



<http://www.americanchronicle.com/articles/61357>

## Farmed Salmon: Sea Lice and Virus

Patricia Sullivan



Patricia Sullivan

May 09, 2008

In April 2008, the Coastal Alliance for Aquaculture Reform (CAAR) welcomed a decision by the British Columbian government to institute an indefinite moratorium on open net-cage salmon farming in northern British Columbia. The provincial government is recognizing the need to protect marine ecosystems and wild salmon stocks from the impacts of current salmon farming practices, a sign of change.

CAAR member group Living Oceans Society's (LOS) Campaign Director Catherine Stewart applauds the government for listening to the citizens of the north and granting a reprieve to the wild salmon and waters of the North Coast. She emphasized the

imperative to move salmon farms in the South and Central Coast to closed containment before the wild pink and chum salmon fall into localized extinctions.

"Along with chemical antifoulants used on nets, waste feed and feces contaminating the benthos – including feed laced with antibiotics, colourants and paracitocides, marine mammal deaths – from 'predator control' shootings and entanglement/drowning," Stewart explained, the biggest problem with open net cage fish farms is sea lice which are killing B.C.'s out-migrating juvenile salmon. Stewart detailed the problem: "Sea lice occur naturally on mature wild adult salmon but die when the salmon move into fresh water to spawn in the fall. In spring, when tiny juvenile salmon entered salt water they would not encounter lice until they were much larger and had scales to protect them. But now, the multitude of salmon farms located near the rivers act as a breeding

ground for lice over the winter and out-migrating wild juveniles no larger than a AAA battery are subject to lethal lice

---

If you have an interesting **Photo, Story, Issue or Report** that you would like included in Aquaculture Stories send it to: [aquaculture@cbgconsultants.com.au](mailto:aquaculture@cbgconsultants.com.au) or Fax (03) 8660 2755

loads when they enter salt water." Stewart cited a piece in the journal Science (Krkosek et al, Nov, 2007) that predicts at the present rate of death of juvenile pink salmon, localized extinctions can be expected within two lifecycles, or four years.

If the transition to closed containment salmon aquaculture projects could be funded and developed, the benefits for British Columbians might be many, including the protection of the wild salmon and the environment; reduction in conflict within coastal

communities; respecting of First Nations rights and title and supporting coastal economic development.

LOS requests letters be written to B.C. Premier Gordon Campbell and urge him to invest in the development of closed containment technology. The \$10 million Closed System Aquaculture Innovation and Development (CSAID) Fund would provide matching funds to entrepreneurs to build and operate closed containment salmon aquaculture projects, and establish transparent environmental and economic monitoring and analysis of these projects and assist in marketing viable new technologies at home and abroad (LOS).

Ironically, a virus called infectious salmon anemia, or I.S.A., is killing millions of Chilean farmed salmon destined for export to Japan, Europe and the United States (Barrionuevo, p.1). According to Stewart, the ISA outbreak has led to serious problems for Norwegian-based Marine Harvest, one of the world's largest aquaculture

companies. The company's 4th quarter profit in 2007 was down \$147 million from the previous year, largely due to the "biological situation" on their Chilean farms. Over one thousand Marine Harvest workers in Chile have recently lost their jobs and

several farms have had to be culled of diseased fish in an attempt to bring the outbreak under control. Chilean non-governmental organizations are highly critical of the rapid expansion of the industry, the lack of regulatory control and enforcement and the density of farm siting along the coast, especially in Chile's Region X. Escapes of farmed fish are also a significant problem – while there are no wild salmon

indigenous to Chile there is now a booming salmon sports fishing industry targeting escaped farm salmon.

These problems are not being ignored; according to information on the World Wildlife Fund web site, impacts of salmon aquaculture were discussed as the top agenda item at the Salmon Aquaculture Dialogue Meeting held in Barcelona in February 2008. More

information is available at the WWF website link <http://worldwildlife.org/cci/dialogues/salmon.cfm>

#### References:

Barrionuevo, A. (March 27, 2008). Salmon Virus Indicts Chile's Fishing Methods. The New York Times. Retrieved on March 27, 2008 from <http://www.nytimes.com/2008/03/27/world/americas/27salmon.html?ex=1364270400&en=16d37d6a1ec90d8d&ei=5088&partner=rssnyt&emc=rss>

Living Oceans Society main page. Retrieved on March 28, 2008 from <http://www.livingoceans.org/> Salmon Aquaculture Dialogue (2008). World Wildlife Fund.

Retrieved on March 31, 2008 from <http://worldwildlife.org/cci/dialogues/salmon.cfm>

<http://www.sbpost.ie/post/pages/p/story.aspx-qqqt=IRELAND-qqqm=news-qqqid=32784-qqqx=1.asp>

## Shellfish company goes into liquidation

11 May 2008 By Ian Kehoe

A Cork firm that bred expensive shellfish has gone into liquidation, with debts of more than €2 million, after failing to secure new investment.

Feirm Eisc Chleire Teoranta, which produced abalone, a delicacy in Asia, has been in examinership for the past two months.

However, a rescue package could not be agreed, and the High Court has appointed Kieran Wallace, a partner at KPMG, as liquidator to the firm. Wallace will seek a buyer for the firm's assets, including its abalone, land and its aquaculture licences.

The company, established in the early 1990s on Cape Clear island off west Cork, ran into financial difficulties after an aborted stock market flotation in London.

Feirm Eisc initially farmed turbot, halibut and rag worms, before starting a pilot scheme in 2002 to farm abalone, which sells for upwards of €100 a kilogramme.

