

MARINE *Life*

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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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Cover Photo: Trial Harbour, West Coast of Tasmania,
- Mike Jacques

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News

National News roundup – more MPA backflips, acidic oceans	1
Antarctic & Southern Ocean news – Macquarie Island flourishing?	3
State-by-state:	
NT	4
QLD	5
SA	6
VIC	10
TAS	11

Bits & Pieces

Plastic shards threatening our oceans	12
Why seagulls are smarter than you think (and almost certainly hate you)	13
Threatened species – are we just not looking hard enough?	14

Feature Stories

Fossil discoveries and seal tourism (VIC)	17
A dark history of whaling (TAS)	19

NATIONAL News Roundup

Commonwealth marine park sanctuaries scrapped

Commonwealth MPA Management plans have been scrapped, including exclusion zones that would have come into effect next July. But the boundaries of all marine reserves and parks will stay in place while a "scientific review" is carried out. Environment Minister Greg Hunt says Labor's plans were flawed and would have locked out fishers. Mr Hunt says a review panel will be announced early next year and they will use a science-based process. "Exactly as we said before the election we have re-established and re-affirmed all of Australia's Commonwealth marine reserves," he said. "What we have done is begun the process of re-establishing the management plans within them."

WA scientist Jessica Meeuwig, has deplored the Abbott Government's decision, saying it is a cynical ploy aimed at watering down protections. The Queensland Seafood Industry Association (QSIA) welcomed the "the perfect Christmas present" for the seafood industry and seafood consumers. "... because our seafood harvesting is environmentally sustainable, it means Queensland also can maintain a healthy marine environment rich in biodiversity. The commercial and recreational fishing bans planned by the previous Government were not necessary but were demanded by environmental lobbyists who are simply philosophically opposed to fishing."

Australian Recreational Fishing Foundation director Allan Hansard said Labor's plan to lock fishers out of vast areas of ocean was done to meet a political agenda. "Australia's recreational fishers should not be locked out of marine reserves unless, after a thorough comparative assessment with other activities such as diving, tourism and defense activities, there is a good scientific reason to do so," he said.

Labor environment spokesman Mark Butler said the government had used obscure powers to undo 20 years of work started under the Keating Labor government and continued under John Howard.

"The management plans for the marine reserves were based on extensive scientific analysis and informed by serious community and industry consultation - now we will see this all happen again, possibly setting these protections back by a good two years," he said in a statement.

Greens Senator Rachel Siewert said this decision gutted Australia's marine parks. "The Government is pretending they are committed to marine parks, but this decision effectively eliminates them. This isn't about marine protection, it is about the Government's mates in fishing and industry," she said in a statement.

Oceans becoming more acidic

A new report shows the world's oceans have become 26 per cent more acidic since the industrial revolution.

[The Ocean Acidification summary](#), released by the International



Geosphere-Biosphere Programme, warns oceans could become 170 per cent more acidic by the end of the century compared to pre-industrial times. It was released as part of the Warsaw discussions on climate change and compiled by 540 experts from 37 nations.

It found about a quarter of all carbon dioxide emissions released by humans since the start of the industrial era have been absorbed by the ocean.

The report warns that unless carbon emissions are reduced there will be long-term, large-scale risks to ecosystems. "It has the potential to affect food security and it limits the capacity of the ocean to absorb CO₂ from human emissions. The economic impact of ocean acidification could be substantial," the report said. It says the rate of acidification is likely to be occurring faster now than at any time in the last 300 million years. It also says the ocean's role in moderating climate change will diminish as it continues to increase in acidity.

One of the report's lead authors, Anya Waite, of University of Western Australia's Oceans Institute, says there needs to be action to address acidification. "Reducing carbon dioxide emissions is the only way to minimise long-term risk," she said. "This particular set of studies has showed us that the acidity has increased by about 26 per cent and the ocean is absorbing a big chunk of the CO₂ that we are putting into the atmosphere

Corals can fight back



Scientists have shown that tropical corals have the ability to fight back against acidifying oceans.

While the threat of coral bleaching from higher sea-surface temperatures and direct human impacts still present serious risks to the long-term prospects for coral

reefs, the research findings suggest that many corals have the ability to largely offset the effects of increasingly acidic oceans.

Prof. Malcolm McCulloch said, "We've looked at many species of corals, including deep sea corals, and found that almost all of them are able to reduce the acidity – or pH – of the seawater they take in, adapting the chemistry of this seawater and hence enabling them to more efficiently extract this important material needed for building their coral skeletons." This process of 'buffering' seawater – raising its pH – only takes up a relatively small amount of energy and provides significant benefits to the coral. However Prof. McCulloch cautions that corals still face serious risks from climate change.

"But the rapid and often abrupt increases in ocean temperatures that are expected over the next 100 – 200 years are also likely to cause serious episodes of coral bleaching and when this happens the bleached corals are unable to function properly," he says. "Corals in this state will probably not be able to modify the chemistry of seawater they take in – an important part of the skeleton-building process – meaning that the effect of ocean acidification would be felt at exactly the time when it is most unwanted."

According to Prof. McCulloch, other skeleton-building marine species,



including some sponges and giant clams are unable to modify the acidity of the seawater they use to extract building material and these species may be even more vulnerable to the effects of climate change.



Antarctic & Southern Ocean News

Macquarie Island is flourishing

per Tasmanian Parks & Wildlife Service

Macquarie Island might be all clear of damaging pests



The blueprint for the pest eradication program on Macquarie Island was drawn up eight years ago, after it became apparent that vegetation loss due to a 100,000-plus rabbit population was causing problems for endangered plants and seabirds. Seabird breeding, plant regeneration and invertebrate populations were also being affected by rats and mice. This winter marks two years since the completion of aerial baiting on Macquarie Island and signs point to the eradication being a success.

Three specially trained rodent detection dogs have been on the island since March this year searching for any sign of surviving rats or mice. There is no fresh sign of rodents.

