

OBLONG TURTLES: CLOBBERED BY CLIMATE CHANGE

Dianne Hunter

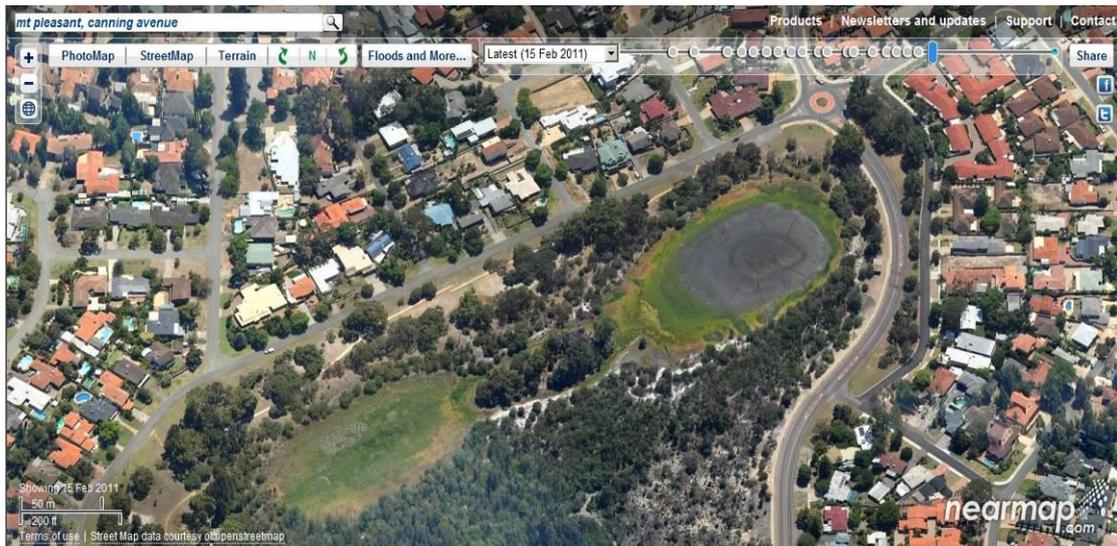
Dedicated to Turtle 17

Turtle Oblong Rescue and Rehabilitation Network Inc
Perth, Western Australia

www.turtleoblonganetwork.org.au ~ treasurer@turtleoblonganetwork.org.au

INTRODUCTION

In January 2011 many of the myriad lakes on Perth's coastal plain were either dry or almost so. A mass exodus of Western Long Necked Turtles (*Chelodina oblonga*) from a small suburban lake prompted an unprecedented rescue and rehabilitation effort



Blue Gum Lake, Mt Pleasant, WA, 15.02.11

The large number of turtles lost through dehydration, starvation and road trauma as a result of this single event brings home just how quickly an animal which is now considered common might become vulnerable.

Mass migrations of turtles from other lakes in the Perth metropolitan area also occurred but without a similarly co-ordinated rescue effort.

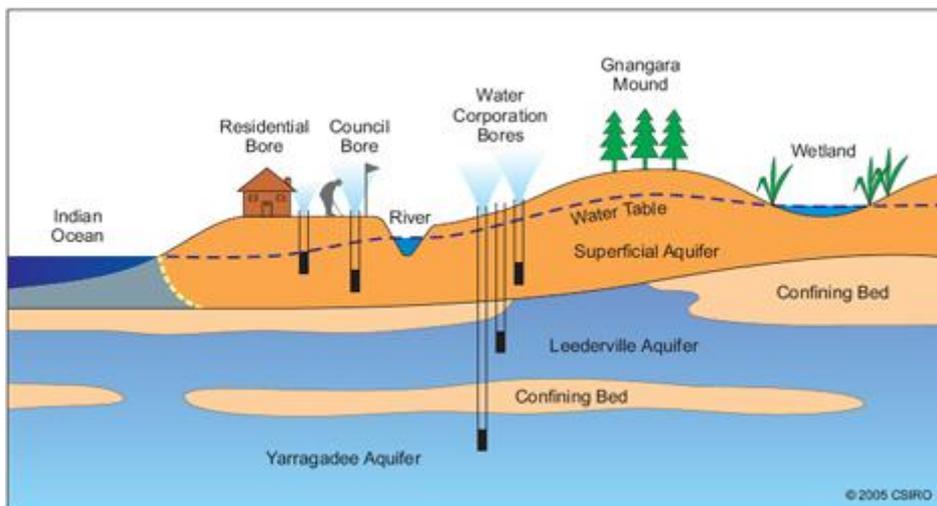
This paper looks at the issues which arise in such circumstance and their solutions – co-ordinating well-meaning but uninformed rescuers, harnessing the caring lakeside community whilst minimising the risk of opportunistic poaching of animals at their most vulnerable, finding sufficient rehabilitation facilities and individuals to take the animals into care, finding suitable re-location sites and accurately tracking all animals rescued.

