# Action statement

*Flora & Fauna Guarantee Act 1988*

## Alpine Spiny Crayfish *(Euastacus crassus)*

**Taxon ID: 1634**

**Action statements are developed under the *Flora and Fauna Guarantee Act 1988* (FFG Act). Their preparation and implementation complement the FFG Act strategy *Protecting Victoria's Environment – Biodiversity 2037* and its vision that "Victoria's biodiversity is healthy, valued and actively cared for".**

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## Species and Distribution

Alpine Spiny Crayfish. Image from Atlas of Living Australia.

Alpine Spiny Crayfish Victorian Biodiversity Atlas (VBA) records since 1970. See NatureKit for an interactive map. The Alpine Spiny Crayfish also occurs outside of Victoria.

## Conservation Status

**Endangered**

**Listing criteria:** 4.1.2(a),(b)(i,ii,iii,v) of the Flora and Fauna Guarantee Regulations 2020.

This means that:

- The Alpine Spiny Crayfish geographic distribution is highly restricted; and
- it is restricted to a limited number of areas that are subject to the same threat or suite of threats that can impact all individuals present; and
- there is a continuing decline or reduction in:
  - its extent of occurrence; and
  - its area of occupancy; and
  - the area, extent or quality of habitat; and
  - the number of mature individuals.

**Corresponding International Union for the Conservation of Nature (IUCN) criteria**: B2ab(i,ii,iii,v).

More information on IUCN listing criteria can be found here: IUCN Red List criteria.

## Species Information

Species information such as its description, distribution, ecology and references are provided in the Alpine Spiny Crayfish Species Forecast Report.

## Threats

Threats listed below have been identified through expert consultation, published literature and spatial analysis.

| Threat | Description |
|---|---|
| **Climate change** | |
| Extreme weather events | • Climate change may increase the frequency and intensity of storms and flooding, increasing erosion and impacting habitat condition, and potentially causing mortality events. |
| Increased frequency and/or length of droughts | • Drying and warming of the environment, including droughts, may lead to habitat changes, and impact recruitment and/or mortality rates. |
| **Fire** | |
| Altered fire regimes | • A hotter, drier climate may increase the likelihood, frequency, and/or intensity of fire impacting the Alpine Spiny Crayfish's habitat, including alterations to catchment hydrology, with the potential to reduce habitat extent and/or condition.<br>• Fires (including planned burns) can result in habitat degradation and mortality, including through alterations to hydrology.<br>• Siltation and flows of debris along waterways following fire events cause habitat degradation, which is exacerbated during high intensity rainfall events. |
| Emergency response | • Some emergency response activities can inadvertently lead to alterations in habitat, vegetation structure, flows or erosion, and mortality of individuals.<br>• Fire retardant can release chemicals into Alpine Spiny Crayfish habitat which may be toxic to the species. |
| Fire management activities | • Fire management operations such as creation of fuel breaks (soil disturbance, slashing) may remove or modify habitat, cause mortality of individuals and increase the accessibility of habitat to introduced predators.<br>• The Alpine Spiny Crayfish is vulnerable to mechanical disturbance from heavy machinery and increased sediment inputs from roads or tracks. |
| **Introduced species** | |
| Introduced fish | • Introduced fish species, including Brown Trout (*Salmo trutta*), Rainbow Trout (*Oncorhynchus mykiss*) or Redfin Perch (*Perca fluviatilis*), can degrade habitat, impact water quality, disrupt ecosystem function, and/or impact directly on individuals through predation, and competition for resources. |
| Introduced herbivores | • Introduced herbivores degrade habitat through herbivory, trampling, wallowing, pugging of wet soils, increasing nutrient loads, erosion of waterway edges, and increasing the accessibility of habitat to introduced predators and introduced plants. |

