# MARINE Life

With bonus "Extreme Weather – maybe it is the Mayan Apocalypse after all?" liftout

**April/May 2013**

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# Marine Life magazine

## Our Goal

To educate, inform, have fun and share our enjoyment of the marine world with like-minded people.

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**Michael Jacques, Co-Editor,**

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**SA Correspondent – Peter Day**



*Cover Photo;* Reef octopus – Emma Flukes

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### *News*



### *Bits & Pieces*



### *Feature Stories*

# Extreme Weather Supplement – it'll blow you away!

Here at Marine Life, we are doing the bonus liftout thing again this month. This time, we're investigating the effect that extreme weather disturbances can have on people and the environment. The focus is on floods and cyclones - think Yasi, Oswald and Yolande. We have a look into the resilience of Moreton Bay, Bundaberg, the Great Barrier Reef, and Tasmania. This all culminates in a bit of a discussion about how places can bounce back after the storms if they are otherwise in good condition environmentally. If that all sounds a bit abstract to you, we do forgive you, but with climate change expected to increase the frequency and severity of these extreme weather events, now has never been a better time to start thinking about what this all means.

**CHECK OUT THE SUPPLEMENT ONLINE HERE**

# NATIONAL News Roundup

## Supertrawler Gone for Good?

The much-publicised "supertrawler" (MV *Abel Tasman*) has recently left Port Lincoln without fanfair after failing to gain approval for its participation in any viable Australian fishery, even as a freezer ship. Seafish Tasmania made the decision to sell the vessel after the permit applications were rejected and is now taking legal action. An expert panel put together to look into the effects of fishing activity by the *Abel Tasman* will still release a report in October. The *Abel Tasman* could be heading to the Pacific under new owners who have not disclosed their further intentions.

## Sustainable fishing methods earn higher prices

Wild caught Australian prawns on the barbie might be a national icon, but local prawn fishermen are struggling against completion from aquaculture and overseas suppliers.

Supermarket giant Coles says only about 20 per cent of the cooked prawns it now sells are wild-caught as price, fishing restrictions, weather and supply issues lead retailers to choose farmed and imported seafood. Of the 1450 tonnes of cooked whole prawns sold by the supermarket chain, 800 tonnes is farmed in Australia, with another 250

tonnes grown overseas. Nationally, imports make up more than half of the 60,000 tonnes of prawns consumed each year. Despite it being a growing market, local trawler fishermen are barely covering costs. Prawn prices have been relatively stable at about $29/kg for wild-caught king prawns, $25/kg for farmed tigers, $16/kg for raw banana prawns and $14/kg for imported Asian prawns.

When you have a premium-priced product, you need to target niche markets. This has been a big driver in the recent emphasis on sustainability labeling. Spencer Gulf prawns recently gained Marine Stewardship Council (MSC) status and were exported to Japan for the first time over the Christmas period. They were a hit with more discerning Japanese consumers and large volumes were sold. Australian producers are also developing a marketing strategy that will include a new logo for Aussie-caught or farmed prawns.

## The stink about our warm oceans

Recently, a few incidents have highlighted the abnormally warm ocean conditions we are experiencing in many parts of the country. A smelly brown slick has been reported floating off Geraldton and is most likely an algal bloom, partly resulting from high temperatures, low swells and low winds. Dr Mick Payne from the Northern Agricultural Catchments Council says ocean temperatures have crept up to six degrees higher than usual around Geraldton this year. He says if it is an algal bloom, it will actually have a "fertilising effect" on the environment and will eventually be broken down naturally by the environment. The algae is dying off as it gets too much UV radiation near the surface "… and that's what's causing the liberation of this lovely smell," he said.

Too many of these algal blooms, especially in enclosed waterways, can be a bad thing though. It deprives the water of oxygen and water users need to avoid swimming in affected areas as the algae can cause skin irritations. Huge rafts of seaweed also washed ashore along Glenelg beach, baking in the sun and causing a stink between the local council and the State Government about the cost of removal.

Slightly less benign were the fish kills. Thousands of baby leather jackets about 70 cms long washed ashore on Adelaide's southern beaches and along the Eyre and Yorke Peninsulas. Ocean temperatures five degrees higher than average for this time of year are believed to be triggering heat stress in fish. Primary Industries and Regions SA (PIRSA) said "Environmental conditions, such as high water temperatures and unusual currents associated with strong onshore winds, are now considered to be a likely cause of these mortalities".

## Some hope for corals

***Colder water corals may be better placed to cope with the gradual acidification of the world's oceans than previously thought...***

As humans release carbon dioxide into the atmosphere, besides warming the planet, the gas is also turning the world's oceans more acidic - at rates that may exceed those seen during past major extinctions of life. This has prompted strong scientific interest in finding out which species are most vulnerable.

Scientists from Australia's ARC Centre of Excellence for Coral Reef Studies, at the University of Western Australia and France's Laboratoire des Sciences du Climat et de l'Environnement, has shown that some marine organisms that form calcium carbonate skeletons have an in-built mechanism to cope with ocean acidification - which others appear to lack.

