

Draft Flora and Fauna Guarantee Action Statement

Dandenong Burrowing Cray *Engaeus urostrictus*

Description

The Dandenong Burrowing Cray (*Engaeus urostrictus*) is a small freshwater crayfish, with a body length of less than ten centimetres. Like all members of the Astacidea, it has an anterior pair of large, equal chelate legs (claws); the following two pairs of legs are also chelate, while the two most posterior pairs are non-chelate (clawless) (Museum Victoria 2007). The Dandenong Burrowing Cray can be distinguished from the Freshwater Yabby (*Cheerax destructor*) by its laterally flatter carapace and smaller, more bristly abdomen (Museum Victoria 2007). Its colour varies from orange to reddish-brown, grey-blue and purple. The morphology of the species and a detailed description are provided in Horwitz (1990).

Distribution

The genus *Engaeus* is found exclusively in south east Australia (Crandall *et al.* 1999), and the Dandenong Burrowing Crayfish is endemic to Victoria. It has a highly restricted distribution, confined to the Dandenong Ranges east of Melbourne. Within this area, it has only been recorded from a few small sub-catchments in Mt Dandenong, Sherbrooke, Sassafra and Emerald. All known locations are in the headwaters of ephemeral streams that flow through largely forested land within the Dandenong Ranges National Park. An outlying record further east (Mt Donna Buang) needs clarification (Horwitz 1990).

Habitat

The Dandenong Burrowing Cray builds burrows in the flood-bed area of streams to maintain a damp habitat. The burrows extend to 25 cm beneath the surface to reach the level of the water table, where water fills small chambers at the bottom of the burrows. The burrows are interconnected with several entrances, and can cover up to half a square metre (Museum Victoria 2007). The Dandenong Burrowing Cray constructs chimneys of pelleted soil up to 13 cm high around burrow entrances (Museum Victoria 2007).

Life history and ecology

Little is known about the biology of the Dandenong Burrowing Cray. It spends most of its time in the burrow and is rarely seen above ground. It is active at night, when it brings soil to the surface. It largely feeds on decaying wood, roots and buried plant material, but will occasionally eat worms or insects (Museum Victoria 2007).

Breeding is likely to occur over spring and summer. Males come to the surface and enter the burrows of females in early summer. The female then incubates clusters of eggs by carrying them beneath her tail. Juveniles hatch in late summer and may remain in the maternal burrow or migrate (Museum Victoria 2007).

Conservation status

Victorian conservation status

The Dandenong Burrowing Cray has been listed as “threatened” under the *Flora and Fauna Guarantee Act 1988*.

The Dandenong Burrowing Cray is considered “critically endangered” in Victoria according to DSE’s *Advisory List of Threatened Invertebrate Fauna in Victoria – 2009* (DSE in press).

Threats

As a result of the species’ highly restricted distribution, there is a risk of population losses from anthropogenic or stochastic events.

Because the ecology of the Dandenong Burrowing Cray is poorly understood, it is assumed that processes which affect the quality of its habitat are potential threats. Polluted water runoff or soil disturbance due to fire or weed control could potentially degrade its habitat. These threats may be exacerbated by the lack of knowledge of the distribution and ecology of the Dandenong Burrowing Cray.

<i>Standard threat</i>	<i>Source Of Threat</i>	<i>Explanation</i>
Groundwater – quantity.	Groundwater - level changes.	Changes to the water table could affect the burrows of the Dandenong Burrowing Cray.
Habitat damage or loss.	Vegetation clearance.	Current records of the species are primarily from a national park; vegetation clearance is therefore unlikely to be an issue for this species. Vegetation clearance and soil disturbance may be a threat, however, if searches reveal that the Dandenong Burrowing Cray occurs in the stream headwaters of adjacent private properties. These activities would destroy the species' habitat and create barriers to dispersal.
Surface water – quality.	Water - nutrients and chemicals.	Degradation of water quality by sediments, toxicants or nutrients could occur as a result of runoff from tracks or from septic tanks on adjacent private properties.
Surface water - quantity/regime	Weather - flood, drought, storms	Drought or changed drainage patterns may reduce water quantity.