Whilst most wildlife admissions are unpredictable, generally, animals arrive in ones or twos. A mass rescue could occur with any species, not just turtles. Flying Fox rehabilitators are, with increasing frequency, faced with large numbers of admissions in a short space of time and have developed networks to deal with such occurrences. It is hoped that some of the experience we have gained will be of use to others faced with a similar situation

IT'S NOT JUST CLIMATE CHANGE

In hindsight, looking at weather records, this event may have been anticipated. In the title of this paper, I've attributed the problems to climate change but other factors come into play. However, we – mankind – are the root cause of most, if not all, the problems besetting our wildlife.

Water Table. Perth relies heavily on its underground aquifers for more and more water as Perth's population continues to grow rapidly. Some, 167,000 or more households have domestic bores for garden use. The sinking of bores is sanctioned as they reduce the amount of drinking water used to water gardens. Local government councils have their own bores for watering reserves and parks. Golf courses and swimming pools account for yet more water consumption. The current state of the Swan Coastal Plain wetlands is a reflection of the water table. The drying out of the lakes, along with run-off is causing lakes to become toxic.



CSIRO Newsletter, December 2006

“Toxic heavy metals and sulphuric acid have developed at Perth wetlands because of decades of drought, over-extraction of groundwater and drainage for housing, according to a leading environmental scientist.

Edith Cowan University ecology professor Pierre Horwitz, whose research group has held a Department of Water contract to monitor Swan coastal plain wetlands for the past 17 years, said the Gnangara mound had been dramatically overextended and the effects were being seen in wetlands.

He said wetlands were surface expressions of groundwater and as they dried, reactions in the sediments produced sulphuric acid and released toxic substances into the water table.”

The West Australian Newspaper, 17 May 2012

Degraded Lakes. The Perth turtles' predicament is due to the degraded condition of metropolitan lakes for which the local councils must bear most of the responsibility – neglect, direct drainage into lakes and invasive weeds. These same councils spend money on creating artificial lakes (which also aren't maintained) and even aerating them whilst neglecting natural lakes.

Land Clearing

“Some 80% of the Swan Coastal Plain wetlands are estimated to have been cleared, filled, drained or otherwise destroyed since European settlement¹. Only 15% are considered to retain high conservation values.

Urban encroachment, residential development, incompatible land-use practices, industry, agriculture, drainage, pollution, run-off, weed invasion and climate change continue to have a significant impact on most of the wetlands that remain.

If the current rate of loss continues, it is expected that almost all of these remaining wetlands will be lost within the next 10–20 years. Urgent action is needed.” WWF c2010

Misinformation. We are hampered by official statements to the effect that turtles are great survivors; that they can survive against the odds, or that all migrations consist of egg-laying females. This information is then perpetuated by local government agencies and the media. Before white settlement, turtles would have been able to survive the problems then encountered. Turtles have been around for 200 million years but they are no match for motor cars, dogs, heavy-metal pollution, extreme weather conditions, the drying of the lakes due to a dropping water table and the inability to indulge in traditional migration patterns in times of hardship.

THE RESCUE EFFORT

This rescue was a cooperative effort and, at the outset, I'd like to thank and acknowledge the help which was so readily given by lakeside residents, the wildlife rehabilitation community in Perth, the vets and their clinic staff. Particularly gratifying was the immediate and generous response from three of the major Perth wildlife centres – Darling Range Wildlife Shelter, Kanyana Wildlife and Native ARC - along with several individual wildlife rehabilitators.

