Pukorokoro Miranda News

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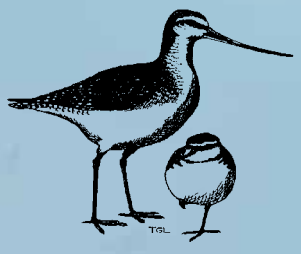
The godwit alarm clock

Phil Battley reports on his latest research into how godwits know when it's time to fly

Exciting plans for developing our land

The Flock spreads across the country



UNDER THREAT: Environmental law expert Pip Wallace says birds like the New Zealand dotterel need more legal protection. Photos / Pip Wallace, Tony Whitehead

Shorebird Snippets

'Disturbing rare birds should be made illegal'

New Zealand urgently needs a law change to make it a specific offence to disturb threatened species of birds, environmental law expert Pip Wallace told PMNT's annual general meeting.

Pip, who is convenor of the Environmental Planning Department at the University of Waikato, outlined a number of gaps in our environmental legislation. And she highlighted the problem of bird disturbance – which she has recently investigated using New Zealand Dotterel as a case study – as a prime example.

This was, she acknowledged, a complex area and it might be reasonable to provide a defence of lack of intention in some limited circumstances. 'However, where the presence of threatened species and the risk of harm from disturbance is communicated to the public, the known vulnerability of the species should limit any defence.'

Overall, Pip said, the laws protecting endangered species in New Zealand were disjointed and ineffective. 'The lack of a comprehensive statute directed at threatened species protection means that the protection of threatened and at risk species is shored up by a range of statutes with disparate foci and functions.'

Of the two key pieces of environmental legislation, the Wildlife Act 1953 was out of date and, while it talked of absolute protection for endangered species, only focused on state-owned land, while the Resource Management Act 1991 covered private land but focused on protection of habitat rather than species.

As a result, she said, endangered species received different levels of protection in different areas or habitats. 'Thus, a dotterel may be entitled to stronger protection from development effects in coastal areas than in inland terrestrial areas, both consisting of habitat where the bird naturally occurs. Likewise, a Bittern may receive more favourable treatment on a Manawatu farm wetland than in Westland.'

To a degree such a variation was to be expected: between a public nature reserve and private land, for instance, or a zoo and a farm. 'Yet when an animal has "threatened" status, a better outcome is for protection to be premised upon that status, rather than place or some other driver.'

The law urgently needed revision to strengthen its consistency, either through the enactment of dedicated

Pieces of NZ birding history go on sale

In 2015 a revised edition of *Field Guide to the Birds of NZ* by Hugh Robertson and Barrie Heather was published. Some original artwork (like the Bush Wrens plate at left) by Derek Onley will be exhibited at Miranda Farm Gallery in October. All works will be for sale with proceeds split between the gallery and Birds NZ. The show will run from 1 to 23 October. See www.mirandafarm.co.nz or ring 09 2382608 for further details.

Cover: Photos of godwits on the move by Phil Battley (top) and Tony Whitehead (bottom).

threatened species legislation, or a national policy statement for species protection complemented by comprehensive spatial planning.

Council elections

The sitting PMNT Council was re-elected unopposed at the annual meeting but, in addition, editor Jim Eagles was elected as a full member rather than ex-officio as previously. The membership of the Council is: secretary, Will Perry; treasurer, Charles Gao; council, Gillian Vaughan, Adrian Riegen, David Lawrie, Ray and Ann Buckmaster, Estella Lee, Wendy Hare, Bruce Postill, Trudy Lane, Cynthia Carter, Jim Eagles. At a subsequent Council meeting, Gillian Vaughan was re-elected to a seventh term as chair.

Youth Camp

A highly successful Birds NZ Youth Camp was held at the Shorebird Centre over Anzac Weekend with PMNT stalwarts like Ray and Ann Buckmaster, Gillian Vaughan and Ian Southey playing key roles in making it a success.

The 11 attendees included young people active in a wide range of conservation activities including two Zealandia ambassadors, a Maui's Dolphin campaigner, two members of the Pirongia Restoration Society and the spokesman for the Kokako's Bird of the Year campaign.

Because of the location they were able to enjoy a wide range of birding activities like hearing a Kokako in the Hunuas, watching Weka at Kawakawa Bay, catching passerines in mist nets in the Centre grounds and, of course, studying a range of shorebirds, including rarities like a Marsh Sandpiper, an Arctic Tern and Black-tailed Godwits. Other activities included dissections of Kahu and Pied Shag by Danielle Sijbranda, talks by John Dowding on reading and recording bands and the threat ranking of New Zealand Birds, and the chance to make birds for The Flock.

Shorebirds on air

Shorebirds have been receiving some great air time from radio services around the world.

The BBC and ABC have produced an excellent four-part radio series on wader migration, the first episode of which can be found at http://tinyurl.com/zv93odh, along with a good text article and some excellent pictures.

BOOMING BIRDING: Birdwatching is obviously becoming an increasingly popular tourist activity in China, as demonstrated by this poster, spotted by David Melville Beijing Airport and featuring a photo taken at Yalu Jiang. Photo / David Melville

The BBC also ran a radio story on how North Korea's isolation and lack of development is protecting a lot of endangered waders. You can find the audio plus another good text piece, and some photos by Adrian Riegen, at http://tinyurl.com/gsoqzzh.

After the piece came out Adrian reported, 'Our contacts in North Korea have had requests from birdwatching tours in Malaysia and Singapore after they saw the BBC story. What have we started?'

And as if that wasn't enough, Keith Woodley was interviewed about the North Korean trip by Jesse Mulligan on Afternoons on National Radio. You can find the interview at http://tinyurl.com/hx7ttu3.

What's on at the Shorebird Centre

27 August, Working bee and potluck dinner
10am-2pm working bee for at the Centre. **2.30**pm high tide.
5pm Potluck dinner followed by address from Australasian Bittern researcher Emma Williams

24-25 September, Nature Journalling Course with Sandra Morris

Enjoy expert tuition on how to record the joy of nature in pencil or paint. Details from the Centre or website.

1-2 October Australasian Shorebird Conference
At Unitec in Auckland, not the Centre, but the Trust is involved in hosting the event and there will be lots of great speakers and displays. Registration details are on the PMNT website.

23 October, Welcome to the Birds
11am Guest speaker to be announced. Birdwatching from 1pm.

20 November, OSNZ Firth of Thames Wader Census
Contact Tony Habraken (09 238 5284) for details.

Seabird pirates launch a raid on shellbank and its residents

A trio of the most feared raiders of the ocean skies, three species of skua, arrived at Pukorokoro this autumn, disturbing the residents of the shellbank and delighting birders, reports **Jim Eagles**

The seven (or possibly eight) species of skua are among the top predators of the seabird world – feasting on carrion, stealing food from other birds, snatching eggs and chicks from nests, killing and eating birds and other small animals - and three of those species spent time at the shellbank this autumn.

Our visitors, the Pomarine Skua, the Arctic Skua and the Brown or Subantarctic Skua, are powerful, aggressive birds with hooked tips to their bills and claws on their webbed feet.

The Brown Skua, known by Maori as hakoako, is the largest of the skuas, weighing in at between 1.5 and 2.2kg, with a wingspan of up to 1.5m and a thickset body, measuring up to 64cm in length. Its taxonomy is the subject of dispute but it is generally referred to in New Zealand as *Catharacta antarctica lonnbergi*.

These birds are found in the North Atlantic as well as across a wide sweep of islands in the Subantarctic and the Antarctic Peninsula.

They are not often seen in mainland New Zealand but breed extensively in the Chathams, the islands off Stewart Island and the Snares, Antipodes and Auckland groups, as well as occasionally in Fiordland and Stewart Island itself.

NZ Birds Online says there is no recent overall population data available on the Brown Skua but there are 'likely 500-1000 breeding pairs, trios or groups in the New Zealand region.' They are classified as Naturally Uncommon natives.

The Pomarine Skua, *Coprotheres pomarinus*, is the biggest of the three northern skuas that regularly visit New Zealand – one or two are reported most years – but still quite a lot lighter than the Brown Skua. They weigh 550-850g and are 46-78cm in length.

Pomarine Skuas breed right round the Arctic and Subarctic, nesting on the tundra or low-lying islands in the northern summer. Population estimates vary hugely, but could be as high as 3 million, and the IUCN Red List considers them to be Not Threatened.

The Arctic Skua, *Stercorarius parasiticus*, is the most common of the three varieties of northern skua which visit New Zealand for our summer (the third species, not sighted at Miranda this year, is the elegant Long-tailed Skua).

In fact, despite being Arctic birds, they are the skuas you're most likely to see in this part of the world, being frequently sighted around the coast, usually in small groups, even though they appear not to have been well enough known to Maori to have been given their own name.

World population estimates vary from 500,000 to 10 million and it, too, is classified as Not Threatened. They breed in the Arctic and Subarctic coastal tundra and moorland before migrating south to spend the northern winter at sea.

