Pūkorokoro Miranda News

Journal of the Pūkorokoro Miranda Naturalists' Trust

November 2023 Issue 130

Nature Journalling

Blue Carbon

Real Estate Adjustments

Editorial – Keith Woodley

The Pūkorokoro coastline is a dynamic, ever-changing place. The pulse of tide and season governs the life of most creatures living there. Sediments that are the building blocks of tidal flats, are continually being sorted and resorted by tidal flow. The shell ridges that comprise the chenier plain are the product of countless tidal and weather events over millennia. This constantly changing geography determines where the big shorebird flocks are to be found which is why, over the years, we have had to continually relocate our bird hides. Such are the natural forces at work here. But now another force is at work, one that will only grow more intensive in time, challenging all of us.

January 5, 2018, when a tidal surge brought the Firth of Thames to the Centre's doorstep, was a massive indicator of just what may be in store for this coast. In this issue we report on several initiatives aimed at mitigation of, and adaptation to, Climate Change and projected sea level rise. Wharekawa 2120 is a project where Waikato Regional Council, Hauraki District Council, Waikato District Council, iwi, and local communities are working together to look at a range ofissues, to try and assess what the next 100 years might look like. How do we identify and understand potential future hazards? How will we respond to such risks in the future, recognising that what we know about them may change 10, 20 and 100 years down the track?

Social and economic implications are likely to be significant, from raising or moving East Coast Road, to relocation of people away from the coast. But what of the ecological values that make this area internationally important? At the Trust AGM in May, Frank Rawiri, Chair of Wharekawa 2120, explained that on the entire coast from the hot springs to Wharekawa, Pūkorokoro and its manu was a number one priority. 'Anything that happens must occur within that context. Looking 100 years into the future, adjacent farmland will all be submerged. We need to manage the process in a way that biodiversity benefits.'

One approach to mitigating Climate Change is to reduce carbon in the atmosphere.

Coastal habitats such as salt marsh and mangroves have been identified as great sequesters of carbon. The carbon that is captured and stored in these coastal wetland ecosystems, known as blue carbon, may be one of the most powerful natural climate solutions. Coastal wetlands can capture larger amounts of carbon than forest areas, and if left undisturbed, it can be stored for thousands of years. Here we report on a project underway at Pūkorokoro to establish its potential for harnessing blue carbon.

Meanwhile to demonstrate it is not always all about shorebirds, in recent issues we have covered moths and lizards. This time spiders get a turn in the spotlight.

Cover image: Stilt Ponds flock ANITA RUGGLE

Shorebird Snippets

Dotterel Course

We held three one-day dotterel management courses in August. Frouk Miller, long-time dotterel warden on the Coromandel, was again lead tutor, though this year she was joined by Kaitiaki Ranger Tansy Bliss. Both brought wide experience of managing coastal species, which greatly strengthened the course, making it even better than the trial ones we ran last year. Participants came from agencies such as DOC and Auckland Council, ecological consultancies, and community groups.

Frouk Miller explaining the correct way to move a dotterel nest. KEITH WOODLEY

Ranger workstation

Our Kaitiaki Rangers have a new workstation. Until now they had been working out of the Wrybill Room, which has had its limitations. Given its multi-use as library, classroom, and meeting room, they often found themselves temporarily displaced. Thanks to a couple of generous donations, a pre-built cabin has been installed behind the Centre garage. Foundation work was done by Tansy and Hera with assistance from Hera's whanau.

Ranger workstation being installed KEITH WOODLEY

Findlay Reserve Improvements

There were valuable upgrades at the bird hides recently. All three now have new roofs, which solves a long-term problem with leaks, especially in the Godwit Hide. Our thanks to Adrian Riegen, Tansy Bliss, and Stuart Laurenson for this work.

L-R Dirk and Joe De Jong building the Stilt Hide extension TANSY BLISS

Stilt Hide extension and new roof TANSY BLISS

A new unenclosed wing added to the Stilt Hide has increased its visitor capacity. When it was originally built, fences either side were installed to confine people to the hide and its two wings. While this proved effective, it did limit the number of people that could view birds at any one time. Now that drainage of the ponds has been improved, and the huge flocks of shorebirds are once more using the area, this is likely going to be the most important hide over summer. So, the extra capacity is going to be most welcome.

Our thanks to long time Trust member Joe de Jong and his son Dirk for this work.

Recent visitors will also have noticed the view from the Stilt Hide is considerably improved, thanks to the efforts of Tansy and Hera. Regular weeding to maintain view shafts will remain an essential ongoing task for our rangers and volunteers.

New roof on the Wrybill Hide TANSY BLISS

A new breeding record for Pūkorokoro?

As mentioned in recent issues, one outcome of the Stilt Ponds retaining excess water was the presence of Dabchicks. These diminutive diving specialists were an appealing addition to the regular waterfowl inhabiting the ponds. Of course, restoring the shallow flow regime suitable for waders meant their eviction. So, it was especially pleasing to learn one pair had merely moved up the road, taking up residence in the Bittern Ponds, opposite the Centre's southern boundary. There was an unconfirmed report of two chicks seen at the end of September. if this were to be confirmed it would be either a new breeding record for Pūkorokoro or the first in many decades.

Red-necked Stints

While the story of godwit migrations continues to astound visitors, and captivate us all, it is easy to forget the feats of other birds. The sparrow-sized, Red-necked Stint for instance, which migrates here from breeding sites in Far Eastern Russia. In September and October two stints regularly roosted among the c.200 Wrybill on the beach at Taramaire. During a four-day field trip at the Shorebird Centre, Auckland University student Kevin Zhao took this image of a stint in flight with Wrybills.

Red-necked Stint in flight with Wrybills KEVIN ZHAO

Shining Cuckoo

Though very familiar, the sound coming from the bushes lining the Centre carpark was quite unexpected. I had heard plenty of pipiwharauroa Shining Cuckoos elsewhere throughout the country. I had heard and seen them on the terraces at the back of the coastal plain, but never on the Pūkorokoro coast. So, the bird calling on 26 September 2022 was a new record.

I suppose the real surprise is what had taken them so long to find us? The plantings around the Centre grounds were well established, some of them over 30 years old. I do not remember the first time I heard a riroriro Grey Warbler, but they have now been a loud presence for well over 20 years. The cuckoo was seldom heard again so may have been in passage. Then on 18 September this year, a cuckoo was present again. It called loudly through the afternoon, each time with the falling note at the end. It was heard again several times over the next few days.

Tony Steer and Tansy PAT STEER

Entomologist

Tony Steer from Mahakirau Forest Estate in the Coromandel Ranges, with Kaitiaki Ranger, Tansy Bliss, identifying moths caught in the Robert Findlay Wildlife Reserve, as part of the biodiversity monitoring programme.

EVENTS CALENDAR 2024

Farewell to the Birds Open Day 3 March 2024.

Please contact Chelsea admin@shorebirds.org.nz

Recent sightings at Pūkorokoro

6400 Bar-tailed Godwits
c.1600 Red Knots
35 Pacific Golden Plovers
3 Whimbrel
1 Curlew Sandpiper
1 Sharp-tailed Sandpiper
1 Red-necked Stint
9 Turnstones
1 Whiskered Tern
2 Common Terns
1 Glossy Ibis

c.200 Wrybill
650 SIPO
75 Royal Spoonbills

PMNT Council 2023-2024 – L-R Stuart Laurenson, Kevin Vaughan, Emma Salmon, Gillian Vaughan, Trudy Lane, Olga Brochner, Keith Woodley (Centre Manager), Adrian Riegen, Bruce Postill, David Lawrie, Bob Rigter, Absent: Wendy Hare. CHELSEA RALLS

Meet our new PMNT Council members

Stuart Laurenson

Joining Pūkorokoro Miranda Naturalist Trust is the latest step in my birding journey.