In 2004, the company agreed a deal with Neptune Ocean Resources and its parent, Asia Abalone. Under the deal, Neptune took a 90 per cent stake in Feirm Eisc, with the remaining 10 per cent controlled by the Cape Clear Cooperative and Udaras na Gaeltachta.

In addition to an initial investment of €440,000, Neptune agreed to pay for the farm's infrastructure and operating costs. Neptune planned to finance the deal with a flotation on the Alternative Investment Market in London, but the listing never took place.

<http://blog.seattlepi.nwsourc.com/environment/archives/138553.asp>

## Myanmar a victim of aquaculture, agriculture?



Tiger prawns: delicious, cheap and -- for the people of Myanmar -- deadly

Photo/[pdphoto.org](http://pdphoto.org)

[Katrina](#) squared. Maybe cubed -- maybe worse.

That's about what we're seeing in the misery spawned by the cyclone that hit Myanmar. And [today we learn](#) that the damage was exacerbated by the removal of mangrove forests in favor of shrimp aquaculture and rice

paddies. Once upon a time, those shoreside buffering areas provided a natural barrier to the cyclones that came barreling up the [Bay of Bengal](#).

Without the mangroves, [storm surge](#) -- the biggest killer in most hurricanes -- was able to drive a wall of water 25 feet high miles inland.

Here's what Jeff McNeely, chief scientist for the [International Union for Conservation of Nature](#), had to say:

If you look at the path of the (cyclone) that hit Myanmar, it hit exactly where it was going to do the most damage, and it's doing the most damage because much of the protective vegetation was cleared. It's an expensive lesson, but it has been one taught repeatedly. You just wonder why governments don't get on this.

[Cyclones](#), btw, are just [Indian Ocean](#) hurricanes. This one, named Nargis, comes just after the pseudo-local [Mangrove Action Project](#) warned about the "[high cost of cheap shrimp](#)" -- including those "tiger prawns" grown where Asian mangroves once stood.

It's a cautionary tale as the United States seems ready to forge ahead on offshore aquaculture. Rep. Nick Rahall, the Democrat from West Virginia who heads the House Natural Resources Committee, today highlighted [this Government Accountability Office report](#) in cautioning that this country [should take a go-slow approach](#) on offshore aquaculture:

Any offshore aquaculture development must be done in a manner that does not jeopardize the health of our oceans or the viability of the fishing industry.

Posted by [Robert McClure](#) **Robert McClure** at May 9, 2008 12:16 a.m.

Categories: [Aquaculture](#), [Fisheries](#), [Food/environment](#), [Habitat conservation](#), [Ocean health](#)

[http://resourcescommittee.house.gov/index.php?option=com\\_content&task=view&id=379&Itemid=99999999](http://resourcescommittee.house.gov/index.php?option=com_content&task=view&id=379&Itemid=99999999)

## Rahall Urges Caution Against Hasty Development of Offshore Aquaculture

May 9, 2008

**CONTACT: Allyson Groff or Blake Androff, 202-226-9019**

**Washington, D.C.** - House Natural Resources Committee Chairman Nick J. Rahall (D-WV), citing a new report released today by the Government Accountability Office (GAO) on U.S. aquaculture, cautioned that the report's findings illustrate that significant barriers still exist in the development of an environmentally safe offshore aquaculture industry.

Concerned by increased industry and stakeholder interest in expanding the U.S. aquaculture industry into offshore waters where no clear regulatory framework exists, Chairman Rahall asked the GAO in February 2007 to assess a variety of policy and regulatory questions to ensure that such development occurs in an environmentally and economically sustainable manner. While there are currently no aquaculture projects in U.S. federal waters, successful onshore farming operations do exist.

The GAO report underscores the need to establish a clear regulatory system to oversee the potential expansion of the aquaculture industry into offshore waters.

In April 2007, Rahall introduced the ***National Offshore Aquaculture Act of 2007 (H.R. 2010)*** at the request of, and as a courtesy to, the Administration. The legislation would authorize the Secretary of Commerce to establish and implement a regulatory system for offshore aquaculture in the United States Exclusive Economic Zone.

"The Administration's proposed bill was a good first step, but it does not go far enough to ensure adequate protection for the marine environment. This new report makes abundantly clear what I have long believed - any offshore aquaculture development must be done in a manner that does not jeopardize the health of our oceans or the viability of the fishing industry," Rahall said.

The GAO report identifies several important safeguards that need to be carefully considered to help regulate the offshore aquaculture industry, including:

- The appointment of the National Oceanic and Atmospheric Administration (NOAA) as the lead federal agency to regulate and permit any offshore aquaculture facilities.
- The clear delineation of the roles and responsibilities of other federal agencies and states in the administration of an offshore aquaculture program to minimize confusion.
- The establishment of a permitting and site selection process that clearly identifies the terms and conditions for offshore aquaculture operations.
- The implementation of a regulatory process to review, monitor, and mitigate the potential environmental impacts of offshore aquaculture facilities.
- Additional research on (1) developing fish feeds that do not rely heavily on harvesting wild fish; (2) developing best management practices; (3) exploring how escaped offshore aquaculture-raised fish might impact wild fish populations; and (4) developing strategies to breed and raise fish while effectively managing possible disease.

The report, "Multiple Administrative and Environmental Issues Need to be Addressed in Establishing a U.S. Regulatory Framework", is available on GAO's Web site at: <http://www.gao.gov/new.items/d08594.pdf>.

