

Abalone Symposium Thailand

DEADLINE for regular registration: 31 May 2009

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Deadline for abstract submission: 31 March 2009

The Organizing Committee invites abstracts for oral and poster presentations at the 7th International Abalone Symposium (IAS 2009), **19-24 July 2009** in Pattaya, Thailand.

to see more information about the topics of the symposium, please visit our website at <http://www.mascat.org/ias2009/paper.html>

You can submit your abstracts after registration and before making payment. Deadline for abstract submission is 31 March 2009.

Please submit your abstracts at

<http://www.mascat.org/ias2009/registration.html>

'Big Fat Oyster' Seller Cops Big Fat Penalty



Voxy News Engine

Tuesday, 17 March, 2009 - 11:38

17 MARCH 2009 - A Gisborne sickness beneficiary has been sentenced to 150 hours community service after he was caught illegally possessing and selling oysters and pipi at Gisborne's Alfred Cox Flea Market.

Watene Tawa Waikari, 59, appeared before Judge Eddie Paul in the Gisborne District Court last Friday.

Fishery officers approached Waikari at the flea market in August last year and questioned him about his activities. He admitted selling bags of pipi for \$5 each and 'big fat pacific oysters' for \$10. He made \$200 that morning from selling approximately 12 bags of oysters and six bags of pipi.

Waikari had taken the pipi and oysters from the Ohiwa Harbour mudflats, near Opotiki, and transported them to Gisborne to sell at the flea market. He had sold oysters at the flea market on another occasion.

Waikari told the fishery officers that he thought selling shellfish was just like selling whitebait and he thought it was OK to sell.

Waikari's lawyer, Mark Skeats, said that his client could not afford to pay a fine nor was he well enough because of health problems to do community service.

Judge Paul said that if Waikari was well enough to gather seafood he could undertake community service, but light duties.

MFish Fisheries Prosecutor, Morgan Dunn, explained that Waikari had a number of previous convictions relating to illegal rock lobster.

In addition to the 150 hour community service, Waikari's profits of \$231 and a blackboard sign which advertised his pipi and oysters, were ordered forfeiture.

Gisborne district compliance manager, Tom Teneti said the illegal sale of seafood at local markets is a serious concern to the Ministry and he hoped that this penalty would deter others from becoming involved in similar offending.

"The general public need to be aware that only legitimate entities can sell directly to the public such as Licensed Fish Receivers and dealers in fish. Any sale of such seafood must come from a legitimate source and be accompanied by appropriate records showing proof of purchase."

He said Waikari's apprehension came from information provided by shoppers at the flea market who alerted fishery officers on the MFish 0800 4 POACHER (0800 476 224) hotline.

"We encourage people to call with their concerns about suspected illegal activity like the offering of cheap shellfish - not only pipi and oysters but also paua, rock lobster, and wetfish".

Whitebait, which is administered by the Department of Conservation, can be sold by recreational fishers but the sale of wetfish and shellfish is strictly prohibited by recreational or amateur fishers under Fisheries Legislation and the Fisheries Act 1996.

<http://www.northernadvocate.co.nz/localnews/storydisplay.cfm?storyid=3795970&thesection=localnews&thesubsection=&thesecondsubsection=>

**The Northern
Advocate**



Northland fisheries officers patrolling remote coastline near Kawerau. Picture/Tania Webb

Paua poachers sentenced to 500 hours' community work

16.03.2009

by Kristin Edge

Two Far North men will spend 500 hours working in their community after they were nabbed with hundreds of undersize paua.

The penalty has been applauded by fisheries officers who say paua stocks on the West Coast of Northland are "at risk".

Fisheries officers patrolling remote coastline near Kawerau, north of Dargaville, stopped the duo who were on a quad motorbike with 222 paua between them. Only eight paua were a legal size.

Chanz Handley, 32, solo parent, and Mihaka Waipouri, 35, unemployed, appeared in Kaikohe District Court, last week after pleading guilty to charges of possessing excess and undersize paua.

The two Hokianga men had been free diving for paua when they were stopped by fisheries officers. The daily limit for paua is 10 per diver, with a minimum size of 125mm.

Handley was caught with 117 paua, with only seven legal-sized shellfish. He explained he had not counted or measured the paua and they were for his family.

Waipouri's bag had 105 paua, with only one making the grade. He told the officers they were for his daughter's birthday.

Handley was sentenced to 200 hours' community service while Waipouri, who has previous convictions for breaking fisheries laws, faces 300 hours' work.

All the gear used by the men to gather the paua was seized.

Northland district compliance manager Darren Edwards said the sentences sent a clear message to people plundering the paua fishery that they would be caught.

"Offending on this scale is placing huge pressure on the paua fishery which is already extremely fragile here in Northland," Mr Edwards said.

It was not uncommon for those stopped by fisheries officers to have more than three times the daily limit of paua.

As a result of the continued offending and pressure, the Ministry had increased its level of patrolling in an attempt to protect the fishery.

"Fishery officers cannot be everywhere and we are reliant on information from the public."

<http://www.weekendpost.co.za/article.aspx?id=398099>

Brazen perlemoen poachers plunder Cape St Francis

2009/03/19

Guy Rogers ENVIRONMENT & TOURISM EDITOR rogersg@avusa.co.za

PERLEMOEN poachers are plundering Cape St Francis at will – and without a boat and divers available for quick reaction, the local marine law enforcement office can do nothing.

