

MARINE *Life*

Issue 9

October/November 2010



Shark
Nudibranchs
Science News
Fisheries management
Seabirds
Maritime history
The wild West Coast
Adopting a reef
and much more...

A romance magazine - if you love Tasmania's oceans.

Marine Life magazine

Our Goal

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

The Editorial Staff

Michael Jacques Editor, a handsome devil!

Emma Flukes, The Loyal Deputy, another handsome devil

Geoff Rollins, Bedevilled

Phil White, The Devil!

Disclaimer: The views expressed in this publication are not necessarily the views of the editorial staff or associates of this publication. We make no promise that any of this will make sense. marinelifetassie@gmail.com

Cover Photo Alan Fletcher , I believe this is a Tasmanian Numbfish caught by a Kelp Gull. This Tasmanian ray if still alive, is capable of giving an electric shock (for a bird quite a big one). It's a great illustration of just how versatile gulls are.

Contact Us;
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An edition somewhat different. Tell us if you love or loathe the format. A bit of a fishy and birdy one too, which is no problem for me - Ed



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Local News

Table Cape Lighthouse opens to the public

21/09/2010

Recent works to the Table Cape Lighthouse have assisted in opening up the heritage-listed structure to the public. Built in 1888, the lighthouse has been given a new lease of life.

A range of conservation, occupation health and safety, and infrastructure work has been undertaken on the Lighthouse precinct in the past year. Works included installing non-slip paints and rubber matting; installing meshing at each internal landing, around the balcony and the external walkway and above the retaining wall; new interpretation signs; realigning roads; and the resurfacing of turning circles and parking areas.

The work was supported by a \$185,000 grant from the Commonwealth Department of Resources, Energy and Tourism.

The results have been well received. At the official opening earlier this month, visitors wound their way up the lighthouse, pausing at the windows that provide picturesque snapshots of the northwest coast.

“The lighthouse was last opened to the public in 1988 for its 100th birthday. It is an icon for the northwest coast and its official opening on 11 September 2010 is a tribute to Waratah Wynyard Council’s perseverance.”

The Table Cape Lighthouse was designed by Hickson and Hutchison of Hobart, and built in two sections. Mr John Luck of Devonport built the foundations, retaining wall and brick tower. The 20,000 bricks for the tower were transported as cargo from Melbourne.

The upper part of the lighthouse containing the landing and the light was built of steel and made in England. It was then dismantled, shipped out to Tasmania and re-assembled on site by the Duff Brothers of Hobart. The original Chance Bros. lantern and lens are still in place today.

Three houses of solid stone were also built for the Head Keeper and two assistant lighthouse keepers. These were demolished in 1923 following the conversion of the light to automatic operation.

Table Cape Lighthouse is the first Commonwealth-operated lighthouse in Tasmania to be open for tours. It is one of only 14 nationally that allows tours of a functional maritime navigation aid.



New turning circle to assist with visitor access to the site



New interpretation panels help explain the history of the site

Ever been mugged by a passing seal?

Capsicum spray approved for use to combat seals

Source ; ABC News Aug 27, 2010

The Tasmanian Government has approved the use of capsicum spray to help fish farm workers defend themselves against an increasing number of aggressive bull seals.



In half a century spent fishing Tasmania's coastline, John Hammond says he has never seen so many seals. "You would have never heard of a seal jumping in a dinghy with an operator 10 or 15 years back. It was unheard of," he said. "But it's happening, [it's] a fairly common occurrence these days and they get pretty nasty."

Mr Hammond says competition for food has lured the animals closer to shore. "It's creating more pressure around the fish farms too, that's why they're going to the fish farms of course because they're running short of food I would say," he said. Fish farmers say it has resulted in a rise in dangerous seal encounters.

Pheroze Jungalwalla from the Tasmanian Salmonoid Growers Association says the seals can be very aggressive. He says workers above the water have been injured in seal attacks but divers are at greater risk. "People have been bowled over, literally, by the seals trying to charge past them. Divers have been nipped, they've had their fins nipped, they've been dragged underwater," he said.

[Ed -Didn't specify whether this was playful or aggressive. In my experience, which isn't in the context of competition for food, they will pull on fins and the like without aggressive intent. Spray is a bit useless underwater anyway]

The State Government is supporting the use of capsicum spray in approved farms to be given to workers to keep on their boats. But there are doubts about whether the measure will work. The RSPCA's Dr Paul Swiatkowski is one of those unsure about the move. "For it to be effective you would have to be in close contact with the seal anyway," he said. "I can't see that it would be an alternative to shooting."

John Hammond also has doubts. "I don't know what happens with a big angry bull seal when you give him a squirt of capsicum spray. It would really turn him on I reckon," Mr Hammond said *[Ed- Perhaps you need a condom for protection then]*. He says the Government should go back to the drawing board.

Historical review of the SE trawl fishery

HMAP is a global research initiative which is part of the census of marine life. They study the past ocean life and human interaction with the sea. About 100 researchers have joined forces to develop an interdisciplinary research program using historical and environmental archives. We analyze marine population data before and after human impacts on the ocean became significant. Our goal is to enhance knowledge and understanding of how the diversity, distribution and abundance of marine life in the world's oceans changes over the long term.

<http://hmapcoml.org/projects/seaustralia/>

New lessees for Low Head Pilot Station

NPWS 13/09/2010

The Parks and Wildlife Service has announced that a new lessee is set to commence commercial operations at the Low Head Pilot Station and Historic Site from 1 October, 2010. Parks and Wildlife Service general manager Peter Mooney said that the consortium Sherrard, Florance and Godfrey (SFG) were the preferred proponents following an Expression of Interest (EOI) process that began in 2008.

"What is also encouraging is that the lessee is committed to investing in the site's accommodation and café and to providing improved visitor experiences."

"The Low Head Pilot Station and Lighthouse Precinct is the oldest group of pilot buildings in Australia, dating back to 1805 and the oldest pilot station operating from its original site. It is a place of national importance and one of Tasmania's most significant cultural assets," he said.

"We're also committed to supporting those community volunteers that contribute selflessly to the operation of the Maritime Museum and a separate lease agreement has been developed to support their activities."

It is expected that SFG will detail their plans for the site closer to the lease commencement date.

Derwent Estuary Habitat Atlas

06/03/2009

A 'Derwent Estuary Habitat Atlas' has been prepared to help improve awareness of the habitats found within the Derwent estuary. In 2008, foreshore, wetland and salt marsh habitats were mapped along approximately 100 km of the Derwent estuary. Wetland and saltmarsh information was extracted from the above vegetation maps and combined with habitat mapping products by other organizations to create a consolidated GIS database of common habitat types associated with the Derwent estuary.

This database is known as the Derwent Estuary Habitat Atlas and it is a web-based mapping resource hosted on the LIST website - [enter here](#) "The vegetation was mapped to improve knowledge of wetland and salt-marsh habitat, including the extent, and in some cases, condition, long-term viability and presence of weeds," Jason says. "A particular focus was to fill information gaps in the Clarence municipality, between Risdon Cove and Iron Pot, and the upper Derwent estuary between Bridgewater and New Norfolk."

Wetland and salt-marsh information throughout the estuary was augmented with other estuarine habitat data, generously provided by Information Land Services, Coastal Marine Branch - Environment Division, Tasmanian Aquaculture and Fisheries Institute, and Seacare Inc., in order to create the 'Derwent Estuary Habitat Atlas'.

To compliment and promote the 'Derwent Estuary Habitat Atlas' and associated mapping products on the LIST, the DEP supported a series of community field trips that were held in cooperation with the Tasmanian Parks and Wildlife Service Summer Rangers Program.

The DEP have also developed education materials in association with a teacher training seminar series at the Tasmanian Museum and Art Gallery.

Web-based interpretation materials on Derwent estuary habitats are available through the [DEP website](#)

The Derwent Estuary Program (DEP) is a regional partnership between local governments, the Tasmanian state government, commercial and industrial enterprises, and community-based groups to restore and promote our estuary.

Whale born in the Derwent

ABC Hobart (19 Aug 2010)

A Southern Right Whale has given birth to a calf in the Derwent River just off the shore of Taroona. The birth is thought to be the first in the river for about 190 years and is seen as a positive sign for both the whales and the river.

Current Fishwise Projects

A new round has just closed on 31 Oct, but here are some current projects of interest on the go



Recreational gillnetting

Lead Agency: Tasmanian Aquaculture and Fisheries Institute (TAFI)
Funding: \$50,600.00
Start Date: 01 October 2009 End Date: 30 June 2011

The project will comprise of two components: the first will be a description of how recreational net fishing practices have changed in relation to management changes and target species availability; the second component will focus on participation, intensity of fishing, catch rates, and catch by netting for the 2009/10 licensing year. Specific objectives are:

1. Describe how net fishers have responded in their fishing practices to recent management changes.
2. Assess recreational gillnet catch (including by-catch) and effort levels by region and season.

Social and Attitudinal Assessment of Recreational Fishers in Tasmania

(Due Soon)

Lead Agency: Tasmanian Aquaculture and Fisheries Institute (TAFI)
Funding: \$16,990.00
Start Date: 01 July 2010 End Date: 31 October 2010

The overarching objective of the proposed project is to provide a social, attitudinal and economic characterisation of Tasmania's recreational fishers. A secondary objective is to determine if and how these dimensions have 'evolved' over the seven years between the two surveys.

Studying the spawning dynamics of striped trumpeter - direct implications to fisheries management

Lead Agency: Tasmanian Aquaculture and Fisheries Institute (TAFI)

Funding: \$31,000.00

Start Date: 01 July 2010 End Date: 30 June 2011

1. Describe spatial variations in the spawning dynamics of striped trumpeter, including:

- the onset and duration of the spawning season across the latitudinal distribution along the east coast of Tasmania;
- spatial variance in the age at maturity;
- size specific fecundity.

2. Develop yield and spawner per recruit models to assess maximum and minimum size limit scenarios - optimise size limit management regulations.

More on Gillnetting Research and the Public Debate

Tasmanian Aquaculture and Fisheries Institute (TAFI) have started a three year study to better understand the impacts of gillnetting and the implications for by-catch and biodiversity.

The Minister said that in recent years there had been a number of initiatives introduced to help reduce by-catch, fish wastage and promote responsible fishing practices. These changes included the banning of recreational night netting in most areas and more recently the introduction of maximum soak times for gillnets following the 2009 scalefish review.

Mr Green said the new research would help determine whether recent management changes were meeting objectives and provide important information about gillnet usage prior to the next review of the scalefish fishery in 2014.

TAFI Director Professor Colin Buxton said in Tasmania commercial and recreational fishers used gillnets for a variety of finfish species. Currently there are around 150 commercial operators who report gillnet use with an average catch of 200 tonnes of scalefish a year. Prof Buxton said over 10,000 recreational net licenses were issued last year. "Previous surveys indicate that recreational fishers targeted much the same species as commercial operators.

"Despite recent improvements in the management of the gillnet fishery there have been conspicuous declines in the abundance of key gillnet species such as bastard trumpeter. There are also increasing community concerns about the ecological impacts of gillnetting," Prof Buxton said.

The research, led by TAFI researcher Dr Jeremy Lyle, is funded through the Fisheries Research and Development Corporation on behalf of the Australian Government.

Key objectives include a synthesis of existing information, assessment of by-catch levels associated with the main commercial gillnet fisheries, implications of recent management changes on recreational netting practices, and relationships between soak times, capture condition and survival of by-catch.

"This study is being undertaken in close collaboration with the Department of Primary Industries, Parks, Water and Environment, commercial and recreational fishing sectors and will involve surveys of fishers, catch sampling and research fishing trials.

"This information will be integrated to conduct an ecological risk assessment to evaluate the impacts of gillnetting on the biodiversity of key inshore ecosystems and to develop strategies to mitigate identified impacts."

The Tasmanian Conservation Trust said a total ban on recreational nets was needed.

"It's about time Tasmania moved into the 20th century because that's when most other states banned gill-netting," the trust's Christian Bell said.

Tasmanian Association for Recreational Fishing spokesman Mark Nikolai welcomed the study but said a ban would rob recreational fishers of a tradition. He said 90 per cent of the 10,000 recreational gill-net licences issued each year were only used at Christmas and Easter. "They're not in the water five days a week," Mr Nikolai said.

Birds Tasmania chairman Eric Woehler said recreational nets posed a threat to penguins and other diving birds. "People have a perception of a traditional right but the world has moved on, we know more now than we did 20 or 30 years ago," Dr Woehler said.

Recreational Fishing Tasmania spokesman Don Paton said amateur netting was sustainable and that seals had a bigger effect on fisheries. He said his organisation would address issues raised by the study, as it had in the past, by increasing net mesh size and adopting other measures.

Ocean planet news

Marine Adaptation Network session Hosted by the National Climate Change Adaptation Research Network for Marine Biodiversity and Resources (a.k.a. the Marine Adaptation Network) to discuss stakeholder needs to respond to, prepare for, and manage the risks associated with climate change impacts on marine biodiversity and resource sectors. The meeting is on October 27th. As the Environment sector's representative, Becc is very keen to put forward any/ all of your concerns and ideas on this issue, so contact her on marine@et.org.au to discuss.

Marine meeting - Thurs 5 October

We're coming up to Summer and lots of great opportunities to get out there and talk about our amazing oceans, so please come along to the next Ocean Planet meeting and help out! Thursday 5th October from 5.30pm Environment Tasmania, Level 1, 100 Elizabeth St Hobart. For more information or directions, call Becc on 0401 854 912

2010 Draft Management Plan Commercial Dive Fishery - Open for submissions

The Tasmanian commercial dive fishery management plan (the rules) expires in December 2010. The main species harvested under the commercial dive fishery are periwinkles and sea urchins. A new management plan has been drafted to supersede existing arrangements. The draft management plan is now open for 60 days public consultation. Stakeholders are invited to submit written submissions to the Department by C.O.B. on 15 November 2010.

<http://www.dpiw.tas.gov.au/inter.nsf/WebPages/LBUN-88P2CL?open>

Friends of Maatsuyker Island

Coastcare Groups and their members show a dedication, facing harsh conditions such as howling winds, torrential rainfall and long, rough boat or helicopter rides through remote coastlands has still not discouraged a hardy group of volunteers from tackling an infestation of invasive weeds on remote Maatsuyker Island, Tasmania.

Their efforts have seen more than 95% of the weed infestations in the area killed and burrowing seabirds returning to their original habitat. Every year the volunteers return to continue their care for the World Heritage-listed island.



Part of the Southwest National Park and Tasmanian Wilderness World Heritage Area, Maatsuyker Island lies 10 kilometers off Tasmania's remote southwest coast. While its wet and windy climate may not be cosy for humans, it provides a perfect home for seals, seabirds, skinks, a single species of marsupial mouse and diverse flora species.



Unfortunately, two destructive weeds found their way to this unique site. Blackberry and Montbretia had infested burrowing seabird habitat, forcing out birds such as the short-tailed shearwater, fairy prions and the threatened soft-plumaged petrel.

