





Playing 'tag' with turtles

The survival of marine turtles in many parts of the world, including Western Australia, is threatened by fishing, boat traffic, human activity on nesting beaches, confusion caused by artificial lights, hunting and introduced predators. In an effort to learn more about the status of turtles, the Department of Conservation and Land Management is about to improve its Statewide turtle monitoring program.

by Rochelle Mutton

Survival is tough for a turtle. The hatchlings have an extremely high mortality rate, falling victim to natural predators such as birds and fish and, since the 1950s, the European fox. It is estimated that only about one in 1,000 hatchlings reach sexual maturity at 20 to 40 years of age.

Juvenile and adult turtles must also dodge many physical dangers. They may become entangled in nets and drown, get strangled by rubbish or hit by boats. Turtles are killed for meat and leather and their eggs are taken for food and aphrodisiacs.

It is important to ensure that Western Australia's turtle species do not begin to disappear, like so many other populations around the world. So an ambitious new Statewide approach to turtle conservation has been formulated by the Department of Conservation and Land Management (CALM) in cooperation with non-government organisations.

Turtle tagging and other forms of monitoring have been going on in most known turtle nesting areas in WA since 1986, largely due to the efforts of CALM wildlife researcher Bob Prince and the tireless work of countless volunteers across the northern half of the State who have assisted him. During the course of the 17-year



Left A rare daylight appearance by a nesting hawksbill turtle is witnessed by Pilbara ranger-in-charge Geoff Kregor, regional ecologist Peter Kendrick and CALM volunteers Sue McDonald and Anna Vitenbergs, on Rosemary Island in the Dampier Archipelago
Photo – Rochelle Mutton

program, thousands of turtles have been tagged. However, with this work—and the greater awareness about the status of marine turtles that it has generated—has come the realisation that even more needs to be done.

Changes are under way that focus on developing a CALM-accredited turtle tagging training program, a community-based turtle nesting monitoring program and the development of a TAFE-accredited turtle guide training course.

Above The ghost crab, one of many predators, scurries in to feast on a flatback hatchling as it emerges from its nest, on Cowrie Beach, Munda Station, east of Karratha.
Photo – Margy Nicholas

Population pressures

While there are five species of marine turtles in WA, only four nest on north-western beaches. Loggerhead turtles are endangered, whereas green, hawksbill and flatback turtles are considered to be vulnerable. The larger leatherback turtle is an ocean-dwelling species and is not known to nest on WA beaches.

The turtle tagging and monitoring programs undertaken around WA since 1986 have provided valuable information about migration paths. Green turtles, for example, were found to travel many thousands of kilometres, from the North West Shelf to the Gulf of Carpentaria and Indonesia. Other

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Flatback turtle hatchlings reach the ocean.
Photo – Jiri Lochman

Left During mid-season for nesting flatbacks, a laying female with a shark bite in its shell dwarfs a flatback hatchling trying to find its way to the water.
Photo – Margy Nicholas



Above Turtles lay 50–150 eggs in a hole in the sand. The eggs within nests in warmer sites develop into females.

Photo – Margy Nicholas

Right A green turtle reaches the ocean.

*Photo – Alex Steffe|Lochman
Transparencies*



information was gathered about the size and location of local nesting beaches and turtle behaviour, but, due to the life cycle and behavioural traits of sea turtles, we still only have limited understanding of long-term population trends and causes of mortality.

CALM sends out t-shirts as rewards for people who return tags. The sender's address shows how far the turtle has travelled. Apparently, the most dangerous places for turtles to travel are northern Australia and Indonesia, where they are used for traditional food and are not necessarily protected by legislation. Some tags have been mailed from Indonesian villages.

One of the many questions that needs to be answered is where hatchlings go during their formative years. The turtles seen in the ocean are decades old. If new generations of hatchlings were annihilated, it would take several decades before the breeding stock would be affected. Individual females do not nest every year either. They commonly skip several years, with some not returning for seven years or more. By the time the first signs of trouble are obvious, it could well be too late to prevent a population crash.

Fox predation is a threat that turtles have only had to contend with since the last century—but it is having a major impact. According to Roland Mau, CALM's nature conservation coordinator based at Exmouth, at least 70 per cent of nests along the Ningaloo coast are being lost within days due to fox predation. Other serious pressures affecting the turtles include indigenous hunting, four-wheel-drive vehicles on nesting beaches, boat traffic and disorienting artificial lights.

