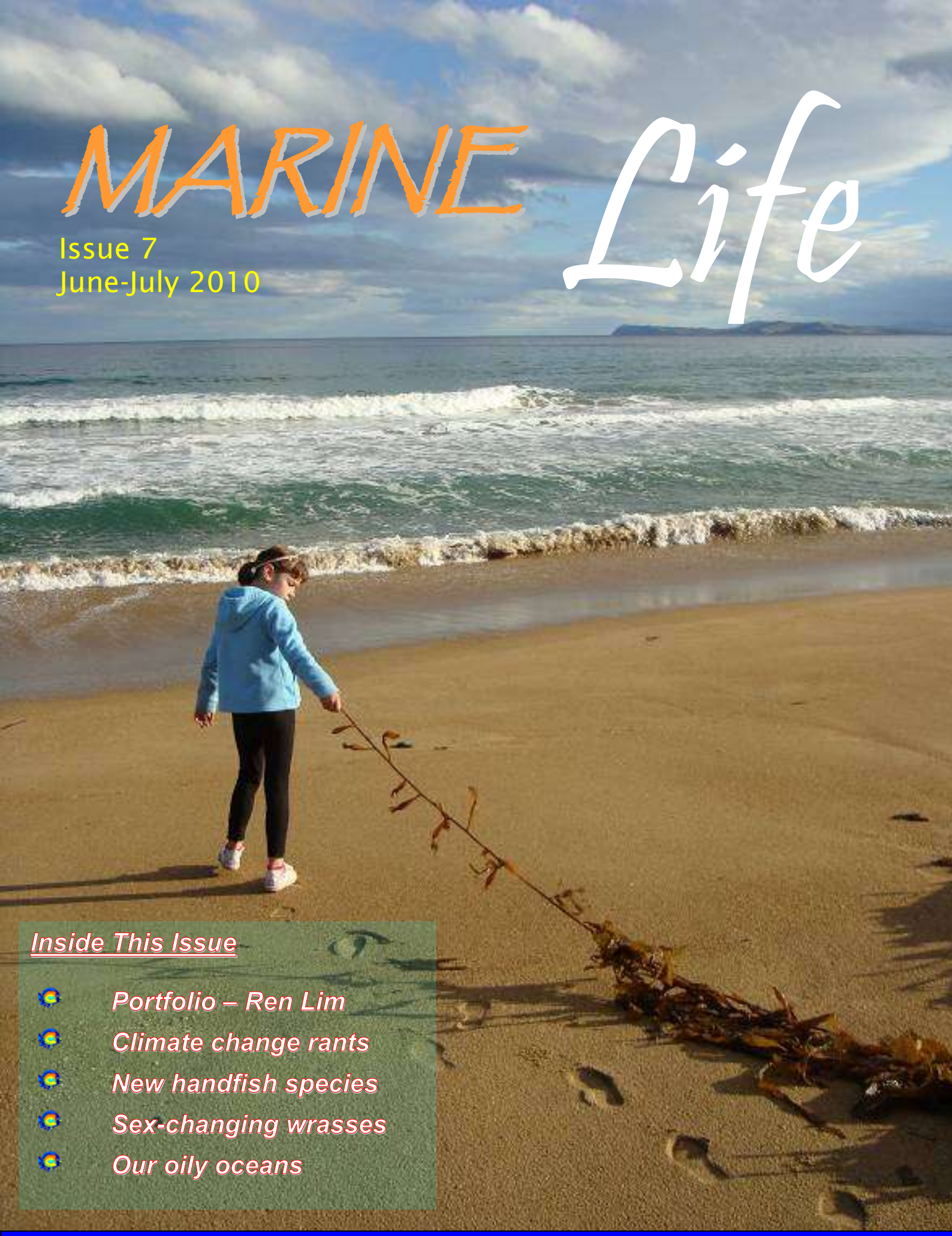
MARINE Life

Issue 7
June-July 2010



Inside This Issue

An eco-friendly community-based magazine for the Tasmanian marine and marine life enthusiast

Our goal

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

Our Team

Mike Jacques

Editor and collector of little blue objects for his bower.

Emma Flukes

Asst Ed, Maker of the beeping noise in the original Star Trek series

The Prince of Sharks

Mr North 1990. Thawed out of glacier and pulled from the teeth of a Giant White Pointer

Phil White

Mr North West. Finder of alien messages in TV snow.

Marine LIFE

This issue

DPIPWE News

Rock Lobster Fishery Review - Release of New Discussion Paper

Find out what is happening and have your say into the review of the management of the fishery. The Department of Primary Industries, Parks, Water and Environment has released a discussion paper on the issues and future management of the rock lobster fishery.

Recreational Fishing forums discussing the stock declines and other issues in the fishery, and ways to address these are being conducted from 10 to 27 May. The venues and dates of meetings are listed in the attached notice, at www.fishing.tas.gov.au,

Comment is welcome until 8 June 2010.

Parks News

Tasman Island feral cat eradications

A project to restore the natural values of Tasman Island will begin next week with an aerial baiting program to eradicate cats from the island.

Parks and Wildlife Service general manager, Peter Mooney, said this will be the first feral cat eradication operation to be undertaken on a near offshore island in Tasmania. The project, costing approximately $100,000, is a cooperative effort between WILDCARE Inc through the Tasmanian Coast Conservation Fund, the Parks and Wildlife Service and the Resource Management and Conservation Division of the Department of Primary Industries, Parks, Water and Environment.

"Despite a long history of human use, the island retains many biodiversity values and the objective of the project is not just the removal of every last cat, but the restoration of the island's ecosystem," Mr Mooney said. Tasman Island is an important seabird breeding site and feral cats are having a big impact on the island's birds. They feed almost exclusively on fairy prions and short-tailed shearwaters, with occasional lizards and insects. "The island's colony of fairy prions is the largest in Tasmania, consisting of between 300-700,000 breeding pairs. "We estimate that there may be between 50-100 feral cats on the island, but they are killing an estimated 50,000 fairy prions each year. Cats are surplus killers, often killing and then not consuming their prey," Mr Mooney said.

The baiting operation will take place next week, when there is a marked drop in the number of seabirds on the island and food is in short supply for the cats. A meat bait using the toxin PAPP (para-aminopropriophenone) will be used as part of on-going research into the use of the toxin as an alternative bait. PAPP is a humane and effective toxin which kills the cats rapidly, but without distress; in a process similar to carbon monoxide poisoning. Trapping, then active hunting of any surviving cats, will follow the aerial baiting. Remote cameras and other technology will be used to continue surveillance of the island for another one to two years.

More information about the project is available on the PWS website here

Arthur Pieman Vehicle Access

The consultation period on the Draft Arthur-Pieman Sustainable Recreational Vehicle Access Report is being extended by another month.

"The report recommends no change to current access for around 80 percent of the 94 tracks identified in the report. The remainder are proposed for summer use only or for closure and rehabilitation. However, the Minister stated that "some concerns have been raised by users of the area. I take these concerns seriously and have decided to extend the consultation period to 4 June 2010 as a result."

