MARINE FARMING ASSOCIATION
To Promote & Nurture Sustainable Marine Farming

APRIL 2023 NEWSLETTER

CONTENTS

IMPORTANT DATES

Q3 Light Audits begin
1st May 2023

Board Meeting
19th May 2023

Closing date for Contestable fund
31st May 2023

RDTSC Meeting
9th June 2023

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

President's Comment

As we head further into Autumn, we begin to wonder if we really had a summer! It's been a strong La Niña weather pattern again this year and there have been some extreme weather events around the country. Once again our thoughts go out to our fellow primary producers who have been adversely affected.

On the mussel farming front, it's been a difficult growing season in terms of crop yield, with most of the season limited to only pockets of mussels in good condition. I know it's been challenging at times for our sourcing crews to find enough product to keep the factories going. However, as we move towards the end of the season, there has been widespread improvement in product condition. Let's hope the winter spawn comes late this year. In the office we recently farewelled Amber who is moving on with her own business ventures, I'm sure we all agree that Amber has done a fantastic job over the years for the MFA. We wish her well for the future.

I'm really pleased to welcome Nicola Russell as the new Office Manager - I'm sure she'll be an asset to the MFA team. Nicola comes to us with a strong background in finance and office management, a passion for the environment and a diploma in Marine science!

We had expected to be providing commentary on the MEP Variation 1/1A decision in this edition of the Newsletter; however, the delays continue. On the 28th of April the Panel did release their decision to Marlborough District Council, but a full council meeting is required prior to its contents being made available to the public. The decision will now be available to us on the 19th of May 2023. Members can expect comms from MFA soon after the decision is uploaded.

Already this year we've had 4 days out on the water with students from the Queen Charlotte Aquaculture Academy, Marlborough Boys College, Marlborough Girls College and Kaikoura High School. We worked with the schools to tailor the experience to fit best with the students' interests. Following the trips, we had a number of students registering for the Gateway programme in aquaculture. Thanks to Aroma Aquaculture, Clearwater Mussels, Sanford and Marine Farm Management for getting involved with the Gateway programme. This is our opportunity to develop our future workforce. If anyone else is interested in getting involved, contact Alex at admin@marinefarming.co.nz

All the best for your autumn activities.

Jono

Marine Farm Compliance Audit Programme

Declarations are Due

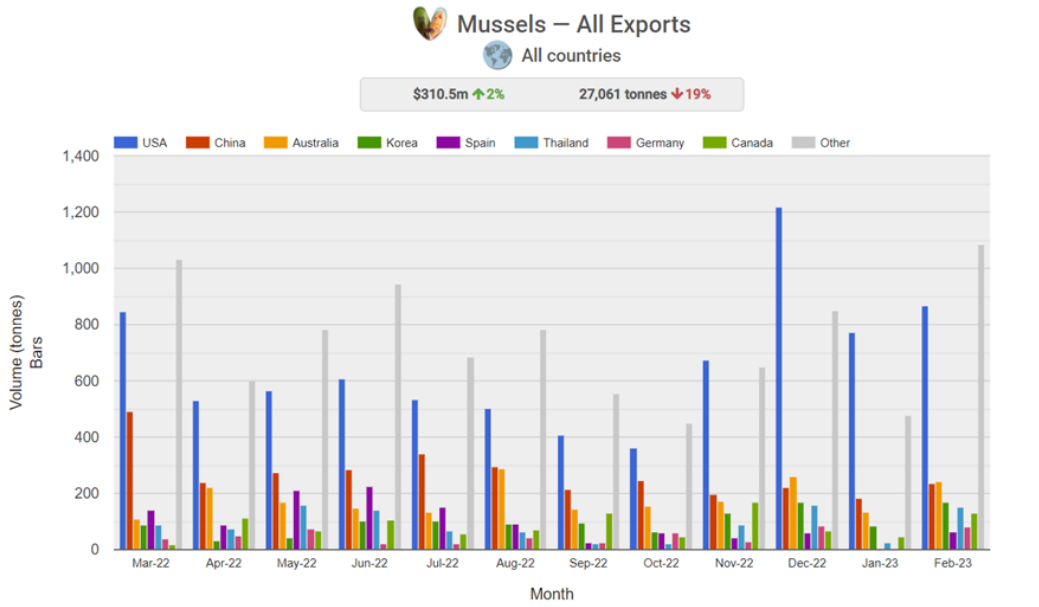
31st July 2023

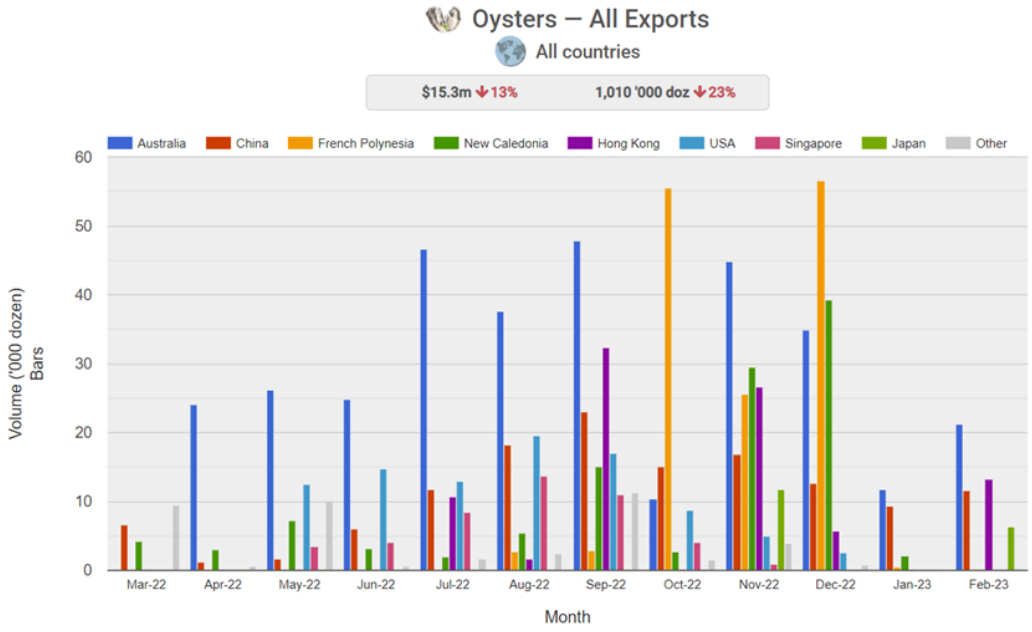
If you have not sent in your declaration for the 3rd quarter, please do so as soon as possible

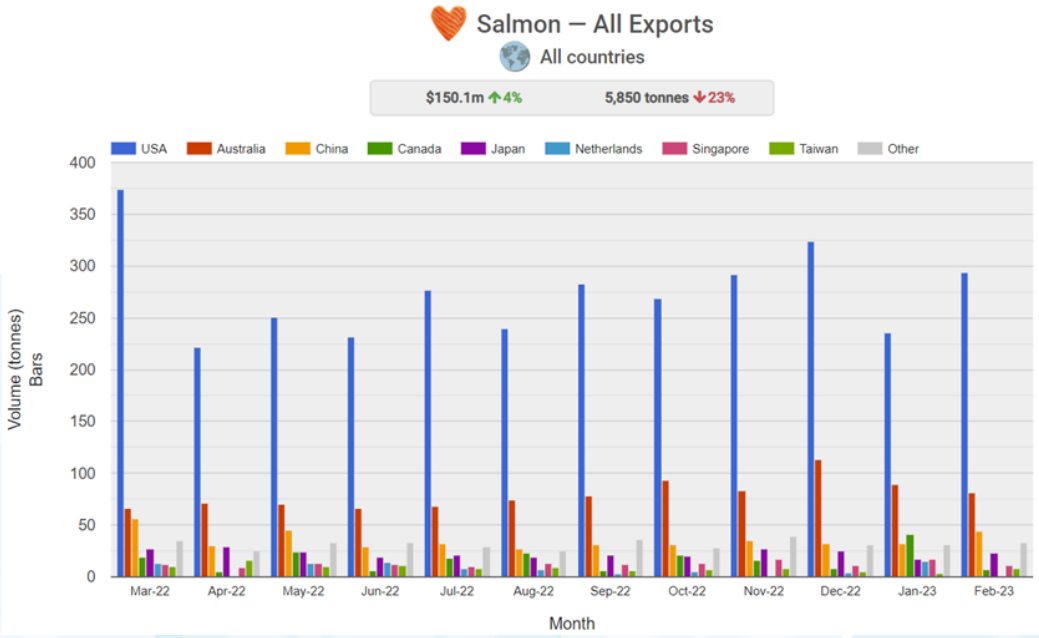
ONE **DECLARATION FORM PER SITE**
DUE BY THE END OF EACH PERIOD

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

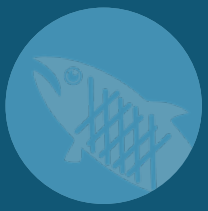
AQNZ Export Data







ADVERTISING RATES



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Horizontal - 180mm x 130mm
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Full Page Advert
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With boarder - 180mm x 267mm
Ordinary Members $100 +GST
Associate / Non Members $200 +GST

Smart+Connected Update

Four workstreams have emerged from November's Smart+Connected Aquaculture forum and there's been some good progress with three of them; meanwhile the latest S+C meeting had an impromptu update on the Te Kaha spat production facility.

