MARINE FARMING ASSOCIATION
To Promote & Nurture Sustainable Marine Farming

APRIL 2021 NEWSLETTER

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IMPORTANT DATES

MFA Executive Meeting
14th May 2021
MFA Boardroom

MFA Environment Committee Meeting
21st May 2021
MFA Boardroom

AQNZ Board Meeting
26th May 2020
TBC

MFA Executive Meeting
18th June 202
MFA Boardroom

AQNZ Board Meeting/AGM
11th August 2021
Rutherford Hotel

MFA & MSOP AGM / Conference / Awards
27th August 2021
Queen Charlotte Yacht Club

AQNZ Conference Day 1
22nd September 2021
Rutherford Hotel

AQNZ Conference Day 2
23rd September 2021
Rutherford Hotel

PO Box 86 . Blenheim . New Zealand | t 03 578 5044
e info@marinefarming.co.nz | w www.marinefarming.co.nz

GM's Comment

Well, the year is certainly flying by one minute it is Christmas, next thing it is end of financial year and planning for the AGM/Conference again.

There is no denying it, 2021 is going to be a tough year for the primary industries, with the impacts of Covid-19 on markets and logistics lingering, in conjunction with various climatic and biotic challenges. There are days when the saying 'if it's not one thing, it's the other' rings very true. The example front of mind is just when live mussel exports are bucking the overall market trend, boom we are dealing with a major harvest restriction thanks to Vibrio.

Despite the headwinds, there is light on the horizon. Globally, the vaccine roll out is gaining momentum and the return to 'normal life' should see demand return. There will be no 'flick of a switch' recovery, but here is hoping we see month-on-month improvements in the second half of 2021.

At a local level, we are currently in the throes of mediation on the natural character and landscape chapters of the Marlborough Environment Plan. My impressions thus far include both admiration of watching the democratic process unfold, mixed with an equal measure of frustration as only stilted progress is made. We are trying to pick off some of the submission issues where parties are not too far apart, or where errors/unintended consequences have made it into the notified Plan. We also understand that the Variation 1A/B aquaculture provisions hearings will likely occur late in 2021.

Early consultation on the Tasman Plan has also just kicked off, with a 'key stakeholders' session held in April. Tasman District Council have engaged Stantec to conduct a review of aquaculture needs that will help inform the Plan. Invitations for Golden and Tasman Bay consent holders to participate in this review will be sent out this week.

I know what you are thinking, 'all this planning just in time for RMA reform'… Yes, changes to national resource management policy will undoubtedly result in changes to the regional planning landscape. That said, given that we do not know what the timeframe for these changes is or what they may comprise of, we still must participate in the already entrained processes.

Following on from the finalization of the A+ NZ Greenshell Mussel Industry Biosecurity Standards in December, MFA has been working with AQNZ to prepare the draft Biosecurity Management Plan for the Top of the South Operational Zone. This is an important step towards better biosecurity management and further consultation with marine farmers, along with farmer/operator workshops on developing farm specific plans will begin in Quarter 3.

In recent months we have really stepped up our efforts in the careers space, including attendance at careers events and the coordination of four on-water days for school-age children in one week! This is important work for both ensuring we can recruit staff to keep the industry moving, but also to increase awareness of our world class aquaculture sector.

Once again, the Havelock Mussel Festival proved to be a wonderful event with nearly 4000 in attendance this year. I would like to thank the committee members, coordinators, and sponsors for their fortitude in such uncertain times and for delivering such a great showcase of our products.

It is always good to finish on a high, and I am delighted to say the Pelorus Mussel Restoration Project won the Cawthron Environment Award for the Marine Category in April. This project is a great introduction for a broad audience to the ecosystem services that mussels provide and the potential of restorative aquaculture. It is great to be getting so many opportunities to tell this story.

Ned Wells

MFA – General Manager

Marine Farm Compliance Audit Programme

Declarations are Due

30th April 2021

If you have not sent in your declaration for the 3rd quarter, please do so as soon as possible

ONE **DECLARATION FORM PER SITE**
DUE BY THE END OF EACH PERIOD

November, December, January	(1)
February, March, April	**(2)**
May, June, July	(3)
August, September, October	(4)

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Aquaculture NZ Stats

An update on the statistics we normally provide from AQNZ, the statistics that are normally printed in the MFA newsletter are just a small sample of the statistics available through the AQNZ online tool.

We now recommend that you request access to the AQNZ online tool and access these yourself. That way you can change all the parameters to what you would like to see.

To register for access, click on the logo below

Aquaculture New Zealand

Environmental Update

The last couple of months have been very busy in this space.

We are still full steam ahead with the update of our Environmental Certification Programme and updated beach cleaning programme, there has been a slight delay in releasing this as we have been waiting on some data from council to complete it.

Originally, we set up the beach cleaning programme by assigning participating companies a beach cleaning target based on their "impact" on the environment. So, the more farm hectares they had the higher their beach cleaning target.

As the MFA covers the entire top of the south, we discovered that hectares were not a fair indicator of impact due to there being differences in farming density. We have decided now to assign beach cleaning targets based on total backbone length.

Most of this data comes from the TOS councils, but individual line leases are having to be manually entered to be able to access the metric data required.

This is still at the forefront of our minds and we are working hard to release it.

In the meantime, cleaning efforts have been increased in the Beatrix, Clova, Crail Bay areas, Darren has been out and met with Kristen Gerard from Hopai and together they have marked out specific areas of concern. The farmers in the area have ramped up cleaning and Darren is monitoring the area closely.

The MFA Environment App is still in testing but very close to release on both platforms, we are hoping that we can release all these new initiatives together very soon.

Late March, we met with Sustainable Coastlines, Marlborough Girls' & Marlborough Boys' Colleges to discuss how to manage the Long Island litter survey area going forward. This site was set up by Marlborough Girls' as part of a research project. The site needs to be assessed quarterly so it was proposed that all the high schools and the community get together and do one assessment each per year. The MFA will pick up the community's turn as part of our big clean in East Bay in December. In the meantime, some training will take place at Long Island and the Manaroa site to get the MFA staff up to speed for December.

Sauce!

Crews should keep an eye out for Darren & Jackie over the next wee while, they are delivering homemade sauce to all vessels for their fridges.

The sauce bottles will be refilled every time they visit your vessel for Environmental refresher training.

Crews need to take note of the message the bottles are carrying.

SAVE THE DATE

Members & Invited Guests

The MFA & MSQP AGM will be held this year at the Queen Charlotte Yacht Club, Picton – 27 August 2021.

Followed by the MFA conference day and awards night dinner.

