Pūkorokoro Miranda News

Journal of the Pūkorokoro Miranda Naturalists' Trust

May 2023 Issue 128

Report of Flyway Meeting

Avian Influenza – AhChoooock!

An Update on Skinks

Miranda chenier plain and stilt ponds BRUCE HAYWARD

Editorial

The Stilt Ponds on a calm, cloudless morning in early April, are a bustle of croaking, honking, yapping, birdlife - all backlit in the low sun. Swans, many preening and sleeping, dozens of Mallards and Shoveler, and a few Canada geese afloat or standing along the edges. Scattered everywhere are loose flocks of restlessly vocal stilts. Out in the middle of the ponds are nine Dabchicks going about their business, diving, and bobbing. There are even rarer visitors too. A semi submerged fence line traverses the northern end of the ponds. On a post there is a preening tern, while a second forages low over the water, plucking invertebrates off the surface or from the air above. They are White-winged Black Terns, and one of them has been in residence here since January.

It is all very idyllic. But there is a disquieting shadow over it all. For this was the scene of the outbreak of botulism detailed in this issue. This is where Tansy did her daily rounds collecting and disposing of dead and dying birds. This is where excessive water retention creates serious issues for us. Conditions underlying the presence of these abundant waterfowl and those diving Dabchicks, mean a major component is missing. The absence of waders apart from those stilts, underline how the ponds are not functioning as they once did. There should be a shallow water regime regularly subject to tidal flushing. In this issue we report on our intention to restore that regime.

The Resource Management Act procedure required to do that, illustrates the difficulty of reconciling two systems: legal, which is a human construction, and ecology. Our consent application affects the Coastal Marine Area, and so adds complexity to the process. The case of the shrinking braided rivers of Canterbury (see page 9) is another example.

We report also on another looming shadow, already wreaking havoc among bird populations elsewhere in the world. The virulent strain of avian influenza H5N1 is not in New Zealand yet, but it is likely on its way.

Elsewhere David Lawrie reports on the recent Flyway Partnership Meeting of Partners in Brisbane. The Chinese Conservation Education Trust (CCET) celebrates its 21st anniversary. And once again moths make an appearance, this time accompanied by skinks.

2024 Calendar

Our calendars are very popular. The 2023 one sold out before Christmas. We are now seeking photos for the 2024 one. If you have images of Pūkorokoro – not just birds, but any other aspects of this place – its biodiversity, its landscape, its changing moods – please send them to us.

Keith Woodley

From the Chair

The Trust council is made up of people who put their efforts, their heart and soul into the place. All of us have other responsibilities, and the time we can put into the place waxes and wanes with what's happening in our daily lives. For all that, it's fair to say that over the last 10 years Ann and Ray Buckmaster have waxed a lot more than they've waned. They've been instrumental in sharing the story of shorebirds, in doing our part to keep the birds coming. After 10 years Ray and Ann have made the decision to step down from the PMNT council. It's hard to recognise all the work they have done for PMNT, I've called out some items below, but I'm almost certain to have missed something.

The restoration project which Ray and Ann started, secured funding for, grew plants, drilled holes, planted plants, weeded weeds, secured more funding for and generally shepherded through its early years

The flock project – engaging with a younger audience, and sharing that around the world – at its height the flock spent a week in Devonport, with thousands of birds planted in the reserve. The flock project has never really stopped, with painted birds arriving on our doorstep just last year from an Alaskan school.

Running the PMNT Facebook account - which can take a lot of time – particularly when satellite tagged birds are migrating and questions are coming thick and fast from the general public.

Ensuring the need for a new manager's roost was clear, then pushing the fundraising for it.

And then there are all the other things, raising funds for, and then doing much of the renovations for the bathrooms in the units, involvement in the field course for several years, numerous small improvements around the Shorebird Centre, creating art for the t-shirts that we are selling in the shop.

My immense thanks, and the thanks of the whole Trust council, to Ray and Ann for the work they have done for PMNT and, for shorebirds.

With the AGM coming up I look back at quite a year. It started quiet – after Covid, visitor numbers still low, but built through the year. By the end of the year we were at nearly pre-Covid numbers. March is usually our biggest visitor month, though January to April are also big. In 2023 the January visitors were the highest we've had (just), February was a bit lower and March visitor numbers are almost exactly the same as 2019. The visitors have been a bit different, more cyclists, less overseas tourists, although that appears to be reverting, with increasing numbers coming through the door each month.

As the visitor numbers grew so did the activity – a new house and then a deck for the house. With new staff members came tidier carparks, better maintained tracks, weeds were kept down round the hides and the predator trapping effort increased. The Shorebird Centre has had a presence at the Kaiaua markets. We had live in volunteers for six weeks. Keith and others are again giving large numbers of talks, both at the Centre and away from it. We are discussing survey trips to China and Korea again.

I've only realised recently how much harder the pandemic and the (necessary) responses to it have made the work we do. There is a real joy in seeing the expanding horizons again. The coming year will no doubt have its challenges, one of which will be filling the giant hole left by the Buckmasters, but I also have no doubt it will be an amazing year. We will have some vacancies on council – please if you have any interest, talk to Keith or I, or any other council member about what's involved.

Gillian Vaughan

Shorebird Snippets

Spotting Scopes

Gardening Volunteers. L-R Norah Peachman, Esther Burgess, Claire Exley, Margaret Wignall, Robert Peachman KEITH WOODLEY

The Centre's collection of scopes continues to grow. We are grateful to Jean Wignell for the donation of a Kowa scope and tripod that belonged to her late mother, Margaret. She was a long-time member of the Trust. She was also a gardening volunteer, regularly joining Esther Burgess and Norah Peachman's team. Much of the vegetation around the centre grounds and Widgery Lake is the result of their efforts over many years.

Plantings around Widgery Lake KEITH WOODLEY

Cyclone Gabrielle

The Centre escaped the worst of the severe weather events over summer. As cyclone Gabrielle approached however, we were somewhat nervous. With memories of the tidal surge of January 2018 still fresh, reports of 13 metre swells off the east coast of Northland induced caution. On the Monday we evacuated the centre just in case. Returning the following morning I found everything unchanged. There was considerable surface flooding in neighbouring paddocks, and Widgery Lake was up on the grass, but no damage was evident. The lethal aspect of the 2018 event was strong north easterlies blowing into the Firth coinciding with a king tide. As Gabrielle moved across the outer Hauraki Gulf to the north of us, winds were from the southeast and southwest, reducing the possibility of dangerous swells building up. But if we emerged largely unscathed, there was no escaping the shock at how severely other parts of the country were impacted by this massive event. And the prospect of future events must surely end any complacency over what lies ahead from climate change.

Chinese connections

PMNT'S long history of working in China has become one of our defining roles. No less important, however, is our engagement with local Chinese communities. Publicising the issues faced by migratory birds through colossal habitat loss at staging sites in East Asia has been a key task for the Trust.

In this regard we owe much to former council member Estella Lee, who, through her voluminous networks, has fostered within those communities a deep interest in Pūkorokoro and its wildlife. A founding member, and inaugural Chair of the Chinese Conservation Education Trust (CCET), Estella has brought many busloads of visitors to the Shorebird Centre. Indeed, a visit to Pūkorokoro was the first ever activity of the newly formed Trust.

Parul Sood, Auckland Council Waste Solutions general manager congratulating Estella Lee and CCET

In April CCET celebrated its 21st anniversary by launching an eBook telling the story of the Trust and the people behind it. It is a compelling read. The diversity of environmental projects they have initiated or participated in is extraordinary. And Estella's expertise and energy is threaded throughout the story.

www.ccet.org.nz/home/wpcontent/uploads/2023/03/CCET_20th_Anniversary_eBook_V1.1.pdf

Pūkorokoro Miranda Shorebird Centre NZ China Friendship Society trip March 2023 RICHARD LAWRENCE

A visit by 50 people from the New Zealand China Friendship Society in March represented another point of contact with those communities. A lively talk at the Centre was followed by a trip to the hides, where the bird flocks co-operated very well.

Deck and carport

Tansy Bliss helping concrete the deck piles KEITH WOODLEY

The new deck emerged in stages. It first appeared last August, in the form of timber stacked underneath the bushes beside the new cottage. One had to use imagination to visualise it as a deck. There it remained as spring rolled into late summer. Then in late February, thanks to Adrian Riegen and a team of volunteers, the pile was transformed into a splendid structure, extending along three sides of the house. There is also a car port.