There has also been evidence of ecosystem recovery in the absence of rabbits and rodents. In March 2013, long term vegetation monitoring plots were revisited for the first time by DPIPWE botanists. Rapid recovery was noted in some of the most palatable and visible species, such as the megaherbs Macquarie Island cabbage (*Stilbocarpa*), silver-leaf daisy (*Pleurophyllum hookeri*), and tussock grass (*Poa foliosa*). The shield fern (*Polystichum vestitum*), is showing good recovery in the enclosures built six years ago to conserve a 'seed' population.



Macquarie Island's bird life is also recovering. Blue petrels are now breeding in more widespread nests on the island, whereas in the past



rat incursions restricted their breeding to offshore stacks. Terns have been seen to be breeding on cobblestone beaches, and grey petrels have had their most successful breeding season since recording of their populations commenced in 2000.



Tagging sharks and dodging crocs



Scientists Peter Kyne and Richard Willans have been sampling and tagging largetooth sawfish, spartooth sharks (*Glyphis glyphis*) and northern river sharks (*Glyphis garricki*) in the Top End for the past two years, seeking information about the species' life history and populations.

"These sharks grow slowly, mature late and produce few young," Richard said. "At present their management is precautionary because we don't know enough to assess whether populations are stable, declining or increasing."

The scientists have spent more than 150 days combing the rivers, billabongs, and muddy pools of nine major river systems. The sampling has involved setting gillnets in likely habitat and watching well into the night to ensure that any captured animals do not get eaten by crocodiles. In that time, they have fitted internal acoustic tags to more than 165 individuals. Peter and Richard have been surprised by the rarity of the largetooth sawfish. Not many of the juveniles are surviving to become sub-adults. Richard said modifications to freshwater river flows, increased crocodile numbers, and variation in rainfall between years, were thought to be potential factors dampening their recovery.

Conversely, the research has revealed an expanded range for the northern river shark.

"We now know this species is found in a lot more rivers in the area between Darwin and the eastern boundary of Kakadu National Park than was previously thought," Richard said. "We have also caught adult, sub-adult and juvenile northern river sharks within the same river system." "For spartooth sharks, however, we have only captured immature animals and it is currently unknown where the adults move to once they leave these rivers."

Despite these results, Richard flags the need for caution.

"Certainly in some of those rivers the populations appear healthy, but the issue is that both river shark species are not found in many other rivers around Australia. They seem to prefer big, turbid, high flow rivers, so although they might be fairly abundant in some rivers, the overall distribution and habitat is still limited. In addition to this, we know very little about where these species occur in habitat outside of rivers and estuaries, as almost all records come from a few rivers.

"We need to wait for the final results of the project that assesses the population status to see whether they are increasing, declining, or stable.

"Our goal is to support the recovery plans for these species and to provide guidance for managers needing to make decisions about proposed activities."

Peter and Richard have been assisted with their research, and with access to rivers, by Northern Territory Fisheries, Traditional Owners and Indigenous ranger groups, cattle station owners, and interns and volunteers from Charles Darwin University.



Queensland News

Bribie Island ocean breakthrough could be imminent

Bribie Island was one a very thick sand island offering a great windbreak for the holiday spot of Golden Beach near Caloundra. For many decades, yearly storms have been eating away at the island and threatening to open out the northern end to the effect of storms. At the same time breakthrough in other placed may cause the popular Pumicestone Passage to silt up with sand.

Environment Minister Andrew Powell has warned the Sunshine Coast council, a breakthrough is imminent if there is a repeat of last year's storm season this summer. However, he also said the Government will not do anything to stop erosion on Bribie Island or provide funding to protect the Golden Beach foreshore. "Take Action for Pumicestone Passage" president, Ken Mewburn, says it is a typical government response and the consequences are severe.



This WWII lookout post at Fort Bribie once rested on top of the dunes; they have eroded away since 1945

Torres Strait Islands going under?

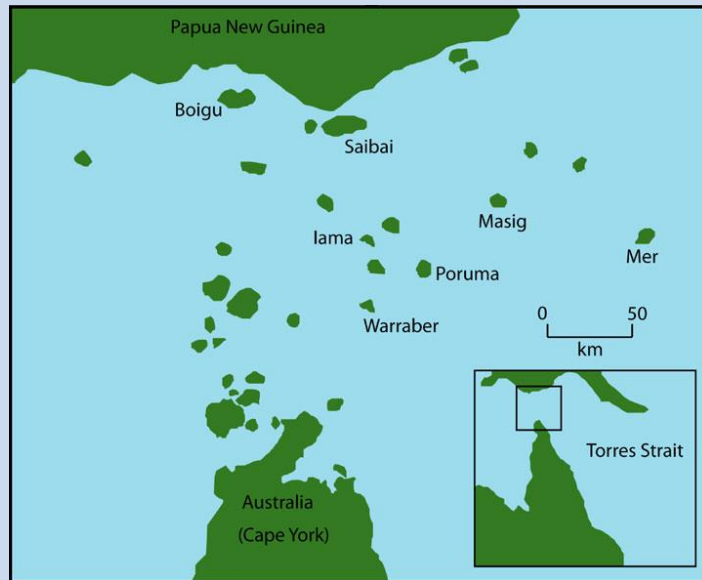


The Mayor of the Torres Strait Island Regional Council, Fred Gela, says he will investigate how to start building \$22 million seawalls after Federal money was granted to the council. While welcome this is only enough to get started, more will be needed to stop flooding of several islands during regular high tides. The Torres Strait is seen as especially vulnerable to rising seas and storm surges because houses and infrastructure are often only metres inland. The coastal erosion in the Strait is a complex combination of wind, tide and wave action.

Every year the residents of six particularly low lying islands endure flooding. Saibai – a low-lying Australian island just south of Papua New Guinea is knee deep in water following every king tide. The problem is expected to become more acute over the next few decades as the average sea level rises by half a metre. This has already been going on for several generations, but has been getting worse. The people have even been asked if they would be willing to abandon their ancestral home, creating Australia's first batch of climate change refugees. The possibility of permanent evacuations is sensitive, because the relationship with specific islands and reefs is intrinsic to the culture of

local people. An elder of Iamo Island, Walter Mackie, said in "That is where our lifestyle evolved. This is our world I am looking at. Relocation is the last avenue for us."