More details will be emailed to those involved in due course.

mfa MARINE FARMING ASSOCIATION
To Promote & Nurture Sustainable Marine Farming

MSQP
Marlborough Shellfish Quality Programme

Mussel Restoration Project for the Marlborough Sounds

- April 2021 Update

Testing Seaweeds for Mussel Larval Recruitment in Kenepuru Sound

Background

Mussels on the shoreline of Kenepuru Sound have declined by over 97% over the last forty years according to a survey we conducted late last year. Large mussel beds once covered extensive areas of the Sound and their declines threaten other vital services they provide like habitat generation, water filtration, sediment stabilization. According to over a dozen long-time locals who were interviewed as part of the survey, the primary cause for these declines was extensive commercial handpicking, primarily in the 1960's and '70s. Despite the four decades that have passed since the end of commercial handpicking, local mussel beds have not recovered and almost no juveniles were recorded on the shorelines in the survey. Some locals have suggested that seaweed changes in the area may have contributed to this lack of recovery by removing an important initial settlement surface for spat. Mussel larvae, or spat, are well known to attach to seaweeds early in their life cycle to drift and grow larger before migrating to hard surfaces or adult mussel beds. Larvae have also been shown to specifically prefer some kinds of seaweeds, so changes to seaweed communities can have cascading impacts on mussel populations. To test this theory and begin to unravel the complexity of natural recovery in Kenepuru Sound, I harvested natural common seaweeds in the area and also deployed frames of local and historically common seaweeds – all of which will be tested for larval settlement.

Wild harvesting

The first component of this project involved collecting samples of natural existing seaweeds in Kenepuru Sound. Samples from a half dozen different common species were collected from five locations throughout the Sound at two different time points in March. Additionally, industry-standard spat-collecting rope was placed at each site to test for larvae that may be in the water, but not settling on any seaweeds. Over the next couple months each sample will be rinsed and sieved to check for any larvae that may have settled on them and then compared to see if there was any preference between the different seaweeds.

Experimental frames

The second component of the project consisted of attaching seaweed samples to frames and then deploying the frames throughout Kenepuru Sound. In particular, one of the seaweeds I tested was historically common in the Sound, but is no longer found in the area, potentially cutting off an important recruitment surface for larvae. Six frames, each testing five different seaweeds were placed at five locations for a total of 30 frames. These samples have also been collected and will be processed in the coming months.

I hope this has provided an interesting look into some of the work going on in the area and I'll continue to update with more information and results! As always if you have any comments or feedback, please feel free to reach me at *ttoo112@aucklanduni.ac.nz*

Cheers,
Trevyn Toone, Ph.D. Researcher, University of Auckland (based in Nelson)

Year Two data confirms the importance of mussel farms as King Shag roosting site

The second year of a three-year study on King Shag, part-funded by the Marine Farming Association and Seafood Innovations Limited, shows that GPS tracked birds are exclusively roosting on mussel farms and regularly feeding in or near them.

King Shag are classified as endangered and while numbers appear stable, their small population of no more than1000 mature birds and their restricted flight range from a small number of weather-vulnerable Marlborough Sounds nesting sites,means the future of the species remains uncertain.

After concerns emerged about the potential effects of aquaculture on the nearby populations of the birds, MFA and SIL (Seafood Innovations Limited) engaged Blenheim-based Wildlife Management International (now Toroa Consulting) on a three-year research project.

This included:

- Determining King Shags'key life history, population parameters and trends
- Tracking them at sea and potential interactions with marine farms
- Investigating their diet
- Looking at potential land based threats on the breeding grounds

The research project has included banding birds and putting GPS trackers on to understand foraging ecology.

In the Year Two his second report, Toroa Consulting principal Mike Bell says during 2019 and 2020, GPS trackers were attached to 11 mature King Shags nesting at either the Duffers Reef or Tawhitinui breeding sites in Pelorus Sound or at The Twins sites near Long Island in Queen Charlotte Sound.

He says the GPS and dive deep analysis show King Shag return to the same areas to feed on successive foraging trips.

"All 11 birds that live in areas with farms present roosted on farms and all foraged immediately adjacent or in close proximity to mussel farms." Four of the eleven chose to feed within mussel farms and one bird also foraged near a Pelorus salmon farm while four of the birds foraged within the marine farms.

The King Shag can dive to 4060m or more and hundreds of foraging dives were often recorded before the GPS trackers fell off.

A lot more birds have been fitted with identification band than those with GPS trackers. After an early trial in 2018 where a dozen birds were banded, a total of 113 chicks and 14 King Shag adults have now been banded. This banding data is critical to understanding longer term population trends. Toroa Consulting then monitored the banded birds from the Tawhitinui and Duffers Reef colonies.

It found that fledglings may only have as little as a 15-22% survival rate in their first year with considerable annual variations, the causes for which were unknown. While this low survival sounds dramatic, Mike has advised that it is relatively common among seabirds. However, although limited by a small sample of banded adult birds, the data suggests that annual adult survival is high.

The final year of the project is now about to get underway and further banding of chicks will continue along with the re-sighting trips to determine juvenile survival. The first cohort of chicks banded should also be sufficiently mature to determine the age of first breeding.

As the number of banded adults increases, Toroa Consulting says it will be better placed to measure annual adult survival. GPS tracking and the monitoring of dive behaviour will also continue.

Improvements in catching methodology will hopefully see an increase in the sample size for the final year. As the adult King Shag is notoriously shy, it is difficult to catch them, which impacts on the number of birds that can be tracked in any one season.

Mike Bell has acknowledged his company's research project would not be possible without the goodwill and co-operation of the MFA and industry which has provided guidance from the King Shag Working Group and vessels for all resighting trips.

