Australian Government
Department of Climate Change, Energy, the Environment and Water

MS25-000049

To: Minister for the Environment and Water (For Decision)

NOTIFICATION OF PROPOSED DECISION - RECONSIDERATION OF REFERRAL DECISION: MARINE FARMING EXPANSION, MACQUARIE HARBOUR, TASMANIA (EPBC 2012/6406)

Timing: No specific statutory timeframe – a decision is required as soon as practicable after the end of the section 78B stakeholder comment period

Recommendation as to proposed decision for notification purposes	The department recommends that you notify the marine farm operators of your proposed decision on the reconsideration. The proposed decision that is the subject of the recommended notification is to revoke the original decision in accordance with section 78(1) of the EPBC Act and substitute it with a new Controlled Action decision made under section 75 of the EPBC Act that specifies the controlling provisions below. Notification of marine farmers will allow you to receive and consider additional information and submissions from the marine farmers for the purposes of making a final decision before any decision is made.	
Recommended controlling provisions identified for the purpose of notification of a proposed decision	World Heritage values of a declared World Heritage property (sections 12 and 15A)	Yes
	National Heritage values of a national heritage place (sections 15B and 15C)	Yes
	Wetlands of international importance (sections 16 and 17B)	No
	Listed threatened species and communities (sections 18 and 18A)	Yes
	Listed migratory species (sections 20 and 20A)	No
	Nuclear Actions (sections 21 and 22A)	No

	Commonwealth marine area (sections 23 and 24A)	No	
	Great Barrier Reef Marine Park (sections 24B and 24C)	No	
	Unconventional gas or large coal mining development with impact on water resources (sections 24D and 24E)	No	
	Commonwealth land (sections 26 and 27A)	No	
	Commonwealth heritage places overseas (sections 27B and 27C)	No	
	Commonwealth Actions (section 28)	No	
Public submissions	Yes	Number: 2,543 See **Attachments H1 to H4**	
Ministerial submissions	Yes	Who: The Hon Murray Watt - then Commonwealth Minister for Agriculture, Fisheries and Forestry The Hon Roger Jaensch - then Tasmanian Minister for Environment and Climate Change The Hon Nick Duigan – then Tasmanian Minister for Parks and Environment See **Attachments G1 to G3**	

Recommendations: **That you:**

1. **Consider** the information in this brief, including the draft Departmental Advice Report at **Attachment A** and all other attachments.

Considered / Please discus

2. **Note** that stakeholder consultation was undertaken from 1 December 2023 to 2 February 2024. All stakeholder submissions are at **Attachments F to I**.

Noted / Please discuss

3. **Note** that additional correspondence received by the Minister for the Environment and Water and the department relevant to the decision is at **Attachment K**.

Noted / Please discuss

4. **Agree** to notify the entities taking the action, Huon Aquaculture Group Pty Ltd (Huon), Tassal Operations Pty Ltd (Tassal) and Petuna Aquaculture Pty Ltd (Petuna) (collectively, the marine farm operators), as well as Salmon Tasmania as an industry body representing the three marine farm operators, of your intention to make a decision to revoke the original referral decision and substitute it with a new decision.

Agreed / Not agreed

If you agree to recommendation 4:

5. **Agree** to notify the marine farm operators and Salmon Tasmania of your proposed decision, being to revoke the original referral decision and to substitute the original referral decision with a new decision made under section 75 of the EPBC Act, that the action is a Controlled Action because the action has had, and is likely to have, a significant impact on:
   - the world heritage values of a declared World Heritage property (section 12 & section 15A);
   - the national heritage values of a National Heritage place (section 15B & section 15C); and
   - listed threatened species and communities (section 18 & section 18A).

Agreed / Not agreed

6. **Agree** that the reasoning in the draft Departmental Advice Report at **Attachment A** reflects your proposed reasoning for the decision you are notifying the marine farmers you propose to make.

Agreed / Please discuss

If you agree to recommendations 4, 5 and 6:

7. **Sign** the letters at **Attachments B1 to B4**, to provide the marine farm operators and Salmon Tasmania with notice of your proposed decision and invite comments for a period of 30 business days. Attachments to those letters will include:
   - the draft Departmental Advice Report at **Attachment A** and its attachments which includes all information relied on by the department in making its recommendation;
   - the department's summary of submissions received during the stakeholder consultation period at **Attachment F2**; and
   - all stakeholder submissions received at **Attachments G, H and I**, as well as additional correspondence relevant to the decision at **Attachment K**.

Signed / Not signed

8. **Sign** the letters at **Attachment B5 to B7** advising relevant Commonwealth and State Ministers that you have notified the marine farm operators and Salmon Tasmania of your proposed decision.

Signed / Not signed

Minister: **Date:**

Comments:

Clearing Officer:	Rachel Short	Branch Head, EAVTPAS, Nature Positive Regulation Division	Mob: s. 22(1)(a)(ii)
Contact Officer:	s. 22(1)(a)(ii)	Director, Tasmania Assessments, NPRD	Mob: s. 22(1)(a)(ii)
Date Cleared:	17.01.2025	Date sent to MO:	20.01.2025

PURPOSE

1. Between June and November 2023, you received three requests to reconsider a 2012 referral decision under section 78A of the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) for Marine Farming Expansion, Macquarie Harbour, Tasmania (EPBC 2012/6406) (the original decision).

2. The reconsideration requests were received from the following parties (collectively, the requestors):

   a) the Australia Institute on 8 June 2023 (**Attachment D1**) with further information received on 31 July 2023 (**Attachment D2**);

   b) Fitzgerald and Browne Lawyers on behalf of the Bob Brown Foundation Inc on 25 July 2023 (**MS23-002605**); and

   c) the Environmental Defenders Office, on behalf of the Australian Marine Conservation Society and Humane Society International Australia, on 23 August 2023 (**Attachment D4**) with another letter received on 20 September 2023 (**Attachment D5**) and further information received on 20 November 2023 (**Attachment D6**).

3. The requestors seek your reconsideration of the original decision – that the action is not a controlled action provided it is undertaken in the particular manner set out in the decision notice (NCA-PM) – on the basis that:

   a) revocation and substitution is warranted by the availability of substantial new information about the impacts that the action has or will have, or is likely to have, on matters protected by a provision of Part 3 of the EPBC Act, in accordance with section 78(1)(a) (all reconsideration requests);

   b) revocation and substitution is warranted by a substantial change in circumstances that was not foreseen at the time of the original decision and relates to the impacts that the action has or will have, or is likely to have on matters protected by a provision of Part 3 the EPBC Act, in accordance with section 78(1)(aa) (all reconsideration requests); and

   c) the Minister should be satisfied that the action is not being, or will not be, taken in the manner identified in the NCA-PM decision notice for the original decision, in accordance with section 78(1)(b) (the reconsideration request made on behalf of the Bob Brown Foundation Inc).

      i) for completeness, the department notes that the issue of compliance with the particular manner requirements is also raised in the reconsideration request made on behalf of the Australian Marine Conservation Society and the Humane Society International Australia, but is not included in that request as a proposed basis for reconsideration of the original decision.

4. The department has considered the information currently before you and based on that information, considers that it is open to you to find that there is substantial new information about the impacts of the action on protected matters for the purposes of section 78(1)(a). The department also considers that, based on the information currently before you, it is open to you to find that there is information which demonstrates that there has been a substantial change in circumstances that relates to the impacts of the action on protected matters that was not foreseen at the time of the original decision for the purposes of section 78(1)(aa). This is described in the draft Departmental Advice Report at **Attachment A**.

5. The department recommends that you notify the marine farmers, as the entities taking the action, as well as Salmon Tasmania, as an industry body representing the three marine farm operators, of your intention to make a decision to revoke the original decision in accordance with section 78(1) of the EPBC Act and substitute it with a new Controlled Action decision made under section 75(1) of the EPBC Act.

KEY POINTS

Revocation and substitution is warranted under sections 78(1)(a) and (aa)

6. The department considers that, based on the information currently before you, it is open to you to find that there is substantial new information about the impacts of the action on protected matters for the purposes of section 78(1)(a). The department also considers that, based on the information currently before you, it is open to you to find that there is information which demonstrates that there has been a substantial change in circumstances that relates to the impacts of the action on protected matters that was not

foreseen at the time of the original decision for the purposes of section 78(1)(aa). This is described in the draft Departmental Advice Report at **Attachment A**.

7. The department considers that, based on the information currently before you, it is open to you to find that the action has had, and is likely to have, a significant impact on protected matters, namely, the endangered Maugean skate (*Zearaja maugeana*) and the World Heritage values and National Heritage values of the Tasmanian Wilderness World Heritage Area.

8. On this basis, the department currently considers that it is open to you to find that:

   a) revocation and substitution is warranted under section 78(1)(a) of the EPBC Act by the availability of substantial new information about the impacts the action has had, and is likely to have, on the Maugean skate and the World Heritage values and National Heritage values of the Tasmanian Wilderness World Heritage Area; and

   b) revocation and substitution is warranted under section 78(1)(aa) of the EPBC Act by a substantial change in circumstance that was not foreseen at the time of the original decision and which relates to the impacts the action has had, and is likely to have, on the Maugean skate and the World Heritage values and National Heritage values of the Tasmanian Wilderness World Heritage Area;

   c) when making a new decision under section 75(1) of the EPBC Act, the action should be determined to be a Controlled Action because the impact that the action has had, and is likely to have, on the Maugean skate and the World Heritage values and National Heritage values of the Tasmanian Wilderness World Heritage Area is significant; and

   d) when making a new decision under section 75(1), the controlling provisions that should be specified under section 75(1) are sections 12 and 15A (World Heritage values of a declared World Heritage property), sections 15B and 15C (National Heritage values of a national heritage place) and sections 18 and 18A (listed threatened species and communities).

9. Before making a decision under section 78C of the EPBC Act, the department recommends you provide the marine farm operators and Salmon Tasmania with notice of your intention to make a decision, and provide them with 30 business days to:

   i) consider the decision you propose to make and the proposed basis for that decision; and

   ii) provide further submissions, comment or additional information in relation to the proposed decision so that you consider them before making any decision.

10. In relation to the request for reconsideration made on the basis of section 78(1)(b) it is not currently proposed that circumstances relating to compliance with the particular manner requirements (being those relevant to the request for reconsideration made under section 78(1)(b)) would form the basis for reconsideration of the original decision. The department considers that, at present, it remains open to you to consider revocation and substitution of the original decision under sections 78(1)(a) or (aa) on the basis of the information that is currently before you.

BACKGROUND

11. On 3 October 2012, the Hon. Tony Burke MP, then Minister for Sustainability, Environment, Water, Population and Communities, determined that EPBC 2012/6406 Marine Farming Expansion, Macquarie Harbour is Not a Controlled Action provided it is undertaken in the particular manner set out in the decision notice (NCA-PM) for the purposes of the EPBC Act (**Attachments C1-C3**).

12. On 16 November 2016, the Hon. Josh Frydenberg MP, then Minister for the Environment and Energy, received a request for reconsideration of the EPBC 2012/6406 NCA-PM decision under section 78A of the EPBC Act. On 17 May 2018, a delegate of the Minister refused to proceed to consider the request on the basis that the action had been 'taken', noting section 78(3) of the EPBC Act (**Attachment J**).

    a) the department's view at that time was that the capital works described in the referral had been undertaken and that the action was fully operational. On this basis, the department considered the proposed action had been taken.

    b) on 6 July 2018, the Federal Court (Kerr J) published its decision in *Huon Aquaculture Group Limited v Minister for the Environment* [2018] FCA 1011. In this decision, Justice Kerr found that the action included the ongoing operations. The judgment concluded that the action has not been taken in relation to section 78(3).

Reconsideration requests

13. Between June and November 2023, you received three requests to reconsider the original decision under section 78A of the EPBC Act (**Attachments D1 to D6**).

14. All three requests seek reconsideration of the original decision on the grounds that there is substantial new information available under section 78(1)(a) of the EPBC Act and that there is a change in circumstances that was not foreseen at the time of the original decision under section 78(1)(aa) of the EPBC Act, with respect to the impacts of the action on matters protected by the EPBC Act, which include the Maugean skate and the listed national and world heritage values of the Tasmanian Wilderness World Heritage Area.

15. The Bob Brown Foundation also requests reconsideration on the grounds that the action is allegedly not being undertaken in the manner specified in the NCA-PM decision notice under section 78(1)(b) of the EPBC Act. The reconsideration requests made by the Environmental Defenders Office on behalf of the Australian Marine Conservation Society and Humane Society International Australia also request that the department investigate compliance with the particular manner requirements but do not expressly request reconsideration on this basis.

Reconsideration process

16. On 27 November 2023, your delegate noted that each of the three separate reconsideration requests for EPBC 2012/6406 Marine Farming Expansion, Macquarie Harbour met the relevant requirements of the EPBC Act and the *Environment Protection and Biodiversity Conservation Regulations 2000*, and therefore are valid requests under section 78A of the EPBC Act.

17. On 29 November 2023, you noted the proposed handling of the reconsideration requests and confirmed the department's recommendation that stakeholder consultation would

commence on 4 December 2023. You instructed the department to conclude the consultation period on 2 February 2024 [refer **MS23-002605**].

18. On 1 December 2023, the department commenced the consultation required under section 78B of the EPBC Act and sought comments from relevant Commonwealth and State Ministers (**Attachments E4–E6**). At the same time, in accordance with procedural fairness obligations, the marine farm operators were also informed of the requests and invited to comment and provide information (**Attachments E1-E3**). Your delegate also notified the organisations that submitted the requests of the upcoming public comment period (**Attachment E7-E9**).
19. A public notice was published on the department's website on 4 December 2023 inviting public submissions via the EPBC Act Public Portal until 2 February 2024 (**Attachment E10**).
20. The department agreed to accept late submissions from the public in response to a request from Tasmanian Senator Anne Urquhart, on behalf of members of the Strahan community who identified difficulties submitting through the EPBC Act Public Portal. Late submissions were also received from other members of the public. The department considered it appropriate in this instance to accept late public submissions on the basis that doing so would not delay the reconsideration process. A total of 20 late submissions were received – the latest late public submission was received on 3 April 2024.
21. The department received 2,551 stakeholder submissions. A register of stakeholder submissions can be found at **Attachment F1**.
22. The following stakeholder submissions were received:
    a) 2,543 **public submissions**, including:
        i) 32 community groups and organisations, Commonwealth and state agencies, elected representatives and industry representatives:
            - *Note*: one submission from the Australian Conservation Foundation included an additional 820 individual comments attached that are collectively counted as one submission (submission 2300 at **Attachment H2**);
            - one submission from the National Indigenous Australians Agency was provided in response to the delegate's invitation to the Minister for Indigenous Australians but was not a submission on behalf of the Minister (submission 2540 at **Attachment H4**);
            - one submission from the Director of Environment Protection Authority Tasmania was in response to the delegate's invitation to the Tasmanian Minister for Environment but was not a submission on behalf of the Minister (submission 2546 at **Attachment H4**);
        ii) 2,511 submissions from other individuals, comprising:
            - 1,429 unique submissions and 1,082 campaign submissions.
    b) three (3) **Minister submissions**:
        i) one from the relevant Commonwealth Minister, the Hon Murray Watt, then Commonwealth Minister for Agriculture, Fisheries and Forestry (see submission 2543 at **Attachment G1**)

ii) two from relevant state Ministers:

- one submission from Roger Jaensch, then Tasmania Minister for Environment (submission 2547 at **Attachment G2)**
- a supplementary submission from Nick Duigan, then Tasmania Minister for Environment (submission 2553 at **Attachment G3**);

c) five (5) submissions from the **marine farm operators** and **Salmon Tasmania**:

i) one submission each from the three marine farm operators (submissions 2544, 2545 and 2452 at **Attachments I1-I3**) – dated 2 February 2024;

ii) one submission from Salmon Tasmania on behalf of the marine farm operators (submission 2468 at **Attachment I4**) - dated 2 February 2024; and

iii) one supplementary submission from Salmon Tasmania on behalf of the marine farm operators (submission 2550 at **Attachment I5**) - dated 18 June 2024

23. A summary of the content of all stakeholder submissions referred to at paragraphs 21 and 22 can be found at **Attachment F2**.

24. The department also recommends that you consider additional correspondence relevant to the decision at **Attachment K**, received from a range of stakeholders outside the stakeholder consultation period and received by 31 December 2024, including:

a) correspondence to you (as the Minister for the Environment and Water) from:

i) Professor Barry Brook, chair of Environmental Sustainability, School of Natural Sciences, University of Tasmania (**Attachment K1**);

ii) Salmon Tasmania (**Attachments K8, K8.1 and K9**);

iii) A group of scientists (Frusher *et al*) (**Attachment K10**);

iv) Other individuals and organisations (**Attachment K13**);

b) correspondence to the Secretary of DCCEEW from Mr Jason Jacobi, the Secretary of the Department of Natural Resources and Environment Tasmania (**Attachments K2 and K3**); and

c) correspondence to the Prime Minister of Australia from:

i) the Hon Jeremy Rockliff, Premier of Tasmania, (**Attachments K4, K5, K5.1, K6 and K7**);

ii) four West Coast Tasmania Mayors (**Attachment K11**);

iii) marine farm operator (Huon, Tassal and Petuna) CEOs and Managing Directors (**Attachment K12**).

25. The department has assessed the reconsideration requests (**Attachment D**), the submissions received from the marine farm operators and Salmon Tasmania on behalf of the marine farm operators (**Attachment I**), relevant State and Commonwealth Ministers (**Attachment G**), the public (**Attachment H),** relevant additional correspondence (**Attachment K**) and other relevant information. The department's analysis is described in the draft Departmental Advice Report (**Attachment A**).

26. The Threatened Species Scientific Committee's draft EPBC Act threatened species listing assessment for the Maugean skate was released for public consultation on 15 August 2024 for 30 business days. Public consultation closed on 26 September 2024.

The department notes that information and submissions received as part of the TSSC listing assessment consultation process was considered for relevance to the present reconsideration process, where the information and/or submissions concerned matters relevant to the issues raised as part of the reconsideration. It was concluded that no further relevant information was provided in addition to that which had already been submitted through the reconsideration decision stakeholder consultation period or additional correspondence.

DEPARTMENTAL ADVICE

27. The draft Departmental Advice Report at **Attachment A** sets out the department's current analysis and recommendations, having assessed the available information relevant to the reconsideration of the original decision.

28. The draft Departmental Advice Report was drafted in consultation with the following areas within the department:

    a) Biodiversity Conservation Division and International Environment, Reef and Oceans Division – the Marine Species Conservation Section provided advice in relation to listed marine species, including the Maugean skate;

    b) Heritage Division – the Natural and First Nations Heritage Section provided advice in relation to listed World Heritage values and listed National Heritage values of the Tasmanian Wilderness World Heritage Area; and

    c) Environmental Permitting and Compliance Division – Compliance and Enforcement Branch provided advice in relation to compliance with the NCA-PM decision notice.

29. The department's current recommendation as set out in the draft Departmental Advice Report at **Attachment A** is that, based on the information currently available, it is open to you to be satisfied that the revocation and substitution of the original decision with a Controlled Action decision is warranted in accordance with ss 78(1)(a) and (aa). The department's current recommendation is that you specify sections 12 and 15A (World Heritage values of a declared World Heritage property), sections 15B and 15C (National Heritage values of a national heritage place) and sections 18 and 18A (listed threatened species and communities) as controlling provisions.

30. In making this recommendation the department notes that:

    a) there is substantial new information available about the impacts the action has had, and is likely to have, on the Maugean skate and the listed National and World Heritage values of the Tasmanian Wilderness World Heritage Area;

    b) there is information which the department considers demonstrates that there has been a substantial change in circumstances that was not foreseen at the time of the original decision in 2012 and which relates to the impacts the action has had, and is likely to have, on the Maugean skate and the listed National and World Heritage values of the Tasmanian Wilderness World Heritage Area;

    c) the information currently before you, including information submitted by the requestors, information received during the stakeholder consultation process and information the department has identified of its own initiative demonstrates that the grounds to revoke the original referral decision and substitute a new decision under section 78(1)(a) and 78(1)(aa) have been met, with the reasoning behind this conclusion detailed in the draft Departmental Advice Report at **Attachment A**.

i) the department notes that there is information before you which disagrees with this conclusion, which is also detailed in the draft Departmental Advice Report at **Attachment A**. This includes views and information submitted by the marine farmers and Salmon Tasmania, Commonwealth and State Ministers, the Premier of Tasmania, Secretary of NRE Tasmania, state government agencies and elected representatives, industry groups and individuals (see **Attachments F, G, H, I, and K**);

ii) the department confirms its view that, having taken this information into account, its recommendation remains that revocation and substitution is warranted;

d) it is presently not proposed that section 78(1)(b) would form the basis for reconsideration of the original decision. In this respect, the department notes:

i) a compliance investigation undertaken to assess if the action was undertaken in the manner specified in the NCA-PM decision notice, was recently completed; and

ii) a further compliance investigation and site inspection undertaken in response to submissions received during public consultation with respect to compliance with the particular manner requirements relating to biofouling and marine debris was recently completed, with the outcome of the investigation being that no evidence of biofouling or marine debris was observed during the compliance inspection.

iii) It is the department's view that operations in Macquarie Harbour were being conducted in a manner consistent with the action's particular manners.

e) the information currently before you indicates that the action has had, and is likely to have, significant impacts on the following protected matters, and therefore should be determined a Controlled Action and undergo further assessment and approval under the EPBC Act:

i) Maugean skate (listed threatened species sections 18 and 18A); and

ii) Tasmanian Wilderness World Heritage Area (World Heritage property sections 12 and 15A and National Heritage Place sections 15B and 15C).

31. The department notes that if you were ultimately to decide to revoke the original decision and substitute it with a Controlled Action decision, the impacts of the action will be required to be the subject of an assessment in accordance with Part 8 of EPBC Act.

MARINE FARM OPERATORS

32. If, following consultation with the marine farm operators you were to ultimately decide to proceed to revoke the original decision and substitute a new Controlled Action decision, the marine farm operators will contravene section 74AA and Part 3 of the EPBC Act if they continue to take the referred action without approval for the action having been granted.

a) under section 74AA of the EPBC Act, it is an offence to take an action that is the subject of a referral while the decision-making process for the referral of the action is ongoing. The offence provision in section 74AA would likely apply to the marine farm operators if they were to continue their marine farming operations in Macquarie Harbour after a Controlled Action decision was made and prior to the making of any further decision approving the taking of the Controlled Action. The maximum penalty for an offence under section 74AA is 500 penalty units.

b) Part 3 of the EPBC Act contains civil penalty and criminal offence provisions which prohibit actions which have a significant impact on a matter of national environmental significance without approval from the Minister or a decision that the relevant provisions are not controlling provisions. A breach of Part 3 could result in a civil penalty (up to 50,000 penalty units for a body corporate) or criminal penalty (up to 2,100 penalty units for a body corporate). If such conduct affects several different protected matters, there may be multiple contraventions.

PROPOSED HANDLING

Consultation with marine farm operators and Salmon Tasmania

33. If you agree with the currently recommended decision and the department's reasoning for the recommended decision, the department recommends that you provide notice of your intention to make a decision and invite comments from the marine farm operators (**Attachments B1 to B3**) and Salmon Tasmania (**Attachment B4**). This notification will allow the receipt and consideration by you of additional information before you make a decision, to ensure you afford sufficient procedural fairness.

34. This opportunity should be afforded to the marine farm operators because their interests are likely to be adversely affected by the decision that has been recommended. As the entities taking the action that is the subject of the referral, the marine farm operators have unique and significant commercial interests which would be adversely affected by a decision to revoke and substitute the original decision with a Controlled Action decision.

35. Additionally, an opportunity to comment on the notice of your intention to make a decision should also be afforded to Salmon Tasmania, in circumstances where Salmon Tasmania is the industry body that represents the marine farm operators, including in relation to the reconsideration. In this respect, the department notes in its submission made during public consultation, Salmon Tasmania stated, "[t]*his submission has been prepared by Salmon Tasmania on behalf of our members, the major operators in Macquarie Harbour, being Petuna Aquaculture, Tassal Operations and Huon Aquaculture*" (see **Attachment I4**).

36. The EPBC Act does not expressly require you to provide this further opportunity to the marine farm operators (as the persons taking the action) or Salmon Tasmania (as an industry representative who has made submissions on behalf of the persons taking the action). However, the common law requirements of natural justice require you to give the marine farm operators and their industry body a sufficient natural justice opportunity in circumstances where the current proposed decision would be adverse to their interests, and accordingly, it is appropriate to allow marine farm operators and Salmon Tasmania an opportunity to provide any further comments, information or submissions in relation to your proposed decision for you to consider before making a decision.

37. Procedural fairness requires two things:

    a) the person affected by the decision must be (the hearing rule):

        i) given notice that a potential adverse decision may be made; and

        ii) provided with the information that may be relied upon in relation to the decision that may be made; and

iii) provided with an opportunity to present their case prior to any decision being made and for that case to be considered; and

b) the decision maker must be impartial and not pre-judge the decision (the bias rule).

38. The department considers that 30 business days is an appropriate period, given the complexity and size of the draft Departmental Advice Report, and submissions. A period less than 30 business days may not provide the marine farm operators and Salmon Tasmania with a sufficient opportunity to prepare information or submissions to present their case.

39. The reconsideration requests and scientific material accompanying the requests relied on in the draft Departmental Advice Report at **Attachment A** were provided to the marine farm operators on 1 December 2023. The marine farm operators and Salmon Tasmania commented on this information (see **Attachments I1-I5**), which the department has taken into consideration.

40. The draft Departmental Advice Report at **Attachment A** also refers to additional new information, which the department has identified of its own initiative and has relied upon in making its recommendation in relation to the proposed decision. This additional new information has been referenced in the draft Departmental Advice Report because the department considers that the information is relevant to making your decision on reconsideration. The draft Departmental Advice Report provides an adequate summary of all the information relied upon (including submissions, as well as this additional new information) when making the recommendation. The department will also provide this additional information to the marine farm operators and Salmon Tasmania.

41. The department therefore recommends that you:

a) provide notice of your intention to make a decision by way of a letter. The department has drafted letters to the marine farm operators (**Attachments B1 to B3**) and Salmon Tasmania (**Attachment B4**) for this purpose;

b) provide the marine farm operators and Salmon Tasmania with copies of the following, for their consideration and further comment:

i) the original decision (**Attachment C**);

ii) the reconsideration requests (**Attachment D**);

iii) the draft Departmental Advice Report (**Attachment A**) which includes all information relied on by the department in making its recommendation;

iv) the department's summary of stakeholder submissions (**Attachment F2**); and

v) all submissions received as part of the consultation process (**Attachments G, H and I),** as well as additional correspondence relevant to the decision (**Attachment K**); and

c) request the marine farm operators and Salmon Tasmania provide any comments within 30 business days:

i) the department notes it is open to the marine farm operators and Salmon Tasmania to request an extension if they consider more time is required.

Notifying relevant Commonwealth and State Ministers

42. The department recommends you advise the following Commonwealth and State Ministers that you have notified the marine farm operators and Salmon Tasmania of your proposed decision, as interested parties:

    a) the Commonwealth Minister for Agriculture, Fisheries and Forestry

    b) the Commonwealth Minister for Indigenous Australians

    c) the Tasmanian Minister for the Environment, cc:

        i) Department of Natural Resources and Environment Tasmania

        ii) EPA Tasmania

43. The department has drafted letters to the above Ministers for this purpose (**Attachments B5 to B7**).

OPTIONS OPEN TO MARINE FARM OPERATORS

44. The department notes that the matters outlined in paragraphs 45 to 51 are not relevant matters for you to have regard to as part of the reconsideration process under s 78(1) and 78C. The information below is provided for your awareness only.

Extension of time to comment

45. One or more of the marine farm operators may seek an extension of time to comment. If an extension is requested, the department would engage with your office to determine if an extension should be granted, and any additional timeframe.

Exemption application under section 158 (a 'National Interest Exemption')

46. It is open to one or more of the marine farm operators to submit an application for an exemption under section 158 of the EPBC Act. In considering such an application, you would need to be satisfied that exempting the action from the relevant provisions of the EPBC Act is in the national interest.

47. The department considers it likely an exemption may be sought in anticipation of a final reconsideration decision to revoke the current NCA-PM and substitute with a Controlled Action decision. The likely practical outcome of a Controlled Action decision would be to stop the action in Macquarie Harbour.

48. An exemption request could be sought to support various scenarios, including:

    a) decommissioning as soon as practicable (removing fish and fish pens and ceasing all marine farming activities);

    b) decommissioning in a controlled manner over a specified period of time, for example when fish currently in Macquarie Harbour conclude their growth cycle; or

    c) continuation of the action either at the current or a lower stocking rate, during the period of an assessment, or ongoing.

Vary the referral, withdraw the referral or submit a new referral

49. The successor to DPIPWE (currently the Tasmanian Department of Natural Resources and Environment), as the entity that made the original referral, may request to **vary** the action under section 156A of the EPBC Act. For example, the marine farm operators

could seek to vary the referral to exclude or remove those activities that have already been undertaken or describe a new way they intend to undertake the action:

a) a request to vary the action cannot be made if a valid NCA-PM decision is in place. Therefore, this option is only available if the NCA-PM is revoked and replaced with a Controlled Action decision.

50. Either the successor to DPIPWE, as the entity that made the original referral, or the marine farm operators, as the persons taking the action the subject of the original referral, may seek to **withdraw** the 2012 referral under section 170C of the EPBC Act at any time, including prior to you making your final decision on the reconsideration. It is open to the marine farm operators, as the persons named in the decision notice as proposing to take the action referred under section 69, to withdraw an action after an NCA-PM decision has been made and the action has been partially taken. The marine farm operators may also choose to cease undertaking the action.

51. Either the successor to DPIPWE, as the entity that made the original referral, or the marine farm operators, as the persons taking the action the subject of the original referral, may consider withdrawing the 2012 referral pursuant to section 170C of the EPBC Act (see paragraph 45) and **submitting a new referral** under section 68 of the EPBC Act. The timing of a new referral is dependent on the referred action, for example:

a) a referral for a different action, such as decommissioning activities, can be submitted at any time, including prior to your final decision; or

b) a referral for parts of the referred action, such as ongoing operations, is not likely to be submitted unless the current NCA-PM decision is revoked. Referring an action that has already commenced, and is not covered by an existing NCA, NCA-PM or approval may result in breaches of section 74AA.

NEXT STEPS

52. If you agree with the department's recommendations, the department will:

a) engage with your office to distribute the notice of proposed decision letters at **Attachments B1 to B7** to the marine farm operators, Salmon Tasmania and Commonwealth and State Ministers; and

b) provide guidance to the marine farm operators and Salmon Tasmania on their responsibilities under the EPBC Act.

53. Without prejudice to the nature of your decisions, the department will develop, in consultation with your office, any communications and stakeholder engagement products that may be required, if you intend to distribute notice of proposed decision letters.

54. It is noted that if you agree with the department's recommendation to provide the marine farm operators an opportunity to be heard in relation to the decision you currently propose to make, marine farming operations can continue under the existing NCA-PM during that time.

Final decision

55. After receiving and considering any submissions and information from marine farm operators the department will finalise a Departmental Advice Report and prepare a final decision recommendation for your consideration.

56. If your final decision was to revoke the original decision and substitute with a Controlled Action decision, you would also be required to designate a proponent at the same time as that determination:

    a) the department would provide advice to you as to designated proponent options, if required, as part of any decision brief. The department notes its proposal, reflected in the enclosed draft letters to the marine farm operators, that the marine farm operators be consulted now as to the appropriate process for designating a proponent for the purposes of any assessment process;

    b) at that time, you will be required to provide notification of your final decision to the requestors, and the parties undertaking the action (marine farm operators);

    c) a reconsideration decision notice would also be published on the department's website and made public, when a final decision is made.

Alternate reconsideration decision

57. It is open to you to form a different view to the department's recommendations that are set out in this briefing package, including in relation to the department's reasoning in the draft Departmental Advice Report at **Attachment A**. If you choose not to proceed as currently recommended, the department will engage with your office and provide advice accordingly.

MANDATORY DEPARTMENTAL SUBMISSION HEADINGS

Data referenced: see attachment list for data sources

Consultation: YES

58. Biodiversity Division, Heritage Division, International Environment, Reef and Ocean Division (IEROD), and Environmental Permitting and Compliance Division were consulted in the preparation of this brief including advice described in the draft Departmental Advice Report at **Attachment A**. Heritage Division and IEROD both assisted by providing advice which was used in drafting the draft Departmental Advice Report, by providing expertise and technical input throughout the drafting process and also reviewing the draft Departmental Advice Report on multiple occasions to ensure its accuracy. IEROD also provided newly published research on the Maugean skate throughout the drafting process.

59. Legal Division, an external legal adviser, Clayton Utz, and Counsel engaged on behalf of the department (Stephen Lloyd SC and Matt Sherman) were consulted on handling and regulatory process, including earlier drafts of this brief, the draft Departmental Advice Report and other attachments, the notice of proposed decision letters (**Attachment B**) and the department's summary of all stakeholder submissions (**Attachment F2**).

Legal advice / Legislative impacts:

60. Legal advice is provided separately and should be considered prior to reviewing this briefing package – see **MS25-000007**.

Financial impacts: Nil

Media and communication opportunities:

61. Communication and media products and handling will be discussed with your office, separately.

Opportunities for First Nations people and their communities: Nil

Attachments

A.	**Draft Departmental Advice Report**
B.	**'Notice of proposed decision' – Letters to marine farm operators** **B1** Notice of proposed decision letter to Huon Aquaculture **B2** Notice of proposed decision letter to Tassal Operations **B3** Notice of proposed decision letter to Petuna Aquaculture **Notice of proposed decision' – Letter to Salmon Tasmania** **B4** Notice of proposed decision letter to Salmon Tasmania **Letters to Commonwealth Ministers** **B5** Notice of proposed decision letter to Minister for Agriculture, Fisheries and Forestry **B6** Notice of proposed decision letter to Minister for Indigenous Australians **Letter to State Minister** **B7** Notice of proposed decision letter to Minister for Environment Tasmania cc to: Department of Natural Resources and Environment Tasmania; and Tasmania EPA
C.	**2012 Original Referral Decision** **C1** Original referral decision notice – signed 3 October 2012 **C2** Original referral decision brief cover page – signed 3 Oct 2012 **C3** Original referral decision brief - unsigned
D.	**Requests for reconsideration - 2023** **D1** Reconsideration request from The Australia Institute – dated 8 June 2023 **D1.1** Moreno and Semmens 2023: *Interim report – Macquarie Harbour Maugean skate population status and monitoring* **D1.2** Moreno et al. 2022: *Application of environmental DNA to survey Bathurst Harbour (Tasmania) for the Endangered Maugean Skate (*Zearaja maugeana*)* **D1.3** Conservation Advice for the Maugean skate (September 2023) **D1.4** Tasmanian Threatened Species Listing Statement: *Zearaja maugeana* – Maugean skate – December 2022 **D1.5** 2016 Tasmanian Wilderness World Heritage Area Management Plan **D1.6** 2015 Senate Environment and Communications References Committee on Regulation of the fin-fish aquaculture industry in Tasmania **D1.7** Ross et al. 2020: Understanding oxygen dynamics and the importance for benthic recovery in Macquarie Harbour **D2** Further information from The Australia Institute – dated 31 July 2023

	D2.1 Ross et al 2016: *Understanding the ecology of Dorvilleid polychaetes in Macquarie Harbour* **D2.2** Moreno et al. 2020: *Vulnerability of the endangered Maugean skate population to degraded environmental conditions in Macquarie Harbour* **D2.3** Ross and MacLeod 2017: *IMAS Technical Report on Macquarie Harbour Condition* **D2.4** Wild-Allen et al 2020: *Macquarie Harbour Oxygen Process model* **D3** Reconsideration request from Fitzgerald and Browne Lawyers on behalf of the Bob Brown Foundation Inc – dated 25 July 2023 **D3.1** Moreno and Semmens 2023: *Interim report – Macquarie Harbour Maugean skate population status and monitoring* **D3.2** EPBC2012-6406 referral decision notice **D3.3** Moreno et al. 2020: *Vulnerability of the endangered Maugean skate population to degraded environmental conditions in Macquarie Harbour* **D4** Reconsideration request from The Environmental Defenders Office on behalf of the Australian Marine Conservation Society and Humane Society International Australia – dated 23 August 2023 **D4.1** Moreno and Semmens 2023: *Interim report – Macquarie Harbour Maugean skate population status and monitoring* **D4.2** Moreno et al. 2022: *Application of environmental DNA to survey Bathurst Harbour (Tasmania) for the Endangered Maugean Skate (*Zearaja maugeana*)* **D4.3** Wild-Allen et al. 2020: *Macquarie Harbour Oxygen Process model* **D4.4** Tasmania EPA 2017: *Macquarie Harbour Tasmanian Wilderness World Heritage and Environmental Status Report, May 2017* **D4.5** Bell et al. 2016: *Movement, habitat utilisation and population status of the Endangered Maugean skate* **D4.6** Moreno et al. 2020: *Vulnerability of the endangered Maugean skate population to degraded environmental conditions in Macquarie Harbour* **D4.7** EPBC Significant Impact Guidelines 1.1 **D5** Additional letter from Environmental Defenders Office – 20 September 2023 **D6** Further information from The Environmental Defenders Office – dated 20 November 2023 **D6.1** Letter from The Environmental Defenders Office – dated 23 August 2023 **D6.2** Letter from The Environmental Defenders Office - dated 20 September 2023 **D6.3** The Environmental Defenders Office letter to NRE - dated 8 November 2023 **D6.4** The Environmental Defenders Office letter to Hydro Tasmania – dated 8 November 2023 **D6.5** Ridgway and Ling 2023: *Three decades of variability and warming of nearshore waters around Tasmania* **D6.6** Conservation Advice for the Maugean skate (September 2023)
E.	**Department consultation notices** **E1** Department consultation letter to Huon Aquaculture - signed 30 November 2023

	E2 Department consultation letter to Tassal Operations - signed 30 November 2023 **E3** Department consultation letter to Petuna Aquaculture - signed 30 November 2023 **E4**: Department consultation letter to then Minister for Agriculture, Fisheries and Forestry - signed 30 November 2023 **E5** Department consultation letter to then Minister for Indigenous Australians - signed 30 November 2023 **E6** Department consultation letter to then Minister for Environment and Climate Change Tasmania - signed 30 November 2023 **E7** Department consultation letter to Australia Institute - signed 30 November 2023 **E8** Department consultation letter to Fitzgerald and Browne Lawyers on behalf of the Bob Brown Foundation Inc - signed 30 November 2023 **E9** Department consultation letter to Environmental Defenders Office on behalf of the Australian Marine Conservation Society and Humane Society International Australia - signed 30 November 2023 **E10** Consultation public notice – 4 December 2024
F.	**Consultation outcomes – submissions** **F1** Register of all stakeholder submissions **F2** Summary of all stakeholder submissions
G.	**Commonwealth and State Minister submissions** **G1** Submission 2543 from then Commonwealth Minister for Agriculture, Fisheries and Forestry – dated 2 February 2024 **G2** Submission 2547 from then Tasmanian Minister for Environment and Climate Change – dated 2 February 2024 **G3** Supplementary submission 2551 from then Tasmanian Minister for Parks and Environment – dated 16 October 2024.
H.	**Public submissions** **H1** Public submissions received through the portal **H2** Attachments to public submissions received through the portal **H3** Public submissions made directly to the Minister **H4** Public submissions made directly to the department
I.	**Marine farm operators and Salmon Tasmania submissions** **I1** Submission 2544 from Huon Aquaculture – dated 2 February 2024 **I2** Submission 2545 from Tassal Operations – dated 2 February 2024 **I3** Submission 2452 from Petuna Aquaculture – dated 2 February 2024 **I4** Submission 2468 from Salmon Tasmania – dated 2 February 2024 **I5** Supplementary submission 2550 from Salmon Tasmania – dated 18 June 2024 **I5.1** Attachment: Marine Solutions Report 2024
J.	**2018 Reconsideration brief** – signed 17 May 2018
K.	**Additional Correspondence from various stakeholders – to 31 December 2024** **K1** Professor Barry Brook – dated 2 September 2024

	K2 The Secretary of Department of Natural Resources and Environment Tasmania to Secretary of DCCEEW - dated 12 November 2024 **K2.1** Attachment 1: IMAS 2024 interim report *Moreno et al.* 2024 **K2.2** Attachment 2: Revised risk assessment (Nov 2024) **K3** The Secretary of Department of Natural Resources and Environment Tasmania to Secretary of DCCEEW - dated 6 December 2024 **K4** Tasmanian Premier to the PM – dated 16 September 2023 **K5** Tasmanian Premier to the PM– dated 8 February 2024 **K5.1** Attachment: West Coast Salmon – Social and economic impact of ceasing salmon production in Macquarie Harbour **K6** Tasmanian Premier to the PM – dated 26 August 2024 **K7** Tasmanian Premier to the PM – dated 29 November 2024 **K8** Salmon Tasmania – dated 30 September 2024 **K8.1** Attachment: Salmon Tasmania submission to TSSC uplisting consultation **K9** Salmon Tasmania – dated 6 November 2024 **K10** Group of scientists, Frusher *et al* – dated 21 October 2024 **K11** Four West Coast Tasmania Mayors to the PM – dated 12 December 2024 **K12** Marine farm executives to the PM – dated 20 December 2024 **K13** Additional correspondence from a range of stakeholders received to 31 December 2024

Australian Government

Department of Climate Change, Energy, the Environment and Water

Departmental Advice Report (Draft)

Reconsideration of referral decision:

EPBC 2012/6406 - Marine farming expansion, Macquarie Harbour, Tasmania

17 January 2025

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List of Figures

1. Summary of Recommendations

1. The department considers that the information before you (Minister for the Environment and Water) is sufficient for you to be satisfied that the decision made on 3 October 2012, that the action described in EPBC Referral 2012/6406 is not a controlled action if undertaken in a particular manner (NCA-PM decision), should be revoked and substituted with a new decision that the action is a controlled action and that sections 12, 15A, 15B, 15C, 18 and 18A of the EPBC Act are the controlling provisions for the action.