Keith Woodley

Deck building volunteers KEITH WOODLEY

Consent Application for stilt pond drainage

The seaward landscape south of the Shorebird Centre is dominated by the Stilt Ponds. During most high tides the visitor should see large flocks of waders – godwits, knots, Wrybill – as well as stilts. When there is water in the ponds there will also be ducks, mainly Mallard or Grey Teal. But there should be times when the water is very shallow, or not there at all. This used to be the normal regime, attuned to regular flushing during the monthly tidal cycle.

Increasingly, over the last few years, this has not been the case. Steady accretion of sediment in the outlet channel south of the car park, along with mangrove encroachment, has blocked regular drainage. The highest tides still flood the area, but too much water is held back and for too long. Rainwater then compounds the situation. The result is a profusion of waterfowl: all the duck species are there, but then so are Black Swans and Canada geese. Even Dabchicks. The presence of these diminutive diving specialists is an attractive novelty for the birder, but a potent indicator of the problem.

On the higher tides in the lunar cycle, when alternative high tide roosts around the Firth are flooded, the Pūkorokoro coast becomes even more important for the birds. The Stilt Ponds are a critical part of the overall roost system. But shorebirds require shallow water, so the area has become unavailable to them.

Excess ponding of water creates other issues. Restoring full tidal exchange would remove the accumulation of bird droppings. In the higher temperature conditions of the summer months the decomposition of these, in what is then a shallow unchanging body of water can remove oxygen, creating conditions for botulism and other toxic organisms to develop. A further problem is a decreased level of salinity fluctuation and biodiversity. Evaporation through the warmer months, associated with limited tidal exchange cause hypersaline conditions which impact on biodiversity of invertebrate fauna and salt marsh vegetation.

Further evidence of something wrong - Black Swan cygnets on the Stilt Ponds. BEVAN WALKER

A resource consent to address this issue has been issued by Waikato Regional Council. We are currently discussing what needs to be done with a local contractor.

Keith Woodley

Recent sightings at Pūkorokoro

International Migrants:

- 400 Bar-tailed Godwit
- 250 Red Knot
- 2 Pacific Golden Plover
- 2 Whimbrel
- 3 Turnstone
- 1 Black-tailed Godwit
- 1 Sharp-tailed Sandpiper
- 2 White-winged Black Tern
- 1 Whiskered Tern

New Zealand species include:

- c.2000 Wrybill
- 2400 Pied Oystercatcher
- 111 Banded Dotterel
- 70 Royal Spoonbill
- 1 Kotuku
- 9 Dabchick

Dead and dying birds became a daily feature around the Stilt Ponds this season

Keith Woodley reports


Grey Teal a victim of botulism TANSY BLISS

In February and March there was a mass mortality of waterfowl around the Stilt Ponds. Over 400 birds – mainly Mallard and Grey Teal were found dead or needed to be euthanised. Other affected species included Black Swan, Paradise Shelduck, Shoveler, and five Pied Stilts. Laboratory tests revealed botulism, a type C botulinum neurotoxin to be the main cause.

Pūkorokoro was not alone, with a major botulism outbreak reported from the Whangamarino Wetlands as well as sites on the Hauraki Plains. In drains and other waterways around the lower Piako River botulism outbreaks have been a regular occurrence for many years, but Pūkorokoro has rarely been impacted. Certainly, an event of this scale is unprecedented.

The clinical signs of botulism in affected birds are flaccid paralysis of the neck, wings, and eyelids. Clinical signs and mortality occur within 1-2 days of exposure. In all cases it is removal of the decaying organic material that leads to the quickest resolution of the problem as that is the fuel for these bacteria. So, to limit the further spread of toxins, bird carcasses need to be removed from the environment as quickly as possible. Kaitiaki Ranger Tansy Bliss had the unenviable job of patrolling the area daily to retrieve and bury affected birds. While there was some welcome assistance from DOC Hauraki staff, the bulk of the grim task fell to her.

Ministry of Primary Industries staff in their report commended Tansy's efforts. 'In this case your prompt removal of the dead birds from the water, led to less toxin being formed within the dead bodies of birds and released into the Stilt Ponds, and thus less exposure of the remaining birds.'

According to MPI, 'clostridial neurotoxins are some of the most potent and effective biotoxins known, with efficacy down in the parts per billion range (nanograms per kilogram of host bodyweight). People use botox (clostridium neurotoxin type A) to stop muscles from contracting and showing wrinkles, and its use in medicine for controlled effect has been around for decades. All clostridium botulinum neurotoxins interfere with neurotransmitters and therefore they all cause some degree of paresis (weakness) or paralysis (inability to move a muscle) depending on dose and exposure route. When animals get botulism, it is usually from eating pre-formed toxin of Type C or D botulinum toxin.'

Anaerobic conditions favour clostridial bacteria. A decaying protein source – such as dead fish, eels, birds, any mammal or it's sewage, and warmth, are the usual prerequisites to an epidemic of botulism in wild birds. Shallow water is more likely to be anaerobic and is easier to warm. The toxin is produced by the bacteria in the decaying organic matter, which then contaminates the surrounding water. The toxin is also found in the maggots feeding on the dead. Birds such as ducks and teal that feed with a shovelling or dabbling motion likely have an increased risk of exposure due to their foraging behaviour. Animals that feed on maggots are also likely to be exposed.


Disposing of a Black Swan botulism victim TANSY BLISS

By mid-March we appeared to be over the worst of the outbreak. Cooler temperatures heading into autumn probably helped ease conditions. It is, however, likely to be a recurring issue, so appropriate management of the Stilt Ponds and water levels remains essential.

NOTICE OF AGM

The Annual General Meeting of Pūkorokoro Miranda Naturalists' Trust will be held on Sunday 14 May at 10am, at the Shorebird Centre. The high tide is at 1410.

There are several vacancies on the Trust council. Do you have interests or skills that may be of value to the Trust? You do not need to be primarily bird-oriented to become involved. In fact, interests in other aspects of the natural world may also be very useful to us.

Migration of Red Knots and other species.

www.globalflywaynetwork.org/

Each species that migrates has its own stories, and with the increasing miniaturisation of satellite transmitters, there are more and more of those stories to tell. The Global Flyway Network works with numerous organisations, like Massey University, to follow numerous species! They are currently tracking Red Knots (some from the Pūkorokoro shell banks). Go to *www.globalflywaynetwork.org/tracks/project/red-knot-new-zealand-china* to follow along.

You can find out about both Black-tailed and Bar tailed Godwit migration, Eurasian Spoonbill, Eurasian Whimbrel, Nordmann's Greenshank and Eurasian Curlew migration on their site. Mid-April the GFN advised they were updating the website to cope with more data and more users, so be patient if it takes a while. Otherwise, you can follow the Global Flyway Network on twitter (or check the feed on their homepage) to keep track of the big moves.

Shorebirds aren't the only group that migrate.

The BTO is tracking cuckoos (*www.bto.org/cuckoos*). They have found the cuckoos leave the UK earlier than expected, with some birds heading through Italy into the Congo rainforest while others head down through Spain to the Côte d'Ivoire, then inland to join the other birds in the Congo.

How does all the tracking and banding help conservation?

Juan Navedo and Theunis Piersma argue in a letter published in Feb 2023, that because the tracking of individual migrants leads to better information we should be using this information to better define wetlands of international importance, rather than focussing solely on counts and minimum numbers. They suggest that *"The sophisticated techniques to measure population characteristics now available should be used to modernize guidance for the application of Criteria 4 and 6 of the Ramsar Convention for waterbirds, based on*

- *time spent in a site throughout migration:*
- *critical ("untouchable") sites:*
- *robustness of designated site network including buffer areas:*
- *full life cycle information—including early life phases:*
- *refuges used on-and-off during migration in emergency situations.*

In these enhanced ways, migratory waterbirds can enact their roles as effective sentinels of the ecological state of the world."

Search for "Do 50-year-old Ramsar criteria still do the best possible job? A plea for broadened scientific underpinning of the global protection of wetlands and migratory waterbirds" to read more.