Friends of Maatsuyker Island (FOMI) face some major challenges in tackling the weeds. The islands remote location means it can only be reached by boat or helicopter. Volunteers must be able to commit two weeks at a time and run the risk of being stranded on the island if weather conditions deteriorate. The small number of volunteers who can cope with these conditions have to carry out weed removal activities without disturbing wildlife and in accordance with strict national park guidelines.

In 2004, nine volunteers spent two weeks on the island targeting the weed outbreaks with approved methods including the Bradley Method of hand control, brush cutting and strategic herbicide application. Group members have visited the island for follow up working bees every year since.

Their efforts have been successful to date. Around 95% of the Blackberry and 98% of the Montbretia has been killed, with minimal re-growth. Subsequently the short-tailed shearwater burrows in the area are being utilised once again.

National/International News

Release of the 2009 State of the Climate report

The 2009 State of the Climate report is a comprehensive appraisal of Earth's climate by more than 300 authors from 48 countries and portrays all aspects of the climate system. Observations spanned the atmosphere, land, and ocean from the poles to the equator, and confirm that the past decade was the warmest on record and that the Earth has been growing warmer over the last 50 years.

Based on comprehensive data from multiple sources, the report defines 10 measurable planet-wide features used to gauge global temperature changes. The relative movement of each of these indicators proves consistent with a warming world. Seven indicators are rising: air temperature over land, sea-surface temperature, air temperature over oceans, sea level, ocean heat, humidity and tropospheric temperature in the "active-weather" layer of the atmosphere closest to the Earth's surface. Three indicators are declining: Arctic sea ice, glaciers and spring snow cover in the Northern hemisphere.

State of the Climate is published as a special supplement to the Bulletin of the American Meteorological Society and is edited by D.S. Arndt, M.O. Baringer, and M.R. Johnson.

<http://www.ncdc.noaa.gov/bams-state-of-the-climate/2009.php>

Taxonomy, a dying art?

ABC News

According to an inventory recently released by scientists around the world, there are 114,000 known marine species. 33,000 are in Australian waters. The decade long ocean census is a \$650 million effort to answer a very old question: what lives under the sea? But they say the study is far from comprehensive and they estimate that there could be as many as a quarter of a million different forms of marine life just in Australian waters. Alan Butler from the CSIRO is the lead author of the Australian component of the study.

"Every time we go to the deep sea and take samples we find that only around about a fifth of the things we find are actually known, the rest are new. So if you take account of that our best guess is there might be something like 250,000 species in Australian waters. Australian waters are particularly vibrant with a variety of marine species. For Australia it's a combination of the way it's drifted away from Antarctica over the last 100 million years or so, leaving a southern margin which has been isolated for a long time. So that's an area where species could, new species, could be formed and the combination of that plus crashing into the South East Asian region at the northern margin of Australia, that's a hot spot of biodiversity and Australia is part of it. So we have a wide variety of environments in Australia ranging from tropical to sub-Antarctic, that again, partly accounts for our high diversity."

But according to Alan Butler there is a threat to the study of marine life in Australia. He said the accomplishments of the study being released today is the result of nearly 200 years work by an army of scientists in the field of taxonomy, the science of classification.

"That army of specialists is dwindling, and that's a bit of a concern that when people retire they're not being replaced as fast as they retire. I think it's a complex of reasons, it's partly

taxonomy, the classification of animals, being seen as a rather dull subject and not as fashionable as genetics and biochemistry and other things. I think those are old fashioned views I must say, I mean now taxonomy uses things like genetics and biochemistry and it's a pretty complicated and exciting field, but there has been a hiatus for the last 10, 20, 30 years when it hasn't been fashionable to do taxonomy. There haven't been many jobs, so students have tended to train in other things, rather than in taxonomy.

More info on the Census of Marine Life <http://www.coml.org/>

Ocean Art

Kimberly Jermain <http://www.coml.org/census-arts/jermain>



Ørnulf Opdahl <http://www.coml.org/census-arts/opdahl>



Critter Files

Tasmanian numbfish (*Narcine tasmaniensis*)

Habitat: sheltered mud, sand

Depth range: 3-640 m

Size: up to 46 cm

Diet: amphipods, shrimps, worms and benthic molluscs

The Tassie numbfish is a bizarre half-shark, half-ray creature. It is most commonly found on the continental shelf in water depths of 200-640 m off mainland Australia, but can also be seen on soft sediments in sheltered bays around Tasmania. If you've dived for scallops in the d'Entrecasteaux Channel, you've likely come across numbfish before but may not have noticed them in your hunting frenzy. Also known as an electric ray, these fish are capable of delivering a mild electric shock if pestered. Unlikely to be a practical source of alternative energy.

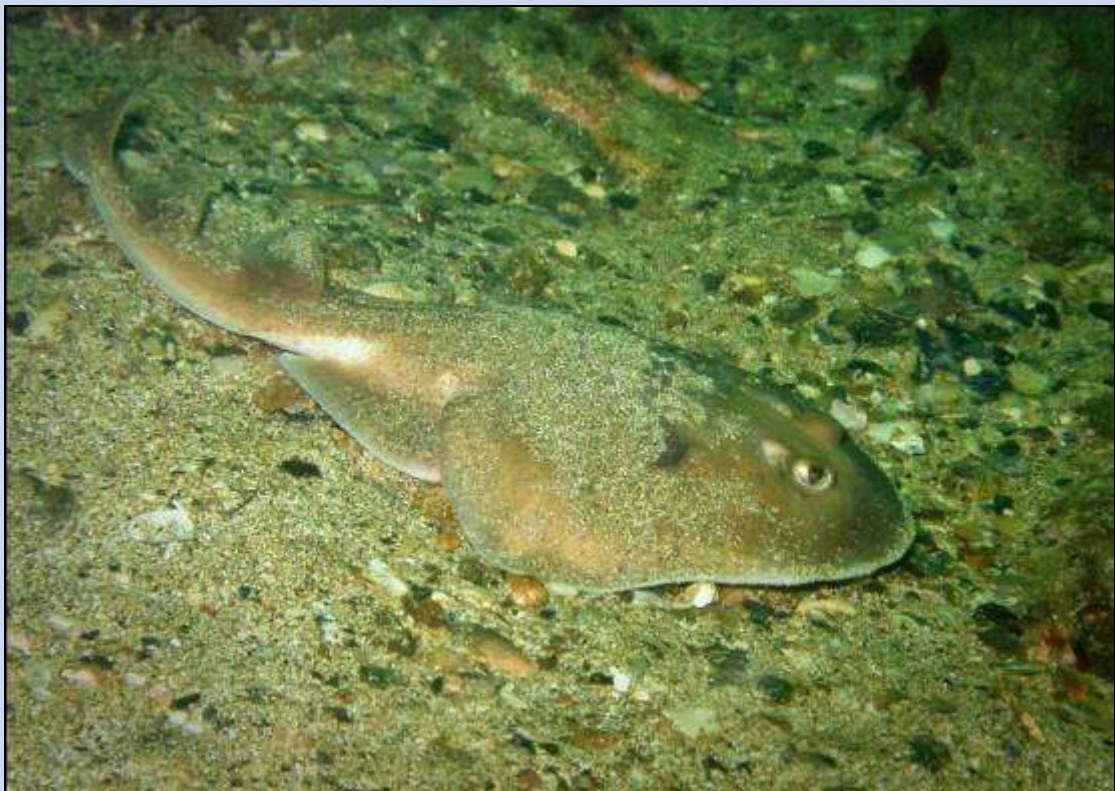


Photo © Emma Flukes

Sharkbait

by Emma



Everything you ever wanted to know about shark attacks and a few things you probably didn't..

If you pay any attention to the media, you've probably been hearing a lot about sharks lately. From shark sanctuaries to sharkfin soup, these guys certainly seem to strike that little something in people that assures them at least page 5 in *The Mercury*. Simply say the word "shark" and most

people conjure up images of a *Jaws*-inspired white pointer indiscriminately devouring unsuspecting swimmers while authorities and scientists stand helplessly by. Indeed, following a spate of bad press, our toothy friends seem to have become the object of increasing concern amongst people using waterways and coastal areas. But how worried should we really be about this perceived threat?

Sharks, like many other large animals, have been documented attackers (and sometimes consumers) of humans around the world throughout recorded history. Depending on who you talk to, the exact date of the first recorded shark attack is somewhere between 400 B.C. and 1845 A.D. However, shark attacks do not appear to have become a subject of particular public interest until the twentieth century. The Florida Museum of Natural History, holder of the International Shark Attack File (ISAF), suggests several factors have contributed to the upswing in public awareness of shark attacks during the last half century.

"First and foremost has been the evolution of the press from a parochial to a cosmopolitan news-gathering system that covers a larger portion of the world in a more rapid and comprehensive manner. Increased competition and a shift of journalistic values in certain quarters additionally has contributed to more active searches for "shock" stories, i.e. those that titillate the public and promote sales. Needless to say, an examination of current weekly tabloids confirms that "shark eats man" is a best-selling story line.

World War II, with a plethora of air and sea disasters never before encountered during previous confrontations or in peacetime, regrettably spawned large numbers of shark attacks and spurred research to find an effective shark repellent. The general worldwide trend towards more intense utilization of marine waters for recreational activities during this time period has also increased the chances of shark-human interactions with a resulting increase in the total number of attacks. Add in fictionalized shark accounts in the popular press and movies and it's easy to see why shark attack is a hot topic."

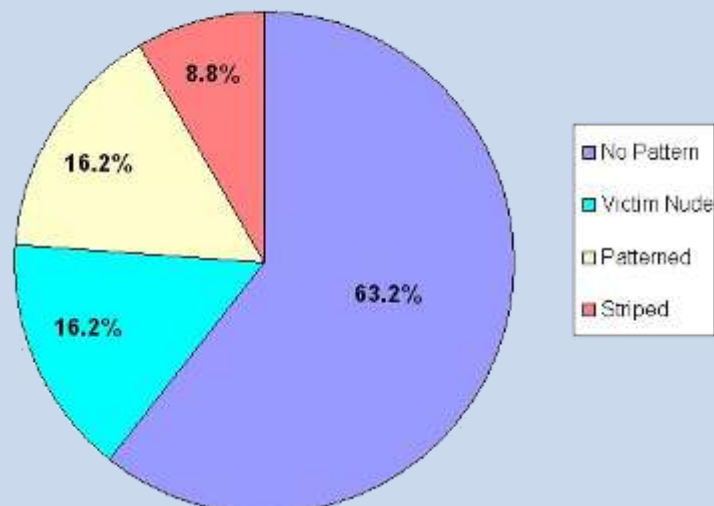


A clever Photoshop job. Or is it...?

Why do sharks attack humans?

Short of sitting down with a shark over coffee and discussing the relative merits of eating humans, it's difficult to determine exactly *why* sharks attack people. Mistaken identity is usually cited as the primary reason behind attacks, particularly non-fatal events. Splashing and wearing reflective jewellery is thought to mimic the action of fishes with light reflecting off scales, while wearing highly contrasting gear makes you especially visible to sharks. Although you might think your slick black wetsuit and fins make you look like a seal, to a shark you're noticeably harder to spot than wearers of fluoro 70's suits and Hawaiian boardshorts. Nude diving also might not be a great idea if you're looking to avoid being chewed.

The General Pattern of Divers' Clothing (N=71)



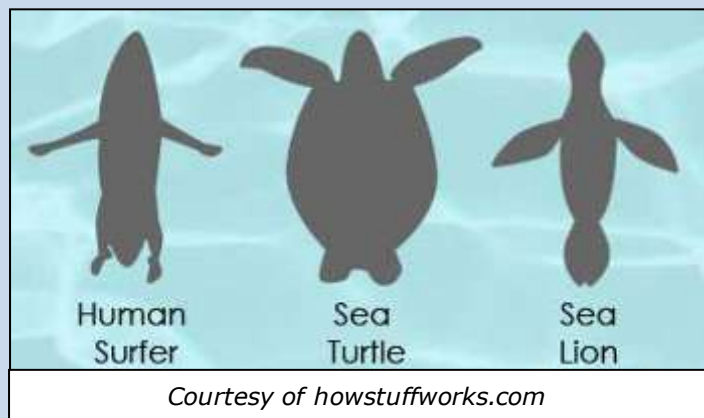
Breakdown of shark attacks on divers based on patterning of clothing. Data from ISAF.

Sharks may respond to human aggression when prodded and poked by divers and swimmers. For this reason, shark attack statistics are divided between “provoked” and “unprovoked” attacks. ISAF defines “unprovoked attacks” as incidents where an attack on a live human by a shark occurs in its natural habitat without provocation of the animal. This does not include incidents involving divers in public aquaria or research holding-pens, scavenging of already dead humans, attacks on boats, or provoked incidents. So-called “provoked attacks” usually occur when a human initiates physical contact with a shark, e.g. a diver bitten after grabbing a shark, a fisherman bitten while removing a shark from a net, attacks on spearfishers and/or people feeding sharks etc.

There are three major kinds of unprovoked shark attacks that have so far been identified and described:

1. The “hit and run” attack

Sharks are highly territorial and, like any sophisticated apex predator, are curious when they encounter something unusual in their territories. Without limbs or sensitive digits, the only way sharks can explore an object is by biting it, termed “exploratory bites”. Hit and run attacks tend to involve a single exploratory bite and usually occur in the surf zone with swimmers and surfers. These exploratory



bites are thought to be a result of sharks mistaking surfers’ silhouettes as the shape of prey under conditions of high turbulence and poor water visibility. It is thought that, upon biting, the sharks quickly realize that the human is a foreign object and release the person. “Hit and run” injuries tend to be confined to relatively small lacerations, often on the lower leg, and are seldom life-threatening.

2. The “bump and bite” attack

This form of attack, although less common than the “hit and run” attack, is reported to result in greater injuries and most fatalities. “Bump and bite” attacks usually involve divers or swimmers in deeper waters and are characterized by the shark initially circling and often bumping the victim prior to the actual attack. Unlike the “hit and run” patterns, repeat attacks are not uncommon and injuries incurred during this type of attack are severe and frequently result in death.

3. The “sneak” attack

Similar to the “bump and bite” attack in terms of frequency and infliction of injury, a “sneak” attack will usually occur without warning. The disappearance of many victims of open ocean disasters such as plane and ship accidents were likely a result of “bump and bite” or “sneak”

shark attacks. An infamous example includes the sinking of the *Nova Scotia* steamship near South Africa during World War II. Of the 1000 people onboard, only 192 survived and the vast majority of lives lost were attributed to oceanic whitetip sharks.

Despite a few rare exceptions (see news stories of these attacks in [2007](#) and [2008](#) in Adelaide and WA), it has been concluded that feeding is not a primary reason for sharks to attack humans. According to something I found on the internet (so it must be true), "...humans are not on the menu. In fact, humans don't provide enough high-fat meat for sharks, which need a lot of energy to power their large, muscular bodies". A large proportion of documented shark attacks have occurred amongst spearfishermen, where fish blood is being released into the water and electrical impulses are given off by struggling fish. A set of electrically sensitive cells ("detectors") under the skin on a shark's snout receive these signals and can cause the animals to become agitated and aggressive, making it easier to mistake a human for its usual prey. Cases in which sharks seem to attack out of aggression are believed to be a dominance display, often taking the form of "punching" with the snout or bites that would not do much damage to the tough skin of a shark. Unfortunately, a dominance display by a shark towards a human can still cause horrendous damage.