2. For the reasons set out in this document, the department makes the following recommendations:

   a. **revocation and substitution is warranted under section 78(1)(a)**

   Based on the information before you, you can be satisfied that the revocation of the NCA-PM decision and substitution of a new decision is warranted by the availability of substantial new information about the impacts the action has had, and is likely to have, on the Maugean skate (*Zearaja maugeana*) (listed Endangered) and the World Heritage listed and National Heritage listed Tasmanian Wilderness, in accordance with section 78(1)(a) of the EPBC Act. Having regard to the information before you, the department considers that it would be open to you to make a decision pursuant to section 78(1)(a) to substitute the NCA-PM decision with a new decision that the action is a controlled action, in which sections 12, 15A, 15B, 15C, 18 and 18A are the controlling provisions for the action.

   b. **revocation and substitution is also warranted under section 78(1)(aa)**

   Based on the information before you, and separately to the above recommendation in relation to section 78(1)(a), you can also be satisfied that the revocation of the NCA-PM decision and substitution of a new decision is warranted by a substantial change in circumstances that was not foreseen at the time of the NCA-PM decision which relates to the impacts the action has had, and is likely to have, on the Maugean skate and the values of the World Heritage and National Heritage listed Tasmanian Wilderness, in accordance with section 78(1)(aa) of the EPBC Act. Having regard to the information before you, the department considers that it would be open to you to make a decision pursuant to section 78(1)(aa) to substitute the NCA-PM decision with a new decision that the action is a controlled action, in which sections 12, 15A, 15B, 15C, 18 and 18A are the controlling provisions for the action.

3. Based on the information currently before the department, the department does not currently propose that the circumstances outlined in section 78(1)(b) would form the basis for revocation and substitution of the NCA-PM decision.

2. Background

2.1. Description of the Environment

2.1.1. Macquarie Harbour and water circulation patterns

4. The unique nature and hydrology of Macquarie Harbour in Tasmania is described in the following paragraphs in this Section (section 2.1.1.) The information in this subsection is taken largely from the department's approved 6 September 2023 Conservation Advice for *Zearaja maugeana* (Maugean skate) (**MS Conservation Advice 2023**).

5. Macquarie Harbour is a large fjord-like estuary system characterised by a shallow sill (submerged sand bar) at the mouth, opening into a long deep basin with a strongly stratified water column (distinct layers of saline, semi-saline (estuarine) and fresh water). Macquarie Harbour is oriented in a north-west by south-east direction (see Figure 1), is approximately 33 km long and 9 km wide, has an average depth of 15 m, a maximum depth of 55 m and a surface area of approximately 281 km2.

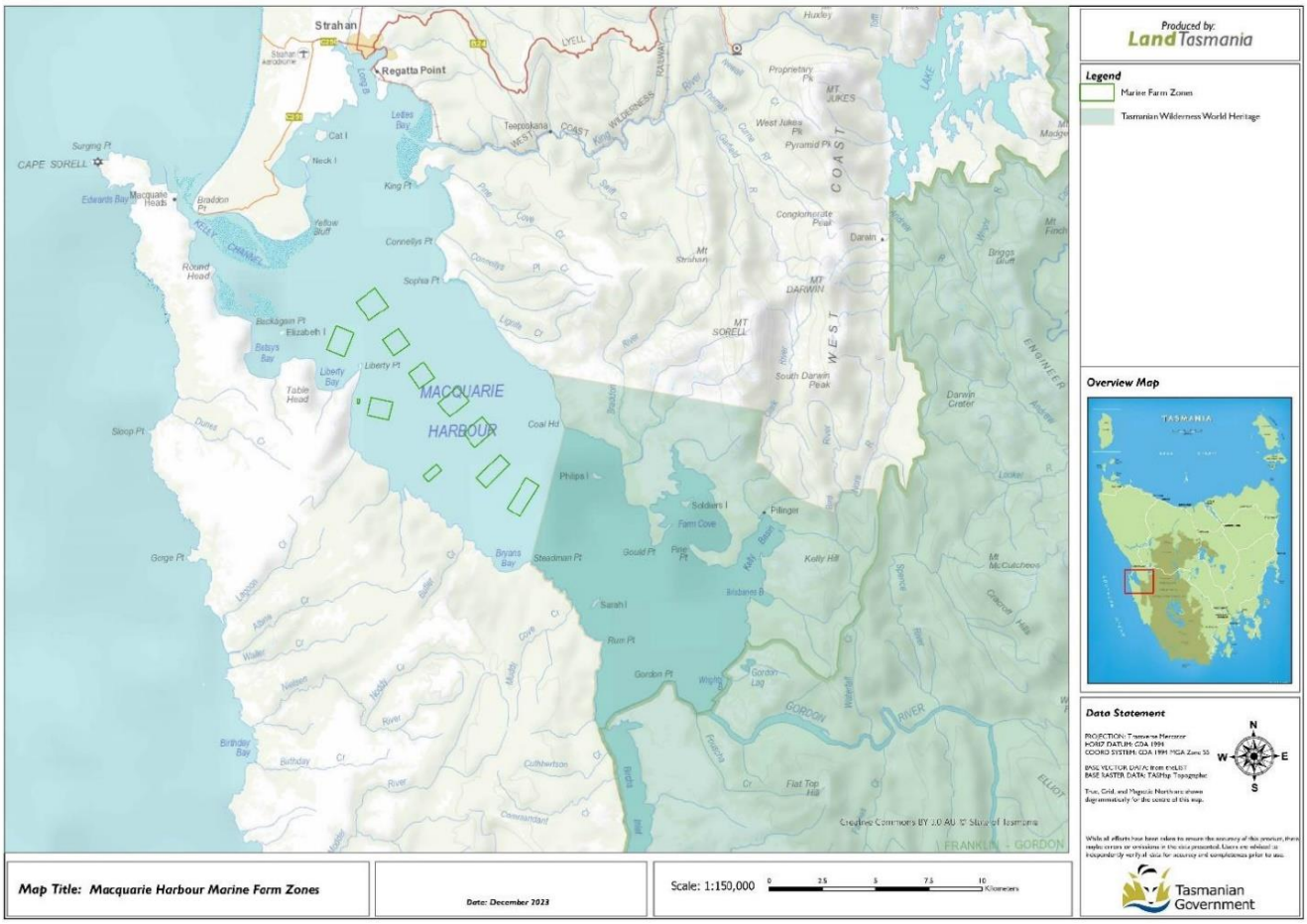

Figure 1: Macquarie Harbour, Tasmania, including delineation of Tasmanian Wilderness World Heritage Area and location of marine farm leases. Map sourced from the NRE Tas Submission (Attachment C02.1).

6. As is common with fjord-like estuaries, Macquarie Harbour is a naturally low dissolved oxygen (**DO**) environment due to the narrow shallow sill and long residence time of deep basin waters (commonly over 100 days). The DO dynamics of Macquarie Harbour are complex, and due to the highly stratified nature of Macquarie Harbour, vary significantly with depth. There are three main stratification layers to the water column (see also Figure 2):

   a. top water layer (0-10 m) - dark, tannin-rich freshwater which limits light penetration and therefore phytoplankton growth. Highly oxygenated (generally greater than 90% saturation) due to surface mixing, with a short residence time, seasonal temperature variation.

   b. middle water layer (around 10-20 m) - naturally oxygen-depleted (generally around 40-50% saturation); brackish water with the lowest rate of mixing, minimal temperature variation.

   c. bottom water layer (greater than around 20 m) - naturally richer in oxygen than the mid-waters due to deep water oceanic renewal, however in recent years this has been less prominent. High salinity level (close to oceanic), stable temperatures; long residence time, meaning that oxygen has more time to become depleted.

7. Stratification layers refer to the zones within the water column (Figure 2). There are typically three layers, however depending on the depth of the harbour floor, all three layers may not be present. For example, if the depth of the harbour is shallow (e.g. 8 m), only the shallow, upper stratified layer would be present. Given the natural variability in water depth across Macquarie Harbour, the level of stratification similarly varies.

8. The Maugean skate is a benthic-dwelling species, which means it spends much of its time on or just above the harbour floor in the “bottom layer” (hereafter referred to as the benthic environment). Maugean skate is known to be found throughout the harbour at varying water depths.

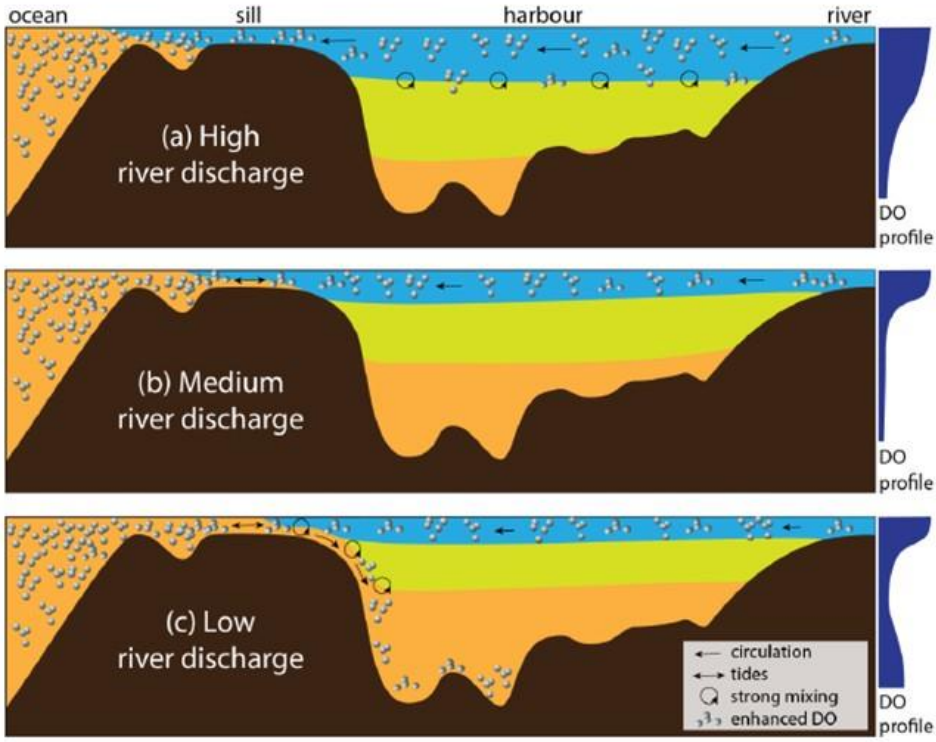

Figure 2: Schematic representation of physical processes operating in Macquarie Harbour under a range of river discharge conditions. Typical forms of the associated DO profiles are shown along the right hand side. This figure is sourced from the Macquarie Harbour Dissolved Oxygen Working Group report, October 2014.

9. Ocean ingress and deep-water ocean renewal is considered a major contributor of oxygen replenishment in fjord-like estuaries. In Macquarie Harbour the presence of a long shallow channel leading to the mouth of the harbour (10 - 12 km long and less than 10 m deep in most places), restricts tidal mixing and reduces exchange with oceanic marine waters.

10. Deep water oceanic renewal events are driven by atmospheric and tidal conditions, low freshwater flows and strong north-westerly winds. These processes bring oxygen-rich ocean water over the sill and into the basin, replenishing deep water oxygen levels (see Figure 2). The magnitude of oceanic deep water renewal events is negatively correlated with freshwater river flows, in that larger river flow inhibits oceanic inflow (see Figure 2). Smaller oceanic deep water renewal events are relatively common, especially in summer months when river flows are naturally lower. The larger oceanic deep water renewal events that transport volumes significant enough to relieve suboxic conditions in the upper reaches of Macquarie Harbour are uncommon and are currently estimated to occur only five to seven times per decade.

11. Two main rivers feed into Macquarie Harbour. The Gordon River mouth is at the southeast end of the harbour and the King River within the northeast region. River flow in the upper catchments of the Gordon and King Rivers have been regulated by hydroelectric dams since 1978 and 1992, respectively. Evidence suggests periods of low flow are important to allowing oceanic water inflow into the harbour. As such, hydroelectric dam releases during otherwise dry periods (which increase natural river flow) are likely to be of significance. Since 1978 the operation of the hydroelectric power station on the Gordon River has substantially modified river flow, to an extent that

ecological changes, such as reduction in the persistence of meromictic lakes (a type of lake where the layers of the water column do not intermix, creating different, unique habitat types within the same waterbody – such as Lake Fidler) associated with the Gordon River (within the World Heritage Area) are evident. The ecological integrity of these lakes relies on saltwater ingress into the Gordon River system which has been reduced due to unnaturally increased river flow preventing this ingress (Tyler et al. 2001). The impact, however, of hydroelectric damming of these rivers on the DO levels throughout Macquarie Harbour is unclear. Dissolved oxygen concentrations across the harbour were consistent from 1993 until 2009, although data collection only commenced after the dams were in operation.

12. The King River has poor water quality due to prolonged historical mining operations in the upper catchment, which resulted in high levels of heavy metal contamination, smelter slag and topsoil erosion being transported into Macquarie Harbour.

2.1.2. Tasmanian Wilderness / Tasmanian Wilderness World Heritage Area

13. The World and National Heritage listed Tasmanian Wilderness covers more than 1.58 million hectares, almost a quarter of the State of Tasmania. This is one of the world's largest and most spectacular temperate wilderness areas and a precious cultural landscape for Tasmanian Aboriginal people, who have lived there for approximately 40,000 years.

14. The Tasmanian Wilderness was inscribed on the World Heritage List in 1982 and included on the National Heritage List in 2007 (see Commonwealth, *Gazette Special*, No S 99, 21 May 2007 at Attachment F02.5). The property's World Heritage boundary was extended in 1989 to include the southeast portion of Macquarie Harbour. In 2023, the retrospective Statement of Outstanding Universal Value for the Tasmanian Wilderness was adopted by the World Heritage Committee. The property's World Heritage values correspond with its National Heritage values.

15. The Tasmanian Wilderness is World Heritage listed as a mixed cultural and natural heritage property and meets seven World Heritage criteria. These are described below.

2.1.2.1. Cultural heritage values justified under World Heritage criteria

a. *Criterion (iii): to bear a unique or at least exceptional testimony to a cultural tradition or to a civilization which is living or which has disappeared:*

   i) the Tasmanian Wilderness bears an exceptional testimony to the southernmost occupation by people during the Pleistocene period.

b. *Criterion (iv): to be an outstanding example of a type of building, architectural or technological ensemble or landscape which illustrates (a) significant stage(s) in human history:*

   i) the Tasmanian Wilderness is a diverse cultural landscape where Aboriginal people have managed and modified the landscape for approximately 40,000 years. Significant stages in human history, from the Pleistocene period to the arrival of Europeans, are illustrated through extensive and diverse Holocene shell middens, artefact scatters, as well as Aboriginal cultural heritage sites.

c. *Criterion (vi): to be directly or tangibly associated with events or living traditions, with ideas, or with beliefs, with artistic and literary works of outstanding universal significance:*

i) rock marking sites provide a tangible reflection of the beliefs and ideas of the southernmost people in the world during the Pleistocene, and of their descendants in later periods.

2.1.2.2. Natural heritage values justified under World Heritage criteria

a. *Criterion (vii): to contain superlative natural phenomena or areas of exceptional natural beauty and aesthetic importance:*

i) extensive and varied wilderness landscapes of exceptional aesthetic importance.

b. *Criterion (viii): to be outstanding examples representing major stages of earth's history, including the record of life, significant on-going geological processes in the development of landforms, or significant geomorphic or physiographic features:*

i) primitive relictual floral and faunal groups with strong New Zealand and Patagonian affinities provide living evidence of the previous existence of Gondwana, corroborating geological evidence within the same area.

c. *Criterion (ix): to be outstanding examples representing significant on-going ecological and biological processes in the evolution and development of terrestrial, fresh water, coastal and marine ecosystems and communities of plants and animals:*

i) the property's great size and wilderness character enable significant natural, biological, and geomorphological processes to continue in terrestrial, coastal, riverine and mountain ecosystems.

d. *Criterion (x): to contain the most important and significant natural habitats for in-situ conservation of biological diversity, including those containing threatened species of outstanding universal value from the point of view of science or conservation:*

i) extensive areas of high wilderness quality ensure habitats of sufficient size to allow the survival of endemic and rare or threatened species such as the Tasmanian wedge-tailed eagle, and many ancient taxa with links to Gondwana. The orange-bellied parrot and an assemblage of marsupial carnivores are found nowhere else. Some of the longest-lived trees in the world are present, with Huon pines reaching ages in excess of 2000 years. Secure habitats, including hundreds of island refuges, contain very few pathogens, weeds, or pests.

16. Approximately one third of Macquarie Harbour (the south-eastern end) lies within the boundary of the Tasmanian Wilderness (Figure 1). The boundary of the Tasmanian Wilderness is located approximately 24 kms from the mouth of Macquarie Harbour and is shallower (by approximately 15 m) than the main body of Macquarie Harbour. As a result of these factors, the World Heritage property and National Heritage place experiences less frequent and less pronounced deep water renewal events which would ordinarily contribute to oxygen replenishment and relieve suboxic conditions.

17. The action is being undertaken in close proximity to the World Heritage property and National Heritage place. The nearest marine farm zone is approximately 375 m and 520 m from the boundary of the World Heritage property and National Heritage place, at its closest point (Figure 1).

18. As an ***ancient taxa with links to Gondwana*** (Criterion (x)), and as a ***rare or threatened species*** (Criterion (x)), the Maugean skate (*Zearaja maugeana)* forms part of the natural heritage attributes which convey the Outstanding Universal Value of the Tasmanian Wilderness.

2.1.3. The Maugean skate – listed Endangered

19. A description of the characteristics, distribution, habitat requirements and threats for the Maugean skate can be found in the **MS Conservation Advice 2023**.

20. The Maugean skate is a medium-sized dark brown-grey skate (cartilaginous fish, family Rajidae) with small pale white spots; with maximum total length of approximately 74 cm in males and 87 cm in females. It has an elongated narrowly pointed snout, dark-edged ventral pores, and a quadrangular disc-shaped body. The Maugean skate lives to approximately 10 years of age, with adults maturing at 4–6 years (**MS Conservation Advice 2023**).

21. The species is named *maugeana* in reference to the Australian cool temperate biogeographic region, the Maugean Province. The species is considered a Gondwanan relic and the oldest lineage of skate in the world, with its closest relatives in southern New Zealand and Patagonia (**MS Conservation Advice 2023**).

22. The Maugean skate is endemic to Tasmania and is only known to have occurred in two biologically unique estuarine systems on Tasmania's remote west coast: Macquarie Harbour (where the action occurs) and Bathurst Harbour. There is considerable uncertainty surrounding the subpopulation in Bathurst Harbour, with recent evidence indicating that, if the species does occur in that location, it is likely only in very small numbers. The subpopulation in Macquarie Harbour is considered to be the only viable population known to occur and is, therefore, considered the last stronghold population for the conservation of the species. (**MS Conservation Advice 2023**).

23. The Maugean skate is the only known skate to be thought to permanently inhabit brackish waters with high tannin loading, poor light penetration, and silty substrate.

24. For a full description of the Maugean skate see the following:

    a. the department's SPRAT database (Attachment F02.1).

    b. **MS Conservation Advice 2023**.

25. In January 2024 the Tasmanian Government established its *Conservation Action Plan for the Maugean Skate* (Attachment C02.2) which responds to the Tasmanian Government's 2022 Maugean Skate Listing Statement and to the declines in ecological health of Macquarie Harbour. This plan is guided by five objectives and identifies 35 priority conservation actions to support the recovery of the Maugean skate.

2.2. Marine farming in Macquarie Harbour

26. Commercial marine finfish farming began in Macquarie Harbour in the late 1980s and includes both Atlantic salmon (*Salmo salar*) and rainbow trout (*Onchorynchus mykiss*). Increased production commenced from 2005.

27. To manage the increase of production, proposed in 2005, (within the pre-2012 marine farming zones (see Figure 3), the then Tasmanian Government Department of Primary Industries, Parks, Water and Environment developed the *Macquarie Harbour Marine Farming Development Plan* (**MFDP**) under the *Marine Farming Planning Act 1995* (Tas) to provide the framework to guide the monitoring of benthic habitats and management and mitigation of environmental impacts.

28. Production steadily increased from 2005, reaching ~9000 tonnes of biomass (within Macquarie Harbour at a point in time) in 2011 across 10 marine farming lease zones covering 564 hectares (Figure 3). According to the referral documentation (Attachment A02-A02.12), three separate marine farm companies operated within the historical pre-2012 marine farming zones (Figure 3): Tassal Operation Pty Ltd (**Tassal**), Huon Aquaculture Group Pty Ltd (**Huon**) and Petuna Aquaculture Pty Ltd (**Petuna**). All three companies continue to operate in Macquarie Harbour.

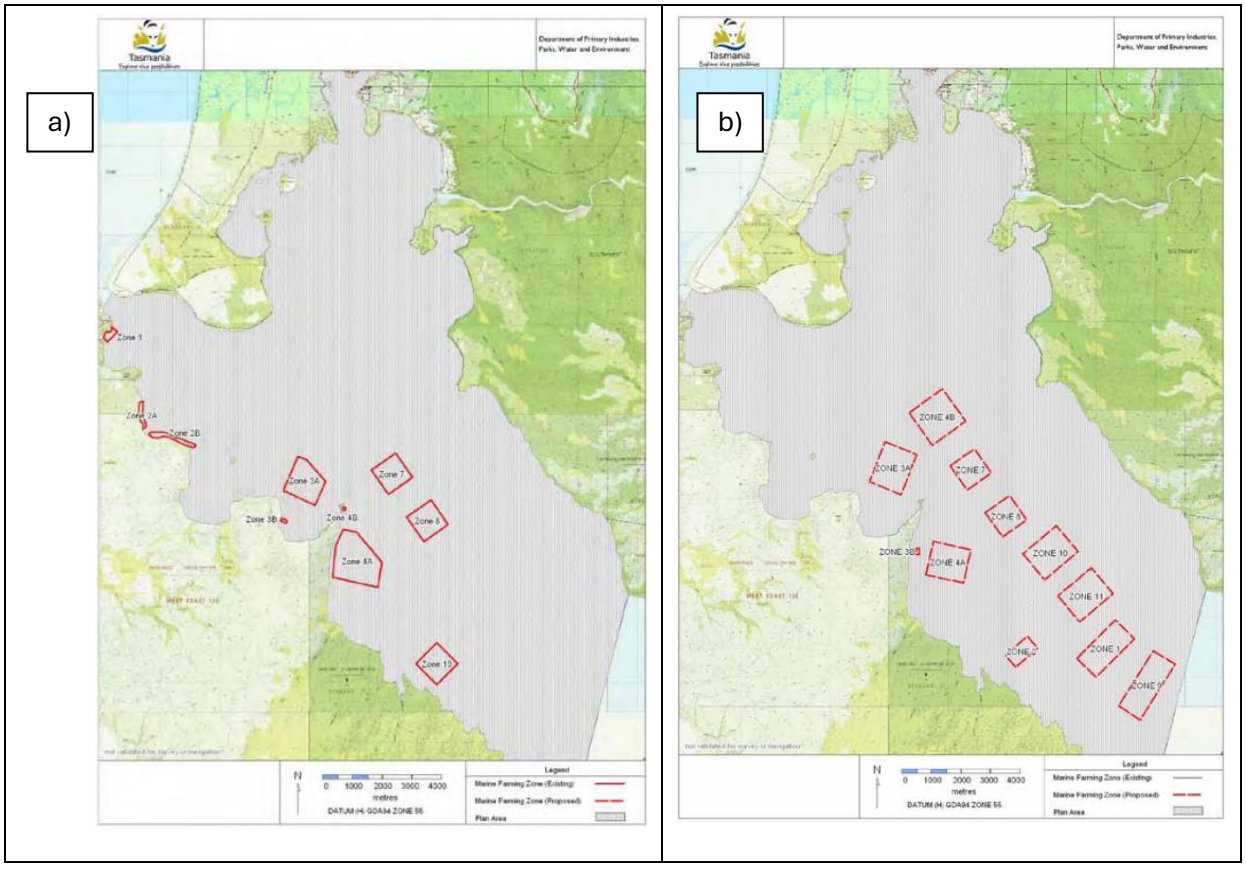

Figure 3: The marine farming zones locations for the a) historical pre-2012 marine farming zones and b) post-2012 expansion marine farm zones associated with the action (red) within Macquarie Harbour, Tasmania. Maps sourced from the 2012/6406 referral.

29. In 2012, the modelled maximum biomass limit (maximum permissible farmed finfish biomass within a determined area at a point in time) for Macquarie Harbour was set at 29,500 tonnes with a proposed review in 2013. The MFDP was amended in May 2012 by the then Tasmania State Minister for Primary Industries and Water to allow the relocation and expansion of the existing marine farming areas and to incorporate controls of biomass limits and stocking rates. The environmental controls and monitoring continued to be in place under the MFDP.

30. On 30 May 2012, the then Tasmania Department of Primary Industries, Parks, Water and Environment referred the action, as described in the amended MFDP to relocate and expand the marine farming proposal under the EPBC Act. The referral documentation (Attachment A02-A02.12) expressed the position that the action was not a controlled action. It referred to the proposed relocation of the marine farming zones out of the preferred habitat of the Maugean skate and stated that the MFDP would ensure the action would be undertaken in a sustainable manner. The referral proposed an interim biomass limit of 15,340 tonnes (52.5% of maximum biomass limit which was identified as 29,500 tonnes) subject to a review of the biomass limits in 2013 and based on monitoring to test the modelled predictions. The referral documentation (Attachment A02-A02.12) proposed that an adaptive management framework would be implemented to manage the potential impacts from the action.

31. On 3 October 2012, the 2012/6406 Marine Farming Expansion, Macquarie Harbour was determined to be not a controlled action provided it was undertaken in the particular manner set out in the decision notice (**NCA-PM**) for the purposes of the EPBC Act. The relevant action aligned with the amendments of the MFDP to relocate and expand the marine farming zones from 564 hectares to 926 hectares (an increase from 10 to 11 zones) and move the zones into deeper channels of Macquarie Harbour. Figure 3 shows the farm zone relocations and marine farming expansion areas.

32. During the implementation of the marine farming expansion action, and in alignment with the particular manner that governed the manner in which the action was to be undertaken, the MFDP and the marine farming licences (implemented under the *Living Marine Resources Management Act 1995* (Tas)) required the marine farm operators to undertake an environmental monitoring program - the *Broadscale Environmental Monitoring Program* (**BEMP**) for water quality and benthic monitoring (see Figure 4). The marine farming industry has also commissioned a number of research and monitoring programs during the duration of the action to inform the Adaptive Management Framework (**AMF**).

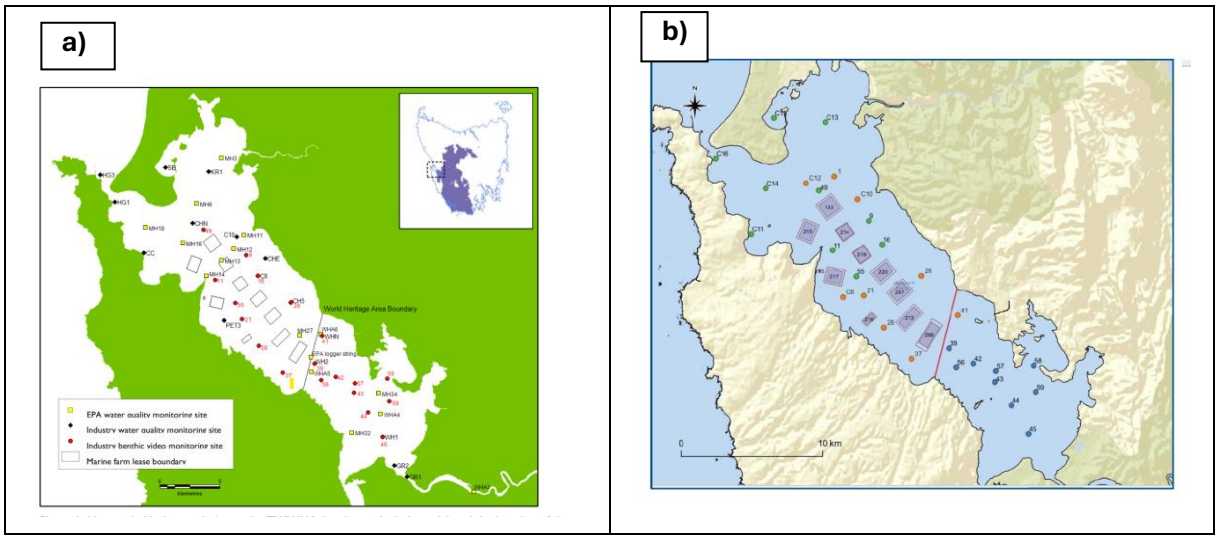

Figure 4. Map of monitoring locations within the Macquarie Harbour for a) water quality across two programs: yellow squares are the EPA Tasmania sites, black diamonds are the industry monitoring locations and red circles are benthic video monitoring sites (source of the map from the EPA (2017)**; and b) Beggiatoa benthic monitoring program control sites** represented in blue circles as Tassal, green circles as Petuna, and red circles Huon (map source EPA Submission, Attachment E03.1).

33. The Environmental Protection Authority Tasmania (**EPA**) has been undertaking independent water quality monitoring in Macquarie Harbour since 1993 (see Figure 4) and monitoring within the Tasmanian Wilderness in alignment with the Tasmanian Government's *2016 Tasmanian Wilderness World Heritage Area Management Plan* (TWWHA Management Plan 2016).

34. Based on the outcomes of a 2013 review by the Tasmanian Government, the biomass limit of 15,340 tonnes was removed and increased to 29,500 tonnes; the predicted maximum sustainable biomass for Macquarie Harbour. Biomass level reached 20,735 tonnes in January 2015.

35. After a peak in production in 2015, the biomass limits have been progressively decreased in response to the results of environmental monitoring (e.g., **BEMP**, **EPA Reports**) which demonstrated declines in the ecological health of Macquarie Harbour. In April 2016, the Tasmanian Government lowered the maximum biomass limit from 29,500 tonnes to 21,500 tonnes.

36. Prior to 2016, marine farming activities were the sole responsibility of the then DPIPWE (now the Department of Natural Resources and Environment Tasmania (**NRE Tas**)). Environmental management obligations consistent with the Macquarie Harbour MFDP were imposed via annual marine farming licences and management directions were made by the Secretary of DPIPWE.

37. In July 2016, the EPA assumed responsibility for the environmental regulation of marine farms in Tasmanian state waters.

38. In 2016, due to concerns about environmental conditions within the harbour, in particular the presence of *Beggiatoa* mats and declining benthic infauna abundance within the National and World Heritage listed Tasmanian Wilderness, the Director of the EPA required Tassal to destock the Franklin lease (**marine farming lease 266**), located approximately 1 km outside of the National and Heritage listed Tasmanian Wilderness boundary, by March 2017.

39. Low DO conditions in bottom and mid-waters were associated with a deterioration in benthic conditions, including an increase in *Beggiatoa* bacteria and a decline in benthic infauna (**Ross and Macleod 2017; Ross et al. 2016).** As a result, the EPA progressively lowered the biomass limit to reduce the pressure on the harbour and allow for environmental recovery.

40. In January 2017, the Director of the EPA determined that the biomass limit should be reduced further from 21,500 tonnes to 14,000 tonnes and then again further reduced the biomass limit to 12,036 tonnes in May 2017. In December 2017, legislative amendments were made to the *Finfish Farming Environmental Regulation Act 2017* (Tas) and the *Environmental Management and Pollution Control Act 1994* (Tas), which allowed the Director of the EPA to issue Environmental Licences in 2018 that substantially mirrored the marine farming licence conditions at the time.

41. Subsequent determinations have been made by the Director of the EPA, as a delegate of the Secretary of the Department of Natural Resources and Environment Tasmania (NRE Tas), to address concerns about the ecological health of Macquarie Harbour that have resulted in further reductions reaching a 9,500 tonne limit in 2018 and 2020, which remained valid until 31 August 2022 . On 31 May 2022, a separate determination was made by the acting Secretary of NRE Tas for the period of 1 June 2022 to 31 August 2027 that was consistent with the previous maximum permissible biomass to be set at 9,500 tonnes. Note – the biomass limit was subsequently replaced with total permissible dissolved nitrogen output limits, as described at section 2.3.

2.3. Total Permissible Dissolved Nitrogen Output (TPDNO)

42. On 1 September 2022, the EPA replaced the biomass limit with a *Total Permissible Dissolved Nitrogen Output* (**TPDNO**) for Macquarie Harbour marine farming (**EPA 2022**). A TPDNO is a set limit for the amount of nitrogen that can be released to the environment via feed inputs per year.

43. Data collected by the EPA under the Marine Farm Licences submitted to NRE Tas indicates that since 2018, annual feed inputs have been gradually increasing (EPA 2022). This occurred while complying with the biomass limit of 9,500 tonnes per annum and appeared to be due to a change in harvesting strategies and increase in total annual production. Biomass limits provide a helpful cap on the total amount of fish being farmed at any point in time, however, biomass limits allow considerable flexibility in relation to feed inputs. As such, the Director of the EPA identified that limits on dissolved nitrogen outputs are a better regulatory mechanism than biomass limits to restrict production.

44. TPDNO is considered by the EPA to be a more relevant constraint on production because it concluded it is more closely related to overall environmental impact (**EPA 2022**), calculated to reflect nitrogen content in feed and science-based assumptions on the fate of nitrogen. TPDNO is specified by the EPA for any 12-month rolling period based on data collected as part of the monitoring program determined by the marine farming licences. The TPDNO for Macquarie Harbour was set at 500.1 tonnes and remains in force until August 2027 unless the monitoring data shows that further reduction of the TPDNO is required earlier than the renewal period of the marine farming licences (**EPA 2022**).

2.3.1. Current state regulatory activities

45. In August 2023, NRE Tas issued a new *2024 Tasmanian Regulatory Framework for Finfish Aquaculture* (Attachment F02.2) outlining the regulatory framework for the industry. The Framework states that NRE Tas regulates finfish aquaculture under the *Marine Farming Planning Act 1995* (Tas) and the *Living Marine Resources Management Act 1995* (Tas), and the EPA regulates under *Environmental Management and Pollutions Control Act 1994* (Tas):

    a. NRE Tas is responsible for regulating the non-environmental aspects of marine finfish farming and undertaking compliance with the marine farming licences, the *Marine Farming Planning Act 1995* (Tas), and Marine Farming Development Plan (**MFDP**) Management Controls.

    b. the EPA is responsible for regulating the environmental aspects of marine finfish farming and ensuring compliance with the conditions of the marine farming licences and the recently released *Environmental Standards for Tasmanian Marine Finfish Farming* (as follows).

46. On 18 October 2023, NRE Tas issued *the Environmental Standards for Tasmanian Marine Finfish Farming 2023* (Attachment F02.3) in consultation with the EPA, who is the authority responsible for implementing these standards and regulating the finfish farming industry. These standards are to be applied through the marine farming licences to ensure the conditions are consistent and clear, there is transparency in the monitoring data and information and better compliance and enforcement.

47. In November 2023, the marine farming licences for each of the marine farm operators operating in Macquarie Harbour were renewed by the Director of the EPA under section 42T(1)(a) of the *Environmental Management and Pollution Control Act 1994* (Tas), for 2 years (Attachment C02.1). The renewed marine farming licences have new conditions that integrated the new approach to shift from biomass limits to controlling TPDNO, and new requirements to provide to the Director of the EPA the overall DO demand resulting from finfish activities on their lease, provide and implement a DO mitigation plan, and undertake water quality monitoring that measures the success of the DO mitigation measures against the interim default guideline values set by the EPA.

3. 2012 EPBC Referral

3.1. Referred action

48. On 30 May 2012, the department received a referral (**EPBC 2012/6406**) from then DPIPWE, now known as NRE Tas, for the marine farming expansion activities at Macquarie Harbour.

49. The referral (Attachment A01) describes the action as follows (footnotes omitted):

    The proposed action is:

    - *the expansion of marine farming operations, that will occur consistent with the 2012 amendment to the Macquarie Harbour Marine Farming Development Plan, including the following activities:*

- *The arrangement and securing of sea pens for fish farming;*
- *The construction of associated water based infrastructure;*
- *The operation of fish farms including:*
  - *Servicing and maintenance of sea pens and associated water and land based infrastructure;*
  - *Feeding and managing the health, waste, processing and predators of fish in the farms;*
  - *Transportation of fish to and from the farms across water and land.*

The following components of each aspect of the action are described below, with specific details on activities to occur within each marine farming zone provided in Appendix 1 and Appendix 2:

Salmon Farming Operations Consistent with the MFDP

- *Construction and Infrastructure Development*
  - *Mooring and Grid System*
  - *Size and Configuration of Sea Pens*
  - *Other Infrastructure/Construction*
- *Operation of fish farms*
  - *Servicing and Maintenance of Sea Pens and Associated Infrastructure*
    - *Boat Movements*
    - *Infrastructure Maintenance*
  - *Feeding and Managing Health, Waste, Processing and Predators of fish in the Farms*
    - *Fish size/stocking density*
    - *Fish Health*
    - *Predator Control*
    - *Waste Management*
    - *Environmental Management*
  - *Transportation of fish to and from the farms across water and land*

Salmonid Farming Operations Consistent with the MFDP

The expansion of salmon farming operations within Macquarie Harbour, consistent with the 2012 Amendment of the MFDP will include activities associated with the construction of aquatic components of marine farms and ongoing operation of both terrestrial and aquatic components of marine farms. These include:

- *The construction, arrangement and securing of sea pens for fish farming;*

- *The construction of associated land and water based infrastructure;*
- *The operation of fish farms including:*
    - *Servicing and maintenance of sea pens and associated water and existing land based infrastructure;*
    - *Feeding and managing the health, waste, processing and predators of fish in the farms;*
    - *Transportation of fish to and from the farms across water and land.*

Construction and Infrastructure Development

In order to operate, the expansion of fish farms in Macquarie Harbour requires the construction and placement of new and existing infrastructure. New mooring and grid structures are required to moor existing, and additional sea pens to. The size of these pens varies across leases, as does their configuration and locations. Additional on water structures are also required for servicing expanded farms (e.g. barges).