Forum facilitator Melissa Macfarlane remains supported by MDC to help bring some of the initiatives to fruition. Among these is rebranding the greenshell™ mussel as a superfood. This is now seeing Melissa develop a toolbox of resources for discussion with mussel company marketing teams.

This will include setting up a shared marketing folder and providing a list of 10 key benefits from consuming GSMs either as a food source or through powder or oil.

The working group has been made aware of some industry caution about the rules around overstating health benefits, particularly for mussels as a food. But they are confident there's a capacity to better promote the benefits that mussels bring.

Dr Matt Miller, who leads Cawthron's Musseling Up research team has been part of the S+C Aqua workshop on mussels as a Superfood. (see separate story on Matt's research.)

Another workstream S+C Aqua is focused on is spat with two sub-projects emerging - a 'Spat Habitat Heatmap' data programme and a 'FLUPSY trial'. The first is a data-driven initiative to look at leveraging environmental

data, sensor data and industry performance data to determine optimal spat habitats. The second is a project to establish a small FLUPSY trial at Waikawa marina – where there's both good water and easy access to power. These are both great examples of pan-sector collaboration with contributions to date from Sanford, Cawthron, NIWA, MFA, AQNZ, SpatNZ and Auckland University with great support from Marlborough District Council and Port Marlborough. It's hoped the FLUPSY could be in the water as early as August.

Meanwhile, the first Smart+Connected Aquaculture 'theme' meeting for the year was held in mid-April – these are now bi-monthly. This gave NZTE's Megan Huddleston the chance to outline the Hatch aquaculture accelerator programme which was due to close April 22. This gives 5 aqua-linked high growth potential start-ups or companies with innovative solutions, the chance to get international mentoring to support market engagement and attendance at the world's biggest aquaculture conference in Norway in August.

Snap IT founder Chris Rodley from Nelson told the meeting that being part of the initial Hatch programme last year had given his company huge acceleration.

He says Snap IT had only dipped its toes in the aquaculture space prior to joining the Hatch initiative and getting in front of some major NZ companies had taken years.

"Hatch allowed us to do that with major overseas companies. They really were generous with their networks."

The April meeting concluded with a brief outline of progress with a mussel spat hatchery development proposed for eastern Bay of Plenty. Pat Verryt told the meeting he is working with Aotearoa Mussel Ltd and they are looking to build a hatchery in Te Kaha. Zane Charman is managing the research team and they have just clicked over two years of their spat research programme through Cawthron.

They are now evolving from research to production volumes and also

Zane was active in helping set up S+C Aquaculture

progressing the final design of the hatchery.

The Te Kaha team have done all the groundwork approvals and have deployed a water buoy near the settlement. Design approval will then allow them to start building. Their target is to have the hatchery live in late-2024, although they face challenging building timelines and costs. The hatchery will be built to bring in several production lines, rather than one, meaning they can commission as they go. Pat says output for the production hatchery is targeting 150,000 metres of seeded roped per month.

Testing in water continues with eleven spat deployments in the water as at mid-April and the venture is aiming for their first deployment with other growers in North Island waters by early June.

Pat says the team's capital fundraising is going well and they are working with local iwi Te Whanau-a-Apanui.

Aotearoa Mussel Ltd was formed by Pat and Zane after they attended the 2019 Smart+Connected Aquaculture forum and saw the scale of demand for mussel spat.

Pat and/or Zane have been invited to give a fuller presentation at the June or August Smart+Connected theme meetings.

"We will be talking about our next projects as well," says Pat.

Brendon Burns

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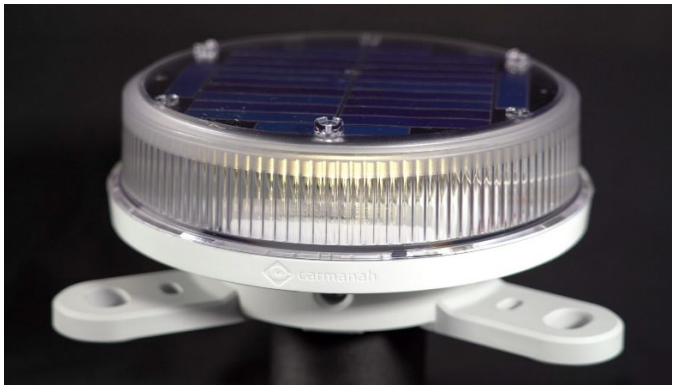

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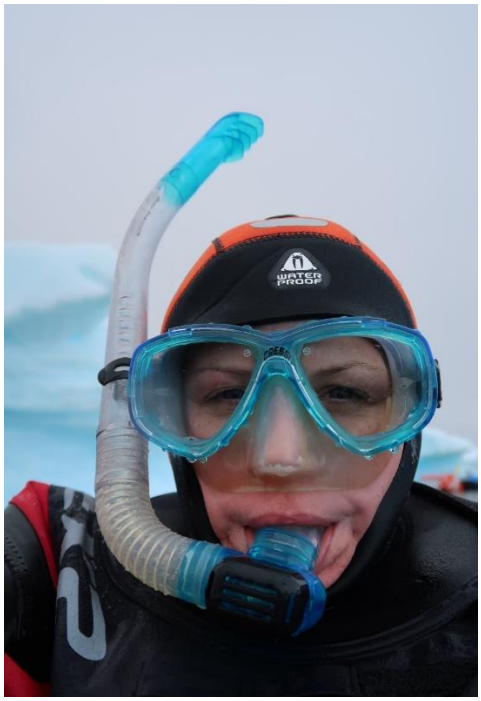
From swimming with sharks to managing the MFA office

Diving in the deep end to run the MFA office isn't a big deal for Nicola Russell – she's been diving for years.



Nicola diving in Antarctica

A holiday in the Solomon Islands as a 12-year old Christchurch school girl got her hooked on going under.

Her dad John had just gained his open water scuba qualification and he took her down sharing his oxygen to see the wrecked Japanese ships and planes.

That experience set her on course to do a Diploma in Marine Studies at the Bay of Plenty polytechnic where she learned more boat handling, advance scuba and rescue techniques as well as focusing on marine science (including aquaculture). All of this added to what she'd picked up on family holidays. They spent every summer in Okiwi Bay or Kaikoura boating and fishing, all helping add salt to her veins.

She completed a season with NZKS at their Canterbury hatchery and planned to work in the marine fields but loved diving so much that she joined the travel industry, allowing her more affordable access to many Pacific diving destinations. That included the Galapagos Islands where her diving companions were more interested in their Go Pros than keeping an eye on their buddy; Nicola was being circled for a time by hammerhead sharks.

"That's probably one of the more terrifying situations I've been in underwater."

Just before the Christchurch quakes hit, she moved to a sales role with Air NZ in Blenheim before managing the local Flight Centre.

A self-confessed 'nerd', Nicola has never stopped studying. After working in banking for a time she gained qualifications become a financial advisor with FANZ Private Wealth, an SBS subsidiary. She's also completed a certificate in Environment & Sustainability with the Open Polytech and recently started learning Te Reo.

"When this job came up it just seemed like the meeting of two worlds. I can use my business and financial knowledge in an industry I'm still passionate about."

Shortly before the Covid lockdown Nicola managed to fit in a visit to Antarctica, which included snorkelling in the icy waters and even a polar plunge in sub-zero temperatures. A pre-dunking shot of vodka helped but only a little when the air temperature was at minus 10 Celsius and the sea water near zero.

"That was horrific – the pain, it actually physically hurts. So worth it though!"

Sadly, there wasn't a lot of marine life to see while snorkelling – in part because algal blooms had even reached the chilly but still warming waters of the ice continent making visibility a challenge.

Nicola says she's already enjoying the environmental focus which comes with the MFA and her new role as Office Manager.

"That feels quite natural for me. I've always walked the line between being a greenie and having a practical business focus. No matter what we do, we're going to have an impact on the environment – it's just making sure we minimise and mitigate that."

Since starting in February, she has already been on a school trip aboard the Grey Heron. Her previous exposure to the Sounds mussel farms was as great fishing spots.

"It was really cool to see the stages of mussel farming with the kids."

She's impressed by those in the sector she's already met.

"I think there are some amazing, passionate people in this industry."

Nicola is grateful for the support she's getting from Ned and Alex – and some handover time with her predecessor, Amber.

"Amber has left quite a legacy behind and I'm keen to carry that on."

Yes, big shoes to fill but Nicola has broken the ice and the flippers are kicking strongly.

Living the Sounds life and loving it

Jan and Ivan Godsiff. MFA 2016 AGM photo

Ivan Godsiff left school at 14 because words tied him in knots - but his Sounds upbringing and ability to handle rope saw him become a skipper on a mussel harvesting vessel and a living industry legend.

His struggles with reading and writing would today be diagnosed and perhaps remedied but back then it saw him leave Marlborough College in the early 1950s after less than a year. "The teacher was quite relieved."

By the late 1970's Ivan was working as a groundsman/general hand at Raetihi Lodge, and with the encouragement of the owners, sat his skipper's ticket in 1980.