That is the view of a Marine and Coastal Management (MCM) honorary officer who fields daily calls from frustrated and irate residents reporting wide-scale, broad daylight pillaging by the poachers in the area.

Speaking to The Herald on condition of anonymity, he said this frustration of law-abiding locals was set to erupt.

“The poachers are so close offshore that one of these days a resident is just going to shoot. Blood is going to flow unless something is done.”

He said the big two-prong bust a year ago – in which the poachers were pursued by an MCM vessel and police divers dropped from an air force helicopter – had hit the poachers hard.

Since then the poachers had gradually returned, however, and there had been a huge influx of rogue “super-duck” boats in the last four months. They were well-known to locals, although they usually travelled with a cover flipped “by mistake” over their registration number, making photographic proof difficult.

“There’s one boat with two 200hp motors that arrives on a trailer at the back of a Land Rover at the Hullet’s slipway in St Francis Bay. It launches from there, with no interference from the authorities, with 10 divers on board

“A skipper takes it out, and the owner fly-fishes at the slipway until it’s brought back. It’s that blatant.”

Other suspect boats come in on the water from Port Elizabeth or the Kromme or Gamtoos mouths and rendezvous with their divers at the St Francis harbour, he explained.

Reasons for this modus operandi presumably included not wanting to have the divers on board later in the day with the contraband, and because the wind often came up later in the day, making the ride much rougher.

Sometimes the divers “disappeared”, only emerging after dark with the perlemoen. On other occasions, they emerged on public beaches in broad daylight, but with no perlemoen on them, he explained.

The approach on these occasions seemed to be that once the shellfish was prized from the rocks and shucked below the surface, it was then stashed in a bag and wedged between the rocks so it did not move with the current. The bag’s position was then recorded on a GPS system for it to be picked up later.

On one occasion, at nine in the morning, a super-duck with 15 divers who had been diving all night off Paradise Beach had appeared in St Francis Bay, 50m off- shore between Main Beach and Kromme River mouth, he said.

“It was like a navy operation. They jumped off, swam in and then walked in full scuba gear across the beach with everyone watching.”

While MCM mans a “compliance office” in St Francis, officials there are tasked and have equipment only to monitor activities on the sea shore. The directorate’s crack environmental patrol vessel (EPV)

squad is tasked with hitting the poachers at sea.

Three (EPV) coastal patrol frigates – Lillian Ngoyi, Victoria Mxenge and Ruth First – cover South Africa's coast and one of them is always berthed in PE together with a smaller, faster ski-boat and rubber duck.

The successful bust in March last year had involved planned deployment of these vessels from PE and some time spent by them in the area – but the problem came in once they had returned, the honorary officer said.

"There is no vessel available here and no officials with diving training. PE is too far away for a boat coming from there to make any difference in an emergency situation where quick reaction is needed. We desperately need a boat and divers to tackle what is going on here."

MCM spokesman Carol Moses said the directorate recognised that perlemoen poaching was "not isolated criminal activity. Poachers often work in association with drug dealers and other organised crime elements".

A ski-boat and rubber duck had been deployed in the PE and East London areas and this approach had been highly successful, she said.

"With this success, however, poachers are now shifting their attention to other areas such as Cape St Francis. We have become aware of this and are addressing the challenge at the moment."

The department had recruited and deployed eight more contract fishery control officers and were "in the process of replacing the ski-boats with much faster and improved rubber ducks and also improved, updated technological equipment".

<http://portlincoln.yourguide.com.au/news/local/news/general/tough-times-ahead-for-ab-industry/1457444.aspx>



Tough times ahead for ab industry

BONNIE PUCKRIDGE

12/03/2009 12:30:00 AM

WESTERN Abalone Processors manager Jim George has returned from Hong Kong with concerns that the abalone industry could be in for a tough time.

Mr George discussed with his buyers several changes that may need to be put in place immediately to help the industry through the economic downturn.

He suggested divers don't work on Fridays and Saturdays and that all divers be finished catching their quota by October 31.

Demand for abalone has dropped over the past 12 months, and Mr George is fearful a turnaround could take a long time.

His discussions in Hong Kong revolved around issues including the current economic situation, spending by housewives on abalone, consumption over Chinese New Year, quality, size ranges and promotions.

"The world wide economic recession will have a dramatic effect on all luxury items, especially abalone," Mr George said.

"I have termed this trip as the depression trip because that is what it was," Mr George said.

"I guess that in some sectors of the market there were positive signs but overall the feeling amongst our clients was doom and gloom."

However, he said sales in the lead up to the Chinese New Year were reasonable, although the profit was marginal.

"We received a substantial order on January 3 and we lifted the imposed diving restrictions after receiving an order for 12 metric tons (MT).

"Combined with our other sales we managed to export a total of 17 MT of greenlip as well as making some good canned abalone sales to Hong Kong by airfreight, Canada and Macau."

Mr George said frozen greenlip abalone would struggle to find buyers this year.

"It is definitely going to be another difficult year and probably worse than in 2003 when we had the SARS epidemic," Mr George said.

"One of our clients has stated that this will be the most difficult year in the past 20 years."