| Threat | Description |
|---|---|
| | • Of particular concern to Alpine Spiny Crayfish are feral pigs (*Sus scrofa*), feral horses (*Equus caballus*), and deer species including Sambar deer (*Cervus unicolor*) and Fallow Deer (*Dama dama*). |
| Introduced predators | • Predation by foxes (*Vulpes vulpes*) and feral cats (*Felis catus*) contributes to mortality of native species. |
| **Altered hydrology** | |
| Altered water regime | • Changes to flow or water regimes which do not align with the Alpine Spiny Crayfish's needs may impact habitat suitability, recruitment and/or mortality, and ultimately site occupancy.<br>• Earthworks that alter drainage patterns or impact creek bank integrity and water flow, may contribute to drying of or alteration to suitable habitat for Alpine Spiny Crayfish. |
| Changes to groundwater | • Changes to groundwater height or salinity may impact vegetation health, degrade habitat, and potentially impact populations through changes in recruitment and/or mortality. |
| **Habitat loss, degradation, or modification** | |
| Degradation of riparian and/or wetland vegetation | • Degradation of vegetation in riparian and wetland habitats reduces habitat extent and/or condition, potentially impacting Alpine Spiny Crayfish persistence.<br>• Riparian vegetation is important for bank stabilisation, as a filter for contaminants (sediment particularly), and as a source of organic debris which provides energy in addition to instream habitat.<br>• Loss or degradation of riparian vegetation can alter the light and temperature of streams, contribute to soil erosion, stream bank damage, increased contaminant input to streams (including siltation and sedimentation), damage to crayfish burrows and increase exposure of Alpine Spiny Crayfish to predators. |
| Forestry operations | • Timber harvesting operations in native forest can contribute to erosion, and sedimentation in the species habitat, which may cause mortality of individuals.<br>• Timber harvesting operations in native forest within the species' catchment can alter hydrological regimes causing habitat degradation or loss. |
| Livestock | • Livestock can cause habitat degradation through the combined effects of herbivory, trampling, soil compaction, soil erosion, pugging of wet areas, and excess nutrient loads. |
| **Human disturbance** | |
| Recreational fisheries | • Incidental mortality can occur through illegal translocation/stocking of introduced trout into the species' habitat. |
| Road and track construction or maintenance | • Roadside populations are vulnerable to loss or damage to individuals and habitat, because of direct impacts of road construction and maintenance works (e.g., grading/mowing/slashing/lopping/herbicide use) and indirect impacts from associated run-off, soil erosion, and potential weed and pathogen introduction. |

| Threat | Description |
|---|---|
| **Population dynamics** | |
| Loss of genetic diversity | • Small, greatly reduced, and/or isolated populations are at increased risk of loss of genetic diversity, which leads to a heightened risk of reduced recruitment and/or increased mortality rates. |
| Small population size | • Small populations have lower resilience to the risk of stochastic events, and increased risk of genetic decline. |
| **Pollutants and toxicants** | |
| Pesticides | • Pesticides (including chemicals used to control plants, fungi, invertebrates, and vertebrates) can impact recruitment and/or mortality rates, may alter habitat or ecosystem function, and may impact persistence.<br>• Spray drift from herbicide application in the riparian zone to control introduced plants may lead to loss of or damage to habitat and may impact recruitment and cause mortality of the Alpine Spiny Crayfish. |

## Conservation Objectives

Conservation objectives are informed by the conservation status and criteria under which the species was listed under the FFG Act. This provides a framework to understand how we can work towards recovery and improve the species' conservation status over time as per the objectives of the FFG Act.

The key objectives of this action statement are:

- Mitigate threats to populations and habitat to increase resilience, improve genetic fitness and minimise future population decline.
- Increase the Alpine Spiny Crayfish's range and/or extent, by providing opportunities for natural or assisted movement.
- Increase knowledge of biology, ecology, distribution, demography, emerging threats, and conservation requirements.
- Support community participation and improve awareness of the Alpine Spiny Crayfish and conservation of its habitat.

## Conservation Actions

The actions below have been identified through expert consultation, published literature and spatial analysis. Actions are listed in alphabetical order to allow all interested parties to prioritise based on their context, capacity and capability. Landscape scale actions may mitigate threats for other species. For more information on where to undertake actions that benefit multiple species and identify the most beneficial locations to undertake actions for this species, please refer to NatureKit.

| Action | Description |
|---|---|
| Avoid and/or mitigate impacts associated with fire management | • Ensure that the Alpine Spiny Crayfish distribution data and ecological information is available and considered in fire management activities.<br>• Undertake biodiversity values check prior to fuel management in areas of the Alpine Spiny Crayfish habitat, to confirm treatment suitability and timing. |