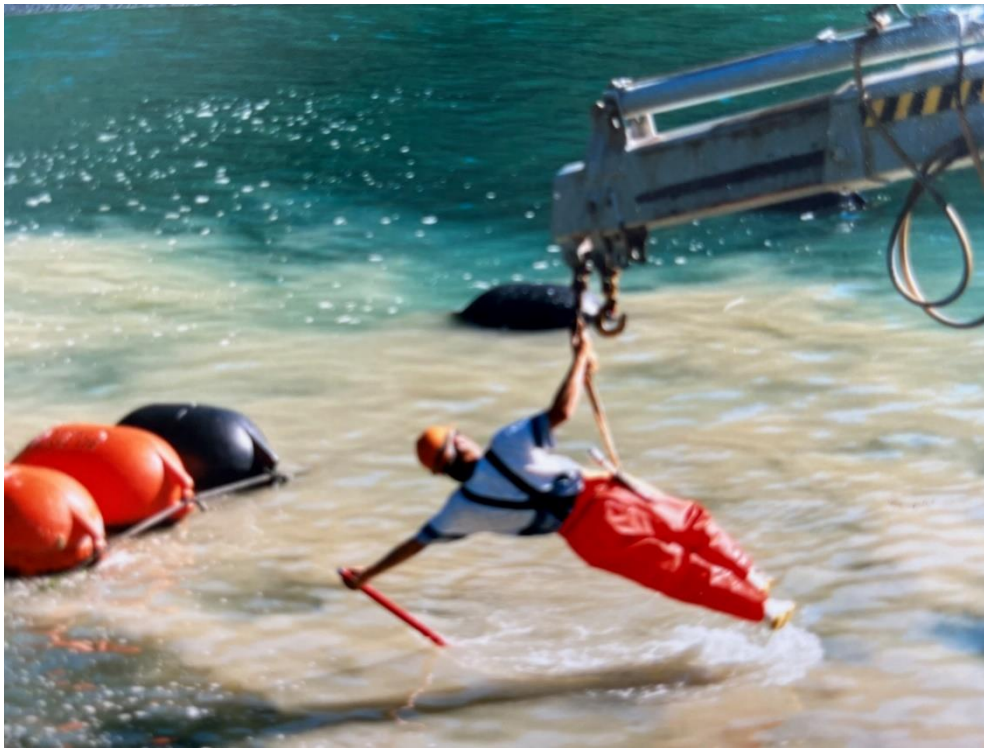
There were two inspectors for the skipper's ticket, and one had a fearsome reputation. Bad weather saw him stuck in Wellington. The other inspector, had enjoyed holidays at St Omer – owned by another of the sprawling Godsiff family which has been in the Sounds since the early 1800s.

"That seemed to help. Then he threw a rope at me across the desk and told me to tie a bowline."

Ivan had been brought up on boats and tied the bowline; the inspector said he'd been the first on the course who knew how to do that; Ivan got his ticket.

"I think I was pretty lucky."

Sanford boat crews 1997. Ivan is in the check shirt on left. From back left Bruce Cardwell, Aaron Williams, John Collins, Clive Godsiff, Craig Waters. Next row. Mike Wallace, Daniel Paget, Ray Naish. Third row Ivan Godsiff, Jay Naish, Steve Bradley, Don Mitchell. Front Mark Whittall, Dick Jones, David Foot, Tony Jones.



Ivan had grown up wanting to own a Sounds farm and upon leaving school he went shearing at Pohuenui station and various sheds around the South Island, before buying a small farm at Rimu Bay in Pelorus Sound, not far from Maori Bay where he'd grown up.

There was a guest house in an adjoining bay where a young woman named Jan Shaw was working. "She loved walking – and guess who she found. We've never looked back. "

The couple have now been married for more than 60 years. Their farm at Rimu Bay was exchanged for a bigger one at South East Bay where Ivan

ran 600-700 sheep and a few cattle but it was still hard going. He leased a farm at Nikau Bay to supplement his income.

Jan and he also took in a boarder in the summer of 1968/69 – Dave Flaws who was completing his honours degree studying mussel biology. This led to a pilot scheme to establish some experimental spat rafts.

Ivan's start in the industry was picking wild mussels, supplying Frank Delaney who processed the mussels at the former Havelock Hospital.

"I could pick up more income in two hours at low tide than seven hours planting trees." There were only half a dozen serious pickers at this time. "We respected each other. We had our own favourite spots and only took a good size."

Then Ivan says demand boomed and the native greenshell mussel beds were stripped. "They've never recovered despite there being oodles of spat around."

He's aware of the MFA-supported project to help restore the wild beds and says that's a great initiative.

During his earlier days Ivan was also doing a lot of forestry planting, including on a former family farm block at Skiddaw.

He continued tree planting until a three-wheeler Gnat lost traction and landed on top of him in the late 1970s, injuring his back. "I had to take a light job for three years." That was his time at Raetihi.

Chris Godsiff, another of the wide Sounds clan, had earlier set up New Zealand Shellfish Holdings with Rob Pooley; they were expanding and looking for a skipper for the harvester Sealord and Ivan has just qualified.

"It all went from there."

Ivan took the vessel and crew out harvesting in Croisilles Harbour the first week, landing the mussels before they were trucked over towards Havelock. Unfortunately, the truck went over a bank.

"So, we had to go back out and do another harvest." Then there were problems with the Sealord's batteries.

"It wasn't a good start. I said to Jan when I got home – if I'm still harvesting mussels in a couple of months I must be mad."

He did continue harvesting and other mussel farming work for many years which included skippering the state-of-the-art Pelorus Trader which Rob and Chris had had built.

Jan also joined the industry and began repairing mussel bags at home on a large darning machine.

After several years skippering the Pelorus Trader, Chris Godsiff and Rob Pooley succumbed to an offer in 1989 from Don Mitchell at Sanford to sell the vessel. They set a condition; take Ivan and the rest of the crew.

Ivan had a total of 18 years harvesting, often working long hours with his crew. Rob Pooley says he is the kindest, most patient man he ever knew.

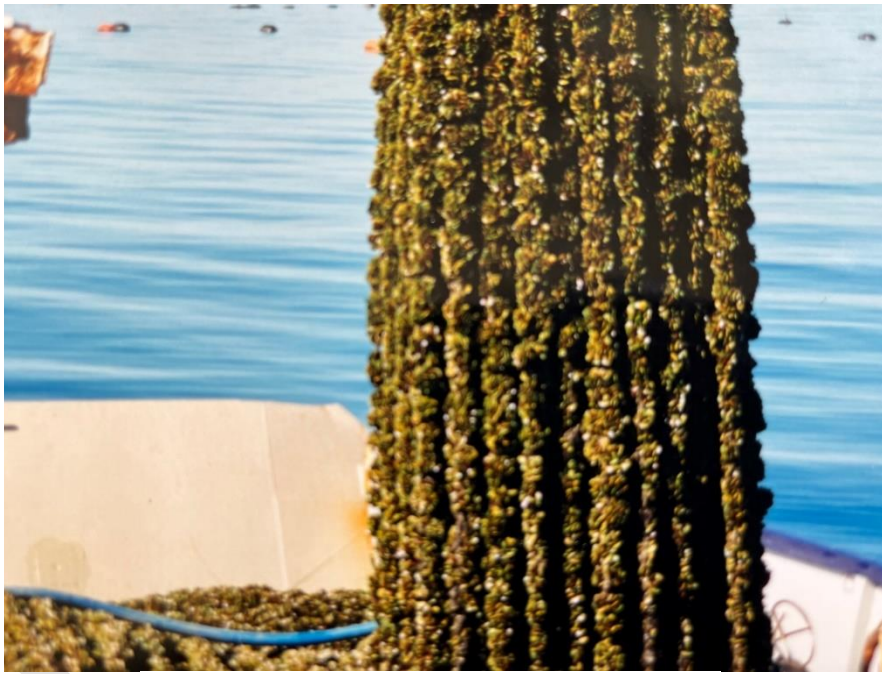
"Ivan will forever be held in the highest regard for his work mentoring so many young men through the industry. The industry is populated with these same young turks. Ivan's sons Clive and Brian, Stoney Burke, Victor Jacobson, Andy Robertson…"

Brian is now a skipper/manager for Clearwater in Golden Bay and Clive skippers barges for Johnsons supporting NZ King Salmon. There are grandchildren in the industry and even a great grandson, Denzil Robertson/Abraham who works for United Fisheries.

Among the various crew he mentored Ivan credits his son Clive with a particularly innovative streak. The pair set up watering systems for freshly harvested seed scallops in Golden Bay and later used this on spat.

Like most marine farmers, Ivan has a theory about the issues with spat catching and retention across the top of South.

He says they used to bring in good hauls of spat on single dropper lines.



Single dropper lines are the way to retain spat, Ivan reckons

"I reckon if they went back to dedicated single dropper spat lines we'd see spat again."

In 2001, Ivan turned 64 and decided to retire from full-time skippering, although he spent a couple of years doing casual fill in work.

Then Graeme Coates from the MFA approached him and asked him to become the organisation's first Environmental Mentor. He worked 3-4 days a week.

"I could choose my weather – they just left me to it. I didn't give that up until I was 80."

Ivan acknowledges there were some bad habits which had to be addressed in the early days – mainly the need to keep all rope and other material on the boat, rather than allowing anything to wash overboard.

His role included inspecting vessels – not that skipper (most of whom he knew) objected.

Single dropper lines are the way to retain spat, Ivan reckons

"They all said it made it easier with new crew when told there was an inspector coming on board."

He started with a 16-footer with an outboard but then moved to a 10m former fishing boat with bunks. One benefit of this was Jan was better able to join him on beach clean-ups, although there was only ever one time sheet.

