

# THREATENED SPECIES SCIENTIFIC COMMITTEE

Established under the *Environment Protection and Biodiversity Conservation Act 1999*

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The Minister's delegate approved this Conservation Advice on 16/12/2016.

## Conservation Advice

### *Liopholis kintorei*

great desert skink

#### Conservation Status

*Liopholis kintorei* (great desert skink) is listed as Vulnerable under the *Environment Protection and Biodiversity Conservation Act 1999* (Cwlth) (EPBC Act). The species is eligible for listing as prior to the commencement of the EPBC Act, it was, by its former name of *Egernia kintorei*, listed as Vulnerable under Schedule 1 of the *Endangered Species Protection Act 1992* (Cwlth). The species name was updated under the EPBC Act to *Liopholis kintorei* effective from 24 December 2009.

The species can also be listed as threatened under state and territory legislation. For information on the current listing status of this species under relevant state or territory legislation, see <http://www.environment.gov.au/cgi-bin/sprat/public/sprat.pl>

It is known as Tjakura (or Tjakurra) in Pitjantjatjara, Yankunytjatjara, Ngaanyatjarra and Pintupi languages, Warrarna in Warlpiri language, Tjalapa by Pintupi speakers around Kintore, Mulyamiji in the Manyjiljarra language spoken by Martu and Aran spoken by the Anmatjere (McAlpin, 2001).

The main factors that are the cause of the species being eligible for listing in the Vulnerable category are its assumed decline in numbers due a cessation in traditional land management practices, which have resulting in fires of increased intensity and size, and increased predation risk by introduced predators.

#### Description

The great desert skink is a burrowing skink well known and important to Aboriginal people throughout the western deserts region of Australia for lore and as a food source (McAlpin, 2001). It is characterised by its large size (weighing up to 350 grams), blunt head, smooth scales, pale fawn to rich reddish brown dorsal colouring and its contrasting creamy or yellow ventral surface (Cogger, 2014; McAlpin, 2001; Mitchell, 1950).

#### Distribution

The great desert skink is endemic to the Australian arid zone in the western deserts region (Pianka, 2014; McAlpin, 2001). It occurs in the Northern Territory (NT), Western Australia (WA) and South Australia (SA) but knowledge of its distribution in these jurisdictions is imprecise, due to the remoteness and inaccessibility of much of the potentially suitable habitat (McAlpin, 2001). There appears to have been a range contraction in WA with surveys failing to detect the species in former strongholds in the Gibson Desert north of Warburton and in the Great Victoria Desert (DSEWPAC, 2013; McAlpin, 2001; Pearson et al., 2001).

Key populations of the great desert skink are in the north-western Tanami Desert (Sangsters bore –Rabbit Flat region), Kiwirrkurra Indigenous Protected Area (managed by Central Desert Native Title Services), Southern Tanami Indigenous Protected Area, Uluru-Kata Tjuta National Park (jointly managed by its traditional owners Anangu and Parks Australia) and adjoining Yulara freehold land (managed by the Indigenous Land Corporation), Newhaven Wildlife Sanctuary (managed by the Australian Wildlife Conservancy), at Watarru on Anangu Pitjantjatjara Yankunytjatjara Lands in SA, Karlamilyi National Park (managed by the Kanyirninpa Jukurrpa) and Ngaanyatjarra Indigenous Protected Area (managed by Ngaanyatjarra Council) in WA.

At Newhaven Wildlife Sanctuary and in the northern parts of the Tanami desert important habitat is palaeodrainage country vegetated with *Melaleuca glomerata* (white tea tree) and *Triodia pungens* (gummy spinifex). In the Gibson Desert the habitat is lateritic downs and plains with *Triodia basedowi* (lobed spinifex). At Uluru-Yulara, important habitat is lateritic sand plains with both gummy spinifex and or lobed spinifex on a palaeodrainage line. At Watarru the habitat is open mulga woodland with *Eremophila gilesii* (desert fuchsia) and *Eragrostis eriopoda* (naked woollybutt). In Karlamilyi the habitat is lateritic sand plains adjacent to saline drainage areas (Steve McAlpin, pers.comm).

### Relevant Biology/Ecology

The great desert skink is viviparous (live-bearing) with 1 – 7 offspring born annually (McAlpin et al., 2011). It constructs and maintains an interconnected network of tunnels within which it aggregates with tunnels being up to 13 meters long and having up to 20 entrances. The tunnels provide protection from predators and the extreme thermal environment in the region and can be continuously occupied for up to 7 years with multiple generations participating in construction and maintenance of burrows (McAlpin 2001; McAlpin et al., 2011).

The principle food source for the great desert skink is the termite *Drepanotermes perniger* which has a naturally patchy distribution and burrow systems that appear to be constructed in close proximity to termite mounds (McAlpin et al., 2011).

Despite the general lack of geographic barriers throughout the Australian arid zone, Dennison et al. (2015) showed considerable genetic divergence in the great desert skink between regions, indicating restricted dispersal throughout their range. Dennison et al. (2015) also demonstrated male-biased dispersal and fine-scale movement in the great desert skink. Juveniles and adult females showed high natal-site fidelity, and males travelled a greater distance between burrow systems, and used a higher number of distinct burrow systems than females (Dennison et al. 2015).

### Threats

The major threat to the great desert skink is predation, particularly by feral cats, also foxes and possibly dingoes, if large areas of cover have been removed post fire. Habitat degradation by feral animals and invasive grasses also threaten the species (see Table 1).

Table 1 – Threats impacting the great desert skink in approximate order of severity of risk, based on available evidence.

