

# Action statement

*Flora & Fauna Guarantee Act 1988*

## Bocara Timbonn (Glenelg Freshwater Mussel) (*Hyridella glenelgensis*)

Taxon ID: 621

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”.

### Species and Distribution



The Bocara Timbonn (Gunditjmara name for the Glenelg Freshwater Mussel). Image by Tarmo A. Raadik.



Bocara Timbonn Victorian Biodiversity Atlas (VBA) records since 1970. See [NatureKit](#) for an interactive map.

### Conservation Status

#### Critically Endangered

**Listing criteria:** 3.1.1; 3.1.2 (a), (b)(i,ii,iii,iv,v) of the Flora and Fauna Guarantee Regulations 2020.

This means that:

- the taxon has undergone, is suspected to have undergone, or is likely to undergo in the immediate future, a very severe reduction in population size; and
- its geographic distribution is extremely restricted; and
- the distribution of the population or habitat of the taxon is severely fragmented; and
- there is a continuing decline or reduction in:
  - its extent of occurrence; and
  - area of occupancy; and
  - the area, extent or quality of habitat; and
  - the number of locations or subpopulations; and
  - the number of mature individuals.

**Corresponding International Union for the Conservation of Nature (IUCN) criteria:** A2abce+3bce+4abce; B1ab(i,ii,iii,iv,v).

More information on IUCN listing criteria can be found here: [IUCN Red List of Threatened Species](#)

## Species Information

Species information such as its description, distribution, ecology and references are provided in the [Bocara Timbonn Species Forecast Report](#).

## Threats

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

Threat	Description
<b>Altered hydrology</b>	
Altered flow regime	<ul style="list-style-type: none"> <li>• Low water flow may increase salinity and water temperature and decrease the oxygen concentration, causing an increased risk of mortality, as Bocara Timbonn is believed to have an upper salinity limit of approximately 4 parts per thousand.</li> <li>• The Bocara Timbonn prefers shallow instream areas that are more susceptible to drying during low flow, exposing mussels to increased water temperature, dehydration and exposure to predators.</li> <li>• Increasing water extraction, Blue Gum (<i>Eucalyptus globulus</i>) and Radiata Pine (<i>Pinus radiata</i>) plantations, and prolonged drought have lowered the water table, causing reduced groundwater outflows, drying of springs, lowering of surface water levels and loss of flow, resulting in habitat degradation.</li> </ul>
<b>Climate change</b>	
Altered rainfall and temperature regimes	<ul style="list-style-type: none"> <li>• The species occupies perennially flowing streams, sustained by groundwater outflow (particularly during droughts), and cannot survive without flowing water.</li> <li>• Reduced annual rainfall and increased maximum temperatures will reduce the availability of groundwater outflow and therefore surface water flow, refuge habitat, and affect spawning cues.</li> </ul>
Increased frequency and/or length of droughts	<ul style="list-style-type: none"> <li>• Increased frequency and length of droughts will further reduce the availability of groundwater outflow, leading to a loss of surface water flow and availability of refuge habitat.</li> </ul>
<b>Fire</b>	
Altered fire regimes	<ul style="list-style-type: none"> <li>• Bushfires can destroy and damage riparian and catchment vegetation, degrade stream habitat and water quality by silt/debris input, and cause direct mortality from heat and ash. The majority of the Bocara Timbonn's habitat was impacted by the bushfires of 2019–20.</li> <li>• Increased bushfire frequency and intensity will increase the risk of fire-related impacts on the species.</li> </ul>
<b>Habitat loss, degradation, or modification</b>	
Degraded riparian vegetation	<ul style="list-style-type: none"> <li>• Degradation of riparian vegetation by livestock can lead to sedimentation and siltation of instream habitat, directly impacting the species' respiratory and reproductive organs by clogging gills and burying individuals.</li> <li>• Removal and degradation of riparian vegetation reduces debris input into the waterway that provides refuge for the mussel, and reduces waterway shading which increases water temperature, and promotes algal growth which can smother mussels.</li> </ul>

Threat	Description
<b>Introduced species</b>	
Introduced freshwater fish	<ul style="list-style-type: none"> <li>Introduced European Carp (<i>Cyprinus carpio</i>) are continuing to colonise downstream in the Glenelg River catchment and will reach all tributaries occupied by the Bocara Timbonn, posing a predation risk and competition for food resources. European Carp also disturb sediments causing siltation.</li> <li>Loss of suitable native fish hosts for the larval stage of the mussel (glochidia), can severely reduce or prevent recruitment. Experimental trials suggest that the glochidia of other freshwater mussels may not utilise Carp as a host, but this requires confirmation.</li> </ul>
<b>Pollutants</b>	
Pesticide use	<ul style="list-style-type: none"> <li>Pesticides used in timber plantations and cropping can drift into waterways or be carried into waterways through surface flow. Evidence based on other riverine mussel species indicate pesticides can lead to mortality.</li> </ul>

## Conservation Objectives

Conservation objectives are informed by the conservation status and criteria (derived from IUCN) in 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, increase genetic fitness and minimise future population decline.
- Increase knowledge of biology, ecology, distribution, demography, emerging threats, and conservation requirements.
- Support community participation and improve awareness of the Bocara Timbonn and conservation of its habitat.