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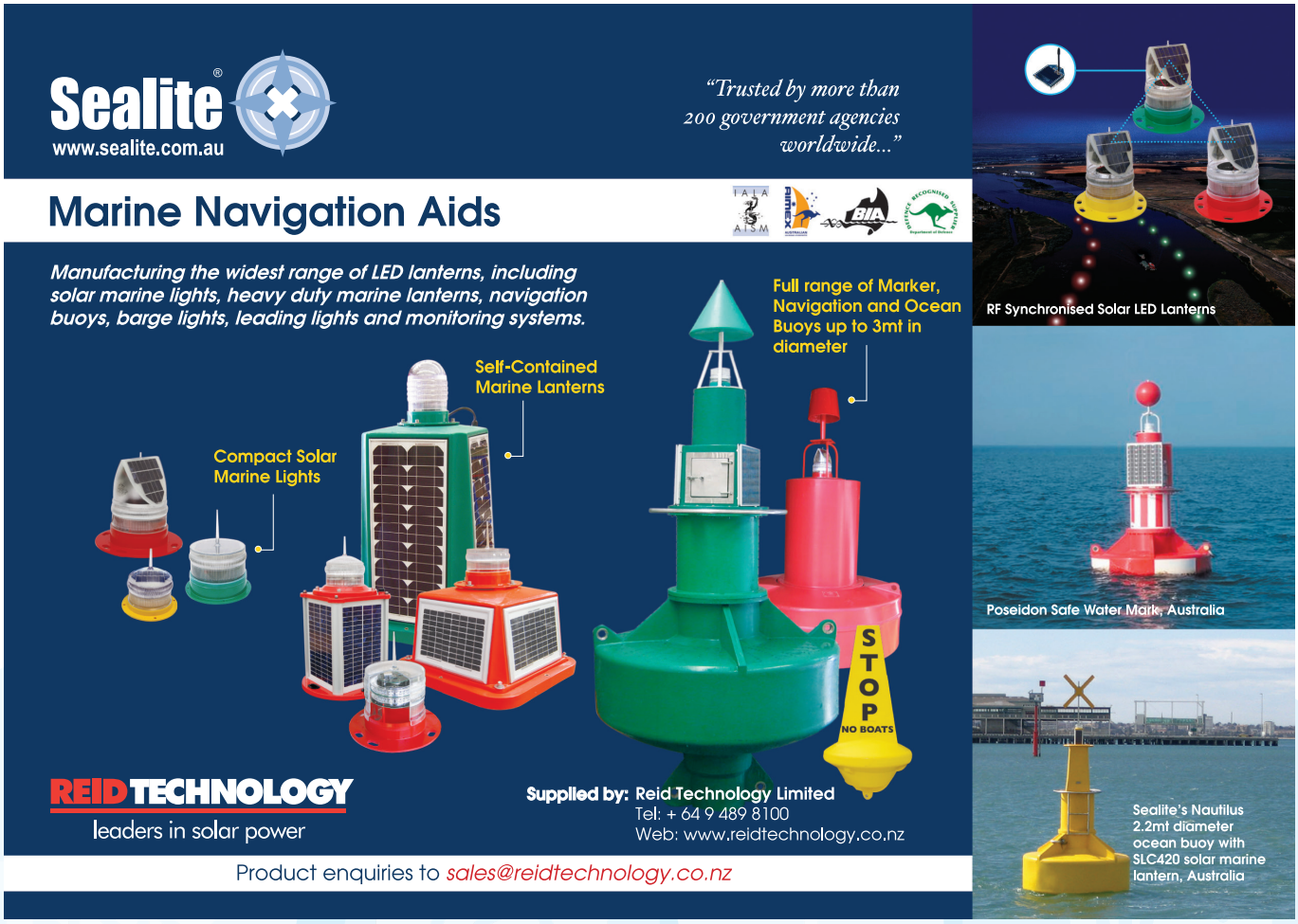


Mussel Farms as Important Fish Habitat

There is growing international interest in the ecological benefits of aquaculture, and how those benefits can be increased through improved farming practices. In New Zealand, relatively little is known about the ecological benefits from aquaculture, with NIWA recently completing an initial review for the Marine Farming Association (www.marinefarming.co.nz/healthy-coastal-ecosystems/).

Greenshell™ farms provide significant three-dimensional structure in the water column, effectively forming artificial habitats that have the potential to directly support fish populations. Additionally, the presence of seaweeds growing naturally off the lines, or cultured within a mussel farm, can increase the habitat function, potentially mimicking natural rocky reef habitats. However, there is little understanding of how fish use mussel farm habitat and whether farms are important for critical stages of their life history, such as larval settlement and recruitment.

Researchers at the University of Auckland have begun investigating the importance of mussel farm habitat to fish, using support from The Nature Conservancy, Gold Ridge Marine Farms and others. An initial study in the Coromandel Harbour has compared the arrival of larval fish into a mussel farm with a high amount of kelp, a mussel farm without kelp, and adjacent natural rocky reef and sandy habitats. The different habitats were sampled over the summer when many fish are breeding using standardised collectors of fish recruits.

A major finding is that a diverse group of small fish species are recruiting into mussel farms, including leatherjackets, spotties, triplefins, bastard red cod, and clingfish. The total number of fish recruits sampled at the mussel farm sites (371) was higher than for the 354 in the natural habitats combined. Interestingly the mix of fish species arriving into the mussel farm habitats was quite similar to the natural reef sites.

The study will also investigate how fish use mussel farm habitat, whether they are feeding on food resources provided by the farm and its associated biofouling, or whether they are just capturing food material passing through the farm, that is either swimming through or drifting through the farm on currents. This will be done using analyses of fish gut contents and chemical analyses of fish tissues which can help to identify their predominant sources of food. To identify what species of fish are living in mussel farms, underwater cameras installed on farms and in nearby control areas are being used to observe and count fish. So far a variety of

Figure 1. Trevally sighted feeding in a Coromandel mussel farm using remote underwater video recording.

fish have been observed, not only some of the small fish that are recruiting to the farms in their hundreds, but larger fish such as trevally, leatherjackets, kahawai, spotties, snapper and kingfish (Fig. 1).

It is hoped that the study will shed more light on how fish are using mussel farm habitat and provide some direction on how farmers can manage their farms to maximize the ecological benefits arising from their farming operations in the future.

By Lucy Underwood (lund481@aucklanduni.ac.nz) & Andrew Jeffs, University of Auckland.

havelock mussel and seafood festival

Another fantastic Havelock Mussel and Seafood Festival! The Graeme Dingle Foundation Marlborough had a great day serving up kai moana with Sanford and New Zealand King Salmon – with proceeds going to the Foundation to support their work with 3,000 of Marlborough's young people every week!

Ted Culley (Sanford) & Kelvin Watt (Graeme Dingle Foundation Marlborough) remind us what they're raising funds for

Kandoo Kiwi & Kelvin, together with the Foundation's aquaculture sponsors - Sanford (Ted), New Zealand King Salmon (Grant), Kono (Karen) and MFA (Amber)

Kandoo Kiwi with his friends from Kono

Graeme Dingle Foundation team helping out at the Sanford tent – bringing a buzz to the site!

Kandoo Kiwi helps New Zealand King Salmon cook up a storm

Kandoo Kiwi was extremely popular with the crowd

Thank you! The Graeme Dingle Foundation Marlborough is so grateful for all your support!

Havelock festival continues to shine

The sun shone, seafood was the star, everyone had a ball and charities benefitted.

The 2021 Mussel and Seafood Festival on March 13 attracted around 4,000 people, proving to be an increasingly popular fixture on the top of the South calendar.