If flooding gets any worse, without ever larger sea walls, flooding will increase. It is likely to wash over rubbish tips, houses, airstrips, sewerage plants and water supplies. Coastal erosion has already seen over half Saibai Island's graveyard disappear out to sea, including recently interred bodies. Other sacred cultural sites are also at risk. The islands have over \$1 billion worth of infrastructure that is being partly damaged every year.



SA News

Concerns about new port plans

New port projects on the Eyre Peninsula have some people worried

There has been a scramble to develop the mineral resources of the peninsula with each miner trying to push its own proposal for a new port. Each of the projects has a range of impacts on the marine environment that have been a cause for concern, and not all the approval processes have encouraged a lot of public dialogue.

A multi-billion dollar port is planned at Cape Hardy by the Iron Road company for its iron ore exports from the Wudinna region. The site near



Port Neill, north-east of Tumby Bay, is about 10 kilometres north of the proposed port site for Centrex Metals' iron ore exports. Last year, a deep water development further north at Port Bonython was

also granted major project status. Another iron ore export facility, using a floating harbour, is planned for Lucky Bay about 100 kilometres south of Port Bonython.

The South Australian Greens say there is no need for multiple deep sea ports on the eastern Eyre Peninsula and asked for the proposals to be

combined. The SA Chamber of Mines and Energy (SACOME) say the state needs at least one deep sea port to attract investment in the mining industry. "We've been lobbying for a deep sea port for some time and we think we do need more than one," she said. "Not necessarily more than one on the Eyre Peninsula, but we probably need between two and three to service the needs of the up and coming mines."

Port Spencer

In 2008, Centrex Metals Ltd launched its proposal for a deep sea port adjacent to Lipson Cove and the Lipson Island Conservation Park, called "Sheep Hill" or "Port Spencer". The port will be for the export of bulk commodities in the region including Centrex's own iron ore projects. The initial design for the port encompasses a 515m jetty into water capable of loading Cape class vessels on any tide. The development will also accommodate Panamax berthing and loading facilities for grain exports.

The port requires no dredging and is in an area that is not subject to extreme weather events. Stage 2 of the project includes associated infrastructure for magnetite concentrate, various pipelines; dewatering facilities and a desalination plant at the port site, together with an accommodation village on Council owned land to the north of the cemetery, to house in excess of 1,000 workers.

Last year, a report found the \$250 million Port Spencer facility would be a boost for the region but identified several environmental impacts, including potential fuel spills into the marine environment. The Government fast-tracked approvals and cut off avenues for public protest. It has imposed several environmental conditions, including developing a Southern Right Whale management plan. Concerns remain about issues like seabed disturbance and oil spill risks.

Lucky Bay

The Lucky Bay project is much smaller and uses the existing ferry harbour on the west side of Spencer Gulf, which will be extended. IronClad will install a loading dock and moorings for its transshipment vessels in the extended harbour. The ore will be trucked to a loading dock where they will be loaded onto 70m long barges for transshipment to 70,000 ton Panamax size export vessels which will moor in deep water 9km offshore. Each barge will carry approximately 90 containers. The containers will be lifted from the barges using a 70m long crane barge moored against the export vessel.

Lucky Bay is located within the Franklin Harbour Marine Park and adjacent to the Franklin Harbour wetlands. Plans have changed from the initial proposals with a new 'covered' iron ore stockpile planned, adjacent to the Franklin Harbour wetlands. The transshipment area is located within the Franklin Harbour Marine Park. Endangered white-bellied sea eagles nest in the Franklin Harbour wetland, and the species' statewide population is an estimated 70 to 80 pairs. Migratory waders feed and roost on the foreshore immediately south of the proposed expanded harbour.

Cape Hardy

A new deep water port proposed for Cape Hardy on the Eyre Peninsula is selling itself as a proposal that will minimize impact on the foreshore, with no requirement for dredging, and with the narrow foreshore vegetation being passed over by an elevated load out jetty.

"The port solution would not require a costly breakwater and only minimal marine construction, with a simple finger jetty being suitable to service loading requirements." There will be the same concerns about noise, spills and marine animal interactions.

Port Boynton

We have previously covered the Port Boynton development and its possible impact on a unique cuttlefish aggregation.

Downsizing

All the projects have had to be downscaled as mineral prices fall. Centrex Metals Limited suggested an alternative option to its Port Spencer development, which uses a similar process to the Lucky Bay proposal and transfers product from a smaller barge to an offshore vessel. Centrex chief executive officer Ben Hammond says the new plan will mean less infrastructure would be built in the water and there shouldn't be any marine concerns. But conservationist and documentary maker Dan Monceaux says, "The concern is that transshipping actually results in more vessel movements on the surface, so while the main vessel to be loaded is further off shore, you've got more movements of barges between the shore and the vessel to load it, so there's more opportunity there for ship strike or disturbance to southern right whales."

Since then Centrex has announced changes to its Stage 2 manganese project for commercial reasons and that might not go ahead. Watch this space, as it is yet far from clear what will happen next. It is only clear that the government wants a new port and seems pretty determined to ram one through.

SA invertebrates in colour

If you want a great summary of all the rare and wonderful invertebrates in South Australia, check out this publication:

<http://www.naturefoundation.org.au/documents/Projects-Marine-Invertebrates.pdf>

Historic diving chamber found



A diving chamber found in the bush at Arkaroola in South Australia's Flinders Ranges has caused us to remember a lesser-known achievement of one of our early marine scientists, the late Dr Reg Sprigg. He was renowned for his geological work, but few know of Reg Sprigg's exploration of coastal waters in a purpose-built diving chamber decades ago, mapping areas of the ocean bed. The three-tonne chamber was hand built in the 1960s and used by Dr Sprigg's company Geosurveys Ltd.