Arctic Skuas are the smallest of our visitors, weighing 330-610gm and reach 45-56cm in length, plus a further 11cm for their tail streamers. They are also the most parasitic of the trio seen this summer – hence the scientific name – though they are also known to prey on small mammals like lemmings

Brown Quail visit Shorebird Centre

On two consecutive mornings in June a Brown Quail was flushed from the trail between the car park and the hide. This was a highly unusual sighting: while it was not the first record for Miranda, no one can remember the last one.

The following week while walking down the Sibson Room towards the kitchen my eye was drawn to a brown bird on the lawn outside, just as it flew and disappeared. While it was only a fleeting glimpse there was no doubting what it was. The stubby shape of these birds make them quite unlike any other species of similar size likely to be seen around the centre.

JUST VISITING? A Keith Woodley portrait of a Brown Quail.

Brown Quail were introduced to New Zealand from the Australian subspecies of *Coturnix ypsilophora*.

Released throughout the country in the late 19th century, they are now largely confined to northern New Zealand – East Cape, Coromandel Peninsula, north of Auckland and several islands in the Hauraki Gulf, including Tiritiri Matangi.

The source of the bird or birds seen at Pukorokoro Miranda is unclear, but either the Coromandel or one of the Gulf islands seem a likely bet. Their presence on off shore islands, where there are no records of them being introduced, would suggest they are capable of long flights.

For further information see nzbirdsonline.org.nz

Keith Woodley

PIRATES: (clockwise from top) Subantarctic Skua, Arctic Skua, Pomarine Skua.

Photos / Neil Fitzgerald, Les Feasey, Colin Miskelly, NZ Birds Online.

and small birds.

The various skuas are most easily distinguished by their bulk. The Arctic Skua is slimmer and more falcon-like, with long, pointed wings and a deep rounded belly, and it has dark, intermediate and pale plumage forms.

The Pomarine Skua has a larger chest, neck, head and bill, but still has fairly slim wings, plus spoon-shaped tail streamers. It has 36 plumage variations which, as NZ Birds Online observes, makes it important to note differences in flight and behaviour, namely its slower, heavier wing-beats, reminiscent of a gull.

Subantarctic Skuas are bigger and even more heavy-set with big, broad wings and with a distinctive white outer-wing patch. They make frequent territorial displays which (as the photo above shows) typically include 'Viking helmet' wing raising.

Although they are top predators skuas don't always get things their own way. Soon after its arrival the Brown Skua was reported to be harassing the resident flock of Royal Spoonbills on the shellbank. But not long after that the skua itself was being chased away by a gang of the smaller Black-backed Gulls.

Recent sightings at Pukorokoro

Arctic Migrants

100	Bar-tailed Godwit
800	Red Knot
1	Marsh Sandpiper
9	Turnstone (north of Kaiaua)

New Zealand Species

2400	Wrybill
4	NZ Dotterel
200	Banded Dotterel
100	White-fronted Tern
	Hybrid Black Stilt
1000+	SI Pied Oystercatcher
6	Variable Oystercatcher
500	Black-billed Gull
600	Pied Stilt
55	Royal Spoonbill
	Caspian Tern
1	Blittern (on the hide track)

PRICELESS LAND: An aerial view of the Robert Findlay Wlidlife Reserve. Photo / Living Water

How should we develop our land?

Now that PMNT owns the area where the birds gather, including the Stilt Ponds and the hides, plans are being made to better manage the water level in the ponds, create permanent roosts, encourage the saltmarsh and control weeds, writes **Keith Woodley**.

It is a place I know very well, but these days I am seeing it from an unfamiliar perspective.

For any regular visitor to Pukorokoro Miranda, the Stilt Ponds are a key feature, not only dominating the landscape alongside East Coast Road, but also forming a critical component of the shorebird foraging/roosting system. The area is aptly named for there are usually stilts to be found there – from just a few birds to several hundred. Yet over the last few years it could well have earned a name change – to Swan Lake.

A few dozen black swans floating elegantly upon a calm sheet of water is an appealing image, but one that conceals a major problem. For the ponds are holding too much water for too long. This is one of the reasons I found myself, one morning in late June, observing the ponds through the eyes of a pair of hydrological consultants whose advice is likely to be crucial to the area's future.

A few weeks earlier PMNT achieved final settlement of the purchase of the Robert Finlay Wildlife Reserve. Robert Findlay purchased the land in 1865 and it remained in the Findlay/Lane family since then. Now it is ours and we have to make the most of that opportunity.

It is a long, narrow block about 1km long and averaging 250m wide, between the road and the tidal creek to the east. The Stilt Ponds, formed in part from the historic extraction of shells for processing at the old Limeworks, dominate the central section. It is land of huge importance to us, lying at the very heart of our operation.

Apart from the ponds there are sections of saltmarsh separated by extensive ridges that mark the southern boundary of the Pukorokoro Miranda chenier plain. There is also, of course, our trail network and the bird hides. So it is a significant acquisition and a massive advance for the Trust, but it also presents us with an exciting challenge: how to manage it most effectively for shorebirds.

What is needed in the short term is to better manage water levels in the ponds. Located in a semi-tidal area, until recently they periodically filled

Halting the march of the mangroves

PMNT has been granted approval to remove a thick belt of mangrove seedlings from the shoreline in front of the hides which, if left, would have seriously threatened the future of the area as a bird roost and observation point.

The approval was granted by Waikato Regional Council which decided there was no need for it to be publicly notified and concluded, after reading the information provided, that the removal was of 'insignificant scale' and its adverse effects would be 'less than minor'.

The Trust's application was prepared with help from the Department of Conservation and Living Water, and attracted support from Te Whangai Trust, QEII Trust, Ecoquest, Ngati Paoa and Waikato Forest & Bird.

The Trust plans to minimise sediment disturbance through the use of kayaks and hopes to have the removal completed by the end of September.

on large high tides or storm events and drained out completely on the low tide or over successive low tides. These tidal variations provided suitable conditions for the growth of saltmarsh and provided good shorebird habitat and roosting areas.

Currently the ponds tend to retain water throughout the tidal cycle. Sustained water retention is a barrier to the growth of saltmarsh, reduces the amount of habitat for wading birds (due to excessive water depth) and may also lead to issues of water quality and potentially bird health such as botulism.

The likely reason for this happening is sediment build up in the main outlet pipe (the culvert at the southern end of the ponds running under the car park driveway) or in the downstream outflow channel to the Pukorokoro Stream. Options for addressing it include fixing the issue at the current outlet, building an additional outlet or outlets, or installing a pump system.

Solving this problem will open the way for other management options. Manipulating water levels will allow:

- regular flushing of the area;
- appropriate fluctuation of water levels within the ponds which could, if adequately controlled, provide for some weed growth control and the creation of an ideal environment for saltmarsh growth and expansion;
- facilitate development and maintenance of high tide roosts.

In the longer term we want to develop a permanent all-season roost in the Stilt Ponds area. This will likely consist of a shallow, contoured ridge running parallel to the shoreline on the eastern side, probably involving the excavation and relocation of material from elsewhere on the property. Roost sites would need to be constructed at a suitable elevation so that periodic inundation could be used to flush the site and to control weeds, while still providing a suitable roosting platform.

A further option may be spray-irrigation of the higher areas with brackish water from the stilt ponds. This would involve the need for pump, pipe and irrigation infrastructure but could be a solution for the control of weeds on elevated areas not prone to inundation. We will install a hide or hides oriented towards the ponds with concealed or semi-concealed access.

DEVELOPMENTS: (above) the new entrance ftrom the car park to the trail leading to the hide; (below) the latest leg of the Hauraki Cycle Trail takes shape alongside the Front Miranda Rd. Photos / Jim Eagles

It is likely that whatever management options are open to us, some form of grazing will need to be included. While it may be feasible to roughly mow weed areas from time to time, a grazing regime is seen as the only long term option. Historically the area has been grazed by cattle and this remains an option, albeit the least desirable one. Another option is to investigate a modest sheep operation which would provide a lighter regime and avoid the enormous problems of pugging and nutrient discharge associated with cattle.

Our task now is to develop an effective management plan, and the hydrological investigation marks the beginning of this process. The next step is to get the land surveyed so we have a clear picture of levels and water flow, before deciding what we need to do.

In the meantime further improvements to our infrastructure are already underway. Thanks to funding from Living Water, the hide carpark has been refurbished and expanded by moving back fence lines. Construction of a new boardwalk from the carpark to the hide has also commenced: the first stage is a wheel chair accessible entrance from the car park to the trail; later a boardwalk running all the way to the bridge and the hides will follow.

Also important to the future of the sites is the construction of the Kaiaua to Kopu section of the Hauraki Cycle Trail which is now starting to take shape, with the section between Pukorokoro Stream and Waitakaruru already well advanced. Associated with this, a toilet block will be installed in the rest area beside the Pukorokoro Stream bridge

Survey of North Korea

PMNT team finds sites of international importance

This year's visit to North Korea provided more evidence of how valuable its relatively undeveloped coast is to migratory shorebirds, reports **Bruce Postill.**

RURAL LANDSCAPE: (above) The survey team in action; (below) a coastal village scene. Photos/Adrian Riegen

Good progress continues to be made in the shorebird survey of the Democratic People's Republic of Korea (DPRK) following this year's visit by a team from PMNT. The latest survey, by Adrian Riegen, David Melville, Keith Woodley and Bruce Postill, visited six sites and counted over 17,000 birds.

