Before the Expert Fast-track Panel

FTAA-2511-1150

Under	the Fast-track Approvals Act 2024 (**FTAA**)
And	
In the Matter	of an application for approvals by **MCCALLUM BROTHERS LIMITED** for the Te Ākau Bream Bay Sand Extraction Project located at Te Ākau Bream Bay, Northland

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Evidence of Jennifer Beaumont on behalf of McCallum Brothers Limited in Response to Comments Received from Invited Persons

(Stony Corals)

Dated 12 August 2026

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Introduction

1. My name is Jennifer Beaumont.

2. I am a benthic ecologist at the New Zealand Institute for Earth Science (hereafter Earth Sciences NZ). I hold a BSc (hons) in Biology with Oceanography from the University of Southampton (UK, 1997) and a PhD in marine ecology from the Scottish Association for Marine Science and the Open University (UK, 2006).

3. I have over 20 years' experience as a marine ecologist and have worked at Earth Sciences New Zealand (formerly NIWA) as a benthic ecologist for the past 18 years. I have worked as a marine ecologist in Aotearoa New Zealand, the UK and in Antarctica undertaking field work in coastal and deep-sea environments, leading subsequent laboratory and statistical analysis, and providing reports for commercial clients. My research interests include the response of benthic fauna to elevated suspended sediments, deep sea coral reproduction, and the recovery of benthic communities following anthropogenic disturbance. I am a member of the New Zealand Marine Sciences Society and the Deep Sea Biology Society.

4. This evidence is provided as part of McCallum Brothers Limited's (**MBL**) response to invited comments on the Te Ākau Bream Bay Sand Extraction Project (**Project**).

5. I prepared the following material lodged in support of MBL's application:

    a. Report titled "Scleractinian cup corals at Te Ākau Bream Bay. Literature review and distribution of cup corals identified within the proposed sand extraction area" dated December 2025 included as Attachment 21 to the MBL Assessment of Environmental Effects.

    b. Report titled "Cup corals and Schedule 7 of the Fast-track Approvals Act 2024" dated December 2025 included as Attachment 15 to the MBL Assessment of Environmental Effects.

Scope of Evidence

6. My evidence responds to the comments from invited parties

Code of Conduct

7. Although this is not a hearing before the Environment Court, I confirm that:

    a. I have read and am familiar with the Environment Court's Code of Conduct for Expert Witnesses as specified in the Environment Court's Practice Note 2023 (**Code**); and

    b. The reports referred to above authored by me:

        i. Are within my area of expertise (except where I state that I rely upon the technical reports of other expert witnesses provided in support of the application);

        ii. Have been prepared in accordance with the Code; and

        iii. I have not omitted to consider any material facts known to me that might alter or detract from the opinions expressed.

Response to Comments

8. The following parties provided comments that relate to scleractinian corals that were not directly addressed in the reports above that I authored/co-authored and which I have responded to within this Statement of Evidence.

9. Parties who commented in relation to reports I authored/co-authored:

Parties who commented
21. Northland Conservation Board
25. Whangarei Heads Citizens Association (WHCA)
29. New Zealand Conservation Authority (NZCA)
36. Langs Cove Residents Association inc. (LCRA)
41. Department of Conservation (DOC)
43. Patuharakeke Te Iwi Trust Board & Ngātiwai Trust Board

44. Forest & Bird

10. I have grouped my responses into themes. Where relevant, I have also identified where these themes were similar to the Panels Request for Information (Minute 4 of RFI 1).

Table 1 Summary of the themes discussed in this evidence.

Theme	**Related Panel RFI**
1. Abundance and distribution of corals within the proposed sand extraction area at Te Akau Bream Bay	
2. Population level effects/habitat suitability estimates	1
3. Resilience to disturbance	1
4. Cumulative effects	
5. Ecological value	
6. Monitoring	
7. Credibility of evidence	

Theme 1. Responses to comments regarding "abundance and distribution of corals within the proposed sand extraction area (pSEA) at Te Ākau Bream Bay"

Table 2. Parties with comments related to Theme 1.

