

MERTENS WATER MONITOR

On 3 March, 2004, Philip Mayes gave the Kimberley Society an interesting PowerPoint presentation on the topic of "Mertens Water Monitor: a field-based study of the ecology of *Varanus mertensi*, inhabiting the Ord River and surrounding East Kimberley". Philip is a Marine Biologist. He completed his Honours Degree in Adelaide studying intercellular blood parasites in bobtailed skinks. He came to Perth in 2000 and went to Kununurra as a doctoral student to study Mertens Water Monitor. He is now back in Perth writing up the results of his study. *Varanus mertensi* occurs across the north of Australia. It is a tropical semi aquatic animal. The adult grows to between 370 and 500 mm, not including the tail, and weighs between 1000 and 4000 gms. It is a big monitor, and it differs from land-based monitors in that its nostrils are on the top of the jaw and its tail is laterally flattened like an eel to suit its aquatic habit. It is a brilliant swimmer. *Varanus mitchellii* is a related aquatic monitor. They can occur together but *V. mitchellii* is much smaller and darker.

The reason for studying *V. mertensi* is that it is close to the top of the aquatic food chain predators and can thus show what significance this has for the chain. The food chain consists of crocodiles at the top, then water pythons, *V. mertensi*, small vertebrates, and, finally, small invertebrates.

Phil chose the Ord River Irrigation area for the study:

1. because, due to endemic flora and fauna, it is in the RAMSAR wetlands listings and is a refuge for many faunal spp. during dry periods;
2. to gain an understanding of the food chains in the Ord River wetlands by looking at *V. mertensi*; and,
3. because it is easy to study *V. mertensi* in man-made freshwater ecosystems, eg it is relatively easy to approach and noose them from the top of irrigation channels.

The Ord River Irrigation Scheme (ORIS) is based on the Ord River dam forming Lake Argyle; a large body of water. This discharges into the Diversion Weir - Lake Kununurra, to the irrigated areas and into Cambridge Gulf. Ivanhoe Plains, adjacent to Kununurra, is the largest irrigated area, and Packsaddle is a smaller area on the other side of the river.

Animals endemic to the region include the Frill-necked lizard, Bee eater, Northern blue tongue lizard, King brown snake, Terrestrial *V. panoptes* - racehorse goanna, Splendid green tree frog, Johnstons and Saltwater crocodiles, Rock monitor,

Gilberts dragon (Ta ta lizard), Geckoes, Red-tailed black cockatoo, Magpie geese, Large water rat, and Orb weaver spiders.

In a linear survey of 11 km of channel, 35 Mertens monitors and 45 crocodiles were counted. Being cold blooded *V. mertensi* basks on concrete or rocks to maintain its core body temperature. The monitors are caught, using a noose rod or by treadle operated cage traps, in order to take blood samples and examine stomach contents. To follow their movements, direction finders are used to track surgically implanted radio transmitters. Sensors are incorporated into the radio transmitters to measure core temperature by observation of heart rate, which is related to temperature. One animal was watched for 12 - 13 hours taking hourly readings to see how it regulated its temperature.

How do they fit into the food chain? What do they eat? To answer those questions, stomach contents obtained by stomach flush and scats were examined. Scats alone were of limited use as everything is digested to such a high degree that little other than things like crab shells and reptile eggs are left.

Reproductive cycle field observations included when mating occurred, when females were gravid and when hatchlings emerged. Mating takes place in the water. Blood samples were used to check hormone levels. Museum specimens were used to examine gonad size.

Results:

1. Spatial Movements: Between 500m to 2km in one day. Their long-term home range takes in 2 to 5 km of linear channel. When the water goes they sometimes leave and they may finish up in swimming pools. When the water is turned off for 3 to 6 months they retire to their burrows and become inactive. One burrow dug out was 15 cm wide and 10 cm high extending about 1 m into the bank close to the water line - 11 to 12 cm away. It had a bowl to allow turning. In the dry season they spend their time basking and in the wet they swim to forage coming out at 6 am and retiring to their burrows at 6 p.m. They maintain a similar body temperature throughout the year but it is naturally lower in the water.
2. Diet: White crabs make up 70%. The rest consists of mice, frogs, spiders, fish, red claw, grasshoppers, reptile eggs and crabs. They are fussy, taking no carrion prey. Their food is taken in or near the water. They are very adept at capturing prey. They taste the air with their tongue and they have good eyesight.
3. Reproductive cycle: Females become receptive from Dec to Feb. Mating always takes place from Dec to Jan. So females control the cycle. Eggs are

deposited from March to June and hatchlings appear 9 - 10 months later, i.e. Dec through Feb.

The preliminary conclusion is that irrigation channels provide a secure environment for the *V. mertensi* in spite of the negative influence of people. Channel banks are slashed to control weed growth, irrigation pumps and road traffic are hazards, and, while no ill effects were observed, the monitors do eat dying fish affected by herbicide applications.

V. mertensi was studied at other Kimberley sites such as natural water holes accessible by foot, eg Neil Pool on Parry Creek Road and Thompson's Spring where a wall was constructed a long time ago to dam water for cattle. Field research in the Kimberley is difficult because of boggy conditions in the wet, flooding and fire. Questions followed. How long can they hold their breath? 30 minutes if still, not so long if moving. Do they eat cane toads? Phillip thought the toads would be too large but maybe younger ones would be taken. Nests? No idea as he had never found one nor seen one being constructed. They may nest in refuge burrows. Hatchlings are taken by birds. They probably live for up to 20 years. The monitors are tagged by toe clips. There are increasing numbers in the irrigation channels.

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