He said the Hong Kong economy has been seriously affected throughout the financial crisis and greenlip sales dropped around 22 per cent during the Chinese New Year compared with 2008.

<http://www.weekendpost.co.za/article.aspx?id=396986>

WeekendPost
—SHARING KNOWLEDGE ADDING VALUE BUILDING COMMUNITIES—

Cycad bust nets bigger fish

2009/03/12

Lee-Anne Butler HERALD REPORTER



DOUBLE WHAMMY ... Uitenhage police dog unit Inspector Christo Gouws displays some of the perlemoen and cycads seized during two busts in the area yesterday.

Picture: MIKE HOLMES

UITENHAGE police made two major breakthroughs yesterday when they seized cycads with a street value of R250000 and then perlemoen valued at up to R200000.

Inspector Christo Gouws, of the Uitenhage police dog unit, who was involved in both operations and in which four people were arrested, had been working on a case of illegal cycad uprooting and sale for four months.

Captain Priscilla Naidu said one man was arrested yesterday afternoon while allegedly transporting the rare plants to Gauteng to be sold. The fronds had been cut off and the roots put in boxes.

Gouws, who was tipped off earlier yesterday, stopped the 42-year-old man on the road and found 263 cycads in the back of the vehicle.

Naidu said that although the cycads had a street value of R250000 here, they could be worth more in Gauteng.

“In Johannesburg, cycads can cost as much as R70 per centimetre, so our estimate could be a little out. But we have commended Inspector Gouws for this breakthrough because he has been following leads and working on this case for four months.”

Naidu said cycads were not allowed in any garden without a permit. The suspect was arrested under the Biodiversity and Environmental Act, which prohibits tampering with or destroying wild specimens of threatened species.

In the second bust, Gouws later visited the farm Breelaagte, near Uitenhage, while still probing the cycad case and arrested three tenants – aged 34, 36 and 37 – for illegal perlemoen possession.

Naidu said it was brought in from Jeffreys Bay and Port Elizabeth and had been processed and cleaned. They seized 30 bags of dry perlemoen packed into potato bags for transportation. Processing chemicals and equipment were also confiscated.

“We are now looking into the possibility that perlemoen might be on more farms in the Port Elizabeth and Uitenhage areas. (They) are ideal because they are remote, quiet and isolated, and no one ever bothers you while you are working.”

<http://www.scoop.co.nz/stories/CU0903/S00168.htm>



New paua friendly plastic fishing knife

Wednesday, 11 March 2009, 5:23 pm

Press Release: Ministry of Fisheries

11 March 2009

M Fish introduces new paua friendly plastic fishing knife

The Ministry of Fisheries has introduced a new plastic paua knife to help divers take paua from rocks without injuring them. The tool was developed in conjunction with the Paua Industry to improve the survival rates of paua which are returned to the ocean, the knife also has a built in paua measurer.

10,000 of these prototypes have been made and will be distributed by fishery officers and honorary fishery officers out on patrol.

“This new plastic paua knife and measurer is a great new tool for protecting our paua fisheries and we are delighted to be able to provide it to paua divers”, said Andrew Coleman National Manager of Fishing Compliance.

“We want to work with divers to ensure that paua is returned to the ocean in the best possible shape and is more likely to survive”

“You will be able to get one from our fishery officers and honorary fishery officers who will be out around the country providing advice and support on its use to fishers” he said.

Paua bleed profusely and their blood doesn't clot which can lead to premature death. Metal fishing knives and screwdrivers are often used to take paua from their bedding on rock; this can injure the paua, often fatally. This specially designed knife can be slid gently under the paua to break the suction without

injury. This means divers can return undersized paua without injury by placing them back on the rock where they were found if, after measuring, it is found they are too small.

“We hope that fishers use this tool to ensure we protect our precious paua stocks for future generations. We also want to remind fishers that the daily catch limit is 10 paua per person per day”

“If any member of the public see suspicious or illegal fishing activity we would appeal to them to contact our 0800 4 POACHER hotline” said Mr. Coleman.

Ends

<http://www.stuff.co.nz/nelson-mail/news/2001025/Black-market-paua-ringleader-jailed>

FOUNDED THE NELSON REGION SINCE 1841
The Nelson Mail

Black market paua ringleader jailed

The Nelson Mail

Last updated 14:38 05/03/2009

The leader of a black market paua operation that took paua from the Kaikoura coast in covert night missions and sold it to members of the Nelson Asian community has been jailed for eight months.

Phuoc Van Tang, 49, a sickness beneficiary and Vietnamese national, was sentenced in the Nelson District Court yesterday.

His partner, Vouch Lim, 40, a Cambodian national living unlawfully in New Zealand, was sentenced to three months' home detention for her part in the racket.

The Fisheries Ministry alleged that Tang and Lim made about \$4000 in a six-week period by poaching hundreds of paua many of them undersized between June 28 and August 6 last year.

Judge Denys Barry said the couple and a teenager drove to Kaikoura nine times and gathered paua, often in rough, cold conditions, before returning to Nelson.

Tang, who previously admitted one charge of obtaining a benefit by taking paua in a way that breached the Fisheries Act, and one charge of obtaining a benefit by selling paua in a way that breached the act, gathered the shellfish.

Lim, who previously admitted a charge of obtaining a benefit by knowingly selling paua in a way that breached the act, bagged the paua and took phone orders for it.