Unfortunately, hopes of finding significant numbers of Red Knots came to nought with only two of the birds being spotted. On the other hand we did see a great many Bar-tailed Godwits, mostly of the *baueri* sub-species which comes to New Zealand, including several with New Zealand flags and one with a geolocator from Catlins Lake.

Two of the sites surveyed were identified as being of international importance, supporting more than one percent of a species population, Far Eastern Curlew and Bar Tailed-Godwit.

While the weather was largely fine, survey conditions were not always ideal. It was often hazy and the birds were frequently 400-600m distant. We recorded 26 different species, the larger numbers being: Grey Plover 599; Lesser Sand Plover 224; Bar-tailed Godwit 6928; Whimbrel 430; Eurasian Curlew 504; Far Eastern Curlew 2716; Great Knot 222 and Dunlin 4513.

It's worth recalling that this survey programme, the first systematic survey of the DRPK's shorebirds, is the result of a joint agreement signed in 2014 between the Nature Conservation Union of Korea (NCUK) and PMNT. We have now made three visits to record shorebirds on the west coast and Adrian believes a further three visits will probably be necessary to finish the job.

The agreement provides that at the conclusion of the surveys a detailed dual-language report will be produced with details of sites, species and populations as a resource to assist in the future management of shorebird sites and species in this part of the flyway.

As we now know, Chinese and Korean coastal mudflats on the Shores of the Yellow Sea provide essential refuelling sites for the thousands of Arctic shorebirds which migrate north every year. With over half of those feeding areas having been lost through reclamation in recent years, notably in China and South Korea, resulting in sharp population declines. The less modified DPRK coastline could be a potential shorebird lifeline.

For the latest visit, which was funded by the Living Water programme, the team flew from China to North Korea's capital, Pyongyang, which is something of a showcase city. The streets are tree lined with separate cycle paths, many park-like gardens, several spectacular buildings and monuments. It is spotlessly clean and well maintained.

DPRK has national parks and reserves and a growing conservation ethos. NCUK staff that accompanied us on the surveys were both very supportive and highly appreciative of PMNT's contribution. They are also interested in the Trust possibly assisting with banding and species management processes.

Because there is no coastal road as such, getting to the various sites was a demanding exercise. We left each morning at 4.30am in a 20 seater bus, travelling through rural farm land, with each journey taking two to three hours. The people we observed looked poor by New Zealand standards. There were no cars and people walked or cycled everywhere. They were well dressed and appeared fit and well.

The roads were very rough with numerous pot holes and, as a result, the bus suffered and required ongoing repairs by the driver. On one occasion we returned to the bus to find it jacked up with motor parts on the ground. Two hours later it was all together and we were on our way.

The driver was perhaps the best I have ever travelled with, getting us through tight places and across difficult terrain, and its thanks to him and the NCUK team that our mission was a success.

The Flock's fabulous flight to fame

PMNT's conservation education project, The Flock, is rapidly taking flight across the land. Taken together with the publication of our Education Kit and the appointment of Krystal Glen as educator it is hoped that the spread of brightly painted cutout birds will inspire thousands more children and their families to learn the wonderful stories of our shorebirds and the threats they face. Here are some of the highlights:

Birds NZ Conference

The Flock attracted plenty of attention at the Birds New Zealand Conference in Napier where project co-ordinator Ray Buckmaster was given a speaking slot for the final 10 minutes of the agenda.

'The reception was good and hopefully there will be some positive consequences,' Ray said afterwards. 'At the very least the birding community from all over New Zealand now know all about the shorebird conservation initiative that the Trust has mounted.'

Early next morning The Flock itself – which had travelled down in Ray and Ann's boot (**see cartoon above right**) – roosted on the Napier seafront so delegates could see the birds for themselves. 'People stopped to chat, some took pictures and some good contacts were made.'

Local schools join in

Schools around the Shorebird Centre are continuing to support the project.

A senior class at Mangatangi School have completed a superb set of birds for The Flock (**see photo below**) and the pupils capped off the exercise with a visit to the Centre to learn more about the stories behind their creations.

All the pupils at Kaiaua School pupils have now painted birds made by a local man. a third school, Waitakaruru, is having about 100 birds made by members of the community and hopes to start painting them next term. It is planned to hold a gathering of the birds produced by local schools on 22 October.

South Island wing

BRaid, the group that cares for the South Island's braided rivers, has enthusiastically taken up an invitation to form a southern wing of The Flock. Needless to say their Flock will have a slightly different look to the main one with lots of Kaki, Wrybills, South Island Pied Oystercatchers, Black-fronted Terns, Black-billed Gulls and Banded Dotterels.

BRaid's Wrybills are planning to fly up to the Shorebird Centre in February next year, along with their feathered counterparts, and they'll winter there together. And the whole BRaid flock has been offered the chance to roost at Christchurch Airport later this year.

Because the Braid flock got a late start and covers such a widespread area its main thrust in schools will be next year. However, Twizel School has already started making its own flock thanks to help from a parent who made 25 birds.

Manukau birds

Manukau Beautification Charitable Trust's Boomer Boys (**one of whom is at right with his birds**) have made 96 birds in its community shed for over-50s. And its Alzheimer's group has primed them ready for painting and decorating.

The Trust plans to invite students from Manukau schools to decorate those birds and, at the same time, to learn about the amazing shorebirds on their doorstep.

It's also hoped to arrange for the The Flock to have a big presence at the highly popular Ambury Park Farm Day, on the shore of the Manukau Harbour, which this year will be held on 2 October.

Kiwi Conservation Club

Rotorua Kiwi Conservation Club members are making and painting a set of birds for the campaign.

Cambridge Resthaven

The enthusiastic team who make use of Cambridge Resthaven's Menzshed (**see photo above**) have been making lots of bird cut-outs for locals, including a local homeschool group, to decorate and add to The Flock. However, when members of The Flock team paid a surprise visit to thank them for their work it seemed as though quite a few of the Resthaven residents would like to decorate birds themselves.

Youth camp

The Flock got another boost during the Birds NZ Youth Camp which this year was held at Pukorokoro Miranda. In between their other activities the participants made some interesting birds including even a Kokako, created by Oscar Thomas, who was spokesperson for the Kokako campaign which almost pipped the godwit for the title of Bird of the Year in 2015.

Devonport roost

The biggest gathering of The Flock this year looks like being in Auckland's seaside suburb of Devonport. Jim Eagles has persuaded all 10 schools in the area to join in so some 2000 birds, mostly painted by local children, will be displayed on Windsor Reserve in November. The event will be opened on 11 November by local MP and Conservation Minister Maggie Barry.

Paeroa Pippins

The Paeroa Pippins and Brownies (**shown in the photo at right**) have also joined the fun. Each youngster created two birds which they hand-delivered to the Centre. While they were there the Brownies also took the opportunity to find out about shorebirds and check out the birds from the hide.

Social media presence

The Flock has had a remarkable presence on social media with a regular electronic newsletter, developed by Sarah Vaughan and now put out by Louisa Chase; its own section on the Trust's website at www.miranda-shorebird.org.nz/theflock; a Facebook spot at MirandaShorebirdCentre; on Instagram at Pukorokoro_Miranda_Shorebirds, a blog at theflocknz.blogspot.com/; and a hashtag – a device that creates interconnectedness across the different kinds of social media - #theflocknz. All this spreads the message to an ever-wider audience.

Te Puke School

Te Puke School is getting involved with The Flock project and its science leader visited the Centre over the school holidays to see how best to do so.

Australian wing

An Australian wing of The Flock is about to take flight in the Adelaide region under the name of The Flock Oz.

Tony Flaherty, who helps coordinate coastal conservation projects for the Adelaide and Mt Lofty Ranges Natural Resources Management Board, wrote to PMNT to seek permission to 'migrate the amazing Pukorokoro Miranda Shorebird Centre Flock project to South Australia and use your excellent information and templates (with acknowledgement) to produce information packs to distribute to schools and wood working groups to get our own flock going.'

The aim, he said, was to create a flock in South Australia to help support the existing shorebird awareness programme with local schools and community groups and to have a flock ready for the various events to welcome the Artic migrants such as the OzAsia Festival and the St Kilda Flyway Festival. 'I would like to keep your The Flock branding but change to The Flock Oz if that is okay?'

The request was enthusiastically approved.

South Korean wing

There is even a presence in South Korea. David Lawrie has sent a consignment of cut-out birds to the East Asian-Australasian Flyway Partnership office in Seoul suggesting that the staff each paint a bird. The hope is that they will either send the completed birds back to join our Flock or use them as the basis for creating a sub-flock in Korea. The Flock newsletter has already featured on the EAAFP Facebook page so the folk there know all about it.

Generous sponsorship

PMNT has received some generous sponsorship for its Flock campaign.

Living Water, the partnership between DOC and Fonterra, gave $4500 towards the project's running costs.

Following an approach by Louisa, Resene Paints sent 48 500ml cans of recycled paint and it has also agreed to provide schools and community bgroups with testpots of brightly coloured paint.