| Action | Description |
|---|---|
| Community engagement and awareness | • Continue to identify, promote, and support opportunities for community involvement in conservation efforts.<br>• Engage citizen scientists in information gathering to inform improved management for the Alpine Spiny Crayfish.<br>• Work with key stakeholders to reduce threats from human disturbance and pesticides and encourage adherence to behaviours that support a healthy environment.<br>• Increase landholder awareness of the Alpine Spiny Crayfish, and the impacts of livestock grazing to the species and its habitat. Provide guidance on the changes to grazing that may be required, such as fencing off riparian zones, to support the recovery of the Alpine Spiny Crayfish. |
| Control introduced fish | • Implement and maintain effective control of introduced fish in priority areas. |
| Control introduced herbivores * | • Implement and maintain effective control of introduced herbivores including feral pigs, feral horses, and deer in priority areas.<br>• Support the implementation of Victoria's Deer Control Strategy. |
| Control introduced predators * | • Implement and maintain effective control of feral cats and foxes in priority areas. |
| Develop, update, and apply forestry protections | • Apply the following additional permanent protection as recommended in the Victorian Government Threatened Species and Communities Risk Assessment (TSCRA):<br>– *Forest zoning amendments*<br>Within the Gippsland, East Gippsland, and North East Regional Forest Agreement Regions the Secretary will establish Special Management Zone(s) based on DEECA's important populations dataset for the Alpine Spiny Crayfish and any additional post-2017 VBA records (with 100 m accuracy or better) with the following conditions:<br>> Environments with high soil absorption capacity:<br>○ Apply 40 m buffers either side of all mapped and unmapped permanent streams and temporary streams upstream and downstream of any Alpine Spiny Crayfish site to the watershed boundary (on average 1 km but responsive to local topography);<br>○ Apply 30 m buffers plus 10 m filter strips to either side of drainage lines upstream and downstream of any Alpine Spiny Crayfish site to the watershed boundary (on average 1 km but responsive to local topography).<br>> Environments with low soil absorption capacity:<br>○ Apply 60 m buffers either side of all mapped and unmapped permanent streams and temporary streams upstream and downstream of any Alpine Spiny Crayfish site to the watershed boundary (on average 1 km but responsive to local topography);<br>○ Apply 40 m buffers plus 20 m filter strips to either side of drainage lines upstream and downstream of any Alpine Spiny Crayfish site to the watershed boundary (on average 1 km but responsive to local topography). |

| Action | Description |
|---|---|
| | > No new road, snig track, in-coupe road, coupe driveway, coupe infrastructure or stream crossing shall be constructed within or through any buffer without an approved exemption from the Secretary.<br>• Where relevant, incorporate species-specific protection measures into plans and permits relating to timber harvesting operations in native forest on private land. |
| Ex-situ management | • Establish and maintain ex-situ populations in suitable secure sites, to service the conservation objectives of the species, if required, particularly after major event such as fire or drought. |
| Genetic rescue | • Investigate the need and options for managing risks from stochastic events and improving resilience through enhancing genetic exchange, via physically linking populations with enhanced habitat, translocation, or genetic management in an ex-situ setting where required. |
| Manage built infrastructure | • Consider the Alpine Spiny Crayfish requirements in the placement and design of built infrastructure near key habitat. Include planning for appropriate buffers to limit off-site impacts of infrastructure. |
| Manage impacts from natural disaster events | • Identify and implement recovery actions for vulnerable populations impacted by natural disaster events (e.g., significant bushfire or flood events). |
| Manage road and track works | • Protect habitat from disturbances caused by road, track, bridge and ford construction and maintenance, particularly from heavy machinery and off-target impacts of chemical use. |
| Protect key habitat | • Identify opportunities to manage threats of land use change and development, including programs to encourage protection and management of remaining habitat.<br>• Minimise alterations to groundwater and surface water hydrological regimes upstream or in surrounding landscapes. |
| Research | • Investigate the impacts of existing and potential threats and identify management actions.<br>• Increase understanding of genetic risks and management options.<br>• Increase understanding of breeding biology and fecundity, lifespan, diet, movement, burrow creation and placement in landscape and other key knowledge gaps that currently prevent translocation. |
| Restoration and/or revegetation * | • Undertake restoration and/or revegetation to increase habitat suitability and/or create new habitat areas.<br>• Habitat restoration activities include the rehabilitation of degraded riparian vegetation where the Alpine Spiny Crayfish is known to occur. |
| Survey and monitoring | • Undertake targeted field surveys to confirm the extent of all known populations and seek to discover previously undetected populations based on predicted habitat and ecological information.<br>• Monitor populations at known sites and other suitable locations to assess distribution, population trends and habitat condition.<br>• Monitor the impact of threats to inform management interventions, including following major events such as fire or drought. |

| Action | Description |
|---|---|
| | • Identify potential translocation sites to establish new subpopulations, or sites requiring bolstering with additional individuals. |
| Translocation | • Design and implement a translocation program to meet the objectives of the action statement, if required. Particularly consider the role of translocation after major events such as fire or drought. |

