Department of Sustainability and Environment

Action Statement

Flora and Fauna Guarantee Act 1988 No. 153

Mallacoota Burrowing Crayfish

Engaeus mallacoota

Description and Distribution

The Mallacoota Burrowing Crayfish *Engaeus mallacoota* Horwitz is a member of the Parastacidae (Decapoda) family. The genus *Engaeus* is restricted to south-eastern Australia, with 34 species recognised (Horwitz 1990a). The Mallacoota Burrowing Crayfish was discovered in 1990 (Horwitz 1990a,b). In common with most other burrowing crayfish, *E. mallacoota* is cryptic and small with adults having a carapace length of approximately 20 mm (Horwitz 1990a). Specimens are inter-sexed, and secondary sexual characteristics may be present in reproductively active females. Large dimorphic *chelae* (to be defined) are present in adults. A full taxonomic description is given by Horwitz (1990a).

The Mallacoota Burrowing Crayfish is currently known from only two sites on the Western region of Mallacoota Inlet along the Double Creek Nature trail in Croajingolong National Park, in East Gippsland.

Distribution in Victoria (DSE 2004)

Habitat

The Mallacoota Burrowing Crayfish is predominantly a burrower, spending most of its life underground. The burrows of the Mallacoota Burrowing Crayfish have been found on steep, clear banks (free of vegetation) in silty and sandy soil in an area of warm temperate rainforest (Horwitz 1990a). The burrows were very complex in structure, descending into the bank at oblique angles, branching frequently to some depth. Large, pelleted chimneys surrounded each burrow opening. Burrows were filled with water at the level of the creek but no connections to the creek were observed.

These are described as 'type 2' burrows by Horwitz and Richardson (1986) which refers to burrows that are connected to the water table and the water is derived from ground water and surface run-off.

Life history and ecology

Most burrowing crayfish are small, solitary animals, although some species occupy the same burrow system during breeding and may share the burrow with their offspring for some time. They generally feed on plant material such as roots and decomposing leaves, rotting logs and small invertebrates (Lake & Newcombe 1975, Suter & Richardson 1977, Growns & Richardson 1988).

The burrows of some species include blind, root-lined 'feeding' chambers (Growns & Richardson 1988).

Life histories of only a few burrowing crayfish are available. Breeding usually occurs over spring and summer. Males come to the surface during late spring and early summer in search of mates. Males enter burrows of females to mate during early summer, and the female carries clusters of eggs under the abdomen throughout summer. By February juveniles have hatched and become independent but may remain in the maternal burrow for some time.

While the life span of most species is unknown, estimates of up to 10 years have been made for *Parastocoides tasmanicus tasmanicus* Clark (Hamr & Richardson 1994).

Conservation status

National conservation status

Mallacoota Burrowing Crayfish has not been listed under the Commonwealth **Environment Protection and Biodiversity Conservation Act 1999**.

Victorian conservation status

The Mallacoota Burrowing Crayfish has been listed as a threatened taxon under the **Flora and Fauna Guarantee Act 1988**.

Decline and threats

In a study of the requirements of rare and threatened burrowing crayfish in Tasmania, Doran and Richards (1996) found that the primary consideration in the management of *Engaeus* species appears to be related to the level of available moisture, soil type and degree of disturbance to which they are subject. Invertebrates, which have limited distributions, such as many species of *Engaeus* are particularly vulnerable to localised environmental perturbations (Williams 1990). Localised catastrophic events, such as an extended drought, fire or large sediment pulse could drastically effect populations of the Mallacoota Burrowing Crayfish.

The distribution and abundance of the Mallacoota Burrowing Crayfish is not well known and based on records from two localities. While these localities occur within Croajingolong National Park, Horwitz (1990b) states that suitable habitat may exist in a north-east direction.

Although National Parks are generally less modified than other areas, they can still contain point sources of pollutants and may be subject to the effects of management practices elsewhere in the catchment (Merrick 1995). The potential threat posed by elevated sedimentation and turbidity within Croajingolong National Park as a result of timber harvesting in adjacent State forest is generally managed through the application of the *Code of Forest Practices for Timber Production* (NRE 1996a).

However, if surveys proposed in this Action Statement confirm the presence of Mallacoota Burrowing Crayfish within or adjacent to State forest, DSE will review the extent of timber harvesting and the potential impacts on this species and its habitat, and will, if necessary, implement further measures to minimise these impacts.

At present, recreational fishing is allowed in Croajingolong National Park and it is not known whether harvesting of crayfish as food or bait is occurring.