Living in Onehunga beside the Manukau Harbour for the past 30 years, the birds of the harbour and its shores have increasingly fascinated me.

Seeing my first Royal Spoonbill was a 'light bulb' moment, filling me with joy! Joining The Ornithological Society of New Zealand, now Birds NZ, was my next step. Going to meetings, listening to speakers, meeting and learning from like-minded people and assisting on wader censuses have all contributed to my birding knowledge.

After joining PMNT several years ago, I have gradually become more involved: attending meetings and AGMs, helping with cannon netting and making regular visits to the shorebird centre and the hides.

After my retirement in 2020 from paid employment in the removals industry, I have had time for more volunteer work. One could describe me as a 'serial volunteer', doing interviewing at Citizens Advice Bureau, pest control work at Ambury Park, shorebird guiding at Pūkorokoro, helping with wader censuses, and now joining the PMNT council.

I really enjoy guiding at the hides, meeting all our visitors, and sharing my knowledge, particularly with young people and children.

Olga Brochner

In her day job Olga Brochner is an ophthalmic nurse specialist in the public hospital service. She is also ardent and passionate about protecting and advocating for our natural environment. Olga, along with her partner Kevin Barker, have volunteered for a host of organisations including Pūkorokoro Shorebird Centre over many years. Olga is also a member of Birds NZ and other societies. She brings passion, intelligence, and a keen desire to advocate for and conserve our natural fauna and flora. Olga joined PMNT after being inspired by one of Keith Woodley's talks many years ago.

Emma Salmon

My true passion for birds started in 2017 after living on a Welsh island run by seagulls. This led to me to start volunteering at Pūkorokoro in 2018. My volunteer tasks have included running the shop, being a summer shore guide, children's page creator and now secretary of PMNT council. My conservation career included working for DOC around the country. Now I have 'settled' in Auckland teaching primary students. I am very excited to have this opportunity to get the inside scoop on the Centre and surrounds.

Nature Journalling

The Nature Journalling Course is a fixture in our annual calendar. **Sandra Morris** reports on the most recent one.

Despite the constant threat of downpours, my nine wonderful participants soldiered on and remained upbeat and positive about venturing into the grey to either collect specimens from field and shore, or down to the Stilt Ponds to attempt sketching wading birds seen through telescopes.

Nature Journallers in the field L-R Jan Tyler, Maddie White, Helen Preston-Jones and Moira Mclennan SANDRA MORRIS

Nature journalling in the field SANDRA MORRIS

Over the weekend we achieved quite a bit of journalling, recording with sketches, and writing our responses to this diverse environment and its inhabitants.

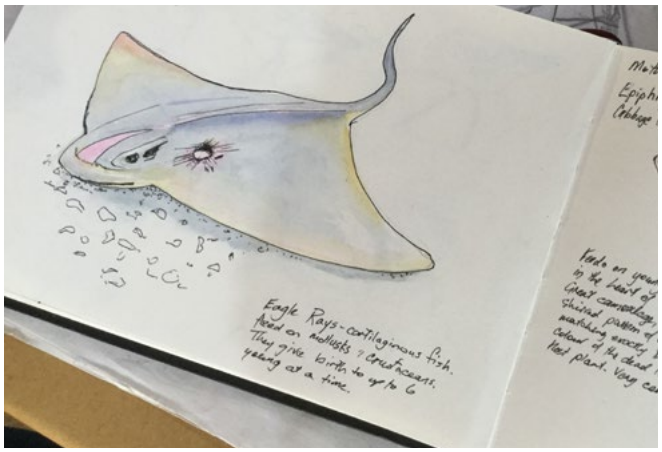
Recording our finds SANDRA MORRIS

Drawing lichen SANDRA MORRIS

With the help of Robert Hoare from Manaaki Whenua – Landcare Research and Tansy Bliss – lead Kaitiiaki Ranger (and course participant) – we caught enough moths in the moth traps set on Saturday night, to enable us to study and sketch them Sunday morning, after they had spent the night slumbering in their little pots in the fridge.

Moths and Shells SANDRA MORRIS

Collecting on the strandline down at Taramaire was a new element to this workshop. We were rewarded with the discovery of a beached eagle ray which, along with an array of shells and flotsam, became a subject for a few of my students.



Recording a beached eagle ray SANDRA MORRIS

The meals are always a highlight of these weekends. We were wonderfully catered for by Jennifer from Thames. Our multiple dietary requirements were not a bother to her.

It's always sad to wave goodbye to everyone at these workshops - but new friendships forged and newly discovered skills apparent to all, are reward enough for me.

Oystercatchers on the beach front at Kaiaua BRUCE SHANKS

Wharekawa 2120 Community Plan

Keith Woodley reports that Climate Change and projected sea level rise are behind a plan for the future of the Pūkorokoro-Wharekawa Coast.

Friday morning, January 5, 2018, is a day seared into our memory. For that is when a king tide subject to an intense low-pressure system and gale force north easterly winds in the wake of tropical cyclone Gita, brought the Firth of Thames to the front steps of the Shorebird Centre. It was a wake-up call, an indication that severe weather events and sea level rise pose an existential threat to the Pūkorokoro coast.

Now Hauraki District Council (HDC) is leading a response. In late September the council adopted its draft Wharekawa Coast 2120 Community Plan which is now out for consultation. The plan has been developed over the past three years in collaboration with Waikato Regional Council (WRC), Waikato District Council (WDC), Ngāti Pāoa and Ngaati Whanaunga, other key stakeholders, and the local community.

In 2020, the Wharekawa Coast 2120 Community Panel came together to provide informed recommendations to Partner Councils on the future of the Wharekawa Coast. With the outcome of an extensive community survey, the panel looked at a broad range of issues affecting those communities with a particular focus on natural hazard risks. The 2120 Community Plan was developed in response to the over 140 recommendations made by the Community Panel.

According to the Plan, over the next five years Councils will investigate a number of issues and future options, some of which are of direct interest to PMNT. These include:

Greater protection of local ecological integrity in a way that will not further impede on natural coastal and freshwater processes. This requires greater local awareness of the significance of Our Place and the natural environment we live in.

WRC's biodiversity inventory work programme will prioritise the Wharekawa Coast site investigation. The Council will also incorporate local ecological protection considerations into its Regional Coastal Plan review.

Securing the future of East Coast Road will be massively important. Councils will approach Waka Kotahi to investigate feasibility for two main options: raising the road or rerouting it. If rerouting is decided on, HDC will consider an amendment to the District Plan via its designation process to acquire land and build a new road.

The Community Plan envisages making provision for new builds to have:

- Flood-proofed wastewater systems
- All building heights above flood level (including garages)
- Water pumps to be above flood levels.

HDC will undertake a summer parking investigation/survey to better manage vehicle access to coastal areas. To stop people parking on sensitive foreshore areas it will consider dedicated parking areas elsewhere, as well as plantings and bollards to prevent access. The aim is for the community and visitors to the area to be clear about appropriate locations for parking along the Wharekawa Coast.

A key consideration is the long-term future of Kaiaua and other coastal communities in their current locations. Partner Councils alongside the Government will look at options for potentially:

- purchasing rural land and land bank it for future town development.
- buying properties that are going to be under water and then lease back to people.
- buying properties that are exposed to flooding and look at the opportunity of an Air BnB process to recoup costs, provide temporary accommodation, and provide local employment.

The Council will work to ensure communities are confident that:

- bridges are sound with regular inspection and any necessary maintenance.
- stop banks are maintained and repaired as necessary.
- ongoing management of rivers results in improved resilience to weather events.