MFA President Jonathan Large says the festival is an outstanding event by any measure which MFA was proud to support, working alongside the Havelock-based festival committee and organisers.

"We again had thousands of people turning out, sampling our seafood, learning how to prepare it, looking at aspects of what our industry does, not to mention enjoying a wine or beer and listening to some top music like Zed and Robinson. "

Jonathan says the day also continues the contributions that companies and individuals in the aquaculture sector give to good causes.

Sanford and New Zealand King Salmon donated all their profits from the day to support the Graeme Dingle Foundation Foundation's programmes for Marlborough youth. Regional Manager Kelvin Watt says this generated nearly $10,000 for his organisation and came on top of strong on-going support from the aquaculture sector.

Festival Committee chair Simon Gibb says several other, of the more than 40 stallholders, donated their proceeds to Nelson Marlborough's Rescue Helicopter. As well, his committee will add to the more than $200,000 given to the Havelock and Sounds community in grants since the festival began more than 20 years ago.

Marlborough Mayor John Leggett who again opened the festival, says the organising committee had shown courage to push ahead during so much uncertainty with Covid.

John and his partner Anne spent several hours at the festival. He says aquaculture is a key part of Marlborough's landscape and it was great to see the focus on science at the festival as this allowed the industry to be managed sustainably.

Celebrity TV chef Michael Van De Elzen who led workshops on preparing mussels and seafood, says for him, the Havelock Mussel and Seafood Festival is among the nation's best organised.

Paradise Oysters won Best Seafood Dish of the festival and a Thai red curry developed by Sanford's Ted Culley took Best Mussel Dish.

Kono's Angela Huntly again won the Open Mussel Shell Shucking competition for another year, maintaining her Guinness World Record of opening 100 mussels in 1 min 55.28 seconds.

Mills Bay Mussels ran a Celebrity Mussel Shuck where Sea Flux director Vaughan Ellis edged out Sanford's Grant Boyd to win.

Celebrity chef Michael Van De Elzen loves our festival

Grant Boyd, left, was just edged out in the celebrity mussel shucker competition by Vaughan Ellis.

The NZKS crew worked hard to meet demand

Fresh Paradise Oysters won Best Seafood Dish

Shellfish Tower

Innovative new 'Shellfish Tower' structure a practical solution for open ocean farming

A recently published study has shown that an innovative new open ocean aquaculture structure is a promising solution for marine farming of shellfish and other species in exposed waters.

Aquaculture researchers at Nelson's Cawthron Institute worked with a team of international researchers and industry partners to design and test the 'Shellfish Tower' structure through an MBIE Endeavour Fund project that began in 2016.

Five years on, a full-scale prototype of the Shellfish Tower has been trialed in partnership with Opotiki's Whakatohea Mussels and shown great potential as a farming system for mussel spat and oysters, and other species like scallops, lobsters, sponges and tunicates. The trial also confirmed the structure performs well in the high-energy open ocean environment, tolerating wave heights of over 7m and currents of over 0.8m/s.

With limited space in sheltered coastal areas for farming, environmental pressures like climate change and the desire to diversify aquaculture species, research leader Kevin Heasman of Cawthron Institute said structures that enable offshore farming in challenging high-energy environments are an essential part of aquaculture's future.

"The Government's Aquaculture Strategy has set a target of growing revenue to $3b p.a. by 2035 and we believe this is possible, but it will require investment in research and technology to underpin and support expansion," Kevin Heasman said.

"We want to see marine farmers working in exposed waters around the world empowered with a variety of tools to support different species.

"We chose to collaborate with aquaculture industry partners at Whakatohea Mussels, Wakatu Incorporation and Sanford Ltd. because they are already committed to innovative R&D that will advance New Zealand's aquaculture industry and they have commercial and operational experience in both inshore and offshore farming that was invaluable in informing the design of the structure."

The Shellfish Tower was modelled, tested and refined in partnership with researchers at the Technical University of Braunschweig and Leibniz University in Hannover and the Alfred Wegener Institute in Bermerhaven. This process involved testing a small-scale prototype in hi-tech wave flumes and a 3D wave and current basin to see how it responded in a simulated open ocean environment.

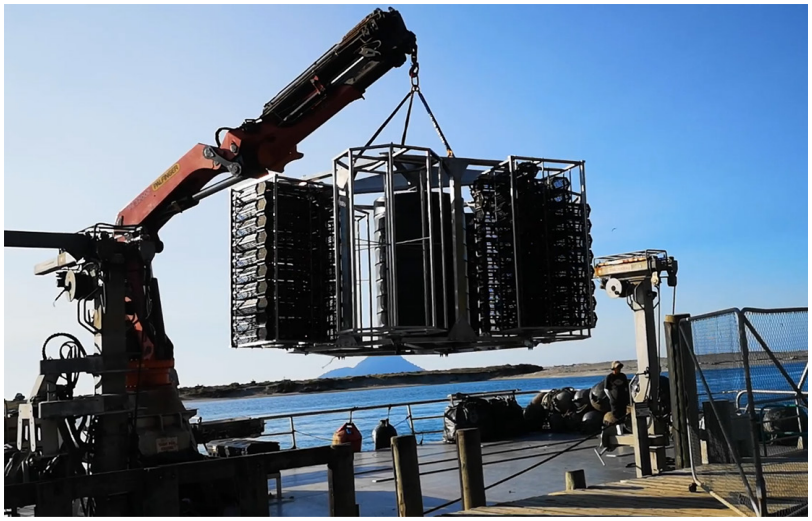
Cawthron Institute's CEO Volker Kuntzsch said the Shellfish Tower is an example of transformative technology that will help marine farmers take advantage of the opportunities the open ocean represents.

"The Shellfish Tower's success demonstrates that offshore farming is developing into an increasingly viable opportunity that will enable the growth of New Zeaand's aquaculture industry, for shellfish and other species, producing high-quality, sustainable food and creating employment opportunities in coastal regions," Volker Kuntzsch said.

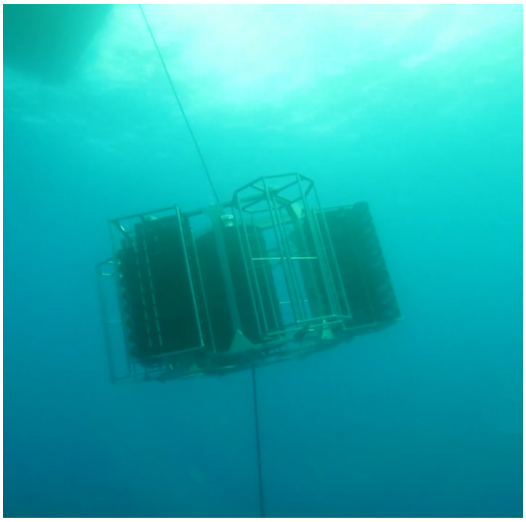
Max Kennedy, Manager Contestable Investments at MBIE, said the goal of the Endeavour Fund is to support scientific excellence and deliver high economic, environmental, and societal impact.

