

THREATENED SPECIES SCIENTIFIC COMMITTEE

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

The Minister's delegate approved this Conservation Advice on 15/07/2016.

Conservation Advice

Stipiturus malachurus intermedius

southern emu-wren (Fleurieu Peninsula)

Conservation Status

Stipiturus malachurus intermedius (southern emu-wren (Fleurieu Peninsula)) is listed as Endangered under the *Environment Protection and Biodiversity Conservation Act 1999* (Cwlth) (EPBC Act) effective from the 16 July 2000.

The species was eligible for listing under the EPBC Act at that time as, immediately prior to the commencement of the EPBC Act, it was listed as Endangered under Schedule 1 of the *Endangered Species Protection Act 1992* (Cwlth).

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

The main factors impacting on the species that are considered to be the cause for its eligibility for listing in the Endangered category are a restricted area of occupancy, a fragmented geographic distribution and ongoing declines in extent of occurrence, area of occupancy, area, extent and quality of habitat, number of locations and number of sub-populations.

Description

Southern emu-wrens are small (approximately 5 – 8 g), insectivorous passerines with characteristic tails comprising six long, emu-like feathers with a reduced, skeletonised structure and short, rounded wings which make them relatively poor fliers (MLRSERT 1998).

Males and females differ in appearance: the male has grey-brown upper-parts with thick dark brown to black streaks, extending from the crown to the rump, and a rufous-brown forehead, while the female has more prominent streaking on the upperparts and a light grey-brown to olive-grey forehead; the male has pale, light blue on the eye-brow, throat and upper breast, while the female has yellow-brown on the eye-brow, throat and upper-breast; however, both sexes have light brown or tawny-brown underparts except for the belly, which is white (Higgins et al., 2001; MLRSERT 1998).

Distribution

The southern emu-wren (Fleurieu Peninsula) is restricted to south-eastern South Australia, where it is found only on the Fleurieu Peninsula and in the southern Mount Lofty Ranges (MLRSERT 1998; Schodde & Mason 1999). Its range extends from Cox Scrub Conservation Park south to Deep Creek Conservation Park (Conservation Council of South Australia 2005; MLRSERT 1998).

Relevant Biology/Ecology

The southern emu-wren (Fleurieu Peninsula) generally occurs in two habitat types - swamp and dry-heath. Their preferred swamp habitat comprises peat-bog vegetation or 'open forest-wet-heath' dominated by *Leptospermum continentale* (prickly tea-tree), *L. lanigerum* (silky tea-tree), *Gahnia sieberiana* red-fruit cutting-grass, sedges (e.g. *Baumea* spp., *Lepidosperma* spp.) and ferns (e.g. *Blechnum minus*, *Gleichenia microphylla*) (Littlely & Cutten 1994). Their preferred

dry-heath habitat includes shrubland with species such as *Allocasuarina muelleriana* (common oak-bush), *A. striata* (tall oak-bush), *Hakea rostrata* (beaked hakea), *Pultenea involucrata* (Mount Lofty bush-pea), *Spyridium thymifolium* (thyme-leaf spyridium) and *Xanthorrhoea semiplana* (yacca), or sometimes low open forest with a heath understorey and open canopy of *Eucalyptus obliqua* (messmate stringybark) or *E. baxteri* (brown stringybark) (Littlely & Cutten 1994). The subspecies also occasionally occurs in open *Muehlenbeckia florulenta* (samphire/lignum) floodplains and reedland (primarily *Phragmites australis* (common reed)) with scattered silky tea-tree (MLRSERT 1998).

The southern emu-wren (Fleurieu Peninsula) feeds almost entirely upon insects, including seed or chinch bugs (Hemiptera: Lygaeidae, including *Nysius*), psyllids (Hemiptera: Psyllidae), katydids (Orthoptera: Tettigoniidae) and beetles (Coleoptera), including weevils (Coleoptera: Curculionidae) (Lea & Gray 1935). Other items recorded in their diet include eggs of katydids (and possibly other insects or spiders), and wasp cocoons (Hymenoptera) (Lea & Gray 1935).

The southern emu-wren (Fleurieu Peninsula) breeds in the spring–summer months, with territories set-up by individual pairs during this period varying in size from less than half a hectare to up to several hectares (MLRSERT 1998). In general, two broods are raised during the spring–summer breeding season; the first during September–November, and a second during December–February (MLRSERT 1998). The female constructs a globose nest, in dense vegetation near the ground, using interwoven stems and leaves of grass and sedge, and sometimes strips of bark and rootlets, bound with sparse spiders' web and egg cases, and scantily lined inside with feathers, finer grass, fur and plant down (Schodde 1982). Most clutches comprise three eggs, with females laying one egg per day in the morning on consecutive days (MLRSERT 1998).