"The good news is that most corals appear to have this internal ability to buffer rising acidity of seawater and still form good, solid skeletons," says Professor Malcolm McCulloch of CoECRS and UWA. Marine organisms that form calcium carbonate skeletons generally produce it in one of two forms, known as aragonite and calcite. The National Newsanimals with skeletons made of aragonite have the coping mechanism - while those that follow the calcite pathway generally do less well under more acidic conditions." This means that well-known corals like *Porites* and *Acropora* may be more resilient than first thought. Ironically, warming oceans may increase the rates of coral growth in corals now living in cooler waters, he says. Those in warm water as increasingly vulnerable to coral bleaching as the water warms. "But the picture for coral reefs as a whole isn't quite so straightforward, as the 'glue' that holds coral reefs together - coralline algae - appear to be vulnerable to rising acidity," Professor McCulloch explains. Plankton, floating in the open oceans and forming a vital component of marine food webs, also appears vulnerable to acidification.

However, the big unknown remaining is whether corals can adapt to global warming, which is now occurring at an unprecedented rate - at about two orders of magnitude faster than occurred with the ending of the last Ice Age.

"It's a more complicated picture, but broadly it means that there are going to be winners and losers in the oceans as its chemistry is modified by human activities - this could have the effect of altering major ocean ecosystems on which both we and a large part of marine life depend." While parts of the study are good news, the overall health of coral reef systems is still largely dependent on managing increasing thermal stress from global warming and local environmental impacts, such as terrestrial runoff, pollution and overfishing."

*Read more about this in their paper, "Coral resilience to ocean acidification and global warming through pH up-regulation" by McCulloch et al.*

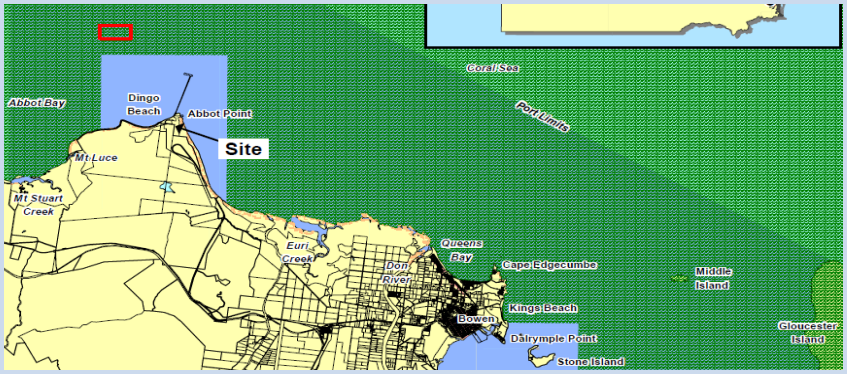
## Queensland News

# Abbotts Point Dredging

*Commentary by Mike Jacques*

***A new coal terminal near Bowen NQ is causing further protests along the lines of the recent Gladstone debate.***

Fishermen have been very vocal opponents of plans to deepen the Abbotts Point harbour and dump 100,000 $m^3$ (a small load in dredging industry terms) at the sea spoil ground used in 1981 for the original terminal construction. This area in now within the Great Barrier Reef Marine Park following the recent expansion of the Park into port waters.




Attempts by North Queensland Bulk Ports to find a compromise haven't been very successful. Fishing representative, Mr Rynn says if the Abbot Point proponents get the green light to "vandalism" of the Great Barrier

Reef Marine Park, it would make a mockery of the Federal Government's new network of marine reserves, "My message to Tony Burke is he's created these massive marine parks around Australia to keep it all preserved and the environment pristine and look after the ecosystems and then he wants to turn the inshore grounds into a dumping ground if he signs off on this."

The initial government reports suggests the likely impacts on water quality will be mobilisation of seabed sediments causing increased turbidity (cloudiness) levels, and release of contaminants from sediments, if any are present. The last part is pretty important because the Abbotts Point area doesn't have a lot of contaminated soil. "The relatively deep waters in the area off-shore from the berth mean that seafloor sediments may be only resuspended and transported during moderate to extreme wind and wave events." "Given the prevailing winds …the Clark Shoal to the immediate west of the berths comprises a relatively shallow (2-4m deep) sandy platform and would be the area most likely to experience any adverse impacts in this regard".

Investigations into the original berth dredging in 1989, which was of a similar scale to the proposed dredging, concluded that the dredging did not have any significant impact on the marine environment. The current reporting does lack specific soil sampling information, but Abbotts Point isn't in the same league as Gladstone, Kimberley or even the Darwin dredging IMHO, although I'd be happy to air any views to the contrary.

## Gladstone port to compensate fishers

Gladstone Ports Corporation (GPC) on Tuesday opened applications for compensation following its large dredging program to accommodate new LNG plants. GPC says those holding fishing licenses for certain areas of the harbour will be compensated with 50 per cent of the value of their annual catch for their best two years of fishing there between 2005 and 2010.