The plan will be finalised at the end of November,

Nocturnal Builders

As a Naturalists' Trust we continue to be interested in all aspects of the natural world. **Tyson Williams** reports on the latest research project to come within our orbit.

After the sun sets, and the last light of dusk fades behind the hills, Pūkorokoro comes alive. Thousands of creatures emerge from hidden nooks and crannies. They begin to climb, reaching the pinnacles of various plants, staking their claim for the evening. They need to eat, and to eat they need to build. These creatures are orb weaver spiders, some of the premiere architects in the animal kingdom.

While Pūkorokoro hosts many species of orb weaver, the ones I am particularly interested in are the *tetragnathidae*, the long-jawed orb weavers, named after their very visible chelicerae (jaws). This family is globally widespread but largely unstudied, especially in New Zealand. For the research component of my Bachelor of Science Honours from the University of Auckland, I'm researching the web building behaviours and cognitive abilities of our local tetragnaths.

The namesake 'long-jaws' of a tetragnath RAY WILSON

I recently enjoyed the hospitality of the Shorebird Centre while conducting 10 nights of fieldwork. I headed out every evening with a tape measure and precision calipers to take 17 different measurements from as many webs as I could find. These measurements relate to web size, shape, location, and complexity (such as number of radials or spirals). I also recorded data on the plants in the area, to see if tetragnaths displayed any preference for plants of a certain species, size, or location.

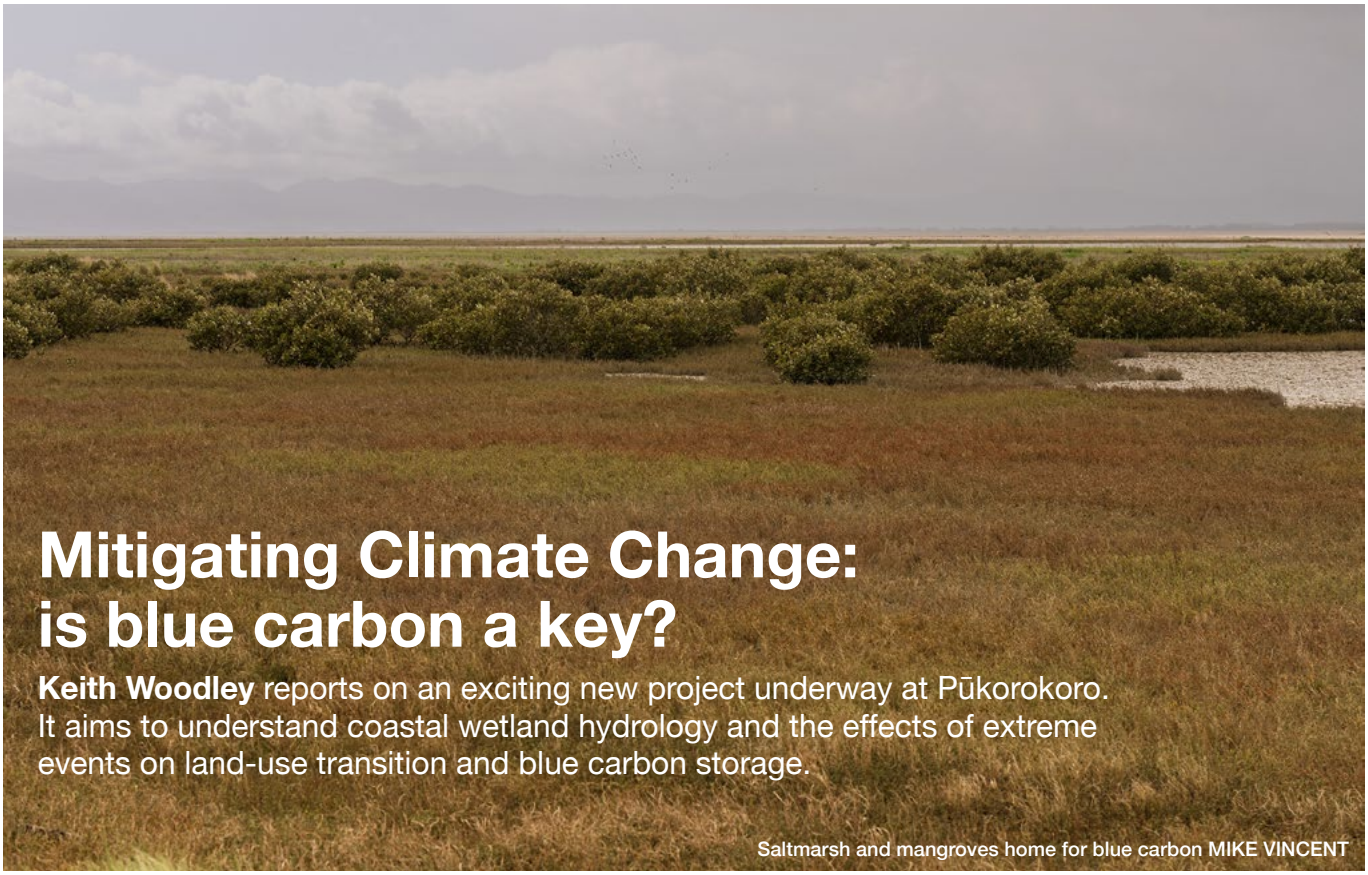
A tetragnath in its web adopts a stick-like pose to avoid detection TYSON WILLIAMS

The ability to construct webs is innate in orb weaver spiderlings from the moment they hatch. It's their only way of hunting, and there is no parental care, so the ability to build a functional web from day one is essential to their survival. While building a basic web seems to be innate, I'm attempting to determine if tetragnaths can change their webs based on variables like weather conditions or preferred prey. If they can, this would suggest that they possess higher level brain function, including memory and learning.

The next stage of research will require capturing some of these orb weavers and studying their web building in laboratory conditions. This will allow me to control what prey they catch and when they catch it. By varying the amount of prey between groups, I hope to determine if tetragnaths can modify their web in response to past experiences. If they can, this will suggest that they possess the ability to remember, and the ability to learn, both of which are considered complex cognitive functions.

While conducting my research I did observe a few fascinating behaviours amongst this population. Spiders would steal food from other webs, even while the web owner was in residence. This has never been reported in this species before. Males regularly fought for territory, sometimes jousting with their long jaws. This jousting behaviour was suspected but had not been confirmed in New Zealand tetragnaths. One observation that may mean a lot for my research was that many tetragnaths still built webs when it was raining. This has been assumed to be a poor decision, as rain can damage webs, and most prey is not active in the rain. However, with so many spiders doing it, this assumption may need to be tested.

I'd like to thank everyone at Pūkorokoro for their support, interest, and hospitality while I was there. I hope I can provide an update on my results once I have them.



Mitigating Climate Change: is blue carbon a key?

Keith Woodley reports on an exciting new project underway at Pūkorokoro. It aims to understand coastal wetland hydrology and the effects of extreme events on land-use transition and blue carbon storage.

Saltmarsh and mangroves home for blue carbon MIKE VINCENT

Precipitated by recent events, following decades of denial and inertia, Climate Change is now for most of us, front and centre in public debate. Extreme images from around the world – fires, storms, floods, heat-waves – fill the media. Closer to home there was the devastation wrought by the Auckland Anniversary floods followed by Cyclone Gabrielle. Even closer to home, at Pūkorokoro, we remember January 2018 when a tidal surge brought the Firth of Thames to the Centre's doorstep. That morning, as I watched water pour across the road and into the Centre grounds, I recall thinking: is this what the future looks like? Well, yes, it would appear so.