Mr O'Byrne said that the Parks and Wildlife Service has worked very closely over a period of years with key community groups, the Arthur-Pieman Conservation Area Management Committee and Off-Road Vehicle Consultative Group to improve the sustainability of recreational activities in the Arthur-Pieman.

Track recommendations will be finalised following input from the community and these will be implemented along with an improved off-road permit system.

Comments will be received until Friday, 4 June 2010 and can be forwarded by email to representations@parks.tas.gov.au. The report is available on the PWS website at http://www.parks.tas.gov.au/file.aspx?id=17494

News up North

Beneath the Tamar: more than silt

1 May – 11 July 2010
QVMAG at Inveresk

The exhibition Beneath the Tamar—more than silt shows the diversity and beauty of the animals living in the Tamar estuary. With a mix of underwater photography and video this exhibition presents a visually stimulating, informative and educational display of organisms that will surprise you. It shows a side of the Tamar that most people never get to see.

The exhibition is curated by David Maynard and Dr Troy Gaston, both lecturers at the Australian Maritime College at the National Centre for Marine Conservation and Resource Sustainability. Troy has over 13 years research experience in estuarine, coastal and marine biology and ecology. David has been photographing Tasmanian marine life for 10 years.
http://www.qvmag.tas.gov.au/whatsoninv.html#tamar

Underwater Hockey Starts in the North

We are starting a regular game of underwater hockey on Tuesday nights at the deep end of the Launceston Aquatic Centre pool. This is an exhilarating game and a great way to keep fit.

The pool and U/W Hockey Association are lending

- the pool space,.
- The pool is water polo/water basketball hats that we will use for head protection.
- access to plastic bats
- lead-plastic pucks

You just need to supply,

- $6.75 in pool fees
- fins preferably without buckles, as these catch on peoples hair
- mask and snorkel
- a gardening or neoprene glove for your playing hand
- bathers
- a mouthguard if you have one that you are comfortable wearing

If you think you will come along on a Tuesday please do e-mail , Garry.Davidson@utas.edu.au and let him know so that they can cater for numbers.

Cheers,
Garry Davidson
Committee Member, Tasmanian Underwater Hockey Association

Ocean Planet News

World Oceans Day Screening BBC documentary Oceans: Exploring the Secrets of our Underworld

Ocean Planet will be screening the amazing BBC documentary about our Southern Ocean. See here: http://www.bbc.co.uk/programmes/b00fpy59 The documentary investigates why parts of the Southern Ocean are warming twice as fast as the rest of the world's oceans and looks at the impact of this phenomenon.

Expedition leader Paul Rose, environmentalist Philippe Cousteau Jr, maritime archaeologist Dr Lucy Blue and marine biologist and oceanographer Tooni Mahto brave some of the roughest seas and the strongest winds on the planet.

They go in search of one of the planet's most curious and enigmatic creatures - the weedy sea dragon. They explore iconic kelp forests to investigate how they're being threatened by the rise in sea temperatures and a new predator. They dive one of the thousand shipwrecks in these waters and in a unique sunken valley, they search for mysterious deep ocean creatures normally found hundreds of metres below the surface. And they enter a maze of perilous sea caves to hunt for evidence of ancient sea creatures that can reveal how this ocean formed.

Where: Dechaineux Theatre
When: 8th June 2010 Time: 6.30pm for a 7pm film start

End of the Line: Coming to the State Cinema in Hobart

For those of you who missed the Ocean Planet pre-screening of Ocean Planet you now have another opportunity to the world's first major documentary about the devastating effect of overfishing.

Imagine an ocean without fish. Imagine your meals without seafood. Imagine the global consequences. This is the future if we do not stop, think and act.

Coastal Protection News

Draft State Coastal Policy 2008

Please see The Tasmanian Planning Commission's website for further information including the Draft Policy and Implementation Guide:
http://www.planning.tas.gov.au/stpol/current_direction_-_scp08

The Commission is now seeking representations generally on the draft Policy, and particularly in the context of contemporary coastal research and knowledge.

Any suggestions for revisions and, or, amendments to the draft Policy are welcome. The closing date for comments is 21 June 2010.

SCAT Planning and Policy 2010

Southern Coastcare Association of Tasmania (SCAT) is undertaking a strategic planning process during 2010 and would love for you to be involved.
I really hope you can join me and other members of the SCAT Committee at one of the workshops outlined in the attachment. If not, please consider filling out our on-line survey form in order to have your say in the future of SCAT.
RSVP for the workshops to our Admin Officer, James Burke on his details attached.
Please pass the invitation attached on to others who you think may be interested. Thanks very much.

Kristy Blackburn
SCAT President
Kristy.Blackburn@environment.tas.gov.au

Marine Debris Clean-Up of Tasmania's Wilderness World Heritage Area

Depending on your point of view this years' trip to the remote beaches of south west Tasmania's Wilderness World Heritage Area was either the most successful to date with a record haul of 17,714 pieces of rubbish or very disappointing as we continue to see increasing amounts of rubbish finding its way into one of the worlds most pristine wilderness areas. Either way we managed to clean a total of eight beaches thanks to the Cray fishermen, fine weather and a very happy, enthusiastic and capable crew.

The rubbish collected was slightly different in makeup to past years. Most noticeably there was a massive increase in aluminium cans mainly due to some thirsty and careless visitors to New Harbour or 'Beercan Bay' on the south coast and Spain Bay in Port Davey. From these two small beaches we found a staggering 599 and 140 cans and can pieces respectively out of a total of 784 cans for all beaches. Most of these cans were clearly identifiable as produced here in Tasmania so are definitely locally derived. This year we also collected more small pieces of plastic, caps and lids than ever before. Most other collected items showed a continual trend upwards indicating we are seeing more and more rubbish making its way into our oceans.

This year we again found an array of strange items including a biohazard waste disposal container, a toy horse, heater, stainless steel shackles and a matching pair of ugg boots. Once again we found a number of clearly identifiable foreign items including numerous bottles and containers produced in Japan, China, Korea, Europe, Africa and South America. We again found two ocean current drift cards one from the 1990's from Australia and one decidedly worn card dated 1973 from South Africa. Check out all the updated info on the Blog at: http://wha-marinedebris.blogspot.com/

Coastal Weed Management Workshop

The SPRATS group (Sea Spurge Remote Area TeamS) is proposing to run a coastal weed management workshop between 1 and 5 pm on Friday 4 June in the School of Geography and Environmental Studies at the Sandy Bay campus of the University of Tasmania.

The aim of this workshop is to present and discuss strategies for the effective and targeted management of coastal weeds in such a manner that other values (eg shore nesting birds, Aboriginal sites, ecological values) are not adversely impacted. In addition, the use of volunteers and partnerships with land managers will be discussed.

Whilst this workshop will concentrate on weed management on Tasmania's west and south coasts, its topics are relevant to performing environmental management in many other parts of Australia.

Contact: Jon Marsden-Smedley jonms@bigpond.com 0427 334 240

Coastal weed management workshop

A coastal weed management workshop will be run by SPRATS (Sea Spurge Remote Area TeamS).