Similarly Josh Nightingale and others have written a paper called "Conservation beyond Boundaries: using animal movement networks in Protected Area assessment" which looks at colour banded Black-tailed Godwits and how they use habitats as a network, moving in and out of protected areas. The data that is available from studying the networks of these individual birds can be used in Environmental impact assessments. In the case they are looking at, the Tagus estuary in Portugal, impacts of developing the non-protected areas are greater than would otherwise be expected. If the paper is a bit much, a good plain English summary is at *www.wadertales.wordpress.com/2023/04/07/conservation-beyond-boundaries.*

Hunting Pressure in Kamchatka

When our birds go north, they move into different worlds and are subject to different threats than are found in New Zealand. The coastal land creation schemes that have destroyed so much habitat around the Yellow Sea have been well documented in past years, but as the birds go further north, as they move to inland breeding grounds, and become widespread, territorial creatures, predation becomes a bigger threat. And in some places so does hunting by humans.

A recent paper by Konstantin Klokov, Yuri Gerasimov and Eugene Syroechkovskiy starts the process of assessing the hunting pressure on Arctic nesting shorebirds in the Kamchatka area, an area that our Red Knots are known to use, and Bar-tailed Godwits from Australia have been tracked to. The paper reports that about 45,000 shorebirds were hunted per year in the Kamchatka area, 80% of which, (37,000) were Whimbrel.

The current estimated East-Asian Australasian Flyway population of Whimbrel is about 55,000 birds. The authors note that if 37,000 Whimbrel a year can be shot then the estimated population is "significantly lower than the reality".

The remainder is about 1,600 large and medium-sized shorebirds other than Whimbrel, and about 6,000 small shorebirds of different species. Several key points:

- although Bar-tailed Godwit became a protected species in Kamchatka in 2019, Black-tailed Godwit is still a game bird. The study found that hunters did not differentiate between species of godwit.
- hunting for small shorebirds has decreased but is still significant.

The paper has several conclusions and recommendations; however, this is clearly only the beginning of the work needed to assess the impact of hunting in the area, and on our shorebirds.

To find out more google "Assessment of hunting pressure on Arctic-nesting shorebirds: first results from the Northeast of Russia"

Compiled by Gillian Vaughan

Report of Flyway Meeting

The 11th meeting of partners (MOP) of the East Asian – Australasian Flyway Partnership was held in Brisbane on 12-17 March. These meetings are usually held every one or two years, but due to the Covid-19 pandemic, this was the first since the 10th MOP at Changjiang China in 2018. Once again International Liaison Officer David Lawrie represented PMNT at Brisbane, and reports on the meeting.

Brisbane MOP EAAFP delegates

Co-Hosted by the Australian Government and Birdlife Australia, in attendance were representatives of most of the partners apart from China and the DPRK. The other New Zealanders present were Bruce McKinlay representing the New Zealand Government, David Melville in his position as the Vice Chair of the technical sub-committee and Jennifer George as a consultant who prepared papers on sister site partnerships and national partnerships. All three are also PMNT members.

On the Sunday before the official meeting started there were meetings of the various working groups and task forces. I attended the shorebird working group and also the CEPA meetings. These were the ones that I had the most interest in, although there were several others taking place at the same time.

The next day the meeting was officially opened with a ceremony by local indigenous people. As host, the Australian government chaired the entire meeting.

The first day was largely taken up with papers relating to procedures and methods of working, the only major disturbance being a ruling that several of the papers could not be considered because of late submission to the delegates.

Over the next three days of meetings there were decisions on a number of matters which I set out below. Some of these were vigorously debated while others were accepted with a minimum of discussion.

The first decision was that the CEPA action plan for the next 5 years be approved. This is something that I have been on the working group preparing for the past 12 months. It sets out recommendations for future activities that could be followed by all partners. I will give a fuller report on this in a future magazine.

The second major decision was developing changes to the technical sub-committee terms of reference which had been set up in some haste at the previous MOP in 2018.

An issue causing much discussion were moves to simplify the site information sheets for Flyway network sites. Over recent years there have not been many new sites designated, even though there are approximately 1,000 important sites throughout the Flyway that need recognition. This decision will enable easier applications and also simplify updates of the site information.

Jennifer George presented a paper describing the values of national and site partnerships to engendering co-operation within countries and even between partners. This has less relevance to New Zealand because of our small number of sites and even smaller number of site managers. Jennifer also presented a paper setting out the advantages and benefits of sister site protocols. The PMNT – Yalu Jiang agreement was put forward as a good example of how these can operate. It should be noted however, that this arrangement was established under the East Asian-Australasian Shorebird Site Network, which preceded formation of the current Flyway Partnership.

The Flyway partnership recently adopted a paper which provides population estimates and trend data for all the migratory species in the Flyway. This was an extensive exercise relying on many sources of information. Discussion centred on how this document could be maintained to keep it relevant in the future. It is especially important that any negative trends can be identified early.

Concerns were raised relating to the outbreak of Avian Influenza, particularly in the northern hemisphere. A task force was established to monitor not only the HBA No. 1 outbreak (see page 10) but also to keep vigilant for other avian diseases in the future.

The next issue, introducing young people into the organisation, is something that we seriously need to consider at Pūkorokoro as well as throughout the Flyway. This remit was to mainstream youth by establishing a youth group and also by encouraging every member to introduce a young person onto the Flyway working parties. This is something that the Trust needs to consider in the near future.

EAAFP secretariat visit to Pūkorokoro. L-R David Lawrie: Dr Hyun-Ah Choi, Hanns Seidel Foundation; Yeonah Ku, External Relations Specialist Flyway secretariat; Jennifer George; Hyeseon Do, Senior Programme Officer and Vivian Fu, Senior Communications Officer.

The Christmas Island Frigate Bird *Fregata andrewsi* has been designated a species threatened with extinction. The outcome of this discussion was the formation of a working group to prepare a single species management plan to develop ways of understanding the threats and ways to overcome them for this species.

The Masked Finfoot *Heliopais personatus* is in a very similar precarious state. This bird is now rarely seen in its Asian habitats and a group is to be established to undertake research and define actions to reverse its slide to extinction.

During evenings and lunch times there were special interest group meetings to make the use of the various experts present at the meeting. I attended a number of these and made a brief presentation to the Yellow Sea monitoring group about our work in North Korea.

It was not all sitting around in meeting rooms, with a field trip on the Thursday to North Stradbroke Island, in Morton Bay. While this did lead to several bird observations it was good to get into the open air on an interesting island and have informal discussions with people.

Bruce McKinlay and I were sharing a room and every morning of the meeting we would get up at dawn and wander around the botanic gardens across the road from our hotel. This gave us the opportunity to see several species of birds in this urban environment, including the Bush Thick-knee *Burhinus grallarius* which were present in some numbers.

The meeting also signified the end of the term of Doug Watkins as the Chief Executive Officer. Doug has served for the past 3 years during the covid crisis and decided that he would finish at the end of his current contract. Doug has been involved in the Flyway partnership and its predecessors since their inception. I am sure he will continue to have an input in the future. His replacement has not yet been appointed.

The meeting is not only about the discussions but is also a good opportunity to meet the other delegates and experts and gain their expertise on the various issues.

Following the end of the meeting Hyeseon Do, Senior Programme Officer, Vivian Fu, Senior Communications Officer and Yeonah Ku, External Relations Specialist of the Flyway secretariat staff and Dr Hyun-Ah Choi, Researcher from the Hanns Seidel Foundation decided to visit the Shorebird Centre. They stayed with Jennifer George in Auckland but on the Tuesday morning we arranged for them to have breakfast at my house because it was a very early tide at Pūkorokoro. So after a quick breakfast we arrived at the hides, observed the birds and had a brief discussion with Tansy. We then visited the Shorebird Centre where they held discussions with Keith about long term future projects.

They really enjoyed their visit and now have a greater understanding of our centre and the type of work that we undertake.

David Lawrie

Dart River KEITH WOODLEY

Upper Rakaia valley KEITH WOODLEY

Shrinking Rivers

In a case where the law meets science, the environment and biodiversity may be the victims. More specifically the braided rivers of Canterbury, so essential to breeding Wrybill and other shorebirds, have suffered.

The problem is riverbeds big and small, such as the Rakaia and Rangitata, Makihikihi and Selwyn, have been shrinking. Across 20 rivers, nearly 13,000ha has been lost since 1990, an area roughly the size of Tauranga. This shrinkage is caused by surrounding landowners encroaching into river margins, constraining the river with flood protection barriers.

Legally? According to court judgements, yes. The problem is defining what is a riverbed. "The space of land which the waters of the river cover at its fullest flow without overtopping its banks".