Fisheries Ministry lawyer Megan Alexinas argued that the couple should receive the same sentences and go to jail, due to the seriousness of the offending and the need to send a strong message to others.

She said black market offending was theft of a natural resource, and was stealing from New Zealanders who took the shellfish for commercial, recreational or customary purposes.

Lim's lawyer, Tony Bamford, said she played a lesser role in the offending. She faced only one charge and was "extremely remorseful".

Mr Bamford said Lim had been directed to take part in the operation by her husband, and because of her culture, she was bound to do what she was told.

Lim was applying for New Zealand residency and the offending was likely to affect her application, he said.

Tang's lawyer, Mark Dollimore, said Tang had been in New Zealand for 14 years. Before coming here, he had been in refugee camps. He had scars on his body from past assaults and suffered from memory loss.

The couple were caught last year after an undercover Fisheries Ministry investigation, dubbed Operation Raro.

Judge Barry said Tang dumped the empty paua shells in locations around Nelson, and once the sites were identified, more than 1100 shells were recovered, over 80 per cent of which were undersized.

Cash raised from the operation was used for living expenses and to possibly pay for costs in Lim's residency application.

He accepted that Tang played the larger role in the operation.

Judge Barry said the offending was serious, and represented a significant blow to attempts to preserve and develop paua stocks in the area by Maori and commercial fishers. Te Runanga o Kaikoura and The Paua 3 Industry Association had spent thousands of dollars reseeding the coastline with juvenile paua.

The judge said iwi were concerned about the impact the poaching would have on those initiatives, and were worried that kaumatua would no longer be able to gather paua easily.

A further nine members of the Nelson Asian community have been convicted and fined between \$600 and \$1800 each for buying the paua.

<http://www.capeargus.co.za/?fArticleId=4867016>

Cape Argus

Minister unscrupulous and callous - perlemoen fishers

March 01, 2009 *Edition 1*

CRAIG McKUNE

perlemoen fishers have lashed out at Minister of Environmental Affairs and Tourism Marthinus van Schalkwyk, accusing him of "unscrupulously and callously" disregarding fishing communities.

Over 150 fishermen marched through Kleinmond yesterday, protesting the minister's blanket ban on perlemoen (also known as abalone) harvesting.

The ban took effect in February last year, costing over 300 small-scale perlemoen quota holders their livelihoods.

But the Department of Environmental Affairs and Tourism said a reversal of the suspension was not an option for now.

"There is no doubt that the abalone resource has declined to such an extent that it is not possible to sustain a commercial activity," said department spokeswoman Carol Moses.

However, Jerome Figaji of the SA Abalone Industry Association was adamant that the science used by Marine and Coastal Management was misleading.

"There is enough abalone," he told the gathered crowd.

Kim Prochazka, director of Resources Research at Marine and Coastal Management, said there were perlemoen populations on the South African coast which were "in a good enough state that they could become healthy again over time", but these needed to be conserved and were the focus of anti-poaching efforts. "The bottom line is that we have to get a hold on the poaching."

She said for a perlemoen population to survive over time, it needs to be above a certain size with enough individuals living closely together.

As she explained, the animals spend their lives attached to rocks, and to reproduce they release large amounts of sperm and eggs into the surrounding water, leaving fertilisation to chance.

If a population is not dense or big enough, fertilisation will be inefficient and it will not survive.

Van Schalkwyk has made it clear since 2004 that a complete ban would be inevitable without a drastic decline in poaching, said Moses.

Although the department discussed several alternative work opportunities with quota holders, such as boat-based whale watching, white shark cage diving, marine aquaculture and fishing within harbours, perlemoen fishermen showed little interest due to the high start-up costs.

And to address short-term needs, the department presented 100 jobs - offering R60 a day - through its Working for the Coast programme. These were ignored and SA Abalone Industry Association spokesman Scott Russell dismissed the offer as "insulting".

In a memorandum presented to the department yesterday, the association said Van Schalkwyk had not investigated the socio-economic impact of the ban, implemented a promised social plan or addressed poaching.

They pointed to research showing that over two million kilograms of poached South African perlemoen reached eastern countries in 2007.

"This is 160% more than what our industry harvested in the same year," they said.

"This level of poaching is threatening the resource from which we earn our livelihood and is bringing lawlessness and drugs, which are destroying our communities."

They also accused the department of "inappropriately" profiting from the sale of confiscated perlemoen.

"We are suffering," said one quota holder, who admitted to poaching. "We don't want to steal from the ocean, but we have no choice."

Said another: "If they give us quotas, we're never going to poach again."

But Figaji condemned such comments and poaching in general. He said it was critical for negotiations with the government that quota holders kept their hands clean.

<http://www.voxy.co.nz/national/paua-poacher-gets-community-service-fine-and-forfeits-dive-gear/5/9663>



Paua Poacher Gets Community Service, Fine And Forfeits Dive Gear

Friday, 27 February, 2009 - 12:09

27 FEB 2009 - Brett Mathew Riki, 38, of Rawene was convicted in Kaikohe District Court on Thursday, 19 February 2009, for possessing 41 excess and undersize paua.

On the charge of possessing excess paua, he was convicted and sentenced to 140 hours community service and \$150.00 solicitor's fees, and his dive gear ordered forfeit to the Crown. On the charge of possessing undersize paua, he was fined \$250.00.