Time and location:

- Friday 4 June 2010 between 1:00 and 5:30 pm,
- Lecture Theatre 1, School of Geography and Environmental Studies, University of Tasmania (building 12 on map: http://www.campuses.utas.edu.au/documents/sandy-bay-building-map.pdf).

Workshop aims:

- strategies for coastal weed management,
- effective use of volunteers,
- managing partnerships with land managers and other parties,
- performing effective weed management whilst minimising impacts to natural and cultural values.

The workshop format will be a series of short talks followed by interactive discussion.

Program

Workshop welcome

Volunteering for environmental management

Adventure weeding: the effective use of volunteers	Geoff Luscombe, SPRATS
Remote area weeding: SPRATS progress to date	Jon Marsden-Smedley, SPRATS
Weeding on a smaller island	Bob and Penny Tyson, Friends of Deal Is

Challenges when performing coastal weed management

Weed identification and emerging weed threats	Matt Baker, Tasmanian Herbarium
Minimising impacts to shore birds	Eric Woehler, Birds Tasmania

Afternoon tea

Strategic issues related to coastal weed management

Australia-wide perspective	Tim Rudman, DPIPWE
A land managers perspective	Chris Arthur, PWS
A regional approach to weed management	Sandy Leighton, STCA
A regional approach to weed management	Greg Stewart, NRM North
Plenary session and key workshop outcomes	Kathleen Broderick, NRM South

For RSVP or more information contact:

Jon Marsden-Smedley
Room 410, School of Geography and Environmental Studies, University of Tasmania
Phone: 6226 7674 (w), 0427 334 240 (ah), Email: jon.marsdensmedley@utas.edu.au

SPRATS is a self-managing WildCare group working in partnership the Parks and Wildlife Service. We have been doing remote area weeding of sea spurge (*Euphorbia paralias*) and marram grass (*Ammophila arenaria*) on Tasmania's west and south coasts for the past four years.

This is a unfunded workshop being run by a volunteer group. The support of the School of Geography and Environmental Studies and NRM South in running this workshop is acknowledged.

Sea Spurge Remote Area TeamS

UTAS School of Geography and Environmental Studies

News in Brief

Maori Screw Shell Pest now impacting fisheries

19 March - Scientists fear an introduced species of shellfish could impact on Tasmania's scallop and trawl fisheries. Survey work using a new remote control underwater camera has revealed the New Zealand screwshell now extends from southern Tasmania to Sydney Harbour.

http://www.abc.net.au/news/stories/2010/03/19/2850870.htm?site=northtas

Fisheries urged to diversify their take - Tasmania

28 April - Australian fisheries scientist Tony Smith, from the CSIRO's Wealth from Oceans Flagship in Hobart, says there needs to be a "balanced exploitation" of the oceans.

"The balanced exploitation approach is suggesting a lower overall exploitation rate - particularly with regard to some of the currently intensively fished species - with the trade off that you exploit a larger part of the ecosystem."

Dr Smith says, for example, that when setting quotas for rock lobsters, consideration should be given to their interaction with sea urchins.

http://www.abc.net.au/news/stories/2010/04/27/2883495.htm?site=northtas

Tasmanian Museum and Art Gallery

Biodiversity Week Exhibition, A Year of Wonder in the Island Arc
Now until 21st December, 2010 9:00 am
Tasmania, with its living cargo of plants and animals, has been a separate island for 12,000 years. The wide variety of landscapes and habitats has been protected from some of the effects of climate change, human impact and introduced species that have caused extinctions in mainland Australia. Through this program of public lectures, curatorial talks, sessions in the Zoology Gallery and web-based outreach, you will discover Tasmania's ancient origins, unique biodiversity, unusually high numbers of endemic animals and plant species that are present here.

Choose one or more of the following events.

- An Island Arc: the Unique Animals and Plants of Tasmania
- Biodiversity trail
- Intergenerational Biodiversity Discovery Sessions – Holiday program
- Video podcast of the Biodiversity Scientists at work
- Public talk(s)

http://www.biodiversity2010.org.au/2010/04/a-year-of-wonder-in-the-island-arc/

Random dive club news

OCEANS doing it hard at Bridport and Croppies

Look at that weather!

TSDC

Get back into diving Day Anzac Day 2010

The idea was to get members back into the pool to try a few skills and have a bit of fun. I think on that score we were pretty successful and had a good turnout from club members, as many as we could handle really.

Thanks to the grand offer of help we received from Ian Cooksey of Aqua Scuba Diving Services, we also were able to offer a try – a dive. We only had 3 starters in the end after some confusion about locations and a few timid non-starters, but those that attended certainly made up for it in keenness.

Thanks also has to go to Clarence Pool for the ½ price deal they do for divers, which makes it financially viable for us. We can't end this article without commenting on the help offered by Gail who prepared a terrific photo display, baked muffins and then helped out with skills training. Above and beyond!

TASMANIAN COMBINED DIVE CLUBS WEEKEND

BICHENO 2010

BICHENO,
QUEENS BIRTHDAY LONG WEEKEND,
JUNE 12TH - 14TH, 2010

Come and join your fellow dive clubs from around Australia at beautiful Bicheno on the sunny east coast of Tasmania for an outstanding long weekend of fun including:

World class diving
Photo competitions
Scuba Olympics
Diving presentations
New gear to try out
Great prizes
Socialising

For more information, please contact:

Andrew Burt 03 6212 8240
or
www.tassiedivers.com

2010 CCW Timetable
Friday
6.00 PM Informal meet and greet at the pub for dinner. Meal orders close at 8pm
9.00 PM Event Registration, diving movie and drinks at the hall
Saturday
8.00 AM Event registration at the town hall during Saturday morning
Morning General Diving
12.00 PM Inter Club Reciprocal Rights Discussion at the hall for those interested
Hosted by Michael Jacques
1.00 PM Scuba Olympics at the oval
Afternoon General Diving
4.30 PM Group Night Dive at Waubs Bay
7.00 PM Meal at hall
8.00 PM Presentations
9.00 PM Quiz night
Sunday
Morning General Diving
12.00 PM Organisation of next year's CCW event at the hall for those interested
Hosted by Andrew Burt
Afternoon General Diving
3.00 PM Spud hunt at Waubs Bay
6.00 PM Meal at hall
7,00 PM Presentations
8.00 PM Photo Competition
9.00 PM Event Prizes and Awards presentation
Monday
Morning General Diving
Revision

More Info:

http://tassiedivers.com/community/index.php?/topic/1830-ccw10-update/

Dear Redmap…

Recent sightings

This octopus usually inhabits waters off New South Wales, commonly Sydney. You would really have to catch this octopus to easily identify it. Often octopus look like two eyes peering out from a rock crevice. If you are lucky enough to spot this up close, look for its white eyes, brown body and distinct orange underside.

AKA: Sydney (Gloomy) Octopus
Habitat: Adult octopus live in reef environments.
Size: Can reach an arm span of 2 m.