Fishermen have previously rejected an offer as low as this and no-one knows if any fishers will apply for the package. Fifty-five fishers, wholesalers and retail operators have launched legal action against the state government for business losses.

## SA News

### Sea Lions safe from shark fishing – at some cost

***An end to sea lion deaths in nets is being attributed to new restrictions on shark fishing in South Australian waters.***

Three years ago, a report estimated shark fishing nets were killing nearly 400 sea lions annually. Unlike the more numerous Australian fur seal, sea lions have not been recovering in numbers since the days when they were decimated by hunting during the colonial era. Australian Fisheries Management Authority (AFMA) then set 'trigger limits' for seal by-catch and then imposed an 18 month ban on fishing in three key habitat areas following the death of eight Australian Sea Lions in nets.

This led to an uproar in the fishing industry with some fishermen threatening to leave the industry. It also forced fishermen to try hooks rather than nets, to reduce possible contact with sea lions. Kyri Toumazos from the shark industry said use of hooks was only part of the answer. "Hook fishing is not as selective as gill netting so a combination of both is probably what we need in this state to be viable," he said. "[The] industry is suffering quite a bit ... because of our low catches, so we're working towards developing friendlier methods of fishing so we can actually access all our historical fishing areas."
AFMA Executive Manager Dr Nick Rayns said that although the closures were absolutely necessary, AFMA recognised that they had a major impact on the fishing industry.

## NSW News

### A "new approach" to MPAs

*Commentary by Mike Jacques*

***The NSW Government recently announced a new strategy for the management of the NSW marine parks.***

Their management "…will now be based on science and in the long term interest of community, marine ecosystems and industry". I assume that means the community of recreational fishermen, and not the views of emotive, ranting, greenie, 'spoilsports' who don't vote Liberal anyway. The NSW Government established an "Independent Scientific Audit of Marine Parks", which included a number of fisheries management scientists who are well-known MPA critics. This has recommended,

- Establishing two new advisory bodies, the Marine Estate Management Authority, to replace the existing Marine Parks Authority, and the Marine Estate Expert Knowledge Panel;
- Effective immediately there will be an amnesty allowing line fishing from ocean beaches and headlands in sanctuary zones with the exception of identified sites for the protection of threatened species. All other recreational fishing restrictions including bag and size limits will apply. The Expert Knowledge Panel will undertake a six month assessment of recreational fishing access to these areas;
- Undertaking threat and risk assessments for the NSW marine estate; and

- Remaining committed to the moratorium on new marine parks, pending advice from the new Marine Estate Expert Knowledge Panel.

"After years of political interference and decisions based on poor or incomplete science by the previous Labor Government, the credibility of Marine Parks and our fishing industries has been undermined," the Minister said.

Associate Professor Bob Beeton, said "These changes will not adversely impact the commercial fishing industry, which is currently undergoing significant reform, and industry can take confidence that future decisions around access to resources will be undertaken in an independent and transparent manner,' Ms Hodgkinson said. The Marine Estate Management Authority will replace the Marine Parks Authority and will be informed by the work of the Expert Knowledge Panel, providing independent advice across ecology, economics, and social sciences.

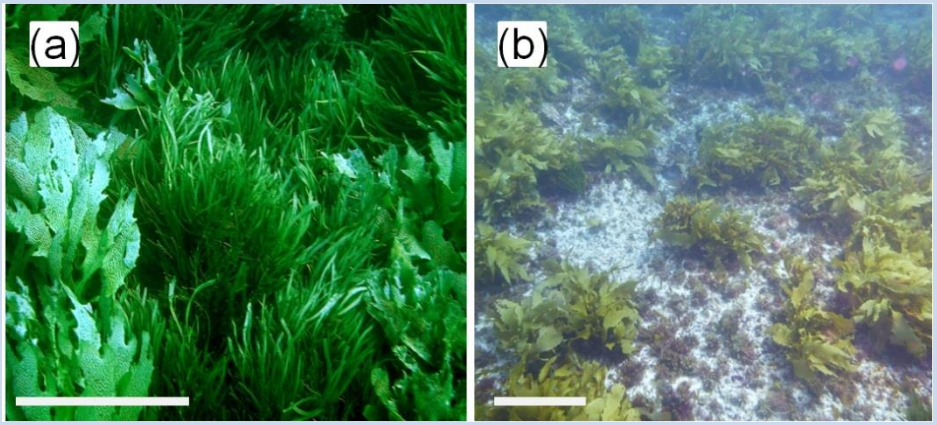
The independent chair of the new Authority is Dr Wendy Craik (a former executive of many bodies including AFMA and the National Farmers Federation) and the independent chair of the Expert Knowledge Panel is Dr Andrew Stoeckel (essentially a macro-economist)." One shouldn't assume that intelligent people will just act as cyphers for government, but the lack of direct experience with MPA management and a dry economic background is noticeable with both of the proposed executives.

