



**FLORA & FAUNA
GUARANTEE**

FLORA AND FAUNA GUARANTEE - SCIENTIFIC ADVISORY COMMITTEE

FINAL RECOMMENDATION ON A NOMINATION FOR LISTING

Western Port Bryozoan Reef Community

DOCID107-417469679-742

Date of receipt of nomination: 19 August 2020

Date of preliminary recommendation: 3 September 2021

Date of final recommendation: 21 January 2022

Validity: The nomination is for a valid item.

Prescribed Information: The prescribed information was provided.

Name of the Nominator is adequately provided.

Name of the Item is adequately provided.

The nominated community is accepted by the Scientific Advisory Committee (SAC) as a valid community because it is adequately defined and described according to accepted practice, and it is described in such a way as to be distinguished from all other communities.

Current conservation status

The nominated community is not currently listed as threatened in Victoria.

Eligibility for listing as a community under the Flora and Fauna Guarantee Act 1988

The nomination was made to the SAC on 19 August 2020 in accordance with the *Flora and Fauna Guarantee Act 1988* (the FFG Act) and Flora and Fauna Guarantee Regulations 2020 and was accepted as a nomination by the SAC on 7 October 2020.

The SAC has assessed the eligibility of this nomination in accordance with Section 16C of the Act.

Community information

Description

The Western Port Bryozoan Reef Community is a species rich, subtidal biogenic reef located in the Rhyll Segment of East Arm, Western Port, Victoria. Bryozoans are non-photosynthetic invertebrate filter-feeders, which live in colonies and are commonly referred to as 'lace corals' owing to the delicate calcium carbonate matrix they produce. The biogenic reef substrate is comprised of three species of bryozoan: *Triphyllozoon munitum*, *Triphyllozoon moniliferum* and *Celleporaria foliata* that form large colonies of up to 1.5 m vertical relief. The *Triphyllozoon* species are fenestrate, mounded colonies while *C. foliata* is a non-fenestrate species forming plate-like colonies that can be mounded, spreading or encrusting. Observations suggest that the two *Triphyllozoon* species are present in approximately equal proportions and these two species are dominant (making up an estimated 80–90% of the reefs), than *C. foliata* (Dutka et al. 2022, Flynn et al. 2020).

Two forms of reefs have been identified. Linear reefs consisting of continuous reef mound rows, separated by tracts of sediment, occur in water depths from approximately 4.8–6 m. Due to the high density of habitat-forming bryozoans in the linear reefs, they are considered to harbour the highest matrix-associated biodiversity (Flynn et al. 2020). Patch reefs occur in water depths ranging from 4.5 to 8.5 m and can be concentrated to form localised continuous patches.

The Western Port Bryozoan Reef community provides habitat for diverse assemblages of matrix-associated and epifaunal macrofauna. The invertebrate communities associated with the bryozoan reefs would not otherwise occur in this area of Western Port (Fathom Pacific 2020a). The structure of bryozoan reefs provide protection from predators and currents, attachment points for larval stage species and feeding opportunities. This often results in the reefs supporting significantly higher species assemblages and higher fish biomass than their surrounding habitat (Dutka et al. 2022, Fathom Pacific 2020a, Fathom Pacific 2020b, Wood et al. 2013). The invertebrate community of the Western Port Bryozoan Reef Community is important in the diets of fish such as snapper, elephant fish and gummy shark. Therefore, in addition to the protection of reef structure, the maintenance of the Western Port Bryozoan Reef community will be reliant on the protection of the life history of the co-occurring species.

Although bryozoan reefs are distributed worldwide, the Western Port Bryozoan Reef community is unique in its species composition, depth range, extensive linear mound formations with high vertical relief (Dutka et al. 2022) and its silty inter-reef sediment and seagrass–*Caulerpa* association.

Distribution

The Western Port Bryozoan Reef community is only known from Western Port in Victoria. The known extent of the community covers an area of approximately 1.74 km² (Dutka et al. 2022). The community has been recently added to the Department of Environment, Land, Water and Planning's CoastKit biotope atlas as ba5.661 – Level 5 – *Western Port bryozoan biogenic reef community* (DELWP 2021). No other community of this kind has been reported elsewhere in Victorian waters. The community has a restricted distribution and research to date suggests that a combination of depth, low light conditions (which precludes competitive algal growth), currents and planktonic food resources are among the factors determining the extent of the community (Flynn et al. 2020).