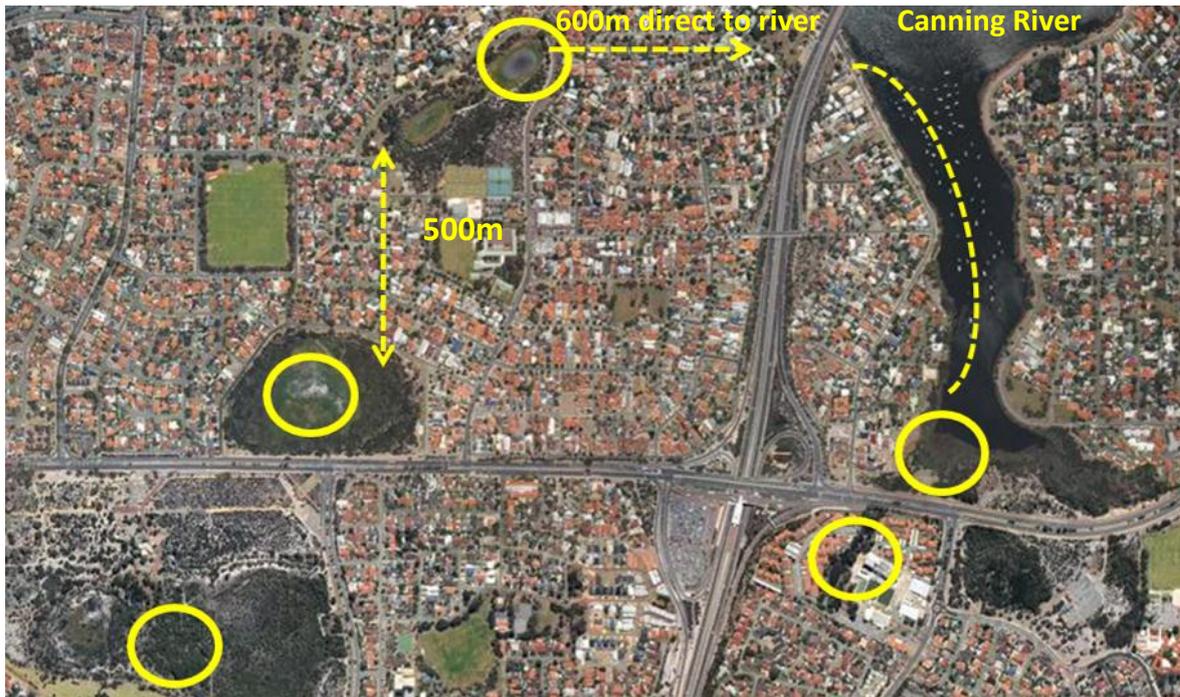
Annually, very few turtles are received into care and those which are admitted are invariably trauma cases or found hatchlings. Dealing with a large number of debilitated animals was something for which no-one was prepared. Not only did we lack any knowledge of the species, we were also lacking in suitable facilities to house the animals.

During January 2011, I had been checking my local lake for botulism, not turtles. At that point the lake was viscous 50cm deep mud with much wetter mud in the centre which, when pointed out to me, I could see was a seething mass of turtles.

Turtles are the forgotten wildlife; you only see them when they're in trouble.

At the end of January, as the Perth metropolitan area was preparing for the approach of Cyclone Bianca, the turtles began to leave the lake in droves – mainly early morning and late afternoon - probably to avoid the extreme daytime temperatures we were experiencing (2011 was the hottest year on record for the Perth metropolitan area). Although Cyclone Bianca had diminished before reaching Perth the barometric pressure remained low. Literature suggests that turtle migrations may be triggered by low barometric pressure.

Unfortunately the turtles' preferred exit route (probably a traditional migration route) was across a very busy road which is a *rat-run* between two major highways. An informal roster of local volunteers was quickly arranged to save the turtles by being on hand to take them across the roads.



Picture Near Map

The local council has since erected a barrier fence which should prevent the turtles' access to the busiest road. Sand pads have also been laid within the fenced area in the hope that any gravid females will utilise these areas rather than going further afield.

Initially, there was much confusion about whether to take the turtles back to the lake, or take them in the direction they were heading. A week into the rescue we were advised that we should be taking the turtles in the direction they were heading.

Two weeks into the rescue, it was confirmed that the animals were debilitated and would not survive aestivation.

It was then that we began taking the animals into care. No animals were removed from the mud; only those turtles which left the mud for the sides of the lake were taken in. Lakeside residents brought us turtles and we also retrieved turtles from lakeside residents' gardens.

I should mention that the animals leaving the lake were a mix of both sexes; it wasn't just females, so egg laying was ruled out.