"The Endeavour Fund supports ambitious, transformative research, science and innovation projects that generate new knowledge and create new opportunities, which is why MBIE invested in Cawthron Institute's open ocean aquaculture farming systems research and development programme," Max Kennedy said.

"This project in particular has seen Cawthron Institute in Nelson work with some of the world's leading open ocean engineering and marine farming experts and build strong international relationships that will support future collaboration."



Shellfish tower deployment



Shellfish tower underwater

A video of the Shellfish Tower's deployment and monitoring can be viewed here.

CONTACT:

Natalie Bird, Senior Communications Adviser
Cawthron Institute
Email: natalie.bird@cawthron.org.nz
Mobile: 027 290 7704

Machine - learning mussel farm management system

Application that uses artificial intelligence to predict and optimise mussel growth now ready for real data from trial users.

The team at Mussel Farm Apps are excited to announce our mussel farm management application is built and ready for future-focused mussel farmers to get on board and start trialing it. We have been consulting with many of New Zealand's mussel farmers for some months now, but if you have not yet heard of us - we believe our system is going to revolutionize the mussel farm industry as we know it.

The Mussel Farm Apps platform is designed to improve and optimise mussel farm growth and harvests. What is new about it? In a world first for mussel farming, the system will use artificial intelligence (AI) to make predictions and suggestions for mussel farm optimization. Now that the platform structure is built, the next stage is to start developing the AI technology by giving it data to work with. The AI learns using real-time and historical industry data, which it will then apply to help mussel farmers get the best growth and harvests from their farms - with the bonus of reducing admin, farm waste, and environmental impact. We believe this predictive - modelling technology is going to significantly increase New Zealand's mussel farm productivity and drive forward the industry's growth and innovation.

How does it work?

In a nutshell, the more real mussel farm data the Mussel Farm Apps platform can draw on, the more accurate its prediction and optimization results will be. The AI system processes all the data, looking for patterns and insights. The system is designed to help farmers optimise across many variables for mussel seeding, such as spacing, density, dates, and crop type. The goal of the platform is to maximize profit per meter of mussel line for each farmer by drawing on individual farmer and community data to produce these insights. The more data made available to the system, the better the outputs for every mussel farmer on the platform.

The data also does not need to be error-free. In fact, data containing human errors is helpful for the AI - because it will learn to identify errors and then stop them occurring in future. In time, we aim to develop the system so it can detect, analyze and plan for bad data or anomalies - for example, because of an inputting error, an unusual weather event, or outside events which affect mussel harvest. This is the real strength of artificial intelligence - it can analyze huge amounts of data and discover useful insights better than a human can. The key is to give the AI as much data to work with as possible - and that's where user trials come in.

Real data from real farmers

Now that the Mussel Farm Apps system has been developed, the next stage is to input as much data as possible to kickstart the machine-learning technology. This process is already underway, with real-world mussel farm data in the system, and Havelock's Mills Bay Mussels signing up as our very first trial user. With the trial phase beginning, we can identify tweaks or changes that will improve the product for our mussel farm customers, and start searching for optimization insights amongst trial users' data. Our aim is to get as much data into the system as we can to ensure the platform provides the most accurate information when we launch commercially.

We want the experts - we want you!

We are always on the lookout for mussel farmers who may be interested in the technology we are developing and who are keen to get involved early. If you'd like to find out more about becoming a trial user for Mussel Farm Apps' machine-learning mussel farm management system, please see details about getting in touch at the end of this article. Without real mussel farm data to process, we cannot programme the AI and bring this innovative technology to market, so we appreciate every farmer who wants to participate. If you're not interested in trialing the product but would like to keep up to date with our progress, you can also sign up to our newsletter - details below.

What is next for the Mussel Farm Apps platform?

Our system has been created with and for New Zealand mussel farmers - so all along the way we have been visiting and consulting with the experts - you. You have told us in detail about the farming process, what you need, and features which would make your life easier. For example, based on farmer feedback, we are currently developing a task management system with calendar reminders; Xero integration for better budgeting; and a simple mobile application to allow farmers to send assessments from the boat straight into the system with no delay - even without internet. We anticipate there will be many more new features and changes as we receive feedback from our trial users about tools they want to see on the platform.

Those following industry developments know that artificial intelligence, predictive modelling, and data capture are the next big areas of development across many of New Zealand's primary industries. Now it is the turn of the mussel farm industry. Register your interest in Mussel Farm Apps and help us build a shared data system to optimise and increase productivity across the mussel farm community - and keep New Zealand at the forefront of aquaculture technology.

Mussel Farm App
P | 09 930 7262 E | join@musselfarm.co.nz
W | www.musselfarm.com

Commercial whitebait production heading south

The company which started commercial production of whitebait in New Zealand is moving to the Mainland, and the pioneer of the industry will be packing his bags to come with them.

Paul Decker, who started working with whitebait 14 years ago at the small training institute he established in Warkworth, says the cooler temperatures of the South Island is a key factor in the relocation of what has now become iwi-owned New Zealand Premium Whitebait.

Paul Decker with a giant kokopu ready to be relocated into the wild

Warkworth and anywhere else north of Auckland is just too warm for whitebait, says Paul, hence the need to relocate.

The South Island offered another key advantage. Whitebait larvae are kept in salt water pumped from the sea, making Warkworth, and anywhere along that coast prohibitively expensive for farming.