<http://www.thefishsite.com/fishnews/6877/new-aquaculture-resource-launched-at-manaia>

Friday, May 09, 2008



## **New aquaculture resource launched at Manaia**

**NEW ZEALAND - Māori Affairs Minister Parekura Horomia launched a new aquaculture teaching resource for total immersion Māori schools with Coromandel's Manaia School today..**

The fact-sheet series Te Ahumoana Ā-mahi or Aquaculture in Action offer students an opportunity to learn more about aquaculture, in particular marine farming, in New Zealand. The lesson plans were developed for Years 7 and 8. The plans were created to assist teachers in helping students investigate and learn about

aquaculture, as well as its impact on our economy and our environment.

“These fact-sheets introduce aquaculture to our tamariki and helps them to build an understanding of its role and impacts in the community, environment and economy”, Minister Horomia says. “They will learn about science and technology in their own home-setting”.

“Māori are already extensively involved in the aquaculture industry through successful Māori-owned companies, such as those in the Marlborough Sounds and the Coromandel region”.

“The participation of Māori in aquaculture figures prominently in both the industry and the government strategies for aquaculture development Iwi involvement will be critical in achieving the government vision of a NZ\$1 billion industry by 2025.

*TheFishSite News Desk*

[http://www.bangkokpost.com/Outlook/08May2008\\_out001.php](http://www.bangkokpost.com/Outlook/08May2008_out001.php)

outlook

[www.bangkokpost.com](http://www.bangkokpost.com)

## A rising tide

*Act now on global warming before it's too late for Thailand's coastline and coral reefs*

Thursday May 08, 2008

**STORY BY NORMITA THONGTHAM, PHOTOS BY DR NALINEE THONGTHAM**



Sediment is killing this coral reef.

Thailand's coral reefs, which have attracted tourists since the 1960s, could be lost in 50 years if carbon dioxide (CO<sub>2</sub>) emissions continue at current rates over the next eight to 10 years.

The warning came from Dr Marea Hatzios, senior coastal and marine specialist at the World Bank, who was one of the scientists who warned of the impact of climate change on coral reefs around the world at the UN Climate Change Conference in Bali, Indonesia, last December.

"The current level of CO<sub>2</sub> equivalent accumulation in the atmosphere is 430ppm [parts per million]," she said. "At current rates, an accumulation level of 450ppm is expected to be reached by 2015, and scientific evidence suggests that once CO<sub>2</sub> accumulation in the atmosphere reaches 550ppm, coral reef ecosystems will be extensively and irreversibly damaged," and reef-building corals will largely disappear.

The Washington, DC-based expert on coastal zone management recently spoke at a seminar organised by the World Bank at its Bangkok office in Siam Tower, Rama 1 Road, recently. The event attracted a full house comprising mostly of marine biologists, researchers and officials involved in coastal management and protection.

Although coral reefs occupy only 0.2 per cent, or 284,300km<sup>2</sup> - a little more than half the size of Thailand - of the ocean floor, they contain the most diverse ecosystems on the planet, she said. They provide a habitat for many species of fish, crustaceans and other marine life, and serve as buffer against strong waves that erode coastlines during storms.



Coastal zone management expert Dr Marea Hatziolos warns that because of its long coastline, Thailand is extremely vulnerable to sea level rise due to climate change.

The economic value of coral reefs, as a source of food for at least 2.6 billion people in developing countries and as a source of livelihood for some 150 million people involved in fishing and related industries, not to mention their role in tourism and coastal protection, could not be put in monetary terms, Hatziolos said.

"It would be in billions of dollars," she said. "Reef benefits to coastal protection alone are estimated to be \$5 billion."

Seventy-five per cent of the world's coral reefs are found in the Indo-Pacific region; however, studies found that coral cover in the region is declining at the rate of one to two per cent annually, due to destructive fishing, tourism, sedimentation caused by coastal development, eutrophication due to untreated wastewater run-off, dredging and climate change.

Disease has also taken its toll on coral reefs. Scientists are now carrying out research to pinpoint the cause of the disease, Hatziolos said, but there is strong evidence that it is linked with pollution from aquaculture, exacerbated by increases in water temperature due to climate change.

Climate change is manifested by a rapid rise in temperatures all over the world. Only 30 years ago scientists were warning that global warming would change precipitation patterns significantly, with heavy rainfall in some areas while others would be very dry. Extreme weather conditions such as storms, floods, droughts and heatwaves would become more intense and more frequent, and sea levels would rise, the scientists warned.



Thailand's coral reefs are threatened by global warming. Rise in water temperatures by as little as 1C above the average temperature of the warmest month of the year could trigger coral bleaching.



One of many ongoing coastal developments that mar Phuket's hillsides and discharge sediment that smothers coral reefs.

These changes can already be observed, according to the report *East Asia Environment Monitor 2007: Adapting to Climate Change*, published by the World Bank.

"In the last few years there have been widespread changes in extreme temperatures, droughts have become longer and more intense, the frequency of heavy precipitation has increased over most land areas, and arctic sea ice has shrunk by 2.7 per cent per decade, resulting in a rise in sea level that is now beginning to submerge small island countries like Kiribati and Nauru in the South Pacific," the report said.

Thailand has 2,880km of coastline along 136 districts in 23 provinces, thus it is extremely vulnerable to sea level rises due to climate change. A one metre rise will not only sink Bangkok and low-lying areas, resulting in destruction of infrastructure, loss of beaches and irreversible damage to coastal ecosystems like mangrove forests and coral reefs, but also cause land subsidence and coastal erosion.

"A one metre rise means a 3km intrusion of saltwater into productive land areas and drinking water supply, leading to a large-scale human migration," Hatzilos warned.

Her warning seems far-fetched, but according to a study by the Department of Marine and Coastal Resources (DMCR), coastal villagers in Ban Khun Samutchin in Samut Prakan have moved their houses eight to 11 times to escape land erosion that has eaten up 11,000 rai of their land over the past 20 years.

