WAI CONNECTION TATAI KI TE WAI

MOUNTAINS TO SEA

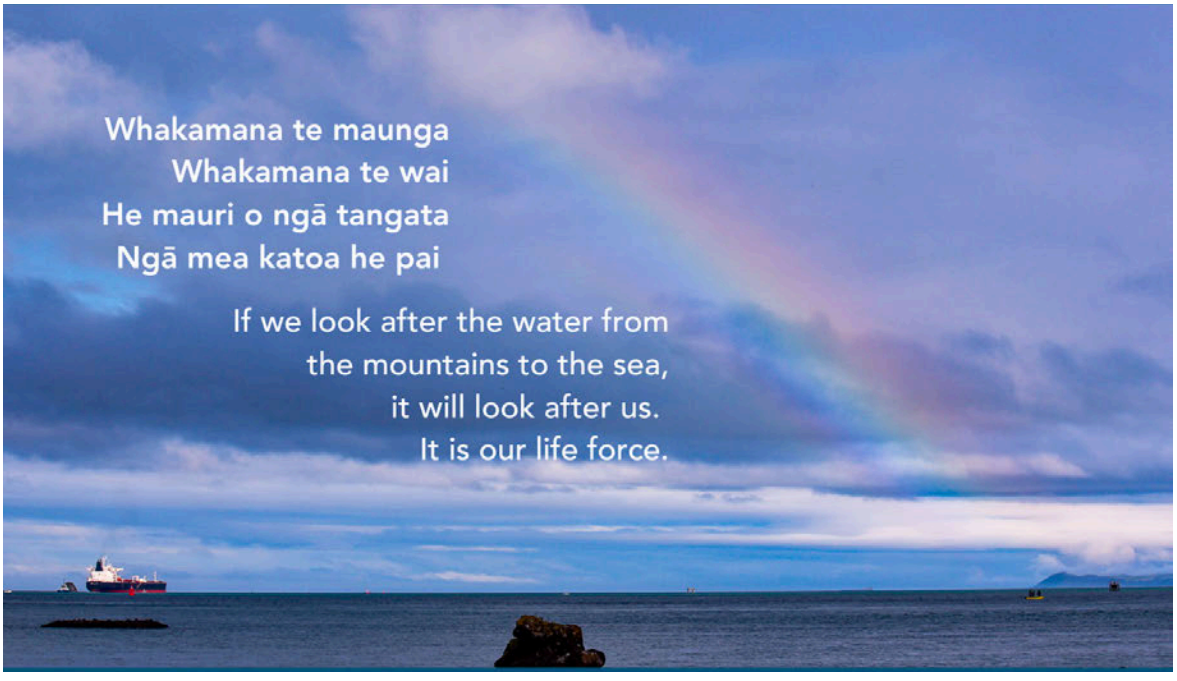
2024 WĀNANGA PROCEEDINGS

Preface

Ngā maunga ki te moana, Mountains to Sea Conservation Trust (MTSCT), was created in 2002 as a vehicle and guiding entity to enable a team of extremely motivated individuals to effectively communicate marine and freshwater science to NZ communities, involve them in experiencing those environments first-hand and in taking action for it, believing that the end result will be an improved environment. All via the programmes; Experiencing Marine Reserves (EMR) and Whitebait Connection (WBC).

This is taken from the original trust deed created in 2002 and remains the same today. A Charitable Trust is hereby established for the purpose of achieving the following outcomes.

- Environmental educational strategies, programs, resources and community engagement activities will be created, fostered and offered to the community.
- Advocate directly within communities and with Government for the establishment of a system of conservation measures and biodiversity protection areas.
- Support and create opportunities for young environmental professionals to work and engage with schools and communities in environmental education and ecological restoration and conservation management.
- Foster and support the pursuit of scientific research, understanding and traditional knowledge of aquatic ecosystems and biodiversity. Ensure that the results of the research are disseminated in the community.
- Provide technical, scientific assistance to the community, schools and environmental advocacy groups for the purpose of furthering the aims of the Trust.



Our team has grown and expanded in many ways since 2002 and currently has 6 trustees, 2 poutokomanawa/ co directors and a team of over 100 coordinators delivering our programmes and projects around Aotearoa.

That's a WHY – there's always a why – the why is one of the key motivating factors that leads thoughts and ideas into action and long-lasting behaviour change. We all have slightly different 'whys' and many connections, things that unite us. Thank you to all those that had a role in what we created on this wānanga – we explored key themes as shown in these proceedings. We also created many non-tangible outcomes – the kind that spur us on and motivate us to keep going. Moments that become powerful memories that don't fade. The 'Why' and making space to connect and be inspired is powerful.

MTSCT has been facilitating wānanga since 2006 for each of our programmes, then in 2010 we combined resources to run the EMR and WBC annual coordinator training events as one and invite a wider range of people – making it a mountains to sea focus, always with a different theme.

The theme for our 2024 event was "Connecting Communities - Hononga hapori" which resonates strongly with the mahi Mountains to Sea Conservation Trust delivers alongside many others. This theme is also core to our current national Tatai ki te wai - Wai Connection project co-funded through the Ministry of the Environment's *Essential Freshwater Fund* (*EFF*). This project aims to empower and connect communities within catchment areas enabling collaboration.

Te Waiariki, Ngāti Kororā, Ngāti Takapari Hapū Iwi Trust

Our 2024 event was hosted at Ngunguru Marae in partnership with Te Waiariki, Ngāti Kororā, Ngāti Takapari Hapū Iwi Trust. We thank Te Waiariki, Ngāti Kororā, Ngāti Takapari Hapū Iwi Trust for their hospitality and sharing their rohe and stories with us.

Kia tū ake te mana o Te Waiariki

The mana of Te Waiariki stands tall, rooted in ancient lineage and rich cultural heritage. Stemming from the unions of Ngāi Tāhuhu sisters Te Huaki and Te Kahuwhero with Te Waiariki brothers Tūkaiteuru and Te Uhi (or Uwhi), Te Waiariki holds a profound ancestral connection.

Te Waiariki tribal boundaries stretch from Te Ihu o Manaia at Tutukaka to Te Whara (Bream Head), encompassing Whangarei Te Renga Paraoa and extending inland through a tapestry of significant landmarks.

Within the landscapes of Tutukaka and Ngunguru, Te Waiariki and Ngāti Takapari Hapū share a whakapapa of Mana Motuhake, embracing sacred sites of cultural importance. Tawhitirahi, and Aorangi (Poor Knights) stand as vibrant reflections of cultural significance, revered as wāhi rongonui and wāhi tapū for Te Waiariki Hapū.

Mauri ora ki te whai ao ki ao marama!