The audit report is already setting the scene for what is expected from the new bodies on the vexed issue of 'no take' sanctuary zones. Despite submissions showing "…there is broad support for marine parks and sanctuary zones…the main concerns are the locations of zones and effectiveness". "The government accepts the Audit's view that sanctuary zones, or areas where extractive activities including fishing are prohibited, do have an important role in marine estate management, including as scientific reference points for monitoring, evaluation and reporting, and in helping conserve biodiversity from a range of threats". However, "…sanctuary zones should not divert attention from the range of actions needed to improve management of the marine estate and do not represent a simple solution to a complex problem." Future marine park management reviews will consider whether existing sanctuary zones are appropriate for meeting their objectives and whether improvements are necessary". That sounds, to my tiny addled brain at least, like we will soon see the significant watering down of sanctuary zone protection in at least some of the more contentious marine parks.

## WA News

# WA Ocean Heat Wave kills seaweed communities

- *by Mike Jacques*




A new research paper is saying that the extreme warming event which began in December 2010 and peaked in March 2011, has killed off an important algal species. Dr Smale said. "During this heatwave we found that the seaweed *Scytothalia dorycarpa* - one of the most prominent habitat-forming species of the temperate coastline - retracted its range some 100km because the extreme temperatures. It has completely disappeared from Jurien Bay. This may have far-reaching implications for the structure and functioning of the marine ecosystem in the region, which is a global biodiversity hotspot."

The damage to the seaweed left rocky reefs uncovered damaging small invertebrates and some other algae. This, in turn, could have knock-on effects on fish which prey on them.

"Extreme climate events are increasing in frequency and magnitude as a consequence of human activities and, in the last 30 years, the number of days of anomalously high seawater temperatures has increased along 38 per cent of the world's coastlines," the authors write.

Though *S. dorycarpa* has been hit hard, it's too soon to judge what its absence will mean in the areas it has disappeared from. "With any kind of environmental change there will be ecological 'winners' and 'losers'," Dan said. "In the short term, the gaps in the seaweed canopy have been colonised by 'weedy' turf algae, which do not provide a complex, 3-dimensional habitat for other species. In the longer term, it is possible that warm-water seaweeds or even hard coral species will colonise the newly-available space. However, this could take many years and other factors like light, nutrients, ocean currents and maybe ocean acidification complicate any predictions. We need to continue to monitor these study locations to see whether communities return to a pre-heatwave state or – more likely – shift in structure towards more 'warm-affinity' communities."

# **OTHER** bits & pieces…

## Our Plastic Century

***Giant oceanic garbage patches, some the size of NSW, are forming across the world where ocean currents are gathering together the harvest of our thoughtlessness.***

New research shows that humans have put so much plastic into the oceans that even if everyone in the world stopped putting garbage in the ocean today, the plastic rafts would continue to grow for another 500 hundred years.

According to Dr Sebille "There are five known garbage patches in the subtropical oceans between each of the continents.  Each contains so much plastic that if you were to drag a net through these areas you would pull up more plastic than biomass [living things]" A swirling mass of plastic debris was first discovered in the so-called north Pacific gyre about 15 years ago.

Another modelling result using data from drifting buoys showed that giant oceanic eddies are helping to move plastics between garbage patches thousands of miles apart and in entirely different oceans. If you were to drop a rubber ducky in the ocean it could end up in any ocean in the world.

"This means that garbage from any country can end up in any one of these garbage patches. This tells us that no single country is responsible. Ocean garbage is an international problem that requires an international solution," said Dr Sebille.

"If you sail through these areas you will not see big lumps of plastics or rubber duckies or things like that. The sun and interaction with the ocean breaks the plastics down into very small pellets that are almost invisible to the naked eye." Dr Van Sebille said.

"However, these plastics even at this small size do affect ecosystems - fish and albatross swallow these plastics." They can also absorb toxic chemicals.

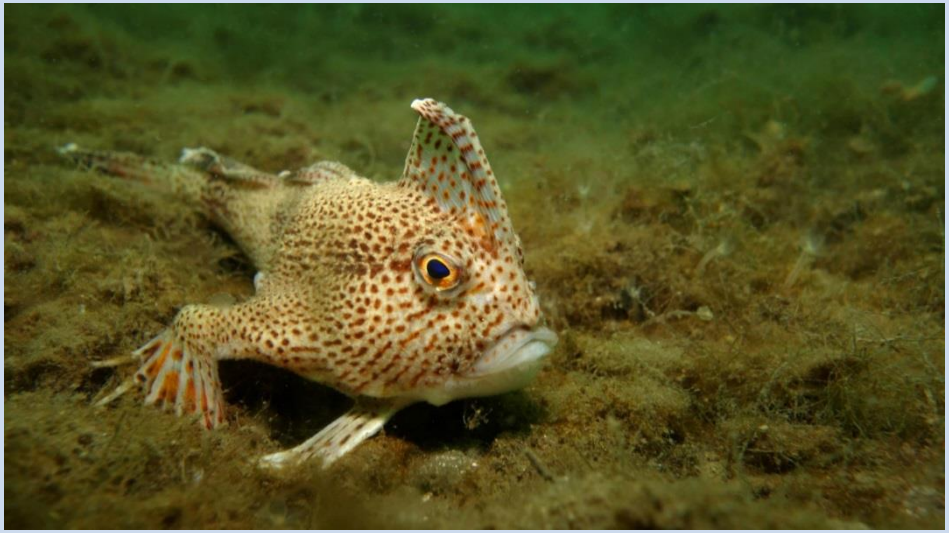
*Garbage at a Bulgarian dam – on its way to the sea.*