Image: R. Stuart-Smith

Kids Fun Day

With the TSDC & Marine Life Magazine

By Mike Jacques
Photos by Kylie McGeary and Sarah Pidgeon

Well in Tassie the chances are good that any outdoor beach event is likely doomed to suffer from howling winds and driving rain. Not so the fun day that had PERFECT weather, clear blue skies, light winds and air conditioner style temperatures.

We started off with world champion sand castle building, then totem tennis, rides in the Zodiac including one out to the Iron Pot, fishing, swimming, a foreshore walk, hot chocolates (thanks Colin) and lots of lollies (I even let the kids have a few). Sarah and Kylie took photographs for everyone and we will include just a few for your pleasure. Basically, everyone was helpful and happy. The kids behaved and enjoyed themselves. Ella Clayton wants to have fun days every week.
We also had everyone who indicated an interest actually turn up, plus a few more blow-ins. From the dive club we had 3 families (McGeary, Jacques and Fillisch), along with 3 families of Marine Life magazine readers (Fry, Clayton and Pidgeon) and one blow-in walking along the beach, a little boy couldn't walk past kids making sand castles and refused to follow his mother home. Just the right number of people according to Amy.

If you are wondering why a e-zine does that sort of thing it's because we can, and helping people with a common interest get to know each other better and have social fun with the ocean.

Leven Hunts for the "Davenport" wreck

March exploration dives – Greg Close and Phil White

Still haven't found the wreck of the Davenport but still looking. Neo and I did a few bounces in the suspect zone and saw nothing that remotely resembled dredge wreckage. In fact I tried to get back on the pulp pipeline for a more thorough inspection but couldn't find that either! The GPS positions marked the last time out did not coincide with what was coming up on the sounder so it was a bit hit and miss. (All miss unfortunately). Not easy to spot when it sits less than a metre off the bottom and there was a swell running of around 7 metres.

Better luck next time. I did find a nudi or two even if they were the more common ones.

Message 2

Spent the morning doing further search dives off Morelands Beach east of 'Wrights Island'. Still no luck in finding the dredge remains.

Few nice little patches of bottom found with good fish life and invertebrate growth.

The remarkable thing this morning was the number of Blue Bottles (Portuguese Men of War) on the surface. In one strip, which was over a kilometer long and 100 or so metres wide, they were so thick there was less than a metre between them.

Critter Files

Giant spider crab (*Leptomithrax gaimardii*)

Habitat: exposed reef, sand
Depth range: 0-820 m
Size: carapace width to 125 mm
Diet: small invertebrates

The giant spider crab can generally be recognised by its orange-whitish colour, massive size and legs that are considerably longer than the body. The species normally occurs in deep water up to 800 m, but local feeding and mating aggregations can form in very shallow water at particular times of the year. Although fun to antagonise, these crabs can deliver quite a nasty finger-crushing sensation with their powerful claws.

Photo © Emma Flukes

Readers have reported seeing spawning aggregations off Kingston as late in the year as only a month ago. Spider crabs have also been found washed up on Bruny where they are often seen in the shallows on the Channel side. Note the number of Maori Screw Shells on the bottom, see news item above for more info.

Serious Kids Stuff

By AMY

While I was doing my squid project, my friend Ella Clayton was looking for information about flathead on the internet. Here is a picture of Ella,

We now have to make paper Mache models of our project animals. Gee, squid are hard. Our teacher, Mr Jeffries is probably going to get our models displayed at Eastlands or the Rosny library.
Michael has put together some of the information we used in the project.

There are different sorts of flathead like the Sand flathead (*Platycephalus bassensis*) , tiger flathead *(Platycephalus richardsoni),* Castelnau's flathead (*Platycephalus speculator*) and the rock flathead (*Platycephalus laevigatus)*. Both eyes are on the top of the flattened head, giving excellent binocular vision to attack overhead prey. Flathead use this body structure to hide in sand (their body colour changes to match their background), with only their eyes visible, and explode upwards and outwards to engulf small fish and prawns as they drift over.

Sand Flathead

Sand flathead grow to at least 50cm in length and over 2kg in weight. On reaching this size they are around 16 years old. Sand flathead spawn around Tasmania from September through to February in coastal bays and inner continental shelf waters. It is the most popular fish targeted by Tasmanian amateur fishermen. Commercial fishermen take 50-60 tonnes of every year and fish stocks are declining.

Tiger Flathead

A similar species, the tiger flathead, has orange-brown spots on light brownish or pinkish grey body. This fish has larger canine teeth than the sand flathead. They are generally found both inshore and on the continental shelf between 0 and 400m. Spawning occurs on the continental shelf between December and February. Tiger flathead grow to at least 65cm in length and a maximum age of about 17 years. The main species of the South East Trawl fishery is tiger flathead which spend part of their life cycle inshore.

No more serious kids stuff for this issue - watch this space!

Editors Rant

Climate Change –A Struggle of Faith and Denial

By Mike Jacques

From where I'm sitting, arguably one of the greatest challenges facing science at the moment is a crisis in confidence over climate change. Increasing levels of public scepticism have seen the erosion of the almost unqualified trust enjoyed by science in the 19th and 20th Centuries. This article of faith is being replaced by a deep scepticism about the motives of scientists and the value of the scientific method. This scepticism is perhaps across society rather than just about science, but it is currently most clearly evident in the arguments around climate change. Is this scepticism just a feature of the deeper hostility that people have developed towards any 'authoritative elite' seen as 'interfering' with their lives? Could we be lumping scientists in with other 'wowsers' and 'spoilsports' who appear to enjoy suggesting restraints to every ordinary pleasure of life? Perhaps it is just another shot in the centuries long battle between religion and secularism? Could it be that the truth is just too terrible to contemplate? Maybe people have been overloaded with bad news? The reasons for people's scepticism might be rooted in all of these factors and it may depend on who you are and your life experience as to which one is more significant.

I don't have any trouble accepting the general idea of climate change despite never having fully read the IPCC report that investigates this in some depth. I take it on trust to a degree because I am still inspired by science and think it is still the best way to deal with these issues and give us the best chance to preserve the Sunday drive and lamb roast lifestyle we fear is under threat. I also 'get' the methodological supremacy of the scientific method over a few anecdotes and half-understood internet blogs. My personal sceptical also works differently. If there is a complex issue then it's unlikely to be resolved by a simple and convenient conspiracy theory that tells me not to worry.

I take my side of the argument on trust because I can't thread through reams of atmospheric research data, and I can't run a supercomputer even if I had one.

I do have one big advantage over many others in the debate. I have dived for a long time and I can SEE strange things happening in the East Coast of Tasmania already thanks to a particularly volatile current that has already warmed up significantly in recent decades.

The other preparation I have had is to travel in South Africa just after the end of the Apartheid era. I saw the unbelievable lengths good people can go to deny the most hideous facts to protect the illusion of a personal oasis of comfort.

Anyway, it's a bit rude of me to lecture you about what I believe when I haven't really done a full investigation myself, so I'm about to embark on a learning process. However, I warn you, I'm a climate change scepticism sceptic.