Te Waiariki, Ngāti Takapari, Ngāti Kororā Hapu Iwi Trust

www.tewaiariki.com

Acknowledgements

Me te aroha tino nui atu It is with deepest sympathy that the team offer condolences to Tyme Rata (wānanga participant) who's mum passed away in an accident during the time of the wananga. *Aroha mai nui Tyme.*

Thank you for making this wānanga possible

Ministry for the Environment
Manatū Mō Te Taiao

Additional thanks to

Vince Kerr, Stefan & Ira Seitzer, Glen Edney, Te-Pu-A-Nga-Maara, Sustainable Coastlines, DJ Average K, MTF Finance Whangārei, Māra at Oceans and The Chocolate FIsh Co.

A special thank you to the haukāinga - Te Waiariki, Ngāti Kororā, Ngāti Takapari Hapū. And to Maria Lawton and her crew for the delicious kai!

Photography by Lorna Doogan and Sophie Journée unless otherwise stated.

A full album can be found in the Mountains to Sea Galleries
www.mountainstosea.org.nz/gallery

Day 1

Pōhiri & Hau Kāinga Introductions

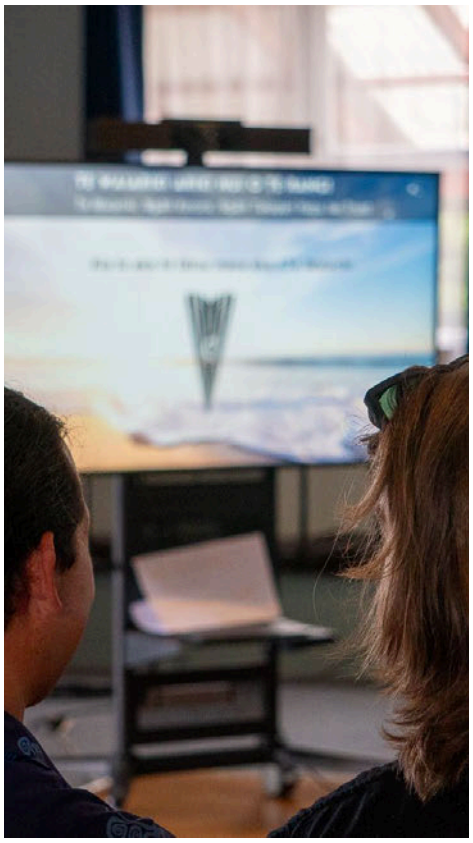
We were given a warm pōhiri welcome onto Ngunguru marae and were made to feel like whānau by Te Waiariki, Ngāti Kororā and Ngāti Takapari hapū.

Later we heard from the hau kāinga about their history, stories, aspirations for their taiao and the mahi they do.

Hapū Aspirations for Te Taiao

Te WaiAriki, Ngāti Kororā, Ngāti Takapari Hapū Iwi Trust Whānau and Kaitiaki - Ripeka Read, Michelle Beattie, Ebonii Shortland, and Donnella Kāhu

Hoe Taiao is the environmental portfolio of the Te Wairiki, Ngāti Kororā, Ngāti Takapari Hapū Iwi Trust. Directed by the hapū vision, we are a small team that oversees Te taiao, involving many different components. Our aspirations are to develop a hapū led resource management unit, implement mātauranga Māori tools and practices to revive the Taiao (environment) and develop strategies to strengthen against and mitigate climate change, and provide resources to strengthen the hapū.



Nga Kohatu Mauri: Represent the cultural values of our hapū. “When on the waka a mauri stone provides guidance and protection while in the waka. All the work being done in our hapū s underpinned by nga kohatu mauri . These cultural values ensure that there is a united and collaborative approach amongst the hapū, keeping relationships intact.

We have many aspirations for our Taiao, but we require greater resourcing and capacity to undertake the work well.

Matauranga Maori is essential to inform and lead our work within the taiao for our hapū. Whenua Restoration

Another aspect is whenua restoration through native planting. If there is restoration and native planting, we want the whakapapa of these plants to come from within the Te Waiariki rohe and the people planting them to be of Te Waiariki (those who have a whakapapa here).

Cultivating Mahinga Kai - Restoring Shellfish

Pipi are a taonga for us, and a major part of our diet. We want to restore tahuna, (sandbanks) and there is tikanga associated with this. We're asking, what are the cultural practices to reinstate and reinvigorate these tahuna? Cultivating a bountiful moana. We are people of the water; our cultural origin says we are guardians of both the water and the sea. We want to ensure we have kai for our people. If the moana is not cared for properly, then these kai sources won’t be available.

Climate Change Mitigation & Adaptation

There are many challenges associated with climate change. One example is our waahi tapu that sit on lowlands are becoming compromised by rising water levels. Te Waiariki is starting to put together an inventory of what is needed and what the mātaruanga Māori practices are that can be implemented to mitigate and adapt to climate change. We also want to undertake guided cultural site visits for people to learn about the local history from our whanāu and hapū.This includes inducting organisations through cultural inductions.

Questions

Q: In areas with overlapping rohe there are added layers of complexity – do you have any recommendations?

A: This can be very complex. Develop relationships with multiple hapū, so you are not disregarding the voice of an individual hapū. You want to work with all and as you begin to build the relationship, they will tell you who you need to be working with.

Q: Sometimes it is very challenging to know or get that initial contact. What's the best way to proceed?

A: You must start with yourself and your own education, once you engage in this space you will understand why you need to reach out to this hapū. Upskill so you understand why it is necessary to engage. Then understand what these aspirations are to build these relationships.

You can find out more about Te Waiariki, Ngāti Kororā, Ngāti Takapari Hapū Iwi Trust and their mahi on their website here.

Introduction from Mountains to Sea

Vince Kerr, Stefan Seitzer, Samara Nicholas, Kim Jones, Lorna Doogan & Patricia Hawkins

The theme of this year's wānanga, 'Connecting Communities' is a key concept that has driven MTSCT forward over the past 23 years. This was evident in the Mountains to Sea Conservation Trust presentation which delved into the past, present and future of the trust.

We heard from Vince Kerr and Stefan Seitzer, founders of MTS. They spoke to the development of the trust and its programmes alongside the other two founders, Samara Nicholas and the late Dr Roger Grace.

Vince saying, "That's the story, four people in sync, wanting to take on the world. Great people with a shared vision just going for it… We structured learning around engagement and got the students talking for two days - This led to the key elements of Whitebait Connection and EMR"

Stefan saying, "By 2002 we had a considerable body of community engagement and that expertise needed a home, so the trust was created. It was an exciting time to create a roadmap for a shared vision. The first 15 years were some of the most inspiring work, we didn't get up to go to work, we were on a mission."

The Mountains to Sea Poutokomanawa Co-Directors Kim Jones and Samara Nicholas talked further to the past, present and future of the trust and the Wai Connection funding that is supporting the current and future vision.