# Critter Files

## *A few observations of the well-loved (unless you're a waterfront building developer) Spotted Handfish*

- *by Emma*

Chances are, if you're reading this magazine and have ever so much as visited Tasmania, you will have heard of the spotted handfish. This little critter is like some weird hybrid between an anglerfish and a frogfish, just with poutier lips, less exciting colouration, and possibly even more limited swimming skills. At a modest size of just 70-90 mm in length, the spotted handfish is not renowned for its performance as a game fishing species. However, these little guys are endemic to Tasmania and choose to live exclusively in the somewhat questionable environment of the Derwent Estuary. It's hard not to feel an element of fondness towards such an ugly fish that has chosen to shack up in a rather difficult environment. Not surprisingly, living in a waterway that borders on highly urbanised areas prevents a unique set of challenges to these little Aussie battlers…

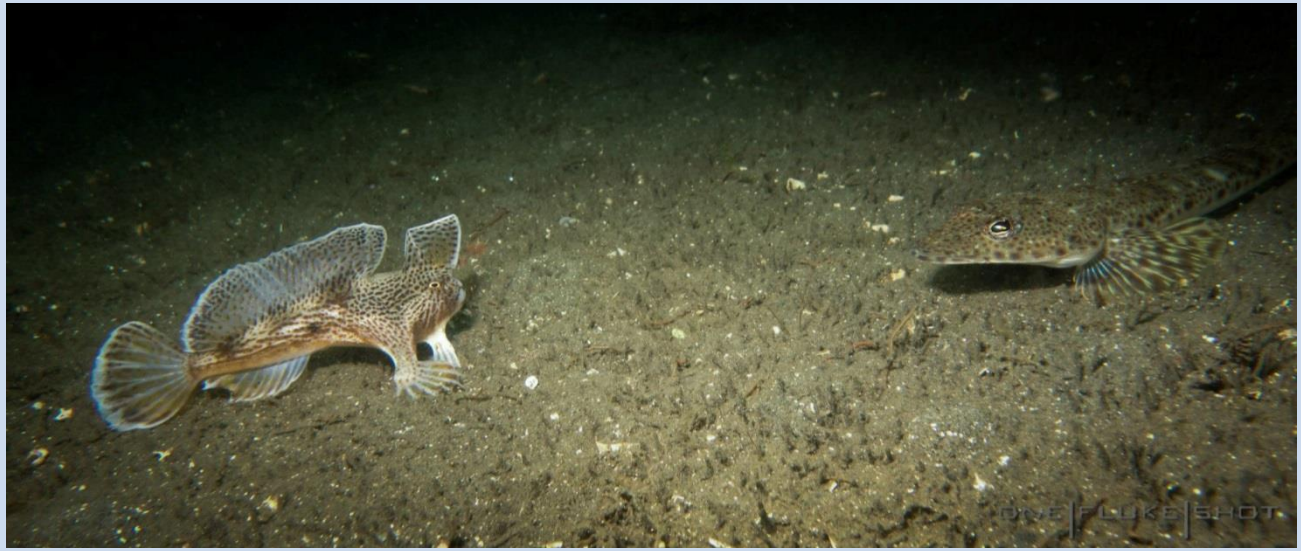


The spotted handfish likes to lay its eggs on sticks. Sounds like a good plan, right? If I were to lay eggs I would probably make a soft, comfortable nest for them, dote on them day and night, and read them bedtime stories. If you're a handfish, however, apparently your way of expressing your maternal love is to use some highly questionable fish derived adhesive to glue your precious progeny to a stick and flap your handy fins in their general direction every now and again to prevent algae from growing on them. Far be it for me to question this style of parenting, though. I once tried to make a butterfly enclosure out of plastic bags and accidentally cooked them all in the sun. We could all do better sometimes.

Now the problem is, on a big 'ol sandflat there are very few sticks to which your defenceless babies can be glued by their faces. The handfish prefer to use the stems of one particular species of stalked ascidian. Historically, these were found all throughout soft sediment areas in the Derwent. As is the case with many stories of urbanisation, these ascidians have declined dramatically, predominantly through being eaten by the invasive northern pacific seastar (fondly known as the "Japanese seastar" after its unfortunate method of arrival into Tasmanian waters via discharge of ballast water from a Japanese tanker ship). A decline in ascidians means a decline in the availability of spawning substrate for the little handfish. This has really put their already somewhat questionable parenting skills to the test (who tries to raise their children in the slums by choice… I mean, really?).

