stock lines and, more recently, keeping up with communications technology that is also now a pivotal part of the operation. The roll call above illustrates a further enormous development: staffing no longer consists entirely of the centre manager. Centre Assistant, Shore Guide, Educator – each role in its own way has become indispensable to the centre’s operation. Job advertisements, assessing CVs, job interviews, financial and contractual paperwork – all were quite unknown in the role of the centre manager in the early years.

Another recent and potentially massive development for us is our role as landowners and neighbours. Actively managing habitat is something very new for PMNT. Of course we have been doing it on a minor scale for some time: weeding around the hides and out on the shell bank, or clearing mangrove seedlings from the bay in front of the hides are examples. But purchase of the Findlay Reserve represents a major step change. Developing a management plan, dealing with drainage issues around the Stilt Ponds, investigating restoration and enhancement options, and ongoing management – these are all new and exciting opportunities. Running in parallel with this is our partnership with DOC to restore and revegetate much of the coastal strip opposite the centre. After years of grazing this highly modified strip retains



THE FLOCK: (left) Ann and Ray Buckmaster set out the fledgling Flock in the Centre grounds; (right) then Prime Minister John Key and Conservation Minister Maggie Barry show off the birds they painted for The Flock watched by Jim Eagles and Adrian Riegen. Photos / Jim Eagles

massive potential for restoration and enhancement as wildlife habitat. We see successful re-establishment of Fernbird on the Pūkorokoro Miranda coast as the key aspiration of this 5-10 year project. We also see these projects as tangible opportunities for working in partnership with Ngāti Paoa and Ngāti Whanaunga.

However in planning these long term projects we must acknowledge the presence of an elephant in the room. Indeed, in a sense a herd of pachyderms manifested themselves on January 5. The weather system and tidal surge that brought the Firth of Thames to our front doorstep is almost certainly not going to remain a one off event. The initial impacts of climate change and sea level rise are now increasingly evident all around the world, and the Pūkorokoro Miranda coast is clearly vulnerable. How prepared are we for the predicted effects of Climate Change? Certainly any work we do on the coastal strip has to be informed by what the coast may look like in 10, 20 or 50 years time. We also need to consider what may need to be done to ensure the Shorebird Centre remains viable in its current location.

Over the last five years a pattern has emerged involving specific projects that directly advance the Trust's objectives while also raising our profile. In most cases one or two individuals are the driving forces behind each of them. A fine example of this was The Flock. The idea was brought to us by Ray and Ann Buckmaster

who also led this astonishingly successful project. As a way of both raising awareness of shorebirds and directly engaging with people of all ages who would otherwise be outside our orbit, it worked brilliantly. Running in conjunction with The Flock was our 40th anniversary in 2015 which we designated Year of the Godwit. This was capped off later in the year with a win for Bar-tailed Godwit in Forest & Bird's annual Bird of the Year poll. We have decided to follow this by making 2019 our own Year of the Wrybill. The current Pacific Golden Plover project, driven by Jim Eagles, is just the latest in this pattern of projects. Of course, there is a common thread through these and so many other PMNT activities: they either would not happen or likely would look much different without the efforts of volunteers.