Within just a few years, Wat Khun Samutrawas, also in Samut Prakan, has lost 70 rai of land to coastal erosion and rising sea levels, and now only four rai remains before the temple is submerged for good.

According to the DMCR report, Thailand Environment Monitor 2006, 80 per cent of global coastlines are facing erosion at various rates. In Thailand, coastal erosion has been observed for 485km in the Gulf of Thailand from Trat to Narathiwat, and 114km along the Andaman coastline.

The causes are mostly man-made, such as the clearing of mangrove forests for wood or aquaculture; groundwater drainage and land subsidence; sand mining; construction of structures such as dams, ports and harbours that obstruct the natural patterns of waves, erosion and sedimentation; and construction of industrial estates along the coastline.

Degradation of coral reefs that act as natural tidal barriers and buffers is also cited as another cause of coastal erosion.

Erosion has become quite severe in the last decade, the report states, with the Upper Gulf of Thailand experiencing erosion at a faster rate than was originally anticipated. A simulation indicates that without intervention, in 20 years coastlines will retreat inland by 1.3km as they are eroded away.

The DMCR report shows 30 critical erosion spots in the whole of Thailand, 22 of them in provinces along the Gulf of Thailand and the rest on the Andaman coast. The highest erosion rates were observed in Bangkok, Samut Prakan, Samut Sakhon, Samut Songkhram and Chachoengsao, which have already lost 18,000 rai of land to coastal erosion.

Ban Khun Samutchin in Tambon Laem Fa Pha, Phra Samut Chedi district of Samut Prakan, is now a pilot site for DMCR erosion prevention projects.

Thailand has 2,130km<sup>2</sup> of coral reefs, much smaller than Indonesia, which has 51,020km<sup>2</sup>, Australia (48,960km<sup>2</sup>), or the Philippines (25,060km<sup>2</sup>) but Thailand's coral reefs are among the most threatened in the world. They are over-fished, smothered by sediment coming from coastal development, choked by algal bloom on nutrient-rich sewage and fertiliser run-off, damaged by irresponsible tourism, and stressed by the ever warming sea waters.

It is not known how a rise in sea levels - now just a matter of when, not if - would affect Thailand's coral reefs, but studies have suggested that global warming will reduce the world's coral reefs in an extremely short timeframe. This does not augur well for Thailand's thriving diving tourism industry.

"The level of the Andaman Sea has not risen noticeably yet," Dr Somkiat Khokiattiwong of the Oceanography and Marine Environment Unit at the Phuket Marine Biological Centre (PMBC), said. "But PMBC researchers found that water temperatures in the Andaman Sea have risen significantly over the last 50 years."

A rise in water temperature of as little as 1C above the average temperature of the warmest month of the year could trigger coral bleaching.

"What's more, cool upwellings are happening more often and becoming more severe," Somkiat added. Cool upwellings deprive the water of oxygen, killing fish and other marine life in coral reefs.

For years, PMBC researchers and DMCR officials have been involved in the conservation and rehabilitation of coral reefs, and following the 2004 tsunami there has been increased public awareness and participation in coral protection. However, unless CO<sub>2</sub> emissions are reduced, global warming will steadily get worse.

A survey by the World Resources Institute in 2000 found that Thailand contributed four per cent to the stock of greenhouse gases in the atmosphere. Greenhouse gases predominantly come from energy use - the burning of fossil fuels in power generation, transport, industry and buildings - as well as agriculture and deforestation.

We should reverse this pattern by planting more trees, protecting and restoring mangroves, using clean and efficient production technologies, driving less and taking public transport more. Everyone must get involved in reducing our carbon footprints, for, after all, it will be us who will eventually suffer if we don't.

Quoting Dr Nguyen Huu Ninh, co-author of the Intergovernmental Panel on Climate Change 4th Assessment Report, and co-recipient of the Nobel Prize for Peace 2007, Hatzios said, "The responsibility belongs to all. Everyone must do their best to protect the environment - for themselves, for their family, for the whole society and for the entire human race."

<http://www.mndaily.com/articles/2008/05/08/72167162>

## MINNESOTA DAILY

SERVING THE UNIVERSITY OF MINNESOTA COMMUNITY SINCE 1900

May 8, 2008

### University to track emerging fish disease

The disease found in fish causes hemorrhaging and death and is creeping closer to Minnesota.

By [Devin Henry](#)

**S**aturday marks the opening of fishing season in Minnesota - 10,000-plus lakes packed with anglers and sportsmen of all kinds.

This year, however, the University is playing a role in monitoring the health of the fish being caught.

A disease called Viral Hemorrhagic Septicemia, known for causing hemorrhaging and death in fish, was discovered in the Great Lakes region for the first time in 2005. It's been steadily making its way toward Minnesota ever since, prompting the University to begin monitoring the disease.

Nicholas Phelps, University aquaculture specialist, said VHS has yet to come to Lake Superior and lakes in Minnesota, but said it isn't far off.

"Looking at the history of it, the virus is spreading quickly," he said. "It's likely someday it could come."

The University is now one of only eight facilities in the United States certified by the USDA to track the movement of VHS.

The disease is naturally occurring, Phelps said, although its origins are unknown. It doesn't affect humans but can quickly affect fish.

Sometimes called the "Ebola virus" of fish, Phelps said VHS reacts in the fish population the same way a new disease would affect a human population.

"Something bad comes into your area, a lot of people will get it, and some won't," he said. "Some people will develop immunity to it, and some will die."

University Veterinary Diagnostic Lab director Jim Collins said he became aware of the disease around its first appearance in the Great Lakes. He hired Phelps shortly thereafter to track the disease.