Ongoing population surveys of handfish numbers and planting of artificial spawning substrate (think, quite literally, burying sticks into the sand) are a vital part of maintaining populations of these fragile little fish. Targeted protection of areas critical to spotted handfish breeding is also important to ensure the survival of this species, much to the bane of building developers who have struggled with environmental impact assessments surrounding the development of waterfront areas (think Ralph's Bay, Battery Point walkway).

That was probably the longest preamble in history to what is a largely rather uninteresting story. But here goes.... The other day, whilst diving on some handfish surveys, I noticed some interesting fish behavior. Often when diving in sandy areas, divers will notice large flathead following them about like a plague of locusts. It's really quite creepy to turn around and see 5 large fish following you, as if to wait for that moment you stop and look a little tired and vulnerable to pounce en masse… Really though, it probably has more to do with the small amount of sediment kicked up by divers and the opportunistic food morsels this contains.



So while photographing an adult handfish I was not surprised to see flathead lurking in the periphery of shots. However, when the little guy I was photographing made a few pathetic attempts at swimming, the flathead would dart after him and sit a metre or two away, keeping one eye on me and the other firmly fixated on the handfish. I saw this happen on a few occasions, and I started to worry that these handfish were being sized up as a flathead meal. To the extent that every time I had finished photographing a handfish, I would chase the flathead away from the area. Whether they were just attracted by the short bursts of movement or were genuinely considering eating a large (by handfish standards) handfish I am not sure. Certainly, the handfish would put up a fight by virtue of sheer unpalatability alone – they are covered with unpleasant-looking tooth-like scales, and are rumoured to be toxic (there is a story about a cat and an aquarium and cat becoming a little too enamored with a handfish in said aquarium and… look, it just didn't end well for the cat). It did make me wonder though whether these big flathead that are comfortably growing fat around urbanised Derwent areas are actually taking adult handfish, in addition to snacking on handfish egg masses? If so, that adds yet another threat to the ever-growing list of vulnerabilities of these fragile little fish…

*As a side-note to divers: documented handfish numbers have been very low this summer/year. If you do happen to spot any whilst diving locally, take a couple of clear photos of the fish and get in contact with us – we can refer you onto the experts of all things handfishy. They would love to receive your images and may be able to track down the individuals from their spot patterns. Great incentive to get in the water for some citizen research!*

*Check out Emma's handfish videos here and here for more nailbiting action.*

FEATURE

# The *Other* Asian Migration Issue

*by Michael Jacques*

Every northern summer, the untouched wilderness of the Arctic Circle provides rich but temporary feeding grounds for more than five million migratory shorebirds. As the days shorten and a chill pervades the air they respond to an instinctive urge to migrate south. Their destination is eastern Australia's many estuaries and wetlands.

The huge flocks of birds follow the coast of China and Korea down to South East Asia then island-hop across the Indonesian Archipelago. As many as 50 million waterbirds migrate down this East Asian - Australasian Flyway with 30 000 shorebirds getting as far as Tasmania. However, every year their numbers sink ever lower. Seventeen species are in decline and five are listed as threatened.

Exhaustion and hunger will make them stop along the way to refuel and some wetlands in East Asia are vital stopping points. The bar-tailed godwit is an endurance flyer and will only make one stop in the Yellow Sea area before moving on to their final destination. These wetlands are under threat from an expanding human population that needs more farm land. Reclamation works in Korea have drastically reduced the size of these refuelling points in recent years.

Environmental issues are seen in a different light in Asia. Some species such as Pandas and cranes are icons of local culture, but few people see or take an interest in shorebirds. They occupy tidal flats seen as unsavoury places. Decision-makers are also strongly attracted to big national growth projects. Huge reclamation works are seen as expanding the size and strength of the country, even if they aren't commercially viable in terms of the value of the land gained, and the losses caused to other industries like fishing.

One of the most topical was the loss of wetlands due to the $20 billion Saemangeum ("New millions of rice harvest") project in South Korea. South Korea has more tidal estuary than Holland and a long history of small reclamation projects. The recently reclaimed area had been home to 400,000 seabirds. The project has finished its 33 km long seawall (the longest in the world) and is now reclaiming the mudflats. The project is creating 28,300 hectares of land and an 11,800 hectare fresh water lake land. This project is being touted by the "Visit Korea" official website as a tourist attraction. "Modeled upon such famous waterfront cities as Amsterdam and Venice, the government is planning to create clusters of facilities for tour and leisure, international affairs, science and renewable energy". The rather grand purpose is to "develop the region into the undisputable economic hub of Northeast Asia". It was Korea's first big environmental debate but environmental (and economic, its $100,000 an acre) objections were turned aside with the suggestion they were somehow unpatriotic.

Meanwhile 1,227, or 12.4% of the total 9,865 bird species in the world are currently classified as globally threatened and 192 of these are considered Critically Endangered on the IUCN Red List of threatened species. An estimated 19% of all known birds and about 30 of the 192 Critically Endangered bird species are migratory. Some prominent examples of "migratory birds in crisis" being the Slender-billed Curlew, the Northern Bald Ibis, the Sociable Lapwing, the Waved Albatross and the Orange-bellied Parrot – all of which are migratory and listed as Critically Endangered.