What the Rough Consensus says

I could recount the ICCP report at great length but I'm lazy. Here's the summary, from Wiki, "The key conclusions in the Summary for Policymakers in *Working Group I: The Scientific Basis* were:

1. The global average surface temperature has increased over the 20th century by about 0.6°C; Temperatures have risen during the past four decades in the lowest 8 kilometres of the atmosphere; Snow cover and ice extent have decreased)
2. Emissions of greenhouse gases and aerosols due to human activities continue to alter the atmosphere in ways that are expected to affect the climate
3. Confidence in the ability of models to project future climate has increased. Such models cannot yet simulate all aspects of climate
4. There is new and stronger evidence that most of the warming observed over the last 50 years is attributable to human activities
5. Human influences will continue to change atmospheric composition throughout the 21st century
6. Global average temperature and sea level are projected to rise under all IPCC SRES scenarios.

If you want a bit more detail here is another extract from the ICCP Report

Observed changes in climate and their effects

Warming of the climate system is unequivocal, as is now evident from observations of increases in global average air and ocean temperatures, widespread melting of snow and ice and rising global average sea level

Eleven of the last twelve years (1995-2006) rank among the twelve warmest years in the instrumental record of global surface temperature (since 1850). The temperature increase is widespread over the globe and is greater at higher northern latitudes. Land regions have warmed faster than the oceans .

Rising sea level is consistent with warming . Global average sea level has risen since 1961 at an average rate of 1.8 [1.3 to 2.3] mm/yr and since 1993 at 3.1 [2.4 to 3.8] mm/yr, with contributions from thermal expansion, melting glaciers and ice caps, and the polar ice sheets. Whether the faster rate for 1993 to 2003 reflects decadal variation or an increase in the longer-term trend is unclear.

Observed decreases in snow and ice extent are also consistent with warming. Satellite data since 1978 show that annual average Arctic sea ice extent has shrunk by 2.7 [2.1 to 3.3]% per decade, with larger decreases in summer of 7.4 [5.0 to 9.8]% per decade. Mountain glaciers and snow cover on average have declined in both hemispheres.

From 1900 to 2005, precipitation increased significantly in eastern parts of North and South America, northern Europe and northern and central Asia but declined in the Sahel, the Mediterranean, southern Africa and parts of southern Asia. Globally, the area affected by drought has *likely*[2] increased since the 1970s.

It is *very likely* that over the past 50 years: cold days, cold nights and frosts have become less frequent over most land areas, and hot days and hot nights have become more frequent. It is *likely* that: heat waves have become more frequent over most land areas, the frequency of heavy precipitation events has increased over most areas, and since 1975 the incidence of extreme high sea level[3] has increased worldwide.

There is observational evidence of an increase in intense tropical cyclone activity in the North Atlantic since about 1970, with limited evidence of increases elsewhere. There is no clear trend in the annual numbers of tropical cyclones. It is difficult to ascertain longer-term trends in cyclone activity, particularly prior to 1970.

Average Northern Hemisphere temperatures during the second half of the 20th century were *very likely* higher than during any other 50-year period in the last 500 years and *likely* the highest in at least the past 1300 years.

Observational evidence[4] from all continents and most oceans shows that many natural systems are being affected by regional climate changes, particularly temperature increases.

Changes in snow, ice and frozen ground have with *high confidence* increased the number and size of glacial lakes, increased ground instability in mountain and other permafrost regions and led to changes in some Arctic and Antarctic ecosystems.

There is *high confidence* that some hydrological systems have also been affected through increased runoff and earlier spring peak discharge in many glacier- and snow-fed rivers and through effects on thermal structure and water quality of warming rivers and lakes.

In terrestrial ecosystems, earlier timing of spring events and poleward and upward shifts in plant and animal ranges are with *very high confidence* linked to recent warming. In some marine and freshwater systems, shifts in ranges and changes in algal, plankton and fish abundance are with *high confidence* associated with rising water temperatures, as well as related changes in ice cover, salinity, oxygen levels and circulation.

Of the more than 29,000 observational data series, from 75 studies, that show significant change in many physical and biological systems, more than 89% are consistent with the direction of change expected as a response to warming . However, there is a notable lack of geographic balance in data and literature on observed changes, with marked scarcity in developing countries.

There is *medium confidence* that other effects of regional climate change on natural and human environments are emerging, although many are difficult to discern due to adaptation and non-climatic drivers.

There is *high confidence* that neither adaptation nor mitigation alone can avoid all climate change impacts; however, they can complement each other and together can significantly reduce the risks of climate change.

Many impacts can be reduced, delayed or avoided by mitigation. Mitigation efforts and investments over the next two to three decades will have a large impact on opportunities to achieve lower stabilisation levels. Delayed emission reductions significantly constrain the opportunities to achieve lower stabilisation levels and increase the risk of more severe climate change impacts.

There is *high agreement* and *much evidence* that all stabilisation levels assessed can be achieved by deployment of a portfolio of technologies that are either currently available or expected to be commercialised in coming decades, assuming appropriate and effective incentives are in place for their development, acquisition, deployment and diffusion and addressing related barriers.

http://www.ipcc.ch/publications_and_data/ar4/syr/en/spm.html

Hard Going? I couldn't get through the full version, or really understand all the graphs – well it seems that a complex issue suffers from not being that easy to explain, and while access to mountains of good data can strengthen a debating position it also seems to make it harder to get a simple message across. The detractors of the climate change position have the disadvantage of having arguably less hard science to support their position, but the benefit of a simpler proposition to sell.

Just so that I can pretend I don't have a bias, I will present the argument against climate change in some detail next month,

Quickie Sex Change on the Reef

Blue-Throated Wrasse

By John Smith

I've been taking a bit of an interest in a female blue-throated wrasse out at Split Rock over the last month or so, hmm, a bit sad I hear you say! Nevertheless, as some of you no doubt know and having brushed up on my fishy knowledge via the internet, it seems that all wrasse are born females and can turn into males as required, according to a somewhat complex social structure.

Apparently the male fish runs a "harem" of 15 or so females, and when he eventually meets his demise (which may be as long as 11 years barring mishaps) the most dominant female in the group (usually the largest) promptly begins behaving like a male, followed shortly thereafter by a colour change and then a complex sex change to physically become a male. The period taken for a complete changeover varies according to the websites I visited, anywhere from two weeks to two months. Anyway once the "reassignment" has occurred, all the females move up a rung and leave a space at the bottom for a new member - cool hey?

So, out at Split Rock in the crevice I would often see a male wrasse and what I am assuming is the dominant female. Whether or not it really was the dominant female or just different females on different occasions I don't really know, but a bit of latitude here please!
Over the last couple of weeks the male has disappeared from the scene and it seems to me that the female I'm assuming is the dominant one is changing colours. I've been watching and waiting for the whole transformation to occur, but low and behold today the male is back. I can tell it's the same fish because it has some sort of puncture wound dorsally just anterior to the tail. I spent probably 20 minutes peering into the crevice today taking photos, but the "shemale" didn't appear. When I eventually tired of this and did a spin around the rock I spotted a female wrasse down on the sand that I figured might well be the lady who's "jumped the gun".