The charges related to 11 November 2008 where Mr Riki was inspected by fishery officers on Waimamaku beach in the Hokianga and found to have 41 paua, all of which were undersize.

"The Hokianga is an established paua fishery, but if it continues to come under sustained pressure from local divers taking excess and undersize paua it will not remain sustainable for future generations" said Darren Edwards District Compliance Manager. "It is extremely disappointing to see continued offending in this area".

The public are reminded that any suspicious activity should be reported to the Ministry of Fisheries on 0800 4 POACHER (0800 476224).

WESTERN FISHERIES

WA'S JOURNAL OF FISHING AND THE AQUATIC ENVIRONMENT

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seaweed

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MARCH 2009

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WINNING THE WAR AGAINST FISH DISEASE

In the first of two articles about fish health, advanced technologies for detecting disease that could infect entire fish populations were explained. In this, the second of the articles, *Steve Ireland* explores the parallels between the methods used to keep humans and fish alive and well, and stop the spread of disease.

Major developments in medicine and hygiene have meant that humans are better equipped than ever before to fight diseases of all kinds. However, the size and density of the world's population have increased in step, meaning that we live much closer together than ever before, so disease has much less of a distance to 'jump' from one community or person to another.

Humans however are very lucky in comparison to fish these days, when it comes to disease. Whilst we may be crammed together in a skyscraper tower block, fish are often confined to a small water body under threat from human urbanisation, or to an aquaculture pond or tank.

What this means for both humans and fish is that when a disease occurs, it is vital that it is detected and identified as quickly as possible, in order to try to stop it spreading – which was the major topic of my previous article on fish health (see *Western Fisheries*, December 2008, 'Stopping fish from getting sick'). What is equally important is if disease does occur, to carry out procedures that stop its spread – the subject of this article.

Over the course of many centuries, humans became aware of the importance

of what we call hygiene – of cleanliness and sanitation – when it came to keeping us healthy. Although this discovery is often connected with the Victorian age and the nursing practices adopted by Florence Nightingale, the basic idea goes back to the ancient Greeks.

The old expression 'cleanliness is next to godliness' is often used as an illustration of the relative importance of hygiene in our lives, but those who use it often don't realise that the Greeks regarded the practice of cleanliness and sanitation as so important that they actually had a goddess for it. Funnily enough, her name was Hygieia – the origin of the word 'hygiene'.

"Disease is often carried by dirt because virus particles will adhere to larger particles, such as those in dirt," explains Dr Brian Jones, head of the Department of Fisheries' Fish Health Unit. "In this case, getting rid of dirt is the most important thing to do, while the next is to use soap and water to clean surfaces and equipment. If you can let them dry naturally, in the wind and the sun, then this will also help.

"The key to this process is that you are not trying to get rid of every last particle, but to reduce the infected dose."

When it comes to disease, the big worry for several fisheries management agencies around Australia right now – including the Department of Fisheries, Western Australia – is keeping out abalone viral ganglioneuritis (AVG). This is a herpes-like virus that causes 'ganglioneuritis' – inflammation of the tissues in the nervous system – leading to paralysis of the abalone's 'foot' that it uses to cling onto rocks, resulting in weakness and eventual death.

The AVG virus is thought to have escaped from an abalone farm near Port Fairy in Victoria in mid-2006. By early 2007 it had apparently spread over a 90 kilometre section of coastline, infecting reefs in the western zone of Victoria's abalone fishery. Prior to their infection, these reefs had been producing about 65 per cent of the western zone's (long-term) annual production of around 160 tonnes¹. In September 2008, AVG was found in a processing facility in Tasmania. The source of the infection is under investigation.

"The major concern now is AVG – and there is concern about people bringing a disease agent for it into Western Australia. In the case of AVG, it would appear that the virus is carried on the guts and mucus

¹ 'A Review of the Outbreak of a Herpes-like Virus in the Abalone Stocks of Western Zone Victoria and Lessons to be Learnt'. By Dr Jeremy Prince, Biospherics P/L, March 2007

of abalone – and it seems to be associated with diving and rock lobster potting,” Dr Jones explains.

“What could happen is that AVG is spread by traces of infected mucus on someone’s wet diving gear or washed into the bilges of their boat. The person then drives their boat and diving gear across the Nullabor without thoroughly washing them and uses them in the ocean in Western Australia – and suddenly we are in big trouble.”

If it could be said that there is a good thing about AVG, it is that the virus only survives for a relatively short time in the water column and is easily killed by disinfection. If fishing and diving gear (from wet suits to boats) that has been used in an area where AVG is present is simply washed in disinfectant, then the virus is likely to be killed.

Dr Jones says AVG has actually crossed the Nullabor once – in a single abalone – but the potential source was found and eliminated. “Several months ago, an abalone carrying the virus was found in a Chinese restaurant – this abalone had been imported from the eastern states.”

However, he considers that the restaurant trade is a low risk when it comes to spreading AVG, as any infected abalone are contained in environments that are not in contact with Western Australia’s estuaries and seas. In contrast, the risk from dive suits and boats carrying infected mucus is high.