The current rate of extinction is a thousand times faster than the natural one. For birds, the natural rate of extinction is one bird per century, but in the last thirty years alone, 21 bird species have become extinct. Without immediate action, many of the "migratory birds in crisis" will no longer exist in ten year's time.

*"The (Saemangeum) reclamation project invites more migratory birds to the area" and "snipes and plovers (shorebirds) easily move their habitat to the Gomso Bay, Geum River estuary or other tidal flat (239,000ha) which are 5 ~ 20km away from Saemangeum."*

*[Ed – Hey, a fridge migrated there at least, so what's the problem?]*

## Bar-tailed Godwit

This large intertidal bird forages by probing in mudflats or marshes. It eats mainly insects and crustaceans, but also parts of aquatic plants.

The Bar-tailed Godwit is a non-breeding migrant in Australia. Breeding take place each year in Scandinavia, northern Asia, and Alaska. The nest is a shallow cup in moss sometimes lined with vegetation. Both sexes share incubation of the eggs and care for the young.


It was shown in 2007 to undertake the longest non-stop flight of any bird.

FEATURE

# SEALS and where to see them

There are 10 species of seals found in Australian waters although most species are only occasional visitors. They live in areas surrounding the southern states, from New South Wales to Western Australia. The Australian sea lion and Australian fur seal are only found in Australian waters. In the 19th century, hunting reduced seal populations to low numbers across southern Australia. All seal species are now protected and they have been slowly recovering. Some seal species, such as Australian fur seals and NZ fur seals, are pretty common now, but their recovery has been patchy. Some old areas have been recolonised, others areas haven't.

Most of us city slickers really love seals. Even though they often live in really remote areas, at least 400,000 Australians and international tourists annually go on a boat tour or visit a viewing platform at a seal haulout. Many others visit places where seals are one of the drawcards, eg, the Bruny Island cruises in Tasmania. One tour operator visits a Victorian site almost daily with a 150-seat vessel. However, 'seal tourism central' is "The Nobbies" (Phillip Island, Victoria) where more than 200 000 people visit each year.

***Aussie Fur seals***

There are five breeding colonies of Australian fur seals on the islands of Victoria, and five on the islands of Tasmania. The largest colonies are at Lady Julia Percy Island and Seal Rocks in Victoria. Haul-out sites extend from southern Tasmania into southern New South Wales (Montague Island, and Seal Rocks near Port Stephens) and Kangaroo Island in South Australia. The total population of Australian fur seals is estimated to be 92 000. Their population is booming in Victoria, but is currently stable in Tasmania. Even so, several islands have not been reoccupied since their populations were removed by early commercial sealing, such as Seal Rocks, near Port Stephens in New South Wales; and Albatross Island, Councillor Island and Georges Rock in Tasmania.

***NZ Fur seals***

*[Yeh, thim Kiwi sills luv across 'The Ditch' too, Eh]*

There are 57 400 NZ fur seals but most of the population is concentrated between the southern tip of Eyre Peninsula and Kangaroo Island in South Australia. New Zealand fur seal populations in Western Australia are also increasing, where there are now about 15000 seals. NZ fur seals are still rare on breeding rocks in Bass Strait.

***Australian Sea Lion***

Some seals species are not doing well. The Australian sea lion population (now 11,200) was historically bigger and more extensive than it is today. Their range once went into Bass Strait in the east, with breeding colonies on islands near Albany and Perth, that are now only used as haul-out areas. The colony on the Abrolhos Islands near Geraldton, is thought to have been more extensive than it is today.

The Southern elephant seal and the Subantarctic fur seal are still in trouble and are classified as threatened species. They are usually only seen occasionally on the Australian coast. Elephant seals bred in Bass Strait in colonial times.

## SEALS and the fun they have with humans

***Strange as it may seem, seals don't really care much about our fascination with them, but devote their thoughts to a love affair with seafood. Therefore it's no surprise that their regular outings are to productive fishing grounds that are also used by recreational and commercial fishermen.***

Seals are intelligent, so some of them have worked out that there is no point vainly chasing after some fast-moving fish in the open ocean, not while humans are laying on a heap of fish immobilised on hooks, in cray pots, half-dead in nets, or herded together in a fish farm.

*Photo: WA Fisheries, seals robbing pots*

Fishermen still often consider them a menace and have been known to illegally shoot seals. Some fishing gear can also accidentally catch or entangle seals.

***Net robbers***

In our offshore scalefish trawling grounds they are often the subject of complaints. Seals can rip open valuable nets or damage the catch by biting off the tails of fish. When fishermen try to release trapped seals from nets they can be a bit upset about it, and dangerous to the crew. The seals are hanging around trawlers in large numbers because they are becoming habituated to this 'easy' meal.

