31 January 2013, 2.33pm AEST

Australian endangered species: Western Swamp Tortoise

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DISCLOSURE STATEMENT

Nicola Mitchell receives funding from the Australian Research Council and The Western Australian Department of Environment and Conservation.

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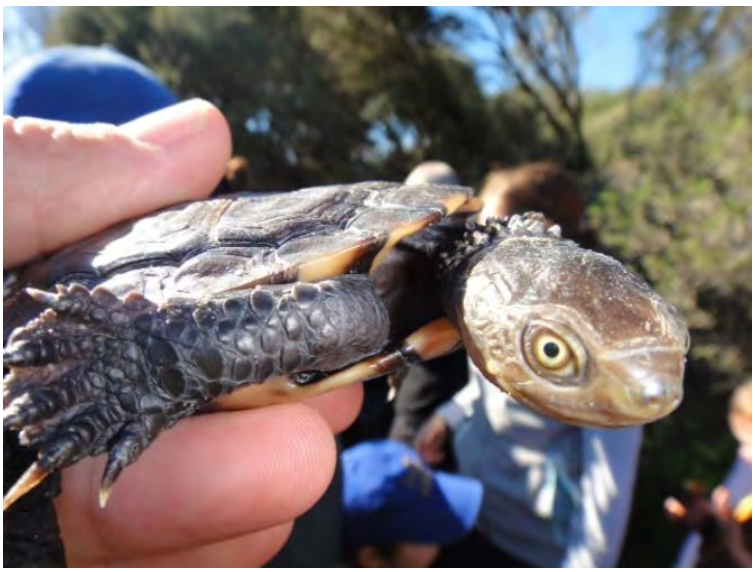

The Western Swamp Tortoise was rediscovered in the 1950s. Nicola Mitchell

The Western Swamp Tortoise (*Pseudemydura umbrina*) is Australia's rarest reptile. Originally it was known only from a single specimen collected in 1839 from an unknown location in Western Australia. No others came to light until the 1950s when a Perth schoolboy found one walking across a road and took it to a wildlife show. Its significance was soon recognised, and *Pseudemydura umbrina* was resurrected as a living species.

With a maximum shell length of about 350mm, the Western Swamp Tortoise is the smallest Australian freshwater turtle and the only one where males are larger than females. During the winter, spring and early summer they live in temporary swamps, feeding on aquatic invertebrates. After the swamps dry in early summer they aestivate (sleep over summer) in holes in the ground or under leaf litter.

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This winter/spring peak in activity is unusual for reptiles. It is also the only turtle or tortoise species where females dig the nest chamber with the fore limbs (rather than the hind limbs). Females usually lay a single clutch of three to five eggs each year. They may live for around 70 years.

Status

The Western Swamp Tortoise is listed as Critically Endangered by international, national and state authorities. The number of tortoises dropped from more than 300 in the mid-1960s to less than 50 in the mid-1980s. Since then intensive habitat management, **captive breeding** and translocations have increased the number to around 200.

Threats

The major threats to this species have been land clearing, swamp drainage and predation by the introduced Red Fox. Its small population size and slow rate of reproduction means that a fire or drought could be a disaster. Its rarity and uniqueness also renders it an attractive proposition for poachers.

The tortoises are also highly vulnerable to climate change. It is not increasing temperatures but declining winter and spring rainfall that is the threat. Harvesting groundwater for agricultural and urban development has limited the flow of water into swamps.

The tortoise breeds, feeds and grows during the hydroperiod. The hydroperiod is the period that standing water can be found in the swamps. In most swamps rainfall is now the primary source of water. Hatchlings must grow to a critical size before their first summer aestivation. Females will reabsorb their eggs or produce smaller clutches if their feeding opportunities are limited.

Assisted colonisation may be needed to save the tortoise under climate change. Nicola Mitchell

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A hydroperiod of around six to seven months appears to be ideal for this species. In recent years hydroperiods have declined to around three months. Projections suggest a continued fall in annual and winter rainfall in Perth. There is a very real scenario that the swamps will cease to support a breeding population.

Strategy

Conservation planning for Western Swamp Tortoises has been at the forefront of conservation practice in Australia. The best habitat was set aside in 1962, captive breeding began at Perth Zoo in 1988, and a recovery team formed in 1990 was one of the first such groups in Australia. More than 500 tortoises bred at the zoo have been released into the wild. All the tortoises are now within predator proof fences or in areas that are fox baited.

Unfortunately, all sites used for translocations offer increasingly marginal habitat because of the drying climate during recent decades. Constant pumping of bore water has been necessary to maintain water levels at Twin Swamps since 2003.

Assisted colonisation has been proposed to keep this species in the wild. From a climatic perspective, south is the logical direction. A **project** led by the University of Western Australia suggests that the coastal regions of the southwest may provide good habitat under future climate. Controversially, these areas are well outside any likely historical range of this species. Unease about introductions of species is certainly well founded based on experiences in Australia and elsewhere.

However, this species has already been moved to new habitats, including into a “threatened ecological community”. Assisted colonisation may not be such a philosophical leap. Instead, the physical “leap” to a novel habitat requires meaningful engagement with stakeholders, careful site assessment, and adequate monitoring of released animals and their impacts on the biological community.

Conclusion

Long generation times and low genetic diversity means that Western Swamp Tortoises are unlikely to adapt quickly to a changing climate. Human intervention will be necessary to

prevent their extinction in the wild.

Current conservation practices show that captive-bred tortoises can be successfully introduced into new areas. Sites that will offer good habitat in the future are urgently required. Fortunately, planning and site selection for “assisted colonisations” is well underway. They may be some of the first conducted for a vertebrate under climate change.

This article was co-authored by Dr Andrew Burbidge who has researched this species for almost 50 years. He is formerly of the Western Australia Department of Environment and Conservation.

The Conversation is running a series on Australian endangered species. See it ***here***

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