Mooring and Grid system

Each company will use their own mooring system to attached sea pens/cages to. There are currently approximately 132 cages in Macquarie Harbour across 5 leases. Planned expansion of the industry under the amendment to the MFDP will see an increase in cage numbers to approximately 211. The mooring systems to be used across zones are described in Appendices 1 and 2. Baseline surveys which establish whether there will be any impacts from mooring and grid systems are not part of this action.

Size and configuration of Sea Pens

The location and configuration of pens associated with the amendment of the MFDP for each company are described in Appendices 1 and 2. Maps 2.1a and 2.1b show the proposed and current zones within the harbour. There are no change to Zones 7 and 8 as a result of this proposal.

Other Infrastructure/Construction Aspects

Additional land and water based infrastructure will be required in order to operate fish farms associated with the proposed expansion. There is likely to be a need for some improvements to land based facilities over time.

Huon aquaculture (sic) immediately require a new centralised feeding system barge, with a view to a centralised feeding system involving dedicated feed barges proposed for each zone into the future. Additional power generators will be associated with new barges. Two additional feeding boats are also likely to be required in the next 7 years. Tassal's feed storage shed is inadequate to cater for current needs and is in a poor state of repair – in addition access to the site is restricted (Appendix 2). It is estimated that traffic movements will increase from around 90 to a maximum of 228 within 5 years – to manage this impost on Strahan township, and to streamline operations an aquaculture hub away from the Strahan township has been proposed.

Operation of Fish Farms

The operation of fish farms in Macquarie Harbour requires a range of activities within the key areas listed below:

- *Servicing and maintenance of sea pens and associated water and land based infrastructure;*
- *Feeding and managing the health, waste, processing and predators of fish in the farms;*
- *Transportation of fish to and from the farms across water and land.*

Servicing and Maintenance of Sea Pens and Associated Infrastructure

Servicing of on water infrastructure involves the movement by boat of maintenance teams multiple times a day to sea pens to undertake a range of maintenance (and stock husbandry) tasks. Boat movements and maintenance tasks are described in detail below.

Boat Movements

Boat movements associated with marine farming activities in Macquarie Harbour can be placed into two categories; vessel movements from shore based operations to marine based operations and vessel movements within lease areas. Table 2.2 illustrates current and proposed boat movements by type.[1]

Vessel movements from shore based operations to marine based operations consist of staff transfers to lease areas, feed transfer, net and equipment transfer, dive team movements and harvest vessels (Table 2.2). The proposed increase in movements represents an increase from 59 movements to 158 movements per week. Table 2.2 does not include movements undertaken by smaller vessels within lease areas. Companies in Macquarie Harbour usually moor a number of vessels within the lease areas which are used to service the lease during operational hours. These vessels generally do not leave the lease area but travel between cages and mother barges.

It should also be noted that harvesting will not occur all year round and from the same lease each year, for example, Tassal will harvested for 6 months of the year from Zone 9 every second year. The figures above have included harvest vessel movements all year round. Appendix 1 contains detailed descriptions of boat movements by zone.

Infrastructure Maintenance

A variety of maintenance tasks are undertaken either routinely or for a specific purpose. These tasks include:

- *Checking of cage nets via scuba diving*
- *Inspection of bird nets*
- *Repair of nets*
- *Vessel maintenance for barges*
- *Routine generator and other equipment maintenance*

[1] Table 2.2 is visible at page 11 of Attachment A01.

- *Inspection of moorings (divers and ROV)*

Off water infrastructure maintenance, including maintenance on large barges occurs either at land based sites or in specialised workshop environments in Devonport and Burnie. Boat servicing, outboard servicing etc occurs at the slip yard in Strahan. Net maintenance and construction occur at land based net areas.

Specific maintenance activities are described by zone in Appendix 1. There will be no change to activities occurring at Zone 7 and Zone 8.

Feeding and managing the health, waste, processing and predators of fish in the farms

The management of fish farming activities includes the management of:

- *fish size and stocking densities;*
- *fish feeding;*
- *fish health;*
- *predator control;*
- *waste management;*
- *environmental management.*

Fish Size/Stocking Density

It is the intention that two species will be cultivated in the expanded marine farming operations in Macquarie Harbour: rainbow trout (Oncorhynchus mykiss) and atlantic salmon (Salmo salar). Sites would be stocked with intake fish ranging in size from 80g – 300g depending on species and company. Harvest size would range from over 4kg to 5kg. Current estimates are that around 3.2 million smolt are used in the harbour per year – this figure is expected to increase to around 6.3 million smolt with the expansion. The maximum stocking density of fish would increase from 15 kg/m³ to 17 kg/m³ of cage volume. Species and stocking approaches by zone can be seen in Appendix 1. Information regarding fish size and number, stocking density (also biomass limits on an area basis i.e. tonnes/ha) and feed volume all have links to the modelling used to determine the sustainable carrying capacity (total biomass and stocking density) of Macquarie Harbour for this development. They are also associated with the adaptive management framework that is proposed. Of these, the potential to prescribe stocking density and biomass limits have been incorporated into management controls.

Fish Feeding

Feeding is currently undertaken via boats using water cannons as well as by centralised feed systems with the operator either using camera feedback systems to control the feeding or, the system responding to appetite ingestion rate of the fish to feed to satiation without waste. The feed used is commercial extruded feed and dry extruded sinking pellets sourced from both within Tasmania and interstate. There is no change to the types of feed to be used in the expansion from currently farmed area. The volumes of feed will vary depending on market expansion, smolt type, smolt size, transfer date, photoperiod regime, water temperature, fish health, and harvest profile.

Sediment monitoring is carried out during the Annual Video Surveys as required by marine farming licence conditions, as well as during routine internal environmental monitoring programs companies run. Monitoring methods follow those employed to assess seafloor condition as outlined in the Monitoring Protocols of the Fish farm licences. Details of each company's approach can be seen in Appendix 1.

Fish Health

Currently, there are no serious disease issues in Macquarie Harbour. Previously, a number of diseases have been identified in Macquarie Harbour; these have included yersiniosis, marine aeromonad disease of salmonoids (MAS) and vibriosis. In 2006, Ichthyophonus caused mortality in rainbow trout. In addition, Aquabirnavirus, Reovirus and a rickettsia-like organism (RLO) have also been detected. The key component in the preventative disease program for Macquarie Harbour is vaccination against Marine Aeromonad Disease and vibriosis. Since the introduction of the vaccination process, there have been no outbreaks of these diseases. Additionally, there is mandatory health surveillance carried out by Department of Primary Industries, Parks, Water and Environment (DPIPWE) personnel within the framework of the Tasmanian Salmonid Health Surveillance Program (Tas SHSP) which is a joint Industry and Government Program. Further, the current operators within the plan area have developed a Fish Health Management Plan (FHMP) which will provide a specific detailed strategy for the ongoing management of fish health in Macquarie Harbour (See Appendix 2). The operators have signed off on the strategies outlined in the FHMP which consists of a combination of compliance, best practice and regulation through management controls and marine farming licence conditions. The FHMP addresses detailed, standard operating practices to prevent disease from entering the harbour, to prevent spread and impact of disease in the harbour and to respond to emergency disease situations. The FHMP will be reviewed annually or more frequently if needed. Under expanded operations there will be an associated increase in the real amount of vaccinations being administered to smolt – currently trout and salmon have one vaccination by injection and one by bath in the hatchery and this will continue.

Chemical Usage

Chemical use in the marine environment will be restricted to fuels and oil based lubricants associated with boats, and disinfectants, cleaning agents and antibiotics. Fuels would constitute by far the majority, by volume, of the total amount of chemicals proposed to be used. Small volumes of disinfectants are used in a variety of manners for hygiene purposes, and cleaning agents are used on harvest infrastructure following harvesting operations. Antibiotics would only be prescribed over short periods to address illness and animal welfare issues. It is not possible to forecast antibiotic use, but it is expected that antibiotic use will remain low, if not absent, due to improved husbandry practices and effective vaccines. It is proposed that most chemical usage will continue across the expansion area proportional to the increase in biomass being farmed. Based on this, it is predicted that a 263% increase will occur in the chemical use associated with the expansion.

Predator Control

Australian and New Zealand Fur Seals are a potential predator of salmon and trout in marine farms. The main means of controlling seal predation will be via exclusion, by means of heavily weighted sinker ring and tensioned cage nets and above water predator nets. Net barriers may also be

required above the handrails to prevent seals from jumping into the cages. There is ongoing investigation and trialling of new exclusion and deterrent technologies. Under the DPIPWE's seal management protocols, marine farmers can apply to the Department to relocate problem seals. Birds are also a potential problem. The means of control to be used is prevention of access to the fish or to feed pellets, by means of properly designed and supported bird nets. See Appendix 1 for further zone specific details.

Waste Management

Both solid and liquid wastes are produced by marine farms and are managed by different means. It is expected that there will be a net increase in most waste streams generated commensurate with an increase in stocked cage numbers. Whilst this will not be realised during the first year of the expansion, there will be a gradual staged increase over time until all sites are fully stocked, at which point a 62% increase from current levels of land-based disposal of waste will be realised. Fish mortality wastes are expected to increase by 60% from current levels (see below). Solid wastes include fish bodies (mortalities), waste from the harvesting process (including body parts and bloodwater), wastes on nets and uneaten feed. Mortalities are collected and buried at an approved mort lease site or mort pit. Bloodwater and solid waste from the harvest process is contained in harvest bins during the harvest and either delivered to a processing facility at Devonport or, the waste is separated with the solid component going to mort pits, and the liquid component released in to the municipal sewerage scheme through a Trade Waste Agreement with Cradle Mountain Water Authority depending on the marine farming company (Appendix 1). Current levels of fish mortalities across the industry in Macquarie Harbour are generally around 1.97% (approx 63000 fish) of stocked numbers by live weight. It is expected that this rate would remain comparable following the expansion resulting in approx 124000 dead fish at full production. This would be an increase from current totals of around 60%. Local government approval is required for fish waste volumes <100 tonnes to mort landfill sites. Currently three mort pits located around Strahan (Table 1.1). At full production levels this approval would be exceeded. It is not anticipated that this approved tonnage of mortality disposal would be exceeded within the first two years of the proposed amendment. Once the Council approval is exceeded the companies would need to gain Tasmanian Environmental Protection Authority approval for an alternative disposal option. Discussions with a third party who currently render all fish mortalities from the east coast of Tasmanian have commenced to investigate ensilage options available for the collection and disposal of mortalities. The increased number of fish mortalities as a result of the proposed expansion would mean that the ensiling of this waste would be economically viable for the third party to the extent that transport costs would be off set. Initial discussions have revealed that it is likely that the third party would employ a local site Manager to ensure that the ensilage facility was run to the Environment Protection Authority approved standards. Nets are, in general, simply hung to dry at the net processing sites. The dry bio-solids fall off the nets and are swept up and collected in bags and disposed of to landfill. Uneaten feed is minimised through the use of underwater-video camera feedback systems and additional tools such as electronic pellet sensors. Any pellets that do fall through the cages are detected in routine video surveys, and the information is used to continuously improve feed management. Fish faeces fall through the bottom of the fish cages and are deposited on the seabed below the cages. The cage positions are routinely fallowed to allow the biological

processes in the sediment to process the organic matter, and for the sediments to recover. All inputs into the marine environment that arise from the present amendment are to be mitigated through the adaptive management framework. This process drives the harbour Fish Farming Environmental Management Plan (FFEMP) which uses as its basis the modelling and a comprehensive regulatory and industry based monitoring program targeting both water quality and benthic parameters. Targeted monitoring of benthic and water column parameters will be used to validate the model into the future and results for the validation will support the decision making process for fish farm stocking levels in the harbour. At present environmental standards for substrate deposition are contained under Marine Farming Licence Conditions, Compliance with Environmental Standards. Recovery and accumulation rates are being addressed through the FFEMP using modelling and the results from the benthic part of the monitoring program and other related research will be used to inform future modelling. For remineralisation the Proponent is collaborating with Institute of Marine and Antarctic Studies (IMAS) and DHI consultants to initiate a research project to elucidate these processes in the harbour. In terms of mitigation measures that may be implemented through farm operations year class fallowing is considered integral to any sustainable farming to allow regeneration of benthic communities and facilitate good environmental maintenance procedures for the production environment. Fallowing is assessed on a regular basis by the Proponent through the use of ROVs below the pens, both as part of the annual regulatory requirements (licence conditions) for substrate assessment and as an operational tool for assessing feed wastage and substrate impact. In the future the fallowing period implemented will be based initially on the results of the benthic monitoring (directed through the FFEMP) as production increases. Appropriate management responses will be implemented if unacceptable changes are observed. Liquid wastes include black and grey water from barges. Black water is either treated with an approved sewage treatment system and discharged after prescribed water quality parameters stipulated in marine farming licence conditions have been met or, it is transported to Strahan and released into the municipal sewage system. Grey water is either discharged within lease areas or released into the municipal sewage system depending on the company (Appendix 1).

Environmental Management

Biogeochemical and hydrological modelling has been used to determine a sustainable maximum carrying capacity of farmed salmonids in Macquarie Harbour of 35 T/ha of total lease area or subleased area held by a leaseholder, based on the planned expansion area. The modelling that has been undertaken is considered to be contemporary. It is however acknowledged that the modelling, as with any form of predictive assessment, has limitations. To balance any potential limitations of the model a FFEMP will be implemented, which will provide an adaptive monitoring and modelling approach to track the initial predictions of the model over time and refine future modelling. See section 4 for further details. Continuing measurements of information to inform the benthic monitoring program and establishment of water quality baseline environmental data are not part of this action.

Transportation of fish to and from the farms across water and land

Significant increases in on and off water vehicular movements are likely to occur as a result of expansion of farming in Macquarie Harbour. Boat movements are described in detail in Appendix 1

and represented in Table 2.2. Overall movements will increase from 59 movements to 158 movements per week. The change in traffic movements one way into Strahan from Hobart and the North West coast by operator are outlined in Appendix 1 – these figures include passenger vehicles and small delivery/service type vehicles. Existing farming operations are not considered to be part of the current action as fish farming in Macquarie Harbour commenced prior to the EPBCA in the mid 1980s, and incremental changes since then were determined unlikely to have a significant impact on MNES. In addition ongoing measurements associated with the benthic monitoring program and the establishment of water quality baseline environmental information are not included in the action.

50. The area covered by the Macquarie Harbour MFDP is the physical extent of Macquarie Harbour outside the Tasmanian Wilderness and includes part of the South West Conservation Area. It consists of the area bounded by the high-water mark between lines drawn from Coal Head and Steadmans Point across Macquarie Harbour to the southeast and the entrance to the Macquarie Harbour to the northwest at a line drawn between Braddon Point through Bonnet Island Light to the western shore.

3.2. Referral decision

51. On 3 October 2012, the Hon. Tony Burke MP, then Minister for Sustainability, Environment, Water, Population and Communities, determined that the proposed action was not a controlled action provided it is undertaken in the particular manner set out in the decision notice (**NCA-PM**) for the purposes of the *Environment Protection and Biodiversity Conservation Act 1999* (**EPBC Act**) (Attachment A04).

52. The then Minister made a decision that the proposed action was not a controlled action, provided that it was taken in the manner set out in the NCA-PM decision. The NCA-PM decision set out specific measures to be taken to avoid significant impacts on:

    a. World Heritage properties (**ss 12 & 15A**).

    b. National Heritage places (**ss 15B & 15C**).

    c. listed threatened species and communities (**ss 18 & 18A**).

53. The particular manner requirements in the NCA-PM decision notice are as follows (see also Attachment A04):

    *To ensure there are no significant impacts to the **Maugean Skate** or to the **Tasmanian Wilderness World Heritage Area,** the person taking the action must undertake the action in accordance with the **Macquarie Harbour Marine Farming Development Plan October 2005.** In particular, the person taking the action must undertake the following measures:*

    *1.To ensure there are no significant impacts to the **Maugean Skate** as a result of changes to the benthic environment, the person taking the action must:*

    *a. Take measures to prevent **substantial benthic visual, physio-chemical** or **biological changes** attributable to marine farming operations at, or extending beyond 35 metres from the boundary of any **lease area;***

*b. Undertake a baseline environmental survey of all new **lease areas** and **compliance sites** prior to commencement of marine farming operations;*

c. Undertake a benthic video assessment of lease areas and compliance sites in accordance with marine farming licence conditions;

d. If a substantial benthic visual, physio-chemical or biological impact is detected as a result of benthic video assessment, targeted management responses must be implemented within 10 weeks of the assessment;

*e. Following any **targeted management responses** undertaken in accordance with 1(d) relating to a **substantial benthic visual impact** within a **lease area,** a follow up **benthic video assessment** must be undertaken at the **lease areas** prior to restocking;*

f. Following any targeted management responses undertaken in accordance with 1(d) relating to a substantial benthic visual, physio-chemical or biological impact at a compliance site, a follow up benthic video assessment must be undertaken at the compliance site to monitor benthic recovery within four months of the targeted management response; and

*g. 1(e) and 1(f) must be undertaken until the **benthic video assessment** identifies that a **substantial benthic visual, physio-chemical** or **biological impact** is no longer occurring.*

*2.To ensure there are no significant impacts on the **Tasmanian Wilderness World Heritage Area** and the **Maugean Skate** as a result of water quality changes, the person taking the action must:*

*a. Undertake a water quality monitoring program for the assessment of the water quality indicators ammonia, nitrate and DO at the **monitoring sites** in accordance with **marine farming licence conditions.** Monitoring must occur at these **monitoring sites** on a monthly basis until 30 June 2013, when the number and location of monitoring sites will be reviewed;*

*b. Take measures to prevent the **rolling annual median value** of quarterly water quality indicator values for ammonia, nitrate and DO, as recorded within the **compliance region,** from exceeding the identified **limit levels;***

*c. If the water quality monitoring program identifies that the **rolling annual median value** for any of the water quality indicators ammonia, nitrate and DO, within the **compliance region,** exceed the identified **limit levels** and that this is attributable to marine farming operations, **targeted management responses** must be implemented within 10 weeks of the most recent quarterly monitoring report;*

*d. Following any **targeted management responses** undertaken in accordance with 2(c), a follow up monitoring assessment of the water quality indicators ammonia, nitrate and DO must be undertaken at the **monitoring sites** to monitor water quality recovery within four months of the **targeted management response;***

*e. 2(c) and 2(d) must be undertaken until the monitoring assessment of the water quality indicators ammonia, nitrate and DO identifies that the identified **limit levels** are not being exceeded; and*

*f. The total biomass held across all **lease areas** must not exceed 52.5 percent of the modelled **maximum sustainable biomass** until limit levels are reviewed in mid 2013, and must not exceed any such altered levels as may be identified thereafter by the **Tasmanian Government.***

*3.To ensure there are no significant impacts on the **Tasmanian Wilderness World Heritage Area,** including as a result of changes to viewfields, the person taking the action must:*

*a. Undertake marine farming debris cleanup activities within Macquarie Harbour at regular intervals of every 12 months at a minimum. Marine debris cleanup activities must also occur on an as needs basis when members of the public or other stakeholders notify the person taking the action of areas, within Macquarie Harbour, requiring particular attention. These activities must be conducted in accordance with any applicable biosecurity control requirements and regulations, including relevant management guidelines relating to Phytophthora cinnamomi and Chytrid fungus (Batrachochytrium dendrobatidis), to prevent the spread of weeds or pathogens into the **Tasmanian Wilderness World Heritage Area;** and*

*b. Ensure that all fish cages, buoys, netting and other floating marine structures and equipment, other than that required for navigational purposes, are grey to black in colour, or as otherwise specified in the **marine farming licence conditions.***

4. 2023 Reconsideration Requests – section 78A

4.1. Reconsideration request from The Australia Institute

54. You received a letter from The Australia Institute dated 8 June 2023 requesting you reconsider the NCA-PM decision under section 78 of the EPBC Act (Attachment B01).

55. You received a further letter from The Australia Institute dated 31 July 2023, that sought to clarify the request and provide further evidence to support the assertions made (Attachment B02).

56. The letters set out the bases upon which The Australia Institute considered the NCA-PM decision should be reconsidered as:

    a. section 78(1)(a) – there is substantial new information available about the impacts of the action on the Maugean skate and the Tasmanian Wilderness World Heritage Area.

    b. section 78(1)(aa) – there has been a substantial change in circumstance that was not foreseen at the time of the First Decision that relates to the impacts of the action on the Maugean skate and the Tasmanian Wilderness World Heritage Area.

57. The 8 June 2023 letter states:

    '*[t]he new information and change in circumstances lead us to conclude that the decision actions in EPBC 2012/6406 will cause significant impacts to Matters of National Environmental Significance under Part 3 of the EPBC Act, in particular (a) an endangered species, Zearaja maugena, per section 18(3) of the EPBC Act; (b) world heritage values of a World Heritage Property*'.

58. The 8 June 2023 letter specified the following sources (but did not enclose copies of the material) that The Australia Institute considered provide a basis for their reconsideration request:

    a. **Moreno and Semmens (2023)** - Moreno, D. and Semmens, J. (2023) *Interim report – Macquarie Harbour Maugean skate,* Institute for Marine and Antarctic Studies, University of Tasmania, Hobart, May (Attachment B01.1).

    b. **Moreno et al. (2022)** - Moreno D, Patil J, Deagle B, and Semmens JM, (2022) *Application of environmental DNA to survey Bathurst Harbour (Tasmania) for the Endangered Maugean Skate (Zearaja maugeana)*, Report to the National Environmental Science Program, Institute for Marine and Antarctic Studies, University of Tasmania, Hobart, August (Attachment B01.2).

    c. **DCCEEW (2023)** - Department of Climate Change, Energy, the Environment and Water (DCCEEW), (2023) *Conservation Advice for* Zearaja maugeana *(Maugean Skate)*, DCCEEW, Australian Government, September (Attachment B01.3).

    d. **NRE Tas (2022)** – Tasmanian Threatened Species Section, Department of Natural Resources and Environment *(*NRE Tas) *Listing Statement for Zearaja maugeana (Maugean skate), v2*, Department of Natural Resources and Environment Tasmania, Hobart, December (Attachment B01.4).

e. **TWWHA Management Plan (2016)** – Department of Primary Industries, Parks, Water and Environment (DPIPWE) (2016) *Tasmanian Wilderness World Heritage Area Management Plan 2016*, DPIPWE, Tasmanian Government, Hobart (Attachment B01.5).

f. **Senate Report (2015)** – Environment and Communications References Committee (ECRC) (2015) *Regulation of the fin-fish aquaculture industry in Tasmania Report to the Senate by the Environment and Communications References Committee*, August 2015, Commonwealth of Australia, August (Attachment B01.6).

g. **Ross et al. (2020)** - Ross J., Wild-Allen K., Andrewartha J., Beard J. and Moreno D. (2020). *Environmental research in Macquarie Harbour FRDC 2016/067 Understanding oxygen dynamics and the importance for benthic recovery in Macquarie Harbour*, Institute for Marine and Antarctic Studies, University of Tasmania, Hobart, February (Attachment B01.7).

59. The 31 July 2023 letter enclosed the following material that The Australia Institute considered provide a basis for their reconsideration request:

a. **Ross et al. (2016)** - Ross, D.J, McCarthy, A., Davey, A., Pender, A., Macleod, C.M. (2016) *Understanding the Ecology of Dorvilleid Polychaetes in Macquarie Harbour: Response of the benthos to organic enrichment from finish aquaculture (FRDC Project No 2014/038)*, Institute for Marine and Antarctic Studies, University of Tasmania, Hobart (Attachment B02.1).

b. **Moreno et al. (2020)** - Moreno, D., Lyle, J.M., Semmens, J.M., Morash, A., Stehfest, K., McAllister, J., Bowen, B., Barrett, N. (2020) *Vulnerability of the endangered Maugean Skate population to degraded environmental conditions in Macquarie Harbour (Fisheries Research and Development Corporation Project No. 2016-068),* Institute for Marine and Antarctic Studies, University of Tasmania, Hobart, October (Attachment B02.2).

c. **Ross and MacLeod (2017)** - Ross, J. and MacLeod, C. (2017) *Environmental Research in Macquarie Harbour - Interim Synopsis of Benthic and Water Column Conditions (Prepared for the EPA and DPIPWE)*, Institute for Marine and Antarctic Studies, University of Tasmania, Hobart, January (Attachment B02.3).

d. **Wild-Allen et al. (2020)** - Wild-Allen, K., Andrewartha, J., Baird, M., Bodrossy, L., Brewer, E., Eriksen, R., Skerratt, J., Revill, A., Sherrin, K., Wild, D. (2020) *Macquarie Harbour Oxygen Process model (FRDC 2016-067): CSIRO Final Report,* CSIRO Oceans & Atmosphere, Hobart, June (Attachment B02.4).

4.2. Reconsideration request from Fitzgerald and Browne Lawyers, on behalf of the Bob Brown Foundation

60. You received a letter dated 25 July 2023, from Fitzgerald and Browne Lawyers, on behalf of the Bob Brown Foundation Inc (Attachment B03), requesting you reconsider the referral decision for EPBC 2012/6406 under Section 78 of the EPBC Act. The letter sets out the basis upon which the Bob Brown Foundation considers the NCA-PM decision should be reconsidered as:

a. section 78(1)(a) – there is substantial new information available about the impacts of the action on the Maugean skate.

b. section 78(1)(aa) – there has been a substantial change in circumstance that was not foreseen at the time of the First Decision that relates to the impacts of the action on the Maugean skate.

c. Section 78(1)(b) – on the basis that the NCA-PM decision is required the persons taking the action 'to ensure that there are no significant impacts to the Maugean skate', and to ensure that there are 'no significant impacts on the Tasmanian Wilderness World Heritage Area and the Maugean Skate as a result of water quality changes', there is information available that establishes significant impacts have occurred, and therefore the marine farming operators are not taking the action in the manner identified in the NCA-PM decision notice.

61. The letter enclosed the following reports which the Bob Brown Foundation considers support the request for reconsideration in relation to section 78(1)(a) and section 78(1)(aa):

a. **EPBC 2012-6406 referral decision notice** - DSEWPAC (Department of Sustainability, Environment, Water, Population and Communities) (2012), *EPBC 2012-6406 Notification of referral decision*, DSEWPAC, Canberra (Attachment B03.2).

b. **Moreno and Semmens (2023)** - Moreno, D. and Semmens, J. (2023) *Interim report – Macquarie Harbour Maugean skate,* Institute for Marine and Antarctic Studies, University of Tasmania, Hobart, 2 May 2023 (Attachment B03.1).

62. The letter specified the following sources (but did not enclose copies of the material) which the Bob Brown Foundation considers supports the request for reconsideration in relation to section 78(1)(a) and section 78(1)(aa):

a. **Moreno et al. (2020)** - Moreno, D., Lyle, J.M., Semmens, J.M., Morash, A., Stehfest, K., McAllister, J., Bowen, B., Barrett, N. (2020) *Vulnerability of the endangered Maugean Skate population to degraded environmental conditions in Macquarie Harbour (Fisheries Research and Development Corporation Project No. 2016-068),* Institute for Marine and Antarctic Studies, University of Tasmania, Hobart, October (Attachment B03.3).

63. The letter refers to **Moreno and Semmens (2023)** in support of its request for reconsideration in relation to section 78(1)(b) as supporting the proposition that 'significant impacts are being inflicted upon Maugean skate'.

4.3. Reconsideration request from The Environmental Defenders Office, on behalf of The Australian Marine Conservation Society and Humane Society International Australia

64. You received a letter dated 23 August 2023, from the Environmental Defenders Office (**EDO**), on behalf of the Australian Marine Conservation Society (**AMCS**) and Humane Society International Australia (**HSIA**) (Attachment B04), requesting you reconsider the referral decision for EPBC

2012/6406 under Section 78 of the EPBC Act. The letter sets out the basis upon which the AMCS and HSIA consider the NCA-PM decision should be reconsidered as:

a. section 78(1)(a) – there is substantial new information available about the impacts of the action on the Maugean skate and the Tasmanian Wilderness World Heritage Area.

b. section 78(1)(aa) – there has been a substantial change in circumstance that was not foreseen at the time of the First Decision that relates to the impacts of the action on the Maugean skate and the Tasmanian Wilderness World Heritage Area.

65. The 23 August 2023 letter also requests an investigation into the compliance of the persons undertaking the action with the particular manner requirements in the EPBC 2012/6406 decision notice and whether the action has been undertaken in accordance with the action described in the referral documentation. It is noted that:

a. the request is taken as having raised section 78(1)(b) as a potential ground for reconsideration - specifically, that evidence may be available that established significant impacts have occurred, and the requestors therefore conclude that the marine farming operators are not taking the action in the manner identified in the NCA-PM decision notice.

b. no evidence to support the request for reconsideration on this ground has been provided on behalf of AMCS and/or HSIA to date.

66. You received a second letter dated 20 September 2023 from the EDO, on behalf of AMCS and HSIA (Attachment B05), noting that the MS Conservation Advice 2023 was effective from 6 September 2023 and requesting urgent and decisive action to protect the Maugean skate.

67. You received a third letter dated 20 November 2023 from the EDO, on behalf of AMCS and HSIA (Attachment B06), providing further information about the asserted substantial change in circumstances under s78(1)(aa) of the EPBC Act.

68. The 23 August 2023 letter specified the following sources (but did not enclose copies of the material) which the EDO considers support the request for reconsideration in relation to section 78(1)(a) and section 78(1)(aa):

a. **Moreno and Semmens (2023)** - Moreno, D. and Semmens, J. (2023) *Interim report – Macquarie Harbour Maugean skate,* Institute for Marine and Antarctic Studies, University of Tasmania, Hobart, 2 May 2023 (Attachment B04.1).

b. **Moreno et al. (2022)** - Moreno, D., Patil, J., Deagle, B., Semmens, J. (2022) Application of environmental DNA to survey Bathurst Harbour (Tasmania) for the Endangered Maugean Skate (*Zearaja maugeana)* Report to the National Environmental Science Program. Institute of Marine and Antarctic Studies, University of Tasmania, Hobart, 30 August 2022 (Attachment B04.2).

c. **Wild-Allen et al. (2020)** - Wild-Allen, K., Andrewartha, J., Baird, M., Bodrossy, L., Brewer, E., Eriksen, R., Skerratt, J., Revill, A., Sherrin, K., Wild, D. (2020) *Macquarie Harbour Oxygen Process model (FRDC 2016-067): CSIRO Final Report,* CSIRO Oceans & Atmosphere, Hobart (Attachment B04.3).

d. **EPA (2017)** - Environment Protection Authority (2017) *Macquarie Harbour Tasmanian Wilderness World Heritage Area Environmental Status Report*, Environment Protection Authority, Tasmania, May 2017 (Attachment B04.4).

e. **Bell et al. (2016)** – Bell, J., Lyle, J., Semmens, J., Awruch, C., Moreno, D., Currie, S., Morash A., Ross, J., Barrett, N., (2016) *Movement, habitat utilisation and population status of the endangered Maugean Skate and implications for fishing and aquaculture operation in Macquarie Harbour Fisheries Research and Development Corporation Project No 2013/008,* Institute of Marine and Antarctic Studies, University of Tasmania, Hobart, February (Attachment B04.5).

f. **Moreno et al. (2020)** - Moreno D, Lyle J, Semmens J, Morash A, Stehfest K, McAllister J, Bowen B and Barrett N (2020) *Vulnerability of the endangered Maugean Skate population to degraded environmental conditions in Macquarie Harbour. Report for the Fisheries Research and Development Corporation. Project No. 2016-068.* Institute for Marine and Antarctic Studies, University of Tasmania, Hobart, Tasmania (Attachment B04.6).

g. **DEWHA (2013)** - *EPBC Act Policy statement - Significant Impact Guidelines 1.1 - Matters of National Environmental Significance* (2013), Department of the Environment, Water, Heritage and the Arts (DEWHA), Australian Government (Attachment B04.7).

69. The 20 November 2023 letter specified the following sources (but did not enclose copies of the material) which the EDO considers support the request for reconsideration in relation to section 78(1)(a) and section 78(1)(aa):

a. **Ridgway and Ling (2023)** - Ridgway, K.R. and Ling, S.D., (2023). *Three decades of variability and warming of nearshore waters around Tasmania.* Progress in Oceanography, 215, 103046 (Attachment B06.5).

4.4. Requirements in section 78A

70. Section 78A(1) of the EPBC Act relevantly provides that a person may request the Minister to reconsider a decision made under section 75(1) about an action on the basis of a matter referred to in sections 78(1)(a) to (ca).

71. Section 78A(2) provides that a request under section 78A(1) must be in writing, set out the basis on which the person thinks the decision should be reconsidered, and must comply with any other requirements specified in the regulations in relation to reconsideration requests. Regulation 4AA.01 of the *Environment Protection and Biodiversity Conservation Regulations 2000* (Cth) (**EPBC Regulations**) sets out the relevant requirements for a reconsideration request made under section 78A(1).

72. The department reviewed the reconsideration requests and concluded that the requests each complied with the requirements in section 78A of the EPBC Act and regulation 4AA.01 of the EPBC Regulations.

73. The department gave consideration to the most practical way to proceed to consider the three separate reconsideration requests. In circumstances where all three reconsideration requests

relate to the same original section 75(1) decision, the department recommends you consider all three requests for reconsideration together as a single decision-making process.

74. On 27 November 2023, your delegate noted the department's advice that each of the three requests for reconsideration individually complied with the requirements in section 78A of the EPBC Act and regulation 4AA.01 of the EPBC Regulations. The submission provided by Salmon Tasmania dated 2 February 2024 (Attachment D04), on behalf of Petuna, Huon, and Tassal, and the submission provided by Petuna dated 2 February (Attachment D02), question whether the reconsideration requests meet the relevant requirements of the EPBC Act.

75. Three main bases were presented in both the Petuna and the Salmon Tasmania submissions dated 2 February 2024, as follows:

    a. none of the asserted bases for reconsideration under sections 78(1)(a), (aa) or (b) are linked to the information provided in the requests.

    b. EPBC Regulation 4AA.01 has not been met as the information provided does not demonstrate that a change in the potential impacts of the action is *likely to happen with a high degree of certainty*.

    c. the information relied upon by the requestors in support of the requests for reconsideration, especially the **Moreno and Semmens (2023)** report (provided with the requests received from all 3 of the requestors), does not provide any new information or a change of circumstances that was not foreseen at the time of the 2012/6406 referral decision. This is due to the knowledge that salmon pens in Macquarie Harbour having an influence on levels of DO and the lack of this information presenting impacts of the action on the Maugean skate.

76. The department has considered the matters raised in the submissions provided by Salmon Tasmania dated 2 February 2024, on behalf of Petuna, Huon, and Tassal and the submission of Petuna dated 2 February 2024 and the supporting information presented. Having considered those submissions, the department's position on the points raised in paragraph 72 (section 4.4) remains that the requests meet the requirements specified in section 78A(2) of the EPBC Act, including regulation 4AA.01 of the EPBC Regulations. To the extent that these submissions relate to the substantive matters for consideration as part of the reconsideration, those matters are addressed elsewhere in this report.

5. Stakeholder consultation

5.1. Requests for stakeholder comments

77. By letter dated 30 November 2023 and sent 1 December 2023, your delegate informed the following stakeholders of the requests for reconsideration and invited them to provide comments as to whether a matter referred to in any paragraph of section 78(1)(a) to (ca) of the EPBC Act was applicable in relation to the action. The letter requested responses be provided by 2 February 2024:

    a. Commonwealth ministers, in accordance with section 78B(4) of the EPBC Act:

        i) The Hon. Murray Watt MP, then Minister for Agriculture, Fisheries and Forestry.

        ii) The Hon. Linda Burney MP, then Minister for Indigenous Australians.

    b. State ministers, in accordance with section 78B(5) of the EPBC Act:

        i) Hon Roger Jaensch MP, then Tasmanian State Minister for Environment and Climate Change.

        ii) the letter to Hon Roger Jaensch MP was copied to:

            - The Director of the Environment Protection Authority Tasmania (**EPA**) because of the EPA's role in regulating marine farming in Macquarie Harbour.
            - The Secretary of NRE Tas, because the original 2012 referral was made by NRE Tas (formally known as Department of Primary Industry, Parks, Water and Environment (**DPIPWE**)).

    c. marine farm operators undertaking farming operations within Macquarie Harbour area, being the persons taking the action described in the referral EPBC 2012/6406, namely:

        i) Huon.

        ii) Tassal.

        iii) Petuna.

78. On 4 December 2023, as required by section 78B(6) of the EPBC Act, the department published, on the department's website, the reconsideration requests and an invitation for public comments on whether a matter referred to in any paragraphs of section 78(1)(a) to (ca) of the EPBC Act was applicable in relation to the action. The public comment period closed on 2 February 2024.

5.2. Stakeholder comments

79. A total of 2,551 submissions were received.

80. A total of 2,549 submissions were received from stakeholders for the purpose of the formal stakeholder consultation period, including public submissions made in response to the request for public comment and other stakeholder submissions made in response to the invitations for comment sent by your delegate described in section 5.1.

a. this figure includes 20 late submissions that were received from members of the public after the close of the public comment period (2 February 2024) but on/before 3 April 2024.

i) the department considered these comments in response to a request from Senator Anne Urquhart on behalf of members of the Strahan community who identified difficulties submitting through the EPBC Act Public Portal.

ii) late submissions were also received from other members of the public.

81. An additional 2 supplementary submissions were received after the formal consultation period, one from Salmon Tasmania dated 18 June 2024 (Attachment D05) and one from the Hon. Nick Duigan MLC, then Tasmania State Minister for Parks and Environment, dated 16 October 2024 (Attachment C03).

82. In making your decision, you should consider all submissions, comments and information included in your decision brief.

83. The department has reviewed and considered all stakeholder submissions referred to in section 5.2 and has taken them into account in preparing this draft Departmental Advice Report.

5.2.1. Commonwealth Ministers

84. One submission was received from a relevant Commonwealth Minister.

85. You received a letter dated 2 February 2024, from the Hon. Murray Watt, then Minister for Agriculture, Fisheries and Forestry, in response to your delegate's 30 November 2023 letter inviting comment (Attachment C01).

86. A response was not received from the Hon. Linda Burney MP, then Minster for Indigenous Australians. However, the National Indigenous Australians Agency (NIAA) wrote to the department in response to the request for comment sent to the then Minister for Indigenous Australians (see paragraph 100 (section 5.2.4.2). The comment from the NIAA has not been considered as a Commonwealth Minister submission, but has been recorded as a public comment (submission number 2540 at Attachment E02).

5.2.2. State Ministers

87. Two submissions were received from the relevant Tasmanian State Ministers.

88. You received a letter dated 2 February 2024, from the Hon. Roger Jaensch, then Tasmania State Minister for Environment and Climate Change (Attachment C02) in response to your delegate's 30 November 2023 letter inviting comment. This letter was provided on behalf of the Tasmanian Government and included a document prepared by NRE Tas and attachments (Attachment C02.1-C02.6).

89. You received a second letter dated 16 October 2024, from the Hon. Nick Duigan MLC, then Tasmania State Minister for Parks and Environment (Attachment C03), providing a supplementary submission. The supplementary submission was provided on behalf of the Tasmanian Government and included a document prepared by NRE Tas and attachments (Attachment C03.1).

5.2.3. Marine farm operators and the industry representative body for the salmon industry in Tasmania (Salmon Tasmania)

90. Five submissions were received from the marine farm operators, including from Salmon Tasmania who submitted on behalf of the three marine farm operators.

91. You received three separate letters dated 2 February 2024, from the marine farm operators Huon (Attachment D03), Tassal (Attachment D01), and Petuna (Attachment D02) in response to your delegate's 30 November 2023 letter inviting comment.