Kim saying, "Wai Connection has offered the opportunity to provide regional multi-year plans and allows us to create tailored plans to meet the needs of the community - thank you MFE. The project has supported a rapid growth in our team across the country from 42 in 2021 to now over 100. Tell me and I forget, show me and I may remember, involve me and I understand. This is the centre of our mahi. Wai Connection is all about bringing people together, connecting them to the wai and their why. "

Samara saying, "We've run our wānanga annually since 2006, with the first one in 2004 at a shed in Leigh. It's great to see it grow from a small meeting to a massive MTSCT wānanga with this huge catchment wide vision. Back in the day, to get people excited about the marine environment we thought it was best to show people a fully functional ecosystem and compare it to an unhealthy ecosystem to bring out the questions… the kaupapa is that you need to look and learn to understand it."

Local Field Trips

In the afternoon wānanga participants got the opportunity to go out and explore the local environment with two field trip options.

Marine Field Trip

Our marine field trip involved a visit to Glen Edneys seaweed nursery at Wellingtons Bay. Participants got to observe and listen to kōrero about the seaweed restoration mahi Glen has been doing alongside the community.

Freshwater Field Trip

The subtheme of the freshwater field trip was "connecting communities through macroinvertebrate communities." This involved an investigation of the macroinvertebrate community living in the pristine bushclad Waiotoi awa tributary on Stefan and Ira Seitzer's property. All participants were engaged and enthused by the diverse community observed. This highlighted macroinvertebrate investigations as a powerful tool for engaging communities in freshwater ecology and education.

Evening Presentations

Ministry for the Environment (MFE)

Essential Freshwater Fund

Katie Owens & Jovan Mokaraka-Harris

Katie and Jovan from MFE did a presentation summarising the Essential Freshwater Fund which was established as part of jobs for nature programme.

The Essential Freshwater Fund has six strategic themes: including tangata whenua, farm advisory and certifier, access to experts, fish passage action plan, integrated catchment management plans, and catchment groups. Wai Connection has been funded through the 'catchment groups' theme.

The merit of the fund is its collective nature which builds up local, regional, and national support.

The 'access to experts' theme is a live and free service, available for everyone to help make it easier to implement the new reforms. Access to experts connect iwi and hapū, regional council staff and local community and catchment groups to freshwater experts who can provide guidance and support on everything from nutrients and sediment to wetlands and mahinga kai. To find out more visit www.access2experts.net.nz.

Jovan also spoke to the Informed Iwi Influenced (IIF) projects, of which there are 22 developed across Aotearoa. The main kaupapa is to allow tangata whenua to engage with what the new environmental/resource reforms might look like.

If anyone wants to be linked into any of these projects feel free to contact Jovan jovan.mokaraka-harris@mfe.govt.nz.

Vince Kerr - Maitai Bay Rāhui

Community monitoring 5 years on

I have been involved in marine conservation projects all over Northland and there have been some great things happening such as the Maitai Bay rahui which has involved EMR. Many of the snapper in the reserve are residents and there are also thousands of juvenile fish in the rahui now, and they are starting to attract the larger predators.

The focus tonight is on kelp forests - "I've been doing this work for 25 years and I started doing it because I wanted something to happen, I wanted to make a difference. It has been a long journey, but it's starting to make a difference. There is a massive problem on this [north-east] coast, with massive spin offs from the loss of the kelp forest"

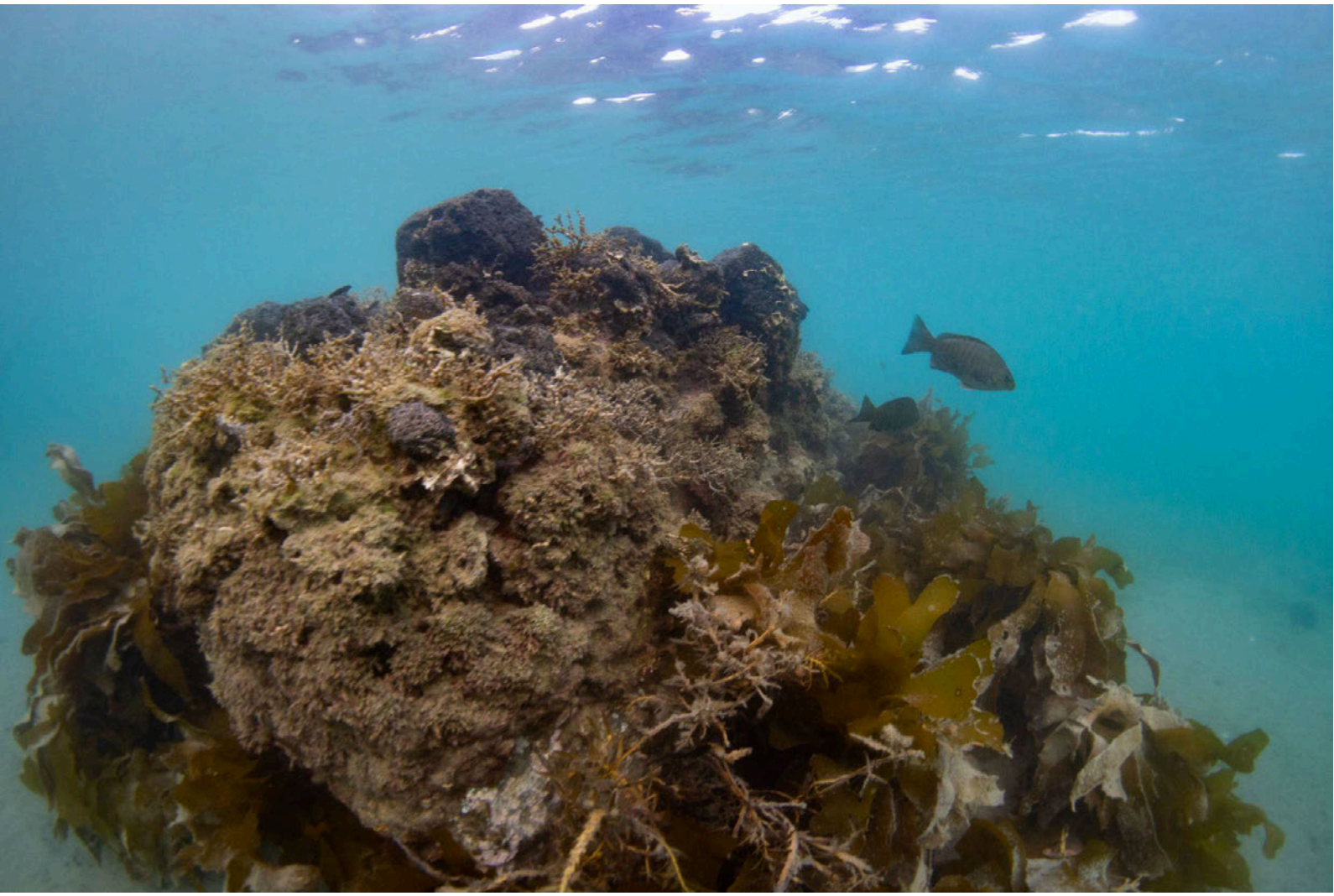
Kelp forest is one of the most diverse and productive marine habitats on the planet, however we have lost the predators and lost the balance between tamure, kōura and kina. In the Tawharanui Marine Reserve, when sums were added there was a ton of kōura per hectare. Up north there was an average of 1.5 kg per hectare. They are not fulfilling their role ecologically.