"But we enjoyed it that much we did it for 14 years. The Sounds mean a lot to me and cleaning up the beaches – I just loved it."

Around the time Ivan turned 80, the MFA gave him its Merit Award which he shared with Jan on stage; a small token of recognition for a life devoted to the marine farming industry the Marlborough Sounds.

Brendon Burns

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.

havelock mussel and seafood festival

Above: The Jordan Luck Band entertaining the 2023 crowd.
Left: Lost Tribe Aotearoa. Below: Simon Gault cooking up a storm.
Credit: Richard Briggs Photography

2023 Festival a success!

The 2023 festival was a roaring success with 3500 people being welcomed through the gates. The atmosphere was electric, with a buzz of excitement in the air. The seafood was delicious, and the entertainment kept the crowds entertained all day. After a long wait, we're proud to give back $5173.50 to the Cyclone Gabrielle Mayoral Fund, as well as be able to facilitate the Community Grants this year.

Community Grants Applications Open May 1st - 31st

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havelockmusselfestival.co.nz

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A big thank you to our 2023 Sponsors. Their invaluable support and significant contributions have made an immense impact at the 2023 festival.

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Another incredible 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 over 3,200 of Marlborough's young people every week!

Growing great seafood, growing great kids! Some of the Graeme Dingle Foundation Marlborough team with the Sanford crew

Good food for a good cause – raising funds for the youth of Marlborough ♥

Kandoo Kiwi with some of his aquaculture friends

Graeme Dingle Foundation team helping out at the Sanford tent

Helping New Zealand King Salmon serve up the hospitality

Kandoo Kiwi was extremely popular with the crowd

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

Remote sensing provides focused view of our coastal ecosystems.

Aotearoa-New Zealand's marine area covers 167,650 square kilometers presenting a staggering distribution of climates, from subtropical to subantarctic waters, to understand and manage.

But it's likely we know more about the surface of Mars than we do about the seafloor of our marine environment.

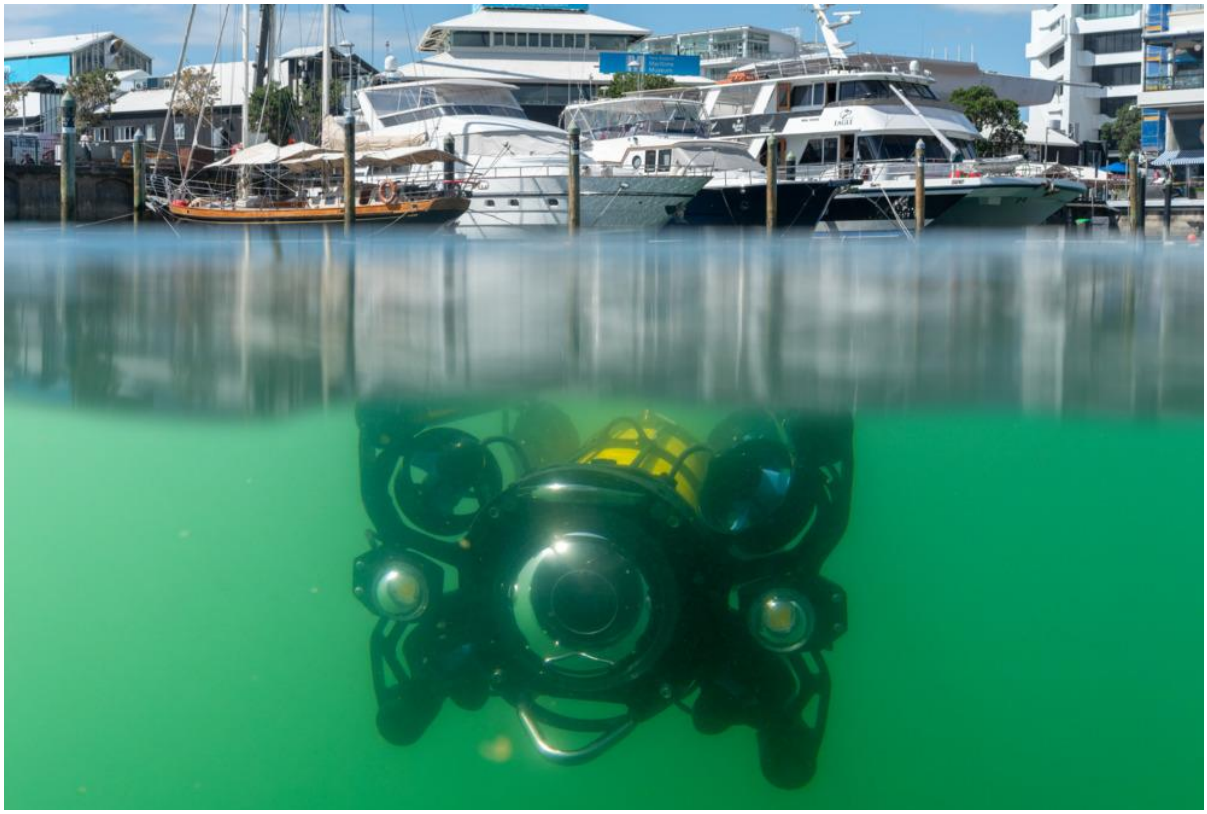
To fill that void, Dr Leigh Tait, a marine ecologist at NIWA, is investigating better use of satellites, drones, and remote operated vehicles (ROVs) to improve our understanding of life under the ocean.

The research is part of the Surveillance Tools and Technologies Project led by Dr Tait who is based in Christchurch.

His work with ROVs is specifically for biosecurity purposes and is funded by NIWA's Marine Biosecurity Programme while his research with satellites and drones is funded by other NIWA programmes.

The aim is to develop or optimise monitoring and surveillance technology to protect aquatic environments from invasive species and to measure the state of our marine environment.

Biosecurity surveillance relates to monitoring the occurrence of specific events. The broader use of the tools being developed by the programme is for monitoring, mapping and assessment.



The Boxfish drone can carefully manoeuvre around underwater structures in harbours. Photo: Stuart Mackay/NIWA

Tait said the work is important because New Zealand's marine ecosystems face threats from climate change, habitat loss, land-use change and invasive species.

There is an urgent need to understand how changes in our marine environment influence the services and values New Zealand receives from the land and oceans.

"We don't have a lot of baseline information about the current state of our marine environment, let alone the extent to which our marine ecosystems have changed," Tait said.

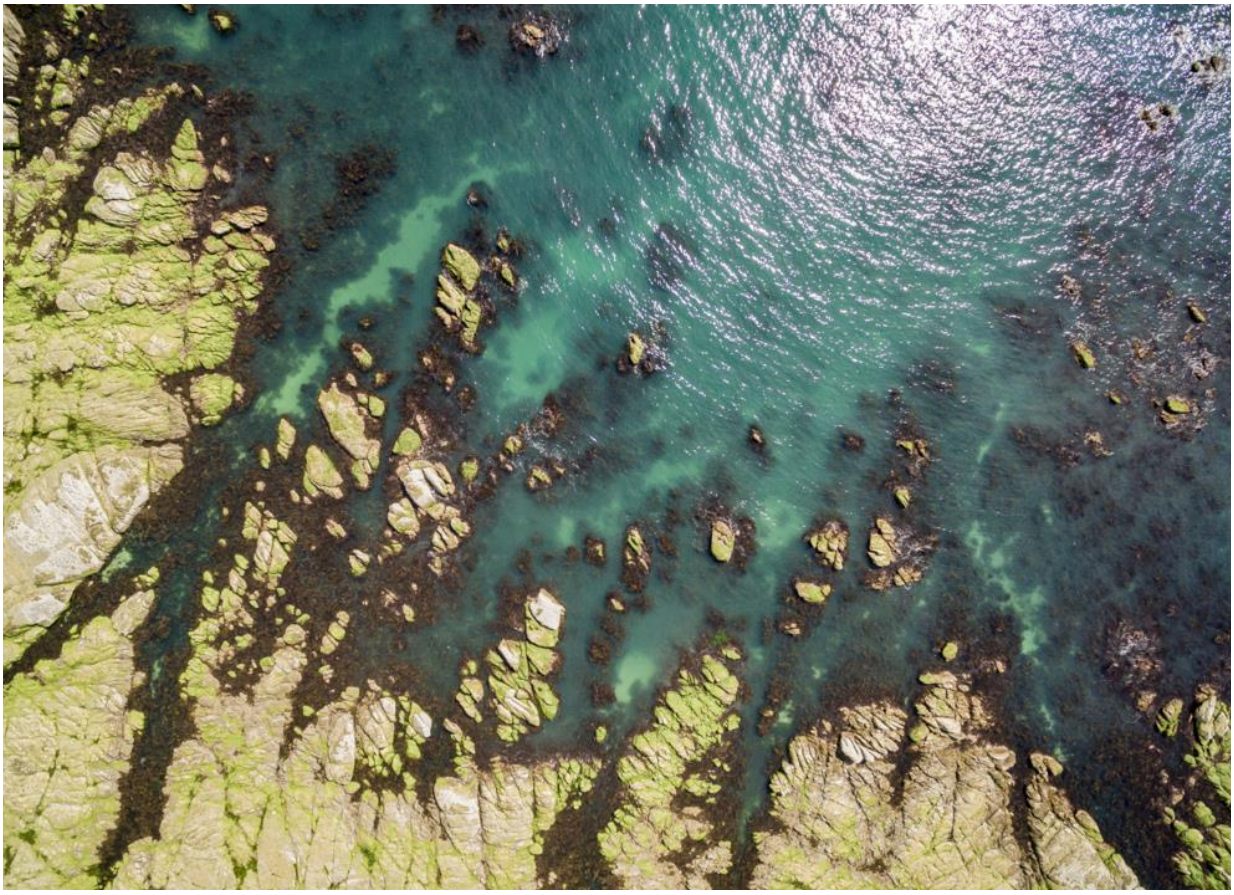
"But the use of remote sensing provides the broad scale of observations that will enable us to establish a time series of data to determine what the main drivers of those changes are."