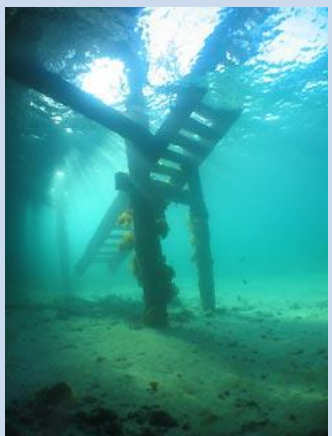
The diving chamber became Australia's first deep diving chamber to survey South Australia's geological and biological diversity. The survey ship, MV SAORI, was used to launch and retrieve the diving chamber. The name of the vessel stood for the South Australian Oceanographic Research Institute (SAORI), which Dr Sprigg established in the early 1960s. Researchers inside the chamber, which has a 1.5 metre diameter, would make observations through the windows and take measurements using a gravity meter. Scuba divers would work alongside the chamber collecting specimens and sediment samples, undertaking up to 10 deep dives a day.

It enabled marine biologists and other researchers to explore parts of South Australia's seafloor for the first time. In the four years after its launch in 1964, the chamber completed more than 560 dives across more than 3000 km² of coastal waters at depths of up to 60 metres. The area studied spanned Gulf St Vincent and Investigator Strait.



The restoration of the chamber has been a 12-month project in Lonsdale by a team of diving enthusiasts, including project leader Richard Harris and Southern Diving Centre's Peter Costello. It was used until the survey of Gulf St Vincent finished in 1969. Mr Sprigg died in 1994.

Edithburgh Jetty pylon removal



The unannounced removal of approximately 52 pylons from beneath the Edithburgh jetty has "shocked" the South Australian dive community.

The historic jetty is considered one of South Australia's most photogenic dive sites. On December 8, recreational divers witnessed a truckload of recently removed pylons leave the jetty, with evidence of corals and sponges still attached.

The Department of Planning, Transport and Infrastructure (DPTI) confirmed that the community was not consulted prior to the works commencing, nor was consideration given to potential environmental impact. DPTI had previously assessed the structure and determined the pylons to be a public safety risk.

Local marine biologist and dive instructor Stefan Andrews has dived this jetty over fifty times and was disturbed by what he saw on Saturday afternoon.

"It's hard to imagine that habitat removal of this scale can be authorised without considering the impact to the marine environment," says Adelaide-based marine conservationist and documentary filmmaker, Dan Monceaux. "Had the dive, marine science and conservation communities been informed of the intended work, we could have offered DPTI suggestions of ways to meet their public safety requirements whilst minimising harm to the marine environment."



The M.E. (Marine Environment) Dive Club and several other groups intend to represent their concerns to the Ministers for Transport and the Environment, in the hopes that similar harm is not caused at other jetties around the state. A group called 'Friends of Edithburgh Jetty' has been formed on Facebook to discuss the issue further. A short video of the damage is available on Youtube at: <http://www.youtube.com/watch?v=M7ryIXTiPBA>



Protest over Vic boat ramp

Abbott's Point move over, the Mallacoota boat ramp protest is heating up!



While some of us might find a construction plan for a boat ramp a bit low-key, this is the exposed Victorian Coast where all-weather boat access means big works with big breakwaters and car parks. For decades locals have been concerned that a big project would destroy the Bastion Point beach and its popular surf break. "Save Bastion Point" spokeswoman, Julie Parker, said while they had been lobbying for an upgrade to the facilities at the beach, the new development is too large.

The current 'ramp' is basically a launch off the open beach. The ramp has a number of safety issues, and is frequently sanded over. The East Gippsland Shire Council argues the \$6.5 million project is needed to improve safety for boats and provide separation for swimmers and

surfers. The Victorian government gave final approval for the Mallacoota Ocean Access Boat Ramp in January. Now the project has well and truly started.

Recently a woman dressed as a seal chained herself to a concrete block in order to obstruct the excavators. Police later charged her with trespass.

Construction of the new boat ramp is expected to be completed in February, a significant hurry-up from the initial planned completion date of September 2014. The new boat ramp will replace a 40-year-old one. Like all environmental protests there have been allegations of skulduggery and favouritism. In 2009, then planning minister Justin Madden allowed the development, despite an independent panel not supporting the upgrade. In 2010, an expert Maritime Safety Victoria panel also advised the state government not to build.



For many, including the major protesters, one of the great sadnesses of the Bastion Point saga is that friendships in Mallacoota (population 1,000) have been affected. One of the contractors working at the site is a childhood friend of the protest leader, "It's very hard to look them in the eyes in the street now," she said.

Tourism interests, abalone and fishing interests, and the East Gippsland Shire are overwhelmingly in favour of the development. Most of the remainder of the population is opposed.



TASSIE News (that 'other' island)

Marine Parks help resist invasive pests

Southeast Australia is an ocean warming "hotspot" – a region where temperature at the ocean's surface is increasing more rapidly than elsewhere. That means this part of Australia is like an outdoor laboratory for understanding nature's response to climate change. In research published this week in [Nature Climate Change](#), we found that marine reserves in this regional "hotspot" are important in reducing the effects of climate change on different species.

As oceans warm, subtropical species migrate into temperate regions. This creates new communities where groups of species may meet for the first time. One species that has already extended its range is the spiny sea urchin. This urchin has grazed down the seaweed beds attached to rocky reefs as it has moved southward, leaving a swath of barren patches in its path.

Habitat reserves protected from fishing within marine reserves appear to deter the urchin. Here, predatory lobsters grow to a size where they can feed on incoming urchins. Marine reserves can also allow a diverse set of predatory fish to develop. These fish may feed on other warm-water migrants, making it harder to colonise the area.

Over 20 years, information has been collected on the fishes from the Maria Island Marine National Park in Tasmania and nearby sites open to fishing. This allows us to look into the past to understand what has changed.

With warming water, fishes that eat seaweed have increased in both the protected and fished communities. These herbivorous species are typically limited to more tropical latitudes where warmer temperatures speed their digestion of seaweed. But now they are being seen in areas previously too cool for them. The proliferation of herbivores has led to greater numbers of species in the region as a whole and, because many of these species have new characteristics, also greater diversity in the functional roles species play in these communities.



photo: Rick Stuart-Smith

Communities in the marine reserve also turned out to be quite resilient. The number and diversity of species in the reserve remained more stable from year to year, as well as across decades, when compared to areas that have been open to fishing. Reserves also limited colonisation by warm-water species moving into the area. This might be because the reserves supported the return of large-bodied temperate species, such as the blue-throated wrasse, which may feed on new migrants.