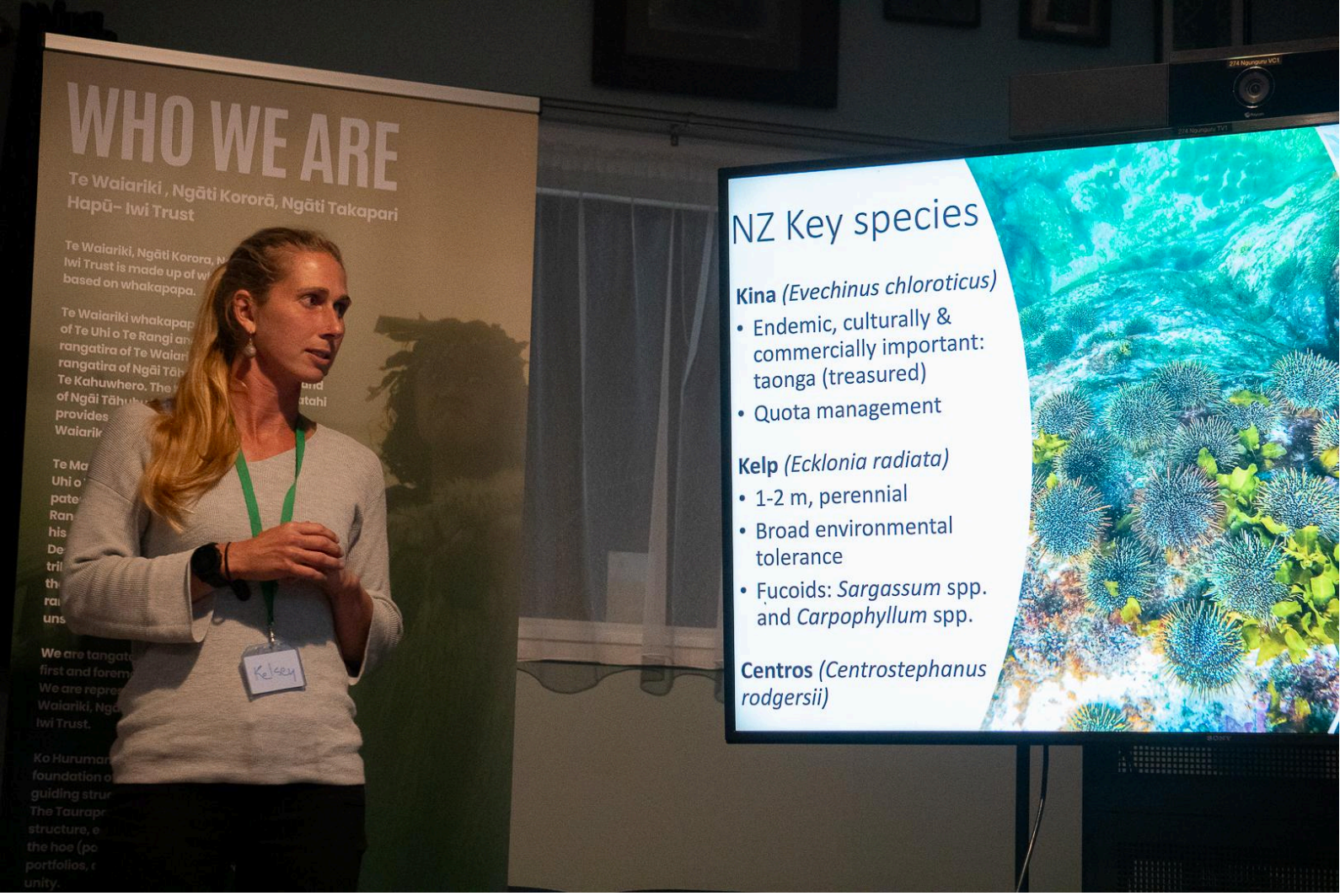
In the early days biologists were contacted to get funding to look at reserves. The late Dr Bill Ballantine had the idea to map habitats, which no one had done before. This was done with diver transects. Basemaps were manually traced over an aerial photo, creating the first habitat map of New Zealand. Out of this, there became the need to have maps to plan the conservation and restoration of the Northland marine environment, and all reef areas from Cape Reinga to Tawharanui were accurately mapped. At seven locations this was fine scale mapping, a result of Roger Grace sticking out the door of a plane with a camera, taking images of the reef below. This accounted for 14% of the whole Northland coast, and took 20 years to map. The last location completed was Maitai Bay, where the kelp was divided into shallow and deep zones. Kina barrens were most prevalent in the shallow reef down to around 16 m in the Far North, and around 10 m

further south toward Leigh. In total, 30% of the shallow part of kelp forest is urchin barren, and the total estimated area of urchin barrens on the north-east coast was estimated at 30 km^2. Within the Marine reserves the equivalent part of the kelp forest was 2% urchin barren. There is a simple conclusion from this, marine reserves work. It takes 10-15 years but it works.

We also tried to put together time series from historical images. In these old photos all you could see was dark black kelp forest, no kina barrens. By the 1970's, these kina barrens were common, and have persisted in a stable state [CL5] for over 30 years. Incidentally, the rise of kina barrens in Northland is in line with the rise in fishing effort (especially the removal of snapper and crayfish).

The maps generally take 2 years, but some take 4 years to complete. Interestingly, the maps at Leigh and Tawharanui show a distinct barrier from inside to outside protected areas. Inside the reserve has solid reef, while outside the reserve has significant barrens.





Keynote | Kelsey Miller - Kelp Forests & Urchin Barrens

Kelsey is a research fellow at the Leigh Marine Laboratory working on kelp reforestation. Her work revolves primarily on evaluating the ecological benefits and feasibility of large-scale sea urchin removal as a tool for restoring kelp forest ecosystems in Te Moananui a Toi (Hauraki Gulf). In her talk Kelsey spoke about this work.