This definition, critics say, is difficult – and, in some cases, impossible – to apply to a braided river.

Unlike their meandering cousins, such as the Avon or Waikato, braided rivers are intricate and complex: a tangle of mobile channels that twist around shifting gravel islands, ecosystems that flow both above and below ground, fluctuating across space, across time.

A further complication is that flood protection barriers can exacerbate flooding.

River scientists advocate taking a different approach to braided rivers. Instead of strangling them with rigid barriers, allowing them to move both dissipates the energy of floods and helps restore biodiversity. They say that barriers can enable flooding – removing them is not just better for biodiversity but can increase resilience and protect surrounding land.

Rather than looking for a traditional riverbed, experts look for a "braidplain", the area the river has historically occupied and may return to. The braid plain is much broader than a traditional riverbed and often includes houses, farms, and flood protection infrastructure. In some cases, it includes towns; in the case of the Waimakariri river, it includes part of Christchurch city. From the air, the former extent of a river may be visible in the form of ghost channels beneath pasture.

However, a High Court decision ruled a narrower definition of riverbed applies in law.

www.hobec.co.nz/news-resources/2019/ february/what-is-the-bed-of-a-braided-river

'Almost overnight, existing rules to protect the margins of braided rivers were hamstrung. In practice, it means most braidplain is now considered land rather than riverbed, allowing a wider range of activities to happen by default (actions in a riverbed are usually prohibited, but actions on land are usually allowed – a subtle but important distinction).'

For the full story by Charlie Mitchell: *www.stuff.co.nz/environment/300797892/how-19-words-thwarted-efforts-to-save-our-shrinking-braided-rivers*

Farewell to the Godwits

We had watched them over the summer months as their condition improved.
They were looking their best, healthy and plump which was ideal for the journey ahead.
The day at the hides had been busy with lots of visitors to view the birds.
The weather was perfect- a clear sky and a light southerly breeze.
Most of the visitors had left, and we were reflecting on the day.
And then it started: we sensed a change.
A large number of birds took off, not to go to the mudflats to feed but to fly high into the blue sky.
At first a loose group, but as we watched them climb it seemed to be a shallow v-shape.
We watched, entranced knowing they had a long, long flight ahead.
We privately wished them well on their journey and to return safely in September –
to Our Place- Pūkorokoro.

From a Pūkorokoro Shorebird Centre volunteer

Avian Influenza - AhChooooooock!

David Melville

Autumn, the season of mists and mellow fruitfulness, and a timely reminder from my friendly GP to get this year's flu jab. Time was when influenza was largely seasonal – for both humans and wild birds.

Avian influenza viruses (AIV) that have been around for millennia living in the guts of wild waterfowl, are usually asymptomatic, generally causing little effect to their hosts. Although many texts note that "shorebirds" also are important hosts, this is a result of heavily biased sampling at Delaware Bay on the east coast of the USA, where the density of waders and gulls feeding on horseshoe crab eggs can exceed 40 birds/sq m – extensive sampling elsewhere has found very low incidence of AIV in waders.

AIV are classified by a combination of two groups of proteins: Hamagglutinin (HA) which binds to host cells and of which there are 18 forms, and neuraminidase (NA) which facilitates the release of virus particles from infected host cells and of which there are 11 forms – hence a typical combination would be H5N1. As with Covid, any one virus subtype, such as H5N1, may have many, and continually evolving, strains.

The classification of viruses as being of low pathogenicity (LPAI) or high pathogenicity (HPAI), which can result from a single amino acid change in the H protein cleavage site, relates to mortality in domestic chickens since, until recently, large-scale mortality in wild birds was very uncommon.

The H5 and H7 viruses are mostly LPAI but have potential to become HPAI and so most attention is currently focussed on these.

In 1996 a new H5N1 virus appeared in domestic geese in Guangdong, South China and in 1997 spread through live poultry markets in Hong Kong. There were 6 human fatalities; further spread of the virus was avoided through massive depopulation of domestic poultry (1.3 million birds killed – this was the largest such exercise globally at the time, but is dwarfed by current levels of culling in the poultry industry – e.g., 77 million birds being killed in the UK in 2021-22). However, further outbreaks in poultry occurred in 2002 and 2003 but the H5N1 virus had a different genetic structure to that in 1997, and by 2004 this virus had spread quickly throughout poultry farms in Southeast Asia with sporadic cases in wild birds, as well as human fatalities.

In 2005 there was a large-scale outbreak in wild birds in Qinghai, China that killed more than 6,000 gulls, Black Shags and Bar-headed Geese – this being the first major mortality event involving wild birds since 1961 when more than 1,300 Common Terns died in South Africa. This virus then spread westwards across Eurasia, carried by both migrating wild birds and the poultry trade, with regular outbreaks in wintering waterfowl. The extent of mortality events increased greatly – in 2021 13,200 Barnacle Geese died in Scotland (a third of the flyway population).

Since 2021 H5N1 has been killing wild birds all year round, rather than mostly over winter, and in 2022 resulted in large-scale mortality of a wide range of seabirds in western Europe. The Netherlands lost 80% of its breeding Sandwich Terns in a few weeks, Gannet colonies in Scotland lost more than 30% of their breeding population, and more than 2,200 Great Skuas (7% of the world population) died.

Avian influenza H5N1 spread across the Atlantic in 2021, apparently caried by migrating birds that staged in Iceland enroute to Arctic breeding grounds, from where the virus was carried south by other birds to Canada and the USA. It then rapidly spread across the continental USA. This followed an earlier incursion in 2014 from East Asia, probably carried by migrating ducks.

Since late 2022, H5N1 has moved through Central America to South America where it has caused the death of tens of thousands of cormorants, pelicans, boobies and other seabirds, as well as spreading to waterfowl.

New Zealand has never had a case of HPAI but there is concern that migratory birds may bring it to the country. Until recently most attention has been focused on waders, although it is hard to see a Bar-tailed Godwit successfully completing an 11,000km migration from Alaska if infected with HPAI. However, other species returning to New Zealand via East Asia might be candidates. There has been relatively little sampling of waders in New Zealand but in Australia a very active surveillance programme over 15 years has resulted in many thousands of samples collected and not a single case of HPAI being recorded despite serological studies showing that Red-necked Stints had been exposed to HPAI H5 virus. The Australian studies suggest that it is a 'sink' for AIVs that are infrequently introduced to the country; those that do arrive apparently then circulate within Australia before becoming extinct – there being no integral links with the Eurasian virus gene pool.

New Zealand has been monitoring wild birds (mostly waterfowl) for AIV since 2004 – to date, although prevalence can be high (45.9% of Mallard at the Kaituna River mouth, Bay of Plenty in 2020), all our recorded viruses are LPAI.

The current outbreaks in a wide variety of seabirds, especially along the west coasts of South America, where a number of New Zealand seabirds, such as Antipodean Albatross, Chatham Albatross and Westland Petrel occur, raises another potential route for introduction of AIV to New Zealand. Very little is known about possible methods of virus transmission at sea (rather than at dense breeding colonies) and it remains unclear how much of a threat seabirds pose.

There is much knowledge missing regarding AIV and wild birds but the large number of current studies should help fill some gaps. However, from a management perspective we are still on the first step. The massive culling that has been employed for commercial poultry is unrealistic, and ethically unacceptable for wild birds. Measures such as carcass removal, advocated in some situations, may have little beneficial effect unless scavengers are assembling on carcasses and most of the carcases can be removed promptly – the threat to scavengers being highlighted recently by the death of at least 10 Californian Condors in Arizona and Utah.

The most important thing is to avoid introduction of the virus. New Zealand is fortunate in our remoteness and strong biosecurity measures on offshore islands.

In New Zealand we all have a role to play in being aware of the issue and keeping our eyes open for unusual mortality events, recognising that birds may die from many causes. Botulism, sadly familiar to visitors to Pūkorokoro, kills waders by poisoning them (Pūkorokoro Miranda News 104: 18). Not all major bird mortality events in New Zealand are disease or toxin related – wrecks of seabirds, which can be massive as in the 2011 prion wreck with an estimated 250,000 dead birds, may be associated with severe storms and food shortages.

Between 23 February and 3 March 2023, the FAO recorded 897 outbreaks of HPAI in animals 763 of which were H5N1.