"(VHS) is an environmental potential catastrophe," he said, "so this is right where the University needs to be in helping solve these kinds of problems."

Since VHS is commonly a cold-water disease, it's most common in spring and fall, Phelps said. As the disease comes closer to Minnesota, Collins said samples sent to the lab for testing will increase.

"The surge is what is really scary to the lab director," Collins said. "Surges bring a laboratory to its knees."

Increased requests for testing are what led the Minnesota Department of Natural Resources to work with the University, Ling Shen, a fish health specialist at the DNR, said.

"When this massive surveillance work came in, we couldn't handle the amount of workload," she said. "So now they are helping us, doing the tests for us, the ones we cannot handle."

When the University tests the fish, it first goes to the diagnostic lab, where certain organs are taken from the fish. They are then exposed to cells, and if those cells die then the virus is present, Phelps said.

The state Legislature is already looking at the possibility of the disease.

A bill scheduled to be presented on the House floor Thursday would add more stringent regulation on transportation and testing of fish, from certifying all fish imported into the state as VHS-free, and to disallow fisherman younger than 16 to take fish from a lake for home aquarium use.

Regulation aside, Phelps said VHS would have only little impact on game fishing in the state.

"Some fish are going to die, but there's a lot of fish in a lake," he said, "But that's not something you want, of course. It just doesn't look good."

<http://www.theglobeandmail.com/servlet/story/LAC.20080507.BCSALMON07/TPStory/Environment>

[globeandmail.com](http://www.theglobeandmail.com)

## 'Chain of legal actions' planned to fight fish farms

**MARK HUME**

May 7, 2008

VANCOUVER -- The legal authority of the provincial government to regulate fish farms on the West Coast is being challenged in the Supreme Court of British Columbia.

Alexandra Morton, an independent scientist who has spent most of the past decade researching the impact of fish farms on wild salmon, has joined forces with four groups in filing a petition that seeks to strike down all the aquaculture regulations B.C. has put in place over the past 20 years.

"The wild salmon are suffering. They are in exceptional decline wherever there are fish farms worldwide," Ms. Morton said at a press conference on the courthouse steps in Vancouver.

"As a biologist and as a mother I just can't let the [wild] salmon go down on my watch. Nobody's listening so we are going the next step. We aim to show that fish farms in British Columbia are unconstitutional, unlawful and invalid."



[Enlarge Image](#)

More Stories

- [Blame Canada](#) 



Ms. Morton said if the petition succeeds, and the authority of the province is struck down, the groups would then consider legal action against the federal Department of Fisheries and Oceans for failing to act to protect wild salmon.

"This will be a chain of legal actions. Once we get this whole mess under one roof, we'll go and clean up that house," she said referring to DFO, which in 1988 entered into a memorandum of understanding with B.C., in which the province took charge of fish farms.

Since then, aquaculture operations have spread along the coast, triggering controversy because of scientific research that indicates sea-lice epidemics in wild stocks are linked to the densely packed fish farms.

The petition claims DFO did not have the constitutional authority to delegate the management of salmon in sea pens to the province.

Three of the groups, representing commercial fishermen and wilderness tourism operators, say they are suffering because of a decline in wild salmon stocks. (The fourth petitioner is the Pacific Coast Wild Salmon Society.)

"We want the farms there. But we want them to be sustainable and we want them not to impact wild salmon, because right now the impact on the wild salmon is threatening the livelihood of our members," said Brian Gunn, president of the Wilderness Tourism Association.

Bear and killer whale viewing tours are dependent on healthy salmon runs.

Robert McKamey, of the Fraser River Gillnetters Association, said his members have been catching escaped Atlantic salmon in the Fraser River and they are increasingly worried about sea lice and disease spreading from fish farms to wild salmon.

"In recent years, wild salmon stocks in British Columbia have declined. Our ability to harvest and earn a living from fishing has likewise declined," Mr. McKamey stated in an affidavit.

He says his members believe fish farms in the Broughton Archipelago, off the northeast coast of Vancouver Island, have caused sea-lice infestations in schools of young, wild pink salmon.

Robert Rezansoff, president of the Fishing Vessel Owners' Association of B.C., expressed similar fears.

"The association is very concerned that currently, aquaculture is not being properly regulated by either the province or the federal government and that the current state of regulation is contributing to the stress on and decline in wild salmon stocks," Mr. Rezansoff's affidavit stated.

Gregory McDade, a North Vancouver lawyer, said the federal government's legal responsibility for ocean fisheries goes back to the British North America Act of 1867, and he will argue that DFO "has abdicated its constitutional responsibility to protect wild salmon populations from the damage caused by fish farms."

The petition seeks a declaration by the court that a series of B.C. aquaculture regulations are beyond the legal authority of the province.

The petition, which is expected to be heard in court in several months, also seeks to prohibit the B.C. government from renewing several fish-farm licences.

Mr. McDade said if the case succeeds, the province "would be out of the business of aquaculture and DFO would have to regulate the health of the wild salmon inside and outside of the fish farms."

Pat Bell, B.C.'s Minister of Agriculture and Lands, said yesterday afternoon that he had not yet seen the petition, but he is aware of the case.

"It's a constitutional issue ... it is administrative in nature and I guess we'll see where it goes in the coming months and years," he said.

In the meantime, Mr. Bell said he is working on reforming the fish-farming industry.

<http://www.thefishsite.com/fishnews/6871/action-plan-to-grow-aquaculture-industry>



Thursday, May 08, 2008

## **Action Plan to Grow Aquaculture Industry**

**AUSTRALIA - The Victorian Aquaculture Strategy and Action Plan has set out to grow the value of Victorian aquaculture from A\$22 million to A\$60 million by 2015 in a sustainable manner.**

According to the Minister Responsible for Fisheries, the Hon. Joe Helper, the growth of the aquaculture industry is important for all Victorians that want a sustainable supply of fresh seafood for future generations.