The key to containing viruses that can be spread by poor hygiene such as AVG is to use education and simple cleaning stations. In recent years, the Waithanui River in the south island of New Zealand has been clogged by the algae *Didymosphenia*, causing large numbers of fish to stop spawning. Like AVG, *Didymosphenia* can be killed by disinfection – and New Zealand’s recreational fishers have been highly successful in fighting it, using the tools of education and cleanliness.

“If you go to any hotel or motel in the areas around these rivers, there is information available about the algae, plus a disinfection station alongside a fish cleaning table. There are signs on all fishing trails in the area and on jetties,” says Dr Jones.

“The whole campaign has been driven by recreational fishers, which is great.”

Didymosphenia algae can be spread by a single drop of water and forms huge

What is Abalone Viral Ganglioneuritis?

Abalone Viral Ganglioneuritis is a viral disease affecting the nervous system of abalone resulting in weakness and death.

The outbreak in abalone aquaculture farms and wild abalone populations in Victorian waters is the first reported case of this disease in Australia, however a similar disease has caused mortalities in abalone overseas.

Abalone Viral Ganglioneuritis only affects abalone species. There are no known or likely impacts for human health.

This disease could have a severe impact on abalone stocks if it spreads to Western Australia.

What are the signs?

- You may see patches of weak and/or dead abalone.
- In some abalone you may see:
 - swelling of the mouth part; and/or
 - edges of the foot curling inwards, leading to exposure of clean shiny shell.

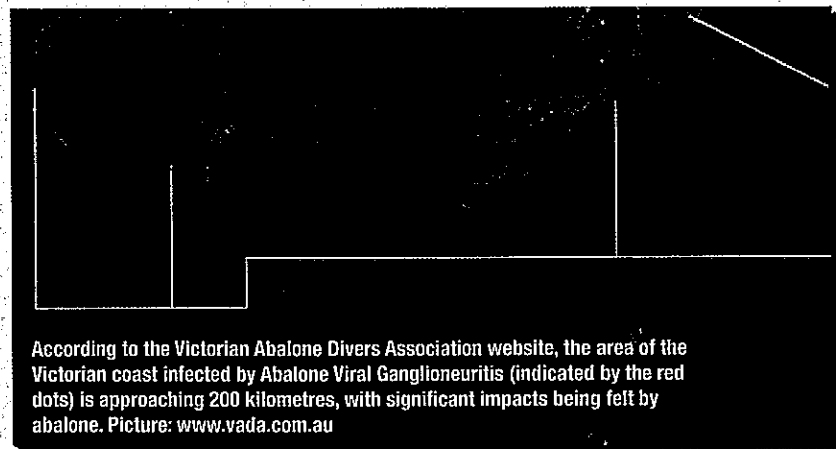


Healthy greenlip abalone



Greenlip abalone showing symptoms of the disease

Above images provided courtesy of the Department of Primary Industries, Victoria.



According to the Victorian Abalone Divers Association website, the area of the Victorian coast infected by Abalone Viral Ganglioneuritis (indicated by the red dots) is approaching 200 kilometres, with significant impacts being felt by abalone. Picture: www.vada.com.au

mats, which cover the surface of rivers. The publicity for the campaign to stop the algae, and all the associated signage and literature, uses the catchy slogan ‘Check, Clean, Dry’, to reinforce the three crucial steps of disinfection.

In this time of expensive fuel and harder-to-find schools of fish, commercial fishers are often fishing less than they used to, while recreational fishers are still going fishing as keenly as ever, as this is now viewed – thanks to community education – as something to do for fun rather than as a source of protein. Whilst this is a very positive change in attitude, it does mean that recreational fishers often have more

contact with the aquatic environment than their commercial brethren – with the increased possibility that it is the recreational fishers who may spread water-borne disease.

“The Department of Fisheries, as with other state fisheries agencies, is going to have to spend more time on educating recreational fishers about biosecurity and how they can help prevent the spread of exotic bacteria and viruses,” Dr Jones remarks.

Back in July 2007, the Commonwealth Government agency Biosecurity Australia announced its decision to restrict the

required to move it to a disease is 'a bit of a lottery'.

One of the crucial aspects of testing for disease in fish – and humans – is to determine whether a virus living within a cell is in a carrier state (present but dormant) or actually causing disease. Once a virus replicates and starts to produce more copies of it, then disease occurs and spreads.

Once a herpes-type virus is present in the body of a human or a fish, it stays there for the whole life of the host. It is only when the human or fish is stressed – say, by poor environmental conditions – that the virus may actually show its presence and turn into disease.

When it comes to 'fish kills' investigated by the Department of Fisheries' Fish Health Unit, only about two per cent are the direct result of disease. However, this statistic gives a far from complete picture about the importance of disease – and is more a sign of being successful – and lucky – in controlling those diseases that could turn into an epidemic.

"The fish kill program that we carry out is an 'early warning' type. If there is an exotic disease incursion, we need to pick it up early, contain and eradicate it – this is why the Fish Health Unit responds to *all* fish kills. We hope we never find an exotic incursion, but if we do, then all this work will be worthwhile," Dr Jones says.

The study of factors affecting the health and illness of populations – of people, animals or fish – is known as 'epidemiology'. This is the foundation of modern preventative medicine, where a major aim is to catch any potential disease before it becomes an epidemic. Sometimes an organism that does not actually cause the disease itself can pass on a disease, transmitting the infection by conveying pathogens from one host to another – what in epidemiology is termed a 'vector'.