Decline

There are no long-term datasets available on the previous known extent of the reefs as the community was only formally described recently, in 2017. It is hypothesised that the substrate that originally supported the settlement and growth of the bryozoan reefs is no longer present, and that new recruitment is limited today to on-reef growth rather than lateral expansion. It is hypothesised that sediment impacts due to land use changes and historic oyster dredging in the area have fundamentally altered the availability of substrate suitable for larval settlement (Ford & Hamer 2016). This leads to the hypothesis that deleterious impacts to the Western Port Bryozoan Reef community may be irreversible.

The high vulnerability of bryozoan reefs to physical damage, the complications and expense of biogenic reef rehabilitation and the apparent limited ability for recolonisation of bryozoans after fundamental substrate alteration, suggest that conservation efforts and education should be focussed on protecting the small amount of reef that currently exists (Flynn et al. 2020, Mello et al. 2021).

Threats

There are several features of the Western Port Bryozoan Reef community that contribute to its vulnerability, such as extremely limited area and extent, slow growth rate, fragility of fenestrate bryozoan species and proximity to sources of sediment and pollution (Flynn et al. 2020).

Physical disturbance

As relatively slow growing filter feeders that build delicate skeletal structures, bryozoan colonies are prone to disturbance more than, for example, rocky reef complexes or deposit-feeding sediment communities. Evidence from New Zealand shows that deleterious physical impacts to bryozoan reefs can be persistent (Cranfield et al. 2003; 2004, Mello et al. 2021) and due to fundamental changes in substrate structure in Western Port, may be irreversible. The area where the Western Port Bryozoan Reef community occurs is a popular recreational snapper and gummy shark fishing location, locally known as 'The Corals'. Evidence suggests that anchoring from recreational fishing vessels causes physical damage to the fragile skeletal structure of the bryozoans and if this continues could result in the extinction of the community.

Marine pests and contaminants

Commercial port operations, increased shipping movements in the Port of Hastings, potential increase in cruise ship activity and anchorages and increasing recreational vessel activity represent additional cumulative threats with respect to marine pest species introductions and contaminants (Dutka et al. 2022, Fathom Pacific 2020a, Flynn et al. 2020).

To date, very limited marine pest incursions have been reported in the Western Port region and there have been no major outbreaks in the bay. Wakame (*Undaria pinnatifida*), now present throughout Port Phillip Bay, presents one of the highest

direct risks to bryozoan reefs as the reefs represent the only significant solid substrate that might be colonised by the algae (Dutka et al. 2022). The Northern Pacific Seastar (*Asterias amurensis*), also present throughout Port Phillip Bay, presents a risk to the abundant bivalve community associated with the Bryozoan Reef community and a potential risk to bryozoans themselves (Flynn et al. 2020).

Sedimentation and pollutants

Increased runoff carrying sediments, nutrients and toxicants entering the bay, principally as a result of land use changes is a potential threat to the Western Port Bryozoan Reef Community and is well documented (Melbourne Water 2018). Although Western Port's catchment is mostly rural with agriculture being the major land-use, parts of Western Port's catchment have experienced major urban growth over the last 15 years, with further expansion likely. This raises concerns regarding increased pollution and its potential to threaten some of the natural values of Western Port in the future (Melbourne Water 2018, Sharp et al. 2013).

Sediment in suspension potentially scours, abrades or clogs the delicate integuments and feeding apparatus of bryozoans on the skeleton surfaces. Sedimentation has the potential to cover or smother living colonies and further lead to chronic sediment stress (Flynn et al. 2020). Future changes to sediment regimes in Western Port due to increased population pressure, combined with sediment disturbance during dredging, represent a potential increased threat that could result in the extinction of the community.

Ocean acidification and climate change scenarios

Bryozoan reefs are expected to be vulnerable to ocean acidification. Bryozoan reef skeleton is composed of calcium carbonate and research on other skeleton-forming marine species suggests that structural integrity could be negatively impacted by ocean acidification (Melbourne Water 2018, Mollica et al. 2018). This, in combination with other climate-mediated effects such as increased wave energy (a known issue in Western Port), hydrodynamic conditions and seafloor integrity (that appear to be critical to defining the bryozoan reef niche) increases the cumulative threats to the reef (Flynn pers comm).