Now, whether or not any of this is factual or just a figment of my imagination I don't really know, but I'll keep you posted of any developments - this is all pretty exciting stuff for Bicheno.

New Handfish Species Found

My summary of Last & Gledhill's article in "Zootaxa 2252"
By Mike Jacques

As you will have heard, the CSIRO has announced that 9 new species of Handfish have been 'found', which means that they have been described for the first time from previously undescribed specimens. We are only talking about a few specimens too, because Handfish are notoriously difficult to find, and it's not very politically correct to put rare beasties in a jar of alcohol in any numbers. So it was a big job for CSIRO to get as far as they have done with the limited resources. Well done Scary and Daniel.

Taxonomy (describing species) is a bit of a dying art with institutions not willing to fund this base research to any great extent. It also isn't as sexy as some of the applied research and doesn't always get a lot of attention from graduates. As a result each institution usually only has one or two specialists in a field and as a consequence they are usually the world experts in that field. They have lists of 1000s of specimens to sort through and no time to get to even a fraction of them.

For a long-time there has been doubt about Handfish classification and just how many species there are. Are some of them just colour variations, or are they the full new deal? This is very important for working out just how rare they might be and just how restricted their range might be. If after a lot of checking we can narrow down each species to a location, well things like planning Marine Reserve locations and working out Fisheries Management regimes for trawling are obvious beneficiaries of that knowledge.

So how come the big announcement, but no details on the famous 9 new species? Well looking at the pics we can see that a lot of the new species aren't the sexy ones that appeal to visual media and have faces that only a mother could love. Also the names are literally all Greek to most people. Nice to see the vernacular names being put down at the start before we all make up several variations of our own.

For the most part the new species are deep trawl specimens. Others are more familiar but some of the confusion between colours and species have been cleared up. One thing that came out loud and clear is that there are probably lots more species out there and their populations are fractured and probably declining. It is possible that bottom trawling has done damage to breeding habitat and further threatened them with extinction.

1. Australian Spotted Handfish (B. australis)

SE Australia 55-120 Metres

An Australian Handfish (42 mm), trawled by K. Graham on *FV Shelley H* at a depth of 100 m, south-east of Bermagui, New South Wales, April 2000. Found from southern Queensland to South Australia and Tasmania. Rarely found in shallow water, prefers waters of 40-100m. Watch out for these when narked as there is a lot of species colour diversity between areas and they can be confused with other Handfish. It's possible that the colours differences are actually different species, but you need a lot more specimens and genetic samples to prove this.

2. Spotted Handfish (b. Hirsutus)

SE Tasmania 5-40M

The one often seen by divers and confined to the Derwent and nearby muddy waterways. It appears that the majority of the population is now contained within small isolated areas within its historic range. Between 1909 and 1957 they were regularly collected in Great Oyster Bay, the Huon and the Channel. In 1974 two specimens were found at Cape Portland and at St Helens. Channel sightings stopped in the 1980s. Perhaps the common denominator being the arrival of the scallop dredge which damaged breeding sites. [hopefully recent sighting the mouth of the Channel presage the re-establishment of Handfish there now the dredges have gone].

3. Pink Handfish (B. Dianthus) NEW

SE Tasmania 30-40M

per K. Gowlett-Holmes

They have been sighted in the Channel previously as well as Tasman Peninsula. Rarely seen, even though their areas are commonly visited by divers, this seems to indicate that they are exceedingly uncommon.

4. Humpback Handfish (B.dossenus) NEW

Eastern Bass Strait area 20-230 M

Despite frequent trawling and sampling done off the Continental Shelf break only sporadic samples have been recovered and seemingly in the same small areas. Their populations are apparently small and very localised.

5. Ziebell's Handfish (B. zeibelli)

E &SE Tasmania 10-20M

Ziebells *per Andrew Maver*

Ziebells Handfish (Loneys colour morph)

As the Waterfall Bay handfish has now disappeared from the species list it is assumed this was just a colour morph of the Ziebell's handfish. Loney's Handfish has also been presumed to be a colour morph of Ziebell's although there are too few specimens to really be definitive. They are rarely seen but have been found from Coxs Bight to Bicheno. Named after the abalone diver who first found them, Alan Ziebell.

They seem to be poisonous, with one caught by Butterfly Perch being rapidly spat out (as observed by local diver James Parkinson). One specimen held in a bucket was fished out by the CSIRO cat and eaten, the cat died for science 1 1/2 hours later.

6.Cockatoo Handfish NEW (P. amplispinnus)

SE Australia 75-120M

7. Narrowbody Handfish NEW (P. compressus)

SE Australia 100-220M

Hard to find despite (or perhaps because of) heavy trawling in its home range.

8. Eltanin NEW (P. eltannini)

Eastern Tas 75-100M

Named after the fisheries research vessel that found it.

9. Longfin NEW (P. macropinnis)
Gt Aust Bight 130M

10. Eyelash NEW (P. nigrocilium)
West Coast Tas 175M

Only one specimen found off Granville Hbr.

11. Moultons NEW (S. moultoni)
SE Tas 100-200M

Named after research scientist Peter Moulton. Rare.

12. Smooth NEW (S. Unipennis)
D'Entrecasteux Channel, shallow waters

It might look terrible but it's been in preservative for 200 years. Known only from one specimen with the location given as 'Australian seas' with no other information. The specimen was obtained by French zoologist François Péron during an expeditionary voyage to Australia in the early 19th century commissioned by Napoleon Bonaparte and led by Captain Nicolas Baudin (1800–04). During 1802, fish surveys were made in D'Entrecasteaux Channel. The captain's journal refers to a little fish 'which is unusual in that its foremost fins are exactly like hands'. However, the Spotted Handfish was also taken on the same expedition, and we cannot be certain whether Baudin was referring to one or both of these species. Interestingly, this species was illustrated together with one other ray, which is the most abundant ray in the D'Entrecasteaux Channel. The possibility exists that in pre-colonial times there was another species which we may have since lost.

13. Red Handfish (T.politus)

SE Tas - Shallow

The red handfish was first collected near Port Arthur in the 1840s where it was so common they were catching several specimens at a time in small dip nets. Only 2 specimens have been sighted in the Pt Arthur area since the 1980s despite it being a popular dive spot. The species has also been found on the Eastern Tasman and Forestier Peninsulas and the Actaeon Islands. The largest known modern population was found at Frederick Henry Bay, but the population took a dive when a common urchin plague swept through their densest habitat and they haven't been seen since.

14. Warty Handfish (T. verrucosus)

SE Australia 80- 230M

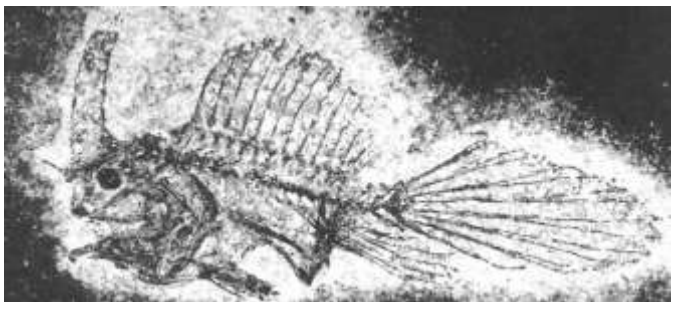
Warty Handfish (tassled morph)

Species now Redundant

Storm Bay Handfish, Waterfall Bay Handfish, Loney's Handfish

These ones are no longer listed species, the specimens having been identified as another of the above 14 species.