Unfortunately, at this busy time we didn't have time to think about photos. The turtles leaving the lake looked like giant snails due to the burdens of mud on their backs. Occasionally, when they began wandering around in circles one of my heroic fellow rescuers, Dan or Jamie, would plough, barefoot into the viscous mud to retrieve them rather than take the chance that they would be crossing the road after we left for the night.

Daily monitoring of the lake continued for the next three months as we were sure that turtles remained in the mud in the centre of the lake. In April, rescuer Dan waded into the mud for one last time to check the turtles still in the mud. A couple of turtles were partially exposed so Dan took the opportunity to check their body condition which was judged to be fair. The two turtles were then returned to the mud to join the others turtles which were still submerged.



After the initial exodus, most turtles were rescued late in the day

A lakeside resident and I became overnight half-way houses for the turtles before they were distributed to wildlife rehabilitation centres and individuals.

Large 40 litre party tubs proved ideal both for rescues, transportation and overnight holding containers. These tubs were later used as dedicated feeding tubs.

Near Map was invaluable for checking out relocation sites before making on-site assessments; it saved a lot of driving.

SECOND STAGE RESCUE

To our relief, very heavy rains partially filled the lake with water on 20 May giving us a false sense of security. What didn't occur to us at that time was that it was going to take time for the food sources in the lake to build up after the first rains.

In July-August 2011, after the lake had filled with water, a *cluster* of dead turtles was found which led to a second stage rescue of 17 animals. The dead turtles were found at the waterline. The animals submitted for necropsy were found to be cachexic. Compared to these poor animals, the animals rescued earlier weren't as bad as we had thought.

The remaining turtles which had barely made it through 2010, and which had survived the particularly hot summer of 2010-2011, were then faced with cold temperatures and continued starvation. Large numbers of weak and lethargic (looking dead to all appearances) turtles basked in the warmer water at the edges of the lake; it was necessary to touch the turtles to determine that they were in fact alive. Only the most lethargic of the turtles were rescued as, apart for concerns for their health, it was felt that they were at risk of predation. Normally, turtles aren't seen, as with their acute hearing, they are out of sight long before anyone is near.

It was at that point that I began daily feeding in an endeavour to keep the turtles alive, and in the lake. The daily feeding continued until October-November when it was apparent that food sources were available within the lake. The first food sources to return were frogs and dragonflies. I do believe that this period of supplementary feeding enabled the remaining turtles to survive.

This second stage of rehabilitation, with much sicker animals, was complicated by the cold winter temperatures, necessitating various forms of heating in order to keep the sick turtles at their Preferred Body Temperature to maximise their rate of recuperation.

HOW DID I GET HERE?

I have never aspired to be a wildlife rehabilitator. However, life is what happens while you're making other plans. Faced with the plight of these turtles, I had no choice but to become involved. 18 months ago I'd never seen a turtle at close quarters, and knew nothing about them. However, like most people who deal with turtles I was very quickly smitten with them – they're intelligent, inquisitive, highly motivated by food and physiologically fascinating . . . good looking too!

Very few of those involved with the rehabilitation of these animals knew anything about turtles. I didn't even know how to tell males from females! Whilst weight ranges are available for most wildlife, there are none available for oblong turtles. Eventually, we tracked down a graph in a PhD thesis on the turtles from this very lake. A fellow rescuer and mathematician converted this graph to weights which we could relate to shell measurements. This was a real breakthrough and we were able to distribute this information to rehabilitators and vets. We've learned from experience that the weights are a bit on the low side but the figures remain a useful tool.



Picture Turtle Oblonga Network: Showing male (top) and female (below) tails

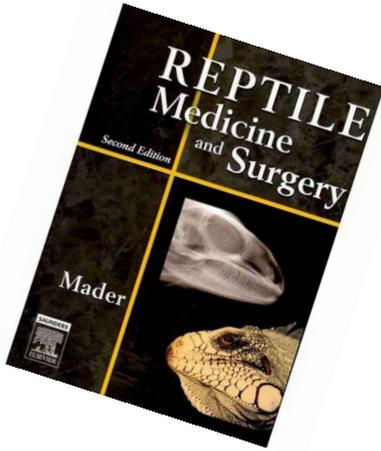


*Picture Turtle Oblonga Network:
Two males with equal length carapaces – emaciated turtle (left), healthy turtle (right)*



*Picture Turtle Oblonga Network:
Fat female overdue for release*

Those of us involved with caring for the turtles spent our time trawling the Internet for information, any information. The only information available at the time was on captive Eastern Long Necked turtles. Caring for a couple of ELNs in a fully-filtered and well-equipped household aquarium is poles apart from the rehabilitation needs of a large number of debilitated wild turtles and their impoverished rehabilitators.