If a significant number of birds are observed in a group sick or dying, report it immediately to Biosecurity New Zealand's Exotic Pest and Disease hotline on 0800 80 99 66

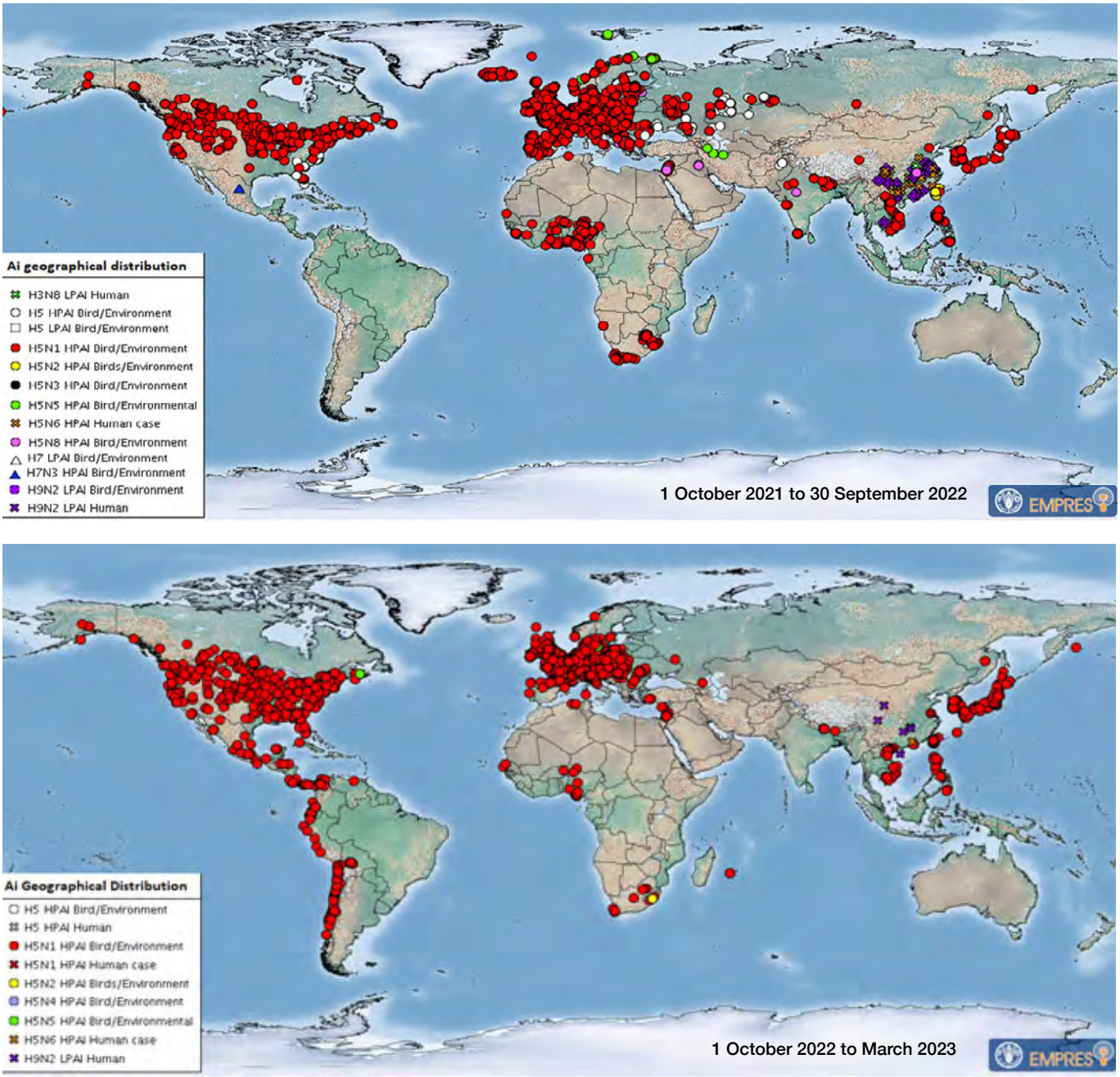
For further information:

www.mpi.govt.nz/biosecurity/pests-and-diseases-not-in-new-zealand/animal-diseases-not-in-nz/high-pathogenicity-avian-influenza-and-the-risk-to-nz/

Gartrell, B. 2022. *The risks and consequences of a high pathogenic avian influenza outbreak in Aotearoa New Zealand.*

www.newzealandecology.org/risks-and-consequences-high-pathogenic-avian-influenza-outbreak-aotearoa-new-zealand

The rapid spread of HPAI to South America is shown in the Figures below.



The global distribution of avian influenza viruses with zoonotic potential. Red dots show occurrence of H5N1 HPAI.

Source: FAO. 2023. *Global avian influenza viruses with zoonotic potential situation update 23 March 2023. www.fao.org/animal-health/situation-updates/global-aiv-with-zoonotic-potential/en*

Planting for Biodiversity at Kopu Bridge near Thames

The mouth of the turbid Waihou River forms the south eastern boundary of the Firth of Thames Ramsar site. A familiar feature of the western approaches to Thames and the Coromandel is the bridge spanning its broad channel at Kopu. Carol Fielding of Kopu Bridge Wetlands Care Group reports on a transformation occurring in the shadow of the bridge.

Looking North between Pohuehue on road bank to distant Wetlands sign are three species of rush. Tidal borrow pit in background. KIMI RUND

On either side of the historic Kopu Bridge and its 2011 replacement on SH25, is a saltwater estuarine area running parallel with the west bank of the Waihou River. This is also the south-eastern corner of Ramsar site 459 which includes 8927 hectares of Crown Marine area across the Firth of Thames/Tikapa Moana and along its western chenier coastline to include Pūkorokoro. When the original cover of kahikatea was logged and the flax lands were drained for farming, Tall Fescue *Festuca arundinacea* and Kikuyu *Cenchrus clandestinum* were grazed by cattle to the edge of the river.

Ngati Maru are tangata whenua and Orongo is the name for the area south of the bridges. 'Orongo' means a listening post. In pre-European times this was an ideal spot to listen for migrating birds in order to set appropriate lures and snares.

The area of our plant restoration project extends west from the mangal forest at the edge of this river through a sea meadow zone dominated until 2004 or so by the native sedge Marsh Club Rush/Kukuraho/ Purua Grass *Bolboschoenus fluviatilis* and Tall Fescue. Occasional shrubs of Makaka/ Saltmarsh Ribbonwood *Plagianthus divaricatus* dotted the area. Our eastern boundary is a borrow pit out of which a stop bank was created, part of the Hauraki Plains Flood Protection Scheme. The borrow pit is tidal, a valuable additional habitat in the mosaic of saltmarsh, shrubland, sea meadow and mangal. On top of the stop bank is the Kopu to Pipiroa section of the Hauraki Rail Trail.

Surviving sea meadow plants included Glasswort/Ureure *Sarcocornia quinqueflora*, Sea Primrose/Makoako *Samolus repens*, Batchelor Buttons *Cotula coronopifolia*, Half Star/ Remuremu *Selliera radicans*, Native Celery/Tutae Koau *Apium prostratum* and Arrow Grass *Triglochin striata*. We have successfully transplanted patches of these to speed up their coverage. Māori Musk *Thyridia repens* from Pūkorokoro area failed to establish as did several plantings of Upokotangata/Giant Umbrella Sedge *Cyperus ustulatus*.

One side of the road to the historic bridge has been planted in native species such as Ake Ake (*Dodonea viscosa*), Karo *Pittosporum crassifolium*, Coprosma *robusta* and *propinqua*, Manuka *Leptospermum scoparium*, Kanuka *Kunzea sp.*, Pohuehue *Muehlenbeckia complexa*, Coastal Tree Daisy *Olearia solandri*, Rengarenga *Arthropodium cirratum*, and Kowhai *Sophora microphylla*. The stony foundation of this road limits planting success on the other side.

Planting and pest control were begun prior to 2004 by Thames-Hauraki branch of Royal Forest and Bird Protection Society. Some of the plants that failed to thrive were Cabbage Tree, Kahikatea, Karaka, Nikau, Puriri, Totara and Wineberry. Flax has struggled on the salt flats but Harakeke *Phormium tenax* has quickly matured on the raised roadside overlooking the area and on less tidal ground to the south of the bridges. Hundreds of Pohutukawa *Metrosideros excelsa* were planted for several years and several dozen of them have flowered or are still alive, but many died, perhaps from salt water and lack of air around their roots. The canopy tree inside the mangal forest of Manawa *Avicennia marina var. resinifera* is now Ngaio *Myoporum laetum*. By 2014, about five hectares had been planted but not intensively so that much Tall Fescue remained and threatened to overwhelm the rushes, flaxes and Mingimingi *Coprosma propinqua*.