The classic example of a vector is the anopheles mosquito, which is a vector for the disease malaria. What happens with malaria is that when the mosquito bites humans, it passes on the malarial parasite *Plasmodium* to us. *Plasmodium* is harmless to its host, the mosquito, but causes malaria in humans (also a host).

"Infectious diseases can be spread in a number of ways – they have a direct lifecycle or use an alternative host or vector like a mosquito. There is some

Another simple ABC of terms used in fish and human health

Antibodies – Proteins that are produced by the body's immune system that are used to identify and neutralise foreign objects. Each antibody binds to a specific antigen – like a lock and a key.

Antigens – Proteins that are produced by a bacteria or virus that is recognised by an animal's immune system as being 'foreign', resulting in the creation of antibodies that specifically target those particular proteins.

Asymptomatic – The condition of having a disease but with no visible symptoms of the disease actually being present.

Bacteria – Single-celled organisms that are self-sufficient.

Carrier – A creature that carries an infectious, potentially disease-causing organism in its cells, but shows no actual (clinical) signs of the disease.

Disease – An unhealthy condition caused by infection, diet or the conditions of life, or is inherited.

Epidemiology – The factors affecting the health and illness of populations.

Histopathology – From the Greek *histos* (tissue) and *pathos* (suffering). This refers to the examination of tissue using a microscope in order to study disease. Specifically, in clinical medicine, histopathology refers to the examination of a surgical specimen by a pathologist, after the specimen has been processed and histological sections have been placed onto glass slides. According to the *Wikipedia*, "this is the most important tool of the anatomical pathologist in routine clinical diagnosis of cancer and other diseases".

Pathogen – From the Greek *pathos* (suffering). An infectious biological agent or 'germ' that causes disease to the host. Pathogens include bacteria, viruses and protozoa – for example, the human immunodeficiency virus (HIV) causes the AIDS disease, while the bacterium *Yersinia pestis* is thought to have caused the 'Black Plague'.

Vaccination – The use or administration of an antigen – the vaccine – to produce immunity to a disease. Vaccines can prevent or ease the effects of infection by a pathogen.

Vector – An organism that does not cause disease itself, but which transmits infection by conveying pathogens from one host to the other.

Viral disease – A disease caused by a virus.

Virus – An infectious particle that requires a host cell to survive.

suggestion that copepods and plankton can be a vector for disease in fish. That being said, most diseases in the aquatic environment are spread because of their lifecycle," says Dr Jones.

"The pilchard herpes virus spreads from sick pilchards to healthy pilchards through a simple mechanism. The survivors of a dying school will join an uninfected school and then the dying fish shed cells into the water and infect the healthy ones. The disease model is exactly the same as for the 'Black Death' – survivors of a village fled to other villages and then infected their populations."

In 1998/99, a herpes-related virus appeared in schools of pilchards off the coast of southern Australia, resulting in the death of a major part of the stocks of this fish. Such was the magnitude of the deaths that there were serious concerns among Department of Fisheries' research scientists about the survival of pilchard stocks in Western Australia.

"There are fish epidemiologists now. As aquaculture increases and the number of fish health professionals grow, there is more call for people who specialise," says Dr Jones.

"The principles of fish epidemiology are exactly the same as human epidemiology. There is the peculiar twist that a fish epidemiologist would look at water-borne transport of viruses and disease instead of air-borne transport, but otherwise everything else is pretty much the same."

Dr Jones says that when investigating the spread of the pilchard herpes virus, the models used were the spread of the Black Death in humans and the spread of rabies in foxes. This is because fish, humans and foxes are all creatures that live together in groups – "in a sense, humans school too," he adds.

One of the major ways that humans have long fought disease is by vaccination – which is the mild exposure to the disease through the administration of a vaccine,

in order to produce immunity to the disease. Although it didn't become well known until the 18th century, the process of vaccination is believed to go back as far as 200 BC, where it was used in China or India to treat smallpox. Vaccination is considered to be the most effective – and cost-effective – method of preventing infectious diseases.

The word vaccination is apparently derived from the latin word for cow, as the first vaccine was allegedly derived from a virus that affected cows². This process is now being applied to fish.

"In aquaculture carried out overseas, fish are routinely vaccinated, particularly salmonids. Most cultured European salmon will be vaccinated against at least one disease," Dr Jones remarks.

The type of vaccination carried out is often of the bath type (where fish are quickly immersed in a vaccine), but injection also can be used (where fish swim down a race and are vaccinated by a team of people as they go past).

Whilst vaccination is effective in scalefish, when it comes to shellfish or crustaceans it unfortunately fails – owing to the fact that these invertebrates do not have the same

immunity mechanism that vertebrates such as humans and fish with scales have.

That being said, Dr Jones says there is increasing evidence that invertebrates may have some form of acquired immunity that is totally different to anything biologists have seen before. As a result, when the mechanism of this immunity can be determined, it may be possible to develop a vaccine for them.

Whilst Australia may be relatively free of many of the major fish diseases that occur overseas, Dr Jones says that the popular notion that the country is relatively free of fish diseases generally is actually a myth – and one that can be quite dangerous.

"Most fish species grown in Australia are unique – and have their own unique parasite fauna. What this means is if you are investigating disease relating to salmonids, plenty of research has already been done on these species in Europe and North America, which can help you.