92. You received a letter dated 2 February 2024, from Salmon Tasmania, sent on behalf of its member entities, Petuna, Tassal and Huon (Attachment D04). This letter was received within the formal stakeholder comment period which closed on 2 February 2024.

93. You received a second letter dated 19 June 2024, from Salmon Tasmania, on behalf of its member entities, Petuna, Tassal and Huon (Attachment D05) providing a supplementary submission.

5.2.4. Public

94. 2,543 submissions were received from members of the public.

95. Of the 2,543 public submissions received during stakeholder consultation:

    a. 1,082 were campaign submissions (standard proforma responses submitted by individuals indicating their agreement to the views described in the campaign text).

    b. 1,461 were unique submissions.

5.2.4.1. Requestors

96. Each of the three organisations that submitted the reconsideration requests (requestors) also provided submissions as part of the public consultation (Attachment E01).

97. Fitzgerald and Browne Lawyers on behalf of the Bob Brown Foundation submitted a comment dated 30 January 2024, via the public portal (Attachment E01.3).

98. The EDO on behalf of the Australian Marine Conservation Society and Humane Society International Australia submitted a comment dated 2 February 2024, via the public portal referencing an attachment which was not included. On 22 February 2024, this attachment was provided directly to the department (Attachment E01.2).

99. The Australia Institute submitted a comment dated 2 February 2024, via the public portal which included an attachment (Attachment E01.1).

5.2.4.2. Government agencies

100. On 22 December 2023, the National Indigenous Australians Agency (**NIAA**) wrote to the department (Attachment E02) in response to the request for comment sent to the Hon. Linda Burney MP, then Minister for Indigenous Australians. The department notes that the response from

the NIAA was not on behalf of the Minister. The NIAA stated that it did not have any comments on the reconsideration requests.

101. You received a letter from Dr Wes Ford, the Director of the Environment Protection Authority Tasmania (Attachment E03) dated 2 February 2024. The department notes that Dr Wes Ford, was copied into the department's letter sent to the Hon. Roger Jaensch, then Tasmania State Minister for Environment and Climate Change, and also notes that the letter from Dr Wes Ford was not on behalf of the Tasmania State Minister and has therefore been considered a public comment.

5.2.4.3. Elected representatives

102. You received a submission dated 15 January 2024, from West Coast Council Mayor through the public consultation process (Attachment E04.1).

103. You received a submission dated 2 February 2024, from Rebecca White MP and Janie Finlay MP through the public consultation process (Attachment E04.2).

104. You received a submission dated 2 February 2024, from Senator Anne Urquhart through the public consultation process (Attachment E04.3).

5.2.5. Additional Correspondence

105. The department recommends that you consider additional correspondence relevant to the decision at Attachment G, received from a range of stakeholders outside the stakeholder consultation period and received by 31 December 2024, including:

a. correspondence to you (as the Minister for the Environment and Water) from:

i) Professor Barry Brook, chair of Environmental Sustainability, School of Natural Sciences, University of Tasmania (Attachment G01).

ii) Salmon Tasmania (Attachments G02 and G03).

iii) a group of scientists (Frusher et al.) (Attachment G04).

b. correspondence to the Secretary of the DCCEEW from Mr Jason Jacobi, the Secretary of the Department of Natural Resources and Environment Tasmania (Attachments G05 and G06).

c. correspondence to the Prime Minister of Australia from:

i) the Hon Jeremy Rockliff, Premier of Tasmania, (Attachments G07, G08, G09 and G10).

ii) four West Coast Tasmania Mayors (Attachment G11).

iii) marine farm operators (Huon, Tassal and Petuna) CEO and Managing Directors (Attachment G12).

106. The department has reviewed and considered this additional correspondence, and has taken them into account in preparing this draft Departmental Advice Report.

6. Statutory framework

6.1. Reconsideration of decisions

6.1.1. The Minister's power to reconsider a decision

107. Under section 78(1) of the EPBC Act, you have the power to revoke a decision made under section 75(1) about an action (the First Decision) and substitute a new decision under section 75(1) for the First Decision, but only if one of the circumstances in section 78(1)(a)-(d) applies. Each of the circumstances outlined in section 78(1)(a)-(d) is a separate basis upon which the First Decision can be revoked and substituted with a new decision.

108. The circumstances most relevant to the present reconsideration requests, and which are referred to in the requests for reconsideration (described in section 4 of this document), are as follows:

    a. if you are satisfied that the revocation and substitution is warranted by the availability of substantial new information about the impacts that the action has or will have, or is likely to have, on a protected matter (section 78(1)(a)).

    b. if you are satisfied that the revocation and substitution is warranted by a substantial change in circumstances that was not foreseen at the time of the First Decision and relates to the impacts that the action has or will have, or is likely to have, on a protected matter (section 78(1)(aa)).

    c. if you are satisfied that the action is not being, or will not be, taken in the manner identified in the notice of decision setting out a component decision that the action is not a controlled action because of the decision-maker's belief that the action would be taken in that identified manner (section 78(1)(b)).

109. Subsections 78(1)(ba)-(d) are not discussed in this document in circumstances where the department considers that those subsections are not relevant to the request for reconsideration, as they cannot be met in the factual circumstances of the present matter.

6.1.2. Revoking and substituting a decision on reconsideration

110. Sections 78(1)(a) or (aa) require you to consider if you are satisfied that revocation and substitution of the NCA-PM decision is warranted by a particular circumstance (the availability of substantial new information about the impacts that the action has or will have, or is likely to have, on a protected matter or a substantial change in circumstances that was not foreseen at the time of the First Decision and relates to the impacts that the action has or will have, or is likely to have, on a protected matter, respectively).

111. Section 78(1)(b) requires you to be satisfied that the action is not being, or will not be, taken in the manner identified in the NCA-PM decision notice for the First Decision, including by having regard to the particular manner requirements outlined in that decision notice.

112. If you do decide to revoke the First Decision and substitute a new decision for the First Decision under section 75(1) of the EPBC Act, you must decide:

    a. whether the proposed action that is the subject of the referred proposal is a controlled action; and

    b. if so, which provisions of Part 3 are controlling provisions for the action.

113. An action is a controlled action if the taking of the action, without your approval under Part 9 for the purposes of a provision of Part 3, would be prohibited by the provision (or would be prohibited but for section 25AA or 28AB). Each provision which would prohibit the taking of the action is a controlling provision for the action (section 67).

114. The department has identified the following relevant controlling provisions in relation to the action described in referral 2012/6406. Each of the relevant controlling provisions sets out a prohibition that a person must not take an action that has or will have, or is likely to have, a significant impact on the relevant protected matter. Specifically:

    a. **World Heritage values:** section 12 of the EPBC Act provides that a person must not take an action that has or will have, or is likely to have, a significant impact on the world heritage values of a declared World Heritage property.

    It is an offence under section 15A(1) of the EPBC Act for a person to take an action if that action results or will result in a significant impact on the world heritage values of a declared World Heritage property. It is an offence under section 15A(2) of the EPBC Act for a person to take an action if that action has or will have, or is likely to have, a significant impact on the world heritage values of a declared World Heritage property.

    b. **National Heritage values:** section 15B of the EPBC Act relevantly provides that certain persons (or persons in certain circumstances) must not take an action that has or will have, or is likely to have a significant impact on the National Heritage values of a National Heritage place.

    It is an offence under section 15C of the EPBC Act relevantly for certain persons (or persons in certain circumstances) to take an action if that action results or will result in a significant impact on the National Heritage values of a National Heritage place. It is also an offence under section 15C of the EPBC Act relevant for certain persons (or persons in certain circumstances) to take an action if that action has or will have, or is likely to have, a significant impact on the National Heritage values of a National Heritage place.

    c. **listed threatened species and communities:** section 18 of the EPBC Act provides that a person must not take an action that has or will have, or is likely to have, a significant impact on a listed threatened species, relevantly including species that are extinct in the wild, critically endangered species, endangered species, vulnerable species, critically endangered communities or endangered communities.

    It is an offence under section 18A of the EPBC Act for a person to take an action if that action results or will result in a significant impact on the aforementioned species or communities. It is also an offence under section 18A of the EPBC Act for a person to take an action if that

action has or will have, or is likely to have, a significant impact on one of the aforementioned species or communities.

115. When making a decision under section 75(1), you must consider all adverse impacts (if any) the action has or will have, or is likely to have, on the matter protected by each provision of Part 3 (noting that the department has identified the protected matters it considers to be relevant at paragraph 114 (section 6.1.2). However, you must not consider any beneficial impacts the action has or will have, or is likely to have, on the matter protected by each provision of Part 3 (**section 75(2)(b)**). This includes the impacts of the entire action, including the portions which have already occurred, as the action under reconsideration is the entire referred action.

116. Section 527E defines 'impact' for the purposes of the EPBC Act. An event or circumstance is an impact of an action taken by a person if:

a. the event or circumstance is a direct consequence of the action (**section 527E(1)(a)**); or

b. for an event or circumstance that is an indirect consequence of the action – subject to sub-section 527E(2), the action is a substantial cause of that event or circumstance (**section 527E(1)(b)**).

117. Section 527E(2) provides that, for the purposes of section 527E(1)(b), if:

(a) a person (the primary person) takes an action (the primary action); and

(b) as a consequence of the primary action, another person (the secondary person) takes another action (the secondary action); and

(c) the secondary action is not taken at the direction or request of the primary person; and

(d) an event or circumstance is a consequence of the secondary action;

then that event or circumstance is an impact of the primary action only if:

(e) the primary action facilitates, to a major extent, the secondary action; and

(f) the secondary action is:

(i) within the contemplation of the primary person; or

(ii) a reasonably foreseeable consequence of the primary action; and

(g) the event or circumstance is:

(i) within the contemplation of the primary person; or

(ii) a reasonably foreseeable consequence of the secondary action.

118. Section 391 provides that you must take account of the precautionary principle in making a decision under section 75, to the extent you can do so consistently with the other provisions of the EPBC Act. While section 78 is not separately listed in section 391 as a decision where the precautionary principle must be taken into account, given the operation of the reconsideration process, you are required to take account of the precautionary principle should you decide to revoke the NCA-PM decision and substitute it with a decision under section 75(1). The precautionary principle is that a lack of full scientific certainty should not be used as a reason for

postponing a measure to prevent degradation of the environment where there are threats of serious or irreversible environmental damage.

119. Section 158A provides that, if the Minister has made a decision under section 75, and at a time after that decision has been made a listing event occurs, that the listing event is to be disregarded in making any further approval process decisions in relation to the relevant action.

120. Section 176 requires you to have regard to any relevant bioregional plan. Section 362 requires you to not act inconsistently with a Commonwealth reserve management plan.

6.2. The reconsideration process

6.2.1. Requesting reconsideration

121. Section 78A(1) of the EPBC Act relevantly provides that a person may request the Minister to reconsider a decision made under subsection 75(1) about an action on the basis of a matter referred to in any of the paragraphs of section 78(1)(a) to (ca) of the EPBC Act.

122. A request for reconsideration made under section 78A(1) must be made in accordance with the requirements outlined in section 78A(2) of the EPBC Act and regulation 4AA.01 of the EPBC Regulations.

6.2.2. Informing interested persons of reconsideration request and inviting comments

123. Section 78B requires that the Minister must inform certain people of the reconsideration request, relevantly including other Commonwealth Ministers and the appropriate State and Territory Ministers. The Minister is also required to publish the reconsideration request on the internet and to invite public comment on the reconsideration request.

6.2.3. Reconsideration of decision and notice of outcome of reconsideration

124. Under section 78C(1) of the EPBC Act, as soon as practicable after the end of the time within which information or comments may be given under section 78B in relation to a request under section 78A to reconsider a particular referral decision about an action, the Minister must:

a. reconsider the decision; and

b. either:

i) confirm the decision; or

ii) revoke the decision in accordance with section 78(1), and substitute a new decision for it.

125. Under section 78C(2), you must relevantly give written notice of the outcome of the reconsideration to the persons who requested the reconsideration, the person proposing to take

the action, and in certain circumstances, the appropriate Minister of the State or Territory. The Minister must then also publish notice of the outcome of the reconsideration.

6.3. Options available on reconsideration

126. You have the following options available on reconsideration:

a. you may confirm the First Decision (that the action is not a controlled action if undertaken in the particular manner described in the particular manner requirements for the First Decision); or

b. you may revoke the First Decision in accordance with section 78(1) and substitute a new decision for it under section 75(1), that:

i) the action is not a controlled action; or

ii) the action is not a controlled action if undertaken in a particular manner; or

iii) the action is a controlled action and is subject to controlling provisions.

6.4. Information to be considered

127. The department recommends that, when considering whether to revoke the First Decision and substitute a new decision on the basis that you are satisfied that the revocation and substitution is warranted because of the circumstances described in sections 78(1)(a) or 78(1)(aa), you should consider:

a. the requests for reconsideration and information referenced therein (listed at Attachment B);

b. submissions, comments and information provided in relation to the reconsideration, including the submissions provided by or on behalf of the relevant Commonwealth ministers, the relevant State Ministers, submissions provided by members of the public (including a number of submissions that were received after the close of the public comment period, but were still considered to contain information and submissions that are directly relevant to the reconsideration) and submissions received from the marine farm operators;

c. other relevant information identified by the department as being relevant to the reconsideration listed at Attachment F01;

d. the original referral for the action (Attachment A02 and A03); and

e. the First Decision (Attachment A01 and A04).

128. While you should, in determining whether you are satisfied that the revocation and substitution is warranted, consider all the materials referred to at paragraph 127 (section 6.4) you must, in reaching the requisite state of satisfaction, apply the relevant tests in sections 78(1)(a) or 78(1)(aa).

129. In this context, the department notes that you have received submissions, including submissions from the then Commonwealth Minister for Agriculture, Fisheries and Forestry, the Tasmanian State Minister, and submissions made by the marine farm operators and on behalf of the marine farm

operators by Salmon Tasmania, in relation to the economic and social consequences of revoking the First Decision and substituting the First Decision with a new decision under section 75(1). These submissions relevantly describe the economic and social impacts of a substituted controlled action decision which would subsequently require the assessment of the action and, likely, the immediate cessation of the action.

130. In deciding whether to revoke the First Decision under section 78(1), in circumstances where these submissions have been made in accordance with the consultation processes prescribed by the EPBC Act you are required to consider these submissions. However, the department considers that, having regard to the statutory tests in sections 78(1)(a) and (aa), in considering whether you are satisfied that the revocation and substitution is warranted because of the circumstances described in sections 78(1)(a) or 78(1)(aa), you should place no weight on those aspects of the submissions which are concerned with the economic and social consequences of revoking the First Decision.

131. In deciding whether the statutory provisions in section 78(1)(a) apply, you are required to consider whether revocation and substitution is warranted by substantial new information about the impacts that the action has or will have, or is likely to have, on a protected matter.

132. In deciding whether the statutory provisions in section 78(1)(aa) apply, you are required to consider whether revocation and substitution is warranted by a substantial change in circumstances that was not foreseen at the time of the First Decision and relates to the impacts that the action has or will have, or is likely to have, on a protected matter.

133. The submissions made with respect to the economic and social impacts of the cessation of marine farming in Macquarie Harbour do not bear upon your assessment of the matters you are required to be satisfied of by the statutory tests in sections 78(1)(a) and (aa).

134. In deciding whether the statutory provisions in section 78(1)(b) apply, you are required to consider whether you are satisfied that the action is not being, or will not be, taken in the manner identified in the NCA-PM decision.

135. You have also received submissions describing the economic and social benefits of marine farming in Macquarie Harbour. These submissions should also be given no weight in considering whether you are satisfied that revocation and substitution is warranted because of the circumstances described in sections 78(1)(a) or (aa).

136. The department notes that economic and social matters may be considered in deciding whether or not to approve the taking of an action (in the event that you do decide to revoke the First Decision and substitute it with a controlled action decision), and what conditions to attach to an approval of a controlled action (under section 136(1)(a)).

137. As noted below, in making a new decision under section 75(1) about the action, you are <u>not</u> permitted to consider the following matters:

    a. any beneficial impacts the action has or will have, or is likely to have, on a matter protected by Part 3 (section 75(2)(b)). In this case, those matters include:

        i) World Heritage properties (**sections 12** and **15A**)

        ii) National Heritage places (**sections 15B** and **15C**)

iii) listed threatened species and communities (**sections 18** and **18A**)

b. any listing events relevant to the action that occurred after the First Decision was made (**section 158A**).

6.4.1. Section 75(1) - key statutory provisions in the EPBC Act

138. Section 75(1) provides as follows:

> **75** ***Does the proposed action need approval?***
>
> *Is the action a controlled action?*
>
> *(1) The Minister must decide:*
>
> *(a) whether the action that is the subject of a proposal referred to the Minister is a controlled action; and*
>
> *(b) which provisions of Part 3 (if any) are controlling provisions for the action.*
>
> *...*
>
> *Considerations in decision*
>
> *(2) If, when the Minister makes a decision under subsection (1), it is relevant for the Minister to consider the impacts of an action:*
>
> *(a) the Minister must consider all adverse impacts (if any) the action:*
>
> *(i) has or will have; or*
>
> *(ii) is likely to have;*
>
> *on a matter protected by each provision of Part 3; and*
>
> *(b) must not consider any beneficial impacts the action:*
>
> *(i) has or will have; or*
>
> *(ii) is likely to have;*
>
> *on the matter protected by each provision of Part 3.*
>
> *…*

139. A 'controlled action' is defined in section 67 of the EPBC Act as follows:

> **67 What is a *controlled action*?**
>
> *An action that a person proposes to take is a **controlled action** if the taking of the action by the person without approval under Part 9 for the purposes of a provision of Part 3 would be (or would, but for section 25AA or 25AB, be) prohibited by the provision. The provision is a **controlling provision** for the action.*

140. The prohibitions in Part 3 of the EPBC Act operate by reference to the significance of the impact of the action. An action will be a controlled action if the taking of the action has or will have, or is likely to have, a 'significant impact' on a matter described in one of the controlling provisions

contained in Part 3 of the EPBC Act. For example, the controlling provision in section 18(3) of the EPBC Act (actions with significant impact on listed threatened species or endangered community prohibited without approval) relevantly provides as follows:

> …
>
> *Endangered species*
>
> *(3) A person must not take an action that:*
>
> *(a) has or will have a significant impact on a listed threatened species included in the endangered category; or*
>
> *(b) is likely to have a significant impact on a listed threatened species included in the endangered category.*
>
> *Civil penalty:*
>
> *(a) for an individual - 5,000 penalty units;*
>
> *(b) for a body corporate - 50,000 penalty units.*

141. 'Impact' is relevantly defined in section 527E of the EPBC Act as follows:

> **527E Meaning of *impact***
>
> *(1) For the purposes of this Act, an event or circumstance is an **impact** of an action taken by a person if:*
>
> *(a) the event or circumstance is a direct consequence of the action; or*
>
> *(b) for an event or circumstance that is an indirect consequence of the action – subject to subsection (2), the action is a substantial cause of that event or circumstance.*
>
> *(2) For the purposes of paragraph (1)(b), if:*
>
> *(a) a person (the **primary person**) takes an action (the **primary action**); and*
>
> *(b) as a consequence of the primary action, another person (the **secondary person**) takes another action (the **secondary action**); and*
>
> *(c) the secondary action is not taken at the direction or request of the primary person; and*
>
> *(d) an event or circumstance is a consequence of the secondary action;*
>
> *then that event or circumstance is an **impact** of the primary action only if:*
>
> *(e) the primary action facilitates, to a major extent, the secondary action; and*
>
> *(f) the secondary action is:*
>
> *i within the contemplation of the primary person; or*
>
> *ii a reasonably foreseeable consequence of the primary action; and*
>
> *(g) the event or circumstance is:*

i within the contemplation of the primary person; or

ii a reasonably foreseeable consequence of the secondary action.

142. The phrase 'significant impact' is not separately defined in the EPBC Act. The Federal Court has held that 'significant impact' requires an impact '*that is important, notable or of consequence having regard to its context and intensity*' (*Booth v Bosworth* [2001] FCA 1453; *VicForests v Friends of Leadbeater's Possum Inc* [2021] FCAFC 66). The *Significant Impact Guidelines 1.1* (Attachment B04.7) published by the department also provide further context as to what constitutes a 'significant impact' with respect to each protected matter described in Part 3. The relevant Significant Impact Guidelines are discussed in the analysis that follows for each relevant controlling provision.

143. In deciding whether an action is 'likely' to have a significant impact, you should consider whether there is a real and not remote chance or possibility that the action will have a significant impact.

6.4.2. Applying the relevant statutory provisions

Having regard to the matters described above, in making any substituted decision pursuant to section 75(1) of the EPBC Act as to whether the action is a controlled action, you are required to consider whether any provisions of Part 3 are controlling provisions for the action. This requires you to consider, as a question of fact, whether the action has or will have, or is likely to have, a significant impact on one (or more) of the matters described in the controlling provisions set out in Part 3 of the EPBC Act.

144. For the action to have a 'significant impact' in relation to a matter protected by Part 3, you must be satisfied that:

a. the event or circumstance constituting the impact is a direct consequence of the action, or that the event or circumstance constituting the impact is an indirect consequence of the action, which is a substantial cause of the event or circumstance; and

b. the impact (either direct or indirect) is important, notable or of consequence having regard to its context and intensity.[2]

6.4.3. Precautionary principle

145. As set out at paragraph 118 (section 6.1.2) you are required to take account of the precautionary principle in making any substituted decision under section 75(1). The precautionary principle applies if you are satisfied that there is a threat of serious or irreversible damage to the environment, and that there is a lack of scientific certainty about the scope or extent of that threat. In that case, you are required not to use that uncertainty as a reason to postpone measures to prevent environmental degradation.

[2] As held by the Federal Court in *Booth v Bosworth* [2001] FCA 1453 (see [99]) and endorsed by the Full Court of the Federal Court in *VicForests v Friends of Leadbeter's Possum Inc* [2021] FCAFC 66 (see [62])

146. As further discussed in section 7 and section 8, the department considers that there is a threat of serious or irreversible damage to the following protected matters as a result of the action:

    a. World Heritage values of a declared World Heritage property (section 12 and section 15A).

    b. National Heritage values of a National Heritage place (section 15B and section 15C).

    c. listed threatened species and communities (section 18 and section 18A).

147. The specific application of the precautionary principle to these matters is discussed in paragraphs 318 (section 7.3.4), 323 (section 7.3.4.1), 367 (section 7.4.1), 377 (section 7.5.2), 408 (section 8.3.3), 432 (section 8.4.3), 444 (section 8.5.1). The department also considers that there is a lack of full scientific certainty in relation to these protected matters on the basis of the information currently available to the department.

148. In relation to the protected matters for provisions which the department does not recommend are controlling provisions, the department does not consider that the precautionary principle would apply as there is no threat of serious or irreversible damage to these matters in the circumstances of this action. Further, the department does not consider that there is a lack of scientific certainty as to the nature or scope of any threat of environmental damage in relation to these other protected matters in the circumstances of this action.

149. There are no bioregional plans or Commonwealth reserve management plans relevant to your decision.

7. Reconsideration under section 78(1)(a) – Substantial new information

7.1. Recommendation in relation to section 78(1)(a)

150. In light of the material before you, the department recommends that you revoke the First Decision and substitute a new decision that the action is a controlled action and that sections 12, 15A, 15B, 15C, 18 and 18A are the controlling provisions for the action, pursuant to section 78(1)(a) of the EPBC Act

151. The department considers that you can be satisfied that the revocation and substitution is warranted by the availability of substantial new information about the impacts that the action has had, and is likely to have, on matters protected by a provision of Part 3.

152. Specifically:

    a. in relation to the **Maugean skate (*Zearaja maugeana*)**, protected as a listed endangered species under section 18 and 18A of the EPBC Act, there is substantial new information before you about the effects of the marine farming that forms part of the action on DO levels in Macquarie Harbour. In particular, the information before you in relation to the impacts of marine farming on the reduction of DO levels in Macquarie Harbour, and the impacts of the reduction of DO levels on the Maugean skate's habitat, behaviour and physiology, area of

occupancy and population is substantial new information about the impacts that the action has had, and is likely to have, on the Maugean skate. In light of that substantial new information, the department considers that you can be satisfied that the action has had, and is likely to have a significant impact on the Maugean skate as a listed endangered species protected under section 18 and 18A of the EPBC Act;

b. in relation to the **Tasmanian Wilderness World Heritage Area**, protected as a World Heritage property under section 12 and 15A of the EPBC Act, there is substantial new information before you about the effects of the marine farming that forms part of the action on the water quality in Macquarie Harbour. In particular, there is substantial new information before you which indicates that marine farming is degrading water quality by causing a reduction in DO levels. The information before you in relation to the impacts of marine farming on the degradation of water quality in Macquarie Harbour is substantial new information about the impacts that the action has had and is likely to have on the natural heritage values of the Tasmanian Wilderness World Heritage Area, including those values justified under World Heritage criteria (vii), (ix) and (x). In light of that substantial new information, the department considers that you can be satisfied that the action has had, and is likely to have a significant impact on the Tasmanian Wilderness World Heritage Area as protected under sections 12 and 15A of the EPBC Act; and

c. in relation to the **Tasmanian Wilderness National Heritage place**, protected as a National Heritage place under sections 15B and 15C of the EPBC Act, there is substantial new information before you about the effects of the marine farming that forms part of the action on the water quality in Macquarie Harbour. In particular, there is substantial new information before you which indicates that marine farming is degrading water quality by causing a reduction in DO levels. The information before you in relation to the impacts of marine farming on the degradation of water quality in Macquarie Harbour is substantial new information about the impacts that the action has had, and is likely to have, on the natural heritage values of the Tasmanian Wilderness National Heritage place, including its listing under National Heritage criteria (a), (b), (c), (d), (e) and (g). In light of that substantial new information, the department considers that you can be satisfied that the action has had, and is likely to have, a significant impact on the values of the Tasmanian Wilderness National Heritage place, as protected under sections 15B and 15C of the EPBC Act.

153. For the reasons outlined above and detailed below, the department recommends that you find that revocation of the NCA-PM decision and substitution with a new decision that the action is a controlled action is warranted. The department recommends that the controlling provisions for the action should be sections 12, 15A, 15B, 15C, 18 and 18A of the EPBC Act.

7.2. Section 78(1)(a)

154. Pursuant to s78(1)(a), the Minister may revoke a decision (in this case, the First Decision) made under subsection 75(1) about an action and substitute a new decision under that subsection for the First Decision, but (relevantly) only if:

a. *the Minister is satisfied that the revocation and substitution is warranted by the availability of substantial new information about the impacts that the action:*

i) *has or will have; or*

ii) *is likely to have;*

on a matter protected by a provision of Part 3

155. The following issues arise for consideration in the context of section 78(1)(a):

a. is new information available (that is, was the relevant information available at the time of the First Decision)?

b. is the information substantial (that is, is it of substance, and more than insignificant or trivial)?

c. is the information about the impacts or likely impacts of the action on a protected matter?

d. are you satisfied that the revocation and substitution of the First Decision is warranted by the availability of new information?

7.3. Substantial new information about the impacts of the action on the Maugean skate

156. The department considers that it is open to you to conclude that there is substantial new information before you about the impacts of the action on the Maugean skate (a listed threatened species included in the endangered category). Specifically, there is substantial new information before you which indicates that the marine farming activities that form part of the action are significantly impacting the habitat of the Maugean skate in Macquarie Harbour, which is in turn leading to a significant impact (a decline) to the Maugean skate's population size.

157. There is also information and submissions before you which contends that the action is not having a significant impact in the manner described in paragraph 157 (section 7.3). However, on balance, the department considers that it is open to you to be satisfied, having regard to the totality of the information, that the marine farming activities comprising the action have had, and are likely to have, a significant impact on the Maugean skate.

158. The marine farming activities result in the release of a large volume of organic matter and nutrients into Macquarie Harbour, in the form of fish feed and waste. The new information before you suggests that the increased release of organic matter and nutrients into Macquarie Harbour due to marine farming activities has contributed to:

a. reductions in DO levels in Macquarie Harbour; and

b. degradation of the benthic environment in Macquarie Harbour.

159. The new information before you indicates that, as a result of the above changes to Macquarie Harbour, which can be largely attributed to marine farming activities, the action has had significant impacts to the Maugean skate's habitat. The impacts of marine farming on the Maugean skate's habitat have led to:

a. impacts on the Maugean skate's behaviour and physiology, including reproduction and survival;

b. a reduction in the Maugean skate's habitat and area of occupancy; and

c. a decline in the Maugean skate's population size.

160. The department's recommendation is that the above information referred to in paragraph 159 and 160 (section 7.3) is substantial new information about the impacts the action has had, and is likely to have, on the Maugean skate, and that in light of this substantial new information, the revocation and substitution of the First Decision is warranted. The sources of the substantial new information are discussed in further detail in this section 7.3.

161. The department further considers that the substantial new information before you demonstrates that the action has had, and is likely to have, a significant impact on the Maugean skate, a listed threatened species under section 18 and 18A of the EPBC Act. On that basis, the department recommends that you substitute the First Decision with a decision that the action is a controlled action, where section 18 and 18A are controlling provisions for the action.

7.3.1. Information at the time of the First Decision

162. The referral form provided by DPIPWE in 2012 included the following statements in relation to the potential impact of the action on the Maugean skate (Attachment A02, pages 45-47):

'[t]he Maugean skate was first discovered in 1989, and scientifically described in 2007. It is a large primate fish and is the only skate worldwide known to be entirely restricted to estuaries. It has no close relatives in Australia, the nearest occurring in New Zealand and Chile, indicating an ancient Gondwanan heritage. The IUCN Red List regards this skate as Endangered due to its rarity, very restricted geographic range, and to ongoing threats associated with gillnet fishing and heavy metal pollution in one of its known locations (Macquarie Harbour) and a lack of recent sightings in the other location (Port Davey).

…

Scientific data relating to the biology, distribution or the environmental requirements of this animal are limited, and the focus of current research.

….

the Institute of Marine and Antarctic Studies (IMAS) researchers (November 2011) undertook some netting in Macquarie Harbour, as part of a larger state wide Fisheries Research and Development Corporation project assessing the impacts of gillnetting, in which they captured 45 Maugean skate. IMAS also undertook a more recent survey on April 2012 that resulted in a further 50 Maugean skates being caught. IMAS stated that the initial 45 animals were captured in 1-15 m depth and that the second 50 were caught in 3-15 m depth. These ranges relate to the fact that nets were set in those depths ranges, perpendicular to the shore on a sloping substrate, therefore it is not possible to be more precise regarding exactly what depths individual skates were in when netted. It should also be noted that the capture locations of Maugean skates in the Harbour are not necessarily reflective of overall distribution of Maugean Skates in the Harbour. IMAS has tagged and released a

number of skates in the Harbour and it is hoped that more information on movement within, and utilisation of, the Harbour will be available soon.

Perhaps the main conclusion from the recent survey work by IMAS is that the skate may be more abundant in the Harbour than earlier estimates suggested. It is still unknown how or if the Skate utilises deep waters (greater than 15 m). IMAS has conducted some limited surveying in deeper waters to date and not recorded any Skate. One egg case was collected in deeper waters (approx 25 m) but it remains uncertain whether this was laid at this depth or if it drifted from elsewhere.

…

The key threats identified for this species include:

- *Physical disturbance of habitat;*
- *Changes in water chemistry – either through inputs (food, waste), incidental additions (oil and diesel) or the re-suspension of contaminated sediments – resulting in adverse health impacts and/or loss of suitable food species;*
- *Entanglement in nets, including those used for fish down and recreational purposes.*

Potential Impacts

The main potential threats to the Maugean Skate are trace metal pollution from historic mining operations in Macquarie Harbour; incidental capture in fishing activities; the introduction of non-native marine species; changes to the water nutrient levels through discharge from cruise ships and fishing vessels; and an increase in tourism pressure in these areas.

Little is known about the extent to which the Skates use deeper water. Research undertaken to date has predominantly recorded the Skates in shallower waters (less than 15m). Conversely the farm sites are predominantly located in deeper water (greater than 15 m). This suggests that there is limited opportunity for direct interaction. However it should be noted that sampling to date and the recreational fishing effort is biased towards shallower waters.

…

The proposal would increase the current leasable area by 362 Ha (from 582 to 924 Ha). Macquarie Harbour occupies approximately 276km2, therefore the total proposed leased area would represent around 3.33% of the total area of Macquarie Harbour. It is possible that skates will continue to be able to utilise the lease area. Skates are benthic rays that feed on benthic infauna and epifauna at the sediment/water interface. It is known from extensive research in Tasmania that solid wastes derived from salmonid farming (predominantly food and faeces) largely settle directly under the pen footprint and may cause changes to the sediment chemistry and biota. However, the pen area only represents a percentage of the leasable area. It therefore could be concluded that solid wastes are unlikely to have a significant impact on the Skate, based on the currently available information on the biology and ecology of the species.

Actions related to shore-based activities may result in very small areas being subject to sedimentation. However, as these will most likely [be] localised and temporary disturbances, it is also unlikely that these will impact on the Skate. Soluble wastes can disperse more widely through

the Harbour than solid wastes. The biggest threat from soluble wastes would be a build-up of NOx from feed and waste inputs, and a resultant broad-scale shift in water quality across the Estuary.

The most significant risk identified is through entanglement as the result of gill netting. Entanglement with netting and equipment related to marine farming activities is considered unlikely, or low risk, as the skate is a benthic or demersal species and farming activities occur predominantly away from the Harbour floor in the shallow to mid water depth range. Conversely there is mounting evidence to suggest that the Skate is highly susceptible to capture in gill nets and this has previously resulted in some skate mortality. Gill netting in the Harbour is undertaken by three commercial fishermen and also by recreational netters. There is a potential that the expanded farming activities may increase the number of escapees or escape events, which may in turn lead to an increase in recreational netting activity. Whether this is likely to cause a significant impact to the Skate is not possible to quantify.

Conclusion

Due to the limited knowledge of this species a precautionary approach has been used for the risk assessment and it has been concluded that, without mitigation there is a ***MEDIUM*** *threat that this proposal would have a significant impact on the Maugean Skate.'*

(original emphasis)

163. At the time of the First Decision, there was limited survey information available about the Maugean skate in Macquarie Harbour. The survey information available included:

a. the referral form (Attachment A02) refers to the results of video monitoring that was undertaken as a requirement of the licence conditions. The additional information submitted by DPIPWE dated 5 September 2012 (Attachment A03) indicates that since compliance-based underwater video monitoring commenced in 1997, 1486 spot dives and 18 km of strip transects have been conducted in depths ranging from 3 to 45 m:

i) the referral form states:

- '*the farm sites are predominantly located in deeper water (greater than 15 m)*'.
- 'a single dead skate (recorded on a 2001 marine farm monitoring survey) has been recorded in close proximity to a fish farm in the Harbour, although the cause of death is unknown'.

ii) the additional information states:

- 'Within the existing marine farming zones, two Maugean Skate have been observed in waters less than 20 metres, one inside and one approximately 35 metres outside a marine farming lease area. No Maugean Skate have been observed in waters greater than 20 metres in any of the proposed marine farming zones that are the subject of the current referral'.
- *'In 2003/04 and 2011/12 gillnetting surveys have been undertaken by the Institute of Marine and Antarctic Studies researchers in various areas around the Harbour, in depths ranging from 0-25 metres. These surveys involved 405 net shots which*

captured 116 Maugean Skate. During the 2011/12 gillnetting surveys, 63 Maugean Skate were caught in Liberty Bay which is in close proximity to the current Table Head marine farming lease'.

b. the referral form refers to targeted netting surveys undertaken by IMAS in November 2011, as part of a larger statewide Fisheries Research and Development Corporation project assessing the impacts of gillnetting, in which they captured 45 Maugean skate in 1-15 m depth (Attachment A02).

c. the referral form also refers to a targeted netting survey undertaken by IMAS in April 2012, in which they captured 50 Maugean skate in 3-15 m depth (Attachment A02).

d. the referral form states that IMAS conducted limited surveying in water depths greater than 15 m and did not record any Maugean skate in these deeper water surveys (Attachment A02). The referral form notes that one egg case was collected at approximately 25 m depth but it was uncertain whether this was laid at this depth or drifted from elsewhere.

164. As evidenced in paragraph 164 (section 7.3.1), there was limited survey information available at the time of the First Decision. It was known at the time of the First Decision that Maugean skate inhabited the benthic environment in water depths less than 15m, but it was unknown at the time of the First Decision if the Maugean skate inhabited the benthic environment in water depths greater than 15 m.

165. The referral form (Attachment A02) makes the following statements that demonstrates the lack of information available about the Maugean skate's utilisation of the benthic environment in middle and bottom water layers where the bottom depth is greater than 15m (see paragraphs 6 and 7 (section 2.1.1) for a description of stratified water layers):

a. *'These ranges relate to the fact that nets were set in those depth ranges, perpendicular to the shore on a sloping substrate……. It should also be noted that the capture locations of Maugean skates in the Harbour are not necessarily reflective of overall distribution of Maugean Skates in the Harbour'.*

b. '*It is still unknown how or if the Skate utilises deep waters (greater than 15 m*)'.

c. '*Little is known about the extent to which the Skates use deeper water. Research undertaken to date has predominantly recorded the Skates in shallow waters (less than 15 m)'.*

d. *'However it should be noted that sampling to date and the recreational fishing effort is biased towards shallower waters*'.

166. The referral form (Attachment A02) states:

a. *'It is known from extensive research in Tasmania that solid wastes derived from salmonid farming (predominantly food and faeces) largely settle directly under the pen footprint and may cause changes to the sediment chemistry and biota. However, the pen area only represents a percentage of the leasable area. It therefore could be concluded that solid wastes are unlikely to have a significant impact on the Skate, based on the currently available information on the biology and ecology of the species'.*

b. *'The biggest threat from soluble wastes would be a build-up of NOx from feed and waste inputs, and a resultant broad-scale shift in water quality across the Estuary'.*

c. *'Little is known about the extent to which the Skates use deeper water. Research undertaken to date has predominantly recorded the Skates in shallow waters (less than 15 m). Conversely the farm sites are predominantly located in deeper water (greater than 15 m). This suggests that there is limited opportunity for direct interaction*'.

167. Appendix 3 to the referral form (Attachment A02.3) states:

'The Panel concludes that while the direct effect of solid waste deposition is likely to be limited to the area below and proximate to salmonid cages, further research is recommended in relation to sediment and water nutrient chemistry in the bottom layer beneath cages. The Panel was satisfied, however, that uncertainties can be dealt with through the adaptive management approach'.

168. At the time of the First Decision, the department considered that although the action may result in physical habitat disturbance from biogenic waste settling in the benthic environment, these impacts would predominately be limited to areas immediately below the pens at water depths greater than 20 m which the department considered, at the time, were unlikely to be inhabited by Maugean skate and therefore that significant impacts due to changes to the benthic environment were unlikely.

169. At the time of the First Decision, the department considered that given 63 Maugean skate were caught near the Table Head marine farming lease, Maugean skate may exhibit a level of resilience to water quality changes associated with marine farming activities. Based on the information available at the time of the First Decision, the department considered that if individual skates were sensitive to changes in water quality associated with marine farming, then it was likely that alternative habitat would be favoured away from the existing leases and therefore that significant impacts due to water quality changes were unlikely.

170. Therefore, based on the information available at the time of the First Decision, the department considered that the impacts of the action on water quality and the benthic environment was unlikely to have a significant impact on the Maugean skate.

171. Therefore, based on the information that was available at the time of the First Decision, the possible impacts of the action on the Maugean skate that were considered at the time of the First Decision, and identified in the referral decision brief to the Minister (Attachment A01) can be summarised as:

a. impacts to benthic environment:

i) solid wastes could build up on the sediment and cause changes to sediment chemistry and biota. These impacts were likely be localised under the pens, where Maugean skate either do not occur, or would avoid.

ii) localised impacts of changes to sediment chemistry and biota directly under pens would represent only a small percentage of the lease area and therefore these impacts are unlikely to be significant on the Maugean skate.

b. impacts to water quality:

i) there was a risk of broadscale shift in water quality due to build up of nitrogen oxides (NOx) from feed and waste inputs, and recognition that soluble wastes can disperse more widely through the harbour than solid wastes.

c. impacts due to entanglement:

i) entanglement with netting and equipment related to marine farming activities was considered unlikely, or low risk, as the skate is a benthic or demersal species and farming activities occur predominantly away from the harbour floor in the shallow to mid water depth range. There was mounting evidence at the time of the First Decision to suggest that the Maugean skate is highly susceptible to gill netting and this has previously resulted in some Maugean skate mortality. It was acknowledged that there was a risk that the expanded farming activities may increase the number of escape events, which in turn may lead to an increase in recreational netting activity.