As George Burgess, director of the International Shark Attack File, succinctly puts it; "attacks are basically an odds game based on how many hours you are in the water".

Global trends in shark attacks

As with traffic accidents, it is difficult to predict short-term trends in shark attack numbers over the scale of individual years. Observed over the scale of decades however, the number of unprovoked shark attacks has risen at a steady rate over the past century. Prior to the 21st Century, the 1990's had the highest attack total of any decade. This upward trend has continued, with the previous decadal total surpassed during 2007. Experts are quick to point out that an increasing number of shark attacks does not necessarily mean there is an increase in the **rate** of shark attacks. Rather, it is likely reflective of the ever-increasing amount of time spent by humans in seas and waterways. As the world's population continues to rise and hence aquatic recreational activities increase, it is realistic to expect an increase in the number of shark attacks. In addition to this, the efficiency of discovering and investigating attacks has improved greatly over the past few decades with fundamental advances in electronic communication and better documentation of attacks spawned by increased media attention.

The situation in Australia

Sharks occur in all coastal and estuarine waters around the 27,000 km of Australia's coastline. Of the estimated 370 species occurring worldwide, at least 166 of these are known to inhabit Australian waters. Only a very small proportion of these species are known to be dangerous to humans. The majority of shark attacks recorded in Australia have come from three main groups of sharks: the white shark (*Carcharodon carcharias*), tiger shark (*Galeocerdo curvier*) and the whalers (Carcharhinidae) containing the bull shark (*Carcharias leucas*). Numerous

other species are capable of attacks on humans, particularly larger ones such as wobbegongs, hammerheads, blue sharks and makos. Identification of species involved in attacks is difficult because victims seldom see the shark at all, or certainly not in sufficient detail to make an accurate identification. However, it's fairly safe to assume that a savage attack by a gummy shark isn't going to leave too much of a mark.



Great white shark, tiger shark & bull shark (L to R).

Along with South Africa and the USA, Australia continues to have a bad reputation when it comes to shark attacks on humans. However it may surprise some of you that over the last 50 years, there have been just 52 fatalities (an average of 1.04 per year) in Australian waters from shark attacks. Below is a breakdown of Australian shark attacks by state:

State	Total cases	Fatal	Injured	Uninjured	Last Fatality
NSW	277	70	148	59	2008 Ballina, Lighthouse Beach
QLD	245	72	150	23	2006 North Stradbroke Island
WA	100	16	63	21	2010 Cowaramup Bay
SA	52	18	27	7	2005 Glenelg Beach
VIC	50	9	26	15	1977 Mornington Peninsula
TAS	21	5	9	7	1993 Tenth Is, Georgetown
NT	10	2	5	3	1938 Bathurst Island
Total	755	192	428	135	(as of 18/08/2010)

In Tasmania, the total over the same period is just 5 with a further 9 people injured by sharks. Below is a list of some of Tasmania's shark sightings and attacks over the past 50(ish) years:

- **2010:** A 5-6m white pointer swims past commercial abalone diver Daniel Walter while diving in the d'Entrecasteaux Channel, 100m offshore from Middleton.
- **2009:** 13 year-old Hannah Mighall is attacked by a 5m white pointer while surfing at Binalong Bay. Her cousin "fends off" the shark, and the victim sustains a single bite injury to her calf
- **2005:** Two 6m white pointers seen off Tasman Peninsula.
- **2000:** A 3m white pointer caught off Bruny Island.
- **1998:** A 6m white pointer menaces divers and fishermen off Tasmania's North-East.

- **1994:** More than 50 bronze whalers and tiger sharks spotted in shallow water off Bakers Beach in the North-West.
- **1993:** A 5m white pointer kills Exeter mother-of-five Therese Cartwright 25km east of Low Head while she was diving at the seal colony of Barrenjoey Island. A similar-sized shark is spotted at the same site just 3 days later.
- **1992:** Shark chases Rosny College student Wayne Fitzpatrick while he surfs at Clifton Beach.
- **1989:** Launceston student Steven Jillett spends 20 minutes avoiding a shark that bit his surfboard at Shelley Beach, Scamander. A 3m shark caught at Anderson Bay near Bridport.
- **1984:** A 6m white pointer takes an abalone diver's catch from his hands off Cape Raoul. A 6m white pointer pins Hobart abalone diver Jamie Mison to the sea bed for more than an hour.
- **1982:** A fisherman spots a 5m white pointer take Hobart skindiver Geert Talen 25m off South-East Cape near Lion Rock. His body was never recovered.
- **1979:** A bronze whaler steals fish from three spear fishermen near Bicheno.
- **1978:** A 5m shark attacks Lauderdale abalone diver Jim Scott off Tasman Peninsula. Scott sustains several broken ribs but survives by hiding among rocks and stabbing the shark's eyes.
- **1975:** Hobart abalone diver Bobby Slack disappears off Fluted Cape on Bruny Island. A shark attack is blamed.
- **1972:** Nubeena abalone diver Gordon Johnson fights off 4m shark off Nubeena in the state's South-East. Needs 32 stitches in his gashed foot.
- **1960:** A 16' boat is rammed while setting crayfish pots off Eaglehawk Neck.
- **1959 (Unconfirmed):** Brian Derry dies January 17 about 100m from his ship, swimming in deep water off Safety Cove near Port Arthur. Accounts reported two sharks, 5.2m and 6m long, nearby. John Grave is bitten on the thigh while swimming in Whale Bay, King Island.

When listed like that, the history of shark sightings and attacks in Tasmania alone all looks pretty impressive. But putting these numbers into perspective, paints a very different story.

Shark attack relative to other risks

On average, heart disease kills 7.2 million people worldwide each year. Cancer - 6.7 million. Mosquitoes – 2,000,000. Motor vehicle accident - 1.2 million. Drowning - 450,000. Snakes – 40,000. Falling off a ladder – 9,000. Bees and wasps – 1,200. Lighting strike – 1,170. Dog attack – 570. Elephants – 500. Falling coconuts – 150. Jellyfish – 100. Vending machines – 13.

Sharks (all species combined) kill around **4-5 people worldwide each year**. This equates to around a **1 in 1.4 billion chance of being killed by a shark**. If you live in Australia, this figure is something like 1 in 20.6 million. Regardless, you're roughly 2,000 times more likely to be killed by falling off a stepladder while pimping out your guttering, or 250 times more likely to be struck and killed by lightning.

The naysayers and sharkphobes tend to scoff at these figures and point out that people are more likely to be exposed to things like bees and wasps than to sharks. And of course they're right - any human can be struck down by heart disease, while many people will never go near a beach or waterway. The point is that every one of us is far more likely to be killed by dogs/bees/ladders/lightning/coconuts/vending machines than by the supposed vicious man-eaters. See [this page](#) for more figures regarding the relative risk of shark attack to humans relative to other risks (US only). When considering *only* the subset of people that are potentially exposed to sharks, the risk of fatality relative to other beach-related risks is still miniscule.

A study by the United States Lifesaving Association found that in the year 2000, approximately 264.1 million people visited US beaches. Of these, lifeguards provided medical aid to 236,642. A further 70,711 were rescued from potential drowning, and 74 people drowned. 23 people were attacked by sharks (unprovoked), and 0 died. To put this into perspective, the likelihood of near-drowning amongst people visiting US beaches was 1 in 3733 people. The likelihood of drowning was 1 in 3.5 million, and the likelihood of an unprovoked shark attack was 1 in 11.5 million. **The chance of any given beachgoer dying from a shark attack in the year 2000 was 0 in 264.1 million.**

Now I'm not much of a gambler, but I'm willing to take my chances with those sort of odds. If you're particularly paranoid, there's an endless list of things you can do to supposedly reduce your chances of attack even further. Some of these include:

- Stay in groups, as sharks are more likely to attack solitary individuals
- Avoid being in the water at night or during twilight hours when sharks are most active and you're unlikely to spot them
- Stay out of the water if you're bleeding
- Don't wear shiny jewellery, as the reflected light mimics fish scales
- Avoid waters containing effluent or sewage as well as those being used by fishermen, particularly if bait fish are present
- Dolphins do not indicate an absence of sharks - they feed on the same things
- Refrain from splashing excessively and keep pets out of the water because their erratic movements can be interpreted as struggling prey
- Don't molest sharks - you'd bite back too in the same situation!

The ocean is not a swimming pool. It's a wild environment. There are things in there that do bite/sting/scratch. Be aware, be smart, and watch out for those falling vending machines.

For more info, and breakdown of shark attacks by activity, location etc. check out the International Shark Attack File at <http://www.flmnh.ufl.edu/fish/sharks/ISAF/ISAF.htm> Also see the Shark Attack Survivors Worldwide Shark Attack File for an open-access collation of worldwide shark attack incidents, currently at 4802 and counting! <http://sharkattackfile.info/index.asp>

Borrowing In The Nude.

by Greg Close



Now that I have your undivided attention, I'll come clean and introduce my fascination with Nudibranchs.

They are just incredible little creatures and the more I find out about them the more questions are raised and I realise how little we really understand about nature and how it works to keep itself in balance.

To qualify myself I must confess that I don't have a scientific background apart from being an inquisitive guy with a genuine interest in the way things work both mechanical and in nature.

I'd been diving for about 10 years before I even knew what a nudibranch was!

It was on a trip to Heron Island on the GBR in the early 1980s with some newly acquired camera gear where I first noticed these colourful little slugs sliding over corals and sponges seemingly immune to the stings of polyps and the diets of numerous other creatures of the reef. I couldn't believe the beauty of these little fellows and was grateful for the company of a

dive buddy who was studying Marine Biology in Adelaide at the time. We both photographed and exchanged pictures of what we had and that's where a fascination for identifying and observing Nudis began.



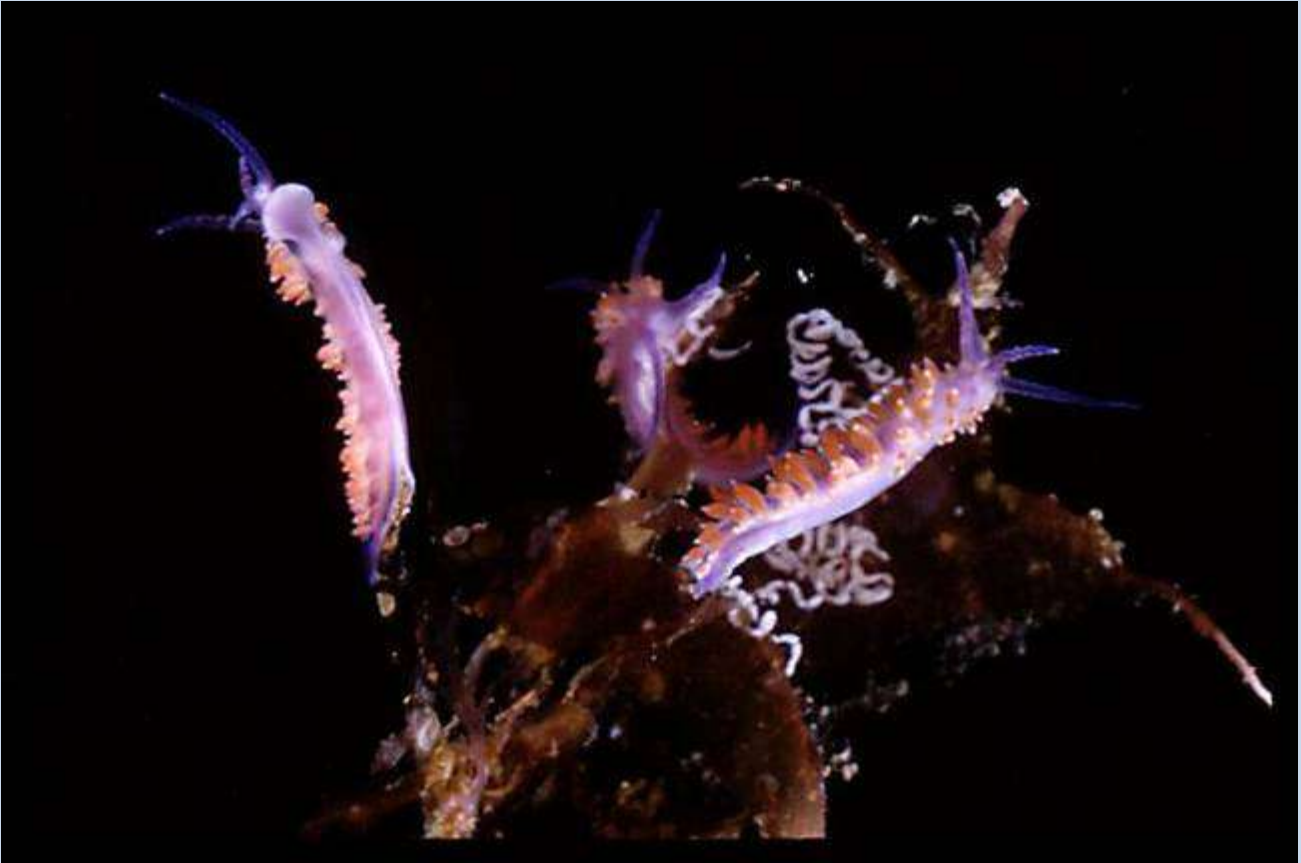
On my return to diving in Tassie I was astounded to find them everywhere. I had never seen them here before! Blinded by the narrow view of the crayfish diver I was looking but not seeing. All that was necessary was to slow down and look closely at what was there.

Nudibranchs are sea slugs known to scientists as Opisthobranchs and are snails which have lost their shells through evolution. They are molluscs related to clams, octopus and squid and are possibly the most beautiful of marine creatures.



Nudis are basically divided into two groups, dorids and aeolids.

Dorids are characterised by two featherlike fronds (rhinophores) at the front of the animal and a feathery gill ring which can be readily retracted at the rear. The rhinophores are chemical sensitive and are used to search out a food supply. Nudis breathe through the gills at the rear. The anus is situated in the centre of the gills... Maybe the creator had become a little tired by the time he/she got to there, or had a sense of humour!



Aeolids have clusters of tubular processes along their backs called cerata which gives the whole animal a featherlike look.

The reference to 'borrowing' in the article title, relates to the ability of some species of nudibranch to remove parts from other animals on which they feed, and use those parts in their own defence or general benefit. I guess that's not borrowing, they just take them!

Aeolids feed on anemones, hydroids, soft and reef corals which possess stinging cells known as nematocysts for their own protection and gathering of food. The stings from these cells are fatal to many creatures and the outcome of stings from box jellies and blue bottles are well documented. However species of aeolids have evolved which not only feed on blue bottles, but remove the nematocysts from them and store them in their own cerata to be used in the nudibranchs own defence!