The potential range of this species also includes areas of private land which is grazed by cattle. This may also lead to impacts such as trampling, erosion and sedimentation of habitat.

Previous Management Action

Horwitz (*pers. comm.*) has surveyed extensively throughout Victoria for all *Engaeus* species.

The Management Plan for Croajingolong National Park incorporates management strategies for rivers and catchments within the Park. A plan for Double Creek Natural Catchment Area is being prepared.

'Degradation of native riparian vegetation along Victorian rivers and streams' (SAC 1996) is listed as a potentially threatening process under the **Flora and Fauna Guarantee Act 1988**.

The Thurra River is designated a Representative River, characteristic of the eastern Victorian dissected uplands and River plains and the catchment of the Benedore River is declared a 'Scientific Reference Segment' under the State Environment Protection Policy – waters of East Gippsland (NRE 1996b). These rivers occur within the potential range of the Mallacoota Burrowing Crayfish and may confer additional habitat protection for the species.

The East Gippsland Forest Management Area Plan includes a specific conservation guideline for this species.

Conservation Objectives

Long-term objective

To ensure that the Mallacoota Burrowing Crayfish survives, flourishes and retains its potential for evolutionary development in the wild.

Objectives of this Action Statement

1. Determine the distribution and abundance of the Mallacoota Burrowing Crayfish

2. Protect the riparian habitat of the known populations of Mallacoota Burrowing Crayfish

3. Improve the understanding of the biology and ecology of the Mallacoota Burrowing Crayfish as the basis for future management

Intended Management Action

The intended management actions listed below are further elaborated in DSE's Actions for Biodiversity Conservation database. Detailed information about the actions and locations, including priorities, is held in this system and will be provided annually to land managers and other authorities.

Systematic surveys

1. Survey the stream-sides in those catchments most likely to contain populations of the Mallacoota Burrowing Crayfish both within Croajingolong National Park and areas to the north-east. Surveys will concentrate on streams within the Double Creek Natural Catchment Area and Genoa Creek.

   Responsibility: DSE (Biodiversity & Natural Resources Division, Gippsland Region)

Habitat protection

General

2. Incorporate actions to protect Mallacoota Burrowing Crayfish into the East Gippsland Regional Catchment Strategy.

   Responsibility: DSE (Gippsland Region), East Gippsland Catchment Management Authority

3. Provide information and advice, including maps of habitat, to local government authorities for inclusion in environmental significance overlays as part of the local planning schemes

   Responsibility: DSE (Gippsland Region)

Croajingolong National Park

4. Protect Mallacoota Burrowing Crayfish habitat within the Croajingolong National Park by avoiding or minimising the impacts of recreation and park management activities on this species or its habitat.

   Responsibility: Parks Victoria

State forest

5. If this species is located in State forest, protect habitat of Mallacoota Burrowing Crayfish, if necessary through the application of zones and/or appropriate prescriptions, to modify or exclude timber harvesting, roading and other activities, in order to minimise their impact.

   Responsibility: DSE (Gippsland Region)

Private land

6. Provide landholders with information and advice regarding measures to protect Mallacoota Burrowing Crayfish if surveys confirm the presence of this species on or near private land.

   Responsibility: DSE (Gippsland Region)

Monitoring known populations

7. Monitor annually at two of the known populations of Mallacoota Burrowing Crayfish, in order to gather information about the ecology of the species (Gippsland Region).

   Responsibility: DSE (Biodiversity & Natural Resources Division, Gippsland Region).

Research

8. Encourage research into the biology and ecology of the Mallacoota Burrowing Crayfish Priorities for research include:

   - Determining the number, size and geographic distribution of the Mallacoota Burrowing Crayfish populations;
   - The long term life history, biology and ecological requirements for the species;
   - Identification of critical habitat including soil types, vegetation requirements, hydrological parameters and catchment-based characteristics;

   Responsibility: DSE (Biodiversity & Natural Resources Division)

Staff awareness

9. Ensure that all relevant staff of the Department of Sustainability and Environment and Parks Victoria working in the known range of the Mallacoota Burrowing Crayfish are aware of its existence and report records of the species to the *Atlas of Victorian Wildlife*.

   Responsibility: DSE (Biodiversity & Natural Resources Division, Forests Service, Gippsland Region), Parks Victoria

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Further information can be obtained from Department of Sustainability and Environment Customer Service Centre on 136 186.

Flora and Fauna Guarantee Action Statements are available from the Department of Sustainability and Environment website: http://www.dse.vic.gov.au

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