

Approved Conservation Advice for
Engaewa reducta (Dunsborough Burrowing Crayfish)

(s266B of the *Environment Protection and Biodiversity Conservation Act 1999*)

This Conservation Advice has been developed based on the best available information at the time this Conservation Advice was approved; this includes existing plans, records or management prescriptions for this species.

Description

Engaewa reducta, Family Parastacidae, also known as the Dunsborough Burrowing Crayfish, is a small burrowing crayfish up to 50 mm in length. It is generally a pale to mid-brown colour with purplish-blue claws. Distinctive characteristics of burrowing crayfish include a narrow abdomen which may be shorter than the head and thorax, reduced eye size and large claws adapted to digging, with the fingers of the claws moving in a vertical plane.

The Dunsborough Burrowing Crayfish is almost identical in appearance to closely related species such as *E. pseudoreducta* (Margaret River Burrowing Crayfish) and *E. walpolea* (Walpole Burrowing Crayfish). Identification of the individual species can be determined by examining anatomical features under a microscope. Dunsborough Burrowing Crayfish can be distinguished by the presence of low, short rostral carinae (raised ridges on the pointed rostrum at the front of the head), which are absent in other *Engaewa* species, and the presence of pits or pores on the lateral processes (side projections) of the 3rd and 4th pereopods (walking legs). In the field, these species are more easily distinguished from each other by the river system in which they are found, as they have extremely limited capacity for dispersal and are geographically isolated (Horwitz and Adams, 2000).

Conservation Status

The Dunsborough Burrowing Crayfish is listed as **critically endangered**.

The species is eligible for listing as critically endangered under the *Environment Protection and Biodiversity Conservation Act 1999* (Cwlth) (EPBC Act) as, in 2009, the Minister considered the Threatened Species Scientific Committee's (TSSC) advice under section 189 of the EPBC Act and amended the list under section 184 to include the Dunsborough Burrowing Crayfish. The TSSC determined that this species met Criterion 2 of the eligibility criteria because its geographic distribution is very restricted and precarious for its survival (TSSC, 2009).

The Dunsborough Burrowing Crayfish is also listed as Schedule 1 Fauna (fauna that is rare or likely to become extinct) under the Western Australian *Wildlife Conservation Act 1950* and ranked as endangered for management purposes.

Distribution and Habitat

The Dunsborough Burrowing Crayfish is known from an area between Dunsborough and the Margaret River in Western Australia, approximately 250 km south of Perth. Nine populations were confirmed in this locality in 2007, occupying an area of around 6 km². The species occurs in the South West Natural Resource Management Region.

The Dunsborough Burrowing Crayfish uses a variety of habitats that provide moist sandy/loamy soils and an accessible watertable. These include vegetated seepages, swamp plains and swampy headwaters of streams. The Dunsborough Burrowing Crayfish construct a complex burrow system that can be several metres deep, extending down to the freshwater watertable in drier months. At wetter times of year burrows are marked by conspicuous chimneys of soil pellets. Vegetation associated with these habitats is native heaths dominated by shrubs (e.g. callistemons, melaleucas) (Burnham, 2005; Burnham et al., 2007).

The burrowing crayfish species of Western Australia, including the Dunsborough Burrowing Crayfish, have been described as ecosystem engineers due to their burrowing habits, which enhance the flow of oxygen, water and nutrients through soil profiles, and create permanent habitats or seasonal refuges for other organisms in the form of their burrows (Horwitz and Rogan, 2003).

The distribution of Dunsborough Burrowing Crayfish is not known to overlap with any EPBC Act-listed threatened ecological community.

Threats

The main actual threats to the Dunsborough Burrowing Crayfish are land clearing, farm dam construction and cattle grazing (Burnham, 2005; Burnham et al., 2007).

- Land clearing for agriculture or logging destroys habitat for the species and can lead to increased salinity in freshwater wetlands.
- Farm dam construction alters surface water and groundwater flows, increases siltation and leads to water logging or flooding of suitable habitat.
- Grazing of cattle leads to soil compaction and erosion, impairs the water absorbing and water holding capacity of soils, and physically destroy burrows.

The main potential threats to the Dunsborough Burrowing Crayfish are drainage activities, groundwater extraction, feral pigs, road and bridge construction and fire (Burnham, 2005; Burnham et al., 2007).