Drones

NIWA has used drones for the Department of Conservation on the West Coast of the South Island, to survey rocky coasts where it was too dangerous for people to go.

"These areas are remote, exposed and difficult to access and so this is an example where drones fill the gap between satellites and ground observations."

Drones which can be mounted with multispectral cameras to detect an array of light wavelengths, to view the sea floor and identify marine plant species. Smaller drones carrying standard cameras are also used for field work.



Aerial drones provide researchers with important vision to help map coastal ecosystems. Photo: David Plew/NIWA

"Drones are largely autonomous and can be programmed to fly an automated path to provide a detailed picture of a particular habitat. They have become accepted as a robust tool for ecological monitoring."

ROVs

ROVs are on a similar trajectory as monitoring tools for undersea environments where divers cannot reach or are too dangerous to visit.

"Satellites and drones provide enormous leaps in the coverage of marine monitoring from above but there is also a need to understand the changes that are occurring well beneath the surface of the ocean, that's why ROVs are important."

NIWA's ROV units are battery powered but tethered to the operator at the surface via a fibre optic cable.

The cable provides real time data and images, and it allows the operator to manoeuvre the ROV which is crucial when working in harbours with submerged structures.

ROVs are already being used by dive companies contracted to detect biofouling on the hulls of ships traveling international waters, to prevent marine hitchhikers establishing in new environments.

NIWA has a role in biofouling research too, focused on developing and testing novel platforms and sensors and ensuring that these instruments are fit for purpose and cost-effective.

In the past year, NIWA used ROVs at Aotea - Great Barrier Island and Mercury Island surveying for the invasive weed, Caulerpa.

Artificial intelligence

NIWA is pioneering artificial intelligence and machine learning to detect invasive species automatically.

The concept is to run video from ROVs through a detector to identify invasive species, eliminating the need for people to spend hours watching the footage.

Satellites launched by NASA, US Geological Society and European Space Agency have been in orbit for decades and continued to provide broad scale data for scientific use.

NIWA is making better use of this resource by developing novel algorithms to detect and map kelp forests across New Zealand, as one example, using moderate resolution satellites.

Traditional methods used to detect marine invasive species require resource intensive surveys, as well as highly specialised personnel and equipment.

Remote sensing has reduced the resources needed but Tait said people were still the key to making the most out of drones, ROVs and satellite data.

"We are still a long way off from being completely hands-free for drone operation and the critical factor is getting the greatest coverage for the least amount of human time."

For more information, contact Dr Leigh Tait: leigh.tait@niwa.co.nz

Blenheim may get major new shell crushing plant

A chance discussion with an aquaculture industry executive sparked a New Zealand technology company to research mussel shell disposal with Blenheim and Tauranga now the two sites being considered for a major new processing facility.

Dr Kapish Gobindlal was completing his PhD in chemistry at Auckland University when he caught up with family friend, Greg Johansson, at a Christmas party.

“Greg mentioned the cost of disposing of greenshell mussels and that got me thinking,” says Dr Gobindlal.

He was already doing some work with Environmental Decontamination (NZ) Limited (EDL) which for more than 20 years has worked here and overseas dealing with hazardous wastes like banned pesticides and asbestos as well as waste recovery.

Now director and chief scientist of EDL, Dr Gobindlal has led the research and development of a mechanochemical technology to turn the many thousands of tonnes of mussel shells dumped each year into high-value calcium carbonate used in a range of industrial products.

MPI came on board in 2020 and granted $313,000 from MPI's Sustainable Food and Fibre Futures fund to conduct pilot-scale trials with shell supply and support from North Island Mussels Ltd, a Sanford/Cedenco JV company based in Tauranga.

Dr Gobindlal says EDL is now looking to build a full-scale facility that aquaculture companies could supply with shells. Blenheim's proximity to the Sounds which still produces 60% of greenshell mussels makes it a leading contender. Tauranga is closer to the trial plant and the expertise which has been developed as well as EDL's Auckland base. North Island Mussels Ltd has already produced a high-level conceptual design for a full-scale operational plant which is envisaged to be implemented at its Tauranga facility.

"We're working on the final design and just trying to figure out the first location. The main thing is to get plant number one off the ground," says Dr Gobindlal.

A decision will be made later this year and he hopes a factory could be operational within two years. There was also potential to set up EDL's grinding systems on site at mussel processing plants across the country and even on sites such as 'Mt Perna' near Havelock.

"Currently mussel shells are disposed of in landfill or used as fill material on farmland, but the shells are classed as biowaste."

The potential benefits to the mussel industry are huge. New Zealand currently processes around 100,000 tonnes of green-lipped mussels a year, leaving 55,000 tonnes of mussel shells requiring disposal.

The current cost of land disposal for shells at the Blenheim landfill is $147.55 at tonne, increasing to $179.23 from July with new waste management levies. Already in Coromandel its $260 a tonne.

"Our aquaculture industry is projected to grow from NZ$600 million in 2019 to NZ$3 billion by 2035 so the issue of mussel shell waste is only going to grow," says Dr Gobindlal.

Development of a horizontal, stirred ball mill has been a big part of the technology developed by EDL. These are much more cost effective, are scalable and have much better throughput than traditional large mills which alone can cost between US$8m-US$15m.

EDL already has interest from major aquaculture companies in New Zealand. Several potential buyers of the end product are already involved testing and validating the technical properties of the calcium carbonate EDL is producing.

“Our testing and validation has confirmed that the technology we’ve developed produces high quality calcium carbonate, suitable for paint, construction, and other high-value applications.”

Participating companies have included Stevenson Concrete (concrete for construction), Resene (paint), Ingredients (ingredient supplier – life sciences), Sanford, and Farmlands Co-operative.

Steve Penno, MPI’s director of investment programmes says calcium carbonate is in hot demand.

“The only other way to produce calcium carbonate is through mining, so this new technology represents a massive step towards more sustainable options. It also provides a local supply of calcium carbonate at a time when supply chains are a challenge worldwide.

“The trials have been a resounding success, and they’ve demonstrated that the technology can be scaled up. The technology offers an innovative solution to deal with the tonnes of mussel shells piling up,” says Mr Penno.

“We’re pleased that this Sustainable Food and Fibre Futures funding has paid off – and we’ve proven that revenue can be generated from this waste stream.”

“New Zealand’s aquaculture sector aims to be the greenest in the world,” says Steve Penno.“This project helps realise the goals of the sector and Government’s Fit for a Better World roadmap for the food and fibre sector,

Dual cascading reactors reduce / transform mussel shells into calcium carbonate.

which aims to boost sustainability, productivity and jobs over 10 years. This includes a focus on turning waste streams into high-value products. This truly is Kiwi ingenuity at its best."

What are some common applications for calcium carbonate?

Calcium carbonate is used as an ingredient across many industries, including:

Agriculture – soil pH stabiliser

Construction – cement replacement and use in other cementitious products

Paint – extender

Life sciences – calcium source for humans and animals

Water treatment – flocculent and contaminant removal

Steel – removes impurities during the blast furnace phase of iron extraction

Plastics – decreases surface energy, provides opacity, and surface gloss

Paper – filler and coating pigment

How are the mussel shells crushed?

Holding hopper. Temporary storage of mussel shells as they exit the production line.

Shell washer. High-pressure water washer to remove residual meat and impurities.

Shell dryer. Convection air dryer to reduce moisture content to <1%.

Shell crusher. Preliminary crusher to reduce shells to 15-20 mm particles.

MCD reactors. Dual cascading reactors to reduce / transform mussel shells into GCC.

Packaging. Preparing the powdered product in accordance with customer requirements.

Brendon Burns

Spat losses on Greenshell™ farms: problem or opportunity?

The early stages of Greenshell™ farming can be extremely inefficient, with the majority of spat seeded out often lost from production. While we know spat losses can reach as high as 99% on an individual farm level, until recently, we had little understanding of how bad spat losses are across the industry as a whole.

To begin to shed light on industry-wide spat losses, we combined data on Kaitaia spat landings on Ninety Mile Beach from MPI with data on spat counts from the CMFA and data on adult mussel production from AQNZ and investigated the trends.

The results were sobering. Despite substantial increases in the harvesting of wild spat over the past 10 years (Fig. 1), Greenshell™ production has not increased concordantly, and has remained largely static at 90,000 tonnes, or approximately 1.78 billion adults. From 2015 to 2020, on average, 344 billion spat were harvested from Ninety Mile Beach alone, yet less than 1% of these were retained on farms from seeding through to final harvest. When considering other spat sources (i.e., line caught and hatchery spat), the numbers get even worse.