The Strategy has been developed following advice from a panel that included people with expertise in science, community, environment, industry, finance and government issues.

It includes six strategic objectives and twenty-four actions to be implemented in consultation with an industry reference group.

Implementing the strategy will see advances in technology, new capital investment, regional economic growth and secure high-value seafood for all Victorians, according to Mr Helper.

## Further Reading



You can view the full strategy by [clicking here](#).

<http://www.dpi.vic.gov.au/DPI/nrenfaq.nsf/LinkView/F17E2B9544149B1CCA25741D0016CCD585BCE8A032C4BCE1>

[http://www.eoearth.org/article/North\\_Australian\\_Shelf\\_large\\_marine\\_ecosystem](http://www.eoearth.org/article/North_Australian_Shelf_large_marine_ecosystem)

## North Australian Shelf large marine ecosystem

### Table of Contents

- [1 Introduction](#)
- [2 Productivity](#)
- [3 Fish and Fisheries](#)
- [4 Pollution and Ecosystem Health](#)
- [5 Socioeconomics](#)
- [6 Governance](#)
- [7 References](#)
  - [7.1 Articles and LME Volumes](#)
  - [7.2 Other References](#)

---

**Content Source:** National Oceanic and Atmospheric Administration (other articles)

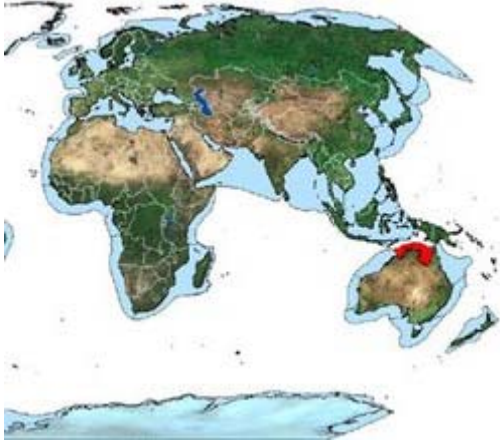
**Article Topics:** Geography, Marine ecology, Oceans and Fisheries

**This article has been reviewed and approved by the following Topic Editor:** Mark McGinley (other articles)

**Last Updated:** May 9, 2008

---

## Introduction



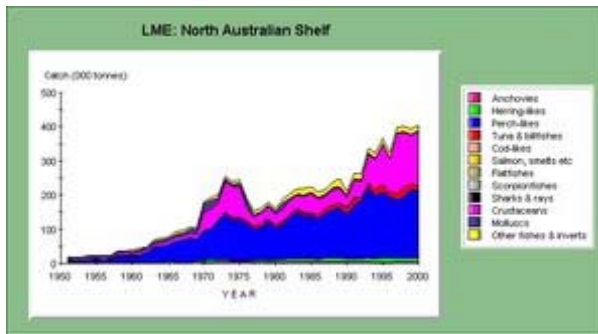
Location of the North Australian Shelf Large Marine Ecosystem (Source: [NOAA](#))

The North Australia Large Marine Ecosystem (LME) is characterized by a tropical climate, and is positioned between the Pacific and the Indian Oceans. Nutrient enrichment and mixing are due to [tidal](#) mixing, monsoons and [tropical cyclones](#) in this LME. The Indonesian Throughflow, a warm-water current flowing from the Pacific into the Indian Ocean, plays a vital role in driving the world's climate system and is also of particular importance to Australia since it helps warm the sea surface of the Indian Ocean. LME articles pertaining to this LME include [FAO, 2003](#).

## Productivity

The LME extends from the Timor Sea to the Torres Strait and includes the Arafura Sea and Gulf of Carpentaria. It is bordered by the Timor Trough to the North. A vast continental shelf links Australia with Indonesia and Papua New Guinea. The LME's Australian [coastline](#) is complex and rather poorly known. Supra-tidal mudflats are found along the arid and dry-tropical coastline of the southern Gulf of Carpentaria. The area has a monsoonal climate and tropical cyclones are common seasonal events. High monsoonal summer [rain](#) and dry winters result in gray mud sediments inshore and well-developed mangrove creeks. [Tropical cyclones](#) in this [region](#) have a pronounced effect on the continental shelf and on coastal [marine](#) ecosystems. The rainfall that accompanies cyclonic weather systems can be a major source of freshwater to the region, causing widespread though episodic flooding. [Temperature](#) and salinity measurements of the Indonesian Throughflow and the South Equatorial Current were made as part of the World Ocean Circulation Experiment (WOCE). Flats in the Gulf of Carpentaria concentrate salt and nutrients for extended periods following tidal inundations and rainfall, then release salty, nutrient-laden water into the [coastal zone](#). The quantitative contribution of these events to the coastal zone is not well known. The North Australia Large Marine Ecosystem is considered a Class I, high productivity (>300 grams of [carbon](#) per square [meter](#) per year) ecosystem based on SeaWiFS global primary productivity estimates. Nutrient discharge from [rivers](#) is restricted to the summer wet season and is highly variable. Tidally induced mixing is a major contributor to the nutrient dynamics of this LME. In these systems, bottom friction acts in a manner analogous to [wind](#) stress on the surface to mix the water column. For information on the marine environment around Australia, see the CSIRO website. For a general understanding of oceanographic processes affecting the nutrient dynamics and productivity of Australian marine ecosystems, read the State of the Environment Report. For more information on productivity, see [Furnas, 2002](#).