Marine reserves have the potential to buffer climate-related biological variability, as well as to limit the spread of range-extending species. While marine reserves are valuable for creating thriving biological communities, they also help us understand ecological change in the absence of fishing. The new knowledge gained from Maria Island was possible because the long-term data on fish species could be usefully compared against nearby fished areas.

If our findings play out in other marine reserves, we can be assured that protected habitat networks will enhance the health of our oceans in an era of human influence and climate change.



photo: Emma Flukes

Bits & Pieces

Tiny threats to the ocean

Tiny plastic beads used in hundreds of toiletries from facial scrubs to toothpastes are slipping through water treatment plants.



Tiny plastic beads are turning up by the tens of millions in waterways. Scientists have worried about plastic debris in the oceans for decades, but recently, the question of smaller bits has gained attention. Plastics degrade so slowly and become coated with poisons in the water like the cancer-causing chemicals known as PCBs.

In recent months, major U.S. cosmetics companies have pledged to phase out the use of the beads in favor of natural alternatives, though they say the shift could take two years or more.

In the North American Great Lakes concentrations of as much as 1.1 million bits of microplastics per square mile have been recorded. Sewage treatment plants are not designed to capture the tiny beads, which vary in size but are about as big as a dot on a newspaper page. The problem of the tiny beads is to limit their use and there are viable natural alternatives.

[Thanks Jane for referring this news item]

Seagulls just hate some people

A recent article in BirdLife Tasmania's magazine "Yellowthroat" describes how readily sea gulls recognise and learn the facial features of humans – especially the ones they see as a potential 'predator'.



No, all seagulls do not look alike. We know that nesting gulls can recognize their mates in flight at a distance of one hundred feet, and that they also recognize neighbours by sight. It is important to be able to identify the nearby seagulls that specialise in nest robbing. They seem to be able to use these skills to identify dangerous humans too.

Research done some time ago in the U.S.A., seems to show that humans wearing different masks get different responses from gulls, the more the mask or face is associated with nest damage, the more they react in alarm.

Some recent local observations support this research. For the last few summers, Tasmanian ornithologist Dr Eric Woehler has been monitoring the Silver Gull colony on the Sorell Causeway. This occurs just before the eggs are oiled by the State Government in a management exercise. As soon as he emerges from his car, irrespective of the clothing and weather conditions, alarm calls are immediately sounded by the nearest gulls. The alarm calls are made despite Eric being outside the colony – walking along the footpath on the causeway is enough. It seems like that the Silver Gulls recognise Eric.

A second local example relates to the abandonment of the Domain Slipyard Silver Gull colony earlier this season. A council employee who has been involved in control measures on site for the last few seasons, attended the colony early in its formation. Just 24 hours later, the colony was empty, having been abandoned by the birds. We believe that the gulls recognised the employee from previous control measures and worked out what was about to happen.

Odd Redmap sightings – warty prowfish



(Not much is known about this rare species, so Redmap is interested in any sightings around Australia).

They're known from Wilsons Promontory to Lancelin, Western Australia and in northern and eastern Tasmania. They usually live in association with sponges, but also found amongst seagrass and macroalgae.

Contact REDMAP on (03) 6227 7277 or email enquiries@redmap.org.au

Extinction of marine species

Primary Source: "Species Extinction in the Marine Environment: Tasmania as a Regional Example of Overlooked Losses in Biodiversity" by Graham Edgar, Cath Samson and Neville Barrett

It's true that few marine invertebrates and plant species are likely to be listed as threatened in the foreseeable future. It's not because they are plentiful, as many species are in serious decline. We aren't finding threatened species because we aren't really looking that hard...

Why worry?

Australia isn't heavily populated and people say that the marine environment is in reasonable condition, apart from a few localised problems like heavy metals and some heavy pest infestation in the main urban rivers. Marine animals usually [but not always] breed well and disperse far and wide. They are pretty hard to kill off.



Gunn's Screw Shell- swamped by the NZ screw shell?

However, things are changing even for the very fertile. Threats to marine species like climate change, invasive species and industrial fishing are accelerating, and there is no place a species can go to get away from them as the effects are often everywhere.

Species declines have often gone unnoticed by different human generations because the changes are so slow compared

to the normal human life span. We think the depleted environment we see today was always like that—this is called the "sliding baseline syndrome".

How many marine animals are threatened?

Few marine animals are listed as extinct or threatened in Australia, with Tasmania having quite a few of the species that are. This apparently rosy story is an illusion. No-one is really looking to see how bad the problem is. In places like Tasmania, the majority of local biologists (≈ 50) and biologically trained managers (≈ 30) dealing with marine subjects have to focus mainly on fisheries issues, not on threatened 'secondary' species. For example, only one mollusc species Gunn's screw shell (*Gazameda gunnii*) has been listed as threatened. However, MOST of the >1000 Tasmanian mollusc species have not been sighted, or collected alive, during the past two decades.



NSW Centrostephanus Rogersii "black" urchin, causing vast barren areas along Tas and Vic coastlines.

If we take a core sample from the sediments, they show that inshore mollusc biodiversity has decreased from an average of 21 species per 5-cm slice of mud at the start of the twentieth century to 7 species per 5cm slice in 1990.

Although NO population data is available for MOST marine species, it is possible to get some idea of general population trends. The data we have indicates major population declines for the majority of species and widespread historical changes to inshore ecosystems.

Catch statistics show that native oysters, commercial scallops, southern rock lobster, orange roughy, eastern gemfish, barracouta, southern bluefin tuna, jack mackerel, school shark, and Bastard trumpeter have declined by >50% over three generations. That's enough to deserve IUCN "endangered" status—and many have declined by >80% (IUCN "critically endangered" status).

Aerial photographs indicate that giant *Macrocystis pyrifera* has declined significantly along the east coast since 1944. Seagrass beds have declined in area by approximately 25% since the 1950s.



Live-Bearing seastars – driven to the brink by NZ cushion stars?

All is not lost, the population declines experienced over the past century, may or may not progress to extinction. Local extinction is a lot more likely, than total extinction. Many marine species disperse widely in the larval stage as plankton. Others will spread very little and have very constrained home ranges, like most species of handfish. However, both are vulnerable to events that change the whole ecosystem, like climate change.