Extreme weather events together with rising sea level pose a serious threat to low-lying areas around the Firth of Thames. Transitioning from coastal farmland to coastal wetland would be a good way of addressing this. And recognising the inevitable. It could bring multiple environmental and social benefits, and economic alternatives; supporting rural communities transitioning to alternative land-use – while still supporting the social fabric of rural communities. Sequestration of blue carbon may be a good tool to help achieve this.

Blue carbon is the carbon that is captured and stored in coastal wetland ecosystems such as saltmarshes, mangroves and seagrass habitats and may be one of the most powerful natural climate solutions. Coastal wetland ecosystems can capture larger amounts of carbon than equivalent forest areas, and if left undisturbed, the carbon can be stored for thousands of years.

The blue carbon economy is attracting significant attention because of the impressive carbon sequestration rates delivered by 'blue' ecosystems, being wetlands, mangroves, seagrass, and saltmarsh. Carbon credits can be generated and sold on the carbon market, attracting both investors and buyers.

But creating and maintaining coastal wetlands and maximising blue carbon sequestration requires understanding the hydrological and hydraulic management options, including under extreme conditions. A consortium of agencies and research organisations has begun investigating this at Pūkorokoro.

The Nature Conservancy (TNC) in New Zealand is partnering with New Zealand Councils, iwi, and coastal communities to address the dual crises of climate change and biodiversity loss. To achieve this, TNC is investing in research and mapping, running pilot projects, and providing policy advice on blue carbon.

As part of the *'Aotearoa New Zealand Coastal Blue Carbon Programme'*, The Nature Conservancy has contracted research partners such as Cawthron Institute, GNS Science and Manaaki Whenua Landcare Research to quantify carbon storage and sequestration, greenhouse gas emissions and sediment accretion for project sites around the country. The project at Pūkorokoro, centred on the Tiaki Repo ki Pūkorokoro (TRKP) reserve and adjacent areas, aims to understand the implications of hydrological and hydraulic management options for this site on:

- the impact of extreme weather events on blue carbon persistence
- protection of adjacent farmland during extreme weather events
- the sustainability of blue carbon resilience credits under sea level rise projections and likely increased extreme weather events
- the co-benefits of increased habitat availability for various aquatic species.

The first stage, led by Manaaki Whenua Landcare Research began in early September with the installation of traps to monitor sediment accretion on the TRKP reserve and adjacent areas. These will be regularly monitored over the next 12 months. Accreted material will be collected and analysed for organic carbon. There will also be regular greenhouse gas monitoring. The collection and analysis of the data is critical to understanding the potential fpf coastal wetlands to sequester and store carbon.

Trust member and lawyer **Pip Wallace** adds further context around blue carbon, its potential for Climate Change mitigation and its limitations.

Globally, the race is on for countries to find ways to meet their 'Nationally Determined Contributions' set under the Paris Agreement. These aim to keep the global average temperature well below 2°C above pre-industrial levels, while attempting to limit the temperature increase to 1.5°C, goals that are looking more and more difficult to achieve.

In 2021, New Zealand set a target of a 50 per cent reduction of net emissions below our gross 2005 level by 2030. Two main measures for achieving the international target are reductions in New Zealand's domestic emissions and removal of carbon dioxide by plantation forests. In addition, New Zealand will look beyond 'at home' mitigation and use offshore mitigation, for instance the purchase of carbon credits from other countries.

These tight targets have catalysed further action to locate methods to mitigate Climate Change, with particular attention to carbon storage and sequestration. Blue carbon projects are one limb and sit alongside projects to store and sequester carbon via plantation forestry, soil regeneration and protection, forest restoration through protection and predator control and deep blue marine sources. A key difference for many projects is that, unlike plantation forestry credits, they do not sit within the Government's Emissions Trading Scheme. Currently any blue carbon scheme would be part of a voluntary carbon credit scheme.

Sceptics and critics of these arrangements have raised questions, such as who pays, who buys and what is the point of this? But voluntary carbon credit schemes are getting off the ground internationally, supported by businesses looking for ways to trade on 'net zero' strategic claims. Financing ecological restoration schemes with a quid pro quo of carbon credits can be a savvy marketing move, as well as meeting corporate sustainability goals. Landowners running out of options to profitably use land subject to periodic inundation may also welcome the opportunity.

All the same, for any scheme to successfully fly, it will need to be backed by rigorous scientific quantification as well as a robust accounting scheme. The work being undertaken by The Nature Conservancy (TNC) at Pūkorokoro is part of the science equation to understand how coastal ecosystems sequester and store carbon, and at what rate. TNC has also been involved (in a coalition with others) in developing framework principles to build investable, high-quality blue carbon projects to ensure positive outcomes for people, nature and climate. The *'High-Quality Blue Carbon Principles and Guidance'* is aimed at developing high quality blue carbon projects and credits.

Despite the many opportunities touted regarding blue carbon, there are caveats. Credit schemes are aimed at emission mitigation as opposed to the bigger hitter, emissions reduction. In addition, the Intergovernmental Panel on Climate Change (IPCC) points out in its 2019 *Special Report on the Ocean and Cryosphere in a Changing Climate* that blue carbon can contribute to mitigation for many nations, but its global scope is modest. The IPCC notes that restoration of vegetated coastal ecosystems, such as mangroves, tidal marshes and seagrass meadows could provide Climate Change mitigation through increased carbon uptake and storage of around 0.5% (medium confidence) of current global emissions annually. However there are also additional important co-benefits of improved protection and management which include providing storm protection, improving water quality, and benefitting biodiversity and fisheries.

The improved protection and management are critical features of blue carbon schemes – without this, it is simply nature doing its own thing and this alone cannot be considered mitigation or abatement. The protection and management are central to successful long-term sequestration and allied to this is the need for confidence in the long-term security of the carbon storage. Damage to a blue carbon source may trigger a shift from a carbon sink to a greenhouse gas emitter. Potential investors won't be encouraged by insecure benefits, therefore understanding site-specific risks to carbon storage is a critical factor.

So, there are sound reasons to investigate and pursue blue carbon projects, whether as opportunities for transition to coastal wetland or repurposing of sites compromised by inundation. But there is still plenty of homework to be done. The work of the TNC and research partners at Pūkorokoro is vital to understanding site-specific carbon storage and flows and the potential of a site to be part of a robust carbon credit scheme. We are looking forward to what the data reveals and understanding more about the intricate processes at work in our coastal ecosystems.

Limeworks CHELSEA RALLS

Blue Carbon Workshop

Hera Clark reports on representing PMNT and Ngāti Pāoa at a workshop in Australia.

In August, the Nature Conservancy hosted the Asia Pacific Blue Carbon workshop at Mooloolaba, on Australia's Sunshine Coast, bringing together global TNC staff, Traditional Owners, practitioners, researchers, government representatives and project developers from Australia and beyond.

A first event of its kind, the workshop aimed to build capacity with indigenous communities across the Asia Pacific region by sharing lessons learned, and identifying opportunities for scaling blue carbon project development. I was lucky enough to be invited to represent Pūkorokoro Shorebird Centre and Ngāti Pāoa.

What is blue carbon?

Blue carbon is the carbon stored in coastal and marine ecosystems like mangroves, tidal marshes and seagrass meadows. It is now being recognised as helping mitigate Climate Change along with other co-benefits such as storm surge protection and supporting biodiversity.

The first day kicked off with Traditional Owners, the Kabi Kabi people of the Sunshine Coast, giving us a traditional welcome using two wooden sticks being hit together and reciting a sacred chant done by their Elders, Past, Present and Emerging to open the three-day event.

This made me feel very relaxed and at home as this is how Māori would usually start and open such an occasion, and to know that we had the blessing of the people of the land felt exactly as it should.

Indigenous peoples form approximately 5% of the world's population. Their traditional knowledge has an important role to play in responding to climate change and they tend to see the world through a different lens compared to modern western science.

