

The Dragon's Lair...

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Diving with Dragons

A Code of Conduct for Diving into the Dragon's Lair Launched

Seadragons are so popular that they attract a lot of attention, not all of it welcome.

As a consequence Dragon Search (SA) and its partner organisations, in conjunction with the South Australian Dept for Environment & Heritage (Office for Coast and Marine) and Primary Industries & Resources SA (Marine Habitat Program), have worked together to produce a SCUBA diving Code of Conduct for the observation of seadragons in the wild.

There is increasing concern about the future of seadragons, which are threatened by habitat destruction. For many South Australians the graceful Leafy Seadragon has come to represent the spectacular but threatened diversity of life in the seas off our state's coastline and it was recently declared South Australia's marine emblem.

The 'Diving with Dragons - Code of Conduct' sets out a few simple guidelines that divers can follow to reduce their impact on these marvelous animals.

The Diving with Dragons brochure can be viewed on the Dragon Search website www.dragonsearch.asn.au or copies can be collected from the Conservation Centre of SA, 120 Wakefield St, Adelaide.

Each of the 13 tips listed in the Diving with Dragons brochure is summarised below. The guidelines, which are available on the website or in hard copy, explore these themes in more detail.

1. Leave them where they are

Do not attempt to take seadragons from the wild. Leafy Seadragons are protected and may not be taken without approval of the SA Government.

2. Look but don't touch

Do not try to touch seadragons as handling may injure or stress them.

3. Home on the range!

When interacting with seadragons do not surround them or attempt to "herd" or chase them. Seadragons have a "home range" and herding may move them out of their

familiar areas, causing stress. You may also be interrupting important feeding or courtship activities.

4. No ups and downs please

Do not attempt to move seadragons up and down through the water column. Under stress seadragons are sensitive to quite small changes in pressure due to depth. This may injure or even kill the animal.

5. Sea lice are fine in moderation

Do not attempt to remove isopods (sea lice) from seadragons. Divers are likely to damage the seadragon trying to remove isopods. You should not handle seadragons for any reason.

6. Watch your feet

Turbulence from divers' fins may disturb seadragons and other marine life.

7. Take care, male mother!

Take special care with egg-carrying male seadragons. Egg-bearing males move more slowly and are more easily stressed than animals without eggs.

8. Turn the lights down

Do not expose seadragons to bright light over an extended period, especially at night. This includes bright torches, excessive use of strobes, and video lighting systems. Some photographers recommend limiting flash photography to 3-4 shots per encounter.

9. Clean up after others

If you find discarded or snagged fishing line please collect it and dispose of it thoughtfully. Seadragons can become entangled in discarded fishing line and be injured or killed.

10. Dive right and watch your gear

Dive gear should be rigged and operated to prevent damage to the seadragon's habitat. Dangling gauges and equipment should be secured. Divers should maintain neutral buoyancy to minimise disturbance of the seafloor by fins and also avoid gripping objects for support or to prevent drift.

11. Respect the marine environment

Do not damage or break off plants and marine life. Collection of 'souvenirs' should be avoided.

12. Remember the 'regs'

Know the laws relating to taking other marine organisms. If you choose to take marine animals observe all current regulations and take only what you need.



13. Appreciate marine reserves

Marine reserves are declared to protect special areas and important species. Be aware that special regulations may apply in marine reserves for the taking of fish and other marine life.

Due to the limited targeted research on these species the information presented in this code is based on the best current knowledge of experts and people that have been working with seadragons and related species.

Dragon Search is preparing a database of all reported sightings of seadragons to try and establish a more complete picture of the distribution, and some understanding of the basic ecology of seadragons. This information will be used to determine research and management priorities for these little-known species.

Seadragon sightings can be reported to Dragon Search by phoning (08) 8223 5155 or via the Dragon Search website: (www.dragonsearch.asn.au).

The Code of Conduct is supported by:
Department for Environment & Heritage South Australia
Primary Industries and Resources South Australia
Fisheries Action Program, Natural Heritage Trust
Threatened Species Network (SA)
Marine and Coastal Community Network (SA)
Marine Life Society of South Australia
WWF-Australia
Scuba Divers Federation of South Australia

SA Update

Last call for Seadragon Sightings Information

The National Dragon Search program is seeking records of sightings by divers, beach wash records and fishing by-catch records of Weedy and Leafy Seadragons in Australia.