Climate Change

Mean surface sea temperature off the Tasmanian east coast has increased by >1° C since the 1940s, which has been one cause of loss of kelp and urchin barrens. If global warming contributes to another 1–2° C rise over the next century, many species of cool-temperate organisms are likely to disappear altogether. This will include a number of unique

Tasmanian species. These species can't go south to escape, at the bottom of Tasmania there is a deepwater barrier.

Introduced Species

Introduced species are another world-wide problem. Impacts of introduced flora and fauna are largely unknown and unstudied. By taking core samples we can have some idea of the effect it has had on local Tasmanian mollusc (shellfish) species.

Introduced species increased from <2% of total shells in 1900 to 50% in 1990. It's the same story when we look for live molluscs. Surveys across south eastern Tasmania indicated that 39% of total mollusc numbers and 83% of total mollusc biomass belonged to introduced species. That means that when you look at the bottom the vast majority of the shells you see are alien, not local.

That's pretty 'uncool' [Amy tells me I'm not allowed to do that word even if my generation invented it, I'm too old and that's uncool], because some of those species like the live-bearing seastar and handfish, really aren't found anywhere else. We are losing not just Tassie species, but whole kinds of animals that are part of the world's natural heritage.

Fishing

Targeted fish catches will rarely cause extinction of a species because the cost of fishing eventually exceeds the economic returns. This is called "commercial extinction". Indirect effects of fishing, however – habitat damage, bycatch, and trophic cascades – are not closely linked to economics and can potentially lead to extinction.

Oyster beds were lost as a habitat type statewide around 1890 following extensive dredging. Inshore scallop beds were depleted during the twentieth century. We don't really know what damage this caused to populations of unique Tasmanian species that relied on these habitats.

In 1989, large schools of orange roughy were discovered aggregating on approximately 70 seamounts off southern Tasmania. Trawling commenced off the deepwater seamounts that rise 300–600m from the continental slope in water depths of 1000–2000 m. During the initial “gold rush” period, all shallow (<1000 m depth) seamounts were heavily trawled, some more than 3000 times. A virtually unregulated trawl fishery blossomed for only 5-years before the fishery collapsed. The coral gardens removed by this process were likely to be unique to the area and have been heavily damaged if not destroyed. It is likely that rare species relying on that habitat have also been badly affected or destroyed. Unfortunately, it’s a bit too deep to go down and check it out easily.

Losses to bycatch can also be important. Shark species appear particularly vulnerable to bycatch threats because of slow growth, late onset of sexual maturity, direct reproduction, low fertility, and low natural mortality.

Indirect effects of fishing remain virtually unknown in Tasmania. In Tasmania annual surveys of plants and animals in four MPAs have revealed direct effects such as increases in rock lobsters and trumpeter,



and indirect effects such as declines in population numbers of abalone. Potentially damaging sea urchins have decreased by 70% in the largest MPA over 12 years. This has not yet translated to detectable changes in algal cover. In New Zealand’s Leigh marine reserve,

the only temperate MPA worldwide that has been studied for more than 20 years, increasing rock lobster and fish predation on grazers ultimately transformed sea urchin barren habitats to macroalgal forests after 15 years.

Conclusion

Our few marine scientists are mostly busy studying more economically important fished species. We don’t really check on a broad range of marine animal populations. As a result, you can’t assume that marine animals are immune from extinction risk. We always have to be careful and watchful.

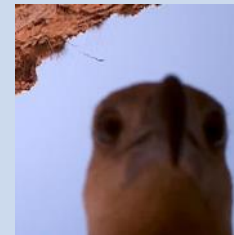


Sea eagle cameraman

Rangers in the Kimberly region of Western Australia recently set up a motion-sensor camera, hoping to record crocodiles.

The camera disappeared. It was later found near the Mary River, about 70 miles away.

A replay of the video footage revealed that a sea eagle had snatched the camera. The video then captured footage of its journey across the country’s remote landscape.



Wildlife rangers then released the [video](#). The bird’s flapping wings can be seen as it grabs the device and takes off, and the eagle later pokes its face into the camera lens.

FEATURE - VIC

Beaumaris fossil finds

An inconspicuous Melbourne bayside suburb is rated by palaeontologists as among the best sites for marine life fossils in Australasia.

The area first came to the attention of palaeontologists in the early 1970s when a teenage Tim Flannery found an articulated section of vertebrae and ribs belonging to an extinct seal while snorkelling. Among the Beaumaris locals 5 million to 6 million years ago were dugongs, killer sperm whales, pelagornis sea birds and giant marsupials. They lived in an era straddling two major epochs on the geologic timeline: the Miocene and the Pliocene. Back then the climate was warm and humid - with temperatures about 3 °C warmer than now.

A keen spear fisherman, diver and collector since his early teens, amateur diver, Ross Wilkie, retrieved a fossil off Beaumaris Beach. Mr Wilkie, 64, says he usually looks for shark teeth.

The 12-centimetre-long piece of flipper bone belonged to a seal, between 5 million and 6 million years old. Little is known about seal evolution in Australia. The mammals' bones are under-represented in the fossil record, as their skeletons are fragile and prone to breaking. The fossil is the first piece of evidence that this type of seal, an ancient relative of the Mediterranean monk seal, lived in Australian waters.



Seals of Nobby's rock

There is an active program of seal research at Phillip Island investigating seal numbers, range, diet and management issues.



Seal Rocks has 30,000 seals - one quarter of the entire population of Australian fur seals.

One and a half kilometres offshore from The Nobbies are Seal Rocks, home to Australia's largest Australian Fur Seal colony. The area became a sanctuary in 1928 and was declared a State Fauna Reserve in 1966.

Between 1966 and 1977, a small research team visited Seal Rocks to study the seal's reproductive behaviour and diet. Many seals were tagged for identification. The population was drastically reduced by early hunting, but annual counts during breeding seasons from 1965-1991 show the colony has slightly increased, though not back to pre-sealing numbers.