Kelp forests are critically important ecosystems due to their high productivity, support for fisheries, cultural significance, and biodiversity. However, they are currently facing rapid decline globally, primarily due to the overgrazing of kelp by sea urchins. This overgrazing often occurs when natural predator populations of sea urchins are reduced, allowing their numbers to explode and create barren areas devoid of kelp. These barren areas can persist for centuries and cover extensive coastal regions.

Kelp enhancement is important if you have a limited kelp spore supply, and where there is a lack of reef structure artificial structure can be used. When overgrazing is the key removal/predation of the grazer is generally required.

Kina are very important for the reef ecosystem, bringing in larval organisms [through reef noise] and turning nutrients over. They aren't the problem, but the barrens they create are. *Ecklonia* forests are quite resilient to temperature. A common New Zealand scene now is mixed kelp, with kina barrens all the way to the deep reef. These barrens were first linked to overfishing in the 1960's. A classic story is in Leigh, where the Goat Island reserve resulted in barrens recovering back into a healthy reef.

Reducing kina density is key, ideally through natural predators or removal efforts. Successful removals have shown kelp regrowth within 1.5 years with <1 kina per m^2 required to reset ecosystems. But kina will keep coming back unless the root cause of the loss is addressed.

Through expert discussions it was decided that culling was the most expedient way to restore the reef in the Hauraki Gulf. This was about science and learning about the underlying mechanisms rather than reef restoration. A special removals permit was granted from MPI and work was conducted closely with local hapūand iwi. Selected sites were bounded by bays/sand to prevent re-incursion. It took 450 hours to remove kina from 71,000 m^2. When the kina were removed their densities dropped and stayed low for a few years, then started to creep up again. At all the sites there was a massive increase in macroalgae, with multiple species self-reseeding throughout the site (~3.5 million new kelp plants).

There was no/low recovery of fish and crayfish, as there was still extensive fishing in these sites. Kina roe quality improved after removal, so the remaining individuals may be harvestable. Quality of roe increases with fresh kelp but varies throughout the year.

While kina removals can initiate recovery, addressing root causes like overfishing is crucial for sustained ecosystem health. Strategies should integrate spatial management like marine reserves and rahui to support long-term reef restoration alongside removal efforts.

Questions

Q: With the recovery [of kelp] are the shallow mixed species coming back as well?

A: Yes, at three of the four sites.

Q: Would a maximum size limit be good?

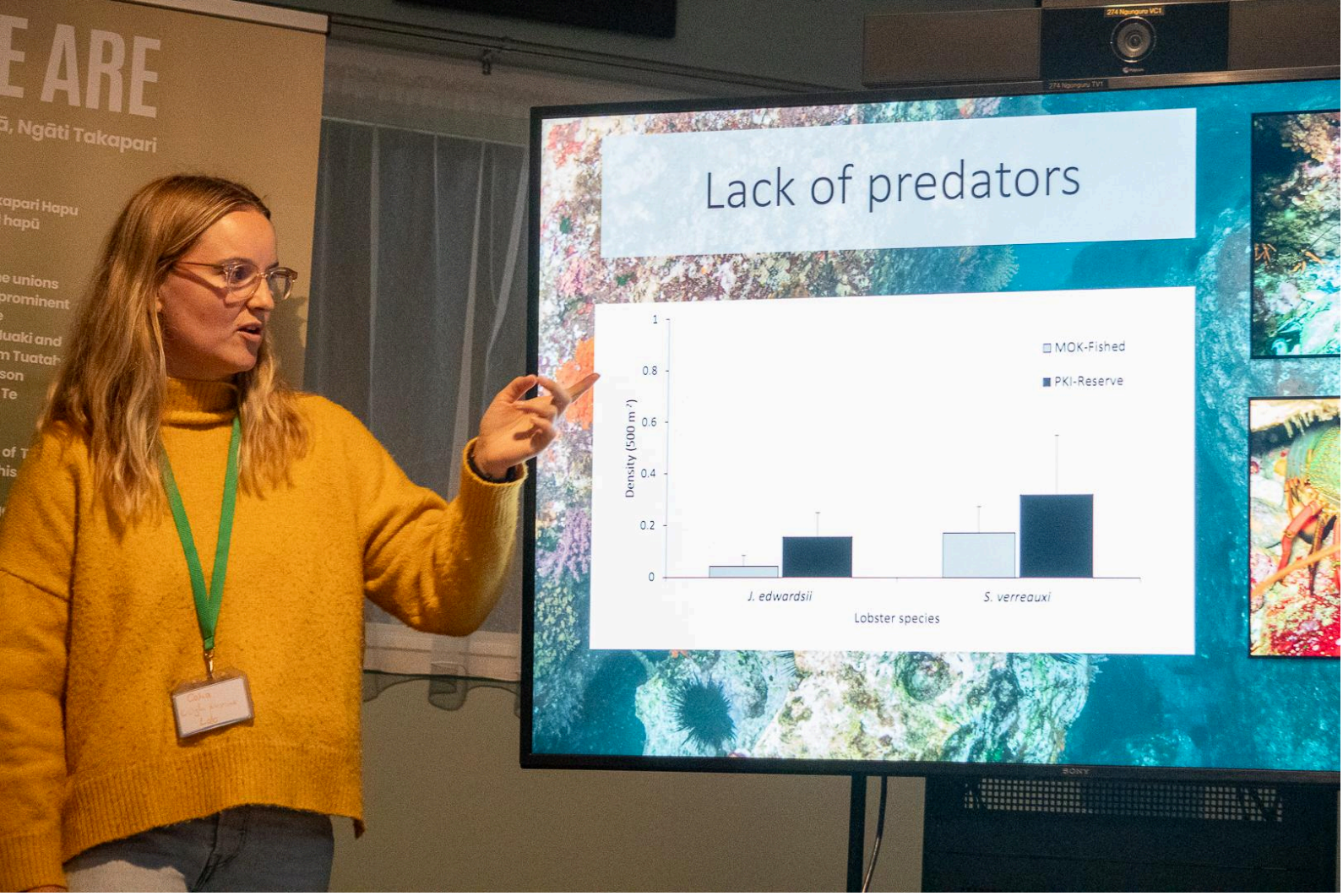
A: Probably. Legal size snapper cannot eat the kina.

Q: Does crushing kina in the water spread the roe?

A: Probably not any evidence of this. Fish will very quickly consume the roe, and they would need to be fully developed.

Q: Are you seeing an increase in other shellfish?

A: We're starting to look at this data now. We're looking at doing a project with green lip mussels to see if there is a relationship. Most other work suggests that the overall biodiversity increase would benefit them as well.



Keynote | Celia Balemi - Changes in species patterns – long spined urchins

Celia's research focuses on the population changes and ecological impacts of the long-spined sea urchin (*Centrostephanus rodgersii*) and how this compares to the endemic kina (*Evechinus chloroticus*).