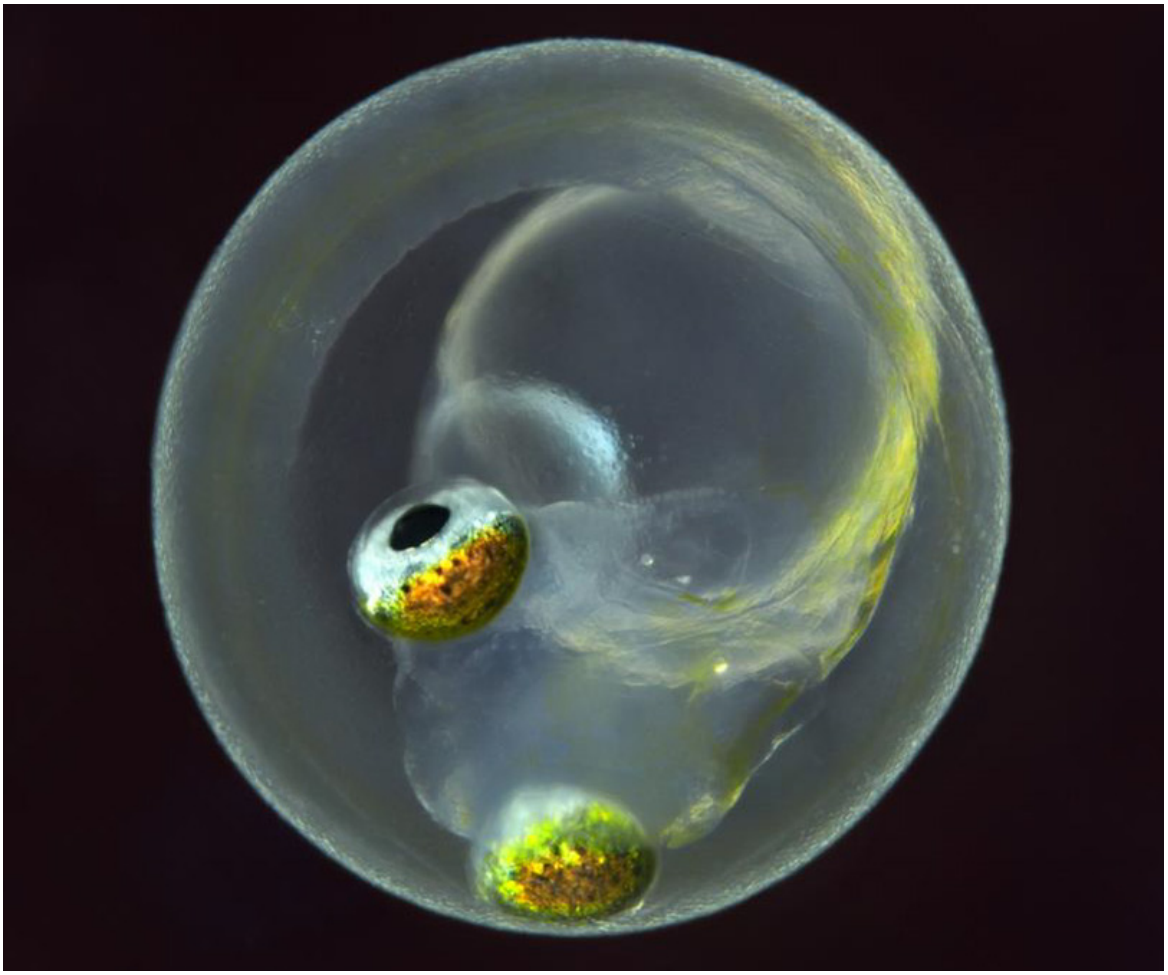
Another factor for relocation is the company's desire to help restock wild whitebait. It is the South Island that continues to produce most of the wild catch, even though numbers are significantly depleted.

NZ Premium Whitebait is considering options including Bluff and Westport,

where a similar venture is underway. New Zealand Whitebait Limited has the backing of both the Buller District Council and local iwi, Ngati Waewae. The Government, through its provincial development funding announced in March, that it is providing the council with a $2 million grant to help support the project.

The company will provide up to $5 million and expects to have a whitebait farm completed by June 2022. The farm itself is predicted to create more than 30 jobs directly, with a similar number emerging from local food businesses once production begins.

Paul Decker says competition is welcome. "It's a good commodity and there's plenty of space in the marketplace for others."



Giant kokpokopku, post fertilsation at 27 days

Paul established Mahurangi Technical Institute in Warkworth more than 40 years ago and it became the largest provider of maritime and aquaculture courses.

In 2007 he and others began experimenting with breeding whitebait with the aim of returning fish to the wild. There are five different species of whitebait. Following testing, it was decided to use the Giant Kokopu, as it proved to be the only species to allow sufficient production. There are now around 50,000 Giant Kokopu in tanks. Paul says that it has been suggested that this is greater than the number left in the wild.

With the sale of MTI to the Manukau Institute of Technology in 2011, the work with whitebait transferred to a commercial focus and Paul became Aquaculture Manager.

The company is currently producing two tonnes of whitebait per year under its Manaki brand. This does not meet current and increasing commercial demand. At present, the price restaurants are paying is around $100 per Kg.

Giant kokopu breed in fresh water but their larvae require salt water – otherwise they turn black, this is not aesthetic customers expect from "white" bait.

Larvae are fed on a base diet made from prawn shell peelings and have a 1:1 feed conversion ratio. Breeding stock are fed mealworms raised at the facility.

Each female can produce 30,000 eggs annually and the company is currently throwing away millions of eggs because of the current lack of space to farm them.

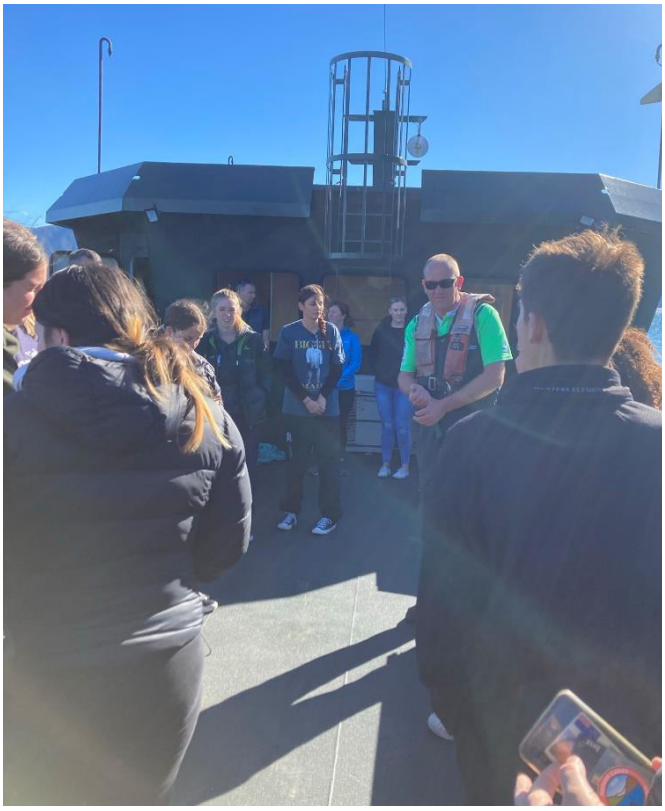
Paul says design work has been done on the new facility for New Zealand Premium Whitebait and a new South Island site is likely to be confirmed this year. It would take a couple of years to then complete relocation from Warkworth.