Research has continued since that date. A count is made of pups each year, at various stages, to try to estimate survival rates. An average of about 15% of pups that are born can die in the first two months of life. A multiplier of 4.5 times the pup births is used to estimate the population of Australian fur seals. Using these figures, we estimate that the total population of Australian fur seals was in the vicinity of 120,000 individuals in 2007.

At Seal Rocks they also do in bi-monthly scat (poo) collections. What the seals have been eating is then easily calculated. So far scientists have identified prey from 42 fish types (taxa), seven cephalopod taxa, no crabs or crays and no birds including no fairy penguins.

Seals basically eat whatever is around that they can manage to catch. Some years they catch a lot of redbait and barracuda. When small pelagic school fish aren't running they stock up on arrow squid, red cod (*Pseudophycis bachus*) and even leatherjackets. Six fish species represent 80% of the fish prey by species.

Scientists also monitor seal entanglement rates. In the past 10 years, they have seen over 300 entangled seals and removed debris from over 150 seals. Trawl net (usually green) has been the most common material on entangled seals, but its frequency has decreased in recent years. Monofilament (fishing) line is next and has also been increasing.

The Phillip Island tourist parade



The Nobby's kiosk on Phillip Island gets 200,000 visitors every year to this spectacular coastal scenery. The scenery is great, which makes up for the seal colony (the advertised attraction)

being miles offshore on an offshore rock and difficult to see. Most do it just as a prelude to a visit to other attractions, but pick a time late in the day or really early, when the crowds have thinned and it is a great experience.

To get personal with the seals you need to take a charter cruise. Boat traffic can be disruptive for seals, but here it happens so regularly that the seals take no notice at all.

Speaking as a Tasmanian, the population differences in Victoria take a bit of getting used to. I usually don't have to drive through heavy traffic for 90 min from the city to commune with nature at places with parking attendants and queues. Expect this on Phillip Island on warm days that coincide with public or school holidays.

If you are after the 'full package', take the kids to the sunset penguin parade at the nearby fairy penguin rookery only 5 minutes down the road (Tip - penguins are actually easier to see for free in their burrows along the boardwalk at the Nobbies). Bring warm clothes as the weather can be inclement and the waits long. Of course kids love waits, so bring some games or earplugs.

These days it is a huge affair, with grandstands, tourist buses and huge lights. A huddle of tourists jostle each other for spots to take prohibited pictures of fairly distant fairy penguins, but most still reckon it is worthwhile. You get a much better view if you pay for VIP tickets. Then you exit via the souvenir shop. Then it's on to the next massaged attraction.

It isn't an event for the spoilsport purists like me, but it's raising money for research and reserve management in the quieter spots.

The kids WILL love it too.



(HERITAGE) FEATURE - TAS

Old whaling ways



Harpooning whales in the South Seas. Note the heavy square-sterned sailing barques used in the Southern Ocean.

At the settlement of Hobart there could be 40 whales in the Derwent River, making it unsafe to cross the river. Small open boats were used initially to catch these whales resting close to the coast. Whale oil exports turned Hobart Town, then a stagnant penal colony, into an export powerhouse.

These coastal whale stocks were soon depleted.

A wave of new investment in large sailing ships for offshore whaling saw the industry grow even more. In the Pacific trade, Tasmanian whalers were well-known world-wide and rivalled the great American whaling fleets. In 1848 there were 37 whalers registered in Hobart. The number had decreased by ten a decade later. At the peak period of the industry between 1827 and 1831, up to 838 tons of oil were exported from Hobart. It was totally unsustainable and in 1859 the industry began to decline. In 1870 there were only 17 locally-owned whalers. In June 1896, the barque "Helen" left Hobart on the last whaling cruise made by a Tasmanian vessel.

A hard life

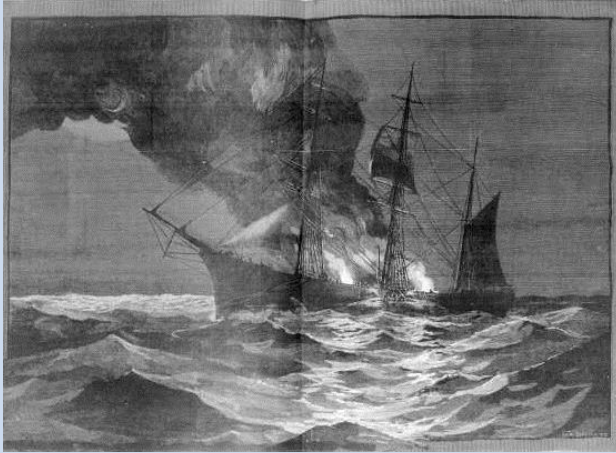
We now appreciate the violence of the trade and its effect on whales. It wasn't just the whales that were brutalised by whaling. Many whaling crews were a mix of displaced men of all nations, Scandinavians, freed African-American slaves, Tasmanian Aboriginals, or South Seas Islanders. Many Tasmanian whalers relied on ex-convict crews, men already hardened to a Spartan, dirty and brutal lifestyle. These men were desperate for work and short of easier options. They drifted from vessel to vessel, earning good money if it was a successful voyage, then losing most of it in drunken spending sprees. Hobart was a major servicing port for the international whaling fleet. It was no sleepy little English village then, but full of squalid waterfront pubs, renowned for violence, robbery, prostitution and chronic binge drinking.

There are many stories of brawling. The Mercury recounts the tale of John Taylor, "Jack the Dandy," a well-known local figure. He got his name after a fight with a French "dandy naval officer" at the White Pheasant pub in Goulburn St. The fight culminated in a duel in the skittle alley. The Ship Hotel was also the site of a regular grudge match between the local army garrison and a particular whaling crew.

The local prostitutes and barmen were known to target unsuspecting foreign sailors, lacing their drink with laudanum and robbing them of their earnings as soon as they were unconscious. Broke, the whalers were forced to sign on again to another voyage, a long dangerous journey to the empty areas of the Pacific where herds of Sperm Whale could still be found.

A successful hunt meant money, but also a steady grind of backbreaking work. They had to boil down the whales before the weather changed. It meant working all night and part of the next day. Sometimes they had to work for 14 hours on end, and got so tired that they were half-asleep at their work.