I'm absolutely amazed at how that can happen. Nematocysts are like a loaded crossbow. They are fully cocked and ready to fire at the touch of any prey but the aeolids can some how put on

the safety catch, remove the loaded cell from the host, pass it through their own body and store it at the end of its own cerata ready to fire just as if it hadn't left the original animal!!
Beats me!



Dorids are pretty clever too. They feed on sponges which are extremely toxic to other creatures. The toxins are removed from the meal and stored in cells around the margins of the animal completely encircling the body of the nudibranch with a ring of toxic cells. Look closely at the frilly bits around the body of a dorid; you can usually see the toxic cells through the tissue.

I kept a marine aquarium at home for storage of collected nudibranchs along with small fish such as leatherjackets, barber perch, blennies etc. It was funny to watch what happened when you dropped a nudibranch into the tank. Just about every fish would have a bite at it (just once) then spit it out and the next would take a turn. It didn't take long for all the fish to work out it was pretty awful to eat and they left it unharmed!

There is an Aeolid (*Pteraeolidia ianthina*) which is white as a juvenile, and as it matures it gathers single celled plants which it cultivates within its body. As the plants reproduce the animal turns from a light brown to a dark blue and in this adult stage can live with almost all its nutritional requirements provided by the little garden on its back!

I find nature completely mind boggling with its ability to adapt and change to meet the requirements of changing conditions. It's been doing it for millions of years and although many species have disappeared in that time, it appears that many others have been discovered.

Were they there all along and we just hadn't found them, or are they a completely new adaptation of something else which didn't cope so well?

I'll probably never know, but it won't stop me looking and wondering!

Cheers, Greg Close



Seabird happenings

WANT TO KNOW MORE?

More bird info at <http://tassiebirds.blogspot.com>

Hosted by Alan Fletcher

"A Great Cormorant surfaced close to the pelican, garfish in bill. This immediately caused the pelican to set off in pursuit of it. The pelican quickly overhauled the cormorant, landed on top of it, causing the cormorant to dive. The pelican failed to acquire the fish, but it did leave me wondering why it had bothered. Perhaps the schools of fish were in too deep water for the pelican to successfully catch them, or perhaps this is a quite normal occurrence."



“Adopt a Reef” Pilot Program

Ever wanted to know a bit more about what happens on reefs?

Well Mike Jacques has rattled around for so long that an idea has finally fallen out. It is to encourage people to target their local reef and try to learn more about it. As a result of that process people should then be able to do something to fix some of the main problems with reefs in their local area.

A lot of it will be underwater work, but if you are keen we can extend it to intertidal surveys and other on-shore activities that are just as important.

Marine Life Magazine will give progress updates to those who may only wish to be involved on a casual basis.

Basically we are going to start with marine life surveys and make a few maps, and I just need you to show up some times to lend a hand if you can and you fell like it.

(p.s. no funding, it's a love job)

PROJECT IDEA –

1. Identify a sheltered local reef which is a biodiversity hotspot
2. conduct surveys of the marine communities, using existing methods
3. Identify significant features of the coast and major threats to the reef
4. Plan a program of action to deal with readily manageable issues
5. Advertise the activities and offer an active program of education
6. Have some fun while learning.

SUGGESTED PILOT REEFS

Primrose Sands

- Has depleted kelp beds due to known native urchin plague
- Known rare fish habitat which has suffered extensive damage.
- In an area so far little affected by climate change so that ecological works like kelp re-establishment are likely to survive. Access to artificially healthy beds for transplanting

Low Head

- Adjacent heritage values, tourist penguin colony and existing popular walking trails
- Near unique tidal invertebrate walls and other high value reef and seagrass habitat

WATCH THIS MAGAZINE FOR MORE DETAILS

or email michael,jacques@transend.com.au



A HUGE SUMMER AHEAD IN TASMANIA



A full calendar of ocean racing awaits the Tasmanian summer. Southern Paddlers have announced 24 races this summer consisting of 12 mid week twilight races, a 10 race Ocean Series, the State Titles and a 40km marathon.

The twilight series consist of 6-10 km races designed to take advantage of the 15-25kt seabreeze that blows up the river into Hobart most afternoons in summer. The upwind leg hugs the lee shore and is usually nice and calm with the return leg straight down wind back to the start. The 2 lap races start and finish at the Derwent Sailing Squadron where we have purpose built ski storage racks for 50 boats 20m from the water, grassy wash down facilities, car parking, change rooms and club rooms for refreshments. These races are designed with the novice paddler in mind with safety boats in attendance.

The Ocean Series consists mainly of down wind races ranging in length from 10 to 40km on courses that take advantage of the summer seabreeze. There are 2 races being held at Boat

Harbour on the north west coast and 2 at Bicheno on the east coast. The rest of the races are held close to Hobart.

The standard of racing continues to improve. Last years series winner and national surfski legend, Jamie Stubbs, is keen to repeat his efforts. Training hard through the cold Tasmanian winter, in 10 deg water and freezing air temperatures are a talented group of challengers. These include Olympic K1 finalist, Peter Genders, world cup DR paddlers Matt Dalziel, Stew Bennett and last years State Champion Ben Maynard, Molokai competitors Angus Sprott and Adrian Petrie. There are even paddlers having private lessons with Olympic coaches on a regular basis to improve their performance. We have also had commitments from some of the states top Surf Life Savers and 2 of the worlds best ocean paddlers going to compete this year.

For more information on the races, results and photos visit, www.southernpaddlers.com



Have Humans Changed Tasmania's Fish Life?

Primary Source: Long-term shifts in abundance and distribution of a temperate fish fauna: a response to climate change and fishing practices ;by Last, White, Gledhill. Hobday, Brown, Edgar and Pecl

A recent scientific paper has asked the question, how much has our fish life changed since the 1800's? Perhaps some fish have become more common and others may have become rare. If fishing pressure and climate change pressures have been heavy over this time you would expect to see some noticeable changes.

Things look OK don't they?

If you haven't been out diving in urchin barren infested areas, or missed being out on the water when we formerly had huge Giant Kelp forests, you might be saying to yourself that nothing much has changed as far as you can see. This is because over short time scales it is very hard to see even big changes and we live with what are called "shifting baselines". If you have only been diving or fishing since the eradication of Grey Nurse Sharks in Tasmania you will assume that 'naturally' they never lived here. Great Grandad's boyhood stories of catching mountains of novel fish within sight of Hobart or Devonport then get written off as old fishing yarns. Our short life spans hide the large effects we have been having on the environment over several generations.

Our reef systems have remained largely stable over the short time periods when we have been doing intensive modern surveys like Reef Life Survey, but over the 200 year time scale of this recent study it seems that there have been much more noticeable changes.

Getting good information

One of the big problems with investigating this question is to get good "baseline" information. People weren't always methodically recording everything they saw or caught, but fortunately a few sources have survived. One of these sources is the records of a naturalist, Dr Allport, who made lists of common fishes in the 1880s. This work was repeated later by keen amateurs and eventually re-done in a more systematic way by modern scientists. The TAFI Reef Life Survey and the REDMAP project are the most recent attempts to thoroughly record fish species in Tasmania. Many of our readers have been helping out with these worthwhile projects.

While there is a lack of high quality information about the distant past, there is enough to give us a good insight into how things have probably changed.

Tasmania's marine life is changing

It appears that about one fifth (61 species) of Tasmania's coastal fishes have undergone important changes in their numbers and range. Some fish have disappeared or are less common. At least five, possibly up to 19, species have undergone serious declines and are possibly extinct locally. Some fish are now found only in very limited places in Tasmania and eight species have reduced their range or population. The fish noted explicitly in the report are obviously not the only fish that have seen troubled times. Serious doubts have been raised in

other studies about other species too, like Red Handfish and Velvetfish, but the old comparison records are deficient and weren't used in this study. Any fish species that are vulnerable to things like netting and habitat change, especially those found only in restricted areas, have to be seen as candidates for further trouble.

Warmer oceans mean trouble

Lots of warmer water fish are now found in Tasmania and this appears to coincide with raised water temperatures on the East Coast. This raised surface temperature is due to the Eastern Australian Current (EAC) getting hotter and stronger with climate change. This current has warmed by about 2.3°C and has advanced south by about 350 km in the last 70 years. Responses to these changes have been seen in larger numbers of 52 coastal fish species. Information provided by recreational fishers also suggest that pelagic warm water fish like tunas and billfishes have increased in numbers in recent years. In addition to fish, other animals like destructive long-spined urchins and some species of coralline algae have also extended south. More evidence is also emerging that new species are not only travelling here, but also breeding here successfully for the first time.

Some of these are 'fun' fish, that are good to catch or see underwater, but their appearance is a sign of profound change and possibly serious trouble for many aspects of the Tasmanian marine environment.

Change is not uniform

Other species have not shown any obvious changes to where they live. Common Bass Strait reef species, like the horseshoe leatherjacket (*Meuschenia hippocrepsis*), the yellowstriped leatherjacket (*Meuschenia flavolineata*), the pencil weed whiting (*Siphonognathus beddomei*) and the scalyfin (*Parma victoriae*), haven't changed, suggesting that it is difficult sometimes to predict which species will move south as the oceans warm up.

Overfishing

Not all the changes are due to climate. In 1883, Johnston observed that estuaries of the south-east contained an abundance of fish species, but today these same species are no longer common. Even in his own time he noted that unprotected areas near population centres were soon "rendered almost barren" by intensive beach seining. At the time, nets were being used to catch reef fish in bays and over shallow reefs, and this method is still used today. Large fishes are particularly vulnerable to gillnetting over long time periods.

While inconclusive, it is likely that local extinctions of large sharks and rays during the 1900s were due primarily to the effects of fishing. Sharks and rays are particularly vulnerable to netting as they have low productivity, mature at a late age and are slow growing. Two shark species appear to have undergone significant population declines in Tasmania.

The Eastern Blue Groper (*Achoerodus viridis*) is also very vulnerable to nets. In the 1800s this species was being sold in Tasmanian fish markets and in the 1920s it was described as common. By 1969, populations of eastern blue groper had been seriously reduced off New South Wales and had disappeared in Tasmania. A total ban on their capture was implemented

in NSW in 1980. A few juveniles were discovered off the northern coast of Tasmania in 2004, but they probably won't re-establish a breeding population in Tasmania. Males take about 10 years to mature and are unlikely to reach this stage before they get caught in nets.

Commercial trawl fish numbers have also changed. The gemfish (*Rexea solandri*) and blue-eye trevalla (*Hyperoglyphe antarctica*), which typically occur in deep water along the continental slope, were once caught trolling at the surface off south-east Tasmania according to past records. In the case of gemfish, populations have been subjected to overfishing off south-eastern Australia and this species is no longer plentiful, even in its usual habitat.

Marine Pests

Other change is caused neither by climate change or fishing, but the introduction of new species. Pacific sea stars caused widespread damage to the Derwent River and Spring Bay when they arrived in the 1980s from Japan in the ballast water of ships. Well before then, new species were being introduced with sometimes dramatic effects, but we have had time to get use to them and just see those species as 'normal'. Lots of species were introduced from New Zealand in the 1920s, probably with shipments of live oysters. The small triplefins *Forsterygion gymnota* and *Forsterygion varium*, are commonly seen by divers or in rockpools. They were long thought to be native fish, but now it seems more likely that they were introduced into the Derwent Estuary and D'Entrecasteaux Channel from NZ. Some of the earlier introduced species, like Maori screw shells, have dramatically altered the sea floor and possibly changed the habitat and numbers of local marine species (see Dr Neville Barrett's recent studies). While the effects might be similar to the changes brought on by Pacific sea stars, the sea star plagues have been more shocking because we can remember what it was like before they arrived and we have records. We can't ask great granddad what it was like before the NZ pests arrived.

What can I do?

The take home message, or 'moral', of the story is that despite these changes we have an amazing and unique marine habitat here, something really special even in international terms.

We can educate ourselves about introduced marine species, help to alert the authorities when they arrive, and follow the hygiene practices necessary to stop them from spreading.

We can limit the impact of our activities by supporting meaningful policies to address climate change and by supporting plans that try to deal with bad fishing practices, even if it hurts our self-interest some times.







We can help out programs to collect information about the health of our environment like Reef Life Survey and Redmap.

We can learn and protect,(but don't forget to enjoy it along the way too!).







Mike Jacques

Some of the Coastal species that it can be established are exhibiting major changes in numbers and range.

Not doing so well

 <p>Crested Bull Shark, <i>Gyropleurodus galeatus</i> Locally extinct</p>	 <p>Grey Nurse Shark, <i>Carcharias Taurus</i> Previously not uncommon but now locally extinct</p>	 <p>Mulloway / Jewfish, <i>Argyrosomus hololepidotus</i> Previously rare but now locally extinct</p>
<p>Gulf Wobbegong, <i>Orectolobus maculatus (Orectolobus halei)</i> Once common, now more restricted in range</p> 	<p>Spotted Handfish, <i>Brachionichthys hirsutus</i> Once not uncommon, now more restricted in range</p> 	<p>Red Handfish, <i>Sympterychthys politus</i> Once common and restricted, now severely restricted</p> 

Fish increasing in numbers or range

 <p>Queen Snapper, <i>Nemadactylus valenciennesi</i> Not common before now believed recovering from overfishing</p>	 <p>Australasian snapper, <i>Pagrus auratus</i> Now more abundant including now in the South-east or in larger areas of the SE</p>	 <p>Eastern Blue Groper, <i>Achoerodus viridis</i> Once common now believed recovering from overfishing and often associated with long-spined urchin barrens</p>
 <p>Southern Roughy, <i>Trachichthys australis</i> Probably once common , now more widespread or recovering</p>	 <p>Bluefish, <i>Pomatomus saltatrix</i> Now more abundant including now in the South-east or in larger areas of the SE</p>	 <p>Yellowtail Kingfish, <i>Seriola lalandi</i> Now more abundant including in the South-east or in larger areas of the SE</p>



Banded Sea Perch,
Hypoplectrodes nigroruber



Half-Banded Sea Perch,
Hypoplectrodes maccullochi



Southern Maori Wrasse,
Ophthalmolepis lineolatus
Now more common fish and often associated with long-spined urchin barrens



Snakeskin Wrasse,
Eupetrichthys angustipes
Now more common fish and often associated with long-spined urchin barrens



Crimsonband Wrasse,
Notolabrus gymnogenis
Now more common fish that are often associated with long-spined urchin barrens



Castlenau's Wrasse, *Dotalabrus aurantiacus*
More abundant including now in the South-east or in larger areas of the SE



Mosaic Leatherjacket,
Eubalichthys mosaicus



Rainbow Cale, *Heteroscarus acroptilus*



Herring Cale, *Odax cyanomelas*
Now more abundant including now in the SE or in larger areas of the SE



Rock Cale, *Aplodactylus lophodon*
Now more common and often associated with long-spined urchin barrens



Rock Blackfish, *Girella elevata*



Luderick. *Girella tricuspidata*
Now more abundant including now in the SE or in larger areas of the SE



Zebrafish, *Girella zebra*
now more abundant including now in the SE or in larger areas of the SE



Southern Silver Drummer,
Kyphosus sydneyanus



White-ear scalyfin. *Parma microlepis*



One Spot Puller, *Chromis hypsilepis*
Now more widespread or recovering



Sea Sweep, *Scorpis aequipinnis*
Now more abundant including now in the South-east or in larger areas of the SE



Silver Sweep, *Scorpis lineolata*



Magpie Perch, *Cheilodactylus nigripes*
Now more abundant including now in the SE or in larger areas of the SE



Dusky Morwong, *Dactylophora nigricans*



Blue Morwong, *Nemadactylus douglasii*
now more widespread or recovering



Australian Mado, *Atypichthys strigatus*



Old Wife, *Enoplosus armatus*



Eastern Kelpfish, *Chironemus marmoratus*



Sergeant Baker, *Latropiscus purpurissatus*
Now more widespread or recovering



Blue weed whiting, *Haletta semifasciata*
Now more abundant including now in the SE or in larger areas of the SE



Ringed Toadfish, *Omegophora armilla*
Now more abundant including now in the SE or in larger areas of the SE



Rock Flathead, *Platycephalus laevigatus*



Yellow Moray, *Gymnothorax prasinus*
Now more common fish and often associated with long-spined urchin barrens



Eastern Shovelnose Stingaree, *Trygonoptera imitata*
Flinders Localized, now more widespread or recovering



Port Jackson Shark,
Heterodontus portusjacksoni
Now more abundant including now in
the SE or in larger areas of the SE



Fiddler Ray, *Trygonorrhina
dumerilii*



Smooth Stingray, *Dasyatis
brevicaudata*
Now more abundant including now in
the SE or in larger areas of the SE



Sparsely Spotted Stingaree,
Urolophus paucimaculatus
Now more abundant including now in
the SE or in larger areas of the SE



Southern Eagle Ray, *Myliobatis
australis*
Now more abundant including now in
the SE or in larger areas of the SE

What other species are
changing? Velvetfish?
Tasmanian Numbfish? Deep
Sea Trawl species?
As our monitoring improves or
new sources are found we
slowly understand more about
human effects on the
environment.