Theme	**Related parties**
1. Abundance and distribution of corals within the proposed sand extraction area at Te Akau Bream Bay	36. Langs Cove Residents Association Inc. (LCRA)
	41. Department of Conservation (Section 51 report)
	44(a). Forest and Bird

11. These parties commented on the inconsistencies and/or high uncertainty of the abundance of corals within the proposed sand extraction area (pSEA) at Te Ākau Bream Bay. The known distribution and estimated abundances within the pSEA, together with estimates of variation/error, for *Sphenotrochus ralpae* and *Kionotrochus suteri* were provided in Beaumont et al. (2025) as summarised in Table 3. These abundances were calculated using data from a benthic survey, conducted on behalf of MBL by Bioresearches, in 2024. It is now known that the abundance of dead

Kionotrochus suteri within the pSEA is less than previously stated due to the mis-identification of two dead specimens, now known to be *Culicia rubeola* (See Beaumont and Anderson 2026). The estimated abundance of dead *Culicia rubeola* within the pSEA is 0.11 ± 0.08 individuals per m^2 (± Standard Error).

12. *Culicia rubeola* is in the Rhizangiidae family of corals. There is little known about this family of corals, or *Culicia rubeola*, but the available information, including spatial distribution, has been described in Beaumont and Anderson (2026). Our assessment (Beaumont and Anderson 2026) is that the likely impact of sand extraction within the pSEA at Te Ākau Bream Bay on *Culicia rubeola* is likely to be minor to negligible.

13. The LCRA[1] also state ""Pre-extraction surveying for protected stony corals (Scleractinian species) be mandatory, independent, and conducted to a standard approved by DOC before each new extraction cell is activated". I follow the reasoning behind this request but it is my opinion that pre-extraction surveying for corals would be difficult to achieve. I've been informed that the corals are hard to detect without direct sampling (e.g., grab sampling) which in itself can cause disturbance and perhaps mortality to the corals you would be trying to protect.

Table 3. Population estimates of corals within the pSEA. * the reported abundance of dead *Kionotrochus suteri* is overestimated due to two specimens previously mis-identified and now known to be *Culicia rubeola*.

Taxon	**Status**	**Average density (inds./m^2) ±SE**
Kionotrochus suteri	Alive	0.11 ± 0.08
Kionotrochus suteri	Dead	0.37 ± 0.23 *
Sphenotrochus ralphae	Alive	0.37 ± 0.16

[1] Section 12 of the Land Cove Residents Association Inc submission in opposition to the Beam Bay Sand Extraction Project.

Sphenotrochus ralphae	Dead	11.11 ± 2.52
Culicia rubeola	Dead	0.11 ± 0.08

Theme 2. Population level effects/habitat suitability estimates

Table 4. Parties with comments related to Theme 2.

Theme	Related parties
2. Population level effects/habitat suitability estimates	21. Northland Conservation Board
	41. Department of Conservation (section 51 report)

14. Both parties stated there are uncertainties within population level effects and DOC considers that the application does not yet adequately address population-level effects. In particular, DOC notes there is insufficient information on connectivity, depth structuring, local population size, or the relationship between corals within the extraction area and those in surrounding habitats.
15. With respect to connectivity between populations there is no available information or data on any of the three coral species that have been recorded within the pSEA.
16. With respect to populations being stratified by depth, as suggested by DOC, there are no data on population structure across environmental gradients for *Sphenotrochus ralphae* or *Kionotrochus suteri*. *Culicia rubeola* has been shown to have larger coralla in habitats sheltered from wave action than it does in more exposed habitats (Brook 1982). Whether this is a direct response to environmental pressures or due to genetically differentiated populations remains unclear. However, the pSEA has relatively shallow depth/environmental gradients and so I consider it unlikely that there would be coral populations stratified by depth across the pSEA.

17. DOC[2] states that "both *Sphenotrochus ralphae* and *Kionotrochus suteri* are not particularly common as shown by their limited range on maps (presented in the NIWA report, albeit with uncertainty), with their extent and abundance in the vicinity of the proposed activity also uncertain."
18. There were insufficient data to determine the population of these three coral species outside of the pSEA at Te Ākau Bream Bay. However, we have not stated that these species are not particularly common but have noted that they have not been much studied. The estimated suitable habitat for *Culicia rubeola* is along the coastlines of much of Aotearoa New Zealand, with a concentration of observations in the northern half of the North Island. It is also present in the wider Pacific region. The estimated suitable habitat for both cup coral species is quite widespread in the northern part of the North Island of Aotearoa New Zealand (Section 3.2, Beaumont et al. 2025). In addition, and as stated in Beaumont et al. (2025), Dennant (1906) noted of *Kionotrochus suteri* that "this interesting coral was dredged at a depth of 100 fathoms by Mr Henry Suter and Mr Charles Hedley about 15 miles outside Great Barrier Island, New Zealand. It is evidently very abundant, as a large number of specimens have been sent to me. About 20 of them are full-grown and tolerably perfect; 20 others are also adult, but worn; in addition, there are more than 30 of the juvenile discoid forms previously mentioned, a few of which are still attached to minute shell fragments." Cairns (1995) stated that *Kionotrochus suteri* is a commonly collected coral that can be found in relatively shallow water in the Aotearoa New Zealand region and has been studied and redescribed several times.