"It did not matter whether you, were freezing almost to death, dog-tired, and famished with hunger, you had to stick it out to the bitter end". At the end of a days work the bunks were hard, the blankets thin and the



food awful. Mutinies and desertions were more frequent than in other types of vessels. In 1842, *The Offley whaler ...has put into Sydney for want of hands, some of the seamen having deserted from her while among the Islands to the Eastward.*

In the 1850s gold rush, whaling captains were reluctant to put into ports anywhere near the gold fields. The whole crew was likely to desert and leave the ship stranded to rot away at anchor.

"After a man had been whaling a few years he became so inured to hardship that it made him callous and impervious to suffering. Human lives were reckoned of little account. Scarcely a voyage went by without some member of the crew being seriously injured, and it was quite a frequent occurrence for a man to be swept overboard."

A captain had to have nerves of steel to control these hard men. Fighting, goading of ship's officers and mutinies were relatively frequent. On a small island in Southport ("Pelican Island") there is the grave of William "Hakey" Atkinson, one of the crew of the "Waterwitch" who was killed with a blubber knife in his bunk. Even while restrained, the murderer had tried to kill another man by beating him over the head with a hammer. At the trial he was found to be a "perfect imbecile" and insane. In another incident, in 1877, the captain of the "Onward" shot and killed one of his own crew in cold blood after a day of abusive taunting. Murders were infrequent, but it was no place for the faint-hearted.

The life and loss of the barque "Offley"

The story of one Tasmanian whaling barque gives us an insight into an important period of our history.

The barque "Offley", named after an English district, sailed from England in 1832 for Van Diemens Land. She made a stop along the way to earn her keep in the New Zealand whaling grounds. *"A fine ship called the Offley, of about 500 tons burthen, commanded by Captain Stavers, arrived in the Bay of Islands, from the port of London... The Offley has been fitted out for the whaling service; she is quite new, the present being her maiden voyage, which she completed in rather more than four months".* Heavy hunting pressure gradually wore away at the herds and profitability fell on the "Offley's" later voyages.

In 1858, she was bought by Dr. W. L. Crowther and sent to new hunting grounds at Kerguelen Island, to take sea elephant oil instead. The schooner "Elizabeth Jane" was sent out to be her tender, but she was damaged in a storm and condemned. The "Flying Squirrel" was sent

from Hobart in her place, but her crew mutinied, and she returned to Hobart.

The "Offley" went to Hurd Island instead, in partnership with an



American vessel. A large quantity of seal oil was collected, but just when things were going well, a sudden storm cast the American vessel ashore with 400 tuns

of the partnership's oil on board. The Offley returned to Hobart with only 100 tuns of oil and the venture nearly sent Dr Crowther broke.

One of the "Offley's" crew lost both of his hands through frostbite during that expedition, and he was afterwards employed by Dr Crowther as watchman. There were other regular accidents. In 1862, the a 19 year old sailor fell from the rigging of the "Offley" and died. In 1866, the mate was killed while loading an explosive harpoon which misfired.



After 1869, the barque was owned by George Salier, a local draper. Captain James Scannon shipped as mate on the "Offley" for one voyage, which was very successful, and the owner gave him command of the barque. In 1879 the "Offley" had been laid up due to a low oil price. In 1880 the vessel was "dogged by bad luck". They left Hobart on a whaling voyage and went to the Middle Ground but found no whales.

The chronometer broke down and they put into Recherche, where a few of the crew deserted. While anchored, a strong easterly gale sprang up, the anchor chain parted, and the vessel went ashore and was abandoned.

While a few speculated about her wrecking being an insurance job, several other vessels were lost along the coast in the same storm. The Court decided that the master, Jeremiah Scannon, was "*wanting in ordinary prudence and caution in not letting the second anchor go and veering away more chain on the first anchor before dark, when the gale and sea had increased and the ship was in dangerous proximity to a lee shore*". His master's certificate was suspended for six months.

In 1885, Mr Graves of Southport bought the hull for £20, after he had 'secured all worthwhile' M. Mazey bought her for 10s., and subsequently offered what was left for 5s. without finding a buyer. She was burned to consume her upper works and liberate the copper and iron. What was

un-burnt by the fire lay "*fathom-deep among the kelp, the home of crayfish and such of the finny tribe as choose to live there*". I have also heard that the locals helped themselves to

anything of use on the wreck, dragging large sections of her around into the sheltered Waterhole Cove to be demolished.

In a 1926 visit to Recherche, Clive Lord from the Tasmanian museum saw the wreck off Evoralls Point, "*Down amidst the kelp off the point can still be observed on a clear day a few barnacle-covered timbers which mark the last remnants of the Offley*".

In 1928 Diver Hodgson relocated the wreck in weed which consisted of only a small 40ft section of the keel and pig-iron and stone ballast. A pile of copper deck pins were recovered for scrap and a lead basin given to the museum.



Only known surviving photo of the Offley, tied up at Salamanca

The wreck lies at the seaward end of Evorall's Point. In very shallow water. Some divers who have been there recently report that only a few brass pins and small fragments of rotten wood remain. Even so, it's an excellent shore dive in its own right. The area was once the D'Entrecasteux expedition's watering place and the rail head for the old Catamaran coal mines. The site looks like it had never seen this sort of activity and the greatest noise is now the incessant buzzing of some ferocious mosquitoes through a picturesque section of regrowth forest.

An old rusty boiler marks the start of the access road (an old tramway formation) which is now impassable and blocked off. A short walk takes

you close to Waterhole Cove on the southern side of the point. A short walk through the scrub in the opposite direction, will bring you to Coalbins Bay past the ruined foundations of the old coal loading facility. On either side there is safe entry and exit although the northern side is clearer and more interesting. Waterhole Cove seems to have a more restricted water exchange and much of the swim is across a muddy bottom covered in lumps of discarded coal. The more exposed seaward reef offers a very nice kelp garden. There are very luxuriant growths of different species of seaweed and all the common varieties of reef fish. A very attractive paddle that is suited to beginners. Novice divers and snorkelers should avoid the more exposed seaward side in rougher weather.



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