From 2016 a smaller group, Kopu Bridge Wetlands Care Group, has focussed on intensively planting and maintaining an area of about 1 hectare. We decided on this use of our limited human resource after seeing the success of planting three different rushes at 750mm spacing. Meg Graeme had noted a lack of Sea Rush *Juncus kraussii* var. *australiensis* and Oioi *Apodasmia similis* communities in 2006. As well as these two species, *Machaerina juncea* was trialled. It has matured and has a

Looking South towards roadside shrubbery. Ten year old flaxes in foreground. Patches of Makaka and rushes. KIMI RUND

Looking NE to the distant inland Manawa edge, is our typical inherited cover of Tall Fescue and occasional Makaka. KIMI RUND

sparser, shorter growth habit, allowing sea meadow plants to grow amongst the rhizomes. Our planted clusters of Makaka/Saltmarsh Ribbonwood have added seedlings to those of the original occasional bushes that grew throughout the site. Pohuehue and Ngaio are also self-seeding now.

Wildlife that will be attracted to this increased diversity includes Fernbirds, Banded Rails, skinks, Copper Butterflies and many invertebrates. At Pūkorokoro Miranda Shorebird Centre 74 bird species have been recorded, many of them rare or uncommon. The hub of this conservation area is 21km in a straight line from Orongo so it is likely that some of these birds will visit to feed and roost. Already we've seen Kotuku White Heron, Cattle Egret, Shoveler, Poaka Pied Stilt, Putangitangi Paradise Shelduck, Kawaupaka/Little Shag and a dozen more common and perching birds. As only two to five restorers are there for two hours each week, there could be other birds we've missed. The Little Shags roost on a nearby communication tower, with a convenient view of the tidal borrow pit.

The group is supported by Waikato Regional Council in buying plants. Annual planting of rushes and shrubs is dependent on numbers of volunteers, and has ranged from 800 to 1400 plants annually up to 2020. This year, 2022, we'll plant only 270, extending at the edges of previous planting, and in-filling where needed. We spray to clear Orache, Kikuyu and Tall Fescue and these are the main plants that we weed out for the rest of the year. The earliest intensive planting of rushes (in 2014) is so thick that only occasional weeds occur Rabbits and Hares nibble at young rushes and Makaka but do not kill them.

The storm surge of 5 January 2018 brought tens of thousands of Manawa seeds up to the road bank and killed a lot of the pre-restoration Makaka bushes. The borrow pit became a mangrove and Cotula nursery and was no longer tidal until early 2022 when it was cleared to replenish the stop bank.

Plants are bought from Te Whangai Trust nursery at Pūkorokoro as their plants are eco-sourced and grown locally.

This year we have placed dozens of Pirita/Green Mistletoe *Ileostylus micranthus* seeds onto a variety of marked shrubs and trees, hoping to increase the flowers we can provide.

Pohue/Pink Bindweed *Calystegia sepium* subsp. *roseate* provides our biggest flower. It appeared about six years ago. In the earlier, larger and drier planting area to the south of the bridges, this vine hangs in autumn like curtains from the tall shrubs.

Other plants for future planting are Toetoe *Austroderia splendens* or *fulvida* and another planting of *Thyridia repens*.

To see the plants that grew here until 1860s, we referred to the paper read by T. Kirk to Wellington Philosophical Society on Nov.13 1869, 'On the Botany of the Thames Goldfields'. His lists were added to by J. A. Adams in 1883, and printed in Transactions and Proceedings of the Royal Society of New Zealand Vol 16.

Further reading:

1] *www.doc.govt.nz/wetlands/wetlands* by region

2] McEnteer, John and Turoa,Taimoana 1993 *'Nga Taonga o Te Kauaeranga Māori Heritage of Thames'* a report commissioned for Thames-Coromandel District Council

3] Graeme, M. 2006 *'Estuarine Vegetation Survey: Inner Firth of Thames'*. Report prepared for Environment Waikato. Environment Waikato Technical Report 2006/40. Natural Solutions – Marine and Terrestrial Ecologists Ltd.

4] Focus, 2013 *'Restoration recommendations for the western bank of the lower Waihou River.'* Prepared for Thames-Hauraki Royal Forest and Bird Protection Society by the Focus Resource Management Group. Focus Report No. 13/106.

Shore skink MIKE VINCENT

An update on skinks in the Robert Findlay Wildlife Reserve

Tansy Bliss reports on skinks, good and bad, at Pūkorokoro.

It is just over 10 years since Wendy Hare reported on the pleasing results from a lizard survey carried out by the Ecoquest Education Foundation in the Whakatiwai Stone Fields, 20 km north of the Pūkorokoro Shorebird Centre *(PMNews 85)*. The two most numerous species caught were Shore Skink, *Oligosoma smithii*, and Copper Skink, *Cyclodina aena*. The article ended with the anticipation of seeing these native skinks in the Reserve and at the Centre. Wendy also added a note of caution about the invasive pest species of skink from Australia, Plague Skinks *Lampropholis delicata*, then known as Rainbow skinks. Although they were first seen in Auckland area in 1960s, in 2012 they were still unrecorded in the Pūkorokoro area.

I am delighted to confirm that over the summer we have been seeing some fat gleaming native skinks lurking in the sunny corners of the Kuaka Hide "wings" and scuttling about in piles of wood stacked in front of the Wrybill Hide. There have also been reports of native skinks out on the shell bank, dashing from the DOC 200 trap boxes and darting across the shell from piles of driftwood.

Unless one is adept at catching skinks either by hand or by camera, identification to species level can be tricky. The two native skinks caught on camera by our volunteers Tony Green and Mike Vincent have been identified as Shore Skinks *Oligosoma smithii*. We would therefore welcome any confirmed sightings and images of the Copper Skink, *Cyclodina aena*.

However, it is relatively easy to at least know if you are looking at a native skink or the introduced and invasive Plague Skink mentioned by Wendy back in 2012. Unfortunately, they are now well distributed around Pūkorokoro. A walk along the roadside on a late sunny afternoon to check out any new visitors to the Stilt Ponds, (Dabchicks, White-winged Black Terns, and a Whiskered Tern) is accompanied by scuttling in the undergrowth as small dark skinks dash off the roadside into the vegetation. Pause on the main track to the hides and fossick about in the Kikuyu grass or the Divided Sedge and you are almost certain to see the same, small, dark skinks scuttling away. Enjoy a cuppa on the Shorebird Centre deck and take note of who else is there, lapping up the sunshine. A Plague Skink or two will not be far away. On a cooler morning, one even had the audacity to come into the centre and sun itself on the lounge floor. Once you start taking note, you will see them everywhere.

How best to identify Plague Skinks

Their location, quantity, size, ratio of body to tail and colour are a good start, and if you can catch it and look at its head scales, you will have the definitive detail.

Locations: almost ubiquitous – could be in your garage, garden, or letterbox; in a folded sunchair, in the house, in industrial areas and all along our roads and paths. Native skinks are usually habitat specific and are often in herbage in more natural environments.

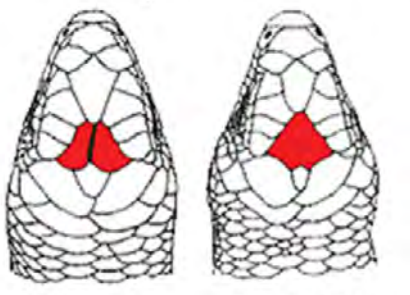
Quantity: numerous, regularly seen. Native skinks are in much lower numbers and quite shy.

Size: they are a small skink. Snout to vent (body excluding tail) - up to 55mm. Snout to tail - up to 110mm. Native Skinks: Shore Skinks are snout to vent – up to 82mm with a total length of up to 150mm. The Copper Skink is smaller with a snout to vent length of up to 76mm, and a total length of around 130mm but still larger than a Plague Skink.

Ratio of tail to body: the intact tail is long and thin and noticeably longer than its body. Native Skink tails are not usually longer than the body and can be quite thick, showing regrowth after damage or loss to escape predators.