## Fish and Fisheries



LME: North Australian Shelf (Source: [NOAA](#))

Fish stocks in the North Australia LME are small but [diverse](#). The level of endemism in northern Australian LMEs is low, with most species distributed widely in the Indo-West Pacific region. Commercial [fisheries](#) are based on the Northern Prawn (Arafura Sea), mud crab, barramundi, salmon, shark, Spanish mackerel, as well as snappers and [reef](#) fish. The Northern Prawn in the Arafura Sea is almost fully exploited. Catch trends are very diverse. The [Food and Agriculture Organization \(FAO\)](#) 10-year trend shows a slight increase from 75,000 tons in 1990 to 80,000 tons in 1999 (see FAO, 2003). There is a very high percentage of crustacean catches (46%), and molluscs (16%). Until recently, fisheries resources were usually managed in units termed as a fishery. Under the Environment Protection and [Biodiversity](#) Conservation Act 1999 (the EPBC Act), the Commonwealth Government now has a framework that helps it to respond effectively to current and emerging environmental problems, and to ensure that any harvesting of marine species is managed for [ecological sustainability](#). For detailed fish catch statistics for this LME, see data collected by the University of British Columbia Fisheries Center. A graphical representation of the data is presented above. FAO also provides information on Australia's fisheries and the characteristics of the industry.

## Pollution and Ecosystem Health

The LME is threatened by an increase in shipping and by the transportation of oil. Ships empty of cargo that enter the ports of Northwest Australia are ballasted with water collected in the last port of call. This ballast water has been shown to contain organisms including [bacteria](#), viruses, algal cells, [plankton](#), and the larval forms of many invertebrates and fish. There are accidental discharges of contaminants, such as [spills](#) and shipping accidents. The dominant human impacts are related to [fisheries](#) and [\[\[terrestrial biome|terrestrial runoff](#) from deforestation, overgrazing and certain [agricultural](#) practices. Compared with most countries, however, these impacts remain few. Population densities are low in all [coral reef](#) areas, while the location of many reefs at some distance from the shore further protects them from human impacts. For more information on marine pollution in this LME, see Environment Australia and a technical paper from EA on [marine](#) disturbances.

## Socioeconomics



(Source: [NOAA](#))

Thousands of people are involved in the [fisheries](#), [aquaculture](#) and processing sectors of the economy. The [FAO](#) provides information on the characteristics and socioeconomic benefits of Australia's [fishing](#) industry. There are significant aquaculture activities based on oyster pearls, prawns and barramundi. Industry, shipping and tourism are major economic activities. Marine and coastal-based forms of tourism are important in this LME both in terms of domestic and international tourism. A significant proportion of the Australian population is involved in recreational fishing, surfing, wind surfing, diving, snorkeling, and boating. Tourists from overseas prize the [coral reefs](#) and the natural and unspoilt marine environment. There are, however, social, cultural, economic and environmental impacts caused by tourism. Tourism may affect the lifestyle of residents in ways they perceive as intrusive. Negative social impacts may include real or perceived increases in crowding, prices, or crime, as well as increased conflict between commercial, recreational and indigenous interests. Australia's Aborigines, and the Torres Strait Islanders who occupy parts of the far northeast of the land area, have traditionally made considerable use of reef resources. Arnhem Land is an aboriginal reserve.

## Governance



(Source: [NOAA](#))

The North Australia LME lies off the [coast](#) of the states of Western Australia, Northern Territory and Queensland, opposite the country of Indonesia. Some governance issues in this LME pertain to the Aboriginal coastal populations who have considerable rights regarding their traditional use of the [reefs](#). However, their numbers are now very low. In terms of [fisheries](#) management, Australian fisheries resources are managed under both Commonwealth and State/Territory legislation. The demarcation of jurisdiction and responsibilities among these various governments has been agreed to under the Offshore Constitutional Settlement (OCS). Under OCS, the states and territories have

jurisdiction over localized, inshore fisheries. The Commonwealth has jurisdiction over offshore fisheries or fisheries extending to waters adjacent to more than one state or territory. Each government has separate fisheries legislation and differing objectives. Transboundary fisheries and foreign fisheries are managed by the Commonwealth fishery agencies. An important goal is to ensure that the exploitation of fisheries resources is conducted in a manner consistent with the principles of [ecologically](#) sustainable development. This includes the need to assess the impact of fishing activities on non-target species and the long-term [sustainability](#) of the [marine](#) environment. For more information on the governance of Australia's fisheries, see [FAO](#) fisheries literature. Reserves have been declared to help protect [rocky shore](#) habitats and marine life, provide opportunities for research and education, conserve Australia's cultural heritage and help boost ecotourism. The marine tourism industry has produced a code of conduct that covers issues such as anchoring, removal of rubbish, fish feeding and the preservation of world heritage values. Australia declared a 200 nautical-mile Exclusive Economic Zone in 1978. Australia is party to the following international agreements: Antarctic-Environmental Protocol, Antarctic Treaty, [Biodiversity](#), Climate Change, Endangered Species, Environmental Modification, Hazardous Wastes, Law of the Sea, Marine Dumping, Marine Life Conservation, Nuclear Test Ban, Ozone Layer Protection, Ship Pollution, Tropical Timber 83, [Wetlands](#), and Whaling.

## References

### Articles and LME Volumes

- [FAO](#), 2003. Trends in oceanic captures and clustering of large marine ecosystems - 2 studies based on the FAO capture database. FAO fisheries technical paper 435. 71 pages.