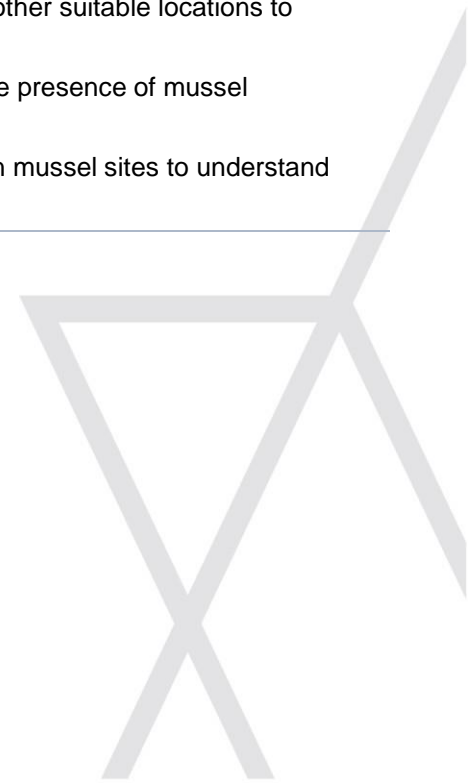
## Conservation Actions

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
Community engagement	<ul style="list-style-type: none"> <li>Engage landholders on the threats to the mussel (including pesticides, livestock grazing in riparian zones, clearing of riparian and catchment vegetation) and its conservation requirements, and encourage fencing of riparian zones.</li> <li>Explore the development of a formal landholder agreement to better manage stream flows, especially relating to spring-fed streams.</li> <li>Engage plantation managers on the impacts of pesticides and herbicides on the species, management of riparian zones, and management of reduced surface/groundwater flow during the early phase of plantation tree establishment.</li> </ul>
Control introduced fish*	<ul style="list-style-type: none"> <li>Implement or supplement existing programs to include effective control and managed of introduced fish species, including European Carp.</li> </ul>

Action	Description
Develop, update and apply forestry protections	<ul style="list-style-type: none"> <li>Maintain prescriptions for this species under the <i>Code of Practice for Timber Production 2014 (as amended in 2022)</i> (the Code).</li> <li>Where relevant, incorporate species-specific protection measures into plans and permits relating to timber harvesting operations in native forest on private land.</li> </ul>
Ex-situ management	<ul style="list-style-type: none"> <li>Develop a method for successful captive breeding.</li> <li>Develop a translocation plan.</li> <li>Following breeding, trial reintroductions into suitable habitat within the species' current range, and into existing subpopulations.</li> </ul>
Manage and protect habitat	<ul style="list-style-type: none"> <li>Re-introduce woody debris into known locations of the species.</li> </ul>
Protect refuge sites	<ul style="list-style-type: none"> <li>Manage and protect known refuge locations for the mussel, focusing on the protection of groundwater outflow volume to sustain perennially flowing reaches as a high priority.</li> <li>Identify streams where flow regulation of surface water and/or groundwater abstraction may impact important populations and habitats.</li> <li>Ensure that knowledge of groundwater outflow is included in river management.</li> </ul>
Research	<ul style="list-style-type: none"> <li>Investigate the evolutionary potential (genetic diversity and inbreeding) of extant mussel populations (required for captive breeding) and the suitability of fish species that act as larval hosts for the mussel.</li> <li>Investigate the impact of reduced rainfall on groundwater availability.</li> <li>Undertake research on catchment groundwater/surface water interactions and spring outflows.</li> <li>Undertake research on mussel physiological requirements and tolerance to reduced flows.</li> <li>Investigate eDNA sampling results to improve detection probability.</li> <li>Investigate impacts of pesticides on the species.</li> </ul>
Survey and monitor	<ul style="list-style-type: none"> <li>Monitor populations and habitat at known sites and other suitable locations to assess population trends and habitat condition.</li> <li>Survey other groundwater-sustained locations for the presence of mussel populations and for suitability as translocation sites.</li> <li>Monitor surface-groundwater interactions and known mussel sites to understand water movements and impact on refuge sites.</li> </ul>

\*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
Develop, update and apply forestry protections	<ul style="list-style-type: none"> <li>The species has a current species-specific prescription in the Code:               <ul style="list-style-type: none"> <li>In the Portland-Horsham Forest Management Area:                   <p>Apply a protection area extending 100 m from each bank for 1 km upstream and 1 km downstream of populations. Disturbance that could impact on water quality must be avoided within the protection area.</p> </li> </ul> </li> <li>The risk of forestry operations was assessed for this species in 2020 under the Victorian Government Threatened Species and Communities Risk Assessment. Additional permanent protections were not found to be required.</li> </ul>
Ex-situ management	<ul style="list-style-type: none"> <li>Emergency salvage was undertaken to establish an ex-situ insurance population following the 2019–20 bushfires. Individuals were placed back on Country eight months after the event, celebrated by a smoking ceremony by the Gunditj Mirring Traditional Owner Aboriginal Corporation.</li> </ul>
Survey and monitoring	<ul style="list-style-type: none"> <li>Surveys undertaken in 2014–15, 2015–16 and 2017–18 contributed to the species' assessment, listing status, and knowledge of distribution.</li> <li>An investigation was undertaken in 2016 into drought refuge in unregulated streams.</li> <li>Sites in the lower to mid Glenelg River basin were surveyed for new and existing populations in January and March 2020.</li> <li>A trial was undertaken of an eDNA survey method in January and March 2020.</li> </ul>

## 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

- [Bocara Timbonn Species Forecast Report](#)
- [Threatened Species Assessment report – Bocara Timbonn \(\*Hyridella glenelgensis\*\)](#)
- [Threatened Species and Communities Risk Assessment](#)
- [Code of Practice for Timber Production 2014](#)
- [Commonwealth Species Profile and Threats database](#)
- [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 / 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](#).

Interested parties are encouraged to work together across community, government, private and public land managers and Traditional Owners to undertake these actions and secure funding for their implementation.

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](mailto: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, including for weeds and introduced animals, and observations as they carry out their projects.

For further information see: Victorian Biodiversity Atlas ([environment.vic.gov.au](http://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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