The Trust is grateful for this help.

Oropi School

Oropi School, in the hills above Tauranga, is quite a way from the nearest shorebird, the school symbol is a Kokako and the senior class is named Ruru. But the senior pupils nevertheless produced 26 superbly finished godwits, knots, oystercatchers and Wrybills to join The Flock.

Jim Eagles visited the school to accept the birds – taking The Flock with him and planting it in the school grounds (see the photo above) – and presented each of the pupils involved with a certificate thanking them for their work on behalf of shorebirds.

'It was a wonderful experience,' he said afterwards. 'The children were all amazingly knowledgeable and enthusiastic. Several of them had made displays about shorebirds. Quite a few came up, thanked me for the chance to take part and said they were going to get their parents to take them to the Shorebird Centre. I was quite touched.'

School holiday programme

During the July school holidays a free activity programme for children, based around The Flock, was held at the Shorebird Centre.

The holiday programme was a first for the Trust and proved to be a big hit with 83 children attending. Families travelled from as far afield as Mission Bay, Hamilton, Awhitu Peninsula, Waihi and Thames to take part in the two-hour sessions.

The programme was put together by the education coordinator Krystal Glen (shown at top right reading a story) with assistance from Keith Woodley and Louisa Chase and was run with the help of several volunteers.

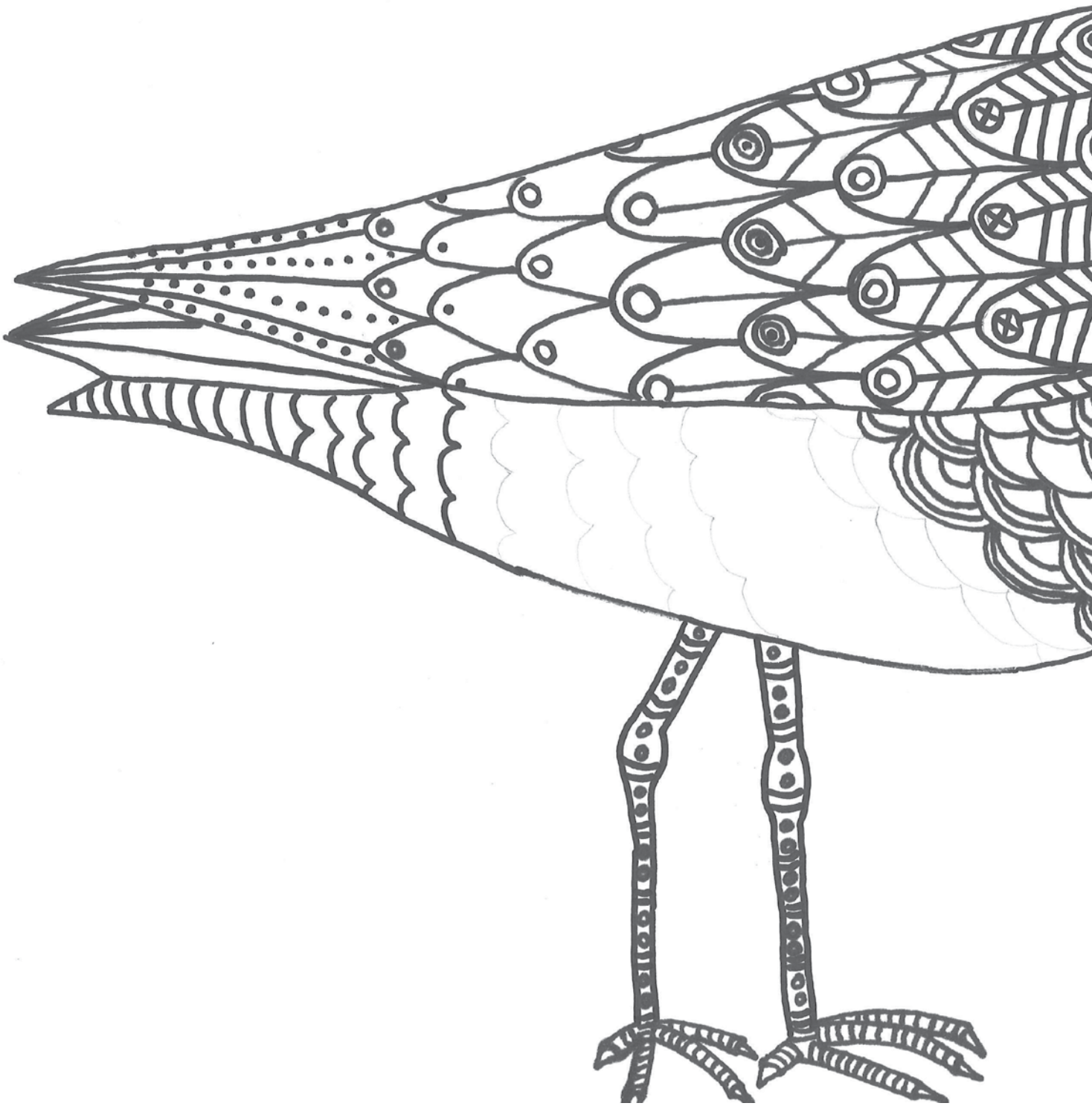
Children and their carers learnt about either the Bar-tailed Godwit or the Wrybill through listening to a story. Afterwards children painted a bird for The Flock (see the bottom photo below), and to finish things off many of them visited the bird hide on the coast where volunteers had telescopes, binoculars, and a wealth of knowledge to share with the kids.

Badly needed

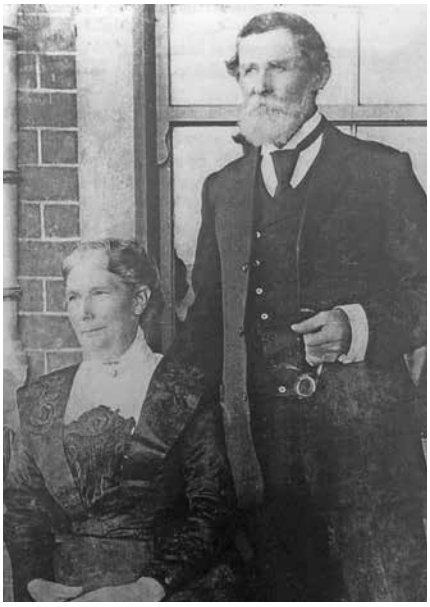
Finally. just to underline the programme's message, the latest DOC ratings for the status of the four main species in The Flock are:
Wrybill - Nationally vulnerable;
Red Knot - Nationally vulnerable;
Bar-tailed Godwit - Declining;
SIPO - Declining.

GODWIT TIMES

Lots of amazing shorebirds are being created around New Zealand as part of The Flock project but just in case you haven't been able to make one I thought I would send you a godwit to colour in however you like.
Happy creating,
Godfrey



These pictures by Caleb, Cameron, Lauren, Oliver and Liam from Oropi School will give you an idea how beautiful a Bar-tailed Godwit can look when coloured in – well, let's face it, we're beautiful any time – so it's well worth the effort.



PIONEERS: Dunkeith, the Findlay homestead, soon after it was built; Robert Findlay Snr and his wife Isabella.

Findlay-Lane family looks back on 147 years of farming the land and welcoming birders

As the Pukorokoro Miranda Naturalists' Trust takes over ownership of the Robert Findlay Wildlife Reserve, **Trudy Lane**, a member of the family and the Trust Council, looks back on a 147 year link with the land.

When Robert Graham Findlay made his first visit to Pukorokoro Miranda in 1869, five years after the conflicts there, the clearly visible and intact rifle pits and trenches dug by Maori on the beach could have left him in no doubt that this was a frontier land.

In that same year Robert, his brother William and their 18-year-old friend George McInnes had travelled from the only world they knew, Keith in Scotland, to New Zealand, as adventurous young men 'to pick up gold in the streets' in Thames.

Why would they have abandoned the comforts of home for this wild land? Perhaps that is explained by a tale Robert would recount to his children later in life of his Grandfather, a Warden in the Scottish legal system. He had encountered a situation with a vicious Lord who at first caused a youth and his mother to be shelterless and starving, and then insisted that the youth be hanged for stealing a sheep to survive.

Refusing to follow the letter of the law in this case, Robert's Grandfather instead led what turned into a protest rally of 50,000 people who marched to Parliament to demand it overturn the capital punishment law.

After spending some months in Thames, the Findlay brothers travelled to Pukorokoro with the intent to farm the land, accompanied by a Peter Hunter and a Swede named Hopkinson (or Hopkengen). At that time the Pukorokoro Stream was navigable for nearly a mile inland from the coast and they stepped ashore on the spot where the Miranda Memorial hall was later built (now 896 Miranda Road).

What historical references we have indicate that they purchased land from Maori and from a man named William Australia Graham. Through this transaction the four men came to be the first European settlers in the area.

Robert, William and George built a shared house and they each took different parcels of land. George McInnes soon asked his sister Isabella if she would join them to housekeep for the three men.