I purchased a copy of Reptile Medicine and Surgery (Mader) for the vet who was dealing with most of the turtles. This book soon proved its worth when a couple of days later a turtle was admitted with aural abscesses which required surgery.

Earlier this year (2012) an excellent book was published – *Health Care and Rehabilitation of Turtles and Tortoises* by Amanda Ebenhack which is available from <http://www.livingartpublishing.com/>

The advantage of this book is that it is written by a rehabilitator and although it's not about Australian turtles, much of the information translates to our turtles. If only we had had this book 18 months ago . . .

Many of the turtles had, or acquired, various bacterial infections during the rehabilitation process. Infections are most often due to poor water quality. Other avenues for infection are via breaches of the skin due to scratches or bites from other turtles (which is why separate feeding is recommended) or unsuitable fencing, along with damage to plastron scutes from abrasive substrates, and pressure sores on heels due to hard substrates.

Thanks to colleague Ruth Haight, RVN, who has for many years been involved in the development of the successful *Bobtail Flu* treatment protocols at Kanyana Wildlife Centre in Perth, we now have a better understanding of the antibiotic protocols necessary to successfully treat turtles.

MASS RESCUE OPTIONS

There is no suitable facility in Perth to deal with a large influx of turtles i.e. large, properly filtered ponds

Normally, animals would be housed separately in rehabilitation but no-one has the facilities to be able to separately house an influx of 80+ animals. Wildlife rehabilitation is unfunded with volunteers relying on personal resources to fund their wildlife rehabilitation work. In the case of mass rescues, animals will most likely need to be housed together for practical reasons. *Minimum Standards* cannot be applied, and certainly not to unfunded volunteers, when dealing with such a predicament.

As most turtles' health problems arise from water-borne microbes, it is recommended that animals are kept in dedicated, individual tubs coded to ID shell markings, with a short period of compulsory dry-docking each day (dry docked turtles must have access to drinking water). Turtles are not physically energetic so do not require large dry-dock enclosures or ponds. Turtles, more than most species tolerate, and indeed appear to choose, crowding with conspecifics.

We now believe that for critically ill animals, the one-to-one care, offered by home carers is necessary for the consistent level of care required for such animals. Many wildlife centres also recognise this need by having their own networks of home carers. With up to 14 different shifts of volunteers per week at some centres, it's just not possible to achieve the necessary consistency of care.

As any breach of the skin or shell (via the paper-thin keratin scutes) is an avenue for infection it recommended that –

- animals are fed separately – both to keep the pond water cleaner and to avoid scratches and bites during feeding. Separate feeding also allows monitoring of the food intake.
- particular care is taken to provide non-abrasive, soft substrates
- any fencing should have a smooth visual barrier* up to about 400-500cm to prevent climbing (and subsequent falls), and abrasions to the ears and snout. *something like thick shadecloth or *Corflute* (a plastic version of corrugated cardboard) offcuts from a signwriter.

Water costs and usage are also important considerations. Without suitable water filtration, daily water changes are necessary. *Note:* Bacterial filters may be rendered ineffective by cleaning fluid and medication residues. We personally encountered OH&S issues in dealing with low tubs of water, and heavy tubs of water.

Due to the seasonal nature of this type of mass rescue, it was necessary to consider the cost, ease of storage, the portability and practicality of turtle housing. The picture below shows our suggested rehabilitation housing for 1-2 turtles.

Although the tubs are 220 litres they're only filled to the top of the hide/basking platform (about 80 litres/80 kilos); the high sides prevent escape and provide a sense of security for the animals. The tubs can be raised to a comfortable working height by placing on concrete or limestone blocks, hay bales or a solid metal bed base. Dark coloured tubs are preferable as they offer a greater sense of security. Aquariums aren't favoured because they are heavy and difficult to store.

As the most of the turtles were rescued in Summer water heating wasn't required until the second rescue effort which occurred in winter.



PictureTurtle Oblonaa Network

For ease of emptying, the tub is fitted with bar sink overflow pipe, to quickly drain water away for cleaning. Alternatively, a tap and hose could be fitted.

The fine mesh top is a precaution against rodents, ravens and foxes. One third to a half of the mesh top is covered with shadecloth.