The research is predominantly focused at Tawhiti Rahi and Aorangi islands/Poor Knights and the Mokohinau islands to examine the differences between a marine reserve and fished areas. This research provides important information on how the population of this species is changing in New Zealand and the potential risk it poses to these iconic locations.

Long-spined urchins, *Centrostephanus rodgersii*, are native in New Zealand but have historically maintained very low numbers and are not known to form urchin barrens. Range expansions of the long-spined urchin in Australia has resulted in extensive damage to kelp habitats.

Long-spined urchins are expanding in Northeast New Zealand due to warming waters and the absence of predators like kōura, which are functionally extinct in the region. This expansion is leading to significant habitat destruction, particularly forming large barrens deeper than those typically seen with kina urchins.The Mokohinau and Poor Knights

Islands have a time series from 1999. The Poor Knights had ~10% urchin barren prior to protection, which dropped after the marine reserve was established. Now there are some large areas of long-spined urchin barrens forming. These can form much deeper than kina barrens, down to 30 m in New Zealand and in some areas of Tasmania down to 60 m.

Their expansion could cause destruction of important habitat, with flow on to the wider ecosystem and commercial fisheries. To limit these impacts we need large-scale rebuilding of predator (kōura) stocks, along with active management (e.g. removal/harvest, predator enhancement).

Some long-spined urchin removals were done as part of Celia's research to better understand the impact of these urchins on rock walls. This was done in combination with hapūand the Department of Conservation. Long-spined urchins were removed from three 35 m x 20 m sites. Within three months a lot of the encrusting community had recovered, and *Ecklonia* recruits were coming back within 6 months. A 1 year survey will be completed soon.

Questions

Q: Do they eat everything?

A: *Centrostephanus* are relatively indiscriminate feeders, compared to kina.

Q: Is there a fishery?

A: In Tasmania fisheries built a 500 t/year fishery to harvest them with a subsidised fishery (the roe were not valuable enough to sustain it).

Day 2

Keynote Continued | Celia Balemi - Urchin Monitoring and Removal

On day 2 of the wānanga Celia spoke about the methodologies she uses in their research.

The long-spined sea urchin are monitored using quadrats to measure benthic cover and observe behaviour (documenting whether they are cryptic). Photos of quadrats are taken but are limited in detail, making in-person observations crucial. Underwater GPS is unavailable, so geolocated surface photos are used. Trials of new technology like photomosaics show promise in identifying habitat types but not biodiversity.

AI is being trained to analyse drop camera images, successfully distinguishing species like kina and Centrostephanus but struggling with substrates. Public observations and EMR surveys are valuable, noting an unexpected increase in Centrostephanus on offshore islands. Their typical range is North Cape to East Cape, so observations beyond this would be interesting. iNaturalist is recommended for data collection, emphasising the importance of recording all data for potential future use.

Questions

Q: Is this [3D & reef imaging] being linked in with EMR/BLAKE?

A: Not currently. It could be a great way to share this with others and look into these options more. Happy to share any footage around with MTSCT team.

Previously we have attempted a kina wānanga for rangatahi, but it didn't quite take off due to covid and a few other reasons. We struggled to engage kids, talked about taking them culling kina, but this is not the message we wanted to convey. We want to do this in a way that doesn't create a narrative demonising kina. Have been developing mauri metres and layering different datasets to involve more people.

Q: What would be the feasibility of trying to do community led kina culls on snorkel? Is it doable on a snorkel?

A: Yes, but you need to understand where the easiest places to go wrong are. You need to know what your goals are, whether that's kelp regeneration or ecosystem regeneration, or simply outreach and engagement. When you do it you need to make sure that the density is brought down low enough to ensure it works, then have a long-term plan to maintain it.

Q: This has happened in Maitai bay, it would be great to have the science side explained to them [locals/hapu]. It could be a good case study as this project is hapūled. Maybe

you could develop some guidelines for communities, to avoid the thinking that kina culls are the silver bullet.

A: A PhD is being done on this right now, so this science will be communicated into a palatable form.

To cull all the kina barrens around Hauturu-o-toi/Little Barrier Island would take an estimated 15,000 diver hours. Across the world urchins don't have much storage for food/fat, so the health of the roe is typically comparable to the state of their habitat. Kina in kelp forests are much healthier. However, even though the roe quality is less good outside of barrens there are still times of the year when the roe is viable for commercial consumption. There is a time and a place where the kina from a barren will be good enough for harvest instead of eradication. Roe also increases in size as you go further south, so most of the fishery is down south. A potential option to consider could be a subsidised fishery up north, similar to the one established in Australia.

Q: [Question around] translocations.

A: High to low density movement/translocation can be difficult and tricky to get around relevant acts depending on where the urchins are (Marine Reserves Act). For the Poor Knights we were required to cull only, regulators do not want to set a precedent of using a marine reserve as a fishery, even if it is for conservation purposes.

Show and Tell Speakers

TriOceans - Aihe Monitoring in the Bay of Islands

Kayla Keyes, Alex Finaly, Ben Harris, Huna Hough, Maia Baillie, Satchet Guilloux & Te Rau Raharaha

The marine kaitiaki course, part of the Jobs for Nature programme, was established by TriOceans, the Tangaroa Research Institute of Oceanographic Study in the Bay of Islands. It focuses on training participants for careers in marine conservation through a 6-month programme.

TriOceans has had a traditional focus on studying bottlenose dolphins and other marine mammals on the Northeast coast using mark-recapture techniques over 30 years. The methodologies include identifying individuals through distinctive dorsal fin notches and body scars visible in photos taken during surveys. This data helps establish population dynamics and usage patterns, crucial for understanding and conserving these endangered dolphins. Currently there is no setup for the public to submit images, however sometimes those from local providers that are familiar with the programme can be useful.

The Bay of Islands is soon to become a marine mammal sanctuary which will be beneficial given the significant decline in dolphin numbers in the area. Establishing this sanctuary was the first legislation signed collectively by all Bay of Islands hapūsince Te Tiriti. In one of these sanctuaries if a vessel is within 300 m of any marine mammal it needs to stop entirely until the mammal has moved out of that range. When the dolphins encounter vessels, they can get very distracted, so they're no longer doing typical feeding, rearing and resting behaviours.

Despite funding challenges, ongoing efforts for this research include sharing research datasets nationally and assessing sanctuary effectiveness in the future.

Questions

Q: What was the biggest takeaway from this course [for the students]?

A: Weaving in different scientific backgrounds and being involved in a community with people of different expertise was great. Diving is a highlight and coming out with open water and project Jonah certificates. Learning skills to give back to the community, networking with others to share knowledge. I really enjoyed the buildup of knowledge and the incorporation of Mātauranga Māori. I enjoy doing something different everyday, getting out, doing stuff, and connecting with people, and learning from each other.