What the Study revealed of the Handfish's Past and Future



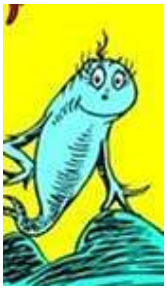
There are fossil records of a probable Handfish species from the Eocene era. It is thought that the species really started to become more diverse about 35 million

years ago. It seems unlikely that this stopped at 14 species and there are probably a lot more Handfish species to be discovered. It also seems unlikely that they walked from Italy to Australia and it seems that a broad extinction event wiped them out elsewhere and the Tasmanian populations are a remnant of a once much broader and widely dispersed group.

Its amazing that a couple of people just sorting through old specimen records can add so much to our knowledge base of this rare animal. Its also amazing that despite describing 9 new species they have identified that the handfishes are probably rarer and much more vulnerable than our worst fears.

For Your Information - Eocene Epoch

The Eocene Epoch, lasting from about 56 to 34 million years ago. The temperature gradient from equator to pole was only half that of today's, and deep ocean currents were exceptionally warm. Although the global climate remained comparatively warm throughout the rest of the Eocene it was this epoch that marked the start of a slow global cooling trend. The Eocene oceans were warm and teeming with fish and other sea life. The first Carcharinid sharks appeared, as did early marine mammals, including *Basilosaurus*, an early species of whale that is thought to be descended from land animals that existed earlier in the Eocene. In the seas, the role of top predator fell onto the Neoselachi, the group of sharks and rays that had survived the mass extinction and they did so relatively unscathed. From these survivors stemmed nearly every species of shark that is around today from the infamous great white to the gentle whale shark and the unusual hammerheads. Their cousins, the rays too thrived in this world but the chimeras were less fortunate. They had seen their peak in the days of the dinosaurs and despite their earlier success, they were left as just a handful of species. The same was true for many of the more ancient lines of fish. The lobe-finned fish that had once been so successful were reduced to just a few remaining species. It was once thought that the Coelacanths had disappeared for good until one turned up in a fisherman's market where they weren't an uncommon fish to be caught. The highly successful hybodonts were not so lucky however, for they have no known surviving relatives. Their line vanished along with the dinosaurs, and as did the ammonites that had once been so abundant. Of these armoured cephalopods, only the Nautilus survives today, far outnumbered by the successful squid and octopus.Prior to the Eocene there was a mass extinction event in the later Tertiary that finished off the dinosaurs and is widely believed to have been caused by a meteorite impact.



P.S. if you are very bored and interested in a not very well thought out proposition as to why handfish disprove evolution click here,
http://tr1.harunyahya.com/Detail/T/EDCRFV/productId/17196/DARWINISTS_COULD_NOT_SPECULATE_ON_THE_HAND_FISH

Amy's Handfish sighting - species 15?

Our Oily Oceans

by Emma

Unless you've been living in a hole for the last few weeks, you've probably heard of the Transocean-owned (on behalf of BP) offshore drilling rig in the Gulf of Mexico that exploded on the 20th April and sank two days later, killing eleven people and causing a massive oil spill. Originally BP estimated the size of the leak to be about 1,000 barrels a day with the only visible oil in the water that which had been on the rig at the time of explosion. However, officials working on the spill quickly discovered that oil was also gushing from the pipe that led to the rig more than 1,500 m below the surface. BP later accepted the government estimates that put the leak at least 5,000 barrels (790 m^3) per day. That's a lot of oil...

BP claims to be harnessing all of its resources to battle the spill, and has been spending up to US $7 million a day to try and contain the disaster. While that's a huge amount of money by anyone's standards, profit made by BP is equal to around US $61 million daily which has led to people questioning why more isn't being done. Interestingly, BP was running the well without a remote control shut-off switch which is intended as a last resort protection against these sort of underwater spills. While the use of these devices is not mandated by U.S. regulations, they are routinely used by two of the world's major oil-producing nations, Brazil and Norway. Given the potentially catastrophic impact of the spill, scientists have continually requested the right to monitor the amount of oil being released per day; however BP has denied this request, stating "We're not going to take any extra efforts now to calculate flow there at this point. It's not relevant to the response effort, and it might even detract from the response effort". However, particle image velocimetry (scientist-speak for fluid properties) analysis of a

videotape of the leak has actually put oil flow rate estimates at between 56,000 to 84,000 barrels per day (8,900 to 13,400 m^3/d), equivalent to one Exxon Valdez spill every 3.5 to 2.4 days, and making the spill possibly one of largest in history.

So what's the big deal about some gloopy oil sitting out in the Gulf for a few weeks? Fish are frequently attracted to oil slicks because they resemble floating food, which in turn attracts seabirds and marine mammals that may dive through slicks to reach food. The effects of oil on marine animals are highly varied and usually catastrophic, ranging from acute toxicity and/or infection, hypothermia resulting from destruction of thermal insulation, interference with breeding behaviour, damage to airways and lungs of mammals, suppression of immune systems, destruction of important breeding and feeding grounds and many more. The slick has already begun to wash up on Louisiana's coastal marshes, which are the breeding ground and home to a wide range of marine life vital to the region's fishing industries. These wetlands are already subject to considerable stress and are exposed to an annual "dead zone" each spring as nutrient-rich water moves down the Mississippi and into the Gulf, triggering algal blooms that rapidly decompose and use up much of the water's dissolved oxygen. The incursion of oil into these coastal marshes is likely to stress these marshes and their biological processes even further.

What makes the Gulf spill different?

Comparisons of the current spill are being made with the Exxon Valdez oil spill which occurred in Prince William Sound, Alaska, in 1989 when the *Exxon Valdez* oil tanker hit a reef and spilled an estimated 250,000 barrels of crude oil. While the Exxon Valdez oil spill was by no means one of the world's largest spills in terms of volume released, its remote location (accessible only by helicopter, plane and boat) and habitat for salmon, sea otters, seals and seabirds resulted in it being considered one of the most devastating human-caused environmental disasters in history. The impacts of the current Gulf spill are surrounded by

considerable uncertainty, as never before has a leak from such depths vented so much oil for so long. Massive quantities of dispersants have been used in an effort to control the spill, and scientists are questioning whether this undercuts the ability of naturally occurring microbes to break down the oil. On one hand, dispersants break a slick into tiny oil droplets which gives more microbes a chance to attack the oil. However, dispersants may actually inhibit the chemicals that the microbes themselves produce to gather and consume the oil. And as this video shows, chemical dispersion of oil is a far cry from actually getting rid of the stuff.