**Indicates landscape-scale actions that may deliver benefits to multiple species*

## Past Actions

The key conservation management actions listed below have been delivered in the past 10 years.

| Past action | Description |
|---|---|
| Community engagement and awareness | • Liaison undertaken with government agencies between 2012 and 2016 to ensure that relevant staff working in the known range of the Alpine Spiny Crayfish are aware of its existence and report records of the species. |
| Control introduced herbivores | • Deer control has been undertaken following the 2019-20 bushfires.<br>• Feral pig control has been undertaken in the Alpine National Park over the past decade.<br>• Feral horse control is occurring across the Alpine National Park and is now guided by the *Protection of the Alpine National Park: Feral Horse Action Plan 2021.* |
| Develop, update, and apply forestry protections | • The risk of forestry operations was assessed for the Alpine Spiny Crayfish in 2020 under the Victorian Government TSCRA. Additional permanent protections were recommended in 2022 and are currently being implemented. |
| Survey and monitoring | • A rapid on-ground assessment of the Alpine Spiny Crayfish was undertaken following the 2019-20 bushfires and management interventions identified.<br>• Post-fire and drought impacts were assessed in 2014 and 2015.<br>• The impact of trout predation was monitored periodically over the past decade.<br>• Surveys were undertaken in both National Park and State Forest to delineate the range of the Alpine Spiny Crayfish in the state.<br>• Survey and monitoring work was undertaken periodically over the past decade to confirm population persistence and to determine population dynamics. |

## Decision Support Tools

Decision making for conservation actions is supported through the following Victorian Government tools which may be of assistance in choosing the most appropriate or beneficial actions for biodiversity:

- Choosing actions for nature: NatureKit
- Biodiversity Knowledge Framework

## Further Information

- Alpine Spiny Crayfish Species Forecast Report
- Threatened Species Assessment report – Alpine Spiny Crayfish (*Euastacus crassus*)
- Commonwealth Species Profile and Threats database
- Threatened Species and Communities Risk Assessment
- Code of Practice for Timber Production 2014
- Victoria's changing climate – understanding the impacts of climate change in Victoria
- Commonwealth Threat Abatement Plans
- Genetic Risk Index
- Flora and Fauna Guarantee Regulations 2020
- IUCN Red List criteria descriptions

## Get Involved and Take Action

If you are interested in supporting this species' recovery, there are some important things you need to consider.

The Department of Energy, Environment and Climate Action (DEECA) is committed to engaging and partnering with Traditional Owners on how they wish to be involved in the planning and implementation of actions for this species. Steps must be taken to avoid harm and where appropriate ensure actions can deliver cultural benefits.

You can find advice about required approvals, land manager and/or owner permissions, options and incentives for private land conservation, and engagement with Traditional Owners and public land managers here: Action statements (environment.vic.gov.au)

To identify the relevant Traditional Owners, use the Aboriginal Cultural Heritage Register and Information System (ACHRIS) Welcome to Country and Acknowledgements Map.

You can also register your interest in taking action so we can connect you to other people or organisations working to help us secure the future for this species at threatened.species@deeca.vic.gov.au

## Reporting Actions

Activity data is critical to monitoring the implementation and progress of actions and evaluating action statements. These data are also used to:

- Determine progress towards achieving the contributing targets for Protecting Victoria's Environment – Biodiversity 2037.
- Inform the five-yearly State of the Environment Report.

For guidance on reporting actions undertaken on this species, refer to Activity Data.

## Submitting Monitoring Data

The Victorian Biodiversity Atlas (VBA) provides a foundational dataset showing where biodiversity occurs across the Victorian landscape and how it may have changed over time. As a core input for decision support tools that inform conservation action, public land management, research activities and reporting, we encourage all participants in the delivery of on-ground actions to submit species records and observations, including for introduced plants and animals, as they carry out their projects.

For further information see: Victorian Biodiversity Atlas (environment.vic.gov.au)

Sign up and begin submitting your data today at: https://vba.biodiversity.vic.gov.au/

**Acknowledgment**

We acknowledge and respect Victorian Traditional Owners as the original custodians of Victoria's land and waters, their unique ability to care for Country and deep spiritual connection to it. We honour Elders past and present whose knowledge and wisdom has ensured the continuation of culture and traditional practices.

We are committed to genuinely partner, and meaningfully engage, with Victoria's Traditional Owners and Aboriginal communities to support the protection of Country, the maintenance of spiritual and cultural practices and their broader aspirations in the 21st century and beyond.



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