### Other References

- Furnas, M. J., 2002. [Land-sea interactions and oceanographic processes affecting the nutrient dynamics and productivity of Australian marine ecosystems](#).
- Maclean, J.L., 1989. Indo-Pacific red tides, 1985-1988. [Marine Pollution Bull.](#) 20(7):304-310.
- Pogonoski, J.J., D.A.Pollard and J.R.Paxton, 2002. [Conservation Overview and Action Plan for Australian Threatened and Potentially Threatened Marine and Estuarine Fishes](#) (pdf). Environment Australia, February 2002.
- Sainsbury, K.J., 1988. The ecological basis of multispecies fisheries, and management of a demersal fishery in tropical Australia. In J.A. Gulland (ed.), *Fishery population dynamics: The implications for management*. John Wiley and Sons, New York. pp. 349-382. ISBN: 0471911518
- [State of the Environment Report](#)

---

*Disclaimer: This article is taken wholly from, or contains information that was originally published by, the National Oceanic and Atmospheric Administration (NOAA). Topic editors and authors for the Encyclopedia of Earth may have edited its content or added new information. The use of information from the National Oceanic and Atmospheric Administration (NOAA) should not be construed as support for or endorsement by that organization for any new information added by EoE personnel, or for any editing of the original content.*

---

### Citation

National Oceanic and Atmospheric Administration (Content source); Mark McGinley (Topic Editor). 2008. "North Australian Shelf large marine ecosystem." In: Encyclopedia of Earth. Eds. Cutler J. Cleveland (Washington, D.C.: Environmental Information Coalition, National Council for Science and the Environment). [Published in the Encyclopedia of Earth May 9, 2008; Retrieved May 9, 2008].

<[http://www.eoearth.org/article/North\\_Australian\\_Shelf\\_large\\_marine\\_ecosystem](http://www.eoearth.org/article/North_Australian_Shelf_large_marine_ecosystem)>

### Editing this Article

[EoE Authors can click here to access this article within the editor wiki](#)

[If you are an expert, but not yet an Author, click here](#)

<http://www.abc.net.au/news/stories/2008/05/09/2240153.htm>



## Vet school seeks host farmers

Posted Fri May 9, 2008 1:00pm AEST

The University of Adelaide's vet school at its Roseworthy campus is looking for farmers to host veterinary students as part of their practical placement.

The aim is to expose students to a range of farming disciplines, including production animals and equine studies, aquaculture, scientific research and even bio-security.

As a result, students hope to gain the knowledge and skills they need to progress to further studies.

The head of the School of Veterinary Science, Professor Gail Anderson, says whilst 50 per cent of the vet students have a rural background, a large proportion of them need help with placements.

"They're expected to do some equine work, some work with a piggery, some work in an intensive poultry unit, some work even with the RSPCA or with some sort of canine husbandry area, so that they see all different kinds of animal production so that they have a better understanding of the background for the industry," she said.

Interested people should contact the Roseworthy campus.

<http://www.growfish.com.au/content.asp?ContentId=11361>



## New GESAMP report on enviro impact of coastal aquaculture

**A new GESAMP report analyses assessment and communication of environmental impacts of coastal aquaculture globally.**

Aquaculture needs to expand to "help bridge the growing gap between what the capture fisheries can supply and the growing global demand for fisheries products." By 2050, global aquaculture needs to expand to 80 million tonnes (from its current 62.9 million tonnes) just to maintain the current level of per capita consumption (FAO, 2004).

With any human activity, zero environmental change is unattainable. The report develops the

process for assessing acceptable levels of change in balance with the expected benefits.

The report comes from GESAMP (Joint Group of Experts on the Scientific Aspects of Marine Environmental Protection) Working Group on Environmental Impacts of Coastal Aquaculture in collaboration with experts of the International Council for the Exploration of the Sea's (ICES) Working Group on Environmental Interactions of Mariculture.

**To view the report click here (6.86 MB)**

[http://www.salmonfarmers.org/attachments/050208\\_GESAMP\\_Risk\\_rpt.pdf](http://www.salmonfarmers.org/attachments/050208_GESAMP_Risk_rpt.pdf)

<http://www.citizen-times.com/apps/pbcs.dll/article?AID=/20080506/LOCAL/80429034>



## Black Tiger Shrimp invades N.C. coast

by STAFF REPORTS • published May 6, 2008 12:15 am

**MOREHEAD CITY** – The N.C. Division of Marine Fisheries is asking fisherman to be on the lookout for a non-native species of shrimp called the Black Tiger Shrimp.

This shrimp, native to the west Pacific, has been found in North Carolina waters and could pose a threat to the native shrimp species.

Fishermen reported capturing three of these shrimp last year, two in waters of the Pamlico Sound and one offshore from Bogue Banks.

During the past several years, Black Tiger Shrimp have also been reported in Louisiana, Alabama, Florida, Georgia and South Carolina waters.

It is believed that Black Tiger Shrimp were introduced into the coastal waters of the south Atlantic and Gulf of Mexico by escaping from aquaculture facilities. No commercial shrimp farms in North Carolina grow Black Tiger Shrimp, so it is unlikely they were released from aquaculture operations in this state.

The impact of these shrimp on native species is unknown. However, many problems can result from the introduction of non-natives, including new diseases and competition for food and habitat.

The Black Tiger Shrimp has distinct dark and white stripes along its back. If a fisherman captures one, he should freeze it, record the date and location where he caught it and contact Trish Murphey at the N.C. Division of Marine Fisheries at 1-800-682-2632 or [Trish.Murphey@ncmail.net](mailto:Trish.Murphey@ncmail.net).

A photo of a Black Tiger Shrimp can be downloaded at [http://www.ncdmf.net/news/images2k8/tiger\\_shrimp.jpg](http://www.ncdmf.net/news/images2k8/tiger_shrimp.jpg).