In its last year of Fisheries Action Program funding under the Natural Heritage Trust 1, the South Australian Dragon Search program is winding up its state program and intends to produce a summary report for both the state and current national picture before September. In the lead up we want to ensure we have the most comprehensive range of records possible prior to the final analysis of the national data before mid-June. So Records need to be in ASAP.

Sightings forms can be filled out online or downloaded as pdf files. Visit our website www.dragonsearch.asn.au/sightfm/sightfm.html or contact our Project Officer Jeremy Gramp <dragonsearch@ccsa.asn.au> or phone (08) 8233 5155.

There is a range of reasons why the South Australian program is winding up. In part it is because the project has achieved its goals. In addition, key project partner, the MCCN, is uncertain about the nature of its continued operations post-June, and therefore the groups involved were hesitant to commit to future plans. We hope to maintain some SA state-based recording through the local Reef Watch reef monitoring program. Some state-based Dragon Search programs will continue for a while in other states, eg NSW.

In the meanwhile the South Australian team would like to extend its gratitude to on-going participants and we look forward to receiving records of your last summer sightings and early winter beachcomb efforts in our dash to the finish line by the end of June. This is particularly important if your sighting was the first time you have ever seen a seadragon at that site.

NSW Update

Pilot Surveys on marine water usage at Weedy Seadragon Hot Spots

The Marine and Coastal Community Network in NSW has recently carried out two pilot studies on water usage in areas known to be hotspots for weedy seadragons.

The surveys were in Sydney and on the far south coast of NSW. The latter was manned by the very enthusiastic newly-formed Sapphire Coast Marine Society.

Local usage surveys can be simple to perform (as was this one), gather quite a lot of information, and lead to better management of waterways. They provide us with information on the stresses faced by aquatic life.

We conducted the surveys on a day that could be expected to have maximum usage (a sunny Sunday in January during the school holidays on the long weekend). Both surveys were carried out on the same day.

The sites were reasonably different, with one being much further south with lower water temperature and a more shallow water depth.



Kurnell Water Usage Hotspot Survey. Photo: Effie Howe.

At both sites water usage (boating and other water activities) were surveyed from 6am to 6pm at 10 minute intervals. The general weather and water conditions were also recorded.

At the pilot site in Sydney approximately 1000 watercraft were observed in a vicinity of approximately 500 metres out to sea in the 12 hour period and 70 divers entered the water. Very few canoes/kayaks, that could be considered to have less impact on the marine environment, were observed on the day of study. Three very large, rusty cargo ships passed through the site. Many of the fishing boats that passed by the area of study out to sea had still not returned by 6pm when we ceased counting. To look at the effect of this traffic on the water other parameters

such as the fuel used, the noise produced and the creation of waves would be useful information to acquire.

At the Sydney site we also performed a very simple random survey of 20 individuals who were using the site for various recreational activities asking if they could identify a picture of a Weedy Seadragon. Even though we had an extremely small sample size we obtained a general indication that walkers, picnickers and fishers were less able to identify the Weedy Seadragon than a SCUBA diver.

Effie Howe
Dragon Search (NSW)

Weedy at the Sydney Aquarium

The Weedy Seadragon is an extremely difficult species to keep in captivity and only specialists should try to keep them. Dave Watts, Jaime Sanchez and their colleagues wanted to show visitors to the Sydney Aquarium the delight of seeing this exquisite animal and to study the weedy in captivity. Little is known about the Weedy Seadragon and any information on behaviour obtained by Sydney Aquarium might help researchers understand how the species might behave in the wild.

The Weedy Seadragon is a protected species and therefore the appropriate permit was needed before the Sydney Aquarium could collect any species from the wild. A permit was obtained to collect Weedy Seadragons but the aquarium decided to catch only one - a male.

Prior to obtaining the Weedy Seadragon, food source localities for mysids had to be ensured. The Sydney Aquarium staff decided both to collect the mysids and purchase them.

Dave and his team then spent some time planning how to collect the Weedy Seadragon and designing a cage for the chosen weedy at Kurnell. Knowing that it would be extremely sensitive to depth changes, they spent 6 hours moving the weedy up in depth. Even when it was finally relocated to the Aquarium they found that it was suffering from being taken up too quickly and so was brought back down again and brought up more slowly.

After the Weedy Seadragon was finally put in a new home behind the scenes at the aquarium the tank was covered in black plastic with a small peephole to allow for acclimatisation. The lighting had to be carefully managed as by experience the aquarium staff found that the Weedy Seadragon reacted badly to any sudden changes. The weedy is going on public display very soon and will have 24-hour lighting.