Waiheke Marine Resources Trust - eDNA and Kākahi in Little Oneroa Stream

Kristin Busher

Waiheke Resources Trust focuses on environmental sustainability and community connection through three main initiatives: Love our Wetlands, Waiheke Waterways, and Marine Education. The Marine Education Initiative involves around 200 students annually, guiding them through learning about local water catchments, rocky shores, and snorkelling experiences with EMR.

The Love our Wetlands initiative initially restored five wetlands, now expanded to seven. The focus of the Love our Wetlands initiative is pest plant management using a no spray approach.

The Waiheke Waterways Initiative has addressed environmental impacts from rapid development in the Little Oneroa catchment, notably improving lagoon health through community engagement. The initiative has successfully raised septic tank compliance rates from 30% to 90%. It has also led to the discovery of kākahi (freshwater mussel) in Little Oneroa Stream using eDNA sampling, enhancing local stream biodiversity awareness.

Field Trips

Snorkelling at Whangārei Harbour Marine Reserve - Reotahi

Wānanga participants who opted to join the marine field trip went on a snorkel excursion to Reotahi. The reserve is now 18 years old and was established by Kamo High School. From 1990 to 2004, more than one thousand Kamo High School (KHS) Year 13 geography students worked on the Whangārei Harbour Marine Reserve Proposal. It is believed to be the first no-take marine reserve application by a school in the world. The students consulted with a large number of organisations, the public, tangata whenua and worked hard to gather information to improve their proposal, seeking expert advice from the likes of the late Dr Bill Ballantine and Wade Doak.

The late Dr Bill Ballantine was engaged in fieldwork teaching in the Whangārei Harbour with Auckland University students. He welcomed the efforts of KHS to promote marine reserves in the harbour and strongly supported their application. Dr Ballantine regarded Motukaroro's southern shore as the best example of zonation seen on an accessible rocky shore anywhere in the world.

Visit to a Local Riparian Planting Site

Participants who chose to attend the freshwater field trip got to see a riparian planting site on a farm at Taurikura Bay. Participants also listened to a kōrero from Arvay Armstrong-Read about the history of the area and the mahi of Te Waiariki, Ngāti Kororā, Ngāti Takapari Hapū Trust. Teresa Battersby, a teacher on placement with Mountains to Sea Conservation Trust as part of the Royal Society Science Teaching Leadership Programme also spoke about the planting work she has done with her students at Whangārei Primary School in the area.

Social Evening

After drying off from the day's adventures, we indulged in a social evening hosted by Māra at Oceans in Tutukaka. Entertainment was provided by DJ Average K.

At the social evening the inaugural Dr Roger Grace memorial award for Marine Conservation was presented to Dr Kelsey Miller.

To learn more about the Dr Roger Grace Memorial Fund and to donate visit:

mountainstosea.org.nz/roger-grace-fund

Day 3

Show and Tell Speakers

Water for Life - action for improved habitat and water quality

Bjorn Leigh - Dream Streams Ltd.

In his presentation Bjorn spoke about his business Dream Streams Ltd. which is aimed to drive action to improve freshwater habitat & water quality. Bjorn's business is focused on improving fish passage, developing good culvert design to ensure passage and ensure resilience to extreme weather events through wetland creation and bank reshaping.

Dream Streams can also support slope adjustment to aid planting, reduce erosion, and create more īnanga spawning habitat. Their services also include fish surveys to inform other works, and pest management such as containing koi carp, trapping turtles, animal surveillance.

Bjorn spoke to an example of his work at Wilsons dam, where a fish passage system was retrofitted for īnanga.

Biosecurity surveillance in Aotearoa

Rachel Hooks - Ministry of Primary Industries

Rachel is a member of the Incursion Investigation Team at the Ministry of Primary Industries (MPI). In her show and tell presentation Rachel spoke about biosecurity surveillance in Aotearoa and the work of her team at MPI.

Biosecurity is about protecting the environment from introduced pests and diseases. The role of MPI is to engage with communities to break down silos between industries. The goal is to reduce risks, as it is challenging to completely mitigate. Initiatives run by MPI include targeted surveillance for marine pests at high-risk sites like ports, and there is an upcoming program targeted for freshwater environments.

General surveillance relies on public participation to report unusual findings, which are then assessed by experts. You can contact a call centre, which then gets passed on to the lab/taxonomy team to identify if something is weird or wrong. All detections are documented online to track and respond to potential new threats effectively.

There are also educational resources for schools available to support broader biosecurity awareness efforts.

If you find anything unusual you would like to report to MPI you can free phone their hotline on 0800 80 99 66 or complete a report online here.

Shortjaw Kōkopu habitat selection and spawning behaviours in the Waipoua river catchment, Northland

Fern Donovan

Fern is a Freshwater Biosecurity and Migratory Fish Species Ranger at the Department of Conservation in Northland. Prior to this she completed a Master of Science at Victoria University studying the habitat requirements and spawning behaviour of shortjaw kōkopu in the Waipoua Forest. Fern spoke to this research during her show and tell presentation.

Acknowledgements go to Te Roroa for their collaboration and support on this work within their rohe.

Shortjaw kōkopu are dependent on pristine waterways and face significant threats due to land use changes such as forestry, agriculture, and urban development. These alterations have likely led to localised extinctions over the past three decades, as the fish require forested streams which have dwindled in number. Ideal habitats for shortjaw kōkopu include sites with large substrate to protect against floods and predators, higher elevation with robust forest cover, and inland locations.

Shortjaw kōkopu have a diadromous lifecycle, spawning between late autumn and early winter and rely on flood events for spawning. Eggs develop within 2-3 weeks, hatching in response to subsequent floods. Despite efforts, no new spawning sites have been identified since 2002.

Fern's project aimed to fill knowledge gaps by surveying and monitoring the physical environment, as well as tagging fish. Spent fish were observed post-spawning, prompting searches for eggs along stream banks. The stream had sensitive macroinvertebrates and mature native riparian areas.

At least two different spawning events occurred during the surveys. Specific findings included approximately 200 eggs at one site, all on bedrock and in early development stages, which disappeared within 3 days, possibly due to predation. Another site had around 1000 eggs on cobbly substrate, similarly disappearing within weeks. Evidence suggests rats may have preyed on the eggs, suggesting targeted rat control during spawning seasons could benefit conservation efforts.

Through her research Fern found threats to spawning included altered flood regimes linked to climate change, terrestrial predation by mammalian predators, and a lack of suitable habitat. Moving forward rodent control plans are being put in place for these survey sites to hopefully see more successful egg development and better recruitment in the future.