Photo source predominantly Aust Museum

MEMENTOS



1900s postcard

GULLS

Nature's garbage guts

Gulls get a pretty bad rap. If they aren't eating our garbage they are attacking the nests of other 'nicer' birds. They can be bad-tempered, aren't especially colourful and can be a nuisance to humans.

However, the gull should be appreciated as nature's ultimate garbage disposal unit. They clean up smelly waste caused by thoughtless humans and have an important evolutionary niche. They are also quite intelligent. They adapt readily to almost any situation and can take advantage of even the most unfamiliar new food source.

If the nuclear holocaust ever happens, you can add gulls to the list of adaptable rats, cockroaches, and ants that have a pretty good chance of surviving.

Silver Gulls

Living and going to school near the Derwent River, I spent every day of my life not too far away from a Silver Gull. Our lunch scraps were enough of an incentive for them to arrive as regular as clockwork at our normal break times. They jostled for the most advantageous begging position and made an annoying racket. We had a low opinion of them and taunted them. They were so common they seemed to be in plague proportions.



In fact, recent counts now show the humble Silver Gull and Pacific Gull are in decline, with more than half being counted only at human garbage tips. For some reason they are being out competed by the Kelp gull. If they get pushed off the dumps by the larger birds, they can readily adapt to a new food source.



Tasmanian bird enthusiast, Alan Fletcher, recently saw one that had adapted to looking for road kill and was tucking into a freshly killed rabbit.

Others have been seen locally learning how to be insectivores. The recent plagues of European Wasps are being exploited by several species of birds including gulls. They can now be seen putting their flying skills to the test trying to catch the wasps in mid-air,



Several gulls lined up, some few metres apart, on the river's edge, facing towards the sun, probably to silhouette the prey. Individual wasps were flying from the shore across the water. The gulls would spot them and give chase as the wasps climbed ever higher. To catch them, the gulls had to use all their flying ability, but I never saw them miss. They would usually descend back to the rocks to eat them, but I couldn't determine whether they removed the sting before swallowing. I'd estimate that they were catching maybe 20 or

30 an hour, so it's probably not going to make too much of a dent in wasp numbers, but every little helps"

The Silver Gull is common throughout Australia and is also found in New Zealand and New Caledonia at virtually any watered habitat and is rarely seen far from land. Birds flock in high numbers around fishing boats as these leave or return to the coast, but seldom venture far out to sea.

Silver Gulls nest in large colonies on offshore islands. Often two broods will be raised in a year, and both adults share nest-building, incubation and feeding duties. Eggs are laid in a shallow nest scrape, lined with vegetation. There have been programs of culling Silver Gull eggs, mainly on the causeways where they represent a driving hazard. Without reducing the amounts of our refuse, this might have simply led to more Kelp Gulls.

Pacific Gull *Larus pacificus*

The Pacific Gull is a very large black-backed gull with a large yellow bill, tipped with scarlet. The upper wings and wingtips are wholly black with a narrow white inner trailing edge, the tail is white with a broad black band near the end. The legs are yellow to orange-yellow.

The Pacific Gull can be confused with the Kelp Gull, but that gull has a much smaller bill, as well as being much smaller and less bulky.



Juvenile Pacific Gulls are mottled dark brown with pale face and the bill is pink with a black tip. The juveniles often get called "Mollyhawks", but they aren't a separate species of bird. The immatures have dark brown wings, whitish mottled body and a black-tipped yellow bill.



The Pacific Gull forages along the coasts between the high-water mark and shallow water on sandy beaches, feeding mainly on molluscs, fish, birds and other marine animals. However, they do scavenge on human refuse at rubbish tips, abattoirs, picnic areas and on fish scraps near wharves.

In some areas the Pacific Gull has adapted to drop shells and other molluscs, especially limpets and mussels, from a height onto a rock in order to break them open. On some islands and headlands, this has resulted in the formation of 'middens' of shell fragments that could be mistaken for ancient beach deposits.

The Pacific Gull is endemic to southern Australia and occurs mostly on south and west coasts, Tasmania and infrequently on the east coast. The Pacific Gull prefers sandy, or less often, rocky coasts and sandy beaches. In eastern Australia, the Pacific Gull prefers areas that are protected from ocean swells such as estuaries, bays and harbours. It usually avoids human habitation but is occasionally seen on farmland and rubbish tips near the coast but rarely inland. It can be found roosting or loafing in elevated situations such as rocky headlands or on structures such as wharves and jetties.



The Pacific Gull breeds in scattered single pairs or small colonies on high points on headlands or islands. Both sexes build the nest with the female doing most of the incubation while the male forages for food and stands guard near the nest. The birds breed from September to December and lay 2-3 eggs that take 28 days to hatch.

The Pacific Gull is easily disturbed by human activities at breeding sites and roosting areas, and have occasionally become entangled in fishing lines.

Kelp Gull



“And the winner is...the Kelp Gull”. The local availability of human rubbish has likely heavily advantaged the Kelp Gull, something of an ‘artful dodger’ in the bird world.

The Kelp Gull is the second largest gull in Australia and likes to hang out in large groups. It can scare off the opposition as well as harass other birds out of their nesting sites. They have taken over 40% of the Northern end of Orielton Lagoon and chased out the migratory wading birds. They have also beaten the Silver Gull and Pacific Gull to the choicest rubbish. They have increased in numbers 8 times since 1980 while the other species of gull are in decline.

They are large, white-headed gulls, with a straight yellow bill . Newly-fledged Kelp Gulls are brown with paler mottling on the hind neck and breast and have a black bill. Immature Kelp Gulls have mottled brown wings and back with a whitish body and an all- yellow bill.



The Kelp Gull has become established in Australia since the 1940s, with the first breeding recorded on Moon Island near Lake Macquarie in New South Wales in 1958. Their numbers have increased rapidly since the 1960s and they are now common in many parts of the south-east and south-west coasts, and especially in Tasmania. They are widely scattered through the southern hemisphere.



It feeds mainly on fish and crustaceans, but will scavenge when an opportunity arises. Like the Pacific Gull, the Kelp Gull habitually drops molluscs from midair onto rocks to smash them. Kelp gulls are opportunistic feeders, preying on and scavenging molluscs, fish, crustaceans, other seabirds, and even their own chicks and eggs. They have also been seen eating amphibians, reptiles, worms, and even small mammals. They are accomplished food stealers and adapt

readily to any new opportunity for a feed. Kelp gulls at Península Valdés, Argentina, have recently developed the habit of feeding on pieces of skin and blubber that they gouge from the backs of southern right whales. The level of harassment in 1995 was almost five times higher than when first studied in 1984 and they now disturb up to 25% of whale feeding time and may compromise calf development and might even induce right whales to abandon Península Valdés for other calving grounds.



Like most southern seabirds, Kelp gulls breed in the summer months; November to December in the subantarctic. Eggs generally hatch in 23 to 30 days. Fledging occurs in 45 to 60 days, although chicks are still fed by their parents until after they can fly. Most Kelp gulls ultimately return to colonies where they were born.

How did Chinamen's Bay get its Name?

Chinese Fishermen in Tasmania



Chinese fishing by moonlight in Victoria 1873. Note the guy on the left using what seems to be a viewing bucket.

The first Chinese arrived in Tasmania in the 1830's many years before the discovery of gold in either California or Australia. Initially they worked in bay whaling stations and market gardens. Abalone or "Bào yú" was well known to these immigrants was a delicacy. Crayfish and dried scalefish were also keenly sought after for traditional dishes.

After 1852 there was a huge influx of new immigrants attracted to the Victorian goldfields. This created a more profitable interstate export market for Chinese delicacies like abalone.

In 1860 Ling Chew (or due to the inability of Europeans to remember Chinese names, also known as Lew Ching/Long Choo/Loo Ching/Loo Choo/Hi Ching) set up a fishing station 'near the mouth of the Derwent' to fish for crayfish that were dried and sent to the goldfields in Victoria. From approximately Nov 1860-1867 he regularly sent bales of dried fish to the diggings by sailing ship from Hobart.

In October 1862 J. Sam was also recorded as making shipments from Hobart.

In July 1863, the schooner "Morning Star" arrived from Southport and "brought up a large quantity of oysters, and two tons of dried fish, cured by the Chinamen, located at Southport, expressly for the Melbourne market,". This trade for Southport appears to have continued until at least June 1864.

The business success of the Chinese was a source of some envy. In 1864 "The Mercury" reported that abalone and dried fish had been long farmed by the Chinese and,

"... made an article of export. And this, we are credibly informed, is what has been done, on the eastern coast of the island, for some time past, by one or more parties of Chinese, who have been driving a profitable, if not a roaring trade at it. Granted that the Chinese live upon

little, and that they are experts at fish catching and fish curing. It does not thence follow that they may not be beaten by associated effort and associated enterprise, on their own ground. If they live upon little, their appliances are small. And if experts at the business of fish catching and fish curing, they can, we suppose, be matched by some of our countrymen, who would have a greater command of capital, and could find a readier market for what they took and cured."

In 1866 it was noted,

"A number of Chinese are still occupying themselves at Maria Island in catching crayfish, and drying them for export to Melbourne. A parcel of eight bags of dry fish was brought up from the curing establishment at the island yesterday in the Kingston, and scarcely a steamer leaves the port but that she has aboard a lot of dried fish, consigned by Chinese here to their celestial brothers in the neighbouring colonies."

Visitors to Southport in 1869 and 1871 also noted Chinese fishing activity in the Far South. In 1871,

The habitations are few and scattered. Nestling among a clump of trees on the western shore of the Port, stood a dwelling built of palings, which, I was informed, was the abode of John Ling, a Chinese, whose acquaintance I had made in Hobart Town some months before. John had married a Tasmanian girl -the daughter of one of the residents of the district-and has by her a family of six children. He is employed in fishing for the Chinese market, and drives a very good trade. The mutton fish, as it is locally named-the Haliotis, or sea-ear of the naturalist-forms the staple product of John. The mode of capture is by spearing. The habitat of these fish is on stones below the surface of the water, and to which they adhere, with a tenacity truly wonderful, by ; what is called the foot. Armed with a long, iron-pointed spear, the fisher thrusts it through the shell, whereupon the mollusc relaxes its hold, and is brought to the surface. Vast, numbers of these perforated shells may be seen among the rocks at Southport. The mode of preparing these fish for exportation is to parboil them, when the mollusc comes away freely from the shell. They are then dried, and in that state ' have the appearance and consistence of leather. The estimation in which such pabulum is held by the disciples of Confucius, I regard as being solely due to a taste acquired by long cultivation. This opinion is founded upon the fact ' of having partaken of one of these molluscs after' its having been cooked according to true Celestial fashion.

The Royal Society also noticed the activity and recorded that the abalone was , " *then dried in a slow oven built for the purpose, after which the dried fish is packed in casks or cases for export. Before cooking it is soaked in water for a considerable time. Crayfish are treated in the same manner, and are cured in large quantities."*

Ah Yow arrived from Melbourne in June 1872 to establish a fishing station and fish curing depot at Ilfracombe on the Tamar. Around that time 'Sing, Young and Chow' had also arrived at Maria Island [or perhaps they were the mis-named Chinese referred to earlier] and began to collect and dry abalone and exported them to the Victorian goldfields. Most of the Tasmanian Chinese were Cantonese but the three Maria Island fishermen were tall northerners, Mandarin

speakers. In November 1875, Ah-Sin Yung (also known as Ah Sin, Sing Yung or Thomas Young) married 16 year old Fanny Skinner. He was then listed as one of three Chinese that fished for abalone on Maria Island. After the wedding Fanny moved into her husband's cottage at Long Point, later known as Chinamen's Bay.

The Hobart Mercury reported that in February 1876 Anthony Trollope Robinson and two friends spent five days on Maria Island hoping to find minerals. After a two hour voyage across Mercury Passage they landed and made camp beside the lagoon near Long Point, where Thomas Dunbabin had his house. The next day they walked across Long Point and passed a grave before arriving at,

"the cottage of Ah Sin, a good natured Celestial who gains a living by catching and curing mutton-fish (abalone) for the China Market. The shellfish are obtained on the rocks at low water and when dried are worth about £90 a ton in China. Ah Sin told us he sends from £150 to £200 worth away annually. After enjoying a good cup of tea made by Mrs Sing, a blooming Tasmanian lass, we walked around the eastern coast".

After the gold rush the Chinese in Tasmania were very low in numbers (just thirteen in 1870), until businessmen in that year brought nineteen experienced Chinese miners from the mainland to work on the Mathinna goldfields. Following the discovery of payable tin in the north-east in 1874, the number of Chinese miners rapidly increased. The Tasmanian Chinese population was never large but up to 1500 lived here in the 1880s. Initially the Chinese in Tasmania were not subjected to the same level of xenophobia as in the Victorian goldfields, although at the start there were race riots at the Arba mine near Branxholm. People then quickly got use to the Chinese and largely got along.

Kwok Sing caught and distributed fish among the north-east community and the netting of small Bream by the Chinese was blamed for denuding the rivers of fish.