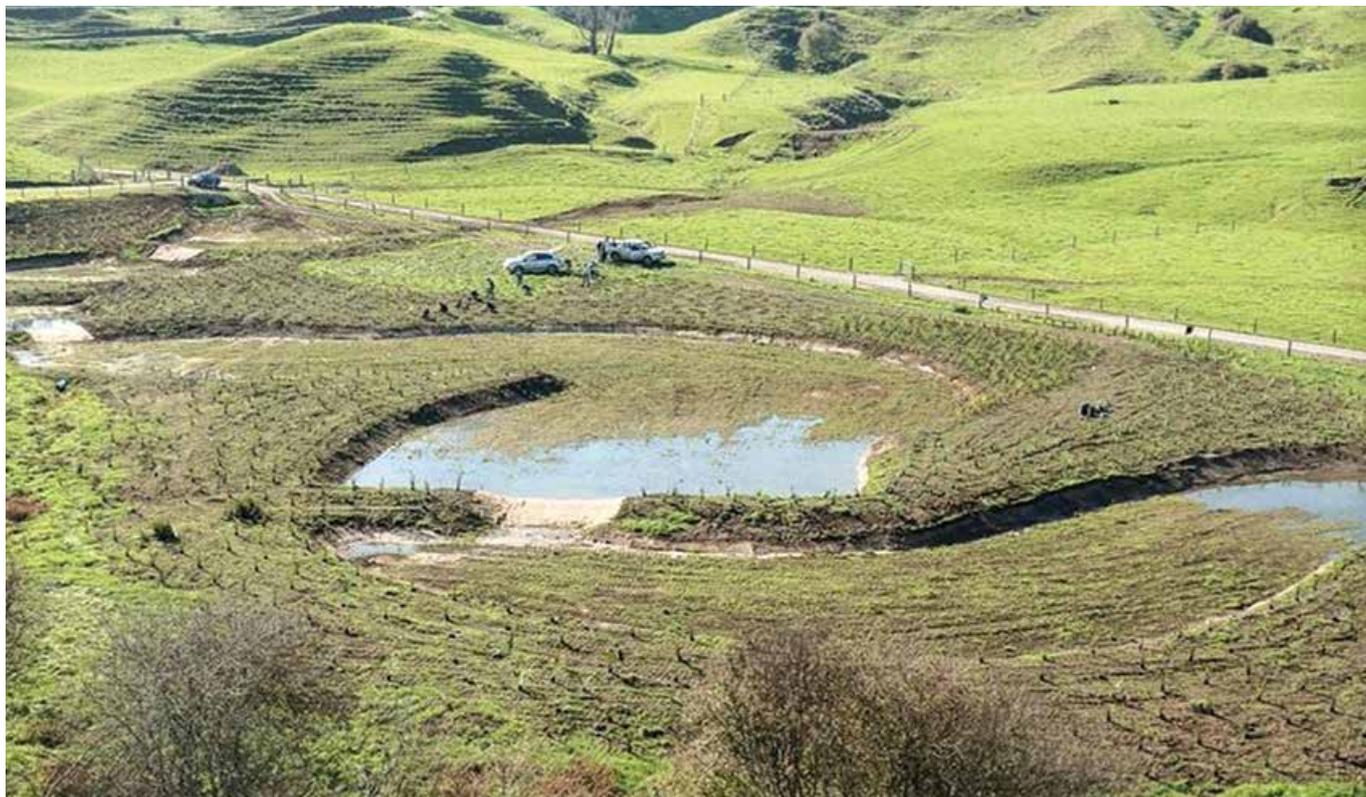
A further pattern within PMNT is



THE KING: Godwin Godwit celebrates being crowned Bird of the Year.

longevity, and I believe this is possibly the most critical component of its success. Twenty five years as centre manager is a long time, but the Trust has been around far longer than that. Through that time it has attracted and, more importantly, still retains the services of several key people. David Lawrie is the most notable example: after 18 years as treasurer and 10 as chairman, David remains closely involved with the Trust. Many are the times his institutional memory has served us well at council meetings. A council member since 1985 Adrian Riegen has made incalculable contributions across a broad front, including shorebird banding and monitoring, being the driving force behind our flyway engagement, and building and maintenance.

Current Chairman William Perry is another longstanding council member, taking up the leadership role after 18 years as secretary. Gillian Vaughan became involved in 2001 and has been an invaluable contributor to PMNT ever since, not the least her long tenure as editor followed by eight years as Chair. I must also acknowledge the tireless efficiency of Alister Harlow who does a marvellous job coordinating funding applications for the Trust. Estella Lee has made an immense and invaluable contribution to our work in China as well as liaising with local Chinese communities. The continuity represented in these and other contributions remains a priceless asset to the Trust.