Schools on the water

Term 2 has kicked off with a bang!

The MFA, in conjunction with Chris Shaw, the Vocational Coordinator from the Marlborough Chamber of Commerce and the fabulous crew from Marine Farm Management have had students, teachers, and careers advisors on the water for 2 days at the start of May educating them about our amazing industry.

We set off from Havelock with around 50 people on board from Marlborough Secondary Schools and youth organisations. We headed out to the NZ King Salmon, Kopaua site near Richmond Bay in the Pelorus Sound.



Once at NZKS, we split everyone into two groups.

Group one set off with NZKS Operations Manager, Charles Park touring the accommodation barge.

We got to see where the feed is stored, how it is distributed out to the pens to feed the salmon and how it arrives to the barge and gets into the hoppers.

Then we went inside via the bottom of the feed hoppers and upstairs to check out the bedrooms, the lounge, and the kitchen. Upstairs Charles told us a bit about the salmon farming industry, the pesky but adorable seals and how they get in and out of the pens and about how the job boards

work in the office. Next a few people at a time, toured the office to learn about the environmental testing that is carried out daily to ensure the best health of the salmon and how the feeding is monitored so they do not keep feeding once the fish are finished.

While Group one was onboard the barge, Group two headed out to the pens to learn how the feeding and the cameras work and how it connects back to the barge for monitoring.

They got to do some hand feeding of the salmon and have a chat to the staff out at the pens, I heard some good conversations around what the staff get up to daily and how they got into the roles they have.

After the salmon farm we all jumped back onboard the Grey Heron and headed for a nearby mussel farm.

The winch lifted a mussel line to see, and Jonathan Large from Marine Farm Management had a chat about the farming process. He talked about the spat (baby mussels) that comes from 90-Mile Beach, locally and from

Golden Bay. How they sprinkle the spat into cotton biodegradable socking to attach to the rope in the middle. Jonathan talked about how his crews spend their time ensuring there are enough floats to keep the lines on the surface of the water as the mussels grow and get heavier, maintaining farms, checking consent conditions are met and helping with project work such as King Shag resighting trips.

He educated us all on how the mussels get stripped off the line several times as they grow, they get de-clumped, then they get reseeded back on to lines so the farmers can control the density on the mussels so there is no overcrowding.

Dave Taylor, Technical Director from Aquaculture NZ then spoke of his career journey from studying Marine Ecology, to his work at Cawthron assessing coastal habitats to ensure the marine farms were being installed in the correct places. These days Dave is known as the "Science Guy" in the office and advises on a myriad of aquaculture projects throughout the country.

Following Dave was Emilee Benjamin who is a PHD student at the University of Auckland. Emilee is leading the research for MFA Mussel Bed Restoration project in the Pelorus Sounds. This project is awesome for so many reasons, the research she is doing, if successful will be the blueprint for restoration work worldwide, the results 2 years in are very promising so this is likely.

The project shows an amazing collaboration between industry, academics, science, and government all behind Emilee and this work.

And just last week this project won the Cawthron Marlborough Environment award for the Marine division.

Emilee told the crowd how the mussel beds were over harvested and dredged in the 1960's, but now it's time to fix this.

The first question was – can mussels even survive in the current conditions on the sea floor like they once did?

To test this theory the first deployment of live mussels went into 5 locations almost 2 years ago, they were put on the sea floor on several different surfaces from silt to rock. All sites were successful; however, some surfaces did do better than others.

The second deployment saw discarded mussel shells from processing dropped to the sea floor to create more of a surface for the mussels to attach to, the live mussels have gone on to these sites and now it is a waiting game to see how it progresses.

The biggest challenge to date has been 11 arm star fish predation, they love our mussels!

Next up was Aiden Gane, skippering his own vessel at the age of 20!

Aiden spoke of his journey from school to the workforce and how if you have got some get up and go and take advantage of the opportunities when they present themselves anything is possible.

Aiden started working for Marine Farm Management part time, filling in shifts when people were off sick or on holiday and he could not get enough.

Aiden loves the outdoors – fishing, hunting, diving so this is the perfect job for him!

Jonathan says Aiden has been driven and he works hard. He ended up finishing his skippers' ticket in amongst the craziness of Covid-19. But because Aiden had proved himself, Jonathan paid for this qualification which is recognized worldwide.

Jono says with the skipper's qualification, Aiden could head off tomorrow and skipper luxury yachts on the other side of the world if he wanted.

We wrapped up the session with Kirsten Norfield from NMIT giving a brief overview of the Aquaculture courses that NMIT provide. From the Level 3 & 4 courses that are free, that do not interfere with your fees free allocation because they come from different funding to the degree and post graduate diploma.

All the courses are hugely practical with weekly field trips, unlike some courses industry work very closely with NMIT so the students that come out of these courses are very employable straight into industry.

Following on from these two trips Jonathan and the crew are on the water for another two trips after this with Riverlands Primary School, John McGlashen College & Columba College.

Mussel bed restoration wins environmental award

Collaboration, MFA support, and industry co-funding for a project to help re-establish wild Greenshell mussel beds in Pelorus Sound were key factors in it winning a 2021 Cawthron Marlborough Environment Award.

MFA GM Ned Wells and University of Auckland PhD student Emilee Benjamin accepted the Marine award at a gala dinner in Blenheim in late April.

Emilee Benjamin and Ned Wells with Rose Prendeville from Marine award sponsor, Port Marlborough

Ned told the audience that without the mussel industry's generous support, the project could not have gone ahead, "The list of companies and organizations who have contributed is too long to recount here, but the support is certainly much appreciated".

The three-year project which received funding from the Government's Sustainable Farming Fund and The Nature Conservancy will soon place its third and final deployment of mussels on the seabed. The project aims to identify a methodology for successfully restoring wild Greenshell mussel beds in areas that were depleted by overfishing prior to the emergence of marine farming.

Emilee says, "This award is excellent recognition for what is a great collaborative project. We wouldn't have the success we've had without the knowledge and support of marine farmers."

In January 2020, the restoration project's first deployment of live mussels took place in five locations throughout Pelorus Sound. After one year on the seafloor the mussels had great success with an average of 88% survival.

Early this year, Emilee worked with Sanford, Aroma Aquaculture vessels, and NIWA scientists to complete the second deployment – involving placing 20 tonnes of live mussels on the seafloor. Half of the mussels were placed atop deposits of recycled shell material, an approach that is hoped to increase overall survival. Monitoring will take place later this year.