Theme 3. Resilience to disturbance

Table 5. Parties with comments related to Theme 3.

Theme	Related parties
3. Resilience to disturbance	
	Whangarei Heads Citizens association
	New Zealand Conservation Authority (NZCA)

[2] Paragraph 35 of statement of advice by Lyndsey Holland, Department of Conservation, Appendix B Technical report (s51) Bream Bay Corals.

	Patuharakeke Te Iwi Trust Board & Ngātiwai Trust Board
	Department of Conservation (section 51 report)

19. The expected direct disturbance to the corals from the sand extraction process (dredging and sieving), and the expected outcome for the corals using available information, has been described in Sections 4.4 and 5.4 of Beaumont et al. (2025). With respect to statements that sediment plumes may smother the corals – this is considered unlikely for *Sphenotrochus ralphae* and *Kionotrochus suteri* because 1) these corals live in mobile sandy sediments and are expected to have some capacity to move through sediments (and clear deposited sediments) to avoid smothering and 2) MBL's Assessment of Water Quality Effects (Attachment 9) in the Appendix G report (Jacobs 2020) states that sediment plumes are expected to be both localised and quickly dissipated, with plume sampling showing total suspended solid concentrations returned to ambient conditions after approximately 26 minutes. Though I note that this report was based on data collected at Pākiri rather than Te Ākau Bream Bay, the evidence in response to comments from Dr Wilson and Ms Jones maintains the opinion in the Assessment of Water Quality Effects. That assessment concludes in Section 8.0, "Te Ākau Bream Bay and Pākiri Embayment are similar benthic environments with regard to benthic sediment quality – both comprise sandy texture, low mud, and low organic content, and low sediment contaminant status. Given that the William Fraser vessel will be used in the proposed sand extraction for Te Ākau Bream Bay, the water quality findings for Pākiri Embayment are applicable to Te Ākau Bream Bay". Species within the *Culicia* genus have also been described as being resilient to high turbidity (See Section 4.3.1 in Beaumont and Anderson 2026).

20. With respect to indirect disturbance to corals from potential changes in sediment profiles (as per the NZCA comment) there are no data available on this for these corals.

21. Patuharakeke commented that if corals are dislodged from the seafloor and passed through the dredge it appears unlikely they will survive. I am

advised that MBL supplied Patuharakeke with the Beaumont et al. (2025) report on 21 July 2025 however it is not clear whether Patuharakeke had read Beaumont et al. (2025) before commenting. The resilience of corals to physical disturbance, including those within the Turbinolliidae family, is discussed in that report. Our assessment was that is it likely that some corals will survive the physical disturbance associated with the sand extraction process because they are expected to have some ability to both move through sediments and to regenerate soft and skeletal tissues following damage/fragmentation. Note that Patuharakeke also include the corals under "large benthic biota". These corals are small – *Kionotrochus suteri* and *Sphenotrochus ralphae* are less than 10 mm in size. *Culicia rubeola*, of which only dead fragments have been recorded within the pSEA, is a colonial species which lives attached to hard substrates such as rock or shell with colonies that can reach up to 60 mm in diameter. However, as described in Beaumont and Anderson (2026), *Culicia rubeola* strongly indicate a preference for hard rocky substrate in shaded locations, rather than mobile soft-sediment sandy, or muddy habitat.