Temperature also has to be carefully monitored. Since the maximum temperature that they have been successfully kept at in aquaria is 20°C, the display will be set up to ensure that this temperature is not exceeded.

It is hoped that data obtained while watching the behaviour of the Weedy Seadragon will aid the conservation of the species.

Effie Howe
Dragon Search (NSW)

Life on "The Net"

The Underwater Research Group of NSW (URG)

The URG is a non-commercial SCUBA Diving Club comprising people from all walks of life who share an interest in and a commitment to the underwater world. Our members are interested in a large range of underwater activities, including marine biology, exploration of wrecks, underwater photography and underwater conservation.

As an environmentally aware group, the URG seeks to promote conservation through involving our membership, and the broader community in learning about the marine environment. To this end we undertake a selection of underwater research projects which will allow our members (who are not scientists), to become involved at the grass roots level with observing, recording and photographing marine life. Simple activities that build awareness!

The URG has undertaken a research project to monitor the re-growth of marine life on the newly replaced rope netting which encloses the Balmoral baths in Sydney Harbour. URG divers returning from boat dives have often visited the netting. The site is an excellent location to "use up" the dregs of air in a scuba cylinder at the end of a day's diving.

The net's main attraction is the resident community of White's Seahorse, *Hippocampus whitei*. These cute creatures are very delicate, yet agile as they swim through the net swinging from their tails.

The club has adopted a very simple methodology for this research. We have placed a marker tag on one panel of the net as our main site for counting seahorses. We have adopted a longitudinal study (a study over time). Approximately once a month members are encouraged to drop in at the net to:

- Count the seahorses at the tag site
- Conduct a more general count over the entire net
- Observe the level of algae and other growth
- Note the level of bottom pollutants
- Note the state of repair of the net
- Take a photo (if you have a camera)

This project has been very successful because of its simplicity. We have enjoyed broad-based participation from our membership, and the research has generated much discussion and enthusiasm across the club. Our results and findings to date include:

- Observing a very unequal distribution of marine growth around the surface of the net. Seahorse numbers correlate with the unequal distribution of growth. We are not yet sure why this occurs.
- Observing oscillating numbers of seahorses. We are not sure why this should be so. One theory (with some anecdotal evidence) is that the seahorses are being harvested from the net!
- Rapid increases in plastic bag pollutants following heavy rains. Storm water traps are a must!

- Many other interesting species of fish.

The URG welcomes all those who may wish to participate. Please check out our web site www.urgdiveclub.org.au for lots of interesting pictures, more information, and an invitation to become involved.

Robert Dennett

WA Update

Leafy Seadragon Clean Drains Program

The Leafy Seadragon occupies Western Australia's coastal waters from Geraldton to Esperance. Seahorses, seadragons and pipefish are threatened by loss of habitat. The Leafy Seadragon Clean Drains Project aims to increase community awareness about the need to protect and conserve the marine environment and the flora and fauna that depend on clean and healthy habitats for survival. We aim to reduce the amount of pollution entering the ocean from stormwater that runs into our rivers and demonstrate a link between the terrestrial and marine environment. The project involves members of the community stencilling symbols of a Leafy Seadragon on storm water drains in Margaret River, Augusta, Gracetown, Cowaramup, Witchcliffe, Preverly and Gnarabup.



Posters, stickers and fridge magnets are being produced and will be inserted into our local newspaper and provide messages about what people can do around their homes and neighbourhood to reduce the amount of pollution entering the rivers and ocean through stormwater drains. A project launch featuring a slide show of our marine creatures by the Australian Marine Conservation Society will be held in Margaret River. The project was funded by NHT and Coastcare in a joint application by the Augusta Margaret River Shire, Lower Blackwood LCDC and the Cape to Cape Catchments Group.

Merryn Delaney

Tas Update

Dragon Search Tasmania

Dragon Search Tasmania has now wound up, with our last grant finishing at the end of February 2002. A report on the data collected throughout the program has been completed, and sent to all Dragon Search participants. It will also soon be available from the Dragon Search

website. Sighting forms sent in will still be entered into the database, and the report may be updated at some time in the future.

Not all work on seadragons in Tasmania will halt, however, as the Tasmanian Marine Naturalists Association will be conducting a number of surveys of seadragon habitat around the state in 2002. These surveys will include video transects, and will increase our knowledge of the species composition of seadragon habitat.

Congratulations to Andrew Dewater and Sieglinde Karl, who won copies of Graham Edgar's *Australian Marine Habitats* for submitting sighting forms in the last six months of the project. Thanks to all participants in the project over the last 5 years, as well as the previous Dragon Search Project Officers Gary Myors and David Bell.