A generation time of 9.7 years (BirdLife International 2011) is derived from an age at first breeding of 2.3 years and a maximum longevity of 17.0 years, both values extrapolated from fairy-wrens (*Malurus* spp.) (Garnett et al., 2011).

Threats

Declines in the number of southern emu-wrens (Fleurieu Peninsula) have mainly been due to the clearance, degradation and fragmentation of the subspecies swamp and dry heathland habitat (Littlely & Cutten 1994; MLRSERT 1998; Pickett, pers. comm., 2005). The largest remaining heathland populations of southern emu-wrens are in protected areas where the major threat is bushfires. However, remaining swamp populations occur almost entirely on private property, which is highly fragmented, rare and subject to incremental alteration or clearance (Garnett et al., 2011).

The subspecies is threatened, or potentially threatened, by a variety of land use and land management processes that could have deleterious effects on its habitat. These processes include continued clearance of native vegetation, grazing of livestock, mining (e.g. sand mining could affect occupied swamps by reducing the supply of groundwater or water quality), plantation forestry (e.g. plantations in the vicinity of occupied swamps could reduce the supply of ground water or cause pollution of the swamps) and residential development (MLRSERT 1998; Pickett, pers. comm., 2005). The grazing of livestock in swamps is considered to be the most serious threat, given that it is a common practice and has direct effects on habitat quality (Pickett, pers. comm. 2005).

The southern emu-wren (Fleurieu Peninsula) is also at risk from bushfire, both directly and through indirect impacts to remaining habitat patches (Garnett et al., 2011). Wildfire is a major ongoing threat to the southern emu-wren (Fleurieu Peninsula) as all populations and habitats are potentially at risk (MLRSERT 1998). During drought, habitat patches are particularly vulnerable to extensive wildfires and deliberate burning to create pasture (Garnett et al., 2011). The subspecies is also threatened by other natural, catastrophic events such as drought, flood or storm (MLRSERT 1998; Pickett, pers. comm., 2005), however floods and storms are believed to be comparatively minor threats to the emu-wren, while drought may pose a major threat to

populations in swamps (Pickett, pers. comm., 2005). Reductions in water quantity and quality may also affect swamp ecology and thus impact on the availability of suitable habitat for the southern emu-wren (MLRSERT 1998).

Table 1 – Threats impacting the southern emu-wren (Fleurieu Peninsula) in approximate order of severity of risk, based on available evidence.

Threat factor	Threat type and status	Evidence base
Habitat loss, alteration and fragmentation		
Land clearing	known ongoing	Declines in the number of southern emu-wrens (Fleurieu Peninsula) have mainly been due to the clearance, degradation and fragmentation of the subspecies swamp and dry heathland habitat (Littlely & Cutten 1994; MLRSERT 1998; Pickett, pers. comm., 2005). Most of the subspecies natural habitat in the Mount Lofty Ranges and Fleurieu Peninsula has been drained and cleared (Garnett et al., 2011), predominantly for primary production (e.g. grazing, dairying, forestry, horticulture). Potential future land drainage and clearance for agriculture still pose a threat to the subspecies (Garnett et al., 2011).
Habitat alteration	known ongoing	Habitat patches have been altered and degraded when they have dried out following the damning of feeder streams or as a result of heavy grazing (Garnett et al., 2011). The degradation of remaining habitat patches by slashing, burning, draining, heavy grazing, mining, plantation forestry and residential development may continue to have deleterious effects on the subspecies (MLRSERT 1998; Pickett, pers. comm., 2005). Remaining swamp populations occur almost entirely on private property, which is highly fragmented, rare and subject to incremental alteration or clearance (Garnett et al., 2011).
Habitat fragmentation	known ongoing	Swamp habitat remains only as small, isolated patches on the Fleurieu Peninsula and dispersal between patches is limited to non-existent (Garnett et al., 2011).
Small population size		
Small population size	known current	Remaining populations of southern emu-wrens (Fleurieu Peninsula) mostly inhabit small and isolated fragments of habitat. In the past, populations could be replenished by birds dispersing from nearby refuges, but as the birds' dispersal is limited because of their poor flying abilities, the increasing isolation of remaining habitat patches means that replenishment is now much more difficult or impossible and populations are prone to localised extinction (MLR Southern Emu-wren & Fleurieu Peninsula Swamps Recovery Team 2007). Given their fragmented distribution and small population size, estimated in 2010 to be approximately 300 mature individuals and decreasing, populations are also at risk from demographic stochasticity and potential genetic stochasticity (Garnett et al., 2011). Consequently, random variations in the population demographics (e.g. survival rates, reproductive success) or the genetic structure of a small population (e.g. due to genetic drift or inbreeding depression) could have a significant impact on the long-term viability of that population (MLRSERT 1998; Pickett 2000; Pickett, pers. comm., 2005).