The smarter ones stay away from the net mouth as it is being reeled out. As the trawler motors along the seals pull out the dead fish (stickers) caught in the net meshes from previous trawls. Dumber younger seals can enter the net mouth were most end up getting trapped. Underwater video footage has confirmed that about half the seals that became bycatch entered the net mouth during net shooting. Fishermen can only avoid this by speeding up the boat and steering clear of known seal haulouts.

To avoid costly issues, sometimes trawlers have to stop fishing and leave the area. This has been a big issue with the SA shark fishery, who get shut down if they accidentally net too many seals. The smarter fishermen don't want to catch seals anyway, as that damages the net and the 'clean, green' branding image they are trying to promote in the marketplace. People have trialed various seal excluder devices with mixed results.

They have also decided upon a Code of Practice, which asks fishermen to delay net deployment if seals are sighted, deploy and haul gear rapidly in the top 150 m of the water column, close the trawl opening when hauling, and avoid sudden course changes.
I have my own views about the effectiveness of voluntary codes, but big-time commercial trawlers appear to be trying at least.

***Fish Farm raiders***

If you want to find seal haters, talk to fish farm employees. On Tasmanian salmonid farms, big male fur seals sometimes leap onto net pontoons (even onto dinghies) and behave aggressively towards the employees, or charge divers trying to clean nets (only one employee has actually been bitten but it isn't nice).

The farm pens have to be tough to deter seals. Seals can leap over barriers and can kill or maim up to 300-400 salmon a night, often not eating all the dead salmon. Most farms in Tasmania operate with pens made in "polar circles" of 60–120 m diameter. When the fish get big enough to attract seals, they also use steel predator mesh outside the normal pen nets.

The local parks service will trap and relocate seals that are getting in the habit of visiting farms. Between 1990 and May 2000, 353 individual seals had been trapped in 672 trapping events (some were repeat offenders). Most are males, especially resorting to farms during the leaner winter months. NZ fur seals have just started to be an issue, and they are less chubby than Australian fur seals and can easily get over predator nets. On the Eyre Peninsula South Australia, NZ fur seals are jumping into the rings and are fast enough to be able to bite the backs out of tuna before jumping out of the rings.

Seals have great fun chasing the fish and also damage nets. Seals are believed to cause the Tasmanian salmoniid industry losses of about $10 million annually. Seals also die in net entanglements.

It costs $550 every time relocation is needed and its becoming a bigger problem every day. Catching a big smart male, that doesn't want to be caught, can be difficult and dangerous.  Other deterrent means are being trialed including explosive crackers, special nets, electrified covers and chemical deterrents. Various products such as super strong nets are being promoted as the total answer to the issue, and hopefully they can overcome the seals natural ingenuity. The various measures have all been heavily scrutinised with complaints about perceived cruelty. There is no need to be overtly cruel, but it isn't really in either party's long-term interest to encourage this unnatural feeding behaviour. They need to be deterred, without causing injury to the seals.

***Game fishermen***

Seals are also catching on to the fun days that can be had while involved in recreational fishing. Game fishing seems to be growing in popularity in south eastern Tasmania, for both seals and humans. It is now considered almost normal to have to first entice the tuna to take a lure, then discourage a seal from instantly biting it in half, both requiring a bit of technique.

According to Franklin Marine, "…when seals hear an outboard motor or a reel start to scream it just tells them it's party time…Recent reports from a competition held at Pedra Branca noted that one in four hook ups were being hit by seals, many times within seconds of the fish striking the lure. Obviously they were following the lure waiting for lunch to hit.

A good tactic to employ when a seal grabs a fish is to immediately flick your reel to free the spool, as this will allow the fish to out swim the seal. Usually the fish will head away from the rock, so follow the fish with the boat for several hundred yards by which time the seal will give up. Then just reel them in."

Seals striking fish also brings into place the danger of interacting with them up close. Large males can be very aggressive when faced with losing their lunch. Seals are like dogs in looks, nature and bite. You wouldn't take a bone out of the mouth of a large pit bull without taking great care, so treat seals the same."

Not everyone bothers. A colleague recently had to report a charter operator (not one of the more well-known ones) for shooting a seal on a charter trip. They had just hooked a fish when the skipper came out with a rusty shotgun and filled a nearby seal with lead. He was not much concerned about prosecution, the boat was full of tourists that he didn't know personally. He seemed to think they would be pleased and was surprised when they were aghast at his behavior.

Seal shooting was often practiced in the 1980s, although rarely discussed, except later in the night after a few beers. I recall that on dive trip we heard shots in the distance near a fishing boat, then we approached the haulout the seals were all swimming in the water and nervous at the approach of our boat.

Calls for seal culls still persist, but they no longer cite economic grounds. Now it is touted as a benefit for the environment, as seals are supposedly changing the population of cuttlefish, penguins or some other iconic species. Seals are recovering to their natural levels, which might ordinarily mean less penguins and cuttlefish if THEY are at unnatural levels. The real issue is that Australian commercial fishing quotas were set post – seal decimation. Many are scared that seal population recovery might mean a contraction of the Australian fishing industry.

***[more on seals next issue]***