In Australia, the involvement and ownership of First Nation people played a crucial role. Their deep connection with the land and water made them not just stakeholders but key players in every blue carbon initiative. Understanding and respecting the values and knowledge of indigenous people are going to be a key input for sustainable outcomes. Additionally, local community support was a pivotal factor in the success of any blue carbon project.

Throughout the workshop, we delved into various topics, including the diverse range of blue carbon projects in the Asia Pacific regions, different methodologies for blue carbon accounting, environmental laws, and enabling policies essential for the success of blue carbon initiatives.

One method used in Adelaide that I found very interesting was the re-establishment of seagrass. Seagrass is not easily able to re-establish in bare sand as the seed has nothing to anchor into and is usually washed ashore, dries up and dies, or floats on the surface of the water where it cannot grow. The seagrass restoration project uses a technique developed in South Australia of placing hessian bags on the sea floor to hold seagrass seedlings in place. By the time the hessian bag decomposes, many seedlings are sufficiently established. This is proving to be very successful, and they are hoping to continue this technique on a much larger scale in the future.

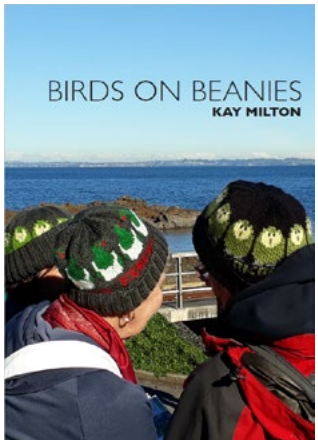
One of the highlights of Day Two was visiting the Blue Heart project, a pioneering blue carbon endeavour in Australia. Collaborating with the Sunshine Coast Council, TNC is helping to transform a non-profitable sugar cane farm that is in a flood zone, into a thriving natural tidal marsh and mangrove ecosystem. We got to explore the Yandina Creek wetland that is connected to the Maroochi River which on both sides of the creek had huge well-formed mangrove trees. These big, widespread trees looked very different to the dense and bushy mangroves we have in New Zealand.

As the group was walking along with me tailing behind, binoculars in hand, trying to take in everything I possibly could and looking for interesting bird life, I came across a Cane Toad. In real life they are quite large and gross looking I must say.

I told our guide that I had come across this Cane Toad and asked what their numbers are, as they had become a pest. She told me about an interesting observation where certain birds had figured out how to eat the toad safely with the toxin not having such a big effect. The birds will pick the toad up and drop it from height onto a hard surface so that all the toxin seeps out of its glands; then they pick the toad up again and rinse off the toxin in a nearby water body, allowing the bird to be able to consume it more safely. How smart is that?

I would like to emphasize a few key take-home messages from this enriching workshop. First and foremost, it is essential to recognize that blue carbon projects are not primarily intended to generate financial wealth. Instead, they serve as incentive and funding models for conservation efforts. Our focus should remain on the core benefits of blue carbon, encompassing biodiversity conservation, cultural preservation, and Climate Change mitigation and adaptation.

Birds on Beanies



One of the fascinating aspects of working with volunteers is learning about their skills and interests and how they might then be able to bring this experience to help support the Trust in some way.

For many years **Kay Milton** has been designing and knitting beanies for the Supporters of Tiritiri Matangi. Kay and her knitting group have handmade over 700 beanies, selling them in the shop on the island. They have raised almost $30,000 for the charity, a significant amount, considering how far our local conservation groups can always stretch a dollar when they have a vision.

So, when Kay contacted the Shorebird Centre and offered to help supply her new shorebird designs to our shop, we were immediately sold on the idea. We are now on the hunt for knitters to turn these designs into beanies. If you are an experienced knitter who would welcome a new challenge, or know of someone who would, we would love to hear from you.

Email us and we can discuss the details – ***shop@shorebirds.org.nz***

Then keep an eye on our shop for the incoming beanies and Kay's pattern book so you can make your own New Zealand bird beanies.

Pukorokoro Open Day 3 March 2024

Tiger and the Wader, and other Wader Tales

Subhankar Banerjee in Sundarban Tiger Reserve 2022

Subhankar Banerjee is a photographer, writer, and conservationist. He is a professor of Art & Ecology and founding director of the Center for Environmental Arts and Humanities at the University of New Mexico.

Since the turn of the century, he has worked closely with Indigenous Gwich'in and Iñupiat peoples of Arctic Alaska, who are also among his most important teachers. Subhankar is editor of *Arctic Voices: Resistance at the Tipping Point*, co-editor of *Routledge Companion to Contemporary Art, Visual Culture, and Climate Change,* and most recently served as the director and co-curator of the award-winning project, *'A Library, a Classroom, and the World'*, for the 2022 Venice Biennale art exhibition *Personal Structures* organised by the European Cultural Centre.

Subhankar Banerjee will speak about his ongoing archival and field research on shorebirds that is taking him to many places around the world – from Alaska to Aotearoa, Argentina and Australia, Andes and the Sundarban. He is working toward a three-volume book and an accompanying exhibition provisionally titled, *Shorebirds in Modern Times*, which will aim to include three entangled histories – art and visual culture; conservation; and science – and bring the story forward to the present day to honour and bring attention to our imperilled shorebirds.

Keith Woodley

Real Estate Adjustments: Swan Lake no longer

Tansy Bliss reports on activity on the Stilt Ponds following drainage work to lower water levels.

Winter 2023: Dabchicks scuttled between long necked swans and teal mingled with the shoveler. Shags fished, leaving a trail of ripples before hauling out on dead mangrove stumps to dry. A Whiskered Tern bill-flicked the water's surface along with swallows, picking up insects with such ease and grace. It was beautiful to watch.

Spoonbills foraging on the Stilt Ponds, though an impressive sight, were symptom of a problem

Then on 17 July there came a dramatic change to this tranquil scene. Skilful work with a digger produced a deep drain in the mud flats to the south of the ponds and water that had been held captive for the last 2-3 years was released into the Firth by way of the Pūkorokoro Stream.

The water movement stirred up nutrients and micro-fauna and the decreasing depth made new food available to a wide range of birds. Immediately the gulls noticed the difference and fed in a chaotic frenzy, a moving mass of white accompanied by continuous calling. Pied Stilts were also quick to take advantage of the dropping water levels and strode up and down feeding regardless of the tide. With them were up to four dark hybrid stilts, often on the edge of the main flock. Within a week the water was low enough to entice the overwintering godwits to roost back in front of the Stilt Hide, with small breakaway groups choosing equally suitable spots to the north and south.

The Glossy Ibis seen on Wader Census Day 11 June, started re-appearing, feeding with the spoonbills in the northern extensions of the ponds and also in the muddy enclaves behind the dead mangroves to the south.

Whiskered Tern at the Stilt Ponds MIKE VINCENT

The Ponds continued to drain, and during high tides salt water flowed back into and out of the ponds, effectively flushing the area. However, those who knew the Stilt Ponds from earlier days were still not happy with this new regime. The water needed to move in and out faster and more water needed to drain out. Some enthusiastic digging by hand on the Working Bee in mid-August cleared the outlet channel by the drain and produced the desired effect. Water levels continued to drop. Areas of mud reappeared and were picked over by the stilts, and areas of shallower water were used by roosting Bar-tailed Godwits and Red Knots. The knots found suitable food just at surface level and hoovered through the mud with notable speed and efficiency.

By early September, the first of the returning godwits joined the roosting flock in front of the Stilt Hide. There was competition with the Black-billed Gulls who seemed reluctant to go back to the outer shell bank. Instead, they were strutting elaborate courtship poses on the muddy island in the Stilt Pond and jostling with the Caspian Terns who also liked this spot. Their raucous calls seemed to spook the godwits into flight, though it was hard to tell if they were just more alert, putting up an alarm call to the whole flock in response to a distant Harrier. A late September count put the number of roosting godwits to be over 6200 and roosting Red Knot to be at least 1600.