Schouten Island Coal Mine Jetty, Crocketts Bay (Stoney, A Residence in Tasmania, 1857)

Tin was first discovered on the Freycinet Peninsula in the 1870s. A number of parties worked the alluvial (surface) deposits during the late nineteenth and early twentieth centuries, with limited success. Work was centred on Saltwater Creek (north of Coles Bay) and Middleton Creek (near Bluestone Bay). Around 1874 three other Chinese mined tin on nearby Schouten Island and they apparently employed the island's children to collect abalone for them. In 1875 Tasmanian abalone were shown as exhibits in the Imperial Exhibition in Melbourne.

By 1880, at least fifty Chinese men were working the alluvial tin ground around the eastern or granite portion of Schouten Island.

The Chinese men were occasionally unfairly blamed for lots of things, including taking jobs away from Europeans. An 1882 Mercury article blamed the Chinese for overfishing,

"A Chinese Fishery Company, of Melbourne, cleaned up all the mutton fish (Venus' Ear), and sent away many tons of crayfish and all the other fish they could catch".

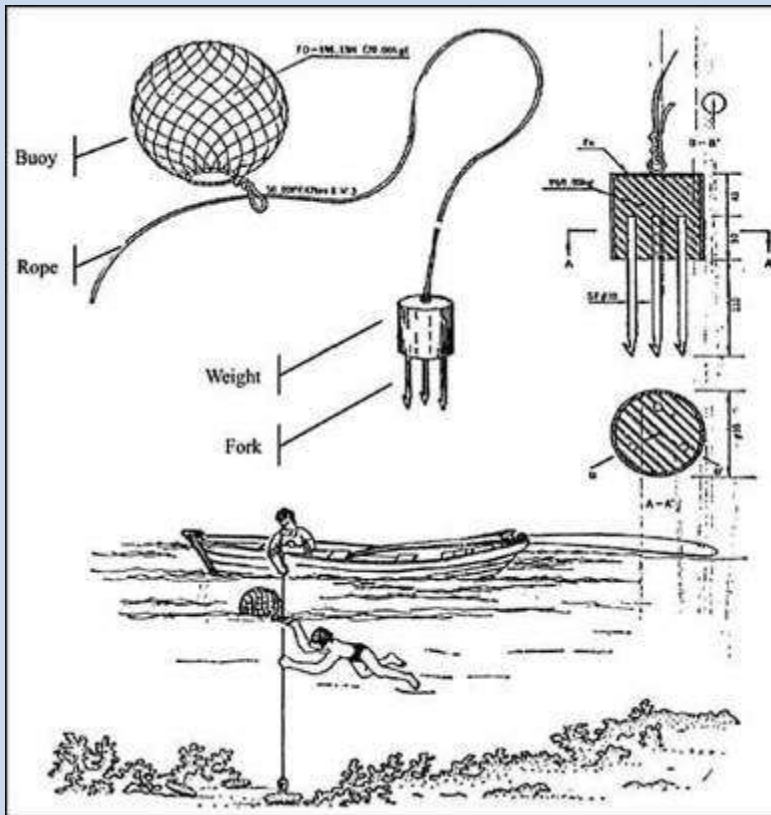
However the predominantly tolerant attitude changed with the depression of the 1890s. The trade union movement in urban areas, where there were actually few Chinese, vigorously lobbied to stop Chinese immigration. Local liberal politicians were in favour of Chinese immigration, but they bowed to increasing pressure as Tasmania moved towards Federation with the more anti-Chinese mainland colonies. The Tasmanian Parliament imposed a £10 tax per person on Chinese landings at Tasmanian ports and family migration was discouraged. The Chinese population declined as the old Chinese miners returned to China to find a wife, or simply died of old age. A few remained and became successful merchants and market gardeners but their interest in abalone faded away as the inter-colonial market dried up. The 1881 census lists one fisherman and two fish curers within the Chinese community, but none were recorded in later censuses.

The Yung's of Maria Island continued to thrive as Mr Yung had married a local girl and had locally-born children. They worked as farm labourers for the Dunbabins who had taken a lease over the island. Fanny and Ah Sin had seven children between 1877 and 1892. Ah-Sin Yung died in Hobart in June 1897. The Yung family of Maria Island branched out and held land interests in Triabunna, Maria Island and Dunalley. There are reports that Chinese fishermen, probably the Yung's, moved from Maria Island to Dunalley late in the 1890s and dried, cured and exported abalone from Pancake Bay, now known as Little Chinaman's Bay.

The first Europeans to commercially fish for abalone in Tasmania followed the Chinese practices and used their business contacts. Amongst the first were a group of Irish shark fishermen at Southport. When the Jesuit priest Father Julian Tennison-Woods visited Southport in 1880, he found ten families fishing for shark there and in Recherche Bay. They boiled down the livers for oil, sold the fins and used the flesh for fertilizer on their cabbage fields. When the weather was too rough to catch shark they speared abalone. The fins and the abalone were boiled and then dried by Wham Sing and his brother Teck at Southport [possibly the now elderly Sing formerly of Maria Is] and shipped to Hobart for export to the goldfields. According to Tennison-Woods the Sydney merchant Chin Ah Teak was prepared to pay 9 pence a pound for any quantity of the shellfish that was 'much esteemed by the Chinese'. The priest found

that although abalone were abundant 'it was too troublesome a fishery to make it a pursuit, except when nothing else could be caught.'

Traditional Chinese Freediving



Although the Tasmanian Chinese fishermen seem to have fished intertidally and probably never went deeper than their armpits, it is possible that they were Tasmania's first commercial abalone divers. The Chinese have known how to free-dive for fish for centuries.

Fishing for sea cucumber is a traditional activity among the local fishers in Qionghai, Hainan. According to historical records, sea cucumber fishing in Xisha, Zhongsha and Nansha islands started in 1681 and has continued without interruption.

Collections relied on free diving and capture of sea cucumbers by hand

in the early periods, so the fishing grounds were restricted to waters with a maximum depth of 20 m. At some point, however, fishermen became unhappy with the collection efficiency as it was impossible to capture the larger specimens living in deeper waters. As a result, a tool known as the "sea cucumber fork" was designed and used in the 1920s to capture sea cucumbers.

The boats used in sea cucumber fishing are generally 50-80 tonnes, in gross tonnage, fitted with a 120-250 hp engine and generally have 12-16 people onboard. Each support vessel usually carries 3 to 4 smaller boats (15-25 hp, 3-5 gross tonnage each) to enable the divers to easily move around the reefs. At the fishing grounds the collection of sea cucumbers is carried out using the smaller boats which carry a crew of 3; one in charge of steering the boat while the other two engage themselves in fishing with the use of masks or "view buckets". Upon detection of the sea cucumbers on the sea bottom the divers enter the water and swim directly above the animal. Fishing is carried out by dropping the fork on the specimen seen by the diver. One end of the fork rope is attached to the boat in order to facilitate the retrieval of the captured sea cucumber. Because of the relative seawater turbidity around the islands the fishing activity is generally restricted in waters not deeper than 60 m. Commonly 20 kg of sea cucumbers, such as *T. ananas*, are collected by each boat (or 2 000 kg/year). Furthermore, fishermen engaged in the collection of sea cucumber very often fish for other species such as sharks, molluscs, as well as collect a variety of seaweed species.

Portfolio

Simon Mustoe



Sunfish

Simon Mustoe, is a qualified ecologist with over nine years professional experience. He co-authored the acclaimed *Bird Census Techniques* (Academic Press) and more recently the *Handbook of Biodiversity Methods* (Cambridge University Press).

Simon has a strong practical and theoretical knowledge of risk assessment and environmental impact assessment and is a particularly skilled consultant with private commercial experience in the UK, Hong Kong, Africa and Australia.

Simon has a business doing ocean adventure voyages, often for cetacean and birdlovers, but basically for anyone who loves the ocean. Here is an example of one of his trip reports.

St Helens

*Departed St Helens harbour on Saturday 14 July at about 10:30 on the Norseman III. Observers came via the Spirit of Tasmania and flights into Hobart and Launceston, some arriving that morning. Weather was initially poor with 2-2.5m seas, a 1-2m swell and a 25-30 knot easterly wind that eased slightly during the afternoon. Despite this, the shelf break was reached and seamount for two berley stops, attracting **Southern Royal Albatross** and a couple of **Northern Royal Albatross**. A large number of **Buller's Albatross** and adult*

Northern Giant Petrels were also observed but conspicuously absent in such numbers on other days. We arrived back in St Helens by about 16:30 that evening.

The second day (15th July) we embarked at 07:30 in slightly better conditions: a 1m swell and about 1.5m sea and a southerly wind of about 15 knots. A good number of **Southern Royal Albatross** were seen, as well as **Northern Royal Albatross** and three exulans **Wandering Albatross**. Surprisingly, no Great-winged Petrels were observed this day. Throughout, mostly adult albatrosses were seen. The highlight of the day was an adult **Salvin's Albatross**, found by Jack Moorhead and a new bird for him! At a berley stop on the way back in, two **Brown Skuas** attended.

The final day began at 07:30 with relatively calm weater but a fresh northwesterly wind increased ahead of a front which struck just after lunch, forcing us back inshore by about 13:30. Nevertheless, almost three hours was spent at the shelf. Highlights included brief views of a **White-headed Petrel**, a white morph **Southern Giant Petrel** and very large numbers (500+) of **Grey-backed Storm Petrels**. At least a couple of New Zealand race Gouldi Great-winged Petrels were observed.

On the way out in the morning of the 14th, a small (presumably subadult) humpback whale was seen repeatedly breaching but could not be observed well, owing to the relatively poor sea conditions. Several individual seals were seen during the trip, well out to sea, including a very large male fur seal.

Oceanographic conditions over the weekend were dominated by a southerly current and unseasonally warm water temperatures of about 16 degrees celsius.

http://www.ecology-solutions.com.au/trip_reports.html



Salvins albatross



Laysan albatross



Grey backed storm petrel

Other Trip Photos



Southern Royal Albatross



Campbell's Albatross



Great Winged Petrel



Killer whale



Dolphins



Young elephant seal



Shy albatross



Shy and Black-Browed Albatross



White Morph Southern Giant Petrel

www.ecology-solutions.com.au

“Vulnerability of Tasmania’s Natural Environment to Climate Change”

“The Vulnerability of Tasmania’s Natural Environment to Climate Change: An Overview” is the first assessment of the potential impacts of climate change on Tasmania’s natural values. It will help guide the formulation of policy and management responses for adaptation approaches that will enhance the resilience of Tasmania’s natural systems.

Summary

There is general consensus that climate change will result in increases in global average air and ocean temperatures, widespread melting of snow and ice, and rising global average sea level.

Over the coming decades Tasmania is expected to experience:

- increased land and sea temperatures;
- changes to rainfall patterns and higher evaporation in most areas;
- wind speed changes; and
- sea level rises.

Despite global and local efforts to reduce greenhouse gas emissions, some level of climate change is now inevitable, and we will need to adapt the way we do things to maintain Tasmania’s social, environmental and economic wellbeing.

The Australian Government and all Australian State and Territory Governments have recognised the importance of adapting to climate change. There is agreement that:

- some climate change is unavoidable
- attention needs to be paid now to our climate change adaptation needs
- adaptation is a shared responsibility – governments, business and the community all have a role.

The report undertakes an initial assessment of the projected impact of climate change on the natural values of Tasmania.

Natural values potentially at risk

Climate change is likely to lead to ecosystem changes, including transformed and novel ecosystems, and local species extinctions. Changes such as decreased rainfall and increased temperature, and increased frequency of extreme events such as drought, storm surges, and fire, will variably impact on biodiversity in different regions in Tasmania.

Tasmania’s natural values are already impacted by a range of threats and disturbance such as fire, weeds and diseases - climate change may exacerbate these.

Climate change is a global issue and Tasmania, like other parts of Australia, is already showing evidence of change.

A decrease in zonal westerly winds may inhibit East Coast Tasmanian upwelling events, and a strengthening of the EAC will limit impingement of nutrient-rich southern waters.

Marine and coastal ecosystems are predicted to be highly vulnerable to the impacts of climate change. Global climate models predict that the greatest warming in the Southern Hemisphere oceans will be in the Tasman Sea.

Effects on estuaries

Climate change was identified as one of the nine potential threats to the biological resources and conservation value of Tasmanian estuaries (Edgar *et al.* 1999).

Other threats among the nine identified, such as modification to water flow and the spread of pest species, are also exacerbated by climate change.

The mix of marine and freshwater influences on estuarine systems suggests that estuaries will be impacted by climate change from multiple sources. There are impacts associated with sea level rise, flooding and shoreline erosion.

Climate change induced changes in pH, water temperature, wind, dissolved CO₂ and salinity can all affect water quality in estuarine waters (Gitay *et al.* 2001). Increased water temperature also affects important microbial processes such as nitrogen fixation and denitrification in estuaries (Lomas *et al.* 2002).

Some of the greatest potential impacts of climate change on estuaries may result from changes in physical mixing characteristics caused by changes in freshwater runoff (Scavia *et al.* 2002). This leads to changes in water residence time, nutrient delivery, vertical stratification, salinity and control of phytoplankton growth rates. The effects of changing rainfall patterns on water supply and stormwater run-off increase sediment loads and cause siltation, thus altering estuarine habitats.

The likely physical effects on the estuarine environment include:

- Widening and deepening of estuaries
- Further upstream penetration of tides, and potentially salt wedges
- Impeded river discharge, potentially increasing flooding
- A greater proportion of fluvial sediment deposited in estuaries, rather than augmenting coastal sediment supply
- Erosion of coastal barriers
- Creation of new lagoon entrances
- Modification of muddy estuarine/ deltaic/saltmarsh landforms
- Penetration of salt water into groundwater
- Rising groundwater tables

Sea level rise and storm surges

Coastal systems in Tasmania are considered some of the environments most vulnerable to climate change and sea level rise. Recent climate science has progressed significantly since the IPCC's Fourth Assessment Report, and data presented at a recent Standing Committee indicates that possible sea level rise is at the upper end of the IPCC 4 projections of 0.8 metres by 2100 (House of Representatives Standing Committee on Climate Change, Water, Environment and the Arts 2009). Sea level rise is projected to result in the gradual inundation of ecosystems for about half of the Australian coast (Department of Climate Change 2009).

The Tasmanian coastal environment is identified in the Tasmanian Climate Change Strategy as vulnerable to the impacts of climate change, with significant areas of coast at risk of erosion from exposure to sea level and storm surge inundation.

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Effect on Shells

The evidence that has emerged of catastrophic losses of shell (mollusc) species over the past 150 years in shallow, sheltered estuarine waters of the south-east (Samson and Edgar 2001), highlights the uncertainty relating to events that have occurred over long periods of time as well as changes that continue today. These losses were previously undetected.

Beach Erosion

More than 1,440 km of Tasmania's coastline has been identified as being at risk of coastal flooding, and more than 975 km of shoreline are at risk of erosion, sand dune mobility, rock falls and slumping as a result of sea level rise and storm surges (Sharples 2006), with consequent impacts on natural values.