22. DOC queries the uncertainty of our conclusion that *Kionotrochus suteri* and *Sphenotrochus ralphae* are able to burrow and self-right within sediments. I accept that there are no data on these species so some uncertainty exists. However, given the evidence in the literature on other members of the same family (See section 4.4.2 in Beaumont et al. 2025), living within similar environments, and the habitat that these species occupy (mobile sandy sediments) it would be unlikely that they were not able to burrow or self-right. Without these abilities, these species would be vulnerable to natural sediment movement through current and storm activity and/or small-scale disturbances from other organisms that disturb the sediment surface/structure as they go about their daily lives.

23. DOC[3] notes that it is possible that certain life history stages rely on the availability of specific substrates for settlement of new larvae (e.g., shell

[3] Paragraph 29 of statement of advice by Lyndsey Holland, Department of Conservation, Appendix B Technical report (s51) Bream Bay Corals.

hash, pebbles, seagrass beds) and that the application did not consider the impacts of the proposed activity on each stage in the coral life cycle, and of areas within and surrounding the extraction area and the links and distances between them.

24. The spatial scale of impacts is expected to be confined to within or very close to the pSEA (e.g., Jacobs 2020; West and van Winkel 2025).

25. The nearest reef (Three Mile Reef) is located approximately 1 km to the northeast of the northern corner of the pSEA, within a circled area of foul ground. It is outside of the expected range of direct impacts and on the edge/just outside of the expected range of indirect impacts (See Figure 5 in West and van Winkel 2025). Cup corals were reported at three sample sites during a survey of Three-Mile Reef (Kerr and Grace 2016) though no further identification or information on abundance was provided. However, the indirect impacts from increased suspended sediments are expected to be localised and quickly dissipated (Jacobs 2020), and all three survey sites were outside the zones of expected impact.

26. No seagrass beds have been documented within the pSEA (West and van Winkel 2025), with the closest seagrass stated as 13 km from the pSEA. However, West and van Winkel (2025) did note macroalgae attached to shells within the pSEA. We discussed hard substrates (e.g., shells) within the pSEA with respect to the impacts of epibenthic dredge sampling (see section 4.4.3 of Beaumont et al (2025)). Our conclusions there are also valid for any anthocauli attached to shells (or other substrates) that are disturbed though the proposed sand extraction process: these corals may suffer some physical damage and potentially increased predation by fish and mobile invertebrates attracted to disturbed sediments. Corals that are damaged and/or fragmented to the extent that they cannot move through sediments may suffer mortality if buried. However, given the potential for cup corals within the Turbinoliidae family to move through sediments and regenerate structures it is expected that at least some corals will survive the disturbance.

27. In response to DOC's comment regarding the burrowing of *D. orientalis* (a species in the same family, Turbinolliidae) being slower than usual for that species due to the damage (fragmentation), Sentoku et al. (2017) stated that fragments of *D. orientalis* were able to burrow into sediments 188 days following fragmentation. There was no mention in the Sentoku paper that the speed of burrowing was slower due to damage once the ability to burrow had returned. I also don't believe the purpose of burrowing is relevant here (suggested to avoid predation) - if a fragmented coral is able to move through sediments to avoid predation then it is able to burrow and also return to surface sediments following shallow burial.

28. Related to the same comment (paragraph 33 above), we (Beaumont et al. 2025) recommended a pause of at least 7 months before re-extracting from the same area, based on the stated time for *D. orientalis* to sufficiently recover from fragmentation to be able to move through sediments/burrow. I agree that longer pauses would be beneficial to the recovery of benthic faunal communities (corals and other organisms) but no available information was found to be able to quantify a longer timeframe. Notwithstanding this, as mentioned in Section 2.5.2 of Attachment 27 – Sand Extraction Operations Methodology, a rotational methodology is used to ensure that extraction does not occur along the same track for at least 12 months at an extraction volume of 250,000 m^3 over 32 years. Whereas, at an extraction volume of 150,000 m^3, the return period before repeating the same track is estimated to be approximately 1.7 years (20 months). The longevity of the cup corals (which is unknown but likely similar to that of other shallow water solitary corals (7-12 yrs)) is not relevant to the timeframe of recovery (individual) from fragmentation/disturbance. It is, however, relevant to the recovery of populations following disturbance (i.e., they are not likely to be long-lived species unlike many deep-sea Scleractinia).