PROTECTING WATERWAYS: The construction of wetlands on dairy farms (above)

Towards a sustainable dairy industry

Improving water quality is a key issue for PMNT. **Ray Buckmaster** takes a look at some of the approaches, both here and around the world, involved in moving the dairy industry toward sustainability.

Dairy cows are receiving a lot of research attention around the world in relation to their impact on climate change and water quality.

In the US, Holstein cows are being breathalysed to determine if a seaweed food supplement reduces the methane content of their breath.

In Australia micro-organisms from the foregut of kangaroos, low emitters of methane, are introduced to the gut of dairy cows.

In New Zealand zeolite, a mineral used to purify water, is being added to the diet of dairy cows to reduce urine nitrogen levels .

These are just a few of the more unusual approaches to deal with the impact of the dairy industry on both climate and water quality.

Global concern is growing, as is the dairy industry. In 2000, 22% of the world's ice free surface was pastureland and 12% was used for cropping. Three hundred years earlier the total figure was 6%. The extra agricultural land took the place of natural ecosystems, forests, natural grasslands and wetlands. Of course, not all pastoral land is suitable for or used by dairy cattle, although cropping land does supply food for cattle feed lots and the

poultry industry.

We do know that in New Zealand, between 2002 and 2007 the pastoral land for dairying increased by 5.1% and between 1990 and 2004 the national dairy herd increased by 50%. Globally the demand for livestock products is expected to double by 2050 as living standards improve.

Fortunately, the trend world-wide is to work toward sustainable dairying and away from increased production that results in greater levels of environmental degradation. Markets and consumers world-wide are demanding strong environmental performances from their suppliers. It is a matter of brand protection to be pro-active in this area and set standards above the regulatory requirements.

An early sign of this movement came in 2013 when the dairy industry launched The Sustainable Dairying Water Accord which was developed alongside the Government and other regulatory authorities. It stated that by May 2017 all stock must be excluded from any permanent flowing river, stream, drain or spring more than a metre wide and 30cm deep. Such Accords are not always legally binding. In the case of Fonterra they reserved the ultimate sanction of refusing to pick up milk from non-compliant farmers. This accord also

related only to dairy cows, not beef animals or sheep. Its provisions included the management of effluent and the exclusion of dairy cows from streams, rivers, lakes, significant wetlands and estuarine regions.

As an incentive, the Government agreed that plantings along fenced waterways could be tax deductible rather than a capital expenditure and riparian fencing was subsidised through a 35% grant.

In late 2017, the then National Government went further and introduced a set of national regulatory measures aimed at improving water quality through fencing and other measures, strengthening the existing regulatory frame work which varied between regional and district councils.

The process of change was underway but, rather like Predator Free 2050, all the understanding and tools needed to bring about change were not in existence.

To fill that gap, in 2013 the Living Water partnership between the Department of Conservation and Fonterra was initiated. It was funded by Fonterra to the tune of \$20 million to be used over a period of 10 years to improve water quality in five catchments. These catchments are test beds where innovative approaches can be evaluated and, if successful, rolled out nationally.



... and planting of riparian buffers are just two of the approaches to improving water quality.

The relationship with DOC is understandable in that, as well as providing considerable accumulated knowledge and expertise in land management, the department has responsibility for much of the New Zealand landscape. Added to that owned by Fonterra shareholders the partnership controls 40% of the country.

Additional partners in each watershed are dairy farmers, the local community, iwi, stakeholders and various regulatory authorities. In some watersheds there are links with a university or research entities such as NIWA. In the Waikato region, PMNT is a partner as is the National Wetland Trust. In these varied partnerships the expressed aim is, 'to achieve leading edge biodiversity and water quality improvements.'

The five watersheds range the country from Wairau at the head of the Kaipara Harbour to Waituna Lagoon. They all share highly modified hydrology and have considerable biodiversity value, two being associated with Ramsar sites of international significance.

Different approaches are being trialled in differing locations. In Waituna lagoon the intention is to reduce both sediment and nutrient content of stream water. Hydro seeding of stream margins rather than the conventional planting approach, installation of peak run-off control structures to reduce bank erosion and the use of fine particle fertiliser application are all being evaluated.