Fire		
Wildfires in remaining habitat patches	known current	Wildfire has caused local extinctions of small populations in the past (e.g. Cox Scrub Conservation Park in 1983 and Toadspring Swamp in 1997) and is a major ongoing threat to the southern emu-wren (Fleurieu Peninsula) (MLRSERT 1998). All populations are potentially at risk, with habitat patches particularly vulnerable to extensive wildfires during droughts (Garnett et al., 2011). The largest remaining population, at Deep Creek Conservation Park, occurs in an environment that is highly susceptible to wildfire, and which could potentially be wiped out by a single unchecked fire event (MLRSERT 1998). If wildfires were to occur at Deep Creek Conservation Park or Finnis the total population of emu-wrens would be severely reduced (MLRSERT 1998).
Deliberate burning to create pasture	potential	Remaining habitat patches may be lost if fires are deliberately lit to create pasture, particularly if fires are lit during drought conditions and potentially spread into surrounding habitat (Garnett et al., 2011).
Flood		
Flooding in restricted streamside habitat patches	potential	Clearing and grazing of habitat along the outer edges of river systems, including Tookayerta Creek and Finnis River, may be forcing emu-wrens to nest closer to the main channels in narrow riparian buffer zones and increasing the risk of nests/adults being lost if the banks flood (MLRSERT 1998).
Water quality and quantity		
Reduction in availability of suitable habitat	known past and potential future	Most of the subspecies habitat has been drained for agriculture or dried out following the damming of feeder streams. Further water extraction and swamp (surface-water) drainage may continue to impact the southern emu-wren in the future (Garnett et al., 2011). Factors that may impact water quantity include: the construction of dams for water storage or the instalment of drains to divert water away from potentially productive sites; sand mining at the source of springs near Mt Compass, as the sand in this area collects and stores water in winter and releases it to the spring system throughout the year; the level of water allocation for agricultural use; and groundwater extraction associated with horticulture and intensification of land use (MLRSERT 1998). Factors that may impact water quality include leaching of herbicides and pesticides, and increased nutrient loads from fertilisers and effluent from stock (MLRSERT 1998). Reductions in water quantity and quality, especially in the Mt Compass–Nangkita area, may affect swamp ecology and thus impact on the availability of suitable habitat for the southern emu-wren (MLRSERT 1998).
Invasive species		
Predation	potential future	Introduced predators such as cats (<i>Felis catus</i>), foxes (<i>Vulpes vulpes</i>) and rats (<i>Rattus rattus</i>), and native predators (e.g. snakes, raptors) and parasites (e.g. cuckoos) are considered to be minor threats to the southern emu-wren (Fleurieu Peninsula). However, the impact of these species upon the subspecies is largely unknown, and may potentially be greater (at least in some small populations) than is currently assumed (MLRSERT 1998; Pickett, pers. comm., 2005).

Weed invasion	potential future	The encroachment of weeds into remaining habitat patches, or the dieback of vegetation due to fungal infection by <i>Phytophthora</i> , may affect the integrity of habitat available to southern emu-wrens (MLRSERT 1998; Garnett et al., 2011).
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Conservation Actions

Conservation and Management priorities

Habitat loss, alteration and fragmentation

- Rehabilitate swamp vegetation (by replanting vegetation of local provenance and altering drainage lines to allow inundation of swamp habitats) to reduce fragmentation and improve the quality and extent of habitat available to southern emu-wrens.
- Protect and enhance southern emu-wren habitat through the active management of conservation reserves, and close liaison with private land owners, at known locations.

Impacts of domestic species

- Work with land owners/managers to promote the use of appropriate grazing management regimes. This includes management of total grazing pressure at important sites through the use of exclusion fencing or other barriers and/or stocking densities that do not detrimentally affect southern emu-wrens.