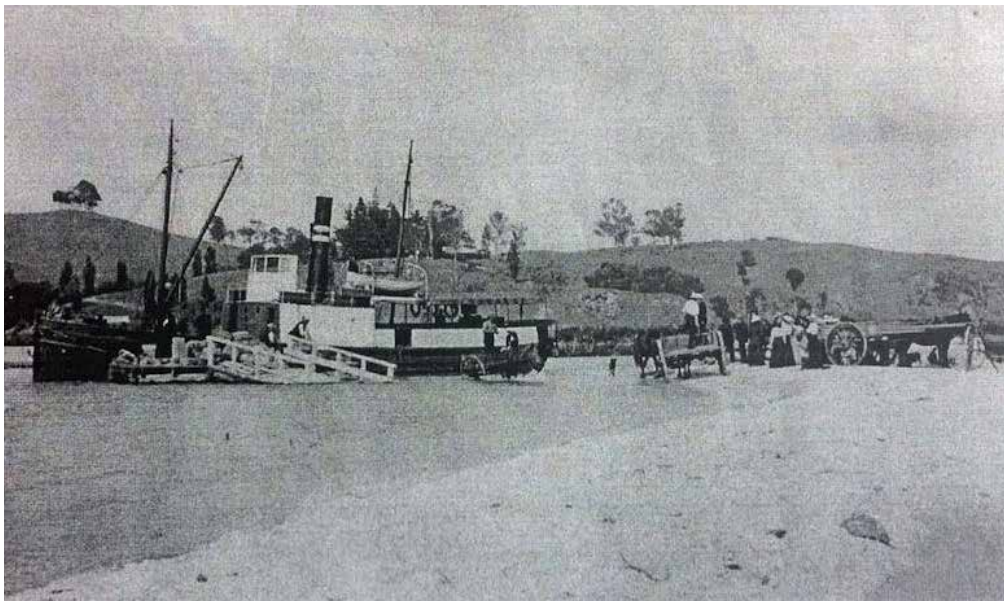
Thus, in 1871, a spirited 19-year-old Isabella McInnes braved the six-month trip to New Zealand, the only woman on board, despite the protests of her family. The Miranda Redoubt was evidently still manned at this time as the story goes that on arrival she was greeted by a detachment of soldiers firing a four-gun salute as she lifted her long skirts to clear the mud while landing from a small boat.

Just over a year later, in 1872, Isabella McInnes and Robert Findlay married. As well as farming, the couple kept a gum store (adjacent to the present house at 928 Findlay Rd) and planted a large orchard of apples, peaches, pears, plums, quince, and walnuts. Many of these heritage fruit trees remain scattered around the family houses today.

Their store joined what was already a long history of trading in the area. Local Maori conducted a flourishing trade in produce with Auckland prior to the Land Wars and early records show that merchants from Sydney had established a branch store between Pukorokoro and Kaiaua as early as 1832.

Isabella largely ran the store, remarkable in itself for the time, and did so with aplomb. On one occasion, when a gum digger was not able to spell or write out his name for her payment ledgers she asked where he was from and in this way accidentally renamed an entire family 'Taranaki'.

George McInnes later commented, 'The pioneer women were all town-bred as were their husbands. The district was roadless and the only communication was by sea to Thames or Auckland. The only direct communication with Auckland was by a rough



EARLY DAYS: The coastal steamer *Hirere* at Miranda Wharf around 1907; Arthur Lane in his Army uniform.

track to the Pokeno railway station, a distance of 20 miles on horseback.'

Neither Robert, William nor George had any farming experience but being young, enthusiastic and determined, they cleared their blocks and transformed them into pasture. They built Findlay Rd and Rataroa Rd by shovelling loose metal off the back of a horse-drawn cart and presumably also built the wharf (you can still see its large wooden beams by the bridge) and the connecting roads.

Family mementoes give a taste of what their life was like. We still have the huge family bible and the large, graphic and detailed medical books for self-diagnosing all manner of ailments and potential medical disasters. Similarly, the pianos, singing songsheets and many, many books and some wonderful collections of strange objects from sea travels tell of the need for self-education and entertainment.

The outside world came a little closer with a telegraph station and post office being built in 1873 and manned by Peter Hunter and his wife.

As the first European settlers the Findlays developed close relationships with local iwi. When the first child of Robert and Isabella, named George, was born in 1874 he was evidently a 'source of wonder' to local Maori, being the first European baby they had seen. Though they also teased his parents that he looked like a maggot.

That close relationship stood them in good stead over the years, so much so that when settlers were advised to head to the safety of Thames because of a 'Maori war party' that was thought to be heading for the coast, they would not consider leaving.

Uncle George, that first-born 'source of wonder', was of a philosophical character and he in particular retained a closeness with local iwi throughout his life, serving on the board of Kaiaua School for 40 years, supporting local Maori in education and health issues, and he was greatly honoured by Maori speakers at his funeral.

By 1906 Robert had built Dunkeith, a large and elegant red brick house with surrounding wooden porches, for his growing family of now seven children: George, Isabelle, Mary, Robert (Graham), Margaret, Sylvia, and Lillian. The house was heralded as a grand achievement at the time, reported in papers in Thames, but Robert was keen not to make a fuss. Today this house is the home of Gary and Adrienne Dalton of Te Whangai Trust.

Inevitably the family branched out and in 1912 Lillian Findlay, by then a young woman and described as 'clear as a crystal', went to visit her cousin George Hendry in Rawene, Northland. While there, Lillian became friendly with Arthur Stephen Lane, who was from a family of boat builders and sea captains from Totara North. This launched a romance which required sailing back and forth between Opononi and Miranda, each time enduring the discomfort of crossing the treacherous Hokianga Bar.

Lillian and Arthur became engaged but World War One intervened, and Arthur enlisted. Hence no time was lost upon his lucky return and they were married at Dunkeith. Lillian and Arthur first lived in the North at Waiotemarama, and their first child, Isabel, was born at home there in 1920 (too soon for the doctor from Rawene to arrive).

However, though they didn't know it at the time, Arthur had contracted tuberculosis in a notorious Army Camp at Salisbury Plains – known as 'the camp of coughing men' – and was no longer the athletic man who had gone to war. Concerned for his sister, in 1923 Robert Graham Findlay (Jnr) – known as Graham - suggested they come to Miranda to sharemilk the easier land. After their sons Allan and Graham Lane were born a home was built for them at 900 Findlay Road, for £125.

Sadly, Arthur's health continued to deteriorate. In 1925 his tuberculosis was diagnosed and he was sent to a sanatorium, never able to work again. This desperate situation worsened when it emerged that over the years the family had also become infected, as in 1928 both Lillian and Isabel became ill, and Lillian died.

As a result, the children were shared out among their Aunts and Uncles in the area. Thus Isabel went to live with her Uncle George at their house at the very top of the Rataroa ridge (where she would gaze down longingly at the as yet undeveloped Miranda Hot Springs). Our Father, Allan Lane, went to live with his Uncle Graham


GENERATIONS: Lillian Lane with her children Allan and Graham; Allan Lane.

(Robert Graham Findlay Jnr) in the house he'd built at 928 Findlay Road. Their youngest child, Graham Lane, went to live at Dunkeith with his two unmarried Aunts, Mary and Sylvia.

Dad recalled that their Father sometimes visited but, as he could not be in physical contact, could only wave at him from the 'Bee House' down the hill.

Dad's Uncle Graham had married Miriam Coxhead (daughter of Evelyn Hill) in 1906. Industrious and inquisitive in nature, he had kept bees as a youngster and began selling honey to Auckland as a teenager. He was also said to be 'interested in everything that walked, swam, galloped or flew'.

Due to his drive and interest in both farming and business, Uncle Graham would become one of the early directors of the NZ Cooperative Wool Marketing Association and later of Farmers Trading Company in Auckland.

Graham also continued the land development work, digging out the drainage channels on the flats with horse carts and shovels, and putting in flood gates to control the sea coming in to flood the plains at high tide. Dad helped with this work and our Mum, Jocelyn Lane, reports that these flood gates required a lot of checking to make sure they were doing their job.

Maybe it came from the settler situation of self-education while discovering the flora and fauna of their new home, but somehow across the various generations of our family there can be found an appreciation of nature. This undoubtedly informed their attitude, from Robert Graham Findlay on, towards the birds and birders that also made use of their land.

Dad's Uncle Graham was known for this and we know that our Grandfather Arthur Lane wrote poetry such as 'an ode to Venus'. Our own Aunty Isabel was always a huge fan of butterflies, plants and other natural phenomena.

Dad expressed amazement at the birds' flights, would create bible studies on the glories of snowflakes and had wanted to be an astronomer. Like many of his generation, his appreciation of nature connected to a Christian view of all this wonder being God's creation. Thus in his dealings with birders and with the Trust he regarded the land as a gift from God to be shared and 'not his to give'. While later generations have a range of beliefs, these values continue to inform us and our respect for the wonders at our doorstep.

Though times change and people move in different directions we are grateful to the PMNT community for the continuing enrichment of our understanding and enjoyment of this special place that we call home. We are all able to have a richer experience through the sharing of its wonders and the role as its kaitiaki. We have enjoyed the relationship with the Trust down the years and look forward to that continuing in the future.

