

Action Statement

Flora and Fauna Guarantee Act 1988

No. 136

Alpine Spiny Crayfish *Euastacus crassus*

Description and distribution

The Alpine Spiny Crayfish *Euastacus crassus* Riek 1951 is a small to medium freshwater spiny crayfish with an Occipital - Carapace Length (OCL) of up to 58 mm (Morgan 1997). Members of the genus *Euastacus* are distinguished by heavy claws or chelae and a spiny appearance (Zeidler 1982). The species is distinguished from the smaller Victorian species by its lack of a male cuticle partition. This partition is a gap between the membrane running from the body onto the underside of the first joint of the fifth walking leg of the male. The membrane does not reach the male genital pore. Females reach sexual maturity at around 30-40 OCL. Specimens usually a deep brown colour, occasionally with red tinges dorsally, with orange thoracic spines and tubercles. The underside is orange and green.

The Alpine Spiny Crayfish is one of the most localised species in the *Euastacus* genus and is restricted to the high country occurring in streams in southern NSW, the ACT and in the eastern semi-alpine country of Victoria. The range extends from north-east to south-west approximately 210 km. In Victoria, it extends as far as Mount Beauty and Mount Hotham at elevations above 1 000 m, which may be snow covered in winter (Morgan 1997). All known sites are located in the Alpine National Park. The most recent records are those of Raadik *et al.* (2001) who found a total of seven individuals from four sites out of a total of 27 sites surveyed in the Upper Murray River Basin.

Habitat

Little is known about the habitat of this species except that it occupies cool streams in alpine and sub-alpine areas. Morgan (1997) describes the



Distribution in Victoria (DSE 2004)

vegetation at the type localities as dry sclerophyll forest and heath in largely granite areas with abundant ferns along stream banks at one site. He also notes that the species is patchily distributed in the ACT at sites with relatively undisturbed vegetation.

Life history and ecology

While the biology of this species specifically is unknown, in general, mating activity between mature crayfish occurs from May onwards each year, following which females carry eggs under the tail. The eggs hatch from October onwards, depending on seasonal conditions and the species. The dependent juvenile crayfish are carried beneath the tail for some weeks or months after hatching.

The yolk of the egg is retained by the young hatchlings as a yolk sac supplying food during early growth. Once the yolk sac has been completely absorbed, the young disperse to fend for themselves.

Most species of *Euastacus* are moderate burrowers, seeking refuge under rock ledges and amongst submerged, in-stream tree roots (Zeidler 1982).

The diet of spiny freshwater crayfish consists primarily of aquatic and semi-aquatic vegetation, benthic invertebrates (Goddard 1988), fungi and bacteria found in rotting detrital matter (DCE 1992).

Conservation Status

National conservation status

The Alpine Spiny Crayfish has not been listed under the Commonwealth Environment Protection and Biodiversity Conservation Act 1999.

Baillie and Groombridge (1996) assessed the Alpine Spiny Crayfish against the IUCN criteria. They determined that it was 'endangered', based on 'Extent of occurrence estimated to be less than 5 000 km² or area of occupancy estimated to be less than 5 000 km², and estimates indicating (a) severely fragmented population or known to exist at no more than five locations; and...continuing decline, inferred, observed or projected in area, extend and/or quality of habitat.'

Victorian conservation status

The Alpine Spiny Crayfish has been listed as threatened under the Flora and Fauna Guarantee Act 1988.

Decline and threats

The Alpine Spiny Crayfish is considered threatened because of its restricted distribution, and relatively low abundance within Victoria (Baker 1990, SAC 2001), paucity of records and very limited biological information on the species. Perceived threats include habitat loss and modification from natural disasters such as wildfire, cattle trampling, altered hydrology and water quality. Predation by introduced predators may also pose a threat to the crayfish.

In its final recommendations the Scientific Advisory Committee (SAC 2001) determined that the Alpine Spiny Crayfish is significantly prone to future threats which are likely to result in extinction, and very rare in terms of abundance or distribution.

The distribution and abundance of the Alpine Spiny Crayfish is not well documented. Recent surveys have recorded the species in low abundance and at only a few sites (Raadik 2001).

The biology of this species is poorly known, and the environmental parameters under which it exists are not well understood. The slow growth rate and low fecundity of many *Euastacus* renders them less resilient to reduction in population numbers through habitat destruction and catastrophic events.

Invertebrate species that have a limited distribution are vulnerable to localised environmental perturbations (Williams 1990). Localised catastrophic events, such as an extended drought or wildfire could effect populations of the Alpine Spiny Crayfish by resulting in the loss of all habitat components. Catastrophic seasonal events that occur irregularly include low flows in drought years, fires, and dust deposition. Following fire, the amount of run-off and the peak discharge increases which leads to great increases in sediment load carried by the rivers. Heavy rainfall can also lead to increased salinity.

Any activity which damages stream bank integrity and alters water tables or stream flow, particularly in smaller streams, could be harmful to the species survival locally (Horwitz 1990).