New program

One of the main issues for nesting populations is the limited knowledge we have about long-term population trends. We are also yet to discover the locations of all the major rookeries on the mainland; until we have that information, we cannot be confident that we fully understand the types of threats affecting marine turtle breeding.

CALM turned to Australia's leading turtle expert Colin Limpus, from the

Queensland Environment Protection Agency, to report on WA's turtle management. Colin has undertaken 30 years of research in his home State. His key findings included the urgent need for long-term census and quantification of population losses. It is hoped that application of knowledge gained from his approach to turtle monitoring can strengthen the Western Australian program. According to Colin, relatively small changes in turtle populations could have a drastic effect if they continued year after year.

Colin said that turtle migration movements over hundreds, and even thousands, of kilometres meant proper management had to be considered on a large scale, and not only at rookery sites. He also said that, in light of escalating human usage, hard work would be required to keep the State's turtle populations healthy. Every turtle egg that was laid could be killed and it would take a whole generation before the consequences became apparent. By



that time, there would be a huge hole in the population, which has been seen to happen all around the world.

Vital volunteers

As in previous years, CALM volunteers will be central to the tagging fieldwork for the new turtle program. CALM has also received invaluable financial support from the oil and gas industry, which has extended its support to many important turtle projects.

Anna Vitenbergs of Point Sampson, a CALM volunteer of 13 years who has led and sustained the Pilbara turtle-tagging program, has done a lot of lonely work on offshore north-west islands. She has camped for many nesting seasons beside prime hawksbill and flatback turtle rookeries on Rosemary Island, in the Dampier Archipelago.

Anna, who is largely self-funded and self-taught in field knowledge, reads the signs in the sand to tell which turtle species have left their tracks and whether they have nested successfully or just busied themselves digging sand



Above left CALM volunteer Anna Vitenbergs tags a nesting hawksbill turtle, one of up to 25 she tags during a lonely night shift on Rosemary Island, Dampier Archipelago.

Left Pilbara regional ecologist Peter Kendrick monitors a nesting flatback on Cowrie Beach, east of Karratha.

Above A hawksbill turtle with a tag on its front flipper. It has been tagged under the Department of Conservation and Land Management's tagging program.
Photos - Rochelle Muttan



Above A flatback turtle makes its way back to the water after a hard night's work nesting on Rosemary Island in the Dampier Archipelago.
Photo - Rochelle Mutton

pits. Working for up to 10 days, she tags about 25 turtles per night with custom-made titanium tags that are clipped onto each front flipper. Woodside Energy has contributed to funding the tagging program for several years.

The Rosemary Island rookery, on an A Class Nature Reserve, has become one of the world's last bastions for large numbers of nesting hawksbills. But without comprehensive scientific studies, nobody can be sure of its status or how rigorously it ought to be protected. The inner reef lies within a proposed marine conservation reserve, which will assist in protecting turtles for the four months of the year that they mate, nest, rest, feed and hatch around the bay.

Anna is enthusiastic about the upgraded turtle-monitoring program, and agrees that there has to be a coordinated program with set timelines that provides comparative data. "Then we can see to what extent turtles are being threatened before it's too late," she said.

Coordinated approach

CALM's new approach to turtle management will coordinate tagging programs between the Karratha regional office and the Denham, Exmouth and Broome district offices. Each of the four turtle species will be tagged on at least two census beaches, selected from 2,000 kilometres of

coastline, or islands. The critical thing is to make sure that every turtle that comes up each night during the two-week peak nesting time is counted, and this must be done on an annual basis so that trends become clear.

Murdoch University PhD student Kellie Pendoley has been studying marine turtles and the management of industrial activity in the North West Shelf for five years. When she began, there was little data on the natural nesting population levels. Working ahead of her time in turtle population studies in the north-west, her aims are echoed on a grand scale by CALM's new turtle program. She has been working towards building a database of comparative information on nesting sites at the Montebello Islands, Barrow Island and Lowendal Island group.

She is already getting a feel for the demographics: what species are where and when, and how many there are. By getting a picture of what the nesting is like right now, there will be reference data to compare with future data if the Montebellos are eventually developed for tourism.