The Pūkoro Mirānda Naturalists' Trust, Ngāti Paoa, The Te Whangai Charitable Trust, the Hauraki District Council and the Waikato Regional Council, Fonterra shareholders, community members and other stakeholders all combine in Living Water's Pūkoro Mirānda Stream restoration. The watershed is 6,000ha and the associated Ramsar site is 8,500ha.

The intentions are to:

- Reduce sediment load.
- Expand shorebird habitat.
- Build international linkages.
- Increase wildlife habitat in a farming landscape.

The long-term plan for the catchment is to connect the source of the watershed to the sea with planted biodiversity corridors along all the waterways.

For the landowners, most of whom are not involved in dairy, the proposed environmental gains have a possible financial downside. Stream margins need to be taken out of production, fenced, planted, weeded and predator-controlled. Evaluating the financial implications of the move to sustainable dairying are a part of this project.

PMNT has benefitted from its association with Living Water which has been an active sponsor of our projects such as the North Korea shorebird survey, development of the carpark and track to the hides and The Flock.

The dairy industry contributes 6% of our GNP with a much larger percentage

contribution to our overseas earnings. It is a major part of our economic landscape. The move toward sustainability being demonstrated by the Living Water Project speaks of a long-term commitment, certainly not a greenwash exercise.

The transition to sustainable dairying is likely to be prolonged but it is underway and the pace is picking up. Not all avenues of research will be productive. For example, the Holsteins mentioned above produced 50% less methane in their breath (though there are no records for the other end of the body) but kangaroo microbes only reduce gut-produced methane in kangaroos.

Similarly, exploiting the marine environment to produce seaweed that reduces methane production in the foregut of Holsteins seems ecologically undesirable.

But the approach being taken is a wide one. It is interesting that Glencoal, wholly owned by Fonterra, will not be exploiting coal reserves it owns at Mangatawhiri to run three local dairy factories. These will transition to carbon neutral electricity.

Water quality improvement is the driving force behind the Living Water Project. They are not alone in the field with DairyNZ, NIWA and Landcare all involved in their own research/management approaches. Change is slowly coming about due to the commitment of the majority of landowners, industry, Government and an increasingly strict regulatory environment. 



From the Chair

A good time to look into the future

Spring is a time to celebrate the returning Arctic birds, welcome home our human travellers, acknowledge the state of the environment and sit down to think about the future, reports PMNT chair **William Perry**.

Spring has arrived in New Zealand and so have the returning shorebirds from the northern hemisphere. We celebrated the return of our birds on Sunday 28 October 2018 with a meeting at the Shorebird Centre. The guest speaker for that event was John Tregidga, Mayor of Hauraki. More of that elsewhere but for me his presentation was a refreshingly candid statement on the current state of the Hauraki Gulf and the wider environment of the Hauraki District and of Aotearoa New Zealand and the world. Many thanks to the mayor for his inspiring and informative words.

Our humans have been migrating too. Keith Woodley, Shorebird Centre manager, took the best part of two months' well-deserved leave to visit the USA and Europe. He has returned, more or less with the birds, and in time to introduce the Mayor at the recent open day. We have missed Keith and we are very pleased to see him return.



At the same time, we acknowledge his very able assistant manager, Chelsea Ralls (at left). During Keith's absence Chelsea stepped

up and acted up as the temporary manager. By all accounts Chelsea has done a fantastic job of looking after everything while Keith was away, and I extend my praise and gratitude to Chelsea for her competence and enthusiasm, loyalty and dependability. Also, yet again, we thank the volunteers who stepped in to open the Shorebird Centre and look after our operation when Chelsea needed time off during Keith's annual leave.

Others of us have also been abroad. David Lawrie has been to the Philippines, spreading the word from Pūkorokoro to others in the Flyway Partnership. Adrian Riegen has been on holiday to various parts of Europe, including the Netherland for a Shorebird Conference (also attended by others of the PMNT team that visited North Korea).