Public field days will be held with all winners over the next few months to share their knowledge and experience. Emilee says, "this will provide another round of opportunities for the wider community to have a look at the restoration project. People will be able to see what the project is all about. Greenshell mussels are a critical species within Sounds' ecosystems, they stabilize sediments, filter water, and provide habitat for other species".

The Cawthron, Marlborough Environment Awards are supported by the Marlborough District Council, Cawthron Institute, Department of Conservation, and local sponsors. They are held every two years across seven categories to showcase businesses and community projects that protect and enhance the environment.

Marlborough Mayor John Leggett told the awards dinner that more is achieved for the environment when people work together. "More than ever, Council is working closely with industry, Te Tau Ihu iwi, the community, and central government on initiatives to look after our environment."

The Marlborough Sounds Restoration Trust, set up in 2003 to stop the rapid spread of wilding pine trees and bring back the native bush and distinctive skylines of the Sounds, won the Supreme Award for 2021's Cawthron Marlborough Environment Awards. Congratulations!

More information on the winners: cmea.org.nz

New eyes for an old problem

The 2019 AQNZ Spat Strategy identified the need for spat managers to count and measure the health/condition of newly settled, microscopic spat; this critical life phase is presently invisible so poorly understood and managed. Quantity and quality information pertaining to each spat batch or catchline will enable spat managers to fine-tune spat operations to improve spat survival and retention. Recognizing this need, Andrea Strang of Aquaculture Solutions Ltd (AquaSol) approached AQNZ and MFA offering to spearhead a project to solve this challenge, having monitored Golden and Tasman Bay spat catches by microscopy for 15 years she was keen to develop a technologically advanced solution.

In targeting artificial intelligence capability to digitally count and measure spat size and condition, AquaSol approached Techion (https://www.techion.com/), a world-leading NZ agricultural parasitology company who have commercialized a solution for counting and measuring parasite eggs in animal faeces. It is hoped that adaption of Techion's existing technology (a smart digital microscope) will enable on the spot assessment of spat.

Sponsored by AQNZ, MFA and CMFA, this SIL-funded project intends to deliver a spat assessment system delivering the following specifications:

- Spat assessments must be delivered in real time,
- Spat assessment must be accessible on the beach, onboard vessels or in the lab.
- Spat sample preparation methods and technology must provide comparable, consistent-quality sample images.

In practice, spat managers will be able to sample spat catches and batches (catchlines and Kaitaia weed) aged 0-6 weeks according to a validated sampling regime. In a specialized washing flask spat will be detached and separated from their attachment substrate and sub-sampled ready for placement a counting chamber. The chamber is fed into a smart digital camera apparatus that captures images of the sample, uploads and presents them to them to an artificial intelligence

image analysis model that will assess spat numbers, size and health. This information will be immediately reported back to awaiting spat managers to guide decisions to optimise spat use.

Phase 1 of the SIL project will develop the method to prepare consistent spat samples then digitally capture and upload images for remote assessment by a technician. With rapid turn-around time of results, this assessment service will offer operational managers and staff an insight into spat that they haven't had previously. Performance of small spat from separate sources, batches, seasons and seeding regimes will become comparable, so enabling targeted improvements in spat management.

Phase 2 of the project advances the technology to pre-commercialisation and the incorporates the use of AI image analysis to assess spat quality and quantity.

Aquaculture Solutions and Techion greatly appreciate the support given by AQNZ, MFA, CMFA and SIL.

Meet Alex
Administrator Extraordinare

Hi, I'm Alex Henry, the new administrator for the MFA. I found my way into the aquaculture industry from an unconventional route but am excited to be here.

I went to university in the UK where I spent four years with the Royal Navy. After graduating I worked as an account manager for a fashion brand, before returning to postgraduate study in education. From here I became a classroom teacher with a leadership role in science. From the conventional classroom I moved into education outside the classroom where I worked as a curriculum advisor designing and delivering a variety of education projects across a wide age range.

Next came parenthood and a decision to move to New Zealand. Following a career break and some casual work at Stadium 2000 I joined the MFA.

My family and I have been in New Zealand for 12 years, becoming citizens in 2016. For fun, I enjoy all manner of things, such as, reading, painting, Zumba. I love getting outside and enjoying all that Marlborough has to offer, learning new things and trying my hand at new stuff such as fishing, camping and kayaking.

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Full Page Advert
No boarder - 210mm x 297mm
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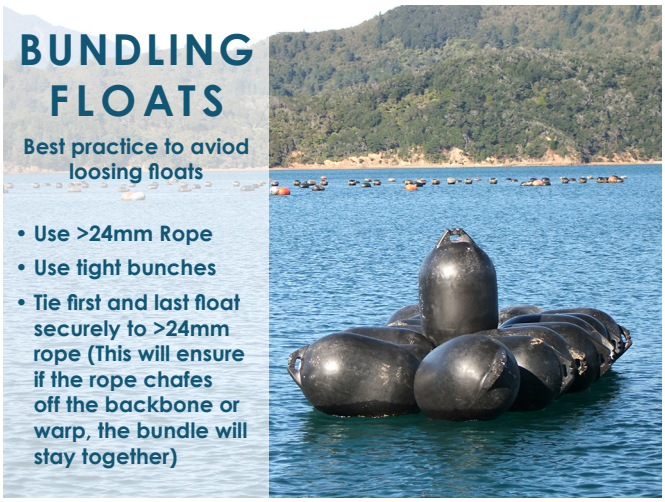


MFA Newsletter Stories

If you have a story that you would like to see published in our newsletter, please forward it to info@marinefarming.co.nz for consideration.

Our newsletter comes out every two months – February, April, June, August, October, and December.

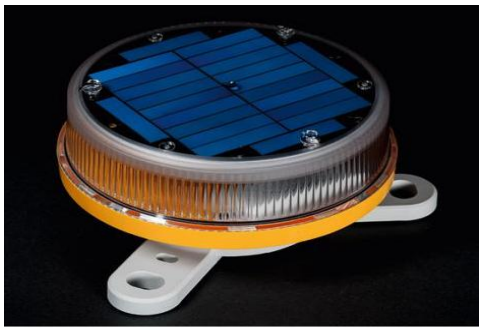
The due date for articles is the 20th eg: for something to appear in the February edition we will need it before 20 February.

Carmanah M550 1-3 NM Lantern

This Solar LED Marine Lantern is ideal for Aquaculture applications.

- **Fully Self-contained, Programmable, IP68, up to 3 NMs**
- **Weighs just 400gms. Direct swap for M502**
- **3x NiMH AA batteries - 5 Yr life. $30.00/set to replace.**
- **Over 1,500 sold in NZ since 2014. Avail ex Stock.**

M660 – World's lightest 4 NM Cardinal Mark Lantern



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