Threat factor	Threat type and status	Evidence base
Predation		
Predation after loss of vegetation cover from fire.	current	Fire in spinifex grasslands adversely affects the great desert skink. Large and frequent high intensity fires resulting in the extensive loss of vegetation cover increases the vulnerability of the skink to predation by feral cats, foxes and potentially dingoes (Moore et al., 2015).
Habitat degradation		
Habitat degradation by feral camels and rabbits	suspected	Camels and rabbits can destroy burrows and are a suspected threat in Anangu Pitjantjatjara Yankunytjatjara Lands (Partridge, 2008).

Habitat degradation as a result of buffel grass invasion	potential	Buffel grass can smother habitat used for foraging and basking and increase fire size intensity and frequency. This may become an increasingly important issue in the future, particularly in SA populations around Watarru. The habitat (mulga woodlands) around Watarru is quite different to other localities in WA and NT and fire is rare in this habitat where fuel loads within the woodlands are very low. If buffel was to take over then habitat may become unsuitable (McAlpin., pers.comm).
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### **Conservation Objective**

The Conservation Objective provides the goal and rationale for the priority actions identified in this Conservation Advice. The objective is to increase the extent of suitable habitat for the species and retain its evolutionary potential across its range through:

- targeted feral predator (cats and foxes) management programs focused on key populations across the species range, and
- prescribed burning practices and traditional fire management that aims to maximise ground cover within the species habitat by reducing the frequency, intensity and size of fires.

Progress towards this objective can be achieved by implementing the conservation actions outlined below in this Conservation Advice. As the majority of great desert skink populations occur on Aboriginal lands, it is recognised that the skills, knowledge and expertise of Indigenous people are essential to the implementation of conservation actions.

Conservation progress can be identified through:

- a reduction in predation by feral cats at identified key populations.
- a reduction in the frequency and size of fire within the species habitat, particularly within the location of identified key populations, and
- population increases demonstrated at the identified key populations through systematic monitoring of burrow system occupancy (used as an index for abundance).

### **Conservation Actions**

Some great desert skink populations are at the time of writing, subject to conservation activities which in some cases may be benefiting the species. These include:

- surveys for the great desert skink, management of large areas of country for fire, feral camel control, feral cat control and monitoring, and management of buffel grass across the deserts region which are being lead and managed by Rangelands Natural Resource Management WA and traditional owner groups.
- annual monitoring, targeted predator control and prescribed burning conducted around key populations of great desert skink on Newhaven Wildlife Sanctuary by the AWC
- monitoring and fire management at Uluru-Kata Tjuta National Park and nearby Yulara freehold lands by Parks Australia.
- monitoring and targeted predator control conducted by the Kiwirrkurra Rangers.

The conservation priorities outlined below are intended to guide conservation effort in the interim to developing a recovery plan for the great desert skink. It is recommended that any proposed actions are focused in the key populations identified in this Conservation Advice.

### **Conservation and Management priorities**

#### Predation after loss of vegetation cover from fire

- Effort focused at managing the intensity, frequency and size of fires which adversely affects the great desert skink by increasing predation:
  - Ensure immediate and ongoing post-fire control of introduced predators within habitat when high intensity and widespread fires do occur.
  - Exclude fire from key sites within distinct localities where the great desert skink is known to be locally abundant (Moore et al., 2015).
  - Depending on the size of these key sites there may also be a need to undertake prescribed burning within the sites to construct strategic firebreaks to ensure any unwanted ignitions do not result in the loss of all vegetation cover (Moore et al., 2015).
  - Outside of these key sites but elsewhere in the skinks range, use fire to create and maintain large areas of mid-late succession vegetation preferred by great desert skinks (Cadenhead et al., 2016).
  - Manage feral cats and foxes to reduce predation pressure on the great desert skink by refining, trialling, and implementing introduced predator control techniques in and around areas where great desert skink occur (primarily traditional hunting, baiting, grooming trap, leg hold trapping, shooting; this should include training rangers and neighbouring pastoralists to trap).
  - Develop strategies which guide predator control for each of the key sites.

#### Habitat degradation by invasive species

- Reduce the numbers of introduced herbivores, including rabbit and camel populations, in and around areas where great desert skinks occur.
- Undertake buffel grass control through spraying in break out areas and along vehicle tracks where it occurs.

#### Stakeholder Engagement

- Develop a national recovery plan for the species in partnership with the state and territory governments, traditional owners and non-government organisations which provides an opportunity for participation and support, and which engenders community awareness and understanding for great desert skink conservation.
- Ensure that projects focusing on great desert skink management have strong involvement of Aboriginal people including funding for participants in predator control work, fire management and monitoring.
- Undertake training in contemporary survey and monitoring techniques, predator control and prescribed burning practices with Aboriginal people.

## **Survey and Monitoring priorities**

- Implement national monitoring and survey protocols to assess national trends.
- Implement an integrated monitoring program of threats (especially fire and predators) at important occupied habitat, to assess the effectiveness of current management actions and inform future management actions.

## **Information and research priorities**

Over the past five years much knowledge has been gained in regards to the ecology and biology of the great desert skink. Recent research has focused on the social structure, mating system, and population dynamics of the species, in addition key threatening processes have been investigated. However additional research priorities include:

- Determining the best fire regime within non-spinifex habitats that leads to sustained or increased populations of great desert skink.
- Undertaking further genetic sampling and analysis in the southwest and north west of the species distribution to confirm the extent of differentiation.
- Identifying populations across the extent of the species range where there is capacity and interest from landholders to manage threats and conduct ongoing monitoring.
- Developing a best practice monitoring approach.
- Undertaking surveys in previously unsurveyed likely habitat to locate new populations, particularly on the edges of their known range.
- Quantifying population status through a best practice monitoring approach.

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