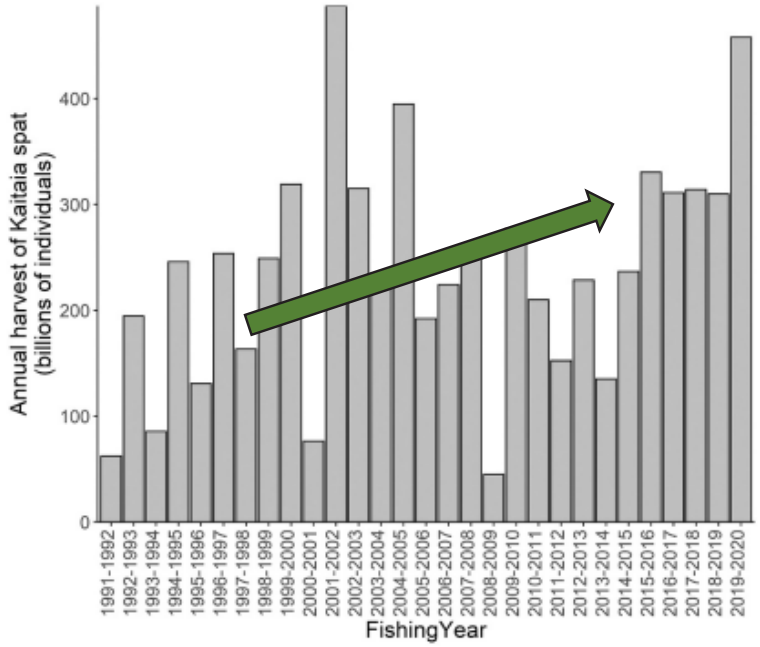


Fig. 1. Annual harvests of Kaitaia spat (billions of individuals) from 1991 to 2020 showing a steady increase in spat harvests.

Although these numbers are depressing, they also begin to give us an idea of the potential of the Greenshell™ industry. If the industry were to grow the spat lost from farms each year to a harvestable size, it would produce an additional 12.1 million tonnes of crop, which would be more than five times the total global aquaculture production for all mussels. On this basis,

if the Greenshell™ industry was to improve spat retention by 25%, it would increase the size of the industry to 3 million tonnes, worth over $4 billion USD annually, and make New Zealand the largest mussel producer in the world. Furthermore, a 25% improvement in spat retention appears to be possible with the integration of land- or sea-based nursey systems such as floating upwelling systems (FLUPSY) to the Greenshell™ production cycle. The Greenshell™ industry is well placed for this level of expansion, given that it is currently using only around a third of the ~15,000 ha of space approved for mussel aquaculture, with spat supply being a major constraint for industry expansion into this farm space.

So while spat losses may be a major problem today, with some further research and improvements to production efficiency, they represent a major opportunity for the future.

Brad Skelton, University of Auckland.

Paul South, Cawthron Institute.

Andrew Jeffs, University of Auckland.

MARINE FARMING ASSOCIATION

MSQP
Marlborough Shellfish Quality Programme

SAVE THE DATE
AGM & CONFERENCE

Date: **25 August 2023**

Start: **9.00 am**

Location: **Queen Charlotte Yacht Club**

Ticketing details to come…

MARINE FARMING ASSOCIATION

Award Nomination Form

It's the time of year again when the Marine Farming Association offer all members the opportunity to nominate an individual or organisation for the MFA Annual Awards.

The Awards will be presented at the MFA Annual Awards Dinner, this year being held on at the Queen Charlotte Yacht Club on Friday 25th August 2023.

Please complete the details below and return your nomination to office@marinefarming.co.nz by 5pm on 28th July 2023.

Details of Nomination:

Nominee Name: _____

Nominee Company: _____

Category:

- ☐ Merit Award
- ☐ Environmental Award
- ☐ Research & Development Award
- ☐ Outstanding Marine Farmer
- ☐ Recent Entrant Award
- ☐ Community Award

Reason for Nomination:

_____

_____

_____

_____

_____

_____

_____

Signed: _____ Date: _____

MARINE FARMING ASSOCIATION

Award Categories

Merit Award

Awarded to an individual or an organisation that has made significant and beneficial difference to our industry over a sustained period.

Environment Award

Awarded to an individual or an organisation that has demonstrated outstanding commitment to the environment through advocacy, leadership, best practice or just getting out and doing it.

Research & Development Award

Awarded to an individual or an organisation that has demonstrated excellence in research and development, with measurable outcomes relevant to the understanding, growth, sustainability, or profitability our industry.

Outstanding Marine Farmer

Awarded to a farming individual or an organisation that has made a significant contribution to the marine farming industry in the Top of the South over the last 12 months.

Recent Entrant Award

Awarded to an individual who during the first few years of involvement in our industry has shown exceptional passion, commitment, and achievement.

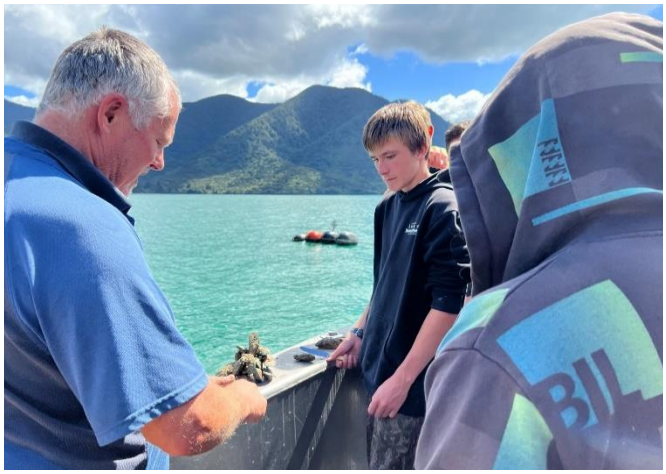
Community Award

Awarded to an individual who is an ambassador for the industry within the community in which we operate.

Note: The choice of the award recipients will be made by a panel of adjudicators.
Their decision will be final, and no correspondence will be entered.
It will be the adjudicator's decision to whether all awards will be presented.

MFA Working with Schools

MFA, in association with Marine Farm Management Ltd and support from the Cawthron Institute, took out Year 12 & 13 students from across Marlborough on a mussel boat. The trips took place over 3 days (13th – 15th March) accommodating students from Marlborough Boys College, Marlborough Girls College and Kaikoura High School. The trips covered vocational experiences, science and maths activities.



Students from Kaikoura High school learning how to open a mussel.

MBC students learning what it takes to work as a deckhand.

All students were taken out on MFML's vessel Grey Heron departing Havelock Marina. The students observed seeding and harvesting vessels at work. The students were then taken to see a recently seeded line and a line ready for harvest. Detailed explanations of the work being undertaken were provided by the Grey Heron's experienced crew.

All students took secchi disk readings and water samples from a variety of mussel growing areas. Thanks to the Cawthron Institute for loaning us the water testing equipment. MBC collected water samples to take back to school and use in a science class.

Both MBC and KHS students were interested in finding out what it takes to work on a mussel boat. The students were shown the engines, given explanations of all the equipment on the bridge and shown the checks the skipper does before departing the berth. The students were also taught knot tying skills, how to raise a mussel line, how to correctly lash a mussel buoy to the line, how to remove biofouling from mussel buoys and how to open a mussel.

All students were given the opportunity to get hands on with a mussel line and explore what other species call it home. Students were shown how mussel sourcing works and learned about mussel biology.

MGC's focus was collecting data for their statistics class. They took part in collecting samples from a newly seeded line, counting, measuring,

KHS students checking the Secchi depth.

MBC student collecting water samples.

MBC students learning how to lash a float to a mussel line.

Students from MGC working out crop yield.

MGC students weighing and taking measurements from samples.

weighing, and recording data from a 1m area of the line. This activity was repeated on a second line that was nearly ready for harvest.

The students were shown how to collect the data and how this affects the sourcing profile. They were shown how the data is sent to the operations managers for analysis, which ultimately determines which lines will be harvested, and how to calculate yield estimates. Overall, three very successful trips with a number of students expressing an interest in aquaculture.

Alex Henry

Queen Charlotte College Mussel Farm Visit

On a stunning Marlborough Sounds Day Queen Charlotte College Year 11 Aquaculture students took part in an on water farm visit to several mussel farming operations. The class was divided into 3 groups and boarded 3 vessels, 2 departing Havelock and 1 from Waikawa.

This was all made possible through the awesome support of MFA, Aroma Aquaculture, Marine Farm Management LTD and Sanford.On board the vessels Hawkeye (Grant and Dave), 88 South (Ben and Wayne) and Sorcerer (Aidan and Stu) the classes were expertly guided and informed and entertained for the day. Throughout the whole time the students were engaged learning about the farm layout and structures, the different types of duties performed in managing the farms.

We were able to see Harvesting in action, farm maintenance and monitoring of the farms. Students also took part in taste testing, size sampling and mussel size comparison between wild spat and

farmed spat. The day was topped off by being given a generous sample of beautiful mussels for the students to take home and enjoy with their Whanau. This was all made possible by the kind support and organisation by The Marine Farm Association, Sandford, Aroma Aquaculture and Marine Farm Management LTD and the students would like to express their thanks for the excellent day.

Tasman Environment Plan Review – April 2023 Update

The Tasman District Council (TDC) is currently reviewing the operative Regional Coastal Plan. As part of this work a number of projects are underway to help inform the decision making. The following sections below provide a brief update on three projects relevant to the aquaculture industry, along with a paragraph on the wider reforms/the timing of notification.