Decision by the Scientific Advisory Committee

The eligibility of the nominated community to be specified in the Threatened List must be determined in accordance with the eligibility criteria prescribed for the purposes of Division 2 of Part 3 of the FFG Act.

The relevant eligibility criteria are prescribed in Schedule 2 of the Flora and Fauna Guarantee Regulations 2020, which provides that a community of flora or fauna is eligible to be listed in the Threatened List if one of the criterion in relation to section 14(a) or (b) of the FFG Act is met.

Criterion 2.1

The community –

(a) is very rare in terms of total area it covers

(b) has a very restricted geographic distribution

(c) has been recorded from only a few localities

Evidence:

The Western Port Bryozoan Reef community is extremely geographically restricted with only one known location in the Rhyll Segment of East Arm, Western Port, Victoria. The currently known extent of the community covers an area of approximately 1.74 km². No other community of this kind has been reported anywhere else in Victorian waters. The Western Port Bryozoan Reef community is unique and research to date suggests that a combination of depth, low light conditions (which precludes competitive algal growth), currents and planktonic food resources are among the factors limiting the extent of the community (Flynn et al. 2020).

Criterion 2.2

The threat is currently affecting the community and is expected to continue affecting the community in the future at a level which is likely to result in the extinction of the community.

Evidence:

Several of the currently operating threats outlined above are expected to continue and, in some cases, increase in the future. While threats such as physical damage from vessel anchors could be mitigated by management, difficult to manage threats such as increasing sedimentation and pollution along with the cumulative effects of climate change are predicted to cause an

ongoing decline of the community. The combination of these threats with the inability for the reef to naturally recover due to the lack of suitable substrate is likely to result in extinction.

Documentation

The published information provided to and sourced by the SAC has been assessed. To the best of their knowledge, the SAC believes that the data presented are not the subject of scientific dispute and the inferences drawn are reasonable and well supported.

Advertisement for public comment

In accordance with the requirements of Section 16D of the *Flora and Fauna Guarantee Act 1988*, the preliminary recommendation report (PRR) was advertised for a period of at least 30 days.

The preliminary recommendation was advertised in:

Victorian Government Gazette on 16 September 2021

DELWP website

DELWP social media

Public submissions closed on 17 October 2021.

Following publication of the PRR, the SAC received two submissions, both supporting the recommendation. In formulating its Final Recommendation on this item, the SAC has considered the submissions and is not aware of any compelling evidence to warrant a change to the preliminary recommendation that the nominated community is eligible for listing.

Final Recommendation of the Scientific Advisory Committee

As outlined above, the nominated community satisfies at least one criterion of the set of criteria prepared and maintained under Division 2 of Part 3 of the FFG Act and stated in Schedule 2 of the *Flora and Fauna Guarantee Regulations 2020*.

The SAC concludes that on the evidence available the nominated item is eligible for listing in Victoria because criteria 2.1 and 2.2 of the FFG Regulations 2020 have been satisfied.

The Scientific Advisory Committee therefore makes a final recommendation that the nominated community be supported for listing under the *Flora and Fauna Guarantee Act 1988*.

Endorsement by the Convenor of the Scientific Advisory Committee

Date



Dr. Michelle T. Casanova
Convenor

21 January 2022

References:

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Fathom Pacific (2020a) Western Port Bryozoan Reefs Project: Macrofauna Biodiversity Report Annual Report. Report to AGL and La Trobe University by Fathom Pacific Pty Ltd.

Fathom Pacific (2020b) Western Port Bryozoan Reefs Project: Report 5 – Bioacoustic Survey of Fish Biomass. Report to Port Phillip and Westernport Catchment Management Authority by Fathom Pacific Pty Ltd.

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Ford, J.R. & Hamer, P. (2016) The forgotten shellfish reefs of coastal Victoria: documenting the loss of a marine ecosystem over 200 years since European settlement. *Proceedings of the Royal Society of Victoria*, 128: 87-105.

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Sharp, S., Myers, J. & Pettigrove, V. (2013) An assessment of sediment toxicants in Western Port and major tributaries. Victorian Centre for Aquatic Pollution Identification and Management Technical Report #27.

Wood, A.L., Probert, P.K., Rowden, A.A. & Smith, A.M., (2012) Complex habitat generated by marine bryozoans: a review of its distribution, structure, diversity, threats and conservation. *Aquatic Conservation: Marine and Freshwater Ecosystems*, 22: 547-563.