Initially hired by West Australian Petroleum, Kellie has also received generous funding for her work from Woodside Energy, Apache Energy, Chevron Texaco and BHP Billiton. It has enabled her to do groundbreaking work on the effects of oilfield lights on turtle rookeries at Barrow and Varanus islands. She discovered that all colours

of light attract hatchlings away from the sea and towards the light source. The funding has also supported satellite tagging of 17 north-west turtles.

At Ningaloo, a threatened species grant kick-started a partnership approach to turtle conservation: CALM, the local Cape Conservation Group, Worldwide Fund for Nature (WWF) and Murdoch University developed the Ningaloo Turtle Monitoring Program in 2001. This program has successfully monitored the level of nesting activity, identified a number of new significant rookeries for the endangered loggerhead turtle, and established threat levels from fox predation, human disturbance and four-wheel-drive use on beaches along the Ningaloo coast.

Last season, more than 1,680 volunteer-hours went into the program: a success in terms of community involvement alone. Monitoring takes place every morning during the nesting season and, like detectives, trained volunteers search the beach for tracks interpreting the evidence left from the night before.

The knowledge that is collected will ensure that rookeries can be



Left Hawksbill hatchlings jostle against each other as they find their land legs and scuttle towards the sea.

Below left The tell-tale tracks of nesting turtles are counted each morning by CALM volunteers on designated turtle-monitoring beaches in northern WA.

Below A newly hatched hawksbill turtle. Photos - Margy Nicholas



new turtle conservation program. There are plans for a turtle interpretive centre near Exmouth, and provision for the public to view nesting turtles adjacent to the Ningaloo Marine Park—similar to the way visitors have observed the Mon Repos loggerhead rookery in Queensland for the last 20 years, without interfering with the nesting turtles.

In another positive step, an expansion of a Statewide CALM volunteer training program for the 2003–04 season has been made possible by an increase in State and federal funding through the NHT.

Turtle tourists also need to be shown how to observe nesting turtles without disturbing them, and it is hoped that a higher profile for Ningaloo beaches will help to protect turtles and give visitors a quality experience.

Combined with the more holistic approach to turtle monitoring and protection, the public will have a window into the needs and mysteries of their local turtles.

protected from the impacts of foxes, vehicles, visitors and proposed development, as well as providing long-term monitoring information about the health of the breeding population. Community volunteers are the key to the success of the program and, with continued funding through the Natural Heritage Trust (NHT) and WWF, the program looks like being around for a long time to come.

Other efforts

Another issue is four-wheel-drives on nesting beaches. Vehicles disturb nesting females, compress nests and create ruts that hatchlings are unable to cross, directing them along rather than down the beach.

In protecting a significant flatback turtle rookery on its Point Sampson port lease, Robe River Iron Associates targeted four-wheel-drives. When general manager of operations Dan Tenardi first saw the nesting turtles on Bells Beach, with four-wheel-drive tracks weaving among them, he ordered the immediate closure of the beach to vehicles. Within hours, the four-wheel-drive entry had been sealed off with boulders—a courageous decision considering the beach's

popularity with local fishers and divers.

Dedicated turtle volunteer Angela Hartnett has been at the forefront of turtle monitoring and protection at the Bells Beach rookery. Last year, Angela won a hotly contested position on the Earthwatch Global Employee Fellowship Program. She was one of 24 international delegates chosen to learn from leading scientists in the environmental field of their interest.

After two weeks with nesting turtles in Malaysia, she learnt how to collect useful scientific data, was taught skills on interacting with turtles while minimising disturbance, and how to nurture public knowledge and involvement. It was the first step in a bigger process that has brought in 30 volunteers from the nearby Wickham community to monitor and protect the Bells Beach rookery.

“Last year, people drove all over the beach willy-nilly, without control. Now the community is aware there are turtles on the beach and that by driving on the beach you disrupt their breeding,” Angela said.

Public awareness

Informing the public about turtle conservation is another priority of the



Rochelle Mutton is a freelance journalist who has specialised in marine science reporting during the last three years, primarily writing for Australian daily newspapers on leading scientific projects. She is accompanied on field trips by award-winning underwater photographers Peter and Margy Nicholas. Rochelle and Margy acknowledge the assistance of Woodside Energy.

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