Craig Woodfield, Tasmanian Marine Naturalists Association

Strangers from the deep: pipehorses in Australia

Among the many strange and fascinating fishes in the seahorse and pipefish family (Syngnathidae) there is a little-known, enigmatic group, the pipehorses. All are in the genus *Solegnathus* and, as their common name suggests, look like a cross between a seahorse and a pipefish. Like a pipefish their head is in line with their body, but, like a seahorse, they can curl their tails up. Australia has more species in its waters than any other country with at least five species and possibly as many as seven. Reaching up to 50 cm long, they are the largest syngnathids known and many have beautiful and colourful markings.

The reason that we know so little about them is that they are usually found in deep water, generally over 40 m, with some reports of capture in 550 m. Only in some unusual locations (Fiordland in New Zealand or the Derwent and Huon estuaries in Tasmania) can they be seen in the shallower depths frequented by divers. As anyone who has seen one alive will tell you, they are beautiful, graceful creatures.

Pipehorses provide an excellent example of the problems of incidental by-catch. They are caught in non-selective fishing gears such as prawn trawls. In Australia they are frequently caught during operations in the Queensland East Coast Trawl Fishery, dried and exported for use in Traditional Medicine, where they are a much sought-after item. Although they cannot be targeted, historically they have been retained and formed an additional fishery.

The knotty problem facing the community is how to manage this sort of fishery. Unlike the target species, not even the basics of the biology of the pipehorses are known – growth rates, age at sexual maturity, fecundity etc. Without this information we cannot work out what catch rates are sustainable. There are another 300 species caught in trawl gear for which the same could be said!

The ultimate answer of course is to reduce levels of by-catch. We need selective fishing gear that does not

destroy the habitat and catch anything in its path. In the meantime, though, we have to focus on modifications to existing gear, protected 'no-trawl' areas and research on the biology of the animals. Let us hope for the sake of the pipehorses, that these efforts are successful...

Dr. Keith Martin-Smith,
Project Seahorse, School of Zoology, University of Tasmania.

Conservation Overview and Action Plan for Australian Threatened and Potentially Threatened Marine and Estuarine Fishes

Environment Australia has recently released the Conservation Overview and Action Plan for Australian Threatened and Potentially Threatened Marine and Estuarine Fishes. This is the first attempt to broadly assess the conservation status of Australia's 4100 marine and estuarine fish species.

The overview of marine fish should act as a serious prompt for the protection of marine habitats and the establishment of a decent marine reserve system, before we are too far down the oft walked path of waiting until the impacts are upon us. Many marine organisms are naturally rare or have a low local abundance (although not all rare species are necessarily endangered).

Together with other overviews on marine macroalgae and molluscs, these are great steps towards redressing the huge gaps in knowledge of the marine environment and its denizens and providing status assessments to further conservation and management.

The Overview has identified 114 species of threatened and potentially threatened Australian marine and estuarine fishes. Three species are listed as Critically Endangered; six species as Endangered; eight taxa as Vulnerable; 16 taxa as Lower Risk, conservation dependent; 14 taxa as Lower Risk, near threatened; 53 taxa as Data Deficient; 15 taxa as Lower Risk, least concern. No species were listed as recently extinct. The listing of commercial species is often contentious and the status of the Eastern Gemfish has been postponed until future management of the species is clarified.

The report recommended a conservation status for both Leafy and Weedy Seadragons in the Lower Risk (conservation dependent) with continual monitoring of their populations via community programs such as the 'Dragon Search' Program to gain a better understanding of their distribution and abundance.

The Lower Risk, conservation dependent category is used to flag species for which continued fisheries management or protection in Marine Protected Areas (MPAs) is necessary to prevent the species from becoming more threatened.

The overview considers that the designation of suitably located "no-take" MPAs may be necessary to protect leafies from aquarium collecting and that "the designation of suitably located and adequately sized MPAs in WA, SA and possibly Victoria would provide additional protection to this species."

The overview highlights the main causes of declines in marine and estuarine fishes as overfishing (of both target and non-target or by-catch species), habitat degradation (from urban development and related activities, trawling, dredging, water pollution, etc.), and, to a much lesser extent, exotic species introductions.

The Commonwealth and non-government organisations have done much to progress the management of marine life beyond the "Dinner Plate Mentality" of the past. The introduction of the Environment Protection and Biodiversity Conservation Act has to some degree redressed the very few marine species listed at a Commonwealth level. However there would still appear to be a Catch 22 situation with regards to the listing of species as endangered where there are little data available.