"However, if you are working on black bream for example – which is an endemic Australian species – no one in the world apart from in this country is likely to have worked on this species before, or has any reason to care about

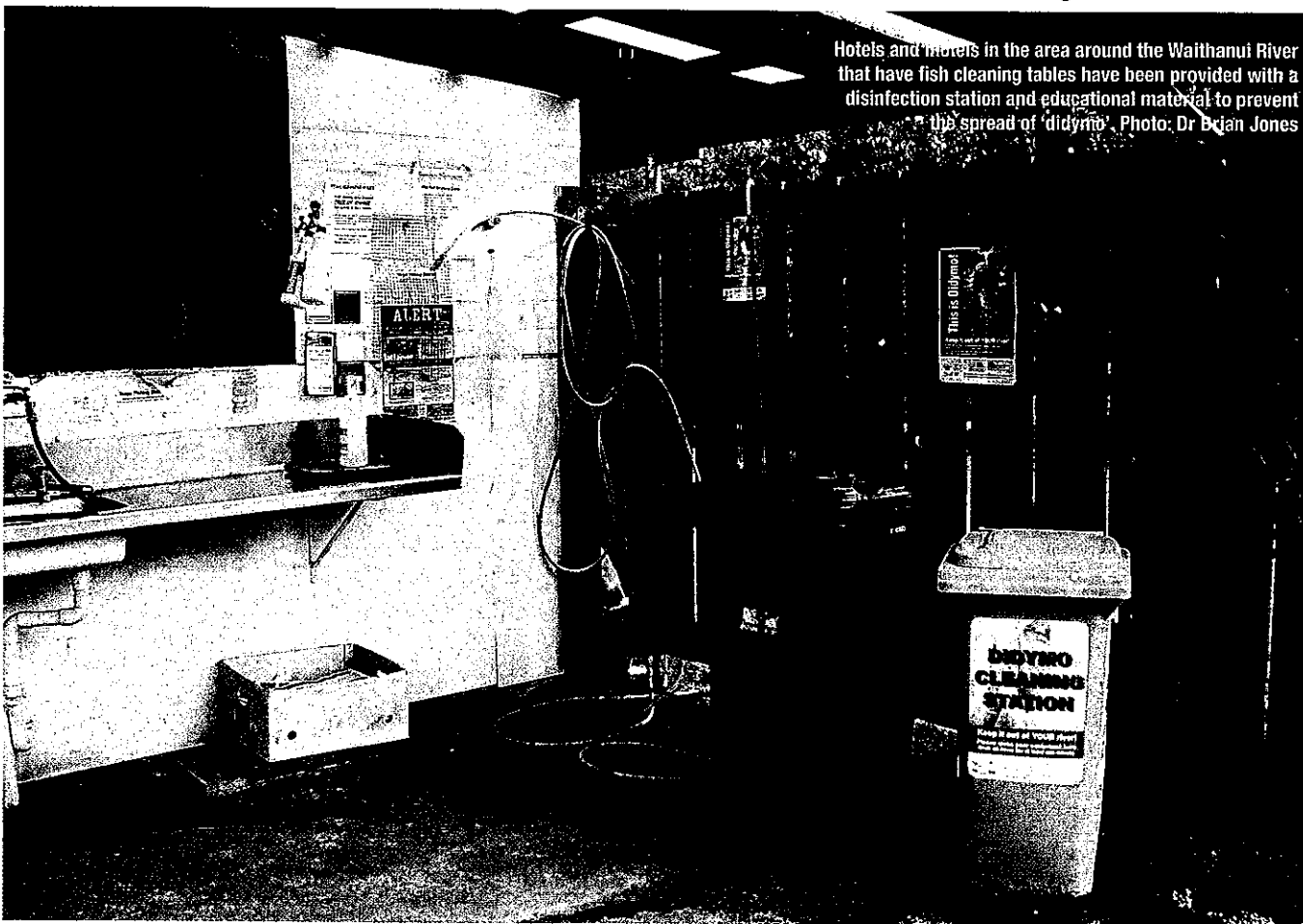
doing this kind of work. We have to research their diseases ourselves."

Whilst this situation can make work tough for Australian fisheries management agencies and their fish health staff, Dr Jones says it also makes it very rewarding.

"Australian parasite fauna is unique and as fascinating in their own way as koalas and platypuses. They have evolved in isolation from the rest of the world, in animals that have evolved in isolation."

As many will know, when the first platypus specimen was sent to England in around 1800 for identification by the country's most expert biologists, the creature's appearance was thought so strange that it was dismissed as a hoax. After all, how could a creature with a muzzle like a duck's bill and with a strange flat tail, like a beaver, be real?

As an illustration of the uniqueness of Australian fish parasites, Dr Jones describes the way a parasitic copepod called *Spyrion* invades first the skin and then the liver of a fish. If you thought the way the creature in the *Alien* film series took over their human hosts was scary, then you really don't want to know about *Spyrion*. On the other hand, it sure isn't boring... ■



Hotels and motels in the area around the Waithanui River that have fish cleaning tables have been provided with a disinfection station and educational material to prevent the spread of 'didymo'. Photo: Dr Brian Jones

² Vaccination, from Wikipedia, the free encyclopedia