29. DOC remains uncertain that the use of a screening deck and moon-pool system on the *William Fraser* will reduce the incidental killing of cup corals. The screen and moonpool result in the corals (and other

organisms) being returned to the seafloor rather than being retained on the vessel. Fauna retained on the vessel would be more likely to suffer mortality than those returned to the seabed. The sub-surface placement of the moonpool, rather than organisms being returned to the seabed via an above-surface pipe, may also increase survivability.

Theme 4. Cumulative effects

Table 6. parties with comments related to Theme 4.

Theme	**Related parties**
4. Cumulative effects	Forest & Bird

30. Forest & Bird note that little has been provided on the effects ocean acidification will have in the application area and that corals (and any carbonate sand) affected by the proposal will also be impacted by climate change and ocean acidification. A section on cumulative impacts was provided in Beaumont et al. (2025) though this didn't go into any detail on the effects of ocean acidification on the corals present within the pSEA.

31. No information has been found on the effects of ocean acidification on the three species of corals recorded within the pSEA and, therefore, the effect is unknown. However, research on other temperate corals have shown ocean acidification to decrease recruitment efficiency (Caroselli et al. 2019), and changes in population structure (higher percentage of juvenile corals, Cassarino et al. 2025) but reproduction and growth rates appear to remain unaffected (e.g., Caroselli et al. 2019; Cassarino et al. 2025; Marchini et al. 2025).

Theme 5. Ecological value

Table 7. Parties with comments related to Theme 5.

Theme	Related parties
5. Ecological value	Department of Conservation (Section 51 report)

32. DOC states that the applicant's response does not capture the important roles that *Sphenotrochus ralphae* and *Kionotrochus suteri* potentially play in carbon cycling, nor as a component of the infaunal seabed community and seabed structure, nor their potential influence on local sediment flow or provision of micro-habitats for microorganisms involved in nutrient cycling. I found no information on the three species of coral found within the pSEA with respect to these roles and so uncertainty remains as to the importance of these organisms to the ecological value of this environment. However, these are small corals that are present at low densities within the pSEA and so the extent of their contribution to these roles would be expected to be small with respect to the infaunal community as a whole.

Theme 6. Monitoring

Table 8. Parties with comments related to Theme 6.

Theme	Related parties
6. Monitoring	Department of Conservation

33. The Department of Conservation have stated[4] "it is also a small consideration that monitoring itself is invasive, as the epibenthic dredge used to sample macrofauna is likely to damage cup corals that it encounters (but is the most likely to find them, as shown in Attachment 15, Table 2-2). The corals may pass through the 35 mm mesh size, but are likely to get damaged by abrasion and become upturned or fragmented as in the sand extraction process. This is perhaps less of an issue for

[4] Paragraph 46, Statement of advice by Lyndsey Holland, Department of Conservation. Appendix B Technical Report (s51) Bream Bay corals.

Kionotrochus suteri (up to 6.8mm) but more relevant to larger (up to 9mm) *Sphenotrochus ralphae*."

34. I agree that the monitoring itself is invasive. However, both *Sphenotrochus ralphae* and *Kionotrochus suteri* are expected to pass through the dredge given it has a mesh size of 35 mm and both species are less than 10 mm in size. The exception to this would be any life stages attached to hard substrates (e.g. the anthocaulus of *Kionotrochus suteri*). *Culicia rubeola* would also be expected to be retained within the mesh if the substrate it was attached to was large enough. Dead specimens of *Culicia rubeola* which have been separated from the substrate may also be large enough to be retained within the dredge. However, live specimens which pass through the mesh could be expected to be disturbed/overturned and perhaps damaged by the dredge. Grab sampling is the only effective method to quantify the corals within the pSEA due to their small size. With respect to non-invasive sampling, high-resolution imagery transects using a towed camera system are generally effective sampling tools, but I have been informed by MBL/Bioresearches that these small corals have not been detected in images that they have collected using their drop-camera.

Theme 7. Credibility of Applicants expert evidence

Table 9. Parties with comments related to Theme 7.

Theme	Related parties
7. Credibility of Applicants expert evidence	Whangarei Heads Citizens Association

35. The Whangarei Heads Citizens Association states that: "McCallum Bros own expert, Dr Jennifer Beaumont of NIWA, signed a declaration affirming her independence and impartiality (Consolidated Expert Declaration, 2025, p. 2). However, in the NIWA cup coral report itself, NIWA disclosed that it "may oppose the extraction" due to a direct financial conflict of interest, namely its "many tens of millions of dollars investment in major aquaculture facilities" located "proximal to the proposed sand extraction area" (NIWA, 2025, p. 3). This contradiction

raises serious questions about the independence of the applicant's ecological assessments."