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Miranda's Pioneering Story, **Hauraki Plains Gazette, 24 February 1958.**
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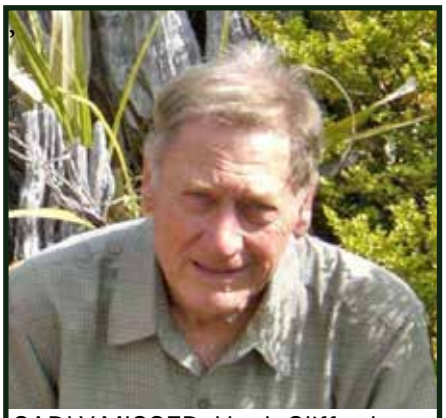


SADLY MISSED: Hugh Clifford.

Obituary

Hugh Clifford toiled to save the Grey-faced Petrel

Hugh Clifford, who died on 8 June aged 85, had a wide range of birding and tramping interests

One of those interests was PMNT, of which he became a life member in 1992, serving on the Council from then up until 1997. But his birding involvement was diverse and he was also active in the Waikato branch of OSNZ, of which he was treasurer and secretary for three years, then taking up the role of egional epresentative for a further five years.

Hugh loved the outdoors and beach patrols fitted well with his tramping background. He covered over 3000km, during his 23 years of patrolling and coordinated Waikato's efforts for 11 of those years.

His greatest legacy is surely his leadership of the OSNZ-sponsored Grey-faced Petrel Project which he led for 20 years. There were 105 day visits and 307 at night to Motuotau Is and Mauao, at Tauranga, in the course of this work and these resulted in a huge and valuable data set.

His ornithological endeavours received recognition from many quarters. He was a meticulous researcher but also a gentle and considerate man who is greatly missed.

In his work Hugh was actively supported by his wife Zoe who died in 2015. In 2005 they received a joint Meritorious Service Award from OSNZ for their five years of field work that contributed to the publication of the Atlas of Bird Distribution in New Zealand.

Ray Buckmaster

ON THE MOVE: Bar-tailed Godwits skimming across the water in a tight formation as they get themselves ready for the long migatory flight. Photo / Phil Battley

Unravelling the mystery of godwit migration

Phil Battley, now associate professor with the Ecology Group at Massey University, reports on the on-going research into the timing of godwit migrations which he began a decade ago at Pukorokoro Miranda.

About ten years ago I started individually marking godwits at Pukorokoro Miranda, using a combination of colour-bands and flags. Soon we started to accumulate enough repeated re-sightings of birds to realise that when birds migrated north, some would typically be seen only into early March whereas others would stay late into the month or even into early April. These late-stayers included some beautiful dark red males that would roost on the cobbles at Kaiaua where they gave excellent views of their legs. Some are still around today.

When I looked at the last records we had of marked godwits from different years, I found that individual birds were pretty consistent in when they migrated in different years. Most birds left within about three days either side of the date they had left the year before. Immatures tended to vary slightly more, as if they were fine-tuning their migration timing. But adults had extremely high individual repeatability. Just what this meant in terms of godwit biology wasn't clear, though there was a trend for later birds to be smaller than earlier birds (even if I accidentally reported the reverse in the published paper on the topic…)[1].

At that point I moved down to Massey University in Palmerston North and our attention shifted to the Manawatu Estuary, where we had also banded godwits as part of an Ornithological Society project into the movements of Arctic waders in New Zealand. Jesse Conklin, who is now well known to many at Miranda, moved to New Zealand to start a PhD on individual variation in godwits. It's probably fairly truthful to say that we didn't have a completely clear idea at the outset of just what we thought we would discover by monitoring a small population of godwits in great detail, but we knew that it should be fascinating! And of course it was.

By using geolocators to track godwits with different departure schedules, Jesse could show that early migrants end up on the Yukon-Kuskokwim Delta in southern Alaska, while later migrants end up further north on the Seward Peninsula or the North Slope of Alaska[2]. Given that these areas thaw up to three-and-a-half weeks later than the southern breeding grounds, the difference in departure dates from New Zealand (and also Asia, as revealed by the geolocators) now made sense, as did the individual consistency between years. The size and plumage variation we observed was also explicable, as the Yukon Delta godwits are much larger and paler than those breeding further north.

Jesse monitored the Manawatu Estuary godwits on a daily basis in March from 2008-2010 for his PhD, but as the results were so interesting and unique [3] we kept this going even after he finished his degree, finding birds whose departure dates varied by as little as a day over a five-year period, and others who went two weeks early when fabulous winds presented themselves. Clearly, there was still much to learn about how godwits' departure dates are regulated, environmentally and internally.

One of the insights that this godwit work gave was that birds seemed to have departure windows within which they would migrate. These seem to be about a week long, and within that period they will migrate when the conditions are suitable. But summarising data on departures for scientific papers misses some of the impressions you get when out in the field watching the birds.

There was one female who had, according to our predictions, missed her departure window that year and was late but unable to migrate due to persistent headwinds. She gave all the signs of being highly motivated to go, as she spent the next couple of days calling and attempting to rouse flock-

TEACHER'S PET; 2WBWB, one of the best-behaved godwits in the Firth, often roosted on the southern edge of the cobbles at Kaiaua with his bands washed clean of mud. Photos / Phil Battley (2006). T Burns (2014)

mates to head off into the stiff norwesterly wind. No other bird showed a skerrick of interest in migrating in such conditions, and she eventually managed to scrape together two other birds on the day that the winds abated and was off.

It is also striking in the field that you can have a flock of birds sleeping away, utterly uninterested in migrating even though another bunch is noisily calling only metres away and preparing to migrate, yet the next day a group that was uninterested the day before may now themselves take off. Why didn't they go yesterday? It really does seem as if godwits have very particular, often very precise, timetables. The next question we are trying to address is how these consistently different timetables are maintained.

To look at this, I teamed up with Dr Andrew Fidler, a molecular ecologist then based at the Cawthron Institute in Nelson. Despite working in what is principally a marine research centre, Andrew's background includes working on birds at the Max Planck Institute in Germany, specifically on Clock Genes that are involved in interpretation of changes in daylength, which is believed to be one of the main timing regulators of the annual cycle of birds.

We were fortunate to secure a Marsden Grant that has allowed us to continue the monitoring work at the Manawatu (now in its ninth year), to expand to another site in southern New Zealand (Catlins Lake, near Owaka) and to revisit the Pukorokoro Miranda birds.

The project is a combination of field work to determine departure schedules, including geolocator tracking to increase our sample size for timing of movements outside New Zealand, and molecular work from blood samples taken during banding. That task has fallen to Angela Merino, a Spanish PhD student working with Andrew. While the molecular side of the project is still ongoing, the monitoring and tracking work has already expanded our understanding of godwit migration from New Zealand.

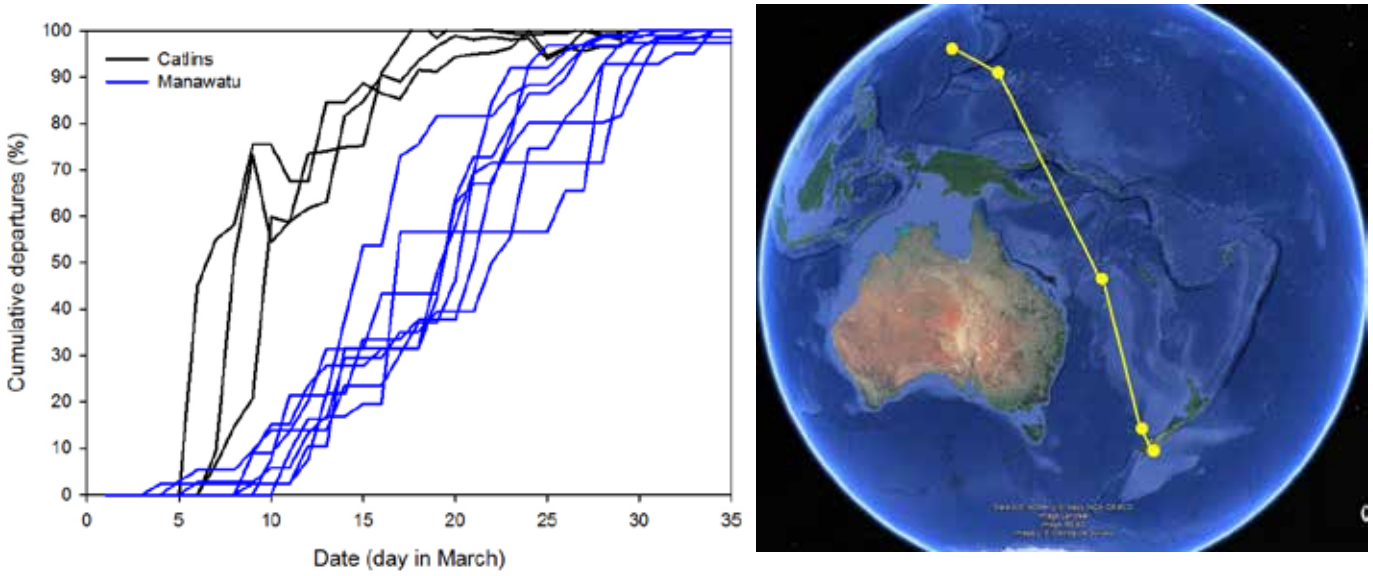
When looking for a new study site, we chose Catlins Lake in south Otago, similar to the Manawatu Estuary in being an isolated estuary with a small godwit population amenable to study. Based on our observations of godwit migration timing at Miranda, the Manawatu Estuary and Farewell Spit[4], and the fact that birds from all across Alaska seem to intermix throughout New Zealand[5], we expected birds to migrate from the second week of March.