172. Accordingly, the particular manner requirements outlined in the decision notice (Attachment A04) were identified to ensure that the following potential impacts of the action on the Maugean skate would be avoided, or mitigated to the extent that impacts to the Maugean skate would not be significant:

a. impacts as a result of changes to the benthic environment, and

b. impacts as a result of water quality changes.

7.3.2. Analysis of substantial new information about the impacts of the action on Dissolved Oxygen levels in Macquarie Harbour

173. There is new information before you about the effects of the action on DO levels in Macquarie Harbour. This information was not available at the time of the First Decision, and demonstrates that:

a. DO levels decreased in Macquarie Harbour after the First Decision (**section 7.3.2.2**),

b. the decrease in DO levels is causing degradation of the benthic environment, which is the primary habitat for the Maugean skate (**section 7.3.2.4**),

c. the decrease in DO levels can be largely attributed to the action (**section 7.3.2.6**), and

d. mitigation measures proposed to mitigate impacts of the action to water quality have not sufficiently mitigated the impacts of the action on DO levels (**section 7.3.2.8**).

7.3.2.1. Information at the time of the First Decision

174. There was limited information available at the time of the First Decision about the impacts of marine farming on DO levels in Macquarie Harbour and the subsequent impacts on the Maugean skate (Attachment A01, A02 and A03).

175. The referral decision brief, referral and additional information does not specifically identify the reduction in DO levels as a likely impact of the action on Maugean skate. Further to this, these documents do not specifically identify the reduction of DO in the benthic environment as a likely impact of the action.

7.3.2.1.1. Dissolved Oxygen levels in Macquarie Harbour

176. The department is aware that DO levels were being measured at the time of the First Decision, as part of the EPA water quality monitoring program (discussed at paragraphs 32-33 (section 2.2) however, these results were not included with the referral and only became available in 2014 (**MHDOWG 2014**). Additional information (Attachment A03) submitted with the referral (Attachment A01) indicates that site-specific median values for DO across all monitoring sites ranged from 8.17 mg/L to 9.28mg/L at 2 m depth at the time of the First Decision. These results were compliant with the interim DO limit level of 6.82 mg/L at 2 m depth listed in the decision notice (Attachment A04). However, the department notes that these results were limited to samples taken from water at 2 m depth and therefore do not provide information on DO levels in depths below 2 m at the time of the First Decision.

7.3.2.1.2. Impacts to Dissolved Oxygen levels

177. The information contained within the referral form and additional information discusses impacts of the action on water quality in general terms, for example:

a. *'It is known from extensive research in Tasmania that solid wastes derived from salmonid farming (predominantly food and faeces) largely settle directly under the pen footprint and may cause changes to the sediment chemistry and biota. However, the pen area only represents a percentage of the leasable area. It therefore could be concluded that solid wastes are unlikely to have a significant impact on the Skate, based on the currently available information on the biology and ecology of the species*" (Attachment A02).

b. *'T]he biggest threat from soluble wastes would be a build-up of NOx from feed and waste inputs, and a resultant broad-scale shift in water quality across the Estuary*' (Attachment A02).

178. The referral decision brief, referral form and additional information provided by DPIPWE has limited detail about the predicted feed inputs and associated organic matter and nutrient loading, including limited information about the subsequent DO drawdown caused by marine farming due to nutrient enrichment and biochemical degradation of organic matter.

179. The referral documentation (Attachment A02-A02.12) noted that there were uncertainties around impacts of the action on water quality and that these impacts would be progressively addressed through precautionary management measures including ongoing adaptive management, further research and water quality monitoring programs. The referral Appendix 11 (Attachment A02.11) states:

> '*Reducing the impacts on water quality or sediment will be managed through monitoring, adaptive management of water quality and sediment health, setting stocking densities, setting cage depths and locations and reporting. These measures*

will collectively reduce soluble and particulate fish waste and uneaten food reducing the risk to water quality from the proposal'.

7.3.2.1.3. Impacts to benthic habitat

180. The referral decision brief, referral and additional information does not specifically identify the reduction in DO levels in the benthic environment as a likely impact of the action on Maugean skate. However, the department notes that impacts to water quality and the benthic environment were identified in general terms.

181. At the time of the First Decision, there was limited information available in the referral form and additional information about impacts to the benthic environment, including potential impacts of the action on DO levels in the benthic environment.

7.3.2.1.4. Mitigation measures and effectiveness

182. The referral form (Attachment A02) stated that an adaptive management framework was considered the best approach to manage potential impacts from marine farming on water quality because it aimed to reduce uncertainty over time and improve future management via the accrual of water quality monitoring data.

183. This was consistent with the strategy used to manage the salmonid industry in the south-east of Tasmania in the Huon River and D'Entrecasteaux Channel at the time of the First Decision. At the time of the First Decision, the department considered that the adaptive management approach would be adequate to ensure that the action would not result in a significant impact (Attachment A01.2).

184. The particular manners specified in the decision notice (Attachment A04) entail a precautionary, adaptive management approach to marine farming activities. These include a requirement to implement a number of measures to monitor impacts to water quality such as:

a. ensuring that '*the total biomass held across all lease areas must not exceed 52.5 percent of the modelled maximum sustainable biomass until limit levels are reviewed in mid 2013, and must not exceed any such altered levels as may be identified thereafter by the Tasmanian Government*'. At the time, the maximum sustainable biomass was modelled to be 29,500 tonnes.

b. measures must be taken '*to prevent the rolling annual median value of quarterly water quality indicator values for ammonia, nitrate and dissolved oxygen as recorded within the compliance region, from exceeding the identified limit levels*'. The decision notice included interim limit levels that would be in place until mid-2013 at which point any modifications to the limit level must be prescribed in marine farm licence conditions. The interim level for DO was set at 6.82 mg/L at 2 m depth, in the decision notice. This limit level was developed in accordance with the guidance set out in the Australian and New Zealand Guidelines for Fresh and Marine Water Quality Guidelines 2000 and was not set on the basis of site-specific data. Ideal DO ranges were not established.

c. monitor the benthic environment including taking '*measures to prevent substantial benthic visual physio-chemical or biological changes attributable to marine farming operations at, or extending beyond 35 metres from the boundary or any lease area*' and undertaking '*a baseline environmental survey of all new lease areas and compliance sites prior to commencement of marine farming operations*'. The decision notice (Attachment A04) also included a requirement to '*undertake a benthic video assessment of lease areas and compliance sites in accordance with marine farming licence conditions*'.

185. The particular manners specified in the decision notice (Attachment A04) also included a number of corrective actions to be implemented to mitigate any impacts, these included:

a. the decision notice (Attachment A04) states that '*if the water quality monitoring program identifies that the rolling annual median value for any of the water quality indicators ammonia, nitrate and dissolved oxygen, with the compliance region, exceed the identified limit levels and that this is attributable [sic] to marine farming operations, targeted management responses must be implemented within 10 weeks of the most recent quarterly monitoring report*'.

b. the decision notice (Attachment A04) states that "*if a substantial benthic visual, physio-chemical or biological impact is detected as a result of benthic video assessment, targeted management responses must be implemented within 10 weeks of the assessment*". The decision notice also requires that following any targeted management responses undertaken, a follow up benthic video assessment must be undertaken at the compliance site to monitor benthic recovery within four months of the targeted management response.

186. The department considered that appropriate targeted management actions could include a reduction in biomass, nitrogen output or redistribution of biomass until the monitoring assessment of the water quality indicators ammonia, nitrate and DO identifies that the limit levels are not being exceeded. At the time of the First Decision, the department considered that the targeted management actions were appropriate to manage water quality related risks of the action.

187. The referral Appendix 11 (Attachment A02.11) also stated that risks, including risks associated with impacts to water quality, associated with the paucity of information relating to the Maugean skate were addressed through the relocation of 59 % of the marine farming operations that were located in shallow waters (that is, less than 20 m) to the central deeper water region of Macquarie Harbour (changes to farm zone locations in addition to expansion of zones formed part of the proposed action). The rationale stated was that this relocation would 'effectively reduce the lease area in regions where the Maugean Skate have been identified' (additional information dated 5 September 2012, Attachment A03).

7.3.2.2. Substantial new information: extent to which Dissolved Oxygen levels have decreased in Macquarie Harbour

188. Since the First Decision, there is substantial new information available that demonstrates water quality has degraded in Macquarie Harbour. Specifically, that significantly lower DO levels have been detected than previously recorded in Macquarie Harbour (reduced DO levels).

189. The department considers the following papers report key evidence of decline in DO levels in the waters of Macquarie Harbour with a downward trend occurring between 2009 and 2014/15, with the first of these papers becoming available in 2014, after the time of the First Decision:

a. a decline in DO levels in the bottom water layer of Macquarie Harbour was confirmed in late 2013. To investigate this issue the Tasmanian Salmonid Growers Association established the Macquarie Harbour Dissolved Oxygen Working Group (MHDOWG) which included representatives from each of the aquaculture companies operating in Macquarie Harbour at the time and representatives from CSIRO, UTAS, and DPIPWE. The report of this working group was finalised on 6 October 2014 (refer **MHDOWG 2014**), it was not made public at the time. MHDOWG (2014; page 4) states that '*there is a clear downward trend in the dissolved oxygen (DO) levels of the deep-waters (> 15m) of Macquarie Harbour over the period 2009-present [2014]; and DO levels less than 2 mg/l are now very common below 20 m and occasionally come to within 12 m of the surface*'.

b. In the following years several studies investigated oxygen dynamics (with a focus on identifying the drivers of oxygen resupply and consumption) within Macquarie Harbour, to clarify the drivers for the DO decline (for example **Ross et al. 2016**; **Maxey et al. 2020**); with general consensus that DO is closely linked to organic carbon loadings in the harbour and the oxygen dynamics linked to stratification within the harbour, oceanic recharge, river flows and surface conditions, and climatic events.

c. **Ross and MacLeod (2017)** outline that Macquarie Harbour DO levels in the waters with a depth greater than 15 m were relatively stable between 1993-2009 and typically ranged between 40 and 70% saturation based on long term EPA records. The authors provide an analysis of the DO conditions within the harbour using all available data to October 2016, confirming a trend of declining DO in the middle and bottom water layers in late 2013. The authors state that there was a slight and temporary increase in DO in 2014 and in late 2016 '*…DO levels are now extremely low throughout the Harbour… and that DO levels in bottom waters are now worryingly low*'. (page 23). This report highlights that the DO levels in the Franklin sampling site (the most southern site nearing the boundary of the World Heritage Area) were particularly concerning with DO less than 10% saturation at all depths below 20m and frequently recording 0% saturation. The authors note '*the levels of DO now observed in bottom waters throughout the Harbour present a significant potential risk to the ecology of the Harbour*' (page 24).

d. in response to **Ross and MacLeod (2017)**, the Australian Government's Fisheries Research and Development Corporation (FRDC) initiated FRDC Project 2016-067: *Understanding oxygen dynamics and the importance for benthic recovery in Macquarie Harbour*. This project resulted in a series of eight technical reports being published from September 2017 through to October 2020; with a final report published in March 2021 (**Ross et al. 2021**). The outcomes confirm that the extremely low DO measured in Macquarie Harbour in 2014 and late 2016 were the lowest recorded to date. It provides a detailed DO profile of change through time from new data collected from 2015 to 2020 which indicates variability in the DO throughout the harbour, with increases in DO levels associated with oceanic recharge and overall the DO in

the middle waters and bottom waters of the harbour remained substantially lower than historical levels.

e. **Ross et al. (2022)** showed that DO levels continue to be significantly below the pre-2010 levels throughout most of Macquarie Harbour, most notably in the southern part of the harbour, including the World Heritage Area. This observation is based on a new analysis of data from the Macquarie Harbour Broadscale Environmental Monitoring Program (MHBEMP), required to be undertaken as a condition of Environmental Licences for the marine farming operators in Macquarie Harbour since 2011.

190. Further to the new information listed in paragraph 190 (section 7.3.2.2), which became available after the First Decision, the EPA released a report in 2023 titled "Circumstances for Consideration Under S42(T)(5)" (**EPA 2023**)**.** This report provided:

> *'A summary of the current scientific knowledge of Macquarie Harbour, the interactions regarding anthropogenic stressors (primarily salmon farming) to the harbour and the response of water quality and the benthic ecosystem response. The circumstances also extend to the current knowledge of the Maugean Skate in the harbour and updated state and commonwealth advice regarding the conservation status of the Maugean Skate'.*

191. This new information (**EPA 2023**) includes findings that are consistent with the papers listed in paragraph 190, (section 7.3.2.2) specifically that there has been a notable decline in DO levels of Macquarie Harbour since 2009. The report presents a new analysis of long-term EPA monitoring data and includes the following statement:

> *'A review of the long-term monitoring data indicates that the dissolved oxygen in most of the harbour continues to be significantly below pre-2010 levels, supporting a weight of evidence case for a declined ecosystem health status compared to pre-2010.*
>
> *While dissolved oxygen levels in the harbour vary due to the circulation pattern hydrodynamics, which are influenced by riverine and marine inputs, the dissolved oxygen drawdown due to finfish aquaculture in the middle and bottom water is significant.*
>
> *The equilibrium state for surface waters (recorded at 10 m depth) has shifted from a normoxic historic range of 5-8 mg/L to a state where the median more frequently occupies a level around the long-term 20th percentile or below.*
>
> *In deeper waters, median dissolved oxygen levels have moved from the historic 20th-80th percentile range of 3-5 mg/L to the severely hypoxic range of 1-2 mg/tL. Levels remain below the long-term 20th percentile.'*
>
> *….*
>
> *'Since October 2022 surface water levels (recorded at 10 m depth) have sharply declined to values not previously recorded. Dissolved oxygen values have dropped below 1 mg/L on occasions, with the balance oscillating around 2 mg/L, compared to the long-term average for this depth of ~5 mg/L. It appears that reduced freshwater flow through the harbour is allowing*

tidal incursions of marine waters to displace bottom (recorded at 35 m) waters upwards into the mid-depth (recorded at 25 m) and subsequently surface (recorded at 10 m) depths. Dissolved oxygen values in bottom and mid-depth water have also declined over this period with bottom waters between 1 mg/L and 2 mg/L, compared to the long-term average ~4.2 mg/L, and mid-depth water in the vicinity of 1 mg/L, compared to a long-term average ~4 mg/L.'

192. This new information **(EPA 2023)** also reports that data collected by licence holders as part of their state licence requirements, showed (at the time of publication in 2023) that DO levels at 20 m depth remained at lower levels despite showing some signs of temporary improvement in 2021. The EPA released updated reports in 2024 detailing the status of DO levels in Macquarie Harbour using data from 1993 to September 2024. These reports show that DO levels declined rapidly from around 2010, with some variable improvements reported since 2016 in response to reduced salmon biomass (**EPA 2024**).

7.3.2.3. Submissions disputing the extent to which Dissolved Oxygen has decreased

7.3.2.3.1. Salmon Tasmania submission dated 2 February 2024

193. The submission by Salmon Tasmania on behalf of the marine farm operators (Petuna, Huon and Tassal) (Attachment D04) dated 2 February 2024, included an unpublished report by Dr Ian Wallis 2024 (see Schedule 4 within Attachment D04), which asserts that DO levels have always been low in the bottom water layer of Macquarie Harbour and that although there can be significant fluctuations of DO levels seasonally or year-on-year, it remains open as to whether what is being observed is a trend in declining DO levels *per se*.

194. The department acknowledges that the Macquarie Harbour estuary system is naturally stratified with limited vertical mixing and naturally low DO conditions in the bottom water and the middle water layers. However, the department considers that, on balance, the scientific evidence concludes that naturally low DO levels are declining further and remain lower than normal for longer periods than may be natural, as discussed in section 7.3.2.2.

7.3.2.3.2. Minister for Parks and Environment submission dated 16 October 2024

195. The supplementary submission by the Hon. Nick Duigan MLC, then Tasmania State Minister for Parks and Environment (Attachment C03), dated 16 October 2024 (provided as an addendum to the earlier 2 February 2024 submission provided by the Hon. Roger Jaensch, then Minister for Environment and Climate Change (Attachment C02)), asserts that new information available shows that water quality in Macquarie Harbour is improving. The supplementary submission enclosed a report by the EPA titled '*Macquarie Harbour Status update for dissolved oxygen*' dated September 2024 to support this assertion. When referring to the data discussed in the report, the supplementary submission states '*The results are showing continued improvements in water quality and confirm dissolved oxygen levels in the Harbour are now within historical ranges*'.

196. The supplementary submission by the Hon. Nick Duigan MLC (Attachment C03) also encloses a document prepared by NRE Tas dated 16 October 2024 (Attachment C03.1), which refers to the BEMP implemented under the MFDP and Marine Farming Licences (through the AMF) which identified water quality and benthic habitat declines within Macquarie Harbour. The document notes that following harbour wide declines in DO levels and associated declines in benthic faunal abundance (**Ross et al. 2017**), the then DPIPWE and EPA Tas have progressively reduced the maximum biomass levels allowed in Macquarie Harbour.

197. The supplementary submission also states:

> *'In February 2024 the Tasmanian Government provided evidence that water quality data available at the time of lodging the submission indicated that DO levels within the Harbour were on a trajectory of improvement and no longer at the low levels documented in Ross's and Macleod's 2017 study, one of five documents submitted to support the reconsideration process. The Tasmanian Government now provides the current water quality monitoring data for Macquarie Harbour which supports this initial statement. The data as presented by the Environment Protection Authority Tasmania (EPA) in the Macquarie Harbour Status update for dissolved oxygen September 2024 report is included in full at Attachment 1'.*

198. Included with the supplementary submission is a report documenting the EPA's Independent Water Quality Monitoring Data, released in September 2024 (**EPA 2024**). This report was provided to support the assertions made in the submission that water quality results show continued improvements and are now within historical ranges. The department has reviewed the report and considers the data in the report indicates the following about DO levels in Macquarie Harbour:

    a. DO levels are improving in some areas over time, likely in response to the decrease in biomass limits and associated declines in feed inputs, coupled with favourable climatic events that have allowed oceanic inflow.

    b. DO levels have improved at the site nearer the mouth of Macquarie Harbour, in areas of more oceanic flushing (and associated natural DO recharging), since 2016.

    a. DO levels in waters deeper than 10 m at the central harbour site and in the World Heritage Area remain below those recommended by the EPA as healthy for Macquarie Harbour and below the DO levels recorded from 1993 – 2008/09.

199. While the data in the report may indicate improvements to DO levels at some sites and depths, the department considers the information set out in (section 7.3.2.2) demonstrates that DO levels in Macquarie Harbour declined after the First Decision.

200. The department considers that there are limitations in the EPA's Independent Water Quality Monitoring Data released in September 2024 (**EPA 2024**). The department notes that the data is collected from three long-term sites in the harbour, which may not adequately represent the DO levels in areas known to be important habitats for the Maugean skate (such as the Table Head/Liberty Point site). The department also notes that the data measures DO at specific depths: 10 m, 25 m, and 35 m for sites MH12 and MH27 and 10 m and 21 m for site MH34 (see Figure 4 for monitoring site locations). However, the department considers this depth-specific approach may

not be representative of DO levels within the benthic environment, where these skates predominantly reside.

201. The department notes that the results are being compared to target levels that are based on data between 1993 and 2009 at a time when marine farming already occurred. The department considers these target levels are not representative of 'natural' levels, however considers they are appropriate because there is evidence that DO was stable between 1993 and 2009 before beginning to decrease in 2009 (**EPA 2017**).

202. The department has considered the EPA's Independent Water Quality Monitoring Data released in September 2024 (**EPA 2024**) and is of the view that the results are consistent with the findings of the reports listed in paragraphs 190 – 193 (section 7.3.2.2), that monitoring data shows there has been a decline in DO levels in Macquarie Harbour, and that the report does not provide evidence to demonstrate that DO has not declined in the past.

7.3.2.4. Substantial new information: Increased organic matter and nutrient loads and associated decreased Dissolved Oxygen levels impact benthic habitat for the Maugean skate

203. There is substantial new information before you about the impacts of low DO levels caused by the biodegradation of an excess of organic matter and nutrients on the health of the benthic environment in Macquarie Harbour. Given Maugean skates primarily occupy the benthic environment, the impacts of the action that result in a decline in health of the benthic environment will impact habitat for the Maugean skate.

204. Increased organic matter and nutrient loads result in increased oxygen consumption, which occurs when detritus-eating animals and bacteria consume oxygen. Furthermore, increased organic matter and nutrient loads favour specific opportunistic species; there is a body of evidence, discussed below, that shows impact gradients associated with organic enrichment from cage salmon farming operations, and the presence of bacterial mats (Beggiatoa spp.) and proliferation of opportunistic species (such as Dorvilleid polychaete worms).

205. In Macquarie Harbour, the biodegradation of an excess of organic matter and nutrients occurs within the benthic environment and within the water column. Since the First Decision, there is substantial new information available that investigates the decreased DO in the middle and bottom water layers; the increased oxygen demand from sediments impacted by fish farms and other sources of organic material in the water column; and the associated impact on the benthic habitat (for example **Ross and Macleod 2017; Ross et al. 2021; Black et al. 2022** which are discussed as follows).

206. **Ross et al. (2016)** described the broad situation in Macquarie Harbour as follows:

    a. '*The comparison with baseline surveys highlighted a change in the broader benthic ecology of the harbour, with the greatest effect arguably being evident mostly in the last 2 years, with an increase in total abundance, species richness and species diversity harbour-wide. At a functional group level, this has corresponded to a decrease in burrowing taxa and an increase in tube builders. Whilst there are a range of explanations for this change, such as a recovery*

from the effects of mining or influx of organic matter associated with changes in the regulation of catchment inflows, it is highly likely that the addition of nutrients and organic matter from fish farming has played a role in stimulating benthic productivity'.

b. 'Comparisons with surveys conducted in 2000 and 2012 indicate that there have been some harbour-wide changes both in the benthic communities and in the overall abundance of Dorvilleids since the onset of large scale farming' and 'As might be expected, the changes are more pronounced in areas where farming has occurred, with "farm communities" converging within the central harbour relatively quickly (<2 years)'.

207. **Ross and Macleod (2017)** attribute the addition of nutrients and organic matter from marine farming as playing a substantial role in stimulating the growth of Dorvilleid worms and bacterial mats; which contribute to increased oxygen consumption, and found:

a. indicators of organic enrichment from marine farming on the benthic environment in Macquarie Harbour, in the form of increased abundance of Dorvilleid worms, were observed closer to stocked cages when feed inputs were low, and conversely appeared at a '*noticeably greater distance*' from the cage where feed inputs were high, with footprint sizes larger and more pervasive for sites that have been farmed for longer and delineated by the feed volumes used.

b. a comparison with baseline surveys '*…highlighted a change in the broader benthic ecology over the past 15 years, and arguably mostly in the last 2 years' from 2015-2017'* and attributed this change as '*…highly likely that the addition of nutrients and organic matter from fish farming has played some role in stimulating benthic productivity'*.

c. results from a benthic survey in October 2016 showed a significant decline in both macrofaunal species diversity and abundance across all study aquaculture leases and at a number of Harbour wide external sites.

d. *'…the sediments in the worst affected areas were virtually devoid of fauna, and severely reduced at others'*.

208. **EPA 2017 -** The EPA published the *Macquarie Harbour Tasmanian Wilderness World Heritage Area Environment Status Report* in 2017, which documents findings based on monitoring in waters within the Tasmanian Wilderness World Heritage Area. The findings include documented cases of benthic bacterial matting (*Beggiatoa spp*) spreading from an aquaculture lease into the TWWHA on the eastern side of Macquarie Harbour in 2016/17. Bacterial mats are evidence of deteriorated benthic conditions; that is, impact to the benthic environment. The event led to the EPA instructing the marine farm operator to de-stock the lease to allow for benthic recovery. The lease was completely fallowed by 10 April 2017. The report states '*increased finfish aquaculture is likely to be one driver of dissolved oxygen decline…'* and notes subsequent deteriorating benthic conditions.

209. A primary focus of FRDC Project 2016-067: *Understanding oxygen dynamics and the importance for benthic recovery in Macquarie Harbour* was the observed response of the benthic environment to high organic matter loads and associated low DO levels. This project resulted in a series of 8 technical reports being published from September 2017 through to October 2020; with a final report published in March 2021 (**Ross et al. 2021**). The penultimate report in this series (**Ross et al.**

2020, page 3) provides a succinct summary of the findings through 2017-2020 in regard to both DO status and associated benthic conditions in Macquarie Harbour and demonstrate a clear link between DO levels, organic loads and health of the benthic ecosystem:

> /…*These reports first described the deterioration of benthic and water column conditions in spring 2016, early signs of faunal recovery in the following autumn, when oxygen levels had improved, and the subsequent decline in benthic conditions when oxygen concentrations in middle and bottom waters returned to very low levels in spring 2017. Since then, oxygen concentrations in the middle and bottom waters have remained variable, declining each spring, and then increasing through summer and autumn due to oceanic and wind driven recharge. In spring 2018 oxygen levels did not decline as far or for as long compared with the previous springs and faunal abundance and diversity was less affected as a result. Surveys in January and June 2019 documented the improved benthic conditions, highlighting that both faunal abundance and the number of species had returned to or were closely approaching the range observed prior to the decline in spring 2016-early 2017 at the majority of both lease and external sites. This report presents the results and interpretation of a repeat survey of benthic communities in January 2020 and DO monitoring data up until March 2020. In spring 2019 oxygen concentrations in the middle and bottom waters again declined to low levels and these conditions persisted for longer than in spring 2018. Oceanic recharge of bottom water was not observed until late December 2019 when the river flows decreased, and the halocline became shallower. Despite the extended period of low bottom water dissolved oxygen concentrations, the macrofaunal abundances and diversity in January 2020 was similar that observed in the January 2019 survey'.*

210. The 2020 FRDC report by **Moreno et al. (2020)** provided as part of the requests for reconsideration supports the view that a decline in benthic environments due to poor water quality impacts the Maugean skate. **Moreno et al. (2020)** tagged 25 adult Maugean skate in Macquarie Harbour with external multi-sensor acoustic tags capable of continuously transmitting information on the depth, temperature and dissolved oxygen concentrations experienced by the individuals over a 12-month period. The study examined the sensitivity of the Maugean skate to decreased oxygen levels and found that chronic exposure to hypoxic conditions, including in the benthic environment, leads to deleterious effects on reproduction and other impacts to the species that occur in the benthic environment.

211. **Black et al. (2022)** found that since 2015, several stations have been monitored that are at least 1km from fish farm lease areas in order to assess "harbour wide" changes. Annual surveys since 2015 have shown a reduction of both species diversity and abundance, most apparent in the deeper middle section of the harbour and at the southern end, most distant from the source of oceanic ventilation. However, at the Lease transect stations, there was evidence of a recovery in both abundance and diversity at these external stations through 2019 most likely caused by the improvement dissolved oxygen saturation in bottom waters which coincided with a reduction of fish farm production by about a half between 2017 and 2019.

212. The EPA **(EPA 2023**) acknowledges that DO levels have been, and will be, a major determinant of benthic response and that this has major implications for the management of marine farming operations and environmental regulation in Macquarie Harbour. The paper concludes

    a. *'In conclusion, the main findings of the research undertaken within Macquarie Harbour highlights the critical role and interplay of bottom water dissolved oxygen conditions experienced harbour wide and the role of organic enrichment and farm management practices in driving lease level faunal responses'.*

7.3.2.5. Submissions disputing the impacts of organic matter and nutrient loads and associated decreased Dissolved Oxygen levels on benthic habitat for the Maugean skate

213. The department notes that no submissions specifically addressed the impacts of organic matter and nutrient loads and associated decreased DO levels on benthic habitat for the Maugean skate.

7.3.2.6. Substantial new information: extent to which decreased Dissolved Oxygen levels can be attributed to marine farming activities

214. The department considers that there is substantial new information which indicates the extent to which marine farming operations are contributing to the decrease of DO levels in Macquarie Harbour. The department considers marine farming operations contribute to a decrease in DO levels because:

    a. marine farming operations involve the release of organic matter and nutrients into the water column (via biogenic waste that includes organic wastes and inorganic nutrients that are generated in the production process: such as from fish defecation, uneaten feed, dead fish. These waste sources in turn release carbon (C), nitrogen (N) and phosphorus (P) waste).

    b. the biochemical degradation of organic matter and excess nutrients is known to lead to DO consumption (oxygen drawdown).

    c. organic matter waste from marine farming operations are considered 100% labile (biologically available) and sink to the sediment, while organic matter from rivers is only 30% labile and confined mostly to the surface waters which largely flush out of the harbour.

    d. There is a clear correlation between the marine farming expansion in Macquarie Harbour and the reported decreases in DO.

215. There is new information before you which was not available at the time of the First Decision, in the form of the following scientific research papers and reports that include information that show the escalated rate of DO drawdown in Macquarie Harbour since 2019, discussed in sections 7.3.2.2 and 7.3.2.4, can be attributed to the marine farming expansion in Macquarie Harbour:

    a. **MHDOWG 2014**

i) consumption of oxygen in Macquarie Harbour occurs largely via benthic and pelagic biochemical degradation processes and is highly influenced by the supply of labile organic carbon.

b. **Ross et al. (2016)**

i) identified that marine farming leads to elevated oxygen consumption, which may result in lower DO levels in bottom waters overlying the sediment—in particular nearer to cages.

c. **Ross and MacLeod (2017)**

i) highlighted the very low levels of DO in Macquarie Harbour, and the possibility of indirect interactions between marine farming and the Maugean skate by virtue of decreased DO. The organic wastes associated with marine farming increase biochemical oxygen demand and thereby decrease DO concentration.

d. **Kirkpatrick et al. (2019)**

i) The study found that more than half of the variation in DO in Macquarie Harbour was explained by fish production. Fish farm wastes have a strong direct relationship with fish farm production; and production strongly predicts DO.

ii) This study notes that:

'*The hypothesis that the recent drop in benthic oxygen levels in Macquarie Harbour is substantially attributable to causes other than increasing wastes from fish production is inconsistent with the lack of significant relationships with flows, rainfall data, wind data, pressure data, and the sea surface temperature data, and the strongly significant negative relationship with fish farm production'.*

e. **Wild-Allen et al. (2020)**

i) simulated an oxygen process model scenario using conditions in 2017-2018 but omitting fish farm respiration and associated nutrient load (e.g., fish farm oxygen drawn-down). Results of the model showed a 50% reduction in hypoxic water volume in Macquarie Harbour (from 21% of the total water column being hypoxic to 14% with aquaculture removed) and a 40% reduction in hypoxic sediment. When this scenario was extended for another 2 years, hypoxia was further reduced, healthy water (> 80% oxygen saturation) volume increased from 46% to 56%, and healthy sediment increased from 32% to 36% of the total harbour area. This scenario showed a larger reduction in hypoxia when compared under other scenarios, such as those involving altered river flow from hydroelectric dams (which showed only slight differences to DO levels).

ii) estimated that rivers flowing into Macquarie Harbour contribute 45% of total nitrogen input, while marine farming operations and sewerage combined contribute 25%. Also identified:

- only 30% of organic matter from rivers is labile (biologically available) and confined mostly to the surface layer so has only a minor impact on DO levels at depth; and

- salmonid waste is 100% labile and sinks, causing DO depletion at depth and build-up of organics in bottom sediments.

f. **Ross et al. (2021)**

i) the final report of FRDC Project 2016-067, finds that there were improved benthic conditions to 2020 since the decline reported for spring 2016 – early 2017 which demonstrates the capacity for faunal recovery with management of marine farming. Whilst this is possibly positive news for the health of Macquarie Harbour, it confirms the existence of a relationship between marine farm nutrient inputs and benthic condition with regards to DO concentrations. As noted in the report, the decline in benthic fauna '*the decline in abundances is likely a result of prolonged low DO levels that extended until the end of December 2019'.*

ii) the report states:

*'It is important to keep in mind that feed inputs, and thereby food availability to the sediments would also have decreased over the same period, and as such, we wouldn't expect faunal abundances to return to the levels seen in the first 4 or 5 surveys when feed inputs were much greater. This highlights the complex interplay between the direct effects of farm enrichment on food availability and sediment condition and the influence of bottom water dissolved oxygen concentrations (**Ross et al. 2021:11**)'.*

g. **Ross et al. (2022) -** the contribution to the 25%, referred to in sub-paragraph eii in this paragraph, (paragraph 216) from sewerage discharge is considered negligible.

h. **Black et al. (2022)**

i) organic carbon material from salmonid aquaculture is highly labile and is mainly released in the already low DO middle waters of Macquarie Harbour and retained in middle waters and bottom waters and within sediments. Therefore, although the quantity of dissolved organic carbon material from rivers exceeds that from salmonid aquaculture, the impact on dissolved oxygen from salmonid aquaculture in the middle waters and bottom waters is likely to be much larger.

216. The department notes that **Bell et al. (2016); Ross and MacLeod (2017); Kirkpatrick et al. (2019); Wild-Allen et al. (2020); Ross et al. (2022)** – consider the most important contributor to the oxygen debt in Macquarie Harbour is ongoing marine farming due to the draw down caused by salmon waste.

217. In **EPA (2022)**, the Director of the EPA stated in a 2022 determination that:

'While DO levels in the harbour vary due to the circulation pattern hydrodynamics, which are influenced by riverine and marine inputs, the DO drawdown due to finfish aquaculture in the middle and bottom water is significant'.

218. The 2023 EPA report titled "Circumstances for Consideration Under S42(T)(5)" **EPA (2023)** states that:

'A review of the long-term monitoring data indicates that the dissolved oxygen in most of the harbour continues to be significantly below pre-2010 levels, supporting a weight of evidence case for a declined ecosystem health status compared to pre-2010. While dissolved oxygen levels in the harbour vary due to the circulation pattern hydrodynamics, which are influenced by riverine and marine inputs, the dissolved oxygen drawdown due to finfish aquaculture in the middle and bottom water is significant'.

219. The report **EPA (2023)** also notes that DO levels have been, and will be, a major determinant of benthic response and that this has major implications for the management of marine farming operations and environmental regulation in Macquarie Harbour. This report states that research findings for Macquarie Harbour:

'*highlights the critical role and interplay of bottom water dissolved oxygen conditions experienced harbour wide and the role of organic enrichment and farm management practices in driving lease level faunal responses'.*

220. The report **EPA (2023)** identified farm practices play a key role in benthic conditions evidenced by benthic compliance history. Of note, the report states: '*With the reduction in allowable standing biomass limits and the proactive farm management practices initiated by each of the 5 lease holders in Macquarie Harbour, there has been significant improvements in the number of non-compliances recorded against the individual environmental licences since the EPA started regulating the salmon farming industry*'. This information supports the conclusion that there is a direct link between occurrence of poor benthic condition and the marine farming operations.

221. The **MS Conservation Advice (2023)** provides the Commonwealth's independent Threatened Species Scientific Committee's assessment of the available scientific evidence which concluded that:

'*The primary threat to the Maugean skate is habitat degradation resulting from sustained reduction of dissolved oxygen. The most important cause of low dissolved oxygen is decomposition and remineralisation of organic carbon inputs to the Harbour (Maxey et al. 2020; Wild-Allen et al. 2020)... the most important anthropogenic contributor to the oxygen debt in Macquarie Harbour is ongoing salmonid aquaculture (Bell et al. 2016; Ross and MacLeod 2017; Kirkpatrick et al. 2019; Wild-Allen et al. 2020; Ross et al. 2022)'.*

222. The EPA released a report titled "Circumstances for Consideration Under S42(T)(5)" which is discussed in paragraph 191 - 193 (section 7.3.2.2) and 213 (section 7.3.2.4), concludes that:

'*…research undertaken within Macquarie Harbour highlights the critical role and interplay of bottom water dissolved oxygen conditions experienced harbour wide and the role of organic enrichment and farm management practices in driving lease level faunal responses'* (**EPA 2023**).

223. **EPA (2017**) state that increased marine farming is likely a driver of DO decline in the Harbour, including '*Finfish aquaculture, as a source of organic load and ammonia, has been identified as one of a number of factors which may influence DO consumption and benthic condition in the harbour*'.

7.3.2.7. Submissions disputing the link between the action and decreased Dissolved Oxygen levels

224. There are submissions before you which dispute the extent to which marine farming is contributing to decreased DO levels in Macquarie Harbour.

7.3.2.7.1. Tasmania State Minister for Environment and Climate Change submission dated 2 February 2024

225. The submission provided by the Hon. Roger Jaensch MP, then Tasmania State Minister for Environment and Climate Change, dated 2 February 2024 (Attachment C02) asserts that the annual:

> '*oxygen budget in Macquarie Harbour is 64,000 tonnes and the current annual marine farming respiration has been calculated at 40 tonnes of oxygen or less than 1% loss from the harbour oxygen budget*'.

226. The submission states '*draw down of oxygen from respiration from marine farming will not have a significant impact on DO levels in the Harbour or on Maugean skate*'.

227. However, the department notes that the submission provided by the EPA dated 2 February 2024 (Attachment E03.1) states that '*harbour-wide, the oxygen budget has remained within a range of approximately 20,000 to 35,000 tonnes with no clear trend over the past decade being evident*'. Oxygen drawdown from respiration is not fully representative of total drawdown from marine farming, as there are other drawdowns in addition to respiration, including breakdown of organic matter (e.g. from uneaten feed and salmon excreta) and associated microbial processes.

228. The submission by the Hon Roger Jaensch MP, then Tasmania State Minister for Environment and Climate Change (Attachment C02), dated 2 February 2024 includes a risk assessment (Attachment C02.4) along with monitoring, management and mitigation measures to control and reduce risks to water quality, benthic conditions and the Maugean skate. The submission asserts that ongoing marine farming operations will not, or are unlikely to, have a significant or cumulative impact on verified habitat for the Maugean skate, nor will they significantly impact the areas of occupancy or quality of habitat available to the Maugean skate.

229. The department notes that the submission from the Tasmanian Government dated 2 February 2024 pertains to ongoing and future anticipated marine farming operations. However, having also considered the other submissions and information provided as part of the reconsideration process, the department considers that you can be satisfied that the action as taken to date has had a significant impact on matters protected under Part 3 of the EPBC Act.

7.3.2.7.2. Salmon Tasmania submissions dated 2 February 2024 and 18 June 2024

230. The submission by Salmon Tasmania dated 2 February 2024 (Attachment D04), made on behalf of the three marine farm operators (Petuna, Huon and Tassal) and which includes two unpublished reports by Wallis (2024) (schedule 3 within Attachment D04) and the Nautilus Collaboration (2024) (schedule 4 within Attachment D04), raises concern about the referenced material provided by the requesting parties, asserting that it:

a. overstates the influence of marine farming on water quality degradation in Macquarie Harbour and does not attribute degradation sufficiently to other key drivers, (including climate change, hydroelectric dams, historic mining activities and gillnet fishing).

b. does not acknowledge that oxygen has always been low in the lower layer of Macquarie Harbour and that it remains questionable if there exists a low DO trend in this layer – further modelling is needed to reflect current operations since data used was based on previous baseline biomass limits.

c. is outdated in that it does not factor in the adaptive management processes (including reduction in biomass limits) that have been adopted by industry to improve harbour conditions.

231. The submissions from Salmon Tasmania, dated 2 February 2024 and 18 June 2024 (Attachment D04 and D05-D05.2) consider that there is doubt over whether a causal link between benthic degradation and marine farming can be drawn with absolute certainty.