The introduction of exotic biota could also be a threat due to predation, competition, or the spread of disease (Horwitz 1990). Predation by introduced species are thought to have reduced populations of *Galaxias* species and to have altered the structure of invertebrate populations in alpine waters (Cullen and Norris 1988). The introduced Brown Trout *Salmo trutta*, occurs in the Berrima River and Snowy River system, and predation by this species may have a detrimental impact on populations of the crayfish.

Grazing and trampling by cattle can cause stream bed and bank degradation, increase in sedimentation and turbidity, and increased nutrient concentrations in water.

Sediment deposition in streams is thought to be detrimental to young crayfish as it coats the substrata and fills interstitial spaces. These areas may be of value in protecting juvenile crayfish from predators. In a recent survey of Gippsland Spiny Crayfish habitat, Koster *et al.* (1999) found that a negative relationship between the presence of South Gippsland Spiny Crayfish and levels of in-stream silt. Increased turbidity can have adverse physical, physiological and behavioural effects on stream dwelling plants and animals.

Populations of Alpine Spiny Crayfish may be threatened by over-collection for food or bait. Whilst collection of specimens for confirmation of identity may be necessary at new sites, this practice should be otherwise avoided. Appropriate survey techniques include the use of baited traps, in which crayfish can be trapped alive and

released, active searching, either at night using a spotlight, or during the day searching amongst in-stream woody debris and rocky substrate, and electro-fishing (the use of electricity to stun fish and macro-invertebrates).

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).

Wider Conservation Issues

Thirty- three species of freshwater crayfish species in Australia are considered rare or threatened (Horwitz 1995), mainly due to their confined geographic distributions (Williams 1990). Few recovery plans are available for freshwater crayfish and until recently, the Orbost Spiny Crayfish was the only *Euastacus* listed in Victoria and therefore the only species with a recovery plan. Monitoring the effectiveness of the measures designed for the Alpine Spiny Crayfish may provide guidance for the conservation of other freshwater crayfish species.

Also occurs with Broad-finned Galaxias *Galaxias brevipinnis* (rare, restricted) and Mountain Galaxias *Galaxias olidus* (insufficiently known).

Existing conservation measures

- A number of surveys have been carried out in the waterways within the range of the Alpine Spiny Crayfish between 1986 and 1999 (Morgan 1986, Raadik 1995, Raadik *et al.* 2001). Between 1997 and 1999, a survey of spiny crayfish was conducted as part of the Regional Forest Agreement process. This study included surveys within the North East Regional Forest Agreement region including sites that occur within the range of the Alpine Spiny Crayfish. A variety of sampling methods were employed, with electro-fishing and the use of baited fish traps being the most common techniques.
- The Alpine Spiny Crayfish occurs in waterways, which flow through the Alpine National Park which provides indirect protection for the species.

Major Conservation Objectives

Long-term objective

To ensure that the Alpine Spiny 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 Alpine Spiny Crayfish
2. Protect the in-stream and riparian habitat of the known populations of Alpine Spiny Crayfish

3. Determine key habitat parameters for the species as a 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 on 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 Alpine Spiny Crayfish. Surveys will concentrate on unsurveyed streams above about 800 m in altitude and within the Alpine National Park.

Responsibility: DSE (Biodiversity & Natural Resources Division, North East Region), Parks Victoria

Habitat protection

2. Protect Alpine Spiny Crayfish habitat within the Alpine National Park by minimising or avoiding the impacts of recreation and park management activities which might pose a threat to this species or its habitat (eg. construction or upgrading of roads, tracks and visitor facilities, and fire prevention or suppression activities).

Responsibility: Parks Victoria

3. If previously undiscovered populations of the Alpine Spiny Crayfish are located, ensure that its habitat is protected using measures which are appropriate to the land tenure and land use in each case, including zoning, prescriptions, planning controls or fencing.

Responsibility: Parks Victoria, DSE (Biodiversity & Natural Resources Division, North East and Gippsland Regions)

4. Incorporate actions to protect the Alpine Spiny Crayfish into the North East Regional Catchment Strategy or its subordinate strategies via Biodiversity Action Plans. Implement these actions, according to priority, as resources become available, in conjunction with other agencies, community groups and landholders.

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

5. 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 (North East Region)

Research

6. Encourage research into the biology and ecology of the Alpine Spiny Crayfish. Priorities for research include:

- Determining the number, size and geographic distribution of the Alpine Spiny 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;
- Examine the interaction between trout and the Alpine Spiny Crayfish, particularly the effects of predation.

Responsibility: DSE (Biodiversity & Natural Resources Division)

Staff awareness

5. Ensure that all relevant Parks Victoria and Department of Natural Resources and Environment staff working in the known range of the Alpine Spiny Crayfish are aware of its existence and report records of the species to the *Atlas of Victorian Wildlife*.

Responsibility: Parks Victoria, DSE (North East and Gippsland Regions)

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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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