Over the past few years we have seen legislation treating native marine fish as "wildlife" rather than "resources". Arguably, a mind shift was in part prompted by the first listing of a marine fish, the Spotted Handfish, as endangered. This was a "wake up call", that the lack of listed marine species does not reflect the secure conservation status of marine species but rather a lack of knowledge and awareness.

Previously, most species listed under the Commonwealth's Endangered Species Protection Act 1992, were 'charismatic mega-vertebrates' such as whales and turtles. Under the EPBC Act the Spotted Handfish is given endangered status and five species of shark are now listed as vulnerable.

The protection awarded to seahorses, pipefish and seadragons (syngnathid fish) through changes to export permitting arrangements under Schedule 4 of the then Wildlife Protection Act, was also a major mind shift. In its wake followed the move to accreditation of sustainable export fisheries under the EPBC Act.



Weedy Seadragon. Photo: Carol van der Pennen

The protection of the Great White Shark at Commonwealth and state levels was another major step. The consensus approach to lobbying for protected status for the White Shark by peak conservation groups and the Australian Seafood Industry Council was at the time a most refreshing alliance.

Listing a species can offer a short-term solution in raising awareness or minimising direct impact on that organism. However a long-term solution is the protection of habitat

and management of human activities to reduce threatening processes.

The overview recognises that “suitably placed, adequately sized and appropriately managed MPAs can provide significant benefits...” However “the multiple-use framework within which this program (the National Representative System of MPAs) operates, means that MPAs alone cannot be relied upon to ensure the conservation of species. Appropriate management of fisheries and other threats outside of MPAs is also necessary.”

There have been some advantages in listings under Endangered Species legislation if it is linked to an outcome in threat abatement strategies. The implementation of threat abatement strategies for sea turtles using turtle exclusion devices on prawn trawlers, and changing techniques of long-line fishing to minimise death of albatross in southern ocean fisheries are two examples.

What has been disheartening, with previous Action and Recovery Plans (Seal, Cetacean and Turtle) is the apparent lack of implementation of key recommendations of such reports at the state level in day to day on the ground management and decision making.

The report *Conservation Overview and Action Plan for Australian Threatened and Potentially Threatened Marine and Estuarine Fishes*, by J.J.Pogonoski, D.A.Pollard and J.R.Paxton, Environment Australia, February 2002 can be found at <www.ea.gov.au/coasts/species/marine-fish/>

Tony Flaherty, MCCN (SA)/Dragon Search (SA)

Moves to eradicate invasive seaweed from SA waters

The invasive seaweed *Caulerpa taxifolia* found in West Lakes and the upper reaches of the Port River has serious implications for the marine environment in South Australia if it is not eradicated.

As the seaweed is able to over run native seagrasses and is extremely difficult to eradicate, it presents a serious threat to the environment and associated marine industries in nearby Gulf St Vincent, the Coorong and Spencer Gulf if it is not contained. As fish do not generally eat it, there is the potential to reduce fish populations.

Caulerpa taxifolia can grow from small fragments accidentally carried by boat owners, fishers and other water users. However, it is not known how the weed established in West Lakes. It is likely to have been introduced on the bottom of a boat or other marine equipment that has been used in infested waters interstate or through the release of an aquarium specimen.

In order to tackle the problem, a cross-government team under the Primary Industries and Resources SA Director of Fisheries has been investigating the extent of the infestation and testing possible eradication options. In the meantime, to help stop the spread of the weed, a ban on fishing in West Lakes and the upper reaches of the Port River as well as restrictions on the use of the lake have been imposed. Anyone using the lake under an exemption has to observe protocols by checking their equipment for weed and disposing of any fragments in a plastic bag well away from the waterway. Similarly, aquarium shops and owners were asked to check and dispose of any *Caulerpa taxifolia* under a one-month amnesty during May. It is an offence to import, sell, or possess *Caulerpa taxifolia* in SA under the Fisheries Act (section 49).

Extensive diving surveys in the nearby Gulf and reaches of the Port River have not found the weed outside West Lakes and near the Jervois Bridge in the Port River.

Tank trial experiments have been undertaken to test the effectiveness of a range of eradication options including high and low salinity, copper sulphate, chlorine and the use of algacide. Further tests will continue, investigating a copper sulphate/fresh water option which appears to be effective for West Lakes, before a final eradication option is approved. Salt and manual extraction is likely to be used in the Port River.

John Gilliland
Primary Industries & Resources SA

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