Port Motueka Strategic Planning

TDC has commissioned WSP to assist Council staff with a strategic planning process for Port Motueka. The intent is to gather data and information, produce a draft strategic plan and then consult further on the draft, with a view to producing a strategic plan by the middle of 2023. This strategic plan will then be used to guide zoning and rule development in the Tasman Environment Plan process, as well as other Council decisions on facilities and land uses at the Port.

Port Tarakohe Strategic Planning

TDC has commissioned Boffa Miskell to assist Council staff with the development of a Structure Plan for Port Tarakohe. This is an opportunity to better understand how the port itself can function in coordination with the surrounding land, including options for growth and expansion. The initial phases of this project have commenced with Council staff using existing reports and previous feedback to narrow down the issues and options. A programme of engagement with iwi, stakeholders and the wider community has been scoped. Initial engagement is planned for March/ April 2023 and will focus on mapping opportunities and constraints and analysing initial options with iwi and key stakeholders. This will be followed by a wider community engagement process to look at what activities are appropriate (and where) and what facilities are necessary in the short, medium and longer term.

Aquaculture Review

TDC is undertaking a staged approach to the review of the aquaculture provisions. Stage one was completed in 2021 and the report reviewed whether the current provisions were fit for purpose and where future areas of change might occur. The next stage will look at the actual and potential effects of aquaculture (both current and future activities) in Tasman. This Stage will be undertaken by Stantec within the next six months, and will predominantly use existing information and research. The final stage will look at where aquaculture should or should not be and the planning framework.

Legislative Reform

The Resource Management Act is set to be replaced with the Natural and Built Environment Bill. The NBEA will introduce greater direction and will be implemented over a decade nationally. The NBEA also requires Tasman and Nelson to produce a joint resource management plan. Undertaking a plan review during the current uncertainty is difficult and Tasman is not yet sure whether we will be early or late adopters of the new framework. Until we get better direction, the Council is continuing to review the plan, however, project timeframes and content are likely to change as it all becomes clearer.

Ned Wells

New era for aquaculture industry training

13 April 2023

Primary ITO | Te Pukenga is launching all-new aquaculture training programmes, making formal, specialised training across fin fish, shellfish, and hatchery available for the first time.

The New Zealand Certificates in Aquaculture level 3 and 4, and an associated apprenticeship, are the culmination of a much-needed revamp of training that had been around since the mid-1990s.

"Up till now, if you wanted formal learning about aquaculture, you would need to take time away from the workplace and go to a classroom," says Primary ITO's Seafood Sector Manager Daniel Edmonds.

"Now you can learn on the job, with the best training resources, supported by a Primary ITO training adviser and your own more experienced colleagues."

The new Level 3 programme enables people at the beginning of their careers, as technicians and farm assistants, to learn about the routine operations of daily care, husbandry and monitoring of fish or shellfish in an aquaculture operation.

For those looking to develop further, the Level 4 certificate will mean people can become experienced operators in either aquaculture diving, hatchery, fish, or shellfish operations involved with stock management and other aquaculture operations.

The development has been in partnership with the seafood industry.

Daniel says having different strands of learning available for the three

major species in the New Zealand aquaculture industry – Pacific oysters, Greenshell mussels and King salmon – ensures they're relevant for each workplace.

"What we know about industry training is that people learn better on the job. It also helps with staff recruitment and retention as good employers are committed to developing their people.

"These formal programmes are also great for some of the grittier requirements of aquaculture, like environmental and safety compliance. Learning that through a formal framework ensures that nothing is missed."

Involved in seafood industry training for over 20 years, Daniel believes the industry has a bright future, and the time is right for new aquaculture programmes with the increasing demand for seafood being matched by the demand for sustainability.

"New Zealand has one of the largest Exclusive Economic Zones of any country – our sea space is 15 times the size of our land. I believe aquaculture will become one of the most important industries we have for providing employment and revenue for NZ. There is so much potential. Training and upskilling our biggest asset, our people, is critical to its success."

Aquaculture expertise at Primary ITO

Experienced aquaculturist Michael Stewart has joined Primary ITO as a seafood training adviser, joining long-time seafood Sector Manager Daniel Edmonds.

Michael has been working in seafood and aquaculture since 2003 when he began at NZ King Salmon's farms in the Marlborough Sounds.

"It was there that I followed a workplace training programme that I could use to gauge my progress and start to build a career," says Michael.

From there, Michael worked with Pacific oysters in the Firth of Thames,

Atlantic salmon in Tasmania and pond farming of prawns in Queensland. More recently, he's been back in Marlborough and Nelson, larval rearing Greenshell mussels in a lab in Nelson, and running the aquaculture programme at Queen Charlotte College in Picton.

"That's been a significant part of my professional journey and why I've now become a seafood training adviser. I'm looking forward to working with companies across Nelson-Marlborough, helping build skills and expertise in their businesses and helping learners achieve their goals."

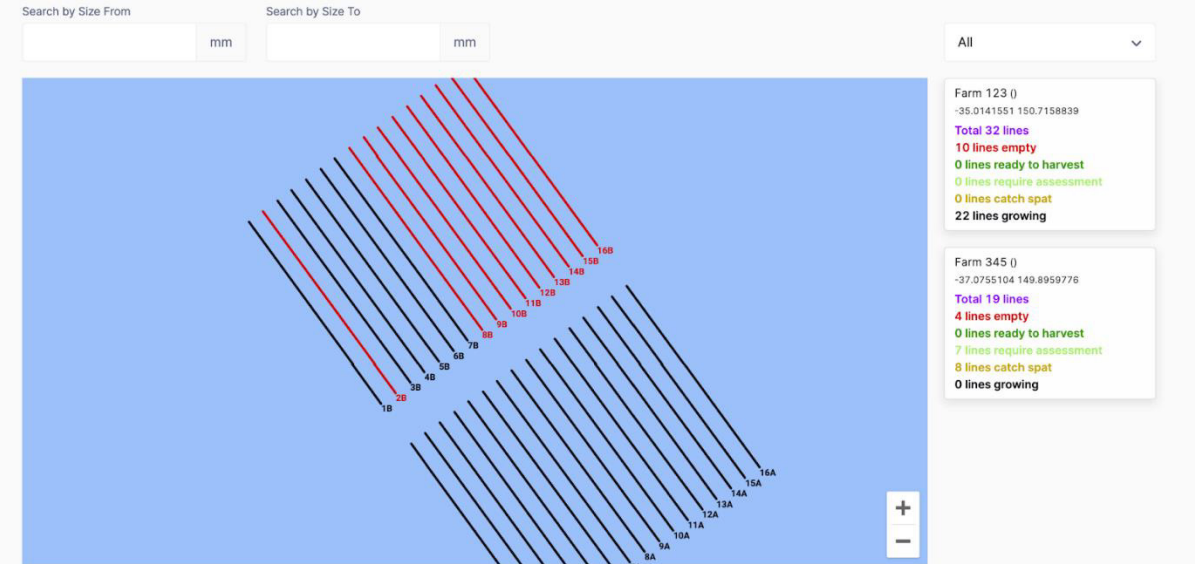
For more information on aquaculture and seafood programmes head to www.primaryito.ac.nz

The Importance of Data Collection

Whilst at the Havelock Mussel Festival, the Mussel App team spoke to a number of mussel farmers about data collection. The consensus was that the farmers wished they had collected more data in the past, however, they noted that the industry has worked for the last few decades without the need for data. They indicated that, while data is useful, there's nothing like a quick trip to the farm to see what's happening and find an answer to most of their questions. It was also indicated that data can be overwhelming. The scientific papers, graphs and charts can be difficult to understand -so why bother?

What's all the fuss about, why should I care?

Farmers need reliable information to make accurate predictions and forecasts for yields and harvests, however, there seems to be a lack of desire to collect and share data. Unfortunately, one doesn't work without the other. For example:



Farm GPS visual information on Mussel App

Let's say we're doing an assessment in Golden Bay. The crew are heading out to the farm in question however, when they arrive, the swell is so big that they can't safely lift the line. Time and petrol have been wasted and you have achieved nothing.

This can be easily avoided – all you have to do is look at the weather forecast. You open your app and check the swell, wind or precipitation in Golden Bay and use this information to plan whether it makes sense to carry out your assessment on that day. If it doesn't, you find something else to do.

This huge time and cost saving is only possible because of years of data collection from satellites, weather stations and manual reports from all over the world that allow complex algorithms to look at the current weather situation and predict what will happen in the next few hours and days accurately.