Bar sink overflow pipe



The *hide* is a child's step stool which, with the water level at the top of the hide, doubles as a basking platform. One hide is required for each turtle. Hides are critical to reduce stress levels in these sensitive animals. Plastic pool furniture is preferred for ease of cleaning with disinfectants e.g. F10

WHAT HAVE WE LEARNED ?

We've learned a lot from the experience but, as always, continuous improvement and review is essential if we are to progress

We have also all learned a lot about oblong turtles but the more we learn the more we realise how little we know about these complex, evolutionary marvels. We'll always be learning !

As help is unlikely to be forthcoming from authorities or local government, it's important to **enlist the help of local residents** as soon as possible by arranging a letterbox drop. Continue to keep local residents informed and involved – either by email or letterbox drop - the public are our greatest allies. We found it necessary to produce a handout *What to do if you find a turtle* to inform residents about handling turtles, what to do with them, what not to do with them (scrubbing the turtle to clean it up !) and, importantly, who to call.

It's equally important is to **alert the wildlife rehabilitation community** and to keep them informed.

In our case, it was important to avoid **media publicity** to prevent opportunistic poaching from the wild. In WA, in 2003, the law changed to allow the licensed keeping of some reptiles and amphibians, including oblong turtles which means that these animals now have a monetary value. We did encounter poachers but, fortunately, they were deterred by the deep mud and the threat of Tiger snakes. Fortunately too, the story below said, incorrectly, that there were no turtles left in the lake.



Picture: The Melville Times, 08.02.2012

As very few vets have reptile and/or turtle experience, some form of **information for vets** should be available if needed; information which is endorsed by a reptile or wildlife vet.

Fortum (ceftazidime) is the **antibiotic of choice** for turtles. For turtles, a course of *Fortum* needs to be twice as long as for mammals i.e. 7-8 weeks for aggressive treatment, 2-4 weeks for prophylactic treatment with injections given every three days.

Triage in mass rescues is an important tool for managing your resources, and the welfare of the animals. Turtles can take a long time to die so it's important to triage all animals preferably by carrying out basic blood tests which may assist in determining which animals should be euthanased at the outset to avoid fruitless and prolonged efforts to save them.

Necropsy all deaths if at all possible

The **rescue co-ordinator** needs to be authoritative to be able to assure local residents that they know what they're doing to prevent people taking matters into their own hands. The co-ordinator should record, the ID-marking*/sex/weight/carapace measurement for each animal before the animals are distributed to wildlife centres. *A series of spots at the front of the carapace using different coloured nail polishes.

For animals with plastron infections or wounds, one of the most valuable tools, which is now regarded as a *must*, is to photograph the plastron or wound weekly so that you can see the progress from week to week. Without **weekly photographs** it's very difficult for a rehabilitator or their vet to gauge the level of improvement.

It's also important that the rescue co-ordinator keep **accurate records** of all animals' whereabouts from rescue to release. Animals which have died whilst in rehabilitation should be sighted by the co-ordinator and submitted for necropsy.

An overnight or **temporary holding facility** (in our case the animals were most often, but not always, rescued late in the day) may be necessary

With turtles, **prevention is everything**. It is no exaggeration to say that the bacterial infections to which they may be prone in rehabilitation, can delay their release by months. Water quality, non-abrasive soft substrates and injury prevention are paramount.

Turtle rehabilitators must have received **adequate training**; turtles are not for beginners. In order to keep on top of and prevent problems from escalating, those caring for turtles should be subject to regular supervision, inspections and insistence on record keeping. Release turtles sooner, rather than later; the longer they're in care the greater the risk of additional problems such as infections.

Release/relocation sites to be approved before release. Waterbirds are predominantly herbivores and, as such, are not indicators of suitable food sources for oblong turtles which are carnivores.