Spoonbills at the Stilt Ponds KEITH WOODLEY

The Stilt Ponds as Swan Lake KEITH WOODLEY

Stilt Ponds as we like to see them KEITH WOODLEY

The Stilt Ponds just after the digger had been RACHEL LANGMAN

Small flocks of Wrybill swooped in, occasionally bringing a Red-necked Stint with them. A Curlew Sandpiper probed frenetically amongst the knots also feeding in the shallow muddy water, whilst the godwits mainly just preened and roosted.

Their chosen roost areas shift with wind direction and water level, spreading south from the northern end. It is a spectacular scene especially when low morning or evening light sets the birds aglow. Pied Stilt and Australasian Shoveler often feed together in the deeper water behind, a wonderful criss-crossing of colour and shape.

Female Mallards are already escorting ten to fifteen ducklings around the ponds, sometimes having to push through the ever-increasing godwit flocks with determination and steadfastness. Grey Teal tend to keep to the edges and haul out at the northern, now dry arm of the pond.

But what of our grebes and swans? The Dabchick numbers quickly fell from a record 31 in July to 2 in August and by mid-September, they were no longer seen on the Stilt Ponds. The odd sighting was noted from the Bittern Ponds opposite the Centre and on the 29th September, a pair scurried across the wind torn surface trailing what were thought to be two chicks in their wake.

The Black Swans had a more protracted departure, clinging on as the water drained from beneath them, gradually moving north to where the water remained deepest. Some took refuge in the wet paddocks across the road, causing electricity outages as they hit the power lines en route. Swan bodies were scraped off the road on a weekly basis, but thankfully it seems that most have now relocated without further incident. (Meanwhile the power company had installed more deterrent devices to the lines.) Numbers dropped on the main Stilt Pond from around 190 during the winter census to a respectable 6 at last count in early October.

With both godwit and knot numbers increasing daily throughout October, and vagrant sandpipers putting in the odd appearance, the Stilt Ponds are once more a very dynamic place. No two days are the same. An additional channel on the eastern edge of the Stilt Ponds, dug in early October means the water level will continue to drop, and salt marsh plants should return to the edges and northern end of the pond. Which birds choose to roost where will be something to watch over the coming months, so try and factor in a visit over high tide while activity is at its peak.

Mel Galbraith 1953-2023

'He made a material difference to the conservation estate of Aotearoa.' Apt words spoken at the funeral service for Mel Galbraith. The massive turnout for the occasion was testament to the love, reverence, and respect this quietly spoken man engendered among so many. There were people from the many sectors Mel touched in his career - as teacher, lecturer, mentor, scientist, researcher, citizen scientist, conservationist.

He was a high school teacher for 20 years and then 20 years as a lecturer at Unitec. PMNT is among the many organisations he was associated with, an early life member and Trust Secretary from 1984-1986. From 1998 to 2004 he served on the Auckland Conservation Board; for 15 years as a member and later chair of the Motu-Kaikoura Trust; 2009 to 2013 vice-president and president of the Ecological Society; and 2016 to 2023 on the Council of Birds New Zealand.

But a key part of his enduring legacy will surely be his involvement with Tiritiri Matangi. Situated on Auckland's front doorstep the island is world renowned as a model of ecological restoration, and as a visitor attraction. Mel was a founding member of Supporters of Tiritiri Matangi, subsequently serving terms as Secretary and Chair, and being awarded an Honorary Life Membership. He also designed their logo. His contribution was immense, as was that of the many people – students and others – he inspired.

Long time teaching colleague Graham Jones says: 'Mel loved sharing his love of the natural world with students, and there is no doubt that his measured, patient, and non-judgmental nature made him a really well-liked classroom teacher.'

He took 100s of school students to Tiri – to plant trees, cut tracks or band Grey-faced Petrels. But Graham pointed to one project that reveals so much about his approach to teaching and the environment. As the Tiri project developed various native bird species were transferred to the island. In the early 1990s it was the turn of Hihi which were translocated from Hauturu Little Barrier.

'Mel's vision made this the focus of a multi-disciplinary exercise at Glenfield College, by harnessing the talents of so many. With the overview of the Department of Conservation he arranged for biology students to write a management plan for Hihi, then to receive training in mist-netting birds. The students then spent a fortnight on Hauturu catching Hihi for transfer and release. It did not stop there.

Mel organised the Technology Department to make nest boxes, the Art Department to design a logo for the project, the Māori Department to write a waiata for the release of this taonga, and the English Department to write it all up as a journalistic exercise published in an in-house magazine. There could be no better example of an integrated, cross-disciplinary education and in the years that followed those students would come to appreciate what an exceptional experience they had had. This was Mel's way, to include others, to think beyond the obvious, and in his own measured and thorough manner, deliver a quality result.'

After teaching for two decades Mel was awarded a Royal Society Teacher Fellowship, studying restoration ecology. This led to a change in his career, and he spent the next two decades in tertiary education. Initially his career at Unitec focused on ecology and ornithology, but it later expanded to encompass entomology, restoration ecology and biosecurity.

According to fellow lecturer Dan Blanchon, Mel was integral in developing three Degree Courses at Unitec. A trans-disciplinary and before-its-time Bachelor of Resource Management, a Bachelor of Applied Science, and a Master of Applied Science. He published journal papers across a diverse range of topics in ecology and ornithology, before more recently moving into social ecology and citizen science, as part of his PhD research. Since 2006 his dream was to develop a peer-reviewed, trans-disciplinary journal of biosecurity. This he achieved in 2017 with the launch of the journal Perspectives in Biosecurity

Marie Doole first encountered Mel as her 5th form teacher at Glenfield College. 'Education is about influence,' she told the gathering. 'It is about giving people information, tools, pathways, courage, confidence to walk in their power to a career that makes them happy. Mel put 100s of us on that pathway. When you send people on pathways and you walk with them in love – it is all the more effective, all the more likely they will stay.' She referred to teaching by osmosis: 'The thing with Mel's influence is you often didn't realise it was happening, you just walked away somehow transformed. There is immense power in that.'

Mel was indirectly involved in my own continuing education. When I arrived at Pūkorokoro with my newly minted interest in birds and nature I had much to learn. Particularly valuable were a series of Nature Notes, information sheets published by the Trust. Noting the author, it was the first time I encountered Mel Galbraith. In subsequent years it was a name I closely associated with one place in particular, for it seemed to me that that Mel and Tiritiri Matangi were fused together.

While in recent years he was not directly involved with Pūkorokoro, his interests taking him elsewhere to places such Aotea Great Barrier, he would visit from time to time, often accompanied by students or colleagues. They were invariably enjoyable visits. More recently we both served on the council of Birds New Zealand, and our encounters became more frequent – at conferences, around the meeting table or before and after at airports. He was always available to me as a source of advice, and it was Mel who made Unitec available as a venue for two of my book launches. A lovely man whose time was tragically cut short.

Our condolences to Sonya, and daughters Josie, Maria, Tessa and Sarah and whanau.

Keith Woodley

Caputnguak LILIANA NAVES

Connecting with Schools Across the Flyways

Chelsea Ralls reports on a continuing connection with schools within the breeding range of godwits in Alaska.

During peak migration this season, we were invited to talk with Caputnguak High School, Alaska about the kuaka (Bar-tailed Godwits), their incredible flights between us and their significance to the people of Aotearoa.