For my part I also went on holiday in



BACK AGAIN: Thousands of Bar-tailed Godwits have once again flown south from the Arctic to enjoy the Pukorokoro sun. Photo / Chelsea Ralls

July 2018 to the UK, including two weeks in Scotland. This was not a birding holiday as such, but we are never not birding, and we always take our binoculars, don't we? As we were boarding a ferry from Mallaig to Skye one afternoon in early July we were pestered for food by a Herring Gull. On closer inspection the gull had a ring (band) on its leg and, with the help of a couple of motor cyclists who were sharing the ferry with us, we managed to get the full number of the ring with the naked eye.

Our report to the British Trust for Ornithology elicited a response indicating that the bird had been banded three years previously about 2km from where we observed it. Evidently no competition for the long-distance migrants that we host here in Aotearoa.

The BTO also shared other information gleaned from its ringing programme: Oldest bird – Manx Shearwater (that's one at right), 50 years and 11 months; longest migration – Arctic Tern, Wales to



Australia 18,000km; strangest recovery – Osprey ring found in the stomach of a crocodile in Gambia.

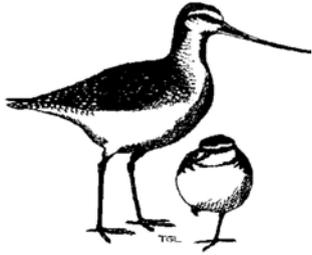
This experience reminded me of what happens when you submit a flag or colour band report in New Zealand: it really is rewarding to receive feedback on your observations and to feel that you are making some contribution to the body of scientific knowledge.

The time has come for us to engage in some navel gazing. Our regular PMNT Council meetings usually address our responses and attitudes to operational issues. This is an important part of our governance role, but we do sometimes need to consider a broader perspective and make plans for the future. To this end we shall devote most of our next PMNT Council meeting on 17 November to planning for the next 10, 15, 20 years ahead.

By the time you read this, we will have held this meeting, guided by an experienced facilitator, and we hope and expect to have some ideas regarding the priorities of our organization. These ideas will guide us, but they will not be set in concrete.

At the risk of being repetitive, I say again that we value the opinions of our members. We accept responsibility, but we also enjoy hearing from you. 

PŪKOROKORO MIRANDA NATURALISTS' TRUST



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Magazine

PūkoroKoro Miranda Naturalists' Trust publishes PūkoroKoro 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.

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See the birds

Situated on the Firth of Thames between Kaiuaa and the Miranda Hot Pools, the PūkoroKoro 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 PūkoroKoro 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 PūkoroKoro 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, in June and November, the census days are a good chance to get involved with field work and research. 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 PūkoroKoro Miranda News. If you want to discuss your ideas contact Jim Eagles.

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.

New shorebird shirts now in stock

Get ready for summer with our recently arrived range of shirts and sunhats in great new colours.

T-shirts
\$29.90

Polos
\$34.90

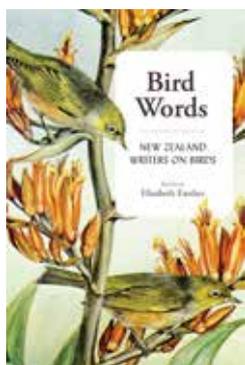
Hats
\$29.90

Pop into the Shorebird Centre and try them on.

Or call 09 232 2781 and have a chat with Chelsea.



Solve your Christmas present problem with the Shorebird Centre's superb nature books



\$35



\$50

Now's the time to buy the 2019 Shorebird Calendar

Get one for yourself and send others to friends and family so they can see why you love shorebirds.

Enjoy the photos of your favourite shorebirds. Use the big calendar block which has lots of room to write on. Find the best times for bird watching by using the tide table for the Findlay Reserve.

Calendars are \$17.90 (including an envelope if required) at the Shorebird Centre. Or visit the website or ring the Centre at **09 232 2781** and we can post them out for you.