Many Tasmanian beaches show evidence of ongoing retreat and some of progradation over the past few decades. It is likely that at least some of this erosion is linked to recent sea level rise induced by climate change. It is difficult to discriminate the extent to which changes such as coastal erosion are a part of natural variability. Nearly all beaches on the south-west coast are currently eroding, with large active foredune erosion scarps (Cullen 1998). Air-photo evidence indicates that this erosion has probably been in progress since at least the 1960s.

The vulnerability of coastal systems to climate change is exacerbated by increasing human-induced pressures in the coastal zone.

Coastal systems are naturally dynamic with some coastal systems more vulnerable than others. Coastal wetland ecosystems and saltmarshes are considered particularly vulnerable.



Significant beach and foredune erosion at Ocean Beach, south of Strahan

Effects on Birds

The Bass Strait Islands are an important habitat for marine species including birds, but inundation by rising sea levels and increased storm surges is likely to result in a reduction in breeding areas for seals and seabirds. Coastal nesting of species such as penguins, terns, gulls and petrels and storm petrels will be impacted by sea level rise, an increase in the formation of steep dune walls, which will limit access, and submergence of low-lying islands and important roosting areas during storm surges.

Other potential climate change impacts include an alteration of currents and upwelling areas, which will affect the foraging behaviour of seabirds.

Food availability will in turn impact the ability for seabird populations with high site fidelity (mostly procellariiformes - such as albatrosses) to relocate, though species with low site fidelity such as gulls, terns and gannets may be able to respond to such changes in food availability.

Inundation of low-lying areas around Tasmanian estuaries could impact saltmarshes, wetlands and intertidal sandflats (important wading bird habitat). For example, inundation around the Derwent Estuary could potentially impact saltmarshes, wetlands and 1,000 ha of intertidal sandflats (Whitehead 2009).

Effects on Seals

The impacts will also affect seals, with a large increase in pup mortality on low-lying breeding colonies such as Reid Rocks. Breeding areas may have to shift in response to changes in upwelling due to changes in wind patterns.

The expansion of Australian Fur Seals into southern islands (Maatsuyker Group), will have implications for rare New Zealand Fur Seals that utilise this area as their primary habitat.

Seals may be impacted by changes in fish assemblages as well as increased fisheries pressures, which will lower food availability.

Effects on Vegetation

Coastal vegetation is exposed to a complex of interacting processes triggered by climate change, including biological and ecological pressures interacting with introduced weeds, pests and pathogens, habitat fragmentation, land use and coastline change. Changes in coastal geomorphology can have profound impacts on availability of different habitats on the coast.

Acidic Oceans

Regardless of the other issues arising from increased CO₂ emissions and their effects on the marine environment and oceanographic processes, the natural absorption of CO₂ by the world's oceans is already having an observable impact (Royal Society 2005).

Increased CO₂ concentrations in seawater are currently reducing the pH levels of the ocean making it more acidic. Changes in ocean chemistry are already leading to decreased calcium deposition of organisms that are a major component of the lower food web.

Although some individual species may benefit from high CO₂ and low pH conditions, it is likely that more acidic oceans will have major impacts on entire ecosystems. Evidence is already apparent of its impacts on the growth and function of many important planktonic species and at this stage it is unclear what impacts the levels of CO₂ predicted for the next 100 years would have on the life cycles of multicellular organisms, and proceeding trophic impacts on the food web.

Warming Oceans

Current evidence is showing an increase in southward extent of the East Australian Current off eastern Tasmania, with a resultant southern extension of warmer, nutrient poor waters, allowing the southern range extension of marine species including pests.

Much of Tasmania has experienced a warming in average maximum temperatures since the 1970's, accompanied by strong decreases in rainfall. Sea level has risen 10-20 cm, in the last century, with water temperatures off Tasmania's east coast increasing by more than 1°C since the 1940s. Ocean acidity levels have also increased in recent times, along with atmospheric CO₂ levels.

South-eastern Tasmania is expected to show the greatest sea surface temperature (SST) rising for any location in the Southern Hemisphere.

The Leeuwin Current which influences the west coast of Tasmania may decrease in strength, affecting important upwelling areas that are critical foraging areas for a number of marine organisms and threatened species such as the Shy Albatross and marine mammals.

The IPCC AR4 identifies that the most vulnerable marine ecosystems include the Southern Ocean.

Tasmania's unique animals will struggle

Possible impacts that have been identified for Tasmanian marine systems include a decrease in marine productivity, which will impact on food chains. The southern extension of warmer waters will cause a southward shift in species distributions.

Many of Tasmania's endemic species have a limited capacity to adapt to such change.

The spotted handfish (*Brachionichthys hirsutus*) is found in the Derwent estuary with an estimated total population of 3,000–5,000 individuals. An increase in water temperature of 1.5° C is likely to put the spotted handfish outside its climate range (Edgar 2008). Changes in terrestrial runoff driven by changes in rainfall patterns and extreme storm events, are all likely to put estuarine dependent species under threat.

Urchins and other alien species

Warmer ocean temperatures in Tasmania now support species that were not viable due to cold water winter temperatures. Ecosystems that are usually in more temperate regions are shifting southward, and along with these changes is the increase in alien species. Alien species in the marine environment can simply migrate with the warming conditions from more northern areas or be introduced as plankton through ballast discharge.

Already there are observable changes in faunal assemblages within the Tasmanian marine environment. An example of southward migration is the *Centrostephanus rodgersii* (sea urchin), which is now self established in Tasmania, presumably by larval transport by the EAC. Outbreaks are known to cause barrens directly affecting ecosystems that are vital for significant fisheries such as the abalone industry. The urchin is now able to produce viable offspring in waters above a winter minimum of 12°C. Warming of eastern Tasmanian waters now contribute to a self-sustaining population (Johnson *et al.* 2005)

Observable range extension has been identified for phytoplankton species including *Noctiluca scintillans*. Formerly only recorded in more temperate waters, this species has for the last several years been observed as an over winter resident in Tasmanian waters.

The European Shore Crab (*Carcinus maenas*) is another introduced predator that has very recently rapidly extended its range into east coast Tasmania, correlating with declines in the abundance of marine organisms (Walton *et al.* 2002).

Giant kelp loss

A decline in marine biodiversity is highly likely. Tasmania's kelp forests (an important fisheries habitat) are already reducing in distribution and abundance. Large declines over the last 50 years have been attributed to rising sea temperature (Edyvane 2003; Edgar *et al.* 2005).

Local cold water corals

Like kelp, cold water corals also act as a keystone species, creating structurally diverse habitat, and are expected to decline in response to both warming and increased oceanic acidity.

Seagrass and other unique habitats

A major reduction in rainfall could threaten the unique Bathurst Channel marine and estuarine community through reduction in the depth and transparency of the halocline (a strong vertical salinity gradient) and increased penetration of macroalgae into the sessile (anchored to the ocean floor) invertebrate zone.

There are likely to be changes in the distribution and composition of seagrass and other macro-algae communities (Bishop and Kelaher 2007). For example, some seagrass species are both temperature and light-sensitive. Photosynthetic groups such as brown algae and seagrass may benefit from climate change by increasing their biomass through increased CO₂ availability (Guinotte and Fabry 2008).

Whales

The impact of climate change on fish and krill populations will in turn have an impact on higher order predators such as seals, whales, seabirds, and penguins. Species that rely on Tasmania as a staging point to exploit Antarctic krill will be impacted by ice depletion and resulting loss of krill abundance. Krill-based whale species are likely to shift in response to declines in krill abundance.

The changes in timing of migrations would have an effect on social structure (cohorts). Low fecundity makes whales highly sensitive to climate change, especially as many populations are still recovering from past levels of heavy exploitation.

Migrating whales are also heavily impacted on changes much further afield than Tasmania, such as whales relying on sea ice extent and krill availability.

Effects on fishing

Significant fisheries rely on Tasmanian marine ecosystems. CSIRO predicts that in 50 years, Tasmanian fisheries can expect a marked reduction (64%) in catch rates even with careful management. Important temperate-water aquaculture operations may be threatened by rising sea surface temperatures, and abalone and rock lobster fisheries are threatened by the likely effects of climate change. These species are extremely important to the economic sustainability of Tasmanian fisheries.

Managing the impacts of climate change

Maintain and protect well-functioning ecosystems

The maintenance of biodiversity is one simple but effective means of maintaining ecosystem function and building resilience into ecosystems. This may become a key management goal under climate change scenarios (Manning 2007), along with "minimising the loss" (Dunlop and Brown 2008).

Increase the protection of habitat

Conserving natural terrestrial, freshwater and marine ecosystems and restoring degraded ecosystems is essential to climate change approaches.

In the face of the uncertainty of the specific impacts of climate change, protection of a diversity of habitats provides heterogeneity that acts as an insurance policy.

The development of the National Reserve System (NRS) has been identified as a priority climate change adaptation approach for the protection of Australia's biodiversity (Dunlop and Brown 2008), embracing the CAR reserve design principles of comprehensiveness, adequacy and representativeness (JANIS 1997).

Linking protected area establishment with off-reserve conservation efforts is a key action

Reduce the impacts of current threats

Australia's biodiversity is already suffering from the impact of a range of current threats, including habitat fragmentation - climate change will exacerbate the existing threats as well as being an additional threat in its own right.

Maintain viable, connected and genetically diverse populations

The movement of species between habitat patches is vital for many species, and will become increasingly so as the climatic envelope of many species shifts with changing climatic conditions. Appropriate levels of landscape connectivity to allow for species and plant communities to migrate to more favourable habitats in response to climate change.

Active interventions

Rehabilitation of habitat, restoration and revegetation will all need to be actively considered as part of our climate change preparation and adaptation approaches. These strategies can be used to extend and buffer existing habitat and to restore ecological connectivity where it is seen to be advantageous.

Translocations may become critical for some ecosystems such as low-lying islands that are threatened by sea level rise and species on mountain tops that may have no habitat to migrate to.

Monitoring the impacts

Monitoring is an integral part of managing natural values in the light of climate change. It is needed to detect change, trends, and trends in condition of natural assets and to identify thresholds for management actions for active crisis intervention for priority assets.

The Great Climate Change Debate and the Psychology of Denial

If you have managed to hang in there with it we have arrived at the end of the 'dry' bit where everyone seems to get all hot and bothered. Now I will have my say about what the 'great debate' is really about. Then we can get on with what is actually happening in Tasmania and whether there is anything we can do about it.

What the non-scientists and bloggers say

The interesting thing is about the climate change debate is that little serious debate actually takes place. The climate change concept has achieved very high levels of consensus and despite what you say to the contrary, a vast majority of the world's scientists accept it in some form or another. That is astounding as it took decades for an idea like evolution to get that level of consensus. Even the Flat Earth Society only gave up quite recently.

A relatively few skeptical scientists aside, most of the 'debate' about the validity of the theory is not happening in the scientific community, but in the general community. It is a bit generous to call it a debate, as it tends to be a spray of anecdotes and allegations rather than a considered exchange of ideas.

Some of the things that are raised in internet blogs, or in small circulation conservative newssheets, are quite amazing. These sources are some of the few places in the world where the instant expert still has full reign. No rant, no matter how distorted, ever has to be subjected to the flamethrower of being put to proof.

Some of this climate change skepticism is deeply held and considered, but some is completely whacky and could be easily remedied by liberal doses of Lithium. They all pretty much point to some form of conspiracy, where scientists love the government so much, they are trying to cheat and subjugate us. This is all the more startling in that some of the commentary comes from prominent social figures like BBC journalists and US Republican Senators,

A sample of the conspiracy theories

1. scientists have needed funds depend for their funding on public anxiety, scientists critical of global warming theory are denied funding,
2. environmental correspondents need constantly to talk up the threat to justify their jobs
3. after the end of the Cold War, governments need a worthy cause to organize, propagandize, force conformity and exercise political influence over society.
4. A small cadre of obscure international bureaucrats are hard at work devising a system of 'global governance' that is slowly gaining control over ordinary people's lives.
5. It's an excuse for greater taxation, regulation and protectionism;

These theories have a common denominator in a fear of social institutions like the scientific elite and a deep scepticism about their motives. Few of these themes directly confront the idea

of climate change itself and the data that has been collected, only that it is such a grand idea it must be a part of a broader "plan".

That plan is then fitted into a pre-existing fear the commentator has about the state of society.

Right wingers protesting about 'big government' is a mantra we have heard for decades in other contexts. Christian Right groups have long viewed the secular pull of science as a challenge to the bible as the ultimate font of truth. The Climate change debate is just another battlefield in the same old war we have been fighting with ourselves for decades,

"... some hold to the climate change mindset with almost a religious fervor. Many elements within the environmentalist movement are so obsessed with protecting "mother earth," that they will use any argument to accomplish that goal, no matter how biased and unbalanced it is. Third, some promote the climate change mentality for financial gain. Some of the strongest proponents of climate change legislation are those who stand to have the greatest financial gain from "green" laws and technologies. Before the climate change mindset is accepted, it should be recognized that not everyone who promotes climate change is doing so from an informed foundation and pure motives. " <http://www.gotquestions.org/climate-change.html>

Amen to that brother but it cuts both ways, not everyone who is a skeptic is doing so from pure motives. Its just another way of criticizing completely unrelated aspects of our society that they have disapproved of for centuries.

Perhaps the last word should not be given to a devout fundamentalist, conservative think tank commentator, climatologist or oceanographer, because the debate is more about our mindset than the facts. That must be the case because we rarely engage in meaningful dialogue about those facts.

A completely different branch of science has another opinion on climate change. Wired.com talked to Kari Marie Norgaard, a Whitman College sociologist about the divide between science and public opinion,

Norgaard: *Climate change is disturbing. It's something we don't want to think about. So what we do in our everyday lives is create a world where it's not there, and keep it distant...we don't have to see the impact in everyday life. I can read about different flood regimes in Bangladesh, or people in the Maldives losing their islands to sea level rise, or highways in Alaska that are altered as permafrost changes. But that's not my life. We have a vast capacity for this.*

Wired.com: *How is this bubble maintained?*

Norgaard: *In order to have a positive sense of self-identity and get through the day, we're constantly being selective of what we think about and pay attention to. To create a sense of a good, safe world for ourselves, we screen out all kinds of information, from where food comes from to how our clothes our made. When we talk with our friends, we talk about something pleasant.*

Wired.com: *How does this translate into skepticism about climate change?*

Norgaard: *It's a paradox. Awareness has increased. There's been a lot more information available. This is much more in our face. And this is where the psychological defense mechanisms are relevant, especially when coupled with the fact that other people, as we've lately seen with the e-mail attacks, are systematically trying to create the sense that there's doubt.*

If I don't want to believe that climate change is true, that my lifestyle and high carbon emissions are causing devastation, then it's convenient to say that it doesn't...we don't have a clear sense of what we can do. Any community organizer knows that if you want people to respond to something, you need to tell them what to do, and make it seem do-able. [Stanford University psychologist Jon Krosnick](#) has studied this, and showed that people stop paying attention to climate change when they realize there's no easy solution. People judge as serious only those problems for which actions can be taken.