Accordingly, Peter Langlands, a freelance ornithologist from Christchurch, was dispatched down at the start of March 2013 to start the daily roll calls of banded birds. Unfortunately he met atrocious weather conditions upon arrival, and then had almost half of the birds disappear on 7 March. This was unexpected and rather baffling, and birders were alerted to our missing birds, yet nobody located them anywhere else.

The conditions for monitoring were slightly better in 2014, but this time there appeared to be a big exodus of birds on 6 March. We got help for Peter so he could expand his search to Southland and Dunedin, but again the missing birds failed to turn up. At this point my certainty about how well I understood godwit migration started to waver.

Not long after, an email came in from China with a report of some colour-banded godwits seen at Yalu Jiang in China. Among them were records of two Catlins birds. They were seen on 18 March and we know that it takes a week of flight to get to China, so they must have left by the 11th. When Peter checked his records he found that both birds were seen daily up to 6 March, and not thereafter. Had we really had 140 birds (42% of all the migrants that season) depart before even a single flock had left the Manawatu?

The next stage in the story was one of those improbable occurrences that seem to happen far more often than they ought to. In April that year a birder at Yalu Jiang found an injured godwit on the sea wall. Moreover it was colour-banded, and was from Catlins Lake. Not only that, it was carrying a geolocator to track its migrations. And not only that, Adrian Riegen happened to be at Yalu Jiang at the time and was able to be handed the geolocator, bring it back with him to New Zealand and hand it to me at the Birds NZ (Ornithological Society)



THE PATTERN EMERGES, Figure 1 (left): Timing of migratory departures of godwits at Catlins Lake (2013–2015) and the Manawatu Estuary (2008–2015). Apparent decreases reflect likely influxes of birds from other sites. Figure 2 (right): Approximate positions of the Catlins godwit that departed on 6 March. After these points, issues with the equinox make it impossible to determine latitude from the light/dark data that geolocators collect.

conference in Palmerston North a few weeks later!

But the twists continued, as it turned out that this bird was not even seen at Catlins Lake that March. However, the geolocator didn't lie, and it showed that the bird had indeed departed on migration on the evening of 6 March, the same day that the 140-odd birds went missing. Even I had to reluctantly admit that the Catlins birds really did leave earlier on migration than the Manawatu and Miranda birds.

So, armed with this information, last year Peter headed down in late February to get a better handle on the departures. Sure enough, flocks were seen departing on 5 and 7 March, and numbers dropped by over 200 birds by the 10th. Some individuals may even have left in late February. Birds evidently do migrate earlier down south.

This is really obvious in a plot of departures (based on changes in daily flock counts) expressed as cumulative percent (Figure 1, above). Catlins birds left a good 10–12 days earlier than Manawatu birds.

This was (as you can gather) not something I had predicted. The distances to Asia aren't greatly different between southern and northern New Zealand, and the track of the Catlins geolocator bird showed it heading directly out across the Tasman Sea without any delays anywhere.

Furthermore, Jesse and I had published a paper boldly titled "*Geographic variation in morphology of Alaska-breeding Bar-tailed Godwits is not maintained on their non-breeding grounds in New Zealand*". Technically that statement remains true, as the scale of variation across Alaska is large, and any differences between populations across New Zealand are small, but… if you read the paper closely you will find one hint in there that there may be geographic variation, with females from the far south being larger than females from the north. This finding may be stronger now with biometrics from more birds, but it looks as if godwits from southern New Zealand may have more southern Alaskan breeders than sites further north.

Just why they leave so much earlier than northern birds is yet to be explained. Ideally we would back this departure information up with a good set of datalogger results from Catlins birds to reveal birds' stopover durations in Asia and eventual arrival times and breeding locations in Alaska. We had deployed almost 40 geolocators at Catlins Lake in 2013 and 2014, but to date their efforts to elude capture have proven more successful than our efforts to recapture them.

We have so far retrieved just three, and one of those was from the injured bird in China. Each of these has, however, proven important in different ways. The first confirmed the departures of 6 March as discussed earlier (Figure 2, above). One of the others did not migrate in 2013 but left on migration on 26 February in 2014, while the third geolocator recorded what is probably the longest tracked flight of any bird on its way back to New Zealand, direct from Alaska to Otago.

Over the coming year we will be completing the critical molecular work, and looking in more detail at the timing and tracking data we have on godwits from New Zealand. I am quite sure that there will be more surprises and insights in store, but hopefully not too many that contradict what I have said in print before!

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DIFFERENT RESPONSES: Mangrove pneumatophores (left) are an unusual example of roots growing upwards to get oxygen; (right) many trees respond to the cold by shedding their leaves.

Photos/Ray Buckmaster, Malene Thyssen.

Plants respond to environmental changes

Plants may or may not flourish when you play them classical music but they certainly respond to changes in temperature, light and water quality in ways which can impact markedly on the wider environment, writes **Ray Buckmaster**.

Some people claim that plants only like certain kinds of music. They are really into classical renditions and rap music is rather low on their priorities. I tend to agree with the sentiment although it is hard to see how plants could develop this sensitivity in an evolutionary way. It is just a bit of dubious science that has found some degree of acceptance and fits nicely into the category of urban myth.

However, plants do have an ability to detect and respond to many environmental factors.

For animals, environmental awareness is usually shown by some form of movement, like escaping the attentions of the neighbour's cat or even migration. Animals mostly perceive the environment through sense organs, and their nerve cells send messages to muscles and movement results.

Plants don't behave in this way because they lack both a nervous system and muscles. They react to the environment by growing in a differential way.

For instance, the downward growth of plant roots can be a response to a number of things. It is a negative response to light but both gravity and water interact positively to make roots grow downwards. The pneumatophores of mangroves, which grow upward to gather oxygen, are a rather special exception to the general rule.

In plants, hormones take the place of a nervous system. By producing more hormone on the darker side of a stem a plant will grow toward the light. A similar response to contact causes the dreaded Convolvulus to bind around stems.

These things are fascinating but even more interesting is the way that plants perceive the changes of the seasons because for most plants, as with most animals, reproduction is a seasonal activity.

Plants can't tell the time but they are 'aware' of the changing seasons. They do this by measuring the relative lengths of night and day. Deciduous trees don't usually keep their leaves in winter and pohutakawa won't usually flower then. However they become 'confused' when they are growing right next to a street light. Short days would normally bring about leaf fall and, in pohutakawa, long days lead to flowering. In each case a plant hormone brings about the change.

On the cheniers a couple of weed species show a more complex environmental response. Both the wild beet and the wild carrot do not respond to day length by producing flowers in their first year of life. They build up reserves for the time when they will flower. In the winter the cold destroys a chemical that prevents them from responding to day length. The next year they will flower. Regular vegetable gardeners know this of course and don't expect winter-grown carrots and silver beet to last long into summer without going to seed.

What is happening on the cheniers has little impact on our migratory shorebirds. The terrestrial ecosystems on which they depend are found in the Arctic permafrost regions. Plants are at the base of the food chain there as everywhere. The insect larvae that feed on these plants are themselves fed upon by breeding shorebirds.

In the past two decades there has been a rise in average temperature of 0.8 degrees Celsius in the Eurasian North American region. As a result a phenological change, a difference

WORRYING TIMES: Climate change is already affecting the Arctic tundra where our Bar-tailed Godwits nest and raise their chicks. Photo / Keith Woodley

in the timing of seasonal events, has been occurring. The onset of spring is earlier by four to six days as is the plant dependant insect peak on which breeding shorebirds rely. The onset of autumn, the season of plant decay, has also been delayed by 8-11 days. What will the affect on the birds be?

In the milder conditions brought about by climate warming the distribution pattern of many plant species has moved northward in that hemisphere and their growth has been greater due to the longer growing season. In North America there has been a suggestion that there will be winners and losers resulting from this vegetational change. The godwit is proposed as one of the losers and presumably this would extend to cover other Arctic migrants.

An alternative view has recently emerged from Russian academics. It is possible to find out about vegetation change in the past by examining core samples of lake sediment that has accumulated during many ice ages. Within these sediments are pollen grains that are characteristic for a species and the sediment can be dated.

Matching up this evidence of vegetational change with existing climate information from other sources produced an unexpected result. After a severe ice age, like the one that finished just 10,000 years ago, there is a lag period whilst vegetation adjusts. This lag period is huge. In fact the vegetational adjustment is not yet complete after 10,000 years.

Areas that currently support the cold adjusted Siberian larch tree should have the warmer climate pines and spruces replacing them. That hasn't happened for a number of reasons. One explanation is that these species only survived the last ice age in very distant refuges and weren't close enough to re-colonise. So the species composition is very slow to adjust but the changes in seasonal timing persist.