Important populations

<i>Location name</i>	<i>Land manager</i>	<i>Catchment</i>	<i>Bioregion</i>
Dandenong Ranges National Park	Parks Victoria	Port Phillip and Westernport	Highlands - Southern Fall

The species is also believed to occur on private land around the Dandenong Ranges National Park.

Past management actions

No specific management actions have been carried out for this species, but Museum Victoria has issued a fact sheet on the Dandenong Burrowing Cray which is available to the public: *Land Crayfish: Who's digging in my lawn?* (Museum Victoria 2007).

Conservation objectives

Long term objective

To ensure that the Dandenong Burrowing Crayfish can survive, flourish and retain its potential for evolutionary development in the wild.

Objectives of this Action Statement

- To improve condition of habitat.
- To increase the extent of habitat.
- To secure populations or habitat from potentially incompatible land use or catastrophic loss.
- To increase knowledge of biology, ecology or management requirements.
- To increase community awareness and support.

Intended management actions

The intended management actions listed below are further elaborated in DSE's Actions for Biodiversity Conservation (ABC) system. 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.

<i>Standard objective</i>	<i>Targets</i>
To improve condition of habitat.	<ul style="list-style-type: none"> • Significant improvement in water quality within the Dandenong Burrowing Cray's habitat, based on periodic monitoring.

<i>Action</i>	<i>Details</i>	<i>Responsible agents</i>
Manage water quality.	<p>Carry out road and sewer drainage improvements to ameliorate threats to water quality within the species' habitat from the runoff of water and sediment from roads and tracks, and wastewater from private properties. For example, the program "Wastewater in the Dandenongs Project" involves inspecting septic tanks and providing advice to landholders on effective maintenance and compliance with regulations.</p> <p>Prevent potential contamination of water in the species' stream habitats from weed control activities. In areas where the species is known to be present, avoid spraying of herbicides and employ other weed control methods.</p> <p>Monitor water quality periodically using standard, cost-effective methods.</p>	DSE Statewide Services - Port Phillip region, Parks Victoria

<i>Standard objective</i>	<i>Targets</i>	
To increase the extent of habitat	Increase in the extent and condition of habitat based on estimated changes for key EVCs within the distribution of the Dandenong Burrowing Cray.	
<i>Action</i>	<i>Details</i>	<i>Responsible agents</i>
Prevent habitat loss	Protect riparian vegetation on private land where the species has been recorded or is likely to occur, via programs such as Parks Victoria's "buy-back program" which provides for purchase of strategically located private blocks with multiple values.	DSE Statewide Services - Port Phillip region
Restore habitat	Improve riparian vegetation on private land where the species has been recorded or is likely to occur, via programs such as Melbourne Water's Stream Frontage Management Program - a program for management of riparian vegetation by landholders with assistance of grants.	Melbourne Water

<i>Standard objective</i>	<i>Targets</i>	
To secure populations or habitat from potentially incompatible land use or catastrophic loss.	<ul style="list-style-type: none"> No avoidable loss of known, important Dandenong Burrowing Cray populations. 	
<i>Action</i>	<i>Details</i>	<i>Responsible agents</i>
Establish/maintain working group.	Establish a working group involving the following organisations: Department of Sustainability and Environment (DSE), Parks Victoria (PV), Melbourne Water (MW), Shire of Yarra Ranges (SYR), City of Knox, Shire of Cardinia, VicRoads (VR), Olinda Creek Landcare group, Friends of Sherbrooke Forest, Friends of Sassafras Creek and other relevant volunteer environmental groups. This working group should be linked to any existing working groups that deal with related freshwater ecology issues in the Dandenong Ranges.	DSE Biodiversity & Ecosystem Services
Liaise with government agencies.	Inform all land managers and relevant agencies (including MW stream maintenance crews, PV field staff and volunteer groups) about the species and its management.	DSE Statewide Services - Port Phillip region
Provide input into regional fire management and operations plans	Prevent potential degradation of water quality in the species' stream habitats from fuel reduction burning. Check Dandenong Burrowing Cray locations on all burn plans, and modify burning operations to avoid these habitats.	DSE Statewide Services - Port Phillip region, Parks Victoria