It is the perfect time to be talking about the incredible ability of these manu to cross the Pacific non-stop. They look for those perfect wind conditions for their departures from the Yukon-Kuskokwim Delta and and will then be in flight for the next 8-9 days. We can then share our pictures and videos of the newly arrived birds and consider the perfect plumage of the juveniles who hatched from an egg at the top of the world 4 or 5 months ago and are now here in the deep south.

Liliana Naves is with the Alaska Department of Fish & Game and has been working on a place – and culture-based shorebird outreach program in the Yukon-Kuskokwim Delta since 2018. Following on from the very successful video conference we had with Hooper Bay in March 2022, Lilian reached out to us about hosting a meeting with another school in Chefornak, Alaska.

I asked Hera (Ngāti Pāoa) to join me, and share her perspectives on the cultural connection and significance of the kuaka for Māori and within the iwi.

Hera shared her pepeha to introduce herself and where she comes from. It is an introduction to the mountains, the rivers, the ocean, the iwi that you are connected to. It is the pepeha of the kuaka that choose to gather here too.

There is the whakataukī (proverb) 'Ko wai kua kite te kohanga kuaka?' ('Who has seen the nest of the kuaka?') that talks of the mysterious nature of the kuaka and looking for something that doesn't exist. And kuaka also play an important role in the story of how Māori arrived in Aotearoa following the manu from Hawaiki, in the history and atua (gods and legends).

Kuaka are woven through the history and connection Māori have with this whenua (land). Māori are the original naturalists of Aotearoa, observing and learning and sharing this knowledge across generations.

And today the importance of the kuaka still grows as we all continue to learn about their incredible journeys, how they manage them and how we can be inspired by this in our own lives. Since our original Zoom with Hooper Bay, the students made beautifully decorated birds that they sent us and these held the place of the kuaka on the Shorebird Centre's lawn over our winter. A godwit exchange program. The model birds displayed here started many more conversations around their cultural significance.

Kuaka are used today in Aotearoa as a symbol of resilience and determination, of support and encouragement of the importance of returning home to places that nourish us and help us to grow.

It has really been a transformative collaboration. We aren't limited by the range of a school bus trip, we have the ability to connect with schools and groups anywhere via Zoom. There is much more to learn about our own local cultural connections and those of indigenous cultures around the flyway and share these with each other.

Quyana (thank you) to the wonderful students and educators at Caputnguak High School for joining us.

Caputnguak High School LILIANA NAVES

Mike Hazel
1941 – 2023

When we decided to migrate to Dunedin after 32 years in Auckland, there were several people who would become new colleagues, contacts, and friends, particularly in the birding community. One of these was a man who has been a member of Pūkorokoro Miranda Naturalists' Trust for about 36 years. He lived in the Auckland region for some of the same time as we did, but I do not recall ever having met him before. Keith Woodley suggested that we contact Mike and suggested to Mike that he contact us. Sure enough, within 10 days of my arrival Mike texted me with an invitation to visit him and Mina for lunch and a walk from their house in Macandrew Bay on the Otago Peninsula. It was our first meeting with these two delightful people but, after only two or three hours, we felt that we had known them for a lifetime.

It seems that Holly and Mina talk together, leaving Mike and me to do likewise. They had only been a couple for about 3 years. Mina and her husband, Alan were close friends of Mike while they were neighbours in Macandrew Bay. Sometime after their respective partners had died, Mike and Mina became a couple, much to the delight of their respective families and friends.

So, it came as a shock when Mike phoned one Saturday morning in early September to tell us that he 'would not be able to enjoy (our) company for much longer'. The cancer that he had been led to believe was treatable had grown and spread to the extent that it was now inoperable.

Michael Joseph Hazel was born in England during World War Two and his early years were spent in Somerset with his mother and older sister while his father was a prisoner of war of the Japanese. The family moved back to Essex after the war and that presumably is where he developed the accent that he retained, even after half a lifetime in New Zealand. Mike was modest about his qualifications, claiming that, 'I don't have any, really; just the occasional Certificate of Competence'. This gives no impression of the lively, well-read, inquiring mind or of the mischievous sense of humour that were Mike's most-endearing features.

In 1967, following a 6-year career in the Royal Navy, Mike and his first wife, Pat, moved to New Zealand and their three children were born in Auckland while Mike served in the Royal New Zealand Navy. Perhaps it was his trips to Antarctica with RNZN that prompted an interest in penguins that Mike was to pursue in the work he did for the Yellow-eyed Penguin Trust years later.

Mike enjoyed his time in the RN and the RNZN but he needed to spend more time with his growing family and so he left the navy to become a probation officer where he dealt with people who variously displayed 'poor education, violent or abusive family backgrounds, substance abuse, illiteracy, mental health issues, low intelligence'. He also encountered 'clever career criminals, white collar criminals, con men and sex offenders'. Mike's background in the navy and as a probation officer with a qualification in social work led him back to the navy as a Senior Social Worker. One of his proudest achievements in this role was the introduction of a lump-sum pay increase that helped lower-paid sailors more effectively than the traditional percentage increases. Another source of pride for Mike was his 100-plus blood donations.

Mike did not really consider himself to be a birder, but he was always interested in birds, especially shorebirds and coastal-breeding species. These interests led him to join Miranda Naturalists' Trust, and involvement with the likes of Forest Action Group, and Supporters of Tititiri Matangi. He also volunteered for DOC in the field on Hauturu / Little Barrier Island, Motutapu, Red Mercury. Once their respective families were independent, Mike and his second wife Margaret moved from Auckland to Dunedin, where Mike worked for the Yellow-eyed Penguin Trust and for Sinclair Wetlands, simultaneously for at least some of the time. One of Mike's favourite jobs in Otago was his 6 years with Nature Guides Otago run by Hildegard Lubcke ('best employer ever').

Mike claims not to have done much for Pūkorokoro ('only one Working Bee that I can remember') but he was a loyal member of the Trust and made some significant financial donations over the years, not to mention helping the Shorebird Centre Manager develop his knowledge of Single Malt.

Perhaps the best way to sum up Mike Hazel is with a quotation from his memoir. The paragraph is titled 'Friendship':

'I was working in the garden when eleven-year-old Zoe, from next door, spontaneously came to help. We beavered away together for about an hour before she had to leave and, when I thanked her, she said, "That's alright, Mike, that's what friends are for." I was rather touched, I think partly because her remark suggested two aspects of friendship that I find important. One is actually to put oneself out and do something tangible for someone as evidence of friendship; the other is the importance of cross-generational friendship. On both counts, I have been a very fortunate recipient.'

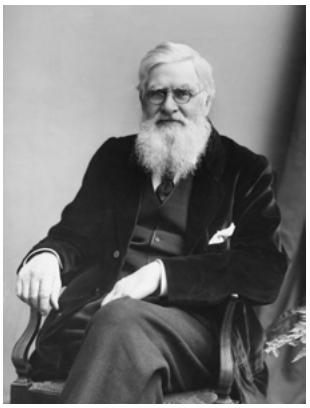
You have been fortunate, Mike, and we are fortunate to have known you.

William Perry

Sourced from an interview with Mike Hazel on 12/09/2023 and from the unpublished ***'The Life in My Years – a Memoir'*** by Mike Hazel.

Book Review

Radical by Nature, by James T Costa



Alfred Russel Wallace (1823-1913) was one of the most famed naturalists of the Victorian age. His expeditions to remote Amazonia and southeast Asia were the stuff of legend.

He collected thousands of species new to science, and founded the discipline of evolutionary biogeography. But it was for his relationship with another eminent Victorian that he is best known.

