Approved Conservation Advice for *Engaewa walpolea* (Walpole 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 walpolea, Family Parastacidae, also known as the Walpole 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 Walpole Burrowing Crayfish is almost identical in appearance to closely related species such as *E. pseudoreducta* (Margaret River Burrowing Crayfish) and *E. reducta* (Dunsborough Burrowing Crayfish). Identification of the individual species can be determined by examining anatomical features under a microscope. Walpole Burrowing Crayfish are distinguished from other *Engaewa* species by several anatomical features including a backward pointing tip on the keel of the sternum (a central ridge running between the leg attachment points on the underside of the thorax) and granulate carinae (bead-like ridges) on the underside of the propodus (penultimate leg segment). 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 Walpole Burrowing Crayfish is listed as **endangered**.

The species is eligible for listing as 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 Walpole Burrowing Crayfish. The TSSC determined that this species met Criterion 2 of the eligibility criteria because its geographic distribution is restricted and precarious for its survival (TSSC, 2009).

The Walpole 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 vulnerable for management purposes.

Distribution and Habitat

The Walpole Burrowing Crayfish is known from three locations near Walpole in southern Western Australia, approximately 450 km south of Perth. These locations are largely within Walpole-Nornalup National Park, in the South Coast Natural Resource Management Region.

The Walpole Burrowing Crayfish uses a variety of habitats that provide very moist soils and a shallow, very accessible watertable. These habitats include headwater seepages and broad drainage depressions. Soil types range from coarse gravelly sand, sandy loams and silty loams rich in organic material. The Walpole Burrowing Crayfish constructs burrows in the soils associated with these habitats that extend down to the watertable. The burrows of Walpole Burrowing Crayfish are generally short and inconspicuous, and the soil pellet chimneys that are often characteristic of other

Engaewa species' burrows are reduced or absent. Native vegetation types associated with these habitats are Karri (*Eucalyptus diversicolor*) woodlands, sedges, peatbogs and heathlands. One population is known from an area with non-native vegetation cover comprising introduced *Dicksonia* species (Burnham, 2005; Burnham et al., 2007).

The burrowing crayfish species of Western Australia, including the Walpole 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 Walpole Burrowing Crayfish is not known to overlap with any EPBC Act-listed threatened ecological community.

Threats

The main actual threat to the Walpole Burrowing Crayfish has been habitat destruction and degradation within its former range, including through historic land clearing, logging, farm dam construction and cattle grazing (Burnham, 2005; Barnham et al., 2007).

The main potential threats to existing populations of Walpole Burrowing Crayfish populations in Walpole-Nornalup National Park are reduced rainfall from climate change, feral pigs (*Sus scrofa*) and fire (Burnham, 2005; Barnham et al., 2007).

- Reduced rainfall from climate change may lead to the drying out and loss of swamp and drainage system habitats.
- 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.
- Fire can severely damage swamp habitats and destroy the organic content, structure and water absorption capabilities of soils found in those habitats.

Other potential threats include disease from introduced crayfish species.

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/remnants.

Priority Actions

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

Invasive Weeds

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

Animal Predation or Competition

- Manage feral pigs at known sites to minimise impacts from ground-rooting, wallowing and predation by feral pigs.

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 Walpole 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 walpolea* (Walpole Burrowing Crayfish).