Changes in timing are not obvious or even existent in the other major ecosystem that shorebirds depend upon, the intertidal. Plant plankton is at the base of this food chain and an easy way of studying seasonal change doesn't work for all estuaries.

Remote sensing by satellites picks up the photosynthetic pigment, chlorophyll. Great for locating marine blooms but it doesn't work in shallow cloudy waters. Chesapeake Bay, the largest estuarine system in North America, shows a spring abundance of phytoplankton which then decreases as the zooplankton population increases and consumes it.

In the Firth of Thames this seasonal pattern exists but good plankton growing conditions can be over-ridden by other environmental factors. A heavy sediment load due to rough seas interferes with light transmission and phytoplankton do not thrive with low light penetration.

One phenomenon is shared by the Firth and Chesapeake Bay. In Chesapeake Bay late summer/autumn seasonal rains place a layer of lighter freshwater over the more dense seawater. Different conditions in the Firth produce a similar result. Seawater, isolated from the oxygen at the surface slowly becomes anoxic as the rain of dead plankton comes down and is decomposed by bacteria.

In conditions of severe oxygen depletion decomposition produces not carbon dioxide but a much more potent global warming gas, methane. This is not usually a problem. As the gas moves upwards it is quickly broken down into carbon dioxide. However, in storm conditions seawater mixing releases it quickly into the air.

The world's estuary systems were once considered to contribute only 3% to global warming. This recent research suggests that Chesapeake Bay manages that amount all by itself.

The extra productivity of many estuary systems due to nutrient enriched land runoff will enhance global warming. An increased input is also coming from the permafrost regions. Un-decayed plant material, accumulated over the millennia, is now breaking down as the permafrost melts. The extra carbon dioxide gives another impetus to global warming.

The way plants respond to stimuli can be important. So think about it before playing that heavy metal tune in the garden.

Book review

Delightful insights into the work of museum curators

THE UNBURNT EGG: more stories of a museum curator, by Brian Gill. Awa Press, $38

Perched on a pile of books and papers is a simple cardboard tray in which there lies a godwit. It looks a little ragged, its bill tip is missing, but attached to its feet are several labels, one of which refers to Norfolk Island, 1804.

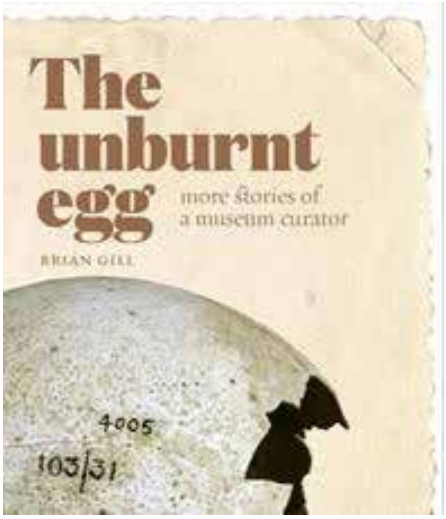
That is what led me to the Naturhistorisches Museum in Vienna one morning in 2008. For it was from this specimen, collected by Ferdinand Bauer, official artist on the voyages of Matthew Flinders in *HMS Investigator*, that the Alaskan population of Bar-tailed Godwits was first named and described for science.

But also attached to this object is a story. Collected in September, the bird is an adult showing remnants of breeding plumage, so it likely had recently arrived back from Alaska. Yet its travels were not over. In 1805, after a voyage of many months, *Investigator* limped into Liverpool. *The Liverpool Chronicle* described 'her sides being covered with barnacles and seaweed, and her sails, masts, and rigging presenting the usual signs of a vessel that had been abandoned'. On board was Bauer with his collection of specimens, and over 2000 drawings and paintings of plants and animals from Australia, Timor and Norfolk Island.

Unfortunately his subsequent publishing career was something of a disaster, partly due to his perfectionist standards: he could not find anyone capable of engraving or colouring plates to his satisfaction, so had to do it himself. Also, Bauer's return to England coincided with the Napoleonic Wars, not an ideal time for launching expensive botanical publications.

In 1814 he returned to Austria and lived near Vienna until his death in 1826. At an auction of his estate 114 of his bird specimens were acquired for what is now the Naturhistorisches Museum where they remain today. One is the object before me, labelled *Limosa baueri:* named after Bauer by Johann Naumann, in 1836.

Any natural history collection in a good museum will have hundreds of such specimens: and behind each there



will be a story. In *The Unburnt Egg* Brian Gill, recently retired as Curator of Land Invertebrates at Auckland Museum, tells many such stories. A sequel to his earlier collection, *The Owl that Fell from the Sky*, this is another fine publication from Awa Press, offering a comprehensive account of the role of museums and curators, and the processes involved in building, managing and making effective use of natural history collections.

But this does not arrive in the form of lengthy expositions, rather through the stories and the context in which they are told. As Gill writes, 'The very stories in this book are examples of ways in which new life can be breathed into hundreds of facts first reported in a multitude of academic publications.'

Museum collections are one of the essential foundations of science. It is the task of Natural History Museums (through egg collections for example) to 'make a permanent and verifiable scientific record of biological biodiversity and its distribution geographically and through time'.

Research using museum specimens can produce extraordinary results. One of Gill's own specialist interests is the cuckoos and he tells how over 400 specimens of Shining Cuckoo from all over the world established there were two distinct populations wintering in widely separated regions in the pacific.

Similarly, he collected 1120 records of Long-tailed Cuckoos, from skins in collections around the world, or references in diaries and field notes of travellers through the Pacific. From these he was able to chart the movements of birds through the year. Revealed was a fan shaped distribution for a species that breeds only in New Zealand, but then migrates northward in a great arc across the Pacific.

A dead rat in a jar of preserving fluid introduces an account of one of New Zealand's greatest ecological disasters. The irruption of ship rats on Big South Cape Island in the early 1960s, and their exponential population growth, led to the disappearance of the last population of South Island Snipe, the Bush Wren and the Greater Short-tailed Bat.

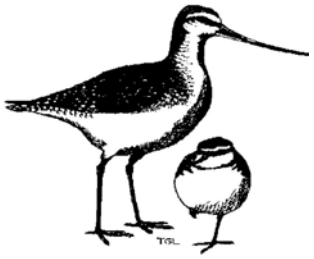
'The loss of this wren is achingly sad at several levels,' writes Gill. 'It is the most recent loss of a species of New Zealand bird, and the wren was imperilled just a little to early to be saved by translocation methods now perfected. Its demise, not realised at first, attracted little public attention, and it was the loss of a member of a family important internationally to the understanding of bird evolution.'

Rat numbers on the island grew so big they almost ate themselves out of house and home, stripping everything edible on the island, even the wallpaper in the huts of mutton birders. They then crashed, although sufficient rats survived to maintain a smaller population. Gill then goes on to draw a pithy but persuasive analogy on a somewhat wider scale involving our own species. 'Countries want the impossible – economic growth without end – and our main politico-economic structures promote few alternatives. Yet endless economic, material and population growth is as damaging and pointless as was the proliferation of rats on Big South Cape Island.'

Gill also tells of his travels to Samoa, Tonga, Wallis and Futuna, Rarotonga, or to museums around the world – the Smithsonian, Paris, New York, London, Brisbane, Melbourne, Sydney and Canberra – or even a graveyard in southwest London. The significance of a brown feather found in a packet of sugar, or a gecko found in a can of beer opened in Singapore, or the unburnt egg itself. There are many great stories here: and there is a wry, accurate and entertaining raconteur to tell them.

Keith Woodley

PUKOROKORO MIRANDA NATURALISTS' TRUST



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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.

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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 Pukokoro 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 Louisa Chase at 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 12 and November 20. 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.

If you like birds you'll love these delightful gifts

Bird bookmarks: Tui, Fantail and Morepork, $8.90 each. Designed and made in NZ from sustainable and compostable materials. Easy and light to post, fit in with most greetings cards.

The Shorebird Centre is a paradise for bird lovers. It's the best place in New Zealand to learn about our shorebirds and then wander down to the coast to see them. And our shop is filled with beautiful, eco-friendly bird gifts: books, bookmarks, ornaments, jewellery, toys and clothes. Just look at this selection of new arrivals.

Bring some cute colourful birds into a child's room with this Tweet Bird Mobile for $24.90. Designed and made in NZ from sustainable materials. Flat packed and easy to post.

NZ Bird Keyrings

$13.90. Made in NZ by Jo Luping Design. Packaged in a card gift box.

See our range of of bird greeting cards from $4.50.

Family Growth Chart: The perfect gift for birding families! $24.90. Designed and made in NZ.

Recyclable or compostable at end of use.

The Shorebird Centre Shop is widely acknowledge as having the finest collection of natural history books in the land. Of course a good many are about birds. But we cover a much wider range than that. And there are also some wonderful children's books.

Try the delightful children's series by Ned Barraud and Gillian Chandler.$19.90 each

If you can't find the time to visit the Centre go to our online shop at

https://shop.miranda-shorebird.org.nz/ or ring 09 232 2781.

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