<i>Standard objective</i>	<i>Targets</i>	
To increase knowledge of biology, ecology or management requirements.	<ul style="list-style-type: none"> Demonstrable improvement in knowledge of the distribution, habitat requirements, and population size and dynamics of the Dandenong Burrowing Cray. 	
<i>Action</i>	<i>Details</i>	<i>Responsible agents</i>
Assess threats.	Identify threats to water quality within the species' habitat resulting from the runoff of water and sediment from roads and tracks, and wastewater from private properties. Identify roads and tracks causing potential runoff problems to the species' habitat, and private properties with direct runoff into headwaters of streams supporting the species.	DSE Statewide Services - Port Phillip region
Compile, maintain and assess information.	Periodically collate, analyse and report on findings, including providing reports on population, habitat and threats to relevant management agencies and groups.	DSE Statewide Services - Port Phillip region
Conduct survey to confirm existing records.	Check for and confirm the presence of the Dandenong Burrowing Cray at locations with existing records. Report all new records to the Victorian Biodiversity Atlas.	DSE Statewide Services - Port Phillip region
Conduct survey to locate additional populations.	Search all headwaters of creeks draining off the Dandenong Ranges, and any other areas with suitable habitats for the species.	DSE Statewide Services - Port Phillip region
Undertake detailed population monitoring and collect demographic information.	Establish a monitoring program to determine population trends and responses to management actions and disturbances. Set up monitoring plots at selected locations, and collect data on burrow entrance numbers and ground-water quality.	DSE Biodiversity & Ecosystem Services
Undertake research to determine habitat.	Identify a method for testing ground-water quality in the species' habitat. Link water quality testing with surrounding disturbance factors such as wastewater runoff from private property.	DSE Biodiversity & Ecosystem Services
Undertake research to identify key biological functions	Identify a method for linking burrow entrance numbers to population size. Establish burrow entrance numbers as a surrogate for population size by comparing to pitfall trapping results.	DSE Biodiversity & Ecosystem Services

<i>Standard objective</i>	<i>Targets</i>	
To increase community awareness and support.	<ul style="list-style-type: none"> Increase in awareness of the Dandenong Burrowing Cray and freshwater ecology issues within the Dandenong Ranges community, based on comparisons of responses to standard questionnaire. 	
<i>Action</i>	<i>Details</i>	<i>Responsible agents</i>
Involve community groups and volunteers in recovery activities.	Support existing Landcare and Friends groups with on-ground work to protect the species and its habitat. Provide support through government programs, grants and practical assistance to assist volunteer groups and landholders in protecting the species.	DSE Statewide Services - Port Phillip region
Promote awareness of item through communication with local community.	Raise awareness of the species and freshwater ecology issues among the Dandenong Ranges community through media coverage in local newspapers, articles in volunteer group newsletters, information packages for primary schools, and incorporation into the Waterwatch program.	DSE Statewide Services - Port Phillip region
Promote community involvement programs.	Provide support through government programs to assist landholders in protecting the species. Distribute information on support programs to landholders.	DSE Statewide Services - Port Phillip region

References

- Crandall, K.A., Fetzner, J.W., Lawler, S.H., Kinnersley, M. and Austin, C.M. (1999) Phylogenic relationships among the Australian and New Zealand genera of freshwater crayfishes (Decapoda: Parastacidae). *Australian Journal of Zoology* **47**:199-214.
- DSE (in press). *Advisory List of Threatened Invertebrate Fauna in Victoria – 2009*. Department of Sustainability and Environment, East Melbourne.
- Horwitz, P. (1990) A taxonomic revision of species in the freshwater crayfish genus *Engaeus* Erichson (Decapoda: Parastacidae). *Invertebrate Taxonomy* **4**: 427-614.
- Museum Victoria (2007) *Land Crayfish: Who's digging in my lawn?* Infosheet. Museum Victoria, Carlton. Viewed 25 May 2009. <<http://museumvictoria.com.au/discoverycentre/infosheets/land-crayfish---who-s-digging-in-my-lawn/>>.

Acknowledgements

Annette Muir, Department of Sustainability and Environment