- Drainage activities for peat, sand mining or agricultural activities could dry out the species' moisture-rich habitats.
- Groundwater extraction could lower watertables, dry out moisture-rich habitats, and potentially cause acidification and toxicification of wetlands.
- Feral pig numbers are increasing in south-western Western Australia due to illegal introductions by recreational pig hunters and subsequent reproductive success (Spencer et al., 2005). Feral pigs could damage habitat through ground-rooting feeding behaviour and prey on crayfish during rare surfacing events.
- Road and bridge construction could alter surface water and groundwater flows, increase sediment deposition and lead to water logging or flooding of suitable habitat.
- Burning of soils rich in organic matter can either destroy them or alter their water-holding capacity so that moisture-rich habitats are lost. The underlying mineral soil may also be lost, changing groundwater system and risking acidification and metal toxification of swamps through drying and re-wetting of soils.

Other potential threats include fire, disease from introduced crayfish species, exposure and subsequent hydration of acid sulphate soils, use of pesticides, fertilisers or herbicides that contaminate or reduce water quality, and climate change reducing rainfall and wetland habitats.

Research Priorities

Research priorities that would inform future regional and local priority actions include:

- Research into the species' life history (longevity, dispersal, reproduction).
- Research into the species' ability to withstand desiccation, acidity and low dissolved oxygen levels and effects of fire.

- Design and implement a monitoring program, including improved ways of catching and releasing animals for study (currently animals must be dug out by hand).
- Undertake survey work in suitable habitat and potential habitat to locate any additional populations/occurrences.

Priority Actions

The following priority recovery and threat abatement actions can be done to support the recovery of the Dunsborough Burrowing Crayfish.

Habitat Loss, Disturbance and Modification

- Monitor known populations to identify key threats.
- Monitor the progress of recovery, including the effectiveness of management actions and the need to adapt them if necessary.
- Minimise adverse impacts from land use at known sites, particularly agriculture and forestry operations.
- Manage any disruptions to water flows to minimise impact on surface water and groundwater flows such as farm dam construction, drainage activities, agricultural, forestry or mining operations, or groundwater extraction.

Invasive Weeds

- Manage known sites to prevent introduction of invasive weeds, which could become a threat to the Dunsborough Burrowing Crayfish, using appropriate methods.

Trampling, Browsing or Grazing

- Prevent habitat degradation/destruction by cattle and sheep grazing at known sites.
- Manage feral pigs at known sites to minimise impacts from ground-rooting and wallowing.

Animal Predation or Competition

- Manage feral pigs at known sites to minimise impacts from predation.

Fire

- Implement an appropriate fire regime for the habitat of local populations.

This list does not necessarily encompass all actions that may be of benefit to the Dunsborough Burrowing Crayfish but highlights those that are considered to be of highest priority at the time of preparing the Conservation Advice.

Existing Plans/Management Prescriptions that are Relevant to the Species

The species is the subject of the following draft recovery plan:

Department of Environment and Conservation (2008). Dunsborough Burrowing Crayfish (*Engaewa reducta*), Margaret River Burrowing Crayfish (*Engaewa pseudoreducta*) and Walpole Burrowing Crayfish (*Engaewa walpolea*) Recovery Plan 2007–2016. Interim Recovery Plan No. 41. Department of Environment and Conservation, Western Australia.

Information Sources:

- Burnham QF (2005). The systematics of the *reducta* complex of the burrowing freshwater crayfish *Engaewa* Riek. Honours thesis, Edith Cowan University, Perth.
- Burnham QF, Koenders A and Horwitz P (2007). Field studies into the biology and conservation requirements of *Engaewa* species in the South-West and Warren DEC Regions. Final Report Prepared for Department of Environment and Conservation 30 November 2007.
- Horwitz P and Adams M (2000). The systematics, biogeography and conservation status of the species in the freshwater crayfish genus *Engaewa* Riek (Decapoda: Parastacidae) from south-western Australia. *Invertebrate Taxonomy* 14: 655–680.
- Horwitz P and Rogan R (2003). Aquatic macroinvertebrate and non-flowing wetland values of the Yarragadee (outcropping and subcropping) groundwater dependent systems of far south-western Australia. Final Report Stages 1 and 2. Centre for Ecosystem Management, Edith Cowan University.
- Spencer PBS and Hampton JO (2005). Illegal translocation and genetic structure of feral pigs in Western Australia. *Journal of Wildlife Management* 69: 377–384.
- Threatened Species Scientific Committee (TSSC) (2009). Listing advice for *Engaewa reducta* (Dunsborough Burrowing Crayfish).