Turtle husbandry needs to consider water usage and **OH&S issues**. The working height of the water tubs is as important as eliminating the need to move heavy tubs of water



THINGS YOU, OR YOUR VET, MAY NEED TO KNOW IF YOU'RE NOT EXPERIENCED WITH TURTLES

- *Ivermectin* must never be used for turtles (fatal)
- Turtles should be examined at their PBT 26-28c
- Injecting medication into the back legs is not recommended as the renal-portal system may flush medication through the kidneys before therapeutic levels are reached.
- *Fortum* (ceftazidime), the antibiotic of choice for turtles, should be diluted with sterile water for injection.
- For turtles, a course of *Fortum* needs to be twice as long as for mammals i.e. 7-8 weeks for aggressive treatment, 2-4 weeks for prophylactic treatment with injections given every three days.
- Alternate injections between one front leg, or the other
- Rehydration fluids. Inject no more than 2-3% of bodyweight over the course of a day (not in a single dose).
- How to X-ray a turtle
- Like birds, turtles do not have liquid pus
- Scutes overlap some of the joints on the underlying bony plates. On X-rays, the joints between the bony plates should not be confused with a fracture
- Best route for euthanasia is the jugular vein along the neck
- Carapace-weight ratio chart (may only be useful for *Chelodina oblonga*)
- Turtle weights will normally fluctuate according to the amount of water the animal has on board. Weigh every three days to obtain a weight trend and either weigh - always wet, or always dry.
- If your Vet is carrying out tests, the local Zoo should have normal values for turtles
- Debriding **must** be carried out under anaesthetic, and with pain relief. Please ask your Vet to check with the local Zoo or a reptile/wildlife vet, if necessary, before anaesthetising turtles. Because turtles can hold their breath and don't always need oxygen, their anaesthetic procedures are different to those of other reptiles.
- Turtles do feel pain and do require pain relief. Unlike mammals, turtles are stoic (and voiceless) and for this reason are misread; pain relief should automatically be given for any painful procedure, and the recovery period. This is an animal welfare issue.

CONCLUSION

Over 100 turtles (over 90% of the turtles rescued were rehabilitated and relocated) were saved and in the process valuable information was gained. It is estimated that this one small lake *lost* two thirds of its turtle population – one third were rehabilitated and relocated and one third died as a result of car accidents, heat and/or starvation. Our experience will benefit future turtle rescuers for what is expected to become a regular occurrence in Perth in the future.

Unfortunately, the turtles in other lakes did not benefit from similarly co-ordinated rescues. It was this which was the catalyst to form a Network with the idea of harnessing people-power, utilising local residents willing to monitor their local lake(s).

Perhaps the most important lesson learned was that we want to be better prepared in future and to this end we have formed the Turtle Oblonga Rescue & Rehabilitation Network which will have a strong veterinary focus. Our aim is that every turtle receives professional and compassionate care.

Amongst the Network's objectives are –

To introduce training for both rehabilitators and the veterinary profession along with the provision of advisory services, and community information
the production of a rehabilitation-focussed husbandry manual
the formation of network of rescuers

Seeking grant applications for –

- Blood testing equipment, vivariums and an egg-incubator
- Turtle tub set-ups for loan and rescue equipment for mass turtle rescues

The Network is made of members of the public, lakeside residents, wildlife rehabilitators and veterinary professionals from the south west corner of Western Australia – *Chelodina oblonga*'s range. Everyone has a role to play, whether from the perspective of a caring lakeside resident or as a rehabilitator. Membership is not confined to rehabilitators.

The Network has made itself known to a diverse range of stakeholders including local government, community newspapers and any groups or individuals whose functions involve wetlands and water bodies and/or wildlife.

By harnessing people power we hope to have local residents and members monitoring their local lake(s) reporting any problems involving turtles in which case the Network will provide support by coordinating volunteers if necessary, providing material for letterbox drops, rescuing turtles and distributing them to suitably qualified rehabilitators.

In future, we'd like to see turtles undergo blood testing and x-rays at triage to determine any underlying health issues which may assist with triage, as well as the collection of a body of data on these animals.

The Network regards the dissemination of community information to be as important as rehabilitation. As urban dwellers become increasingly removed from the natural world so their interest in wildlife increases. We would like to see communities putting pressure on their local councils and related authorities to improve and maintain the health of their wetlands and lakes which would go a long way to improving the lot of suburban turtles.

Together we can make a difference

DIANNE HUNTER: Dianne left a glamorous wildlife-free arts career to find herself increasingly involved with wildlife. Recognising the dearth of administrators and organisers in the wildlife rehabilitation arena, she decided her existing skills would be of more use and now is hands on with computer keyboards and phone keypads rather than wildlife. However, she was uprooted from her comfortable computer chair by a crisis on her doorstep when the turtles in her local lake decided to, lemming-like, leave the dried up lake in never-ending droves. Broken of back and financially poorer but totally dedicated to turtles she has survived to tell the tale and has gone on to form the Turtle *Oblonga* Rescue & Rehabilitation Network.