Between 1854 and 1859 Wallace was in the Malay Archipelago where he killed, skinned, preserved, packed, and shipped more than 100,000 specimens. Collecting specimens for science was a lucrative occupation that helped fund his travels. But he was more than just a collector: as a keen and inquisitive naturalist he paid close attention to specimens, recording their behaviour, distribution, and relationships to similar species and making ground-breaking discoveries in biogeography, sexual selection, and protective coloration. While exploring the archipelago, Wallace refined his thoughts about evolution, leading him to the idea of natural selection. In 1858 he sent an article outlining his theory to Charles Darwin, to whom it came as a profound shock as for two decades he had been mulling over that very same idea.

To his credit Darwin published Wallace's paper along with his own writings. But it also spurred him to begin writing *On the Origin of Species*. Thus began a complicated relationship between the two men. Most historians give Wallace equal credit for discovering natural selection, although he remains in Darwin's shadow. Wallace always gave Darwin full credit for the idea, graciously applauded his friend and rival, becoming one of his most ardent and effective defenders.

In *Radical by Nature* James Costa tells the story of Wallace's epic life and achievements, from his stellar rise from humble origins to his complex friendship with Darwin and other leading scientific lights of Britain, to his devotion to social causes and movements that threatened to alienate him from scientific society. Referring to the title of his book, Costa sees Wallace as 'an envelope-pushing radical.' He draws on letters, notebooks, and journals to provide a multifaceted account of a revolutionary life in science as well as Wallace's family life. He shows how the self-taught Wallace doggedly pursued bold, even radical ideas that caused a seismic shift in the natural sciences, and how he also courted controversy with non-scientific pursuits such as spiritualism and socialism.

Wallace was born in Monmouthshire to intellectually curious parents of very modest means. Costa describes an early childhood much of which, was spent outdoors exploring the wonders of the natural world. Forced to leave school at age 14, he travelled widely throughout Britain as an apprentice surveyor and map maker. He later taught drawing, mapmaking, and surveying, before working as a civil engineer. His travels also brought him in contact with the learning societies known as Mechanics' Institutes, which proliferated in mid-19th-century Britain. These institutes are described as 'equal parts library, technical college, and community centre where science, politics, and social reform went hand in hand'. They were where Wallace got his first exposure to the utopian ideas of the socialist philanthropist Robert Owen and where he attended lectures on mesmerism, a type of hypnotism, 'giving him a taste for the esoteric.'

In 1848, Wallace left for Brazil and would spend the next four years in South America, supporting himself by collecting and selling insects and other animal specimens to museums and collectors back in Britain to fund the trip. He returned as a respected member of British scientific circles, winning support for a three year expedition to the East Indies. Costa provides fascinating, highly detailed accounts of these expeditions,

A conceit of the book charts Wallace's relationship with lines, both drawing them and crossing them. 'His was a life marked by borders, boundaries and lines of delineation, both literal and figurative, lines he drew and lines he erased, lines he respected and lines he transgressed, lines he discovered and lines he thought he had discovered.'

Costa observed that his birthplace in Wales straddles a geological line, the Llanbadoc Fault, that shaped the landscape of his childhood. Between 1837-1847 he was a surveyor and map maker, drawing lines related to church tithes and foreclosures, though later in life he came to champion the dispossessed, campaigning against foreclosures. He was not averse to crossing other lines either and Costa describes his courageous social advocacy of women's rights, labour reform, and other important issues.

Most famous and enduring of course is the line bearing his name. While crossing the 20 km wide strait between Lombok and Bali, he recognised the remarkable transition between species on each side. Birds on either side of the narrow strait, wrote Wallace, 'belong to two quite distinct zoological provinces, of which they form the extreme limits', Java, Borneo, Sumatra and Malacca, and Australia and the Moluccas. This zoogeographical boundary eventually became known as the Wallace Line.

Yet it seems remarkable that this complex man, this noted scientist and champion of science, also subscribed to spiritualism – the world of séances and mediums, which he regarded as an overlooked branch of natural history. Only mysteriously creative forces, he maintained, not natural selection could have produced the human brain. Such views clearly did not impress Darwin. 'I hope,' wrote the great evolutionist to Wallace, 'you have not murdered too completely your own and my child.'

This is a highly detailed biography, dense but accessible. The publisher's blurb is spot on. 'Weaving a revelatory narrative with the latest scholarship, *Radical by Nature* paints a mesmerizing portrait of a multifaceted thinker driven by a singular passion for science, a commitment to social justice, and a lifelong sense of wonder.' You come away knowing much about the man, wishing you could sit down and yarn with him about his many adventures and his many ideas.

Keith Woodley

GODWIT TIMES

with Emma Salmon

Tēnā koutou

Welcome back to the Godwit Times!

It's Kōanga (Spring)! All my siblings and cousins are making their way to Pūkorokoro!

Guess which exciting bird has terned up... see what I did there – It's the whiskered tern!

In the last 50 years, only 20 whiskered terns have been seen in NZ, Cool eh!

Have a look below to find out some super cool facts about the whiskered tern.

See you at Pūkorokoro.

Ngā mihi, Godfrey

The Infamous Whiskered Tern!

I have my chicks in the middle of Australia!

I eat insects, fish and crabs! Sometimes I eat frogs and mice!

When I am thirsty, I search far and wide for freshwater!

I weigh 80 grams! That's the same as 11 pencils!

I am only 24cm long!

I have a short and forked tail!

Pūkorokoro Miranda Naturalists' Trust

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Magazine

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

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See the birds

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

Budget accommodation

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

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

Become a member

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

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

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

Bequests

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

Become a Volunteer

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

Gifts from the Shop

2024 Shorebird Calendar

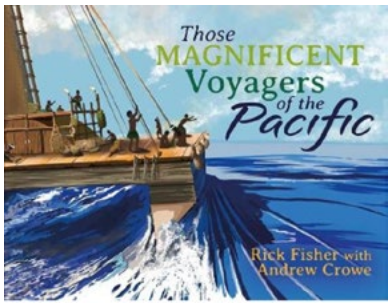
$18 +Postage

The perfect Christmas gift!

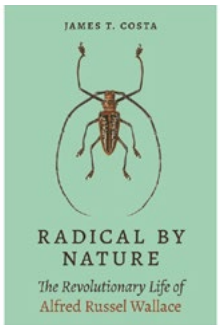
Stunning photos of Pūkorokoro and its manu. A big calendar block with lots of room for notes. High tides for Pūkorokoro and dates of our events

www.shop.shorebirds.org.nz/shop/2024-shorebird-calendar/

Great Reads from the Shorebird Centre Shop



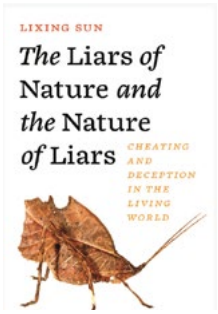
Those Magnificent Voyagers of the Pacific
***Andrew Crowe & Rick Fisher* – $35**
www.shop.shorebirds.org.nz/shop/those-magnificent-voyagers-of-the-pacific/



Radical by Nature
***James T. Costa* – $70**
www.shop.shorebirds.org.nz/shop/radical-by-nature/

A Naturalist's Guide to the Birds of New Zealand (2nd Edition)
***Oscar Thomas* – $30**
www.shop.shorebirds.org.nz/shop/a-naturalists-guide-to-the-birds-of-new-zealand-2023/

New Zealand's Biggest Year
***Harry Boorman* – $40**
www.shop.shorebirds.org.nz/shop/new-zealands-biggest-year/



The Liars of Nature and the Nature of Liars
***Lixing Sun* – $58**
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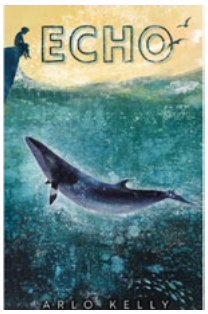

Echo
***Arlo Kelly* – $20**
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