36. The conflict of interest stated above is at the organisation level and not a personal level. Within the Earth Sciences NZ organisation we have established and maintained information barriers between teams engaged for different parties/different purposes.

37. I reiterate that my evidence is independent and impartial and my evidence is provided in accordance with the Environment Court's Code of Conduct for Expert Witnesses as specified in the Environment Court's Practice Note 2023.

Conclusion

38. Whilst a number of respondents have raised concerns around the abundance and distribution of corals, resilience to disturbance, cumulative impacts, ecological value, monitoring and the credibility of my evidence with respect to stony corals, it remains my opinion that for the reasons outlined in this statement of evidence the impact to the Aotearoa New Zealand population of these stony corals will be minor to negligible.

References

Beaumont, J., Anderson, O. (2026) The scleractinian coral *Culicia rubeola* at Te Ākau Bream Bay. Literature review and distribution of Culicia rubeola identified within the proposed sand extraction area. Prepared for McCallum Bros Limited. June 2026: pp. 36.

Beaumont, J., Anderson, O., Mills, S. (2025) Scleractinian cup corals at Whanga-a-Tamure Bream Bay. Literature review and distribution of cup corals identified within the proposed sand extraction area. *NIWA Client report 2024322WN prepared for McCallum Brothers Limited. Version 4*: pp 62.

Brook, F.J. (1982) The scleractian coral fauna of Rakitu Island, north-eastern New Zealand. *Tane*, 28: 163–173.

Cairns, S.D. (1995) The marine fauna of New Zealand: Scleractinia (Cnidaria: Anthozoa). New Zealand Oceanographic Memoir 103: 139. https://docs.niwa.co.nz/library/public/Memoir%20103_Scletactinia_of_New_Zealand%20-%201995.pdf

Caroselli, E., Gizzi, F., Prada, F., Marchini, C., Airi, V., Kaandorp, J., Falini, G., Dubinsky, Z., Goffredo, S. (2019) Low and variable pH decreases recruitment efficiency in populations of a temperate coral naturally present at a CO_2 vent. *Limnology and Oceanography*, 64: 1059–1069. doi:10.1002/4lno.11097

Cassarino, C., Manusco, A., Prada, F., Sani, T., Dall'Ara, S., Wallnoefer, O., Marchini, C., Tassi, F., Campanelli, A., Marini, M., Hammel, J.U., Kaandorp, J., Falini, G., Dubinsky, Z., Caroselli, E., Goffredo, S. (2025) Newly discovered CO2 (carbon dioxide) vent cave drives r-strategy shift in a Mediterranean aphotoendosymbiotic coral. *Science of the Total Environment*, 1005: 180858. doi.org/10.1016/j.scitotenv.2025.180585

Dennant, J. (1906) Madreporaria from the Australian and New Zealand coasts. *Transactions of the Royal Society of South Australia*, 30: 151–165.

Jacobs (2020) Pākiri Sand Extraction Consent Application- Water Quality Technical Report. Report No. IZ111900-NP-RPT-003, V2. Prepared for McCallum Brothers Limited, August 2020 299.

Kerr, V.C., Grace, R. (2016) Three Mile Reef, Bream Bay: A photographic survey. Kerr and Associates: pp 24.

Marchini, C., Prada, F., Caroselli, E., Gizzi, F., Airi, V., Palaček, D., Destefani, I.Z., Manusco, A., Valdrè, U., Falini, G., Dubinsky, Z., Goffredo, S. (2025) Increasing acidification does not affect sexual reproduction of a solitary zooxanthellate coral transplanted at a carbon dioxide vent. *Limnology and Oceanography*, 70: 1666–1677. doi:10.1002/lno.70072

Sentoku, A., Tokuda, Y., Ezaki, Y., Webb, G.E. (2017) Modes of regeneration and adaptation to soft-botom substrates of the free-living solitary scleractinian *Deltocyathoides orientalis*. *Lethaia*, 51: 102–111. 10.1111/let.12228

West, S., van Winkel, D. (2025) Assessment of Ecological Effects. Report for McCallum Bros Limited. Version 6.3: pp 120.

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12 August 2026