232. Notwithstanding the matters raised and the information referred to in those submissions, the department considers that it remains open to you to be satisfied that marine farming contributes to nutrient and organic loading in Macquarie Harbour, which in turn has had, and is likely to continue to have, an impact on the DO levels and the benthic environment within the harbour.

233. The department further considers that it would be open to you to find that there has been intermittent improvement in localised impacted areas when leases have been fallowed (providing weight to link of causation to lease activities), and further, that there is a lack of evidence that would enable you to reach a robust conclusion to the contrary.

7.3.2.7.3. Commonwealth Minister for Agriculture, Fisheries and Forestry submission dated 2 February 2024

234. The submission provided by the Hon. Murray Watt, then Commonwealth Minister for Agriculture, Fisheries and Forestry (Attachment C01) dated 2 February 2024, also refers to a range of factors potentially being relevant to the Maugean skate's habitat in Macquarie Harbour, stating that in November 2023

> '*industry and community representatives raised a range of threats to the Maugean skate population including climate change, the Tasmanian government owned and operated hydroelectric operations, historic mining activities and gillnet fishing*'.

235. The department acknowledges that the presence of marine farms does not affect Macquarie Harbour water inflow events (unlike hydro-electric dams and changed weather events due to climate change) and that DO levels fluctuate considerably as they are influenced by complex riverine and marine inputs. However, reviews of long-term EPA monitoring data (**EPA 2017; EPA 2023; Ross et al. 2022**) highlight that trends of low DO within Macquarie Harbour correspond with the marine farming biomass increases (and associated increases in food and waste inputs) and that evidence now available shows that DO levels in middle and deep water layers continue to be below pre-2010 levels within most of Macquarie Harbour. Additionally, while some signs of improvement

have been observed in recent years, long-term median DO levels remain, with a few exceptions, in the hypoxic range.

7.3.2.8. Substantial new information: Mitigation measures insufficient to reduce the impacts of the action on decreased Dissolved Oxygen levels

236. There is substantial new information before you about the efficacy of mitigation measures previously thought to be effective in addressing the impacts of the action on water quality, which is relevant to considering the impacts of the action on decreased DO levels.

237. At the time of the First Decision the Minister agreed with the department's recommendation that applying limits to fish stocking levels (also referred to as 'biomass limits'), as per the Adaptive Management Framework required under Tasmanian state regulation, was an appropriate means for avoiding significant impacts of the action on the Maugean skate caused by changes to water quality and the benthic environment. However, the information that has become available since the time of the First Decision suggests that biomass limits have not effectively managed impacts to water quality and the benthic environment so to avoid significant impacts of the action on the Maugean skate.

238. In response to a progressive decline in DO levels from 2009 – 2014/15, which coincided with a substantial increase in marine farming (**MHDOWG 2014; Ross et al. 2022; EPA 2017**), the EPA reduced the permissible biomass limit in 2017 and again in 2018.

239. However, while biomass was reduced, the amount of fish-feed was increased in order to maintain production levels as confirmed by a statement made by the Director of the EPA (**EPA 2022**):

    a. '… data submitted to the Department of Natural Resources and Environment Tasmania (NRE Tas) indicates that since 2018, annual feed inputs have gradually been increasing. This has occurred while complying with the peak standing biomass limit of 9,500 tonnes and appears to be due to a change in harvesting strategies and an increase in total annual production'.

    b. 'Increases in finfish production since 2018 have occurred through production and harvesting strategies within an unchanged biomass cap'.

240. In 2022, recognising that '*biomass limits allow considerable flexibility in relation to feed inputs*' the EPA introduced TPDNO limits to replace the standing biomass limits used in previous determinations, as a new measure to address '*[o]ngoing concerns regarding the status of the Maugean Skate…*' **(EPA 2022)**. The Director of the EPA identified that '*limits on dissolved nitrogen outputs are a better regulatory mechanism than biomass limits to restrict production*' because it limits the amount of nitrogen which can be released to the environment via feed inputs. The TPDNO limit for Macquarie Harbour is 500.1 tonnes, applicable for any rolling 12-month period from 1 September 2022 to 31 August 2027.

241. The appropriateness of using TPDNO within Macquarie Harbour has also been considered. **Wild-Allen et al. 2020** noted that phosphorous is not the limiting factor in Macquarie Harbour due to the dark tannin-laden fresh water layer limiting light penetration into the water column and the **MS Conservation Advice 2023** suggests an assessment should be made as to whether TPDNO should be

supplemented and/or replaced with water quality indicators and regulations that are better aligned to the protection of Maugean skate habitat, specifically dissolved oxygen and organic matter content.

242. The inadequacy of biomass limits as a mitigation measure, the imposition of TPDNO limits, and the need to replace the previous mitigation approach with TPDNO limits, is substantial new information about the impacts of the action on the Maugean skate's habitat in Macquarie Harbour. In particular, it is information that indicates that the mitigation measures considered to be adequate to address the impacts of the action on the Maugean skate at the time of the First Decision were not sufficient.

7.3.2.9. Submissions about the effectiveness of avoidance and mitigation measures

243. There are submissions in the material before you which contend that the implementation of avoidance and mitigation measures will be sufficient to ensure that significant impacts as a result of a decrease in DO levels are avoided.

7.3.2.9.1. Submissions that contend that the current Adaptive Management Framework is sufficient to manage impacts to the Maugean skate

244. Submissions by the marine farm operators (Attachment D01-03), Salmon Tasmania (Attachment D04-05), and the Hon. Nick Duigan MLC then Tasmania State Minister for Parks and Environment (Attachment C03) express the view that avoidance and mitigation under the current adaptive management framework is sufficient for managing impacts from marine farm operations such that marine farming in Macquarie Harbour can continue without having a significant impact on the Maugean skate. Specifically:

a. the submission from Huon (Attachment D03) states that '*…confidence is strengthened by the additional requirements imposed by the Tasmanian EPA within each operator's Environmental Licences. These new conditions require licence holders to determine and mitigate the impacts of marine finfish farming activities on dissolved oxygen levels at and beyond the boundary of marine farm leases*'.

b. the Salmon Tasmania submission dated 2 February 2024, states that '*the adaptive management principles integrated into the NCA-PM Decision, through requiring compliance with the Tasmanian Government's regulatory regime, including the Macquarie Harbour Marine Farming Development Plan and licencing conditions, are an effective and appropriate framework to identify and address any significant impacts of salmon farming to the Macquarie Harbour environment*'.

c. the then Tasmania State Minister for Parks and Environment the Hon. Nick Duigan MLC, dated 16 October 2024, refers to the EPA September 2024 DO Status Report (**EPA 2024**) together with the Interim Report released by IMAS on 20 September 2024 (**Moreno et al. 2024**), which they consider demonstrates that *'…the existing Adaptive Management Framework (AMF)…is fit for purpose'* and that *'the Tasmanian Government believes the rigorous AMF for the ecologically sustainable marine farming in Macquarie Harbour, in combination with the*

comprehensive CAP and other work, will ensure marine farming in Macquarie Harbour can continue in accordance with the 2012 decision without significant adverse impacts on the Maugean skate'.

245. As already discussed in paragraph 199 (section 7.3.2.3), the department acknowledges that data presented in the EPA September 2024 DO Status Report (**EPA 2024**) indicates that, in some areas, DO levels appear to be improving over time in response to the decrease in biomass limits. However, DO levels in waters deeper than 10m at the central harbour site and in the World Heritage Area remain lower than the guideline levels set by the EPA to ensure the health of the harbour.

246. As outlined in paragraph 203 (section 7.3.2.3), the department also considers that there are limitations to the EPA's Independent Water Quality Monitoring Data used in the report (**EPA 2024**), when considering the relevance of the data to measuring impacts to Maugean skate habitat and Maugean skate.

247. However, the department notes that any improvement in DO levels does not alter the fact that, based on the information currently before you, a significant impact has already occurred. This demonstrates that the mitigation measures previously thought to be effective in addressing the risk of significant impacts on the Maugean skate were therefore not successful.

7.3.2.9.2. Submissions that contend current state licence conditions are sufficient to manage impacts to the Maugean skate

248. The submission from the Director of the EPA considers that the Tasmanian Government's regulatory regime currently being implemented by the EPA provides more appropriate tools than were in place previously to deliver further environmental improvements for Macquarie Harbour and the Maugean skate (Attachment E03.1).

249. The department considers that the mitigation measures implemented to date have not been successful in avoiding significant impacts to the Maugean skate, evidenced by prolonged reductions in DO and a decline in the quality of benthic habitat, discussed in sections 7.3.2.2 and 7.3.2.4, and further discussed in section 7.3.3, that these impacts have led to reductions in the area of occupancy for the Maugean skate and a reduction in the Maugean skate population.

250. The department considers that while the mitigation measures may be considered to reduce the severity and duration of impacts to the Maugean skate, they are unlikely to successfully lead to the avoidance of the significant impacts described in section 7.3.

251. Further to this, the department considers that while the mitigation measures may be considered to have reduced the severity and duration of past impacts, the department notes that the information before you demonstrate that they have not effectively mitigated the impacts so to avoid significant impacts. The department considers that the new information discussed in section 7.3 demonstrate that significant impacts have already occurred.

252. The department notes from the EPA's submission, that the EPA intends to implement a range of additional mitigation and monitoring requirements as part of the conditions for Environmental Licences which were renewed on 30 November 2023.

253. The EPA (Attachment E03.1) aims to address the shortcomings of current compliance testing and monitoring with variations in marine farming licences. The submission states that '*[c]urrently it is intended that water quality Investigative Trigger Values will be incorporated into Environmental Licences during 2024*'.

254. The department notes that, on renewing Environmental Licences in November 2023, the EPA Director imposed additional conditions on these licences. The additional conditions included requirements for each environmental licence holder to:

    a. provide the Director with the overall dissolved oxygen demand resulting from finfish activities on their lease.

    b. provide and implement a Dissolved Oxygen Mitigation Plan to substantially offset or reduce dissolved oxygen demand from their lease.

    c. develop for approval and implement a Water Quality Monitoring Plan to measure the success of the dissolved oxygen mitigation measures against the interim default guideline values set by the EPA.

255. In relation to the Dissolved Oxygen Mitigation Plan, the EPA submission (Attachment E03.1) states *'By 24 April 2024, or a date otherwise advised by the Director in writing, the licence holder must submit a Dissolved Oxygen Mitigation Plan for the activity. The Dissolved Oxygen Mitigation Plan must be submitted for the Director's approval and must outline measures to offset or reduce the estimated dissolved oxygen demand resulting from the activity. The Dissolved Oxygen Mitigation Plan must: be prepared in relation to the 2024/25 production period, or another period specified by the Director in writing, and must address seasonal variation in dissolved oxygen demand; contain a detailed description of the measures that will be implemented to offset or reduce the calculated dissolved oxygen demand; provide an estimate of the level of offset or reduction to be achieved; describe implementation steps including timelines for key milestones; describe methods to measure success of the identified mitigation measures; provide estimates of resulting dissolved oxygen concentrations at and beyond the lease boundary and comparison against the interim Default Guideline Values published by the EPA for Macquarie Harbour'.*

256. In relation to the Water Quality Monitoring Plan, the EPA submission (Attachment E03.1) states:

    'By 24 April 2024, or a date otherwise advised by the Director in writing, the licence holder must submit a Water Quality Monitoring Plan for the activity. The Water Quality Monitoring Plan must be submitted for the Director's approval and must outline a monitoring program designed to measure success of the dissolved oxygen mitigation measures on water quality at and beyond the lease boundary. The Water Quality Monitoring Plan must: take into account existing monitoring requirements; be prepared in relation to the 2024/25 production period or another period specified by the Director in writing; contain a description of monitoring locations, parameters, water depths and frequency of sampling and / or recording that will be implemented; as a minimum, provide for the continuous monitoring of dissolved oxygen at one location at the lease boundary at a number of representative depths in the water column; specify methods for the determination of current speed and direction as required to interpret the results of dissolved oxygen monitoring in relation to the activity. Where data gaps are identified, the deployment of an ADCP is to be considered and

discussed; describe implementation steps including timelines for key milestones (e.g. deployment of equipment); identify proposed data collection and reporting methods and timeframes. Once approved, the licence holder must act in accordance with the approved Water Quality Monitoring Plan. Any variation or substitution of the plan approved by the Director, by notice in writing, replaces the earlier approval with effect from the date specified in the notice'.

257. The department considers that a direction for companies to 'substantially reduce or offset' their oxygen demand – without an accompanying value given around how much they have to reduce by, may not achieve a material difference; for example, marine farm operators could reduce oxygen consumption by only a small percentage and still be compliant with the directive. Furthermore, the department notes that these are stated intentions only at this current time. There are also no indications about what, if any, actions would be taken should there be non-compliance.

258. The department notes that the plans required by the EPA have not yet been approved and made public and, as such, the mitigation measures proposed are not known by the department.

259. The department acknowledges that while it is possible that remediation and offsets effort could in theory lead to the reduction in the long-term significance of the impacts, the success of such actions does not alter the finding that a significant impact has already occurred.

260. The department notes that the mitigation measures implemented to date have not been successful in avoiding significant impacts to the Maugean skate. Further information that discusses the impacts of prolonged reductions in DO and associated impacts to the Maugean skate population are discussed later in this report, in section 7.3.3.

7.3.2.9.3. Submissions that contend the Macquarie Harbour Oxygenation Project will contribute to successfully managing impacts to the Maugean skate

261. The submission from Salmon Tasmania dated 2 February 2024 identifies that an oxygenation program, the Macquarie Harbour Oxygenation Project (MHOP) is currently underway. The project is a joint initiative of the FRDC and Salmon Tasmania and is being led by IMAS:

    a. the MHOP is trialling mechanical oxygenation techniques to increase oxygen levels to determine if it can provide a long-term solution to offset marine farming oxygen drawdown and increase oxygen levels.

    b. the pilot trial commenced in Summer 2023/24 and is progressing in a staged approach. The volume, duration and injection method is being progressively scaled based on oxygen plume dispersion modelling and detailed water quality and ecosystem observations to ensure that the oxygen is delivered and retained in the bottom waters with no adverse ecological effects.

262. The MHOP has been endorsed by the National Recovery Team for the Maugean Skate as one of the immediate priority actions to support the conservation and recovery of the Maugean skate. This priority action is also included in the **MS Conservation Advice (2023)** and the Tasmanian Conservation Action Plan for the Maugean Skate (Attachment C02.2).

263. The supplementary submission from Salmon Tasmania dated 18 June 2024 provides an update on the progress of the MHOP. They report that the trial has been injecting 3000kg of oxygen per day into a section in Macquarie Harbour. The submission states that:

    a. '*There have been no unfavourable environmental responses observed as a result of the trial, and the radiating sensor network around the injection site is reporting elevated levels of DO at the recorded location*'.

    b. '*These initial results demonstrate the real potential to improve conditions within Macquarie Harbour through engineered solutions that will assist in reducing the impacts of the various natural and anthropomorphic inputs affecting the environmental conditions and DO levels at depth in Macquarie Harbour'.*

264. The department notes, that the Salmon Tasmania submission acknowledges that the two-year trial should be allowed to run its course before any conclusions are reached about its efficacy.

7.3.3. Analysis of substantial new information about the impacts of decreased Dissolved Oxygen levels on the Maugean skate

265. There is new information before you about the impacts of the DO levels attributable to the action on the Maugean skate. This information was not available at the time of the First Decision, and indicates that:

    a. decreased DO levels attributable to the action are impacting the Maugean skate's behaviour and physiology.

    b. decreased DO levels attributable to the action are reducing the Maugean skate's area of occupancy.

    c. impacts to the Maugean skate's behaviour and physiology and the reduction of the Maugean skate's area of occupancy are leading to a decline in the population of the Maugean skate.

7.3.3.1. Information at the time of the First Decision

266. There was limited information available at the time of the First Decision about the impacts of marine farming on DO levels in Macquarie Harbour, as discussed in section 7.3.2.1. There was also limited information available at the time of the First Decision about the population size and composition, area of occupancy, behaviour and physiology of the Maugean skate to allow determination of the full extent of the impacts that changes to water quality (particularly DO) would have on the Maugean skate.

7.3.3.1.1. Impacts to Maugean skate behaviour and physiology

267. The referral decision brief, referral form and additional information do not specifically identify changes to Maugean skate behaviour or physiology as a likely impact of the action.

268. The referral documentation (Attachment A02-A02.12) states that it was unknown how, or if, the Maugean skate utilises waters deeper than 15 m. One egg case was collected in deeper waters (at

approximately 25 m), but it was uncertain whether this was laid at this depth or if it drifted from elsewhere.

269. The referral appendix 3 (Attachment A02.3) noted that any physical habitat disturbance would be limited to areas immediately below cages, and that these areas were relatively small and potentially in water depths that were unlikely to be inhabited by the Maugean skate. Physical habitat disturbance identified was the accumulation of marine farm waste suspended in the water column and settled on the harbour floor.

270. At the time of the First Decision the department concluded that the species was likely to primarily inhabit shallow upper regions of estuaries in depths of 5-7 m, was unlikely to occur in deeper waters and that there was likely to be minimal overlap between core skate habitat and marine farm lease sites. This conclusion was based on limited information, including limited surveys which did not detect animals in depths greater than 15 m (see additional information to referral at Attachment A03).

271. The referral documentation (Attachment A02-A02.12) indicates that marine farming may impact the Maugean skate through changes to the benthic environment from marine farm waste settling directly under the pen footprint and causing changes to the sediment chemistry and biota. When solid waste settles on the seabed, it may decompose through processes that consume oxygen leading to hypoxic conditions in the bottom water layer.

272. The referral states that "*the biggest threat from soluble wastes would be a build-up of NOx from feed and waste inputs, and a resultant broad-scale shift in water quality across the Estuary*". Appendix 3 to the referral decision brief (Attachment A02.3) acknowledges that the Maugean skate might be impacted by a reduction in DO due to eutrophication. However, there was no information available at the time of the First Decision that specifically discussed the impacts of changes to water quality and the benthic environment in the context of Maugean skate physiology, behaviour, mortality and consequential impacts to population or area of occupancy.

273. At the time of the First Decision, it was assumed that if the Maugean skate was sensitive to nutrient loading associated with marine farming, alternative habitat would be favoured. Mitigation measures listed in the referral decision brief and decision notice address water quality changes (such as altered nutrient levels) attributable to marine farming operations.

274. Based on the information available at the time of the First Decision, it was concluded that the impacts of water quality changes from marine farming operations on the Maugean skate would be avoided as it was considered that impacts on water quality would be confined to depths greater than 20 m which were not at that time considered to be inhabited by Maugean skate.

7.3.3.1.2. Impacts to area of occupancy and population size

275. The referral decision brief, referral form and additional information do not specifically identify a reduction in the area of occupancy or population size of the Maugean skate as a likely impact of the action.

276. At the time of the First Decision, there was limited information available on the size of the Maugean skate population and the area of occupancy of the Maugean skate within Macquarie Harbour.

277. At the time of the First Decision, there were no reliable population estimates for the Maugean skate available. The 2004 Listing Advice stated: "*Initial surveys of* Raja *sp. L suggest that its population is likely to be small (probably in the order of 1000 individuals)*" (Attachment F02.6). This estimate was based on 3 surveys in Macquarie Harbour between 1994 and 1995 that found only 6 individuals. The referral form also made the following statement about population size: "*Perhaps the main conclusion from the recent survey work by IMAS is that the skate may be more abundant in the Harbour than earlier estimates suggested".* The department therefore concludes, that at the time of the First Decision, there was no information available that accurately described the population size or composition of Maugean skate.

278. At the time of the First Decision, the species was not believed to be in decline. Species decline was not documented in the scientific literature as a known threat at the time of the First Decision. The previous listing advice (2004) and **Conservation Advice (2008)** (Attachment F02.4) for the Maugean skate, which was available at the time of the First Decision, referred to a restricted geographical distribution and small population size with potential future population decline as a result of ongoing threats from ecotourism, trace metal pollution, incidental bycatch in fisheries activities and water nutrient level changes as a result of ship discharge, as the basis for the listing of the Maugean skate. At that time, marine farming was not considered to be a threat to the species.

279. Based on the information available at the time of the First Decision, it was concluded that the impacts of water quality changes from marine farming operations on the Maugean skate would be avoided. Therefore, there was no information collected or presented that addressed how changes to water quality or the benthic environment would impact the area of occupancy or population size of the Maugean skate.

7.3.3.2. Substantial new information: Decreased Dissolved Oxygen levels significantly impact the Maugean skate's behaviour and physiology

280. There is new information that was not available at the time of the First Decision which indicates that prolonged exposure to low DO levels in the benthic environment cause physiological stress and mortality in the Maugean skate and may disrupt reproductive potential and survival of all life stages (**Morash et al. 2020; Moreno et al. 2020**). Sustained periods of low DO conditions or rapid fluctuations negatively impact biological processes (growth, reproduction) and survival (**Moreno et al. 2020; Moreno and Semmens 2023**).

281. The following papers, which became available after the First Decision, indicate that decreased DO levels in the benthic environment, below those naturally occurring in the benthic environment of Macquarie Harbour are likely to impact survival of all life stages (from egg stage to adult):

    a. **Bell et al. (2016)** report on the first comprehensive study of the ecology and biology of the Maugean skate. This was the first study showing that Maugean skate are poorly adapted to very low DO levels and may only be able to cope for short periods of time before cell damage

and subsequently death will occur. The report states that long term changes to DO levels in Macquarie Harbour are likely to restrict their habitat and present a threat to the development and survival of eggs.

b. **Morash et al. (2020)** report on a study into hypoxia tolerance and survival strategies of the Maugean skate and describe the metabolic characteristics of the species and its physiological response to hypoxia. Findings documented in the report include:

   i) the Maugean skate shows oxyconformity, with a decrease in the metabolic and oxygen consumption rates with increasing hypoxic conditions, and a reliance on anaerobic metabolism.

   ii) the significant increase in tissue and blood lactate suggests that low oxygen stress for periods longer than 48 hours may not be tolerable.

   iii) Should hypoxic exposure persist beyond 48 h within the preferred depth of the skate, it is possible that they may be forced to spend increasing amounts of time at shallower depths where DO is higher, potentially resulting in loss of available habitat or shifts in their preferred habitat.

c. **Moreno et al. (2020)** report on physiology studies of the Maugean skate to determine the physiological costs of the DO levels Maugean skate are exposed to in Macquarie Harbour, and to assess the implications of declining DO on the future viability of the Maugean Skate population. Moreno et al. (2020) tagged 25 adult Maugean skate in Macquarie Harbour with external multi-sensor acoustic tags capable of continuously transmitting information on the depth, temperature and dissolved oxygen concentrations experienced by the individuals over a 12-month period. The study examined the sensitivity of the Maugean skate to decreased oxygen levels.

   i) Maugean skate survive chronic exposure to hypoxic conditions (< 20% DO) by using metabolic depression as a survival strategy.

   ii) metabolic depression cannot be sustained long-term, and as a result skate may seek oxygen in the shallower waters of the harbour where they will encounter hyposaline conditions and higher temperatures, leading to further metabolic stress.

   iii) Neonates may have a lower tolerance threshold which could have important implications for survivorship of early life stages.

   iv) The skate population may have reached the limits of their tolerance to environmental change.

282. Several studies have also found that prolonged exposure to hypoxic conditions leads to (inter alia) deleterious effects on skate reproduction and physiology:

a. **Morash et al. (2020)** examined the sensitivity of the Maugean skate to decreased oxygen levels and found that chronic exposure to hypoxic conditions may not be tolerable and would lead to loss of habitat. They noted that '*further declines in DO as a potential result of expanded aquaculture may prove to be detrimental to the Maugean skate*'.

b. **Moreno et al. (2020)** found that using metabolic depression as a survival strategy comes at the cost of other energy intensive life history processes, such as growth, foraging and reproduction.

c. **Moreno et al. (2020)** also found that low DO levels in bottom and middle water layers of Macquarie Harbour may restrict the highly specialised diet of the Maugean skate by impeding access to usual foraging areas, as well as reducing the health of crustacean prey. This may result in changed behaviour whereby skate individuals increasingly use sub-optimal habitat. This in turn may have deleterious effects on various lifecycle stages (e.g. reproduction, survival of eggs/hatchlings)**.**

d. **Moreno and Semmens (2023)** reported on interim survey findings using data from 2012-2021, which found that a substantial population decline of 47% had occurred since 2014. It stated that the reported recruitment failure was likely due to lower hatching success or juvenile survival and highlighted the vulnerability of the species to degraded environmental conditions. The authors attribute the population decline to low DO levels which are impacting the skate, increasing mortality rates, and pushing the species beyond their adaptive threshold.

283. The new information regarding the hypoxia tolerance of the Maugean skate, marks a key notable difference from the time of the First Decision in the ability to predict and assess impacts to the species from any further reduction to already low DO levels in Macquarie Harbour. At the time of the First Decision, there was little known about the species' physiology and behaviour, nor the impacts of reduced DO levels on the behaviour and physiology of the species. The then Minister accepted the department's view that the species was somewhat resilient to both localised and broader water quality changes in Macquarie Harbour.

284. However, the department notes that despite previous assumptions that the Maugean skate is well adapted to cope with naturally low DO levels, new information reports that prolonged exposure to low DO conditions is expected to cause physiological stress and mortality in the Maugean skate and may disrupt reproductive potential and survival at all life stages (**Bell et al. 2016; Morash et al. 2020; Moreno et al. 2020**).

285. In light of the new information outlined in paragraphs 281-285 (section 7.3.3.2), the department considers that the species is sensitive and vulnerable to chronic exposure to low DO. The new information enables a more meaningful assessment of the nature, scale and severity of impacts on species behaviour and physiology that could result from reduced DO levels, compared to what was known at the time of the First Decision.

286. The department considers that the information regarding the impact of decreased DO levels on the Maugean skate's behaviour and physiology at paragraphs 281-285 (section 7.3.3.2), indicates that the action has likely already caused physiological stress to the Maugean skate.

287. Having regard to the matters outlined in section 7.3.3.1 and the information referred to at section 7.3.3.2, the department considers that you can be satisfied that this information comprises substantial new information about the impacts the action has, and is likely to have, on the Maugean skate's behaviour and physiology. In particular, the department considers that reduced

DO concentrations in Macquarie Harbour from the action has resulted in, and is likely to continue to result in, the reduction in health and size of an important (stronghold) population through:

a. Physiological changes impacting all life stages.

b. Behavioural changes impacting all life stages.

7.3.3.3. Submissions disputing that decreased Dissolved Oxygen levels significantly impact the Maugean skate

7.3.3.3.1. Supplementary submission by the Tasmania State Minister for Parks and Environment dated 16 October 2024

288. The supplementary submission from the Hon. Nick Duigan MLC, then Tasmania State Minister for Parks and Environment (Attachment C03), dated 16 October 2024, attaches the updated interim findings from **Moreno et al. (2024)** (together with the DO status report) and states '*This new evidence indicates that water quality and population numbers of Maugean skate within the Harbour can improve concurrent with salmonid farming and questions whether the substantial new evidence presented during the reconsideration process is current, relevant or valid'.*

7.3.3.3.2. Seafood Industry Tasmania submission dated 2 February 2024

289. The submission from the Seafood Industry Tasmania (Attachment E05.1) disputes the link between decreased DO levels in Macquarie Harbour and impacts to the Maugean skate's physiology, and that the species is highly adapted to fluctuating DO levels in Macquarie Harbour and can tolerate a wide range of DO levels and variable salinities (Attachment E05.1).

290. The department has considered this submission and considers that, even if the research is insufficient to identify a 'direct' causal link, there is evidence before you which appears to demonstrate a causal link between marine farming and impacts to the Maugean skate's physiology, through the effects of marine farming on decreased DO levels. This evidence can be found in particular in the following papers:

a. **Bell et al. (2016); Morash et al. (2020), Moreno et al. (2020)** conclude that prolonged exposure to reduced DO levels causes physiological stress and mortality and disruption to reproductive potential and survival of all life stages, as discussed in paragraph 285 (section 7.3.3.2).

b. **Moreno et al. (2020); Moreno and Semmens (2023)** conclude that prolonged exposure to low DO levels negatively impact biological processes (growth, energy update and reproduction (egg viability)) and survival.

c. **Moreno et al. (2020); Moreno and Semmens (2023)** conclude that there is compelling evidence linking low DO levels to possible recruitment failure and the decline of the Maugean skate population.

7.3.3.4. Substantial new information: Decreased Dissolved Oxygen levels significantly impact the Maugean skate's area of occupancy

291. There is information that was not available at the time of the First Decision which indicates that decreased DO levels attributable to the action has had, and is likely to have, a significant impact to the Maugean skate by reducing its area of occupancy.

292. The estimated area of occupancy for the Macquarie Harbour population is 208 km^2 and it is likely the species occurs in the benthic environment throughout the harbour (**MS Conservation Advice 2023**). There are differences in site specific abundance patterns, with the Table Head / Liberty Point area likely to contain a significantly higher proportion of skate than other sites in Macquarie Harbour (**Bell et al. 2016**; **Moreno et al. 2020; Moreno et al. 2024**).

293. As identified in paragraphs 281 – 285 (section 7.3.3.2), new evidence in relation to the Maugean skate's intolerance of sustained low DO levels (greater than 48 h duration) indicates that a decrease in DO levels in Macquarie Harbour has resulted in, and is likely to result in, a loss of available habitat for the species due to their inability to remain in hypoxic areas for long periods of time. This suggests that the total area of occupancy available for the Macquarie Harbour population, is likely to have reduced as a result of degraded water quality and degraded benthic habitat (**Bell et al. 2016; Morash et al. 2020**).

7.3.3.5. Submissions disputing that decreased Dissolved Oxygen levels significantly impact the Maugean skate's area of occupancy

7.3.3.5.1. The Tasmania State Minister for Environment and Climate Change submission dated 2 February 2024

294. The submission provided by the Hon. Roger Jaensch MP, then Tasmania State Minister for Environment and Climate Change (Attachment C02.1), dated 2 February 2024, states that:

> '*The action moved farming lease areas away from potential habitat and the environmental standards outline that all pens must not be placed on the seabed. Consequently, the action will not directly reduce the area of occupancy for the Maugean Skate within Macquarie Harbour*'.

295. The department considers that the new information available indicates that the Maugean skate utilises benthic habitats across the entire depth range of Macquarie Harbour. In addition, skate eggs have been found in depths from 2.5 m (**Moreno et al. 2020**) to greater than 30 m (**Moreno et al. 2020**) indicating that the benthic environment in all depth ranges may comprise habitat for all life stages.

296. The submission from the Hon. Roger Jaensch MP, then Tasmania State Minister for Environment and Climate Change (Attachment C02.1), dated 2 February 2024, identifies that at the time of the First Decision, it was concluded that actions would not significantly affect areas inhabited by the species, then thought to be limited to shallow waters under 10 m. The submission also refers to subsequent research conducted by **Bell et al. (2016)** established the skate's preferred depth range

as 5-15 m. The submission also states that long term monitoring indicates that DO levels in this habitat range have remained consistent at approximately 50% saturation, deemed highly suitable for Maugean skate.

297. The department has considered this submission and considers that new information shows the Maugean skate may be found in all depths throughout the harbour, specifically:

a. the department considers Maugean skate to naturally occupy all depths of the harbour. 'Preferred' depths identified for the species may be a result of intolerable dissolved oxygen levels elsewhere in the harbour rather than reflecting a true preference. Low dissolved oxygen concentrations appear limiting for the skate and they utilise significantly deeper waters and substantially expand their activity areas following recharge events (**Bell et al. 2016**; **Moreno et al. 2020**).

b. further, as eggs have been collected in all depths (**Moreno et al. 2020**) reduced DO levels at depths greater than 15 m may result in eggs being exposed to very low dissolved oxygen concentrations during development, which may influence recruitment success and population viability (**Moreno et al. 2020**).

c. therefore, reduced DO to hypoxic levels at depths greater than 15 m would reduce the available habitat, and thereby the area of occupancy, for the skate.

d. as outlined in paragraph 192 (section 7.3.2.2), long term monitoring data shows that DO levels in waters deeper than 10 m at some sites remain below those recommended by the EPA as healthy for Macquarie Harbour.

e. Further, as outlined in paragraph 201 (section 7.3.2.3), the EPA data may not adequately represent the DO levels in areas known to be important habitats for the Maugean skate, nor be representative of DO levels within 1 m of the seabed, where these skates predominantly reside. Therefore, there are limitations to the use of the data that is referred to in the submission.

7.3.3.6. Substantial new information: The action has significantly impacted the Maugean skate's population size and composition

298. There is new information available that indicates that there has been a decline in size of the population in Macquarie Harbour since the First Decision, as follows:

a. **Bell et al. (2016)**

i) the first population estimate reported there were around 3,200 Maugean skates not including egg stage in 2014 (published in 2016).

b. **Moreno and Semmens (2023)**

i) reported the results of a population monitoring study for the Macquarie Harbour population which indicated a decline in relative abundance of the species of 47% between 2014 and 2021.

ii) stated that the scale of the decline and reported recruitment failure created significant concern for the conservation of the species and highlighted the vulnerability of the species to degraded environmental conditions.

iii) concluded there is a high likelihood that changes in population structure have occurred in the Maugean skate population within the past 10 years with evidence of adult mortalities linked with extreme environmental events. While extreme environmental events are naturally occurring, they exacerbate the already deleterious impacts of declines in DO throughout the harbour as a result of salmon farming. Further, the frequency and intensity of these extreme events are likely to worsen with climate change.

iv) These authors conclude that the ongoing impacts to DO levels are of extreme concern for the persistence of the species.

c. **Moreno et al. (2024)** Interim Report released by IMAS on 20 September 2024 outlines preliminary results of updated population monitoring using data from 2012 – 2024:

i) the report indicates that there has been a decline of 40% from 2014 to 2023, and the Maugean skate population may have stabilised at a very low population level in 2023-24, following ten years of decline.

ii) The report states that the Maugean skate remains at very low abundance levels and potentially subject to major environmental events leading to mortality, as observed in 2019. It indicates the high risk of extinction has not changed.

d. **Grant et al. (2023)**

i) Used mathematical methods (a Population Viability Analysis, PVA) to extrapolate a population estimate for the Macquarie Harbour population in 2021 using the 2014 population estimate and rate of decline reported by **Moreno et al. (2020)**. This approach estimated the female population, including egg capsules, to be between 545 and 1,348 (therefore total population between 1,060 and 2,969 animals).

ii) Predicted a continued decline in population. Modelling using the baseline rate of mortality resulting from environmental oxygen depletion assuming no other mortality related events occur projected a decline of 89% by 2041.

299. There is also new information before you which indicates that there has been a change in the composition of the Maugean skate population in Macquarie Harbour since the First Decision, as follows:

a. **Moreno et al. (2020)**

i) gillnet data collected between April 2012 and 2018 indicated shifts in the size structure of skate in Table Head/Liberty Point area, including a reduction in the relative abundance of juvenile and sub-adult individuals. This report suggests a decline in recruitment, possibly due to lower hatching success or juvenile survival.

ii) evidence of adult mortalities potentially related to stress caused (directly or indirectly) by the significant changes in the DO levels of the harbour coupled with the consequences of climate change (including occurrence of extreme weather events).

b. **Moreno and Semmens (2023)**

i) size composition data collected between 2012 and 2021 indicates a change in the size composition of the population in Macquarie Harbour, with a significant increase in the median size of females, and a significant decrease in the proportion of juveniles captured, consistent with recruitment failure.

ii) the scale of the overall decline and the scarcity of new juvenile recruits to the population creates significant concern for the conservation of the species.

iii) indications of possible recruitment failure coupled with the growth of existing adults (i.e., an ageing population) was not documented in the scientific literature or foreseen by the decision maker at the time of the First Decision.

c. **Moreno et al. (2024)**

i) report an absence of successful recruitment for a period of 8 years up until 2021, with an 87% decline in relative abundance of juveniles and sub-adults.

ii) These authors reported that, while there are positive signs of at least one year-class of recruits coming into the population since 2021, it is too early to determine what this recruitment event might mean for the future population trajectory.

d. **Weltz et al. (2018)**

i) Analysis of tissues collected from Maugean skate in Macquarie Harbour found the population shows low genetic diversity, highlighting a conservation concern with regards to its evolutionary potential to adapt to environmental changes occurring in the harbour, increasing the risk of local extinction.

300. More recent information indicates genetic diversity is likely to have further decreased since the mortality events of 2019 and population declines documented between 2014-2021 (**Moreno et al. 2020; Moreno and Semmens 2023**).

7.3.3.7. Submissions and correspondence disputing that the action has impacted the Maugean skate population composition and size

7.3.3.7.1. Salmon Tasmania submission dated 2 February 2024

301. The submission from Salmon Tasmania on behalf of the marine farm operators (Attachment D04), dated 2 February 2024 disputes findings indicating that the Maugean skate is in decline (refers to **Moreno and Semmens 2023**), asserting that this is consistent with the natural mortality rate of 40% for skates (citing **Grant et al. 2022** which the department assumes is meant to refer to **Grant et al. 2023)**.

302. The submission also considers that findings of the **Moreno and Semmens (2023)** are interim preliminary findings only and that subsequent to the release of the report the researchers reported capture of juvenile Maugean skates in significant numbers compared to historical efforts.

303. The department considers that Salmon Tasmania has applied an incorrect interpretation of **Grant et al. (2023)**, in that the natural mortality rate referred to in this report reflects the hatching success of skate eggs as reported by **Moreno et al. (2020)** and not the mortality rate of adult skates.

304. Further, the department considers that there is evidence available that demonstrates a significant rate of decline in the Maugean skate population, as discussed in section 7.3.3.6. In particular, in:

    a. **Moreno and Semmens (2023); Moreno et al. (2024)** - Population monitoring data indicates a decline of at least 40% between 2014 and 2021, with a reduced relative abundance of juveniles and sub-adults.

305. The Salmon Tasmania submission dated 2 February 2024 also asserts that there is no direct causal link between marine farming and impacts on the Maugean skate population, and that reports provided by the requestors do not establish a direct causal link between the impacts of marine farming and impacts on the Maugean skate population (Attachment D04).

306. The department has reviewed this submission and considers that there is evidence available that demonstrates a link between marine farming and impacts to the health of the Maugean skate population. In particular, the department considers that there is sufficient evidence in:

    a. **Ross et al. (2016); Ross and MacLeod (2017)**; **Kirkpatrick et al. (2019); Wild-Allen et al. (2020) and Ross et al. (2022)** to conclude that marine farming contributes to reduced DO levels in Macquarie Harbour due to nutrient enrichment and the biochemical degradation of organic matter, as discussed in paragraph 216 (section 7.3.2.6).

    b. **Bell et al. (2016); Morash et al. (2020); Moreno et al. (2020)** to conclude that prolonged exposure to reduced DO levels causes physiological stress and mortality and disruption to reproductive potential and survival of all life stages, as discussed in paragraph 282 (section 7.3.3.2).

    c. **Moreno et al. (2020); Moreno et al. (2023)** to conclude that prolonged exposure to low DO levels negatively impact biological processes (growth, energy update and reproduction (egg viability)) and survival.

    d. **Moreno et al. (2020); Moreno and Semmens (2023)** to conclude that there is compelling evidence linking low DO levels to possible recruitment failure and the decline of the Maugean skate population.

7.3.3.7.2. Salmon Tasmania additional correspondence dated 30 September 2024

307. You also received additional correspondence from Salmon Tasmania (Attachment G01), dated 30 September 2024 which included a copy of their submission made to the TSSC on the draft listing assessment and draft conservation advice. The letter to the TSSC included a copy of the unpublished paper by Professor Barry Brook (see Attachment C within Attachment G01.1).

308. Salmon Tasmania state *'A report by University of Tasmania Professor Barry Brook, a specialist in population viability analysis with 30 years' experience, found the information used by TSSC about the state's population had "severe information gaps" and a "bigger problem" which "is that the outcomes is essentially forced'*.

309. Details of the issues raised in the correspondence, and the department's response are detailed in paragraphs 314 – 316 (section 7.3.3.7.4).