The published DOC post can be found here:
https://blog.doc.govt.nz/2024/07/23/rats-snapped-devouring-eggs-of-threatened-fish/

Charlies Art Workshop

Charlie Thomas

Charlie uses art as a powerful tool to convey environmental messages. He was first inspired to take action through art when working for sea cleaners in Auckland, rescuing a shag entangled in a fishing line. Charlie later travelled to Hawaii with Sea Cleaners, witnessing the impact of human activity on albatross populations.

Currently working as an educator on Rotoroa Island, Charlie leads student excursions and emphasises the impact of art in environmental education. He believes art serves as a universal medium, accessible to all, and has effectively engaged students who may not otherwise participate.

At the end of the presentation everyone partook in an engaging art activity.

Love RimuRimu

The team from Love RimuRimu run by Mountains to Sea Wellington (Mountains to Sea Conservation Trust provider region) did a brief kōrero on their work in Wellington. You can find out more about their mahi on their website here.

Download their seaweed ID guide here

Keynote: Enabling Kaitiakitanga and Ecosystem Based Management

Lara Taylor (Ngāti Tahu, Te Arawa, Ngāti Pāhauwera, Ngāi Tahu ki Murihiku)

Lara has attended the past 4 MTSCT wānanga. Over that period, she has shared the progress of her research journey "Enabling Kaitiakitanga and Ecosystem-based Management", a 3 year MBIE-funded, Sustainable Seas National Science Challenge project which she has co-led with Dr Dan Hikuroa.

This time, Lara returned to share the final research outputs and the 'toolkit' Te Kete Kaitiakitanga that has been developed to enable Kaitiakitanga and EBM. It has been designed in collaboration with a range of partners for the use of agencies, organisations and iwi/hapūwishing to improve marine governance and management outcomes.

The toolkit features three key tools to support the co-existence of kaitiakitanga and EBM, promoting a whole systems approach that incorporates both indigenous and Western perspectives:

- E Toru Ngā Mea – information to advise and help users gain an understanding of the critical elements required for Mana Moana involvement in marine governance and management.
- Mahi Tūhonohono – guidance to support users to provide for those critical elements to the necessary extent.
- Te Tiriti Relationship Enhancer – an assessment tool that enables users to evaluate their organisational approach to implementing marine governance and management in a way that provides equity of opportunities and outcomes across the socio-ecological and cultural seascape.

All three tools are centred around relationships, transparency and accountability. The tools enable users to explore relationships, knowledge and approaches founded in te ao Māori that offer the opportunity to enhance the well-being of people and the ocean through kaitiakitanga and EBM. They aim to support making greater space for te ao Māori, particularly rangatiratanga (Māori leadership), mātauranga (knowledge and knowledge making), and tikanga (best practice). The toolkit is to be used sequentially,

focusing on kaitiakitanga first, thinking about rangatiratanga, mātauranga Māori, and tikanga.

Watch Lara's talks on Ki uta ki tai - Landscape-scale restoration here, and conceptualising E Toru Ngā Mea: three things for enabling "Kaitiakitanga" and "EBM" here.

Here is a link to the 'toolkit' for kaitiakitanga and ecosystem based management developed for Sustainable Seas with Dr Dan Hikuroa.

Keynote: Catchment Groups as Pathways to Improve Northland Rivers

Graham Mathews - Piroa Conservation Trust

Graham Matthews has farmed in Waipū for approximately 35 years and is now the Bream Bay Rivers Catchment Coordinator for the Piroa Conservation Trust/Ministry of Primary Industries project. The goal of the project is to use catchment groups as the vehicle to involve the diverse mix of farmers and lifestyle block owners in Bream Bay to combine and improve the water quality and biodiversity of their rivers. It is hoped this will provide a model for the rest of Northland.

In his presentation Graham talked about the strategies to communicate and engage with farmers and lifestyle block owners to achieve long term commitment, and buy in.

The Piroa Conservation Trust (PCT) morphed from various conservation groups in the Brynderwyns region, initially driven by a community effort to address possum issues and

increase kiwi populations. Over time their focus has broadened to include a focus on freshwater.

The project Graham is involved in was a Ministry for the Environment funded, Ministry of Primary Industries instigated community group project. The project involves partnership with Patuharakeke, crossing over wherever possible.

In his presentation Graham spoke of the challenges of catchment scale work in Northland associated with multiple landowners with varied land use practices. Piroa Conservation Trust advocates for holistic catchment management to address issues such as sedimentation and fish passage, stressing the need for community buy-in and intergenerational commitment.

Some of the key messages Graham highlighted for getting farmers and catchment communities onboard to achieve long term commitment included:

- Leadership and ownership within the community are crucial for driving progress across different land uses, from economic ventures to lifestyle blocks.
- Education has a crucial role in engaging farmers and communities through initiatives like SHMAK testing for water quality.
- Highlighting the ecological importance of inanga and other species present within awa is a great engagement tool for community.
- Promote habitat restoration - wetland creation for inanga has been successful for Piroa Conservation Trust and a great engagement tool
- Provide community recognition to sustain momentum
- Leverage social media

Connecting Communities Workshop Led by Camden Howitt

Camden was the co-founder of the charity Sustainable Coastlines and more recently senior manager in PwC's Sustainability, Climate & Nature team. He's had the privilege of spending the past 15 years working around the motu, bringing people, communities and businesses together to protect and regenerate nature.

At the end of the wānanga Camden led a workshop with all participants wrapping up the wānanga and its learnings surrounding the theme of 'Connecting Communities'. We started our workshop with a fun bingo game then proceeded to draw out themes around what participants are doing to connect communities, what is working, and what is not working. We worked together to brainstorm solutions and plan actions.

Evaluations and Feedback

Thank you for your feedback and evaluation of the different components of our wānanga event. This will inform our planning to improve future events.

Key things we have taken onboard for improving future wānanga include providing more activities for tamariki, creating time and space for decompression and relaxation and ensuring quality content over quantity to improve time management.

It was evident from your feedback that everyone found the event beneficial and that there were a lot of learnings. Main highlights for the event that were evident in the feedback included the opportunity for whakawhanaungatanga with likeminded people from around the country, korero from hau kāinga and field trips in the local environment.

As part of the feedback process we asked you to provide an action you will complete post wānanga with a completion date. Actions ranged from following up with connections made at the wānanga to undertaking personal development or training. We would love to hear your updates on how your actions are going. You will receive an email update one week prior to the due date you gave for your action.

If you have any suggestions, feedback or questions about future wānanga events feel free to contact Patricia (patricia@mountainstosea.org.nz) or Lorna (lorna@mountainstosea.org.nz).

Our next wānanga will be hosted at Ōnuku Marae, Banks Peninsula in April 2025. Dates and further information is to follow.

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