Another factor is that we no longer have a sense of permanence. Another psychologist, Robert Lifton, wrote about what the existence of atomic bombs did to our psyche. There was a sense that the world could end at any moment. Global warming is the same in that it threatens the survival of our species. Psychologists tell us that it's very important to have a sense of the continuity of life. That's why we invest in big monuments and want our work to stand after we die and have our family name go on. That sense of continuity is being ruptured. But climate change has an added aspect that is very important. The scientists who built nuclear bombs felt guilt about what they did. Now the guilt is real for the broader public.

Wired.com: *So we don't want to believe climate change is happening, feel guilty that it is, and don't know what to do about it? So we pretend it's not a problem?*

Norgaard: *Yes, but I don't want to make it seem crass. Sometimes people who are very empathetic are less likely to help in certain situations, because they're so disturbed by it. The human capacity of empathy is really profound, and that's part of our weakness. If we were more callous, then we'd approach it in a more straightforward way. It may be a weakness of our capacity as sentient beings to cope with this problem.*

Read More <http://www.wired.com/wiredscience/2009/12/climate-psychology/#ixzz0l3hyVofh>

OK , So the Answer is, we all care TOO much and its so disturbing that we can't see an easy way out, so we have to turn away to preserve our sanity. Worse, we then listen uncritically to anyone with a beef against the type of people supporting the scientific view, as a release for the moral anxiety we feel.

So stop caring so much you guys! Just look at the facts dispassionately, do a few of the small things we might be able to do to the best of our ability, push our politicians to manage it at a broader level as best they can, then we just get on with life.

West Coast Adventures – Part II



The dam debate

When I think of the Strahan I recall rescuing a German backpacker from a service station attendant who wanted to beat him up because he looked like a "Greenie". That was 1983 at the height of the Franklin Dam blockade. Strahan's business centre was largely abandoned and boarded up and you could count the tourists visiting the West Coast on one hand.

The West Coast communities were addicted to mining and Hydro development, but Hydro industrialisation was coming to an end and mines were shedding jobs. It was a community afraid of the future and ill equipped to move to a service based economy. Many were warning everyone to look to tourism, but then the "service" at the Hotel Cecil in Zeehan was a thrashing with a pool cue if the Renison miners decided to take a dislike to you. However, I kept coming back. The big drive and anachronistic locals never deterred me.

The West Coast is just so interesting, beautiful and wild. Everything is blunt and overwhelming. If I had to describe it, it would be a clichéd phrase like a "rugged, unforgiving beauty". You can cast your eye over Gondwana like rainforests unchanged since the age of the dinosaurs, or a dramatic heritage site hidden like an ancient ruin amongst the vines. One moment there is a feeling of relaxation as you sit motionlessly to admire a waterfall. Then, a second later, several March flies have bitten you on the leg and it starts sleeting. If you are far from a car and wet weather gear in a few hours you might die of exposure. The West Coast is an exciting if reluctant maiden who plays hard to get.

Everyone starts a West Coast adventure at Strahan these days, so let's start by tagging along with the crowd.



Tourist Boom

If the dam debate alienated West Coasters from the rest of the community, it also set in train events that were to give new life to the area. By the late 1980s, Strahan had boomed on the infamy it gained during the blockade, selling off the negative air time as charter boat tickets to visit the now much lauded Gordon River. Soon Strahan was one of Tasmania's most visited spots and everyone wanted to come for a crowded, tightly scheduled, snapshot of the "wilderness".

Strahan took to the new money blowing into town with much greater success than the equally historic and interesting towns of Zeehan and Queenstown. While the residents of those once grander towns waited nostalgically for the discovery of a new 'mother lode', Strahan got on with milking a trade it already knew quite well. Strahan had always been a bit of a resort town. Virtually cut off from the rest of the world by the West Coast Ranges, Strahan had been the only place where a West Coast family could 'get away from it all'. Mining families would take the ABT railway from Queenstown to escape the sulphurous smelter fumes and bleak landscape of the Mt Lyell mine. At Strahan there was vegetation and a bit of fishing, boating, hunting, or sightseeing. Many Queenstown miners still maintain shacks in the area.

During the recent boom, investors, including sometimes large corporations, studded the crumbling town with a proliferation of new hotels and restaurants. Many seachanging 'outsiders' moved in and restored the old houses and set up new small businesses. The newcomers have sent real estate prices soaring past the means of any local wanting to own a shack by the harbour. The crumbling railway formations have become tourist walks and renewed government interest has seen money flow back into public infrastructure. Generous grants reopened the ABT railway as a tourist attraction, restored the old railway station and renewed the rotting wharves. Roads were repaired and Strahan can now even boast the odd bit of road rage. There has been a lot of primping of private buildings, not all of it sympathetic to the heritage values of the old town. Overall, the renewed interest has stopped Strahan from falling foul of decay and insurance fires, a fate that has befallen much of Zeehan and is starting to eat away at large parts of Queenstown.



The old Entrance Island Keeper House (apparently haunted) was moved near Lettes Bay for use as a shack. Recently it has been almost entirely dwarfed by a modern extension. Even a spook needs a third bathroom it seems.

The Heart of Strahan

You could just rush through Strahan and spend all day with 200 other people on a Gordon cruise instead and I'm not saying that it isn't a worthwhile experience. However, these days I'd prefer to skip all that and dig a bit deeper into the whole West Coast story. The history of the area is just as interesting as the scenic tours, but it takes time to read up on and appreciate. Just reading about it or visiting museums also seems a bit stale. I'd prefer to explore for the rusty relics that are part of our history, the ones that have confounded our efforts to eliminate 'untidy' and 'unflattering' things from the landscape. I'm after the stuff that's left "in context" as the archaeologists nowadays keep talking about.

A tour of the town starts around the Western wharves and old Customs House. Once bustling with large freighters unloading mine machinery, today freighting sightseeing passengers is the trade. In the early history of the harbour, prospectors came here to resupply at F.O. Henry's store. Henry had a reputation as a soft touch and accepted worthless mine shares from struggling diggers in return for provisions. His generosity paid off when he ended up holding a significant part of what later became the Mt Lyell copper mine. His fortune allowed him to build a mansion at West Strahan Beach called "Ormiston" that can still be seen today.

The Huon pine sawmill at the wharves is still nominally working. Pining was the earliest trade on the harbour and Huon pine had been used to build many fine colonial sailing ships. Resistant to shipworm and waterlogging this extremely slow-growing riverside tree allowed Tasmanian shipbuilders to turn out vessels superior even to English vessels of the day. A Huon pine rush had started by as early as the 1820s. Stocks are now so low that no living tree can be felled and the current trade is based on salvaged drift logs alone. The timber is so rare and valuable that millers have already gone back into the bush to dig out the stumps left by the old convicts. When that ran out they returned to recover even the roots. A sailing ship built from Huon Pine would cost a small fortune today. Nowadays the timber is often used for tourist

bowls and salad forks. Functionless and unimaginative, the only wonder comes from the scent. Even that eventually fades away.



A few relics of the shipping and sawmilling era have been left 'in situ' along the Strahan foreshore.

Walking the foreshore

You might need to feed the parking meter and dodge a few overlength campervans, but the foreshore walk along the old railway track is well worth it. Take the time to stop at the "Peoples Park" and admire the waterfall. The interpretive signs are handy, but I'd also suggest bringing along a history book with a few old photos of the town. It would be the perfect spot for a picnic, sketch or snooze on a hot day, except for the incessant March flies. This is an athletic adventure where the flies keep you on the move at least until you get to the pub at the end to re-create that other common mining activity, beer drinking. Once a bit too roughhouse, the pub is now quiet and friendly.



The old railway from the Customs House to Regatta Point is now a tourist walk with interpretive signs. Unfortunately a lot of old railway relics were recently removed and sold for scrap to make room for this foreshore beautification. If the foreshore wreck of the S.S. "Glenturk" is still there I didn't see it.



The railway

At Regatta Point there is often some action around the restored railway station with the shunting of engines and snapping of cameras. From here the ABT railway arrives from Queenstown. The rail trip is unique and well worth the reasonably inconvenient cost. The railway will probably always need government support as it was originally built on one of the most difficult rail routes in the world. The grades defied the normal rules, requiring special locos to be bought in from Germany with a unique ABT 'rack and pinion' gear to help them over the big hills. Maintenance was and still is a nightmare with dozens of wooden bridges including one a ¼ mile long. Any heavy bushfire and flood damage will be harshly expensive to deal with, as it was when the railway was in service. Again, knowing the history enlivens the whole journey. The ABT was one of two competing railways built in the 1890s by a couple of prominent and quite grumpy old mining magnates. They hated each other and wouldn't co-operate. It would take too long to explain the whole saga, so read Blainey's "The Peaks of Lyell" instead. They don't make soap operas scripts as good as the genuine local mining history.



This unnoticed steam crane would have once been a common site all over the world, but to see it in its original location would be a rare site in most busy harbours today. These cranes loaded copper nodules into waiting steamers at Regatta Point. Its heritage value keeps growing while its scrap value remains a pittance. One fell through the rotten decking and is still there to see for any diver who doesn't mind the dark waters.

The King River delta

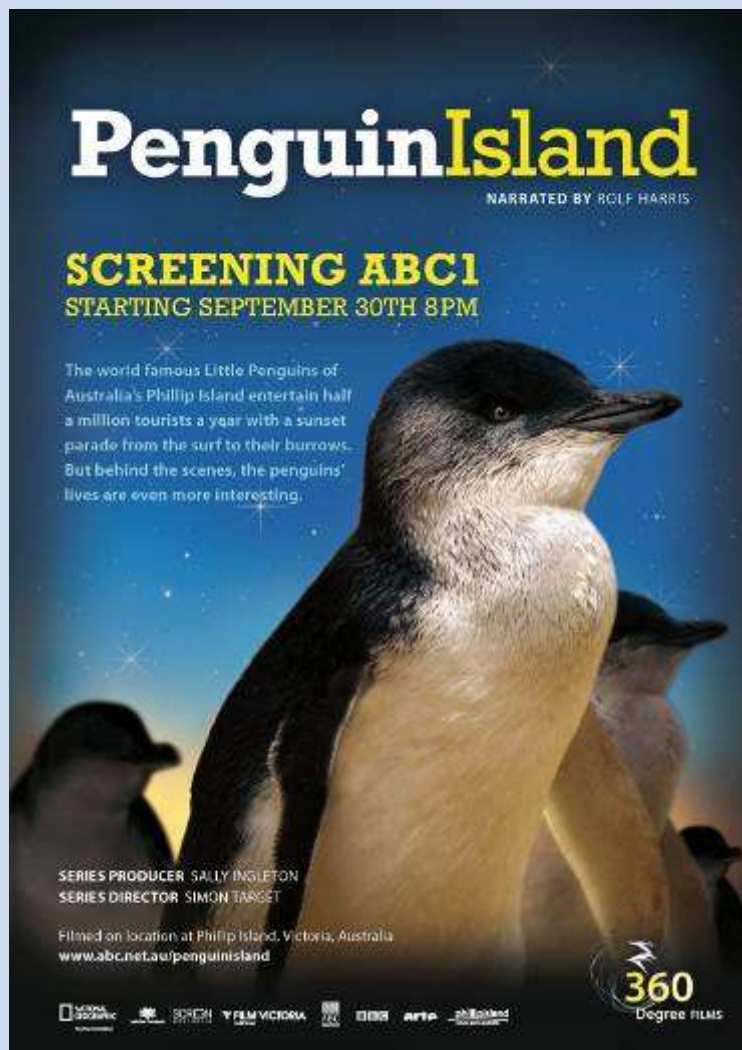
The ABT railway tourist brochures don't talk much about mining development, but focus on the manferns. In reality, when Mt Lyell mine opened the miners slowly removed half a mountain and shipped the recovered copper down to Strahan over this little railway. Most of the mine rubble didn't contain copper and was allowed to wash into Conglomerate Creek at Queenstown, which was basically a big open drain loaded with silt and mineral contaminants. That creek in turn fed into the King River and the pyritic sediments smothered the riverside vegetation with a blanket that has resisted nature's best efforts to revegetate. There was so much silt it created a 250 hectare delta at the mouth of the river at Lowanna on Macquarie Harbour. Progressively the mine operators have reigned in their outflows until today the water is relatively clear. The contaminated soil is still resisting revegetation, but eventually the verdant greenery will triumph, as it has slowly reclaimed the moonscape at Queenstown. The Mt Lyell mine has left a legacy of heavy metal contamination in the harbour which is a challenge to the clean image of the local marine farms.



Just typical West Coast, even a huge contaminated wasteland can be compelling and strangely perhaps even beautiful.

Strahan can be a beautiful place and it is much-admired. The mining landscapes of Queenstown and Zeehan, in different ways are just as novel, but in contrast they have been shunned. Even the lessons to be learned from studying the uncontrolled despoliation of the landscape that accompanied early mining have to be forgotten when you only want to be sold a somewhat romanticised vision of an untouched and ennobling 'paradise'. Perhaps in our own over-industrialised lives its harder to appreciate another bleak "hole in the ground" as also a heritage site that tells a human story. That human story was one of hardship and toil that made West Coasters the dangerous and innovative radicals of their day, ironically something like the radical "Greenies" of our times.

It might be hormonal, but there is something about the local tourist boom in Strahan that seems quite artificial to me. Perhaps it's just that the "wilderness" values are only superficially touched upon and it's less than half of the story of the area anyway. Let's try and tell a bit more of that story next month.



WHAT'S ON in Spring 2010

Amalgamated club calendars

Like to get in touch with someone for a dive or day out, email us and we'll forward your message. If you would like to advertise your club calendar also drop us an email. If you're cranky because your club calendar isn't appearing here, it's because you haven't forwarded us the details.

October 2010

TUDC – Tuesday 12th – Night dive at Bellerive Beach

TUDC – Saturday 17th – Day diving at Tinderbox

TUDC – 22nd to 24th – Weekend of Bicheno diving

November 2010

TUDC – 12th to 14th – Weekend of Tasman Peninsula diving based at the Koonya field station

Leven Scuba Club may also have ad hoc dives planned and go out most calm weekends.

TUDC dives Register online at http://www.tudc.org.au/diving/dive_calendar.php

Essential news and links for the perfect day out

Water temperature http://www.bom.gov.au/cgi-bin/nmoc/latest_YM.pl?IDCODE=IDY00004

Link to marine wind forecasting <http://www.bom.gov.au/jsp/marine/wind/index.jsp>

Moon phases and Tides - Low Head, Hobart & Burnie

<http://www.bom.gov.au/oceanography/tides/MAPS/tas.shtml>

Advanced weather planner based on past records

http://www.bom.gov.au/climate/averages/tables/cw_092003.shtml

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How to make a contribution

This involves sending us an article by email, preferably not too long and with a photo or two. Sorry, no money, its all a love job and just for the glory. We'll use your contribution for the purpose for which it was given, for non-commercial uses and with attribution. *Contact Us;* marinelifetassie@gmail.com

Back Issues

We have been gathering together a lot of information and stories since November 2009, so if you are new and interested, please log on our back issues page which has been generously hosted by the Tasmanian University Dive Club, <http://www.tudc.org.au/news/marinelifeph>

Ocean Art

Kevin Raskoff <http://www.coml.org/census-arts/raskoff>