Colour: a glossy brown or brown grey with an iridescent sheen in bright light.

Head scales: the frontoparietal diamond-shaped scale is singular. In all native skinks, it is divided in two.



Native Skink Plague Skink

Plague skink head scales TANSY BLISS

Native skink frontoparietal scales
TONY GREEN

This can be tricky to see without the aid of a magnifying glass or close-up photography.

How have Plague Skinks got so numerous and is it a problem?

Plague Skinks are "Unwanted Organisms" under the Biosecurity Act 1993 and yet since the 1960's have managed to become widespread from Northland to Waikato and the Bay of Plenty, with outposts in Wanganui, Palmerston North and Foxton Beach. In the South Island, there are established populations in an industrial park in Blenheim and at the Havelock marina, having travelled from the Coromandel in coils of mussel buoy ropes. Despite consistent efforts by MPI to control these outbreaks, Plague Skinks have persisted in any new areas they have colonised.

Plague Skinks have a few advantages over our native skinks which makes them both good colonisers and difficult to control. They lay between 2-8 eggs per clutch and can have up to 3 clutches a year. If a female finds a favourable place for egg laying, other females may also use it. These communal nests have been reported to have up to 250 eggs in them. The eggs are laid in loose soil, so can be in spoil heaps, compost, fine gravel, plant pots, or even in the folds of large sacks where soil and dirt have accumulated. The eggs are slightly leathery and if disturbed by movement or vibration during the last stage of development, the unborn skinks can spontaneously hatch and quickly disperse.

This was experienced literally first hand as Kaitiaki Ranger, Hera Clark was clearing alongside the main track to the hides and uncovered a little nest of eggs. She called me over and as we examined the eggs cupped in her gloved palm, a diminutive but very active Plague Skink hatched and tried to escape. Another skink partially hatched but did not wriggle free.

Plague skink eggsTANSY BLISS

The ability to have numerous young per season and to have communal nests, means high densities of Plague Skinks can quickly appear. In contrast all but one native skink give birth to an average of 4-6 live young a year. Plague skinks also reach sexual maturity in one year whereas most native skinks take 2-3 years. This further increases their ability to multiply rapidly. While the exact impact of Plague Skinks on native skinks is not yet known, it is thought they directly compete for food resources and will prey on native invertebrates.

What can you do to stop the spread of Plague Skinks?

Learn to identify Plague Skinks so you know if you have them in your home, garden or garage. *www.pest-detective.org.nz/culprits/plague-rainbow-skink/*. If you do, be extra vigilant checking for eggs or live skinks before you travel to an area that is Plague Skink free. Be especially cautious if travelling to any of the pest free islands. If you introduce Plague Skinks, they will likely be there for good!

Read and follow the biosecurity information provided by the Department of Conservation and Auckland District Council provided in the link below.

www.doc.govt.nz/globalassets/documents/parks-and-recreation/places-to-visit/auckland/hauraki-gulf/ti-plague-skink-factsheet.pdf

Reference: *Reptiles and Amphibians of New Zealand. A field Guide.* Dylan van Winkel, Marleen Baling and Rod Hitchmough.

Newly hatched Plague Skink TANSY BLISS

Moths resting in egg carton after coming to light trap TANSY BLISS

More on moths

Tansy Bliss continues her exploration of moths at Pūkorokoro.

With the departure of Ecologist and moth researcher, Sean Clancy in late February, I assumed moths would feature less in my Kaitiaki Ranger role, but this has proved not to be the case.

Almost immediately the Convolvulus Hawk-moth or Hīhue caterpillar made itself known to one of our Wednesday gardening volunteers as she cleared the invasive bindweed from the native Oioi at the edge of Widgery Lake. The caterpillar was extremely large (70mm) and a striking luminous green as it hung amidst the Oioi stems.I was quite confused as to which end was the head, for it had a magnificent horn pointing skyward. I found out the horn was the rear end, when it deposited a soft green dropping into my hand while I was moving it to a safer location!

Convolvulus Hawk-moth caterpillar in Oioi TANSY BLISS

Establishing which end is which TANSY BLISS

Cycling home a few days later I noticed a substantial brown caterpillar crossing the cycle track. By the time I dismounted and got my camera ready, it had retreated into the vegetation. When I attempted to remove it, it flexed and pulsed, flashing its colourful horn in a very aggressive manner. This was a brown version of the Convolvulus Hawk-moth caterpillar (larva) and far less attractive than the green one seen in the Centre gardens.

In early April, Kaitiaki Ranger Hera Clark informed me of a huge green caterpillar in one of the Shorebird Centre DOC 200 trap boxes – it was another Convolvulus Hawk-moth larva. As mentioned in *PM News 127*, there had been no verified records of the larva at the Shorebird Centre, despite adults being seen on numerous occasions and thought to be breeding here. At last, we can confirm their presence at Pūkorokoro.

It is likely that all these larvae were ready to pupate. However, unlike the well-known Monarch Butterfly larvae, they will not turn into delicate pendulous jewels. Instead, the larvae burrow into loose soil or sand and pupate in an underground chamber. Here in the dark confines of the earth, a new Convolvulus Hawk-moth is formed. The challenge is now to see a pupa, a shiny russet- brown bundle, with an external proboscis or elongated sucking mouth part. Planting in the Robert Findlay Wildlife Reserve on the 24th June will be a good opportunity to look out for such an odd creature.

www.landcareresearch.co.nz/tools-and-resources/identification/what-is-this-bug/kumara-moth-pupa/

Also in the moth article, Issue 127, Sean Clancy reported that the Shorebird Centre could be one of the world's most southerly outposts of a breeding population of Convolvulus Hawk-moth. Any seen further south would likely be annual migrants from Australia. However, while light trapping near Raglan in late February, we came across another possible breeding population. Up to 15 of these large distinctive moths came to the trap, each night. Their sheer number and freshness made us suspect they were breeding in the area and had emerged close by. Based on this information, I am now cutting back some of the rampant Convolvulus vine around Widgery Lake before it takes over entirely!

Moth encounters in the Robert Findlay Wildlife Reserve

An interesting consequence of the botulism outbreak in the Stilt Ponds (see page 5), was the need to circumnavigate the ponds daily to remove dead and dying waterfowl. This was often early in the morning. As I strode purposefully through the pondside vegetation, I was struck by the number of different moths flying up in front of me. Some were pale, small, and non-descript, but one was numerous and slow flying enough for me to identify as a Golden Grass Carpet Moth or Willowherb Yellow *Anachloris subochraria*. It occurs naturally in New Zealand and Southern Australia and its larvae will feed on introduced Willowherb and Ragwort. Little wonder it is in abundance, as there is plenty of the weedy Willowherb currently in the Reserve!

Surprisingly, even the tedious task of removing invasive Kikuyu grass from around some of our native plantings, turned up interesting moths. The rather plain and unattractively named Cosmopolitan Armyworm, *Mythimna separata* and more exotic looking Oriental Leafworm or Tropical Armyworm, *Spodoptera litura* were hiding deep amongst the

Cosmopolitan Armyworm TANSY BLISS

Oriental Leafworm or Tropical Armyworm TANSY BLISS

vegetation and remained motionless long enough for me to record their presence.

Both moths are immigrants that have become resident in New Zealand. They are widespread in South-east Asia, Australia, and the Pacific. Their larvae can become serious agricultural pests with the Cosmopolitan Armyworm attacking maize and grasses and the Tropical Armyworm causing significant damage to lucerne crops, and clover, plantain, and chicory in pastures. Dr Robert Hoare, in his photographic guide to *Moths and Butterflies of New Zealand* relates how in 1910, a plague of Cosmopolitan Armyworms brought the Whanganui train to a standstill! More recently in 2022, it was reported on Stuff, that Bay of Plenty residents complained of "a plague of black worms like they fell out of the sky". These were identified as Tropical Armyworm larvae.

www.stuff.co.nz/bay-of-plenty/300574302/plague-of-black-worms-like-they-fell-out-of-the-sky-chomping-bay-of-plenty-gardens.

So, let's pay more attention not only to moths but also their larvae as we work in our gardens and the Reserve and why not check our windows on these longer dark evenings to see who has come to the light.

For anyone interested in learning more about our moths and butterflies, I recommend Dr Hoare's excellent guidebook. It is available from the Shorebird Centre bookshop, just click the link.