Small population size

- Prepare a translocation strategy for the southern emu-wren (Fleureiu Peninsula), including investigation of options for linking, enhancing or establishing additional populations.
- If necessary, undertake and monitor best-practice translocations through the implementation of the translocation strategy.

Fire

- Provide maps of known occurrences to local and state Rural Fire Services and seek inclusion of mitigation measures in bush fire risk management plan/s, risk register/s and/or operation maps.
- Inform land owners/managers about the potential impacts of fire on southern emu-wren populations and actively discourage the deliberate lighting of fires for the purpose of pasture creation.

Water quality and quantity

- Work with land owners/managers at important locations to reduce the likelihood of reductions in water quantity and quality in the southern emu-wrens swamp habitat.

Invasive species

- Implement a control program to reduce the possible impacts of cat and fox predation on southern emu-wrens.
- Identify and remove new weeds, or undertake weed control, where weed invasion could impact on the quality of habitat available to the southern emu-wren.

Stakeholder Engagement

- Coordinate conservation through the Mount Lofty Ranges Recovery Team.
- Liaise with land managers to encourage their involvement in conservation.
- Prepare a southern emu-wren management strategy with input and from local experts.

Survey and Monitoring priorities

- Design and implement a monitoring program for all remaining populations of southern emu-wren (Fleurieu Peninsula).

Information and research priorities

- Review and analyse monitoring data to more precisely assess population size, distribution, ecological requirements and the relative impacts of threatening processes.
- Review the effectiveness of management actions in contributing to species recovery, and adapt management actions if necessary.
- Investigate the potential impacts of cats, foxes and rats on the southern emu-wren.
- Identify populations at high risk from potential flooding and determine whether these populations may be suitable for inclusion in any possible future translocation programs.

References cited in the advice

- BirdLife International (2011). Species factsheet: *Stipiturus malachurus*. Available on the internet at: <http://www.birdlife.org/>.
- Conservation Council of South Australia (2005). Mount Lofty Ranges Southern Emu-wren Fact File. Available on the internet at: <http://www.ccsa.asn.au>.
- Garnett, S. T., Szabo, J. K., & Dutton, G. (2011). The Action Plan for Australian Birds 2010. Collingwood, Australia: CSIRO Publishing.
- Higgins, P. J., Peter, J. M., & Steele, W. K. (Eds) (2001). Handbook of Australian, New Zealand and Antarctic Birds. Volume 5: Tyrant- Flycatchers to Chats. Melbourne, Australia: Oxford University Press.
- Lea, A. H., & Gray, J. T. (1935). The food of Australian birds. *Emu* 35,145-178.
- Littlely, T., & Cutten, J. M. (1994). Draft Recovery Plan for the Mt Lofty Ranges Southern Emu-wren (*Stipiturus malachurus intermedius*). Adelaide, Australia: Conservation Council of South Australia.
- Mount Lofty Ranges Southern Emu-wren Recovery Team (MLSERT) (1998). Recovery Plan for the Mt Lofty Ranges Southern Emu-Wren *Stipiturus malachurus intermedius* 1999 - 2003. Canberra, Australia: Department of the Environment, Water, Heritage and the Arts. Available on the internet at: <http://www.environment.gov.au/resource/national-recovery-plan-mt-lofty-ranges-southern-emu-wren-stipiturus-malachurus-intermedius>
- Mount Lofty Ranges Southern Emu-wren & Fleurieu Peninsula Swamps Recovery Team (2007). Recovery Plan for the Mount Lofty Ranges Southern Emu-wren *Stipiturus malachurus intermedius*: 2006–2011. Adelaide, Australia: Conservation Council of South Australia.
- Pickett, M. (2000). The Mount Lofty Ranges Southern Emu-wren *Stipiturus malachurus intermedius* recovery program: banding and monitoring 1994-1999. Unpublished report prepared for the Conservation Council of South Australia. Adelaide, Australia: Conservation Council of South Australia.
- Schodde, R. (1982). The fairy-wrens: A monograph of the Maluridae. Melbourne, Australia: Lansdowne.

Schodde, R., & Mason, I. J. (1999). *The Directory of Australian Birds: Passerines*. Melbourne, Australia: CSIRO Publishing.

Willson, A., & Bignall, J. (2009). *Regional recovery plan for threatened species and ecological communities of Adelaide and the Mount Lofty Ranges, South Australia*. Adelaide, Australia: South Australian Department for Environment and Heritage.

Other sources cited in the advice

Pickett, M. (2005). Personal communication by email, December 2005. Ornithologist at Conservation Council of South Australia.