7.3.3.7.3. The Minister for Parks and Environment supplementary submission dated 16 October 2024

310. The supplementary submission provided by the Hon. Nick Duigan MLC, then Tasmania State Minister for Parks and Environment (Attachment C03.1), dated 16 October 2024, refers to the Interim Report released by IMAS on 20 September 2024 (**Moreno et al. 2024**). **Moreno et al. (2024)** outline preliminary results of updated population monitoring using data from 2012 - 2024, though sampling for 2024 is incomplete. The submission states that IMAS '*have confirmed the population trend appears stable, and the recruitment of juveniles into the population is occurring at levels identified in 2014*'.

311. As discussed in paragraph 300cii (section 7.3.3.6), the department considers that while the report indicates that there are positive signs of at least one year-class of recruits coming into the population since 2021, it is too early to determine what this recruitment event might mean for the future population trajectory.

312. The supplementary submission (Attachment C03.1) also refers to the Population Viability Analysis (PVA) model reported in **Grant et al. (2023)** that estimated the population of Maugean skate at 40-120 mature animals, predicting a high extinction risk over three generations (2014-2041) due to low recruitment rates, habitat degradation, and environmental pressures. The submission states *'while it is generally acknowledged the 2023 Population Viability Analysis was developed in a data poor context, driven by a sense of urgency, significant issues are identified with the model…this includes the accuracy of the data used and the validity of the assumptions underpinning the model'*.

313. The department considers that PVA used the best available evidence to inform the analyses. It was developed at the request of the Recovery Team, and the department understands it is considered an iterative analysis and will be updated and revised when new information becomes available.

7.3.3.7.4. Prof. Barry Brook correspondence dated 2 September 2024

314. You received correspondence from Professor Barry Brook dated 2 September 2024 (Attachment G07) enclosing an unpublished paper detailing the outcomes of an independent review of the 2023 PVA (**Grant et al. 2023**). Professor Brook was commissioned by Salmon Tasmania to review the Threatened Species Scientific Committee (TSSC)'s draft listing assessment that was released for public comment on 15 August 2024.

315. The unpublished paper by Barry Brook critically evaluated the PVA conducted by **Grant et al. (2023)**. Brook argues that the reliability of the PVA is constrained (as is often the case in PVAs) by

information gaps and the quality of the underlying data. Furthermore, Brook emphasises the need for expert reassessment of the PVA's precautionary application.

316. As stated in paragraph 313 (section 7.3.3.7.3), the department considers that PVA used the best available evidence to inform the analyses. It was developed at the request of the Recovery Team, and the department understands it is considered an iterative analysis and will be updated and revised when new information becomes available.

7.3.4. Revocation and substitution is warranted by the availability of substantial new information

317. The department considers that the information described in sections 7.3.2 and 7.3.3 is substantial new information about the impacts and likely impacts of the proposed action on the Maugean skate, a listed threatened species protected pursuant to section 18 and 18A of the EPBC Act. The department further considers that revocation and substitution of the First Decision is warranted by this new information, in circumstances where the new information demonstrates that the action has had, and is likely to have a significant impact on the Maugean skate.

318. Separately, the department notes that its recommendation, that you consider the action has had, and is likely to have, a significant impact on the Maugean skate, is consistent with the application of the precautionary principle.

7.3.4.1. The action has had, and is likely to have, a significant impact on the Maugean skate

319. As discussed in section 7.3.2, there is new information before you that indicates that the decrease in DO levels in Macquarie Harbour can be largely attributed to marine farming, and that this decrease in DO levels is in turn impacting on the benthic environment, which is the Maugean skate's habitat.

320. As discussed in section 7.3.3, there is new information before you which suggests that decreased DO levels are significantly impacting the Maugean skate's behaviour and physiology and area of occupancy and that this is leading to a decline in the population of the Maugean skate.

321. The department considers that the information before you, that has been discussed in section 7.3.2 and section 7.3.3 demonstrates that you can be satisfied that the action has had, and is likely to have, a significant impact on the Maugean skate.

322. Separately, the department notes that its recommendation is consistent with the guidance contained in the *Significant Impact Guidelines 1.1* (Attachment B04.7) which state that an action is likely to have a significant impact on a listed threatened species, listed Endangered, if there is a real chance or possibility that it will:

a. lead to a long-term decrease in the size of a population,

b. reduce the area of occupancy of the species,

c. fragment an existing population into two or more populations,

d. adversely affect habitat critical to the survival of a species,

e. disrupt the breeding cycle of a population,

f. modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline,

g. result in invasive species that are harmful to a critically endangered or endangered species becoming established in the endangered or critically endangered species' habitat,

h. introduce disease that may cause the species to decline, or

i. interfere with the recovery of the species.

323. The department's recommendation, that it is open to you to conclude that the action has had, and is likely to have, a significant impact on the Maugean skate, is consistent with the application of the precautionary principle in light of the information before you.

7.3.4.2. Submissions disputing that the impacts of the action on Maugean skate are significant

324. The department notes that Tasmania EPA and Salmon Tasmania have made submissions that assert that impacts of marine farming on the Maugean skate are not significant impacts.

325. The EPA submission (Attachment E03) dated 2 February, stated:

> '*There has been progressive reduction in finfish biomass in the Harbour since 2017, and it is evident that the management decisions by the EPA Director have had positive effects in Macquarie Harbour over time. This is highlighted by IMAS's recent dissolved oxygen budget and the fact that the best two consecutive compliance results from four-monthly benthic video surveys under EPA's watch occurred in 2023*'.

326. The submission from Salmon Tasmania dated 2 February 2024 (Attachment D04), stated '*The IMAS 2023 Report does not present any information about the impacts of the Marine Farming Expansion on the skate, let alone any substantial new information about such impacts or their likelihood of occurring*'.

327. The department has considered the submissions from Salmon Tasmania (Attachment D04) and the Tasmania EPA (Attachment E03), both dated 2 February 2024 and is of the view that reductions to the population are considered significant as they pose a real risk to survival and recovery. This conclusion is also consistent with the department's *Significant Impact Guidelines 1.1* (Attachment B04.7).

7.3.5. Recommendation: The action is a controlled action and sections 18 and 18A are controlling provisions

328. Based on the information before you, the department concludes that the evidence available supports a finding that the action has had, and is likely to have, a significant impact on the Maugean skate, as a listed threatened species protected in section 18 and 18A of the EPBC Act.

329. In particular, there is substantial new information before you which suggests that the action:

a. has had a significant impact on the Maugean skate as the information before you demonstrates that the action has:

i) led to a long-term decrease in the size of a population.

ii) reduced the area of occupancy of the species.

iii) adversely affected habitat critical to the survival of the species.

iv) disrupted the breeding cycle of a population.

v) modified, destroyed, removed, isolated or decreased the availability or quality of habitat to the extent that the species has declined.

vi) interfere with the recovery of the species.

b) is likely to have a significant impact on the Maugean skate as the information before you demonstrates that is a real chance or possibility that the action is likely to:

i) lead to a long-term decrease in the size of a population.

ii) reduce the area of occupancy of the species.

iii) adversely affect habitat critical to the survival of the species.

iv) disrupt the breeding cycle of a population.

v) modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that the species has declined.

vi) interfere with the recovery of the species.

330. Accordingly, the department recommends that you revoke and substitute the First Decision with a new decision under section 75(1) that the action is a controlled action, and sections 18 and 18A are controlling provisions for the action.

7.4. Substantial new information about the impacts of the action on the Tasmanian Wilderness (World Heritage Area)

331. The department considers that there is substantial new information before you about the impacts of the action on the Tasmanian Wilderness, a World Heritage property and a National Heritage place. Specifically, there is substantial new information before you which indicates that marine farming activities that form part of the action are significantly impacting water quality by causing a reduction in DO levels.

332. The department's recommendation is that the above information is substantial new information about the impacts and likely impacts of the action on the values of the Tasmanian Wilderness as a World Heritage property, and that in light of this new information, the revocation and substitution of the First Decision is warranted.

333. The department further considers that the information before you demonstrates that the action has had, and is likely to have, a significant impact on the heritage values of the Tasmanian Wilderness, as a World Heritage property under sections 12 and 15A of the EPBC Act. On that basis, the department recommends that you substitute the First Decision with a decision that the action is a controlled action, where sections 12 and 15A are controlling provisions for the action.

7.4.1. Information at the time of the First Decision

334. The action overlaps with the western boundary of the TWWHA within Macquarie Harbour, with the nearest marine farming zone and associated lease being approximately 375 m and 520 m respectively from the boundaries (Figure 1).

335. The referral provided by DPIPWE in 2012 included the following statement in relation to the potential impact of the action on TWWHA (Attachment A02):

'The project area borders the Tasmanian Wilderness World Heritage Area (TWWHA), with the nearest proposed zone and associated lease being approximately 375m and 520m respectively from the WHA boundary. Currently, the closest marine farming zone is 910m from the WHA boundary with the associated lease 930m from the boundary. The potential impact of the proposal on the TWWHA was assessed by considering the multiple values for which the area has been listed, the activities that may potentially impact on those values (hazards), and the criteria for triggering a significant impact established by the Commonwealth (Commonwealth of Australia, 2009). The preliminary assessment identifies those values of the TWWHA that could potentially be significantly impacted upon by the proposal. Two of these relate to on-going evolutionary processes and the relatively undisturbed nature of the area, three relate to the significant aesthetic value of the WHA and also relate to the lack of disturbance, and one relates to the significance of the relatively undisturbed geomorphological processes occurring in the area (Criteria vii), viii), ix) and x))'.

336. Appendix 3 to the referral form (Attachment A02.3) states:

'The Panel was not convinced that the evidence presented in the EIS is sufficient to demonstrate the extent of likely nutrient enhancement in the harbour (including in the World Heritage Area) from farming operations, or the nature and extent of the effects of such enhancement. The Panel was satisfied, however, that uncertainties can be dealt with through the adaptive management approach.'

337. At the time of the First Decision, the department considered that the action may potentially impact the TWWHA through changes to water quality as a result of nutrient loading in the water column and benthic changes that may affect threatened species habitat. At the time of the First Decision, the department considered that the risk to the TWWHA and Maugean skate from changes to water quality was low.

338. Impacts to social and visual amenity in the form of rubbish and waste materials were also considered a potential impact of the action on the TWWHA at the time of the First Decision.

339. Based on the information available at the time of the First Decision, the department considered that the action was unlikely to have a significant impact on the TWWHA.

340. Accordingly, the particular manner requirements outlined in the decision notice (Attachment A04) were identified to ensure that the following potential impacts of the action on the TWWHA would be avoided, or mitigated to ensure that significant impacts to the TWWHA would not occur:

a. impacts as a result of changes to the benthic environment.

b. impacts as a result of marine debris.

c. impacts as a result of water quality changes.

7.4.2. Analysis of substantial new information about the impacts of the action on the Tasmanian Wilderness World Heritage Area

341. There is substantial new information before you about the impacts the action has had, and is likely to have, on the TWWHA. This information was not available at the time of the First Decision, and indicates that:

a. marine farming is degrading water quality by causing a reduction in DO levels.

b. marine farming is impacting the benthic environment.

7.4.2.1. Substantial new information: Impacts of the action to habitat for endemic, rare or threatened species survival (including a Gondwana relic) [World Heritage criterion (x)]

342. There is substantial new information before you about the impacts that the action has had, and is likely to have, on the World Heritage values that contribute to the Outstanding Universal Value of the Tasmanian Wilderness, as captured by World Heritage criterion (x). Specifically, there is substantial new information before you which suggests that decreasing DO levels caused by the action are significantly impacting on the habitat of the Maugean skate, an endemic, rare and threatened species with links to Gondwana.

343. In 2016, the Tasmanian Government released the TWWHA Management Plan (**TWWHA Management Plan 2016**). The Plan does not allow marine farming within any of the management zones within the World Heritage property.

344. New information in relation to impacts on water quality and the benthic environment outlined in section 7.3.2.2 (Substantial new information: extent to which DO levels have decreased in Macquarie Harbour) and section 7.3.2.4 (Substantial new information: Increased organic matter and nutrient loads and associated decreased DO levels impact benthic habitat for Maugean skate) is relevant to impacts on habitat for endemic, rare or threatened species that are attributes conveying the World Heritage values that contribute to the Outstanding Universal Value of the World Heritage property justified under World Heritage criterion (x). Notably, there is evidence of a deteriorated environment (benthic environment) in Macquarie Harbour (including within the TWWHA) as compared to the time of the First Decision and evidence that the action has contributed to these impacts.

345. The Maugean skate is an endemic, threatened species that is unique to the west coast of Tasmania, and it is likely that Macquarie Harbour is the only location where a viable subpopulation of the Maugean skate occurs. New information as outlined earlier in this document, indicates that the action has resulted in degradation of habitat for the Maugean skate due to degraded water quality and degradation of the benthic environment.

7.4.2.1.1. Decreased Dissolved Oxygen levels in the World Heritage Area

346. The EPA has been monitoring water quality within Macquarie Harbour since 1993, including on the TWWHA boundary (**EPA 2024**). A 2017 report by the EPA (**2017**) provides a summary of monitoring of the environmental condition of Macquarie Harbour within the TWWHA. Among its key findings, it notes the following (p 2):

a. *'There is evidence of deterioration in the environmental condition in Macquarie Harbour broadly, and also within the TWWHA region. The most likely cause of this deterioration is the protracted period of low levels of dissolved oxygen (DO) adjacent to the harbour floor, and in the midwater regions'.*

b. *'Ongoing water column monitoring has indicated that dissolved oxygen (DO) levels remain very low. Current DO concentrations in both the mid and bottom waters across the harbour and within the TWWHA are significantly lower than long-term averages'.*

347. As discussed in paragraphs 190 – 193 (section 7.3.2.2), the department considers the following papers provide substantial new information about decreased DO levels in Macquarie Harbour and specifically the TWWHA:

a. **Ross et al. (2022)** showed that DO levels in 2020 continued to be significantly below the pre-2010 levels throughout most of Macquarie Harbour at depths greater than 20 m, including within the TWWHA (also noted by **EPA 2023**).

b. The EPA's monitoring report from February 2023 (**EPA 2023**) states that [emphasis added]:

> '*Over the past 12 months dissolved oxygen values measured* ***at the WHA (World Heritage Area) boundary have remained critically below the long-term averages****. Since October 2022* ***surface water levels (recorded at 10 m depth)*** *have sharply* ***declined to values not previously recorded****. Dissolved oxygen values have dropped below 1 mg/L on occasions, with the balance oscillating around 2 mg/L, compared to the long-term average for this depth of ~5 mg/L. It appears that reduced freshwater flow through the harbour is allowing tidal incursions of marine waters to displace bottom (recorded at 35 m) waters upwards into the mid-depth (recorded at 25 m) and subsequently surface (recorded at 10 m) depths.* ***Dissolved oxygen values in bottom and mid-depth water have also declined over this period with bottom waters between 1 mg/L and 2 mg/L, compared to the long-term average ~4.2 mg/L, and mid-depth water in the vicinity of 1 mg/L, compared to a long-term average ~4 mg/L****'.*

348. **EPA (2024)** - The EPA's Oxygen Status Update report released in September 2024 included the EPA's Independent Water Quality Monitoring Data at site MH24 which is located in the TWWHA

and is 20-25m deep (See Figure 4). A decline in DO at 10 m water depth has been recorded since approximately 2010, with DO levels frequently below target levels. At 21 m DO levels started to decline sharply from 2010 to 2017. Since 2017, DO levels have remained consistently in the 1-2mg/L range (levels described as 'critically low' by the EPA in February 2023, para 346 (a)), and far below the EPA target levels.

7.4.2.1.2. Impacts to benthic environment in the World Heritage Area

349. A report by the EPA **(EPA 2017)** provides a summary of 'recent' monitoring of the environmental condition of Macquarie Harbour within the TWWHA portion. Among its key findings, it noted the following:

    a. '*an observed decline in dissolved oxygen concentrations in the water column and subsequent deteriorating benthic conditions*'.

    b. '*it is clear that increased finfish aquaculture is likely to be one driver of dissolved oxygen decline in the Harbour, but that other drivers exist, including organic load from freshwater inputs*'.

    c. that DO level decline has resulted in a broad-scale loss of benthic infauna across the deeper regions of Macquarie Harbour, including in the TWWHA.

    d. that deeper sites surveyed, showed the greatest decline in faunal abundance and number of species in 2017 compared with early 2015 and 2016.

    e. '*the most recent monitoring of benthic condition has indicated that the number of sites in the TWWHA at which Beggiatoa spp. was observed has increased over the period January 2015 (zero of ten sites) to January 2017 (seven of ten sites). This is indicative of a low oxygen environment and a source of organic input…*'.

350. In their submission (at Attachment E03.1), dated 2 February 2024, the EPA stated that in November 2016 the Director of the EPA required Tassal to destock the Franklin lease (MF266), located approximately 1 km outside of the TWWHA boundary, by March 2017, due to concerns about environmental conditions within Macquarie Harbour, in particular the presence of *Beggiatoa* mats and declining benthic infauna abundance within the TWWH:

    a. results of video monitoring (from January 2017) from the farming lease located approximately 1 km outside of the TWWHA boundary) demonstrated a 'likely lease impact' whereby a *Beggiatoa spp*. bacterial mat extended from the south-eastern lease boundary to approximately 1,035 m, and crossed into the TWWHA boundary by approximately 50m.

    b. the lease was subsequently completely fallowed by 10 April 2017.

    c. subsequent industry monitoring in March and April 2017 indicated that the *Beggiatoa spp.* extent contracted substantially to well outside the TWWHA boundary.

351. The department considers that this is substantial new information in that the event suggests that the nutrient loading of a stocked lease area has had, and is likely to have, an impact on the benthic environment that is substantial in both scale and severity. It also demonstrates that a significant

impact has already occurred in this location, on habitat critical for the survival of a threatened species and on the World Heritage values that contribute to the Outstanding Universal Value of a World Heritage property.

7.4.2.2. Submissions disputing impacts of the action to habitat for endemic, rare or threatened species survival (including a Gondwana relic) [World Heritage criterion (x)]

352. Section 7.3.2.3 (Submissions disputing the extent to which DO has decreased) and section 7.3.2.7 (Submissions disputing the link between the action and decreased DO levels) discusses a number of submissions that dispute that there is new information about impacts of marine farming on DO levels in Macquarie Harbour, and thereby on water quality and the benthic environment.

353. By implication the department considers that these submissions also dispute that there is substantial new information about impacts that marine farming poses to the natural values of the World Heritage property and attributes conveying the Outstanding Universal Value of the Tasmanian Wilderness, including on habitat of the Maugean skate, an *endemic, rare and threatened species with links to Gondwana*.

7.4.2.2.1. Director of the EPA submission dated 2 February 2024

354. In their submission (at Attachment E03.1), dated 2 February 2024, the director of the EPA discusses the events described in paragraph 350 (section 7.4.2.1.2) and notes that, while Beggiatoa presence is indicative of a low DO environment and organic inputs, '*these observations do not indicate the source of the organic matter and it is acknowledged that in addition to aquaculture inputs there are other significant sources of organic matter that may contribute to oxygen drawdown in Macquarie Harbour (e.g. riverine inputs from the Gordon River)'.*

355. The department acknowledges that there are several sources of organic matter entering Macquarie Harbour that may contribute to DO drawdown. As discussed in paragraphs 207 and 208, **Ross et al. (2016) and Ross and Macleod (2017)** attribute the addition of nutrients and organic matter from marine farming as playing a substantial role in stimulating the growth of Beggiatoa bacterial mats. Therefore, while it is not possible to discount other sources as potential contributors to the decline in DO that caused the event described in paragraph 351 (section 7.4.2.1.2), the department considers that it is likely that marine farming was the primary cause of the event.

7.4.2.2.2. Salmon Tasmania submission dated 2 February 2024

356. The submission from Salmon Tasmania, dated 2 February 2024 (Attachment D04) disputes claims of a causal link between benthic degradation and marine farming, or otherwise raises that there is a lack of certainty in new information provided to establish the link.

357. The department is of the view that it is open to you to be satisfied that there is a casual link between benthic degradation and marine farming and that marine farming does contribute to nutrient and organic matter loading in Macquarie Harbour, as discussed in section 7.3.2.6 and in **Ross et al. (2016); Ross and MacLeod (2017)** and **Ross et al. (2021)** which suggests a direct link

between marine farming and *Beggiatoa* matting (see paragraphs 204-213). The department further considers that, based on the information before you, there is a lack of evidence to support a contrary view with scientific certainty.

7.4.2.3. Substantial new information: Impacts of the action to an unusual assemblage of deep marine species found within estuary [World Heritage criterion (ix)]

358. There is substantial new information before you in relation to the impacts that the action has had, or is likely to have, on the World Heritage values that contribute to the Outstanding Universal Value of the Tasmanian Wilderness, as justified under World Heritage criterion (ix). Specifically, there is substantial new information before you which suggests that the action is impacting an unusual assemblage of deep marine species found within the estuary.

359. New information in relation to impacts on water quality and the benthic environment outlined in section 7.3.2.2 (Substantial new information: extent to which DO levels have decreased in Macquarie Harbour) and section 7.3.2.4 (Substantial new information: Increased organic matter and nutrient loads and associated decreased DO levels impact benthic habitat for Maugean skate) is relevant to impacts on an *unusual assemblage of deep marine species found within the large estuaries where communities are moderated by dark tannic freshwater, overlaying salt* that are attributes conveying the World Heritage values that contribute to the Outstanding Universal Value of the World Heritage property justified under World Heritage criterion (x). Notably, there is evidence of a deteriorated environment (benthic environment) in Macquarie Harbour (including within the TWWHA) as compared to the time of the First Decision and evidence that the action has contributed to these impacts.

360. The Maugean skate is an endemic, threatened species that is unique to the west coast of Tasmania, and it is likely that Macquarie Harbour is the only location where a viable subpopulation of the Maugean skate occurs. New information as outlined earlier in this document, indicates that the action has resulted in degradation of habitat for the Maugean skate due to degraded water quality and degradation of the benthic environment.

7.4.2.3.1. Decreased Dissolved Oxygen levels in the World Heritage Area

361. The information outlined above in relation to habitat for endemic, rare or threatened species survival in section 7.4.2.1.1, is also relevant to *an unusual assemblage of deep marine species found within the large estuaries where communities are moderated by dark tannic freshwater, overlaying salt* (natural heritage values justified under World Heritage criterion (ix)).

7.4.2.3.2. Impacts to benthic environment in the world heritage area

362. The information outlined above in relation to habitat for endemic, rare or threatened species survival in section 7.4.2.1.2, is also relevant to *an unusual assemblage of deep marine species found within the large estuaries where communities are moderated by dark tannic freshwater, overlaying salt* (natural heritage values justified under World Heritage criterion (ix)).

7.4.2.4. Submissions disputing impacts of the action to an unusual assemblage of deep marine species found within estuary [World Heritage criterion (ix)]

363. Section 7.3.2.3 (Submissions disputing the extent to which DO has decreased) and section 7.3.2.7 (Submissions disputing the link between the action and decreased DO levels) discusses a number of submissions that dispute that there is new information about impacts of marine farming poses on DO concentration levels in Macquarie Harbour, and thereby on water quality and the benthic environment.

364. By implication the department considers that these submissions, referred to below, also dispute that there is substantial new information about impacts of marine farming on the natural heritage values and attributes conveying the Outstanding Universal Value of the Tasmanian Wilderness, including on the *unusual assemblage of deep marine species* found within the estuary, which includes the Maugean skate.

365. Therefore, the discussion outlined above in section 7.4.2.2 (Submissions disputing impacts to habitat for endemic, rare or threatened species survival is also relevant to *an unusual assemblage of deep marine species found within the large estuaries where communities are moderated by dark tannic freshwater, overlaying salt* (natural heritage values justified under World Heritage criterion (ix)).

7.4.3. Revocation and substitution is warranted by the availability of substantial new information

366. The department considers that the information described in section 7.4.2 is substantial new information about the impacts and likely impacts of the proposed action on the TWWHA, a World Heritage property protected under sections 12 and 15A of the EPBC Act. The department further considers that revocation and substitution of the First Decision is warranted by this new information, in circumstances where the new information demonstrates that the action has had, and is likely to have, a significant impact on the TWWHA.

367. Separately, the department notes that its recommendation, that you consider the action has had, and is likely to have, a significant impact on the TWWHA is consistent with the application of the precautionary principle.

7.4.3.1. The action has had, and is likely to have, a significant impact on the TWWHA

368. The department considers that the information before you, that has been discussed in section 7.4.2 constitutes substantial new information and demonstrates that you can be satisfied that the action has had, and is likely to have, a significant impact on natural heritage values and attributes which convey the Outstanding Universal Value of the Tasmanian Wilderness.

369. Separately, the department notes that its recommendation is consistent with the guidance contained in the *Significant Impact Guidelines 1.1* (Attachment B04.7), which state that an action is likely to have a significant impact on the World Heritage values of a declared World Heritage property if there is a real chance or possibility that it will cause:

a. one or more of the World Heritage values to be lost,

b. one or more of the World Heritage values to be degraded or damaged, or

c. one or more of the World Heritage values to be notably altered, modified, obscured or diminished.

7.4.4. Recommendation: The action is a controlled action, and sections 12 and 15A are controlling provisions

370. Based on the information before you, the department concludes that the evidence available supports a finding that the action has had, and is likely to have, a significant impact on the TWWHA, as a World Heritage property protected in sections 12 and 15A of the EPBC Act.

371. In particular, there is substantial new information before you which suggests that the action:

a. has had a significant impact on the World Heritage values of the TWWHA through impacts to the listing Criteria (ix) and (x), as the information before you demonstrates that the action has caused:

i) one or more of the World Heritage values to be degraded or damaged.

ii) one or more of the World Heritage values to be notably altered, modified, obscured or diminished.

b. is likely to have a significant impact on the World Heritage values of the TWWHA through impacts to the listing Criteria (ix) and (x), as the information before you demonstrates that is a real chance or possibility that the action is likely to cause:

i) one or more of the World Heritage values to be degraded or damaged.

ii) one or more of the World Heritage values to be notably altered, modified, obscured or diminished.

372. Accordingly, the department recommends that you revoke and substitute the First Decision with a new decision under section 75(1) that the action is a controlled action, and sections 12 and 15A are controlling provisions for the action.

7.5. Substantial new information about the impacts of the action on the Tasmanian Wilderness (National Heritage place)

7.5.1. The National Heritage values correspond to World Heritage values

373. In accordance with subitem 1A(3) of Schedule 3 of the *Environment and Heritage Legislation Amendment Act (No.1) 2003,* each World Heritage value justified under World Heritage criteria that the World Heritage Committee has agreed justified the World Heritage listing of the Tasmanian Wilderness is taken to cause the place to meet a corresponding National Heritage criterion – in this

case, National Heritage criteria (a), (b), (c), (d),(e), (g) (Commonwealth of Australia Gazette, 21 May 2007).

374. The World Heritage values that contribute to the Outstanding Universal Value of the Tasmanian Wilderness are therefore the same as the National Heritage values of the Tasmanian Wilderness. The department considers that the new information about potential impacts described in section 7.4.2 for the World Heritage property will also apply to the National Heritage place.

375. In accordance with subitem 1A(3) of Schedule 3 of the *Environment and Heritage Legislation Amendment Act (No.1) 2003,* the Tasmanian Wilderness is included in Australia's National Heritage List under the following criteria:

a. criterion **A** (*Events and processes*) - the place has outstanding heritage value to the nation because of the place's importance in the course, or pattern, of Australia's natural or cultural history.

b. criterion **B** (*rarity*) - the place has outstanding heritage value to the nation because of the place's possession of uncommon, rare or endangered aspects of Australia's natural or cultural history.

c. criterion **C** (*research*) - the place has outstanding heritage value to the nation because of the place's potential to yield information that will contribute to an understanding of Australia's natural or cultural history.

d. criterion **D** (*principle characteristics of a class of places*) - the place has outstanding heritage value to the nation because of the place's importance in demonstrating the principal characteristics of:

   i) a class of Australia's natural or cultural places; or

   ii) a class of Australia's natural or cultural environments.

e. criterion **E** (*aesthetic characteristics*) - the place has outstanding heritage value to the nation because of the place's importance in exhibiting particular aesthetic characteristics valued by a community or cultural group.

f. criterion **G** (*social value*) - the place has outstanding heritage value to the nation because of the place's strong or special association with a particular community or cultural group for social, cultural or spiritual reasons.

7.5.2. Revocation and substitution is warranted by the availability of substantial new information

376. The department considers that the information described in section 7.4.2 is substantial new information about the impacts and likely impacts of the proposed action on the TWWHA and notes the corresponding National Heritage values for the Tasmanian Wilderness as described in section 7.5.1. The department further considers that revocation and substitution of the First Decision is warranted by this new information, in circumstances where the new information demonstrates that the action has had, and is likely to have, significant impact on the National Heritage place.

377. Separately, the department notes that its recommendation, that you consider the action has had, and is likely to have, a significant impact on the National Heritage place is consistent with the application of the precautionary principle.

7.5.2.1. The action has had, and is likely to have, a significant impact on the Tasmanian Wilderness National Heritage place

378. The information described in sections 7.4.2 constitutes substantial new information in relation to the impact the action has had, and is likely to have, on natural heritage values and attributes which are National Heritage values of the National Heritage place.

379. Given the department considers that the action has had, and is likely to have, impacts on the heritage values that contribute to the World Heritage property's Outstanding Universal Value, including as is set out in sections 7.4.2 and 7.5.1, the department considers that the action has had, and is likely to have, a significant impact on the National Heritage values of the National Heritage place as there is a real chance or possibility that it will cause:

a. one or more of the National Heritage values to be degraded or damaged, or

b. one or more of the National Heritage values to be notably altered, modified, obscured or diminished.

7.5.3. Recommendation: The action is a controlled action, and sections 15B and 15C are controlling provisions for the action

380. Based on the information before you, the department concludes the evidence available supports a finding that the action has had, and is likely to have, a significant impact on the Tasmanian Wilderness National Heritage place protected in sections 15B and 15C of the EPBC Act.

381. In particular, there is substantial new information before you which suggests that the action:

a. has had a significant impact on the National Heritage values of the Tasmanian Wilderness through impacts on heritage values and attributes recognised under National Heritage criteria (a), (b), (c) and (d) that contribute to the Outstanding Universal Value of the World Heritage property justified under World Heritage criteria (ix) and (x), as the information before you demonstrates that the action has caused:

   i) one or more of the National Heritage values to be degraded or damaged.

   ii) one or more of the National Heritage values to be notably altered, modified, obscured or diminished.

b. is likely to have a significant impact on the National Heritage values of the Tasmanian Wilderness through impacts on heritage values and attributes recognised under National Heritage criteria (a), (b), (c) and (d) that contribute to the Outstanding Universal Value of the World Heritage property justified under World Heritage criteria (ix) and (x), as the information before you demonstrates that there is a real chance or possibility that the action has and will cause:

i) one or more of the National Heritage values to be degraded or damaged.

ii) one or more of the National Heritage values to be notably altered, modified, obscured or diminished.

382. Accordingly, the department recommends that you revoke and substitute the First Decision with a new decision under section 75(1) that the action is a controlled action, and sections 12 and 15A are controlling provisions for the action.

8. Reconsideration under section 78(1)(aa) – Substantial change in circumstances

8.1. Recommendation in relation to section 78(1)(aa)

383. In light of the material before you, the department recommends that you revoke the First Decision and substitute a new decision that the action is a controlled action and that sections 12, 15A, 15B, 15C, 18 and 18A are the controlling provisions for the action, pursuant to section 78(1)(aa) of the EPBC Act.

384. The department considers that you can be satisfied that the revocation and substitution is warranted by a substantial change in circumstances that was not foreseen at the time of the First Decision that relates to the impacts that the action has had, and is likely to have, on matters protected by a provision of Part 3.

385. Specifically:

a. in relation to the **Maugean skate (*Zearaja maugeana*)**, protected as a listed endangered species under sections 18, 18 and 18A of the EPBC Act, there has been a substantial change in circumstances since the First Decision in relation to the effects of the marine farming that forms part of the action on the population size of the Maugean skate. There is information before you in relation to the substantial change in circumstances since the First Decision in relation to the size of the Maugean skate population, and the relationship between the impacts of marine farming on the reduction of DO levels in Macquarie Harbour, and the impacts of the reduced DO levels on the Maugean skate's habitat (including the benthic environment), behaviour, physiology and area of occupancy that is leading to a decline in the population of the Maugean skate. In light of that substantial change in circumstances, which was not foreseen at the time of the First Decision the department considers that you can be satisfied that the action has had, and is likely to have, a significant impact on the Maugean skate as a listed endangered species protected under sections 18 and 18A of the EPBC Act.

b. In relation to the **Tasmanian Wilderness World Heritage Area**, protected as a World Heritage property under sections 12 and 15A of the EPBC Act, there has been a substantial change in circumstances since the time of the First Decision with respect to the effects of the marine farming that forms part of the action on the water quality in Macquarie Harbour. The information before you indicates that the impacts of marine farming undertaken in

accordance with the action on the water quality and benthic environment in Macquarie Harbour is more significant than first thought at the time of the First Decision, with water quality in Macquarie Harbour having since degraded due to the reduction in DO levels as a result marine farming practices. The information before you in relation to the impacts of marine farming on the degradation of water quality in Macquarie Harbour indicates a substantial change in circumstance, namely the impacts that the action has had and will have on the natural heritage values of the Tasmanian Wilderness World Heritage Area, including criteria (ix), and (x). In light of this substantial change in circumstances, which was not foreseen at the time of the First Decision, the department considers that you can be satisfied that the action has had, and is likely to have, a significant impact on the Tasmanian Wilderness World Heritage Area as protected under sections 12 and 15A of the EPBC Act.

c. In relation to the **Tasmanian Wilderness National Heritage place**, protected as a National Heritage place under sections 15B and 15C of the EPBC Act, there has been a substantial change in circumstances since the time of the First Decision with respect to the effects of the marine farming that forms part of the action on the water quality in Macquarie Harbour. The information before you indicates that the impacts of marine farming undertaken in accordance with the action on the water quality and benthic environment in Macquarie Harbour is more significant than first thought at the time of the First Decision, with water quality in Macquarie Harbour having since degraded due to the reduction in DO levels as a result marine farming practices. The information before you in relation to the impacts of marine farming on the degradation of water quality in Macquarie Harbour indicates a substantial change in circumstance, namely the impacts that the action has had and will have on the natural heritage values of the Tasmanian Wilderness World Heritage Area, as justified under National Heritage criteria (a), (b), (c) and (d). In light of this substantial change in circumstances, which was not foreseen at the time of the First Decision, the department considers that you can be satisfied that the action has had, and is likely to have, a significant impact on the Tasmanian Wilderness National Heritage place, as protected under sections 15B and 15C of the EPBC Act.

386. For the reasons outlined above, the department recommends that you find that revocation of the NCA-PM decision and substitution with a new decision that the action is a controlled action is warranted. The department recommends that the controlling provisions for the action should be sections 12, 15A, 15B, 15C, 18 and 18A of the EPBC Act.

8.2. Section 78(1)(aa)

387. Pursuant to section 78(1)(aa), the Minister may revoke a decision (in this case, the First Decision) made under subsection 75(1) about an action and substitute a new decision under that subsection for the First Decision, but (relevantly) only if:

the Minister is satisfied that the revocation and substitution is warranted by a substantial change in circumstances that was not foreseen at the time of the first decision and relates to the impacts that the action:

i) has or will have: or

ii) is likely to have;

on a matter protected by a provision of Part 3

388. The following issues arise for consideration in the context of section 78(1)(aa):

a. Is there a substantial change in circumstances (being a change in circumstances that is of substance, and is more than trivial or insignificant) that was not foreseen at the time of the First Decision?

b. Does the substantial change in circumstances relate to the impacts that the action has or will have, or is likely to have, on relevant protected matters?

c. Are you satisfied that the revocation and substitution of the First Decision is warranted by the substantial change in circumstances?

8.3. Substantial change in circumstances that relates to the impacts of the action on the size of the Maugean skate population

389. There has been a substantial change in circumstances that was not foreseen at the time of the First Decision and which relates to the impacts that the action has had, and is likely to have, on the Maugean skate (a listed threatened species under sections 18 and 18A of the EPBC Act).

390. The information before you indicates that as a result of the action, there are decreased DO levels in Macquarie Harbour, which has impacted the Maugean skate's habitat, area of occupancy, physiology and behaviour which has led to a decline in the Maugean skate's population. The population decline of the Maugean skate is a change in circumstances that was not foreseen at the time of the First Decision, which is related to the impacts of the action on the Maugean skate.

391. The department's recommendation is that you can be satisfied that this change in circumstances in relation to the Maugean skate's population decline was not foreseen at the time of the First Decision and relates to the impacts of the action on the Maugean skate as a listed threatened species protected by sections 18 and 18A of the EPBC Act, and that in light of this substantial change in circumstances, the revocation and substitution of the First Decision is warranted.

392. The department further considers that the information before you demonstrates that the action has had, and is likely to have, a significant impact on the Maugean skate, as a listed threatened species under sections 18 and 18A of the EPBC Act. On that basis, the department recommends that you substitute the First Decision with a decision that the action is a controlled action, where sections 18 and 18A is a controlling provision for the action.

8.3.1. Information at the time of the First Decision

393. There was limited information available at the time of the First Decision about the impact of the action on the population size of the Maugean skate and a decline in population size was not identified as a potential impact of the action.

394. Section 7.3.3.1.2 details the limited information that was available about the Maugean skate population in Macquarie Harbour at the time of the First Decision.

8.3.2. Analysis of substantial change in circumstances that relates to the impact of the action on the population size of the Maugean skate

395. You can be satisfied that there has been a substantial change in circumstances that was not foreseen at the time of the First Decision, and which relates to the impacts that the action has had, and is likely to have, on the Maugean skate.

8.3.2.1. Substantial change in circumstance: Decline of the Maugean skate population

396. There is information before you which indicates an unforeseen change in circumstances, namely that the size of the Maugean skate population in Macquarie Harbour has declined, and is likely to continue to decline, since the First Decision.

397. Information that demonstrates that the Maugean skate population has declined since the First Decision has been discussed in section 7.3.3.6 and is as follows:

a. **Bell et al. (2016)**

i) the first population estimate reported there were around 3,200 Maugean skates, not including egg stage in 2014 (published in 2016).

b. **Moreno and Semmens (2023)**

i) reported the results of a population monitoring study for the Macquarie Harbour population which indicated a decline in relative abundance of the species of 47% between 2014 and 2021.

ii) stated that the scale of the decline and reported recruitment failure created significant concern for the conservation of the species and highlighted the vulnerability of the species to degraded environmental conditions.

iii) concluded there is a high likelihood that changes in population structure have occurred in the Maugean skate population within the past 10 years with evidence of adult mortalities linked with extreme environmental events. While extreme environmental events are naturally occurring, they exacerbate the already deleterious impacts of declines in DO throughout the harbour as a result of salmon farming. Further, the frequency and intensity of these extreme events are likely to worsen with climate change.

iv) these authors conclude that the ongoing impacts to DO levels are of extreme concern for the persistence of the species.

398. There is also information before you which indicates that the unforeseen change in circumstances, that the Maugean skate population in Macquarie Harbour has declined since the First Decision, is likely to continue:

a. **Moreno et al. (2024)** Interim Report released by IMAS on 20 September 2024 outlines preliminary results of updated population monitoring using data from 2012 – 2024:

i) the report indicates that there has been a decline of 40% from 2014 to 2023, and the Maugean skate population may have stabilised at a very low population level in 2023-24, following ten years of decline.

ii) The report states that the Maugean skate remains at very low abundance levels and potentially subject to major environmental events leading to mortality, as observed in 2019. It indicates the high risk of extinction has not changed.

b. **Grant et al. (2023)**

i) Used mathematical methods (a Population Viability Analysis, PVA) to extrapolate a population estimate for the Macquarie Harbour population in 2021 using the 2014 population estimate and rate of decline reported by **Moreno et al. (2020)**. This approach estimated the female population, including egg capsules, to be between 545 and 1,348 (therefore total population between 1,060 and 2,969 animals).

ii) Predicted a continued decline in population. Modelling using the baseline rate of mortality resulting from environmental oxygen depletion assuming no other mortality related events occur projected a decline of 89% by 2041.