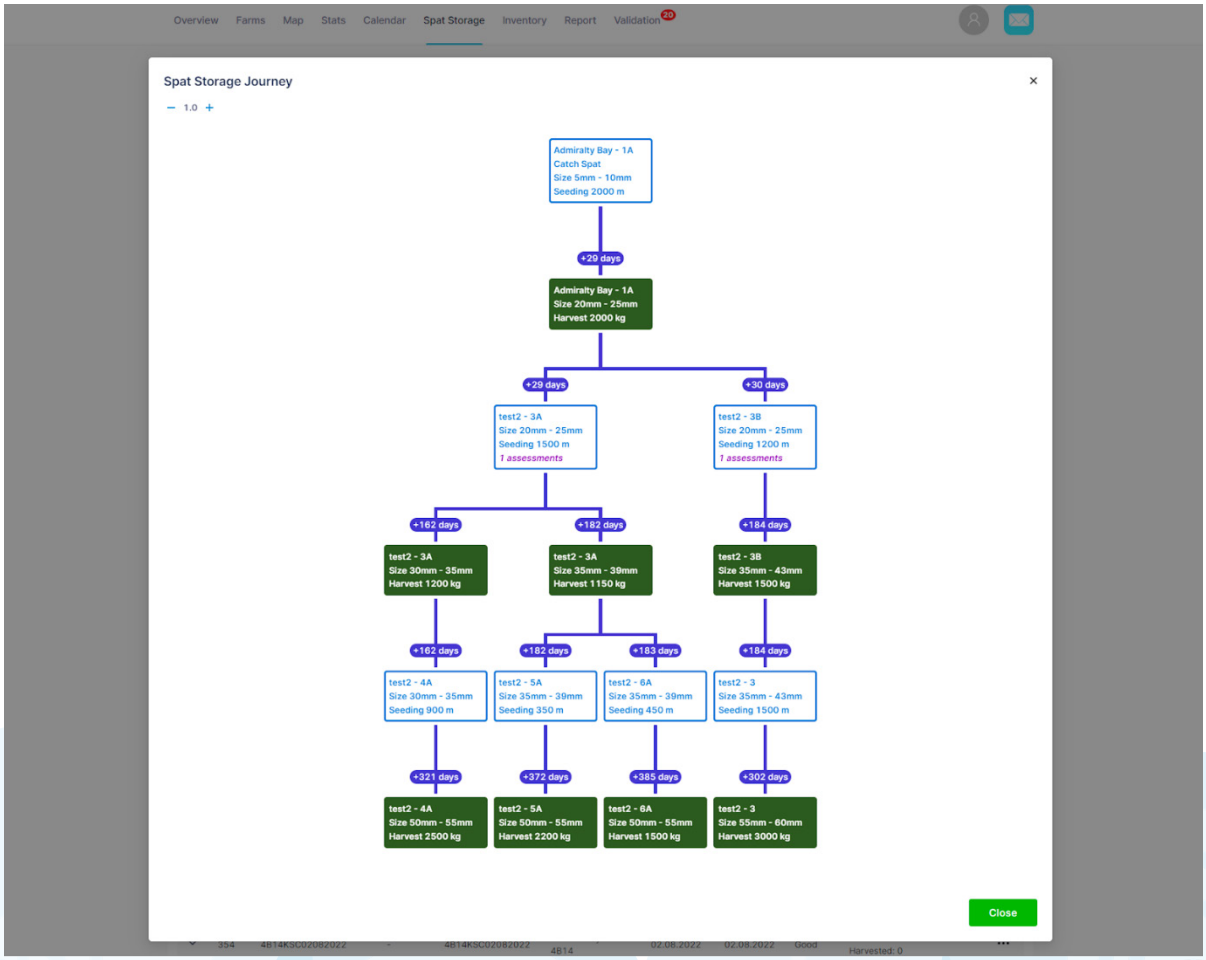
That's cool but what would I get from accurate data collection?

You get concise information to enable you to make accurate operational decisions and plan your work appropriately and cost effectively. That's why we created Mussel App. Currently industry data is patchy and not consistent. Mussel App is designed to unify and analyse the data to help you better manage your farming operations.

How can we make this work?

Industry from across the top of the South need to work together.

If everyone accurately tracks spat movement from line to line, we can forecast the best location for the spat at each stage of its life cycle. If everyone accurately tracks first seeding, we can accurately predict the future harvest. If everyone reports spat mortality, we will be able to tell if the mortality rate is higher or lower by percentage and work out how to make improvements.



Full spat performance tracking in Mussel App

Not convinced?

Imagine this, by working together and using data algorithms, you will be able to ask the app "Where should I reseed spat from farm N4123 line 4B, they're from Kaitaia and currently 20-30mm". The system will tell you that the best forecast for reseeding is on farm 1234 line 1A to have a 1:4.2 ratio, or farm 5678 line 8B with a 1:4.5 ratio and that both lines are now empty.

Sounds complicated?

You actually don't need to do anything differently. You are already collecting a massive amount of data. Taking photos, recording harvest data on paper or in Excel. The difference is that using one system, will enable industry to unify this data. What does this mean? Well, it simply means having a "one size fits all" ruler. For instance, at the moment, the mussel quality for harvest is measured from 1 to 10, A++ to D, Excellent to Bad and more. Unifying the quality unit allows for exploring better predictability and better communication between processing plants. If you put everything together in one system, you can analyse not only 1 farm but, like a weather forecast, predict the changing circumstances. Warmer water? No problem, the system will learn from the North Island. Big swell coming? No problem the system will learn from open ocean farms. Imagine a system that simulates you having a beer with every skipper in NZ every Friday and learning from them.

The future of the industry?

The industry holds the knowledge of what worked in the past. And with the changing environment, higher sea temperatures and increased El Nino and La Nina patterns, there's no better time to prepare yourself for change than now. I've seen some amazing innovations coming from the startup community, Universities and research centres around NZ. From anti-fouling, through innovative floats and ropes to AI mussel recognition, the industry has a bright future. But we also have to remember that every change needs to be validated and measured, and collecting the right data is the best way to measure performance and make improvements.

To find out more about the use of data and Mussel App subscribe to our newsletter on www.musselfarm.co.nz

Ralf Kliss

Skipper Training NZ

Skipper Training NZ offers faster pathway to Skipper Restricted Limits through recognition of prior learning.

Simon Pooley was really happy with the results of the skipper training course delivered in Havelock last month by Skipper Training NZ.

Graduation after the 4-week course in Havelock on 1 April 2023. Our small class sizes make learning more enjoyable and meaningful.

Like most commercial operators, he has highly experienced crew that don't have much time for long courses and may not be so adept at online learning. That's why this course fits the bill really well and Simon sent one of his staff, Pick, to complete the course.

Milo invented the concept of a practical skipper course that includes the completion of the Training Record Book after teaching at a polytechnic and seeing the more hands-on mariners struggle with the months of online learning and completing their training record book before sitting in the classroom for 5 weeks.

Simon and Milo's paths on the water have crossed again and again over the last 20 years and they have developed a strong personal connection and mutual trust.

Simon says "I like the adaptability and flexibility that Skipper Training NZ offer. Having a newly trained skipper fresh from one of Milo's courses is an asset. The level of competency acquired is high and the short duration of the course is extremely valuable".

Pick at the helm of the dedicated skipper training vessel, 52-18.

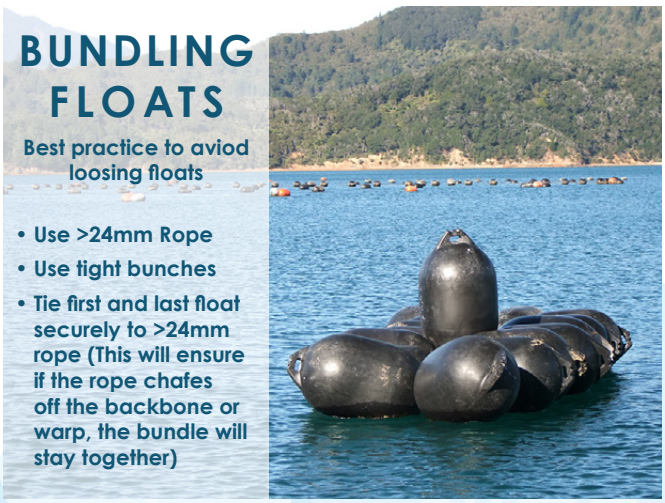
The joy of success after blind navigation exercise

Pick really enjoyed the course. Aside from being a practical learner, Pick believes it's crucial to learn and be tried and tested on the water rather than in a classroom. Pick says he's really glad Simon put him through Milo's course, "I was stoked", he says, adding "it's a great course and you actually learn

everything. Especially with having the boat there and actually going out and doing it, it's a big thing."

Skipper Training NZ has pioneered a pathway for those with significant experience and/or training to complete their training more quickly. They are offering more SRL courses this year as well as other training, including a 500 ton workshop on the 19th of June.

Isabella Merschdorf (Skipper Training NZ)



Applications Welcome

The MFA Contestable Fund is now open for applications.

MFA is offering up to $40,000 for companies or individuals to develop products, services or projects that will benefit the aquaculture industry.

If you have a research or innovation project that covers the following, now is the time to apply.

- Increasing productivity and production
- Implementation of research findings (ie commercialising science)
- Developing digital technologies for use in marine farming
- Developing new farming systems
- Improved spat health.
- Spat retention.
- Developing new uses for existing farmed species
- Maximising the value of existing species farmed by MFA members (Pacific Oysters, King Salmon, Greenshell Mussel)
- Addressing emerging issues

For more information and to apply visit our website MFA Contestable Fund | Marine Farming Association Incorporated

Applications close 31st May 2023

For Sale

12mm netlon oyster bags

DIMENSIONS

- Bags measure 60cm wide x 90cm long.
- Weight dependent on whether there is shell debris on/in the bag (approx. 1kg-2kgs)
- With the centre present (held in by 3 cable ties) it is approx. 10cm thick, with the centre removed approx. 1cm-2cm thick.

DETAILS

- These are ex-oyster farm stock that includes 2x stainless steel clips. Some are in excellent condition, and most are in good condition.
- Bulk price discount

CONTACT US

- Please contact Nadia for more information:
  nadia.burrell@moana.co.nz
  (07) 8668564

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