Deep-sea slicks

Given the depth from which the Gulf oil is seeping, the spill has the potential to profoundly impact deep-sea ecosystems. Within the last four years, deep-ocean reefs have been discovered in the Gulf with associated mussels, tube worms and shrimps at depths similar to that of the spill. For many of these creatures, food drifts down from the surface, as does heavily weathered and dispersed oil droplets. A research cruise two weeks ago found what could be oil spreading horizontally at depths of 700 and 1300 m. Multiple subsurface plumes resulting from deepwater blowouts have been predicted in the scientific literature for more than a decade and have been experimentally demonstrated off the coast of Norway. This suggests that the full dimensions of the plume remain unclear, as does the extent of the spill's impacts through sinking oil globules which have the potential to affect bottom dwelling marine creatures for decades.

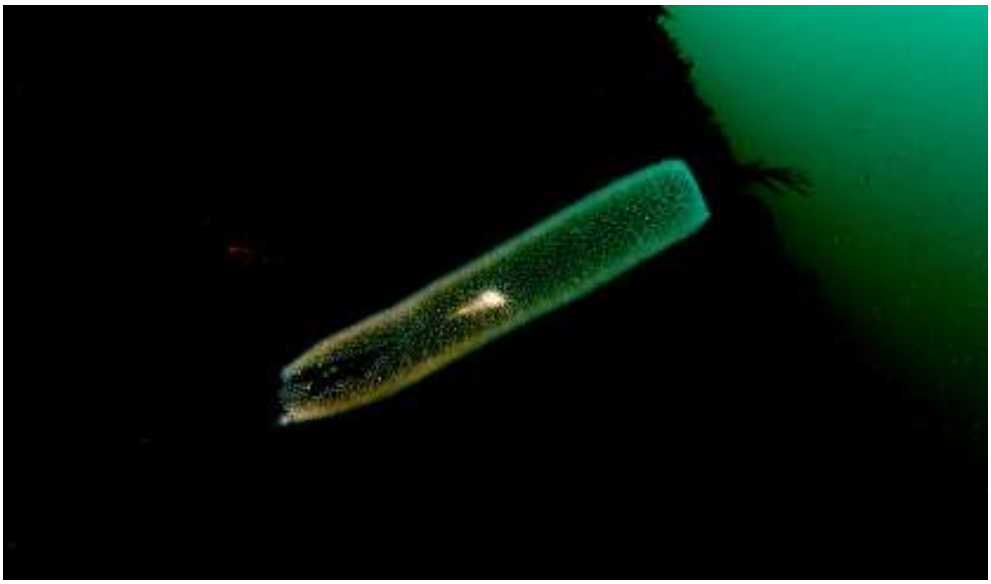
Attempts to plug the leaking well-head have ranged from pumping high-pressure mud, concrete, golf-balls and tyre shreds into the pipe to placing a 125-tonne container dome over the largest of the leaks and piping the oil to a surface storage vessel. However, all attempts so far have proved unsuccessful due to the immense difficulties associated with operating at such depths. As failure after failure occurs, it seems increasingly likely that the only realistic way to stem the flow is by drilling a pressure relief well which is estimated to not be completed until at least August. If left alone, it will take up to 7 years for the oil deposit beneath the sea floor to empty.

While the true extent of the slick is likely yet to be discovered, it hopefully comes as a wake-up call for both oil-drilling companies and the regulating bodies surrounding them. Accidents will inevitably happen, but evidently the existing safety regulations (at least on this rig) were not sufficiently redundant. The affected zone is likely to experience severe impacts of the spill for many years. In combination with existing stressors (intense fishing pressure, agricultural runoff, climate change etc.), the spill may affect ecosystems to an extent from which they never fully recover. - Emma

Some of our favourites from your portfolio

Presenting Ren Lim, Part 1

Ren gets frustrated with his shots even though they are to my eyes brilliant. Ren has one of those occupations that tests a census collector, he is a cetacean vet, specialising in dolphins. He is soon to start work in a major new aquarium in Singapore. Ren loves Tassie and has bought a home in Kingston. He's hopeful of returning soon once he gets some more work experience and completes his studies. He is a keen member of a local dive club and has plans for coming back when he can to do some challenging dives, he also loves kayaking, his car, and nature. Ren is the perfect gentleman and will 'kill' you with kindnesses.



Pyrosoma, a free-swimming tunicate or sea squirt

Catshark

Yellow commensal zoanthids (sea daisies)

Jack Mackerel

Stingray eye

Threefin

My Compact Camera

Male Shaws Cowfish by Richard Mason

WHATS ON in Autumn 2010

Major biological events and Sighting Reports

The water has stayed warm relatively late in the year with a very large and sustained fish run occurring sending tuna fishermen out in force. Apart from large schools of baitfish we have also seen a lot of Jack Mackerel. This year the seals seemed particularly adept at robbing anglers, with some stating that 2 out of 3 fish were lost. I also heard a story of a 20kg tuna caught in a sea kayak off the Hippolytes with seals threatening to jump onboard to seize it. Not sure that is the safest form of fishing around.

Whales have already started their northwards migration and will soon be appearing off the East Coast.

(you should report any interesting finds to the TAFI CCRedmap project at www.redmap.org.au)

Landcare and conservation events (more details this issue)

1 May – 11 July 2010 Beneath the Tamar: more than silt QVMAG at Inveresk

4 June Coastal Weed Management Workshop

6 June Arthur Piemen Review comments close

8 June Crayfish review comments deadline

8 June World Oceans Day movie screening

21 June Draft State Coastal Policy 2008 comments due

Amalgamated dive club calendars

Like to get in touch with someone for a dive or day out, email us and we'll forward your message.

June 2010

FRIDAY June 11th – Monday June 14th Combined Clubs Weekend At Bicheno

TUDC - 20th June - Isle De Phoques

TSDC - June 19/20th

TSAC - 26 June - Troy D night & day dive Mitchell Rolls 25m

ODP - June 26th / 27th - North West Coast Day trip

TSDC - June 26/27

TUDC – June 27th – Ninepin Point scenic dive

July 2010

TUDC - July 3rd/4th – Lake Pedder (with camping!)

ODP - July 10th / 11th - Eaglehawk Neck – GO DIVE WEEKEND

TSAC - 10th July - Nord Jak Denny 45m

ODP - July 18th - Kelso Night Dive High tide: 5.53pm

ODP - July 24th / 25th - Scallop Dive D'Entrecasteux Channel

TSAC – 24th July - Stewarts bay / Hippolytes Porteous

TSDC - D'Entrecasteux Channel scallop and scenic dives – all month

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

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

Future inter-club event

OZTeK'11 - is booked and scheduled for 12 -13 March 2011. And will again be held at Australian Technology Park, in Sydney

Essential news and links for the perfect day out

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

Vis recently
Tamar- a bit down lately as low as 10M visibility.
NW Coast - Conditions ok with about 8 to 10M viz in the outer Mersey, more in the Strait.
Bicheno – reports of 15-20 Metres

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

How to help us get the message out

We are asking people and organisations to help circulate the newsletter. Please ACTIVELY distribute Marine Life amongst your interest group, friends and colleagues so we can get the message out there, or give us email contacts (after asking your people for any objections to release of email contacts) so that we can distribute it for you.

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/marinelife.php