Reference to newspaper article: *www.envirohistorynz.com/2013/03/27/caterpillars-stop-train/#more-10736*

www.shop.shorebirds.org.nz/shop/a-photographic-guide-to-moths-butterflies-of-new-zealand/

Sean Clancy shares his results from eleven nights light trapping at the Pūkorokoro Shorebird Centre in December 2022 and January 2023 and from 2018/19 and 2019/20 (PM News 115).

	Dec 22/ Jan 23	Combined 2018/19, 2019/20, 2022/23
Number of different species	67	121
Endemic species	26	56
Immigrants (flown or come through human agency)	40	64
Introduced for biocontrol	1	1

The species identified includes both micro and macro-moths.

Micro-moths are generally smaller and evolved 250-200 million years ago.

Macro-moths are generally larger and evolved later, 125 million years ago.

However, one of the most common moths that came to the light trap almost every night and in good numbers was the Apple Looper, *Phrissogonus laticostatus*, a small macro-moth.

It is an easy moth to identify as the male has small projections on the forewing which are hair like scales. It is thought these are scent scales and used in courtship. They are not present on the female.

Male laticostatus with tufts TANSY BLISS

EVENTS CALENDAR 2023

Sunday 14 May | 10am
PMNT AGM
High tide: 2.15 pm

Saturday 24 June
Findlay Reserve Planting Day
There will also be planting and other tasks to do in the weeks before this day, so please contact the Centre if you wish to help.

Friday – Sunday 7-9 July
Printmaking Course

Saturday 12 August
Working Bee/Potluck Dinner and Quiz

Friday – Sunday 22-24 September
Nature Journaling Course

Sunday 22 October
Spring Migration Day
Speaker: **Claire Fearnley** former New Zealand Ambassador to China and Korea.
High tide 1.15 pm

10-16 January 2024
Field Course
Limited vacancies

GODWIT TIMES

with Emma Salmon

Tēnā koutou

Welcome back to the Godwit Times!

Winter can be a lonely time for me, as most of my siblings and friends have flown to Siberia and Alaska.

But wait! I have all of my lovely readers by my side. On your adventures this winter, can you please help me figure out where my siblings that didn't make it overseas are? I might just fly and catch up with them.

Don't forget if you have been on any birding adventures or have a cool story/artwork about birds, just send Godfrey an email godfreygodwit@shorebirds.org.nz

See you at Pūkorokoro!

Ngā mihi, Godfrey

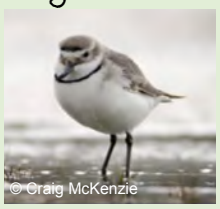
Can you help me find my siblings and friends?

Bar-Tailed Godwit

1	2	3	4	5
6	7	8	9	10
11	12	13	14	15
16	17	18	19	20

20+ Enter no.: _____

Wrybill



1	2	3	4	5
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11	12	13	14	15
16	17	18	19	20

20+ Enter no.: _____

White-Faced Heron

1	2	3	4	5
6	7	8	9	10
11	12	13	14	15
16	17	18	19	20

20+ Enter no.: _____

Banded Dotterel

1	2	3	4	5
6	7	8	9	10
11	12	13	14	15
16	17	18	19	20

20+ Enter no.: _____

Variable Oystercatcher

1	2	3	4	5
6	7	8	9	10
11	12	13	14	15
16	17	18	19	20

20+ Enter no.: _____

Black-Billed Gull

1	2	3	4	5
6	7	8	9	10
11	12	13	14	15
16	17	18	19	20

20+ Enter no.: _____

New Zealand Dotterel

1	2	3	4	5
6	7	8	9	10
11	12	13	14	15
16	17	18	19	20

20+ Enter no.: _____

Red-Billed Gull

1	2	3	4	5
6	7	8	9	10
11	12	13	14	15
16	17	18	19	20

20+ Enter no.: _____

Where did you spot these birds?

Pūkorokoro Miranda Naturalists' Trust

The Shorebird Centre

283 East Coast Road
RD 3 Pokeno 2473
phone (09) 232 2781
admin@shorebirds.org.nz
www.shorebirds.org.nz
www.facebook.com/

Miranda Shorebird Centre Manager: **Keith Woodley**

Centre Assistant: **Chelsea Ralls**

Pūkorokoro Kaitiaki Ranger: **Tansy Bliss**

Assistant Ranger: **Hera Clark**

Pūkorokoro Miranda Naturalists' Trust Council

Chair: **Gillian Vaughan**

Deputy Chair and Banding Convenor: **Adrian Riegen**
riegen@xtra.co.nz
09 814 9741

Secretary: **Trish Wells**
Trishwells1@gmail.com
027 268 8057

Treasurer: **Kevin Vaughan**
kandjvaughan@gmail.com
09 817 9262

Council members: **Ann and Ray Buckmaster, Wendy Hare, Trudy Lane, David Lawrie, Bruce Postill, Bob Rigter**.

Magazine

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

Acting Editor: **Keith Woodley**
keith@shorebirds.org.nz, 09 232 2781
Layout and production: **Bernie Cornford**

See the birds

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

Budget accommodation

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

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

Become a member

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

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

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

Bequests

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

Become a Volunteer

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

New Winter Stock

We have a new range of Pūkorokoro sweatshirts, hoodies and long-sleeved tee's for the coming winter months. Order online now!

Uni LS Tee Logo Sm Grey Marle

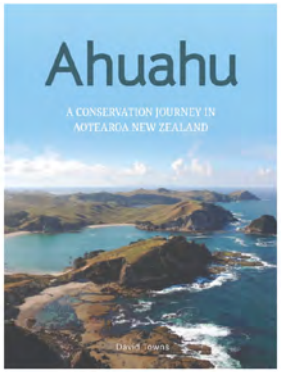
Hoodie Logo Sm Slate Blue

Uni Crew Logo Lg Petrol Blue

Uni Crew Logo Lg Pine Green

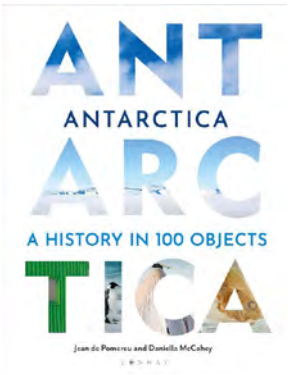
Hera, Chelsea and Tansy wearing some of the new arrivals

Great Reads from the Shorebird Centre Shop

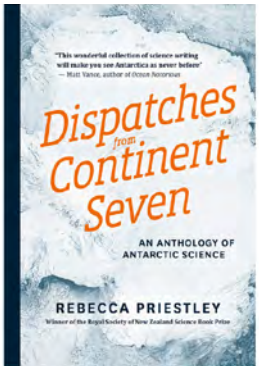


Ahuahu – a conservation journey in Aotearoa New Zealand
David Towns – $80
shop.shorebirds.org.nz/shop/ahuahu-a-conservation-journey-in-aotearoa-new-zealand/

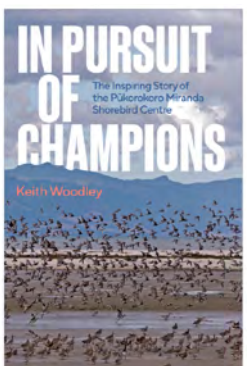
Birds and their Feathers
Britta Teckentrup – $34.90
shop.shorebirds.org.nz/shop/birds-and-their-feathers/



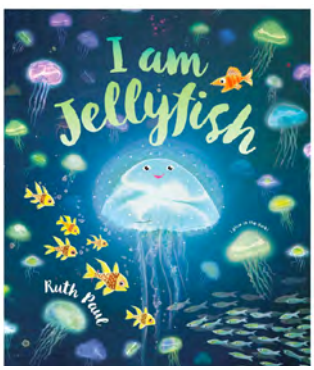
Antarctica – A history in 100 objects
Jean de Pomereu and Daniella McCahey – $54.90
shop.shorebirds.org.nz/shop/antarctica-a-history-in-100-objects/



Dispatches from Continent Seven
Rebecca Priestley – $55
shop.shorebirds.org.nz/shop/dispatches-from-continent-seven/



In Pursuit of Champions
Keith Woodley – $40
shop.shorebirds.org.nz/shop/in-pursuit-of-champions/



I Am Jellyfish
Ruth Paul – $19.90
shop.shorebirds.org.nz/shop/i-am-jellyfish/

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

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