399. The information before you indicates that the changes in circumstances described above are related to the impacts of the action. In particular, decreased DO levels are considered to be the most significant factor influencing this population decline. As noted in this report, the reduction in DO levels in Macquarie Harbour is linked largely to the biodegradation of increased organic matter and nutrient inputs from marine farming.

8.3.2.2. Submissions and correspondence disputing that the Maugean skate population has declined

8.3.2.2.1. Salmon Tasmania submission dated 2 February 2024

400. As discussed in section 7.3.3.7.1, the submission from Salmon Tasmania, dated 2 February 2024 (Attachment D04) disputes that there is evidence available that demonstrates the Maugean skate population has declined in Macquarie Harbour as a result of marine farming operations.

401. Details of the assertions raised in the submission, and the department's response are detailed in section 7.3.3.7.1.

8.3.2.2.2. The Minister for Parks and Environment supplementary submission dated 16 October 2024

402. As discussed in section 7.3.3.7.3, the supplementary submission from the Hon. Nick Duigan MLC, then Tasmania State Minister for Parks and Environment (Attachment C03.1), dated 16 October 2024, refers to the Interim Report released by IMAS on 20 September 2024 (**Moreno et al. 2024**).

Moreno et al. (2024) outline preliminary results of updated population monitoring using data from 2012 - 2024, though sampling for 2024 is incomplete.

403. Details of the issues raised in the submission, and the department's response are detailed in section 7.3.3.7.3.

8.3.2.2.3. Professor Barry Brook correspondence dated 15 August 2024

404. As discussed in section 7.3.3.7.4, correspondence from Professor Barry Brook (Attachment G07) dated 2 September 2024 enclosed an unpublished paper detailing the outcomes of an independent review of the 2023 PVA (**Grant et al. 2023**). Professor Brook was commissioned by Salmon Tasmania to review the Threatened Species Scientific Committee (TSSC)'s draft listing assessment that was released for public comment on 15 August 2024.

405. Details of the issues raised in the correspondence, and the department's response are detailed in section 7.3.3.7.4.

8.3.3. Revocation and substitution is warranted by an unforeseen substantial change in circumstances

406. The department considers that, having regard to the matters described in section 8.3.1 and section 8.3.2, you can be satisfied that there has been a substantial change in circumstances that was not foreseen at the time of the First Decision, and that the substantial change in circumstances relates to the impacts that the action has had, and is likely to have, on the Maugean skate.

407. The department further considers that, having regard to these matters, revocation and substitution of the First Decision is warranted, in circumstances where the substantial change in circumstances demonstrates that the action has had, and is likely to have a significant impact on the Maugean skate.

408. The department's recommendation, that you consider the action has had, and is likely to have a significant impact on the Maugean skate is consistent with the application of the precautionary principle.

8.3.3.1. The action has had, and is likely to have, a significant impact on the Maugean skate

409. Based on the information described in sections 8.3.1 and 8.3.2, the department considers that you can be satisfied that the action has had, and is likely to have, a significant impact on the Maugean skate, as a listed threatened species protected by sections 18 and 18A of the EPBC Act.

410. Separately, the department notes that its recommendation is also consistent with an application of the *Significant Impact Guidelines 1.1* (Attachment B04.7), which relevantly state that an action is likely to have a significant impact on a listed threatened species, listed as Endangered, if there is a real chance or possibility that it will:

a. lead to a long-term decrease in the size of a population,

b. reduce the area of occupancy of the species,

c. fragment an existing population into two or more populations,

d. adversely affect habitat critical to the survival of a species,

e. disrupt the breeding cycle of a population,

f. modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline,

g. result in invasive species that are harmful to a critically endangered or endangered species becoming established in the endangered or critically endangered species' habitat,

h. introduce disease that may cause the species to decline, or

i. interfere with the recovery of the species.

8.3.4. Recommendation: The action is a controlled action, and sections 18 and 18A are controlling provisions for the action

411. For the reasons set out above and on the basis of the information set out in section 8.3.2, the department recommends that you revoke and substitute the First Decision with a new decision under section 75(1) that the action is a controlled action, and sections 18 and 18A is a controlling provision for the action.

412. Based on the information before you as discussed in section 8.3.2 and 8.3.3, the department concludes that the evidence available supports a finding that the action has had, and is likely to have, a significant impact on the Maugean skate, as a listed threatened species protected in sections 18 and 18A of the EPBC Act.

413. In particular, there is information before you about a change in circumstances which suggests that the action:

a. has had a significant impact on the Maugean skate as the information before you demonstrates that the action has:

   i) led to a long-term decrease in the size of a population.

b. is likely to have a significant impact on the Maugean skate as the information before you demonstrates that is a real chance or possibility that the action is likely to:

   i) lead to a long-term decrease in the size of a population.

414. Accordingly, the department recommends that you revoke and substitute the First Decision with a new decision under section 75(1) that the action is a controlled action, and sections 18 and 18A are controlling provisions for the action.

8.4. Substantial change in circumstances that relates to the impacts of the action on the Tasmanian Wilderness (World Heritage Area)

415. There has been a substantial change in circumstances that was not foreseen at the time of the First Decision and which relates to the impacts that the action has had, and is likely to have, on the TWWHA (a World Heritage property protected under sections 12 and 15A of the EPBC Act). Specifically, there has been a change in the circumstances in respect to the TWWHA's water quality and the benthic environment as a result of the impacts of the action.

416. The information before you indicates that as a result of the action, DO levels in Macquarie Harbour have decreased, which has impacted the water quality and benthic environment in the TWWHA. This is a change in circumstances that was not foreseen at the time of the First Decision, which is related to the impacts of the action on the TWWHA's natural values.

417. The department's recommendation is that you can be satisfied that this change in circumstances is substantial, was not foreseen at the time of the First Decision and relates to the impacts of the action on the TWWHA as a World Heritage property protected by sections 12 and 15A of the EPBC Act, and that in light of this substantial change in circumstances, the revocation and substitution of the First Decision is warranted.

418. The department further considers that the information before you demonstrates that the action has had, and is likely to have, a significant impact on the TWWHA. On that basis, the department recommends that you substitute the First Decision with a decision that the action is a controlled action, where sections 12 and 15A are a controlling provision for the action.

8.4.1. Information at the time of the First Decision

419. There was limited information available at the time of the First Decision about the impact of the action on the Tasmanian Wilderness World Heritage Area.

420. Section 7.4.1 details the information that was available at the time of the First Decision, including that the department considered that the action may potentially impact the TWWHA through changes to water quality due to nutrient loading in the water column and benthic changes that may affect threatened species habitat. At the time of the First Decision, the department considered that the risk to the TWWHA and Maugean skate from changes to water quality, was low.

8.4.2. Analysis of substantial change in circumstances in relation to the impacts of the action on Natural Heritage values of the TWWHA

421. You can be satisfied that there has been a substantial change in circumstances that was not foreseen at the time of the First Decision, and relates to the impacts that the action has or will have, or is likely to have, on the listed world heritage values of the Tasmanian Wilderness.

8.4.2.1. Substantial change in circumstance: Impacts of the degradation of water quality and the benthic environment on the World Heritage criteria (x and ix)

422. There is information before you which indicates an unforeseen change in circumstances, namely that as a result of the action, DO levels in Macquarie Harbour have decreased, which has impacted the water quality and benthic environment in the TWWHA.

423. Information that demonstrates that the water quality and the benthic environment in the TWWHA has declined since the First Decision has been discussed in sections 7.4.2.1 (Substantial new information: Impacts of the action to habitat for endemic, rare or threatened species) and 7.4.2.3 (substantial new information: Impacts of the action to an unusual assemblage of deep marine species found within estuary) and is as follows:

a. The EPA has been monitoring water quality within Macquarie Harbour since 1993, including on the TWWHA boundary (**EPA 2024**). A 2017 report by the EPA (**2017**) provides a summary of monitoring of the environmental condition of Macquarie Harbour within the TWWHA. Among its key findings, it notes the following (p 2):

   i) *'There is evidence of deterioration in the environmental condition in Macquarie Harbour broadly, and also within the TWWHA region. The most likely cause of this deterioration is the protracted period of low levels of dissolved oxygen (DO) adjacent to the harbour floor, and in the midwater regions'.*

   ii) *'Ongoing water column monitoring has indicated that dissolved oxygen (DO) levels remain very low. Current DO concentrations in both the mid and bottom waters across the harbour and within the TWWHA are significantly lower than long-term averages'.*

   iii) '*an observed decline in dissolved oxygen concentrations in the water column and subsequent deteriorating benthic conditions*'.

   iv) '*it is clear that increased finfish aquaculture is likely to be one driver of dissolved oxygen decline in the Harbour, but that other drivers exist, including organic load from freshwater inputs*'.

   v) That DO level decline has resulted in a broad-scale loss of benthic infauna across the deeper regions of Macquarie Harbour, including in the TWWHA.

   vi) That deeper sites surveyed, showed the greatest decline in faunal abundance and number of species in 2017 compared with early 2015 and 2016.

   vii) '*The most recent monitoring of benthic condition has indicated that the number of sites in the TWWHA at which Beggiatoa spp. was observed has increased over the period January 2015 (zero of ten sites) to January 2017 (seven of ten sites). This is indicative of a low oxygen environment and a source of organic input…*'.

b. **Ross et al. (2022)** showed that DO levels in 2020 continued to be significantly below the pre-2010 levels throughout most of Macquarie Harbour at depths greater than 20 m, including within the TWWHA (also noted by **EPA 2023**).

c. The EPA's monitoring report from February 2023 (**EPA 2023**) states that [emphasis added]:

> '*Over the past 12 months dissolved oxygen values measured* ***at the WHA (World Heritage Area) boundary have remained critically below the long-term averages****. Since October 2022* ***surface water levels (recorded at 10 m depth)*** *have sharply* ***declined to values not previously recorded****. Dissolved oxygen values have dropped below 1 mg/L on occasions, with the balance oscillating around 2 mg/L, compared to the long-term average for this depth of ~5 mg/L. It appears that reduced freshwater flow through the harbour is allowing tidal incursions of marine waters to displace bottom (recorded at 35 m) waters upwards into the mid-depth (recorded at 25 m) and subsequently surface (recorded at 10 m) depths.* ***Dissolved oxygen values in bottom and mid-depth water have also declined over this period with bottom waters between 1 mg/L and 2 mg/L, compared to the long-term average ~4.2 mg/L, and mid-depth water in the vicinity of 1 mg/L, compared to a long-term average ~4 mg/L****.'*

d. **EPA (2024)** - The EPA's Oxygen Status Update report released in September 2024 included the EPA's Independent Water Quality Monitoring Data at site MH24 which is located in the TWWHA and is 20-25m deep (See Figure 4). A decline in DO at 10 m water depth has been recorded since approximately 2010, with DO levels frequently below target levels. At 21 m DO levels started to decline sharply from 2010 to 2017. Since 2017, DO levels have remained consistently in the 1-2mg/L range (levels described as 'critically low' by the EPA in February 2023, para 346 (a)), and far below the EPA target levels.

424. In their submission (at Attachment E03.1), dated 2 February 2024, the EPA stated that in November 2016 the Director of the EPA required Tassal to destock the Franklin lease (MF266), located approximately 1 km outside of the TWWHA boundary, by March 2017, due to concerns about environmental conditions within Macquarie Harbour, in particular the presence of *Beggiatoa* mats and declining benthic infauna abundance within the TWWH:

a. results of video monitoring (from January 2017) from the farming lease located approximately 1 km outside of the TWWHA boundary) demonstrated a 'likely lease impact' whereby a *Beggiatoa spp*. bacterial mat extended from the south-eastern lease boundary to approximately 1,035 m, and crossed into the TWWHA boundary by approximately 50m.

b. the lease was subsequently completely fallowed by 10 April 2017.

c. subsequent industry monitoring in March and April 2017 indicated that the *Beggiatoa spp.* extent contracted substantially to well outside the TWWHA boundary.

425. The department considers that this is substantial new information in that the event suggests that the nutrient loading of a stocked lease area has had, and is likely to have, an impact on the benthic environment that is substantial in both scale and severity. It also demonstrates that a significant impact has already occurred in this location, on habitat critical for the survival of a threatened species and on the World Heritage values that contribute to the Outstanding Universal Value of a World Heritage property.

8.4.2.2. Submissions disputing evidence that relates to the unforeseen impacts of the action on water quality and the benthic environment

426. The department notes that there are a number of submissions that dispute evidence that relates to the unforeseen impacts of the action on water quality and the benthic environment.

427. Section 7.3.2.3 (Submissions disputing the extent to which DO has decreased) and section 7.3.2.7 (Submissions disputing the link between the action and decreased DO levels) discusses a number of submissions that dispute that there is new information about impacts of marine farming on DO levels in Macquarie Harbour, and thereby on water quality and the benthic environment.

428. Section 7.4.2.2 (Submissions disputing impacts of the action to habitat for endemic, rare of threatened species survival - world heritage criteria x) and section 7.4.24 (Submissions disputing impacts of the action to an unusual assemblage of deep marine species found within estuary – world heritage criteria ix) discusses a number of submissions that dispute there is new information about impacts of marine farming on water quality and the benthic environment in the TWWHA. These include submissions from the Director of the EPA, dated 2 February 2004 and from Salmon Tasmania, dated 2 February 2024.

429. By implication the department considers that these submissions referred to in paragraphs 427 and 428 (section 8.4.2.2) also dispute that there is information available that demonstrates there is a change in circumstances that relates to the impacts of the action on water quality and the benthic environment in the TWWHA.

8.4.3. Revocation and substitution is warranted by a substantial change in circumstances

430. The department considers that having regard to the matters described in section 8.4.1 and section 8.4.2, you can be satisfied that there has been a substantial change in circumstances that was not foreseen at the time of the Fist Decision, and that the substantial change in circumstances relates to the impacts that the action has had, or is likely to have, on the TWWHA.

431. The department further considers that revocation and substitution of the First Decision is warranted by this substantial change in circumstances, in circumstances where in light of the substantial change in circumstances you can be satisfied that the action has had, and is likely to have, a significant impact on the TWWHA.

432. The department's recommendation, that you consider the action has had, and is likely to have, a significant impact on the TWWHA is consistent with the application of the precautionary principle.

8.4.3.1. The action has had, and is likely to have, a significant impact on the TWWHA

433. As discussed in sections 7.4.2.1.1 and 7.4.2.1.2, there is information before you that indicates that the decrease in DO and decline in health of the benthic environment in the TWWHA can be attributed to marine farming.

434. Based on the information described in section 8.4.2, the department considers that the action has had, and is likely to have, a significant impact on the World Heritage values of the TWWHA as a declared World Heritage property protected by section 12 and 15A of the EPBC Act.

435. Separately, the department notes that its recommendation is consistent with an application of the *Significant Impact Guidelines 1.1* (Attachment B04.7), which state that an action is likely to have a significant impact on the values of a World Heritage Property, if there is a real chance or possibility that it will cause:

a. one or more of the World Heritage values to be lost,

b. one or more of the World Heritage values to be degraded or damaged, or

c. one or more of the World Heritage values to be notably altered, modified, obscured or diminished.

8.4.4. Recommendation: The action is a controlled action, and sections 12 and 15A are controlling provisions for the action

436. For the reasons set out above and on the basis of the information set out in section 8.4.2, the department recommends that you revoke and substitute the First Decision with a new decision under section 75(1) that the action is a controlled action, and sections 18 and 18A is a controlling provision for the action.

437. Based on the information before you as discussed in section 8.4.2, the department concludes that the evidence available supports a finding that the action has had, and is likely to have, a significant impact on the TWWHA, as a World Heritage property protected in sections 12 and 15A of the EPBC Act.

438. In particular, there is information before about a change in circumstances you which suggests that the action:

a. has had a significant impact on the World Heritage values of the TWWHA through impacts to the listing Criteria (ix) and (x), as the information before you demonstrates that the action has caused:

i) one or more of the World Heritage values to be degraded or damaged.

ii) one or more of the World Heritage values to be notably altered, modified, obscured or diminished.

b. is likely to have a significant impact on the World Heritage values of the TWWHA through impacts to the listing Criteria (ix) and (x), as the information before you demonstrates that is a real chance or possibility that the action is likely to cause:

i) one or more of the World Heritage values to be degraded or damaged.

ii) one or more of the World Heritage values to be notably altered, modified, obscured or diminished.

439. Accordingly, the department recommends that you revoke and substitute the First Decision with a new decision under section 75(1) that the action is a controlled action, and sections 12 and 15A are a controlling provisions for the action.

8.5. Substantial change in circumstances that relates to the impacts of the action on the Tasmanian Wilderness (National Heritage place)

440. In accordance with subitem 1A(3) of Schedule 3 of the *Environment and Heritage Legislation Amendment Act (No.1) 2003,* each World Heritage value that the World Heritage Committee has identified for the Tasmanian Wilderness is taken to cause the place to meet a National Heritage criterion (i.e. the National Heritage values correspond with the World Heritage values).

441. The listed World Heritage values for the TWWHA, identified in sections 2.1.2.1 and 2.1.2.2, therefore are the same as those for the listed National Heritage values for the TWNHP.

442. The department considers that the change in circumstances described in section 8.4 that relates to impacts of the action on water quality and the benthic environment for the World Heritage property also applies to the National Heritage place.

8.5.1. Revocation and substitution is warranted by a substantial change in circumstances

443. The department considers that the information described in section 8.4.2 is substantial new information about the impacts and likely impacts of the proposed action on the TWWHA, and notes the corresponding National Heritage Values for the TWNHP as described in section 7.5.1. The department further considers that revocation and substitution of the First Decision is warranted by this new information, in circumstances where the new information demonstrates that the action has had, and is likely to have, a significant impact on the TWNHP.

444. Separately, the department notes that its recommendation, that you consider the action has had, and is likely to have, a significant impact on the TWNHP is consistent with the application of the precautionary principle.

8.5.1.1. The action has had, and is likely to have, a significant impact on the TWNHP

445. Based on the information described in section 8.4., the department considers that the action has had, and is likely to have, a significant impact on the National Heritage values of the TWNHP as a declared National Heritage place as there is a real chance or possibility that it will cause:

a. one or more of the National Heritage values to be degraded or damaged.

b. one or more of the National Heritage values to be notably altered, modified, obscured or diminished.

8.5.2. Recommendation: The action is a controlled action, and sections 15B and 15C are controlling provisions for the action

446. For the reasons set out above and on the basis of the information set out in section 8.4, the department recommends that you revoke and substitute the First Decision with a new decision under section 75(1) that the action is a controlled action, and sections 15B and 15C are the controlling provisions for the action.

447. Based on the information before you, the department concludes the evidence available supports a finding that the action has had, and is likely to have, a significant impact on the Tasmanian Wilderness National Heritage place protected in sections 15B and 15C of the EPBC Act.

448. In particular, there is information before you about a change in circumstances which suggests that the action:

a. has had a significant impact on the National Heritage values of the Tasmanian Wilderness through impacts on heritage values and attributes recognised under National Heritage criteria (a), (b), (c) and (d) that contribute to the Outstanding Universal Value of the World Heritage property justified under World Heritage criteria (ix) and (x), as the information before you demonstrates that the action has caused:

   i) one or more of the National Heritage values to be degraded or damaged.

   ii) one or more of the National Heritage values to be notably altered, modified, obscured or diminished.

b. is likely to have a significant impact on the National Heritage values of the Tasmanian Wilderness through impacts on heritage values and attributes recognised under National Heritage criteria (a), (b), (c) and (d) that contribute to the Outstanding Universal Value of the World Heritage property justified under World Heritage criteria (ix) and (x), as the information before you demonstrates that there is a real chance or possibility that the action has and will cause:

   i) one or more of the National Heritage values to be degraded or damaged.

   ii) one or more of the National Heritage values to be notably altered, modified, obscured or diminished.

449. Accordingly, the department recommends that you revoke and substitute the First Decision with a new decision under section 75(1) that the action is a controlled action, and sections 12 and 15A are controlling provisions for the action.

9. Reconsideration under section 78(1)(b) - Action being undertaken in the manner identified in NCA-PM

9.1. Recommendation in relation to section 78(1)(b)

450. In light of the information and submissions currently before you, the department does not currently propose that section 78(1)(b) should form the basis for a reconsideration of the NCA-PM decision.

9.2. Section 78(1)(b)

451. Pursuant to s78(1)(b) of the Act (the EPBC Act), the Minister may revoke a decision (the First Decision) *made under subsection 75(1) about an action and substitute a new decision under that subsection for the first decision, but only if:*

(b) the following requirements are met:

i. The first decision was that the action was not a controlled action because the Minister believed the action would be taken in the manner identified under subsection 77A(1) in the notice given under section 77;

ii. The Minister is satisfied that the action is not being, or will not be, taken in the manner identified

452. The Bob Brown Foundation requests that the Minister reconsider the NCA-PM decision having regard to section 78(1)(b). The reasons cited are reflected in the following extract from the request for reconsideration sent on behalf of the Bob Brown Foundation:

As to the request under s.78(1)(b)(ii) of the Act, the decision required the persons taking the action 'To ensure there are no significant impacts to the Maugean Skate…". Under paragraph 1 of the decision, certain measures were identified.

The decision also required there to be "no significant impacts on the Tasmanian Wilderness World Heritage Area and the Maugean Skate as a result of water quality changes…". Other measures were identified at paragraph 2(a)-(f) of the decision…

…all three companies that operate fish farms in Macquarie Harbour, being the action(s) in question, are not taking the action in the manner identified in the first decision of EPBC 2012/6406 that requires the companies to: Take measures to prevent substantial benthic visual, physio-chemical or biological changes attributable to marine farming operations at, or extending beyond 35 metres from the boundary of any lease area'.

453. The issue of compliance with the particular manner requirements is also raised in the correspondence in relation to the request for reconsideration sent by the Environmental Defenders Office on behalf of the Australian Marine Conservation Society and Humane Society International

Australia. That correspondence requests that the department investigate whether there is compliance with the particular manner requirements prescribed by the NCA-PM decision.

454. Section 78(1)(b) is addressed in the submission submitted by Salmon Tasmania on behalf of the marine farm operators, dated 2 February 2024. These submissions state that there has not been any non-compliance with the particular manner requirements set out in the NCA-PM decision and submits that the reconsideration requests do not contain information that establishes that the action is not being taken, or will not be taken, in the manner identified in the NCA-PM decision.

455. The department has considered the submissions, comments and information relevant to section 78(1)(b).

456. The department considers that the introductory words setting out the desired outcome of the particular manner decision is not itself part of the particular manner requirements set out in the component decision for the purposes of section 77A. As such, the department considers that, as long as the specific measures set out in the NCA-PM decision (and extracted at paragraph 53 of this document) were complied with, the particular manner requirements were not contravened.

457. In relation to the issue of compliance with the particular manner requirements, the department's Compliance and Enforcement Branch has undertaken two compliance investigations. These investigations were completed in July 2024 (**July Investigation**) and November 2024 (**November Investigation**).

458. The department's Compliance and Enforcement Branch undertook a compliance investigation (July Investigation) to assess if the action was being undertaken in accordance with the particular manner requirements specified in the NCA-PM decision notice. The department's Compliance and Enforcement Branch undertook this investigation by way of a desktop review of documentary information available with respect to the monitoring data, survey results and licence conditions provided by the EPA, the marine farm operators, Tasmanian Government agencies and the Institute for Marine Studies, University of Tasmania. On 7 July 2024, the July Investigation was finalised and the department's Compliance and Enforcement Branch determined there was no evidence to substantiate non-compliance with the particular manner requirements.

459. The department's Compliance and Enforcement Branch's case assessment report for the July investigation is at Attachment H01.

460. In response to information received in August 2024, the department's Compliance and Enforcement Branch undertook a further compliance investigation (November Investigation) to assess if the action was being undertaken in accordance with the particular manner requirements specified in the NCA-PM decision notice.

461. Specifically, in August 2024, YouTube videos (covering the period 2017 to 2024) were provided to the department during the public consultation period for the reconsideration. The videos show debris such as plastic piping, ropes and netting fouling the shoreline of Macquarie Harbour at several locations and include commentary stating the debris is from marine farming operations. Some videos suggest macroalgae biofouling on the shoreline is associated with marine farming operations however, direct evidence of association with marine farming operations is not provided. The particular manners associated with the First Decision include requirements that marine farm

operators undertake regular clean-up operations of marine farming debris at intervals of a minimum of every 12 months. In addition, clean-up activities must also occur in response to notifications by members of the public or stakeholders. The particular manners do not establish a standard that clean-up operations are required to meet other than timing and biosecurity requirements to prevent the spreading of weeds or pathogens. Some of the videos show clean-up operations being conducted by employees of marine farming operators and provide concerns over the effectiveness of the clean-up operations.

462. In response to the videos submitted during public consultation, the department's Compliance and Enforcement Branch commenced a new compliance investigation (the November Investigation), which included a site inspection of Macquarie Harbour.

463. On 29 August 2024, as part of the November investigation, the department issued a request for information to each marine farm operator seeking:

a. evidence that cleanup operations were being conducted in accordance with the particular manners.

b. evidence that shoreline biofouling is not a result of fish farming operations.

c. other information relevant to the department's enquiries.

464. Each of the marine farm operators responded to the request for information to state that cleanup operations are conducted on a regular basis. This included the frequency of shoreline cleanups operations and any co-operative arrangements. The operators stated that they were not aware of any biofouling resulting from marine farming operations.

465. On 14 November 2024, representatives from the department's Compliance and Enforcement Branch conducted a site inspection of marine farming operations in Macquarie Harbour. Observations made during the site inspection did not identify any evidence of marine debris on the inspected shoreline and surrounding water of the TWWHA. In addition, observations did not identify any evidence of biofouling being present in the harbour. No areas of non-compliance were recorded at the time.

466. The department's Compliance and Enforcement Branch's case assessment report for the November investigation is at Attachment H02.

9.3. 78(1)(b) conclusion

467. In respect of non-compliance with the particular manners of the Original Decision, the department considers that the introductory words which set out the intended outcome of the particular manner decision is not itself part of the particular manner requirements set out in the component decision for the purposes of section 77A.

468. Following the finalisation of the two compliance investigations, which included requests for further information and site inspection (in relation to the November Investigation only), it was the department's view that its investigations did not reveal that there was non-compliance with the particular manner requirements.

469. In respect of the request for reconsideration under section 78(1)(b), the department does not currently propose that section 78(1)(b) should form the basis for revocation and substitution of the NCA-PM decision. This is in circumstances where the department otherwise considers that sections 78(1)(a) and (aa) provide separate bases for reconsideration, revocation and substitution of the NCA-PM decision.

10. References

Bell JD, Lyle JM, Semmens JM, Awruch C, Moreno D, Currie S, Morash A, Ross J and Barrett N (2016) *Movement, habitat utilisation and population status of the e0ndangered Maugean Skate and implications for fishing and aquaculture operations in Macquarie Harbour*. Fisheries Research and Development Corporation Project No. 2013/008. Institute for Marine and Antarctic Studies, University of Tasmania, Hobart. Antarctic Climate and Ecosystems Cooperative Research Centre, ISBN 978-1-921197-06-8, 2010 (Attachment B04.5)

Black K, Tett P, Reinhardy H (2022) Review of broad-scale environmental monitoring programs: Macquarie Harbour. A report by SAMS Enterprise for EPA Tasmania (Attachment F01.1)

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EPA (Environment Protection Authority Tasmania) (2024) *Macquarie Harbour Status update for dissolved oxygen*, dated September 2024. (Attachment C03.2)

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MHDOWG (Macquarie Harbour Dissolved Oxygen Working Group) (2014) *Final Report to the Tasmanian Salmonid Growers Association (TSFA).* Published October, 2014. (Attachment F01.8)

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Moreno D, Lyle J, Semmens J, Morash A, Stehfest K, McAllister J, Bowen B and Barrett N (2020) *Vulnerability of the endangered Maugean Skate population to degraded environmental conditions in Macquarie Harbour (Fisheries Research and Development Corporation Project No. 2016-068),* Institute for Marine and Antarctic Studies, University of Tasmania, Hobart, October. (Attachment B02.2, B03.3 and B04.6)

Moreno D, Patil J, Deagle B, and Semmens JM, (2022) Application of environmental DNA to survey Bathurst Harbour (Tasmania) for the Endangered Maugean Skate *(Zearaja maugeana)*, Report to the National Environmental Science Program. Institute for Marine and Antarctic Studies, University of Tasmania. (Attachment B01.2 and B04.2)

Moreno D, and Semmens J, (2023) Interim report – Macquarie Harbour Maugean Skate population status and monitoring, The Institute for Marine and Antarctic Studies, University of Tasmania. (Attachment B01.1, B03.1, B04.1)

Moreno D, Tracey S and Semmens JM (2024) Interim Report Number 2 - Macquarie Harbour Maugean Skate population status and monitoring, The Institute for Marine and Antarctic Studies, University of Tasmania. (Attachment D02.3)

Ross, D.J, McCarthy, A., Davey, A., Pender, A., Macleod, C.M (2016) *Understanding the Ecology of Dorvilleid Polychaetes in Macquarie Harbour: Response of the benthos to organic enrichment from finish aquaculture*. FRDC Final Report Project No 2014/038 (Attachment B02.1)

Ross J and MacLeod C (2017) *Environmental Research in Macquarie Harbour – Interim Synopsis of Benthic and Water Column Conditions*. Report to Environment Protection Authority and Department of Primary Industries, Parks, Water and the Environment. Institute for Marine and Antarctic Studies (IMAS), University of Tasmania, Hobart, Australia (Attachment B02.3)

Ross J, Wild-Allen K, Andrewartha J, Beard J and Moreno D (2020). *Environmental research in Macquarie Harbour FRDC 2016/067 Understanding oxygen dynamics and the importance for benthic recovery in Macquarie Harbour*, Institute for Marine and Antarctic Studies, University of Tasmania, Hobart, February (Attachment B01.7)

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DPIPWE (2016) *Tasmanian Wilderness World Heritage Area Management Plan 2016*, DPIPWE, Hobart, Tasmania (Attachment B01.5)

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11. Glossary

Anoxic: is the absence of oxygen, so an anoxic environment is one that has no oxygen available

Benthic environment: area at the bottom of a body of water, including the seabed surface, sediment and sub-surface, that interfaces with the water column and in which biological activity occurs

Biofoul discharge: build-up of biofouling on farm infrastructure being discharged into the water column (e.g. through cleaning practices)

Biomass: the total quantity or weight of organisms in a given area or volume

Brackish: somewhat salty or briny, as the water in an estuary or salt marsh

Cage: the physical structure in which fish are kept, typically consisting of a floating collar and attached net or nets (also referred to as pen)

Deep water ocean renewal: the process by which dense ocean water from outside enters the harbour and sinks to the bottom, replacing the less dense resident water

Dissolved inorganic carbon: the sum of the aqueous species of inorganic carbon (e.g. CO2, HCO−3, CO2−3) in a solution

Dissolved oxygen: free, non-compound oxygen present in water. (Non-compound oxygen, or free oxygen (O2), is oxygen that is not bonded to any other element). Dissolved oxygen is usually measured in percentage (%) of oxygen saturation, as the mg/L unit measure is dependent on temperature. Following values taken from FRDC (Moreno et al. 2020):

- naturally low DO – In Macquarie Harbour, this is generally 5-8 mg/L in surface waters and 3-5 mg/L in deeper waters (also known as **normoxic).** NB: these values are taken from pre-2010 data but at a time when marine farming was already in operation in Macquarie Harbour.
    - **normoxic**: 50-100% (however, values highly dependant on temperature, salinity and depth)
- reduced/declined DO – generally where levels of DO are below 'naturally low levels'/50% (NB: highly dependant on temperature, salinity and depth). These can be described as:
    - **hypoxic**: 20-50% (See definition for 'hypoxic') (1-30% according to Wild-Allen et al. 2020)
    - **suboxic**: 1-20% (See definition for 'suboxic')
- **anoxic**: less than 1% (See definition for 'anoxic')

DPIPWE: Tasmanian Department of Primary Industries, Parks, Water and Environment, now known as the Department of Natural Resources and Environment Tasmania (**NRE Tas**)

eDNA: environmental DNA

EPA: Environmental Protection Authority Tasmania (also referred to as Tas EPA, and/or EPA Tas)

EPBC Act: *Environment Protection and Biodiversity Conservation Act 1999* (Cwlth)

EPBC Regulations: Environment Protection and Biodiversity Conservation Regulations 2000 (Cwlth)

Epibenthic: organisms that live on or just above the bottom sediments in a body of water

Fallowed: in a marine aquaculture context it refers to leaving an aquaculture site or area unstocked and free from fish or shellfish farming activity for a certain period of time.

Farm Zone: in relation to a lease or permit area, means the area bounded by the shortest line connecting the outer edges of a group of pens placed next to each other (noting that there may be more than one farm zone within a lease or permit area if more than one pen bay grid is present) (also referred to as zone)

First Decision: the referral decision made by the Minister for the Environment on 3 October 2012 under the EPBC Act

Fish pen: the physical structure in which fish are kept, typically consisting of a floating collar and attached net or nets (also referred to as cage or pen)

Fitzgerald and Browne Lawyers (FBL): one of the requestors that submitted the reconsideration request under Section 78A of the EPBC Act

Huon: Huon Aquaculture Company Pty Ltd

Hypoxia: In ocean and freshwater environments, the term "hypoxia" refers to low or depleted oxygen in a water body. DO<2 mg/L or 20-50%

Labile: easily broken down or displaced

Lease: (a) a lease granted under Part 4 of the *Marine Farming Planning Act 1995*; or (b) if there is a sub-lease in relation to the lease, the sub-lease;

Lease area: the area which is the subject of a lease; lease boundary, in relation to a lease, means the perimeter of the lease area (a lease area exists within a marine farm **zone**)

Licence holder: the holder of an environmental licence as defined under section 42B of the *Environmental Management and Pollution Control Act 1994* (Tas) in relation to marine finfish farming (excluding land-based or freshwater fish farming). For licences prior to 2016 the environmental licences were defined under *Living Marine Resources Management Act 1995* (Tas) by NRE Tas

Marine farm operator: A person named in the referral as undertaking the action (Huon Aquaculture Company Pty Ltd, Petuna Aquaculture Pty Ltd, and Tassal Operations Pty Ltd)

Marine farming licence: An environmental licence that was granted for finfish farming under the *Living Marine Resources Management Act 1995* (Tas) by NRE Tas, up to 2016 and granted under the *Environmental Management and Pollutions Control Act 1994* (Tas) by EPA, 2016 until present

Macquarie Harbour Marine Farming Development Plan (MFDP): the plan approved under the *Marine Farming Planning Act (Tas) 1995* and includes Amendment No.1 to the Macquarie Harbour Marine Farming Development Plan (October 2005)

NRE Tas: Department of Natural Resources and Environment Tasmania (formerly DPIPWE)

Nutrient load: biogenic waste from marine farming that includes organic wastes and inorganic nutrients that are generated in the production process: such as from fish defecation, uneaten feed, dead fish and biofoul discharge. These waste sources in turn release carbon (C), nitrogen (N) and phosphorus (P) waste

Outstanding Universal Value: means cultural and/or natural significance which is so exceptional as to transcend national boundaries and to be of common importance for present and future generations of all humanity. The World Heritage Committee considers a property as having Outstanding Universal Value if it meets one or more World Heritage criteria, and also meet conditions of integrity and/or authenticity and has an adequate protection and management system to ensure its safeguarding in accordance with section78 of the *Operational Guidelines for the Implementation of the World Heritage Convention* (September 2023).

Oxyconformity: oxygen consumption occurs at rates proportional to environmental concentrations but cannot be regulated

Oxygen drawdown: The consumption of oxygen through biotic (microbial) or abiotic (chemical) mechanisms (including fish respiration)

Pen: the physical structure in which fish are kept, typically consisting of a floating collar and attached net or nets (also referred to as fish pen or cage)

Petuna: Petuna Aquaculture Pty ltd

Protected matter(s): matter(s) protected by a provision of Part 3 of the EPBC Act

Reduced DO: where DO levels have been reduced below naturally occurring levels (refer to 'DO' for more detail)

Referral documentation: means the referral form, referral attachments and additional information submitted at the time of the First Decision (Attachment A02-A02.12 and A03).

Requestor: any of the following three parties who requested reconsideration of the First Decision under Section 78 of the EPBC Act:

a. The Australia Institute

b. Fitzgerald and Browne Lawyers, on behalf of the Bob Brown Foundation Inc

c. The Environmental Defenders Office, on behalf of The Australian Marine Conservation Society and Humane Society International Australia (AMCS)

Salt wedge: a layer of saltwater below a layer of freshwater, which is pushed into an estuary by tides. As the saltwater is denser than the freshwater, it tends to move up the estuary below the less dense freshwater, creating a wedge-shaped layer of saltwater.

Stochastic: having a random probability distribution or pattern that may be analysed statistically but may not be predicted precisely

Suboxic: describing a zone of water, between the oxic and anoxic zones, in which the concentration of oxygen is very low. See definition for DO.

Tassal: Tassal Operations Pty Ltd

The Australia Institute (AI): one of the requestors that submitted the reconsideration request under Section 78A of the EPBC Act

The Environmental Defenders Office (EDO): one of the requestors that submitted the reconsideration request under Section 78A of the EPBC Act

TPDNO: means *Total Permissible Dissolved Nitrogen Output* and refers to the total allowable mass of dissolved nitrogen (in kilogram or tonnes) which may be released over a specified time (i.e. a 12-month rolling period). TPDNO limits the amount of nitrogen which can be released via feed inputs into a defined area

TWNHP: Tasmanian Wilderness National Heritage place

TWWHA: Tasmanian Wilderness World Heritage Area, also referred to as the Tasmanian Wilderness

WHA: World Heritage area, also referred to as the World Heritage property

Zone: in relation to a lease or permit area, means the area bounded by the shortest line connecting the outer edges of a group of pens placed next to each other (noting that there may be more than one farm zone within a lease or permit area if more than one pen bay grid is present) (see also farm zone)

12. List of attachments

A	**Information available at the time of the First Decision** **01:** 2012 Original Referral Decision Brief **01.1**: Signed by Minister - 3 October 2012 (first two pages only) **01.2**: Signed by delegate - 1 October 2012 (entire brief) **02**: Attachment 1 to referral brief: Referral form for EPBC 2012/6406 **02.1**: Referral appendix 1 – Specific activities **02.2**: Referral appendix 2 – Draft amendment No.1 **02.3**: Referral appendix 3 - Draft amendment No.1 and Panel report **02.4**: Referral appendix 4 - Changes to management control **02.5**: Referral appendix 5 – Report on public consultation **02.6**: Referral appendix 6 – Risk assessment methods **02.7**: Referral appendix 7 – WHA listing criteria **02.8**: Referral appendix 8 – Marine species and whales identified **02.9**: Referral appendix 9 – Adaptive management **02.10**: Referral appendix 10 – Background water quality monitoring **02.11**: Referral appendix 11 – Specific mitigation measures **02.12**: Referral appendix 12 - References **03**: Attachment 2 to referral decision brief: Additional information dated 27 June and 5 September 2012 (combined) **04:** Referral decision notice for EPBC 2012/6406
B	**Requests for reconsideration** **01:** Letter from The Australia Institute – dated 8 June 2023 *Sources specified in letter (but did not attach copies of the material)* **01.1**: Moreno D and Semmens J (2023) *Interim report – Macquarie Harbour Maugean Skate population status and monitoring*, Institute for Marine and Antarctic Studies, University of Tasmania, Hobart, Tasmania. **01.2:** Moreno D, Patil J, Deagle B, and Semmens JM, (2022) Application of environmental DNA to survey Bathurst Harbour (Tasmania) for the Endangered Maugean Skate *(Zearaja maugeana)*, Report to the National Environmental Science Program. Institute for Marine and Antarctic Studies, University of Tasmania, Hobart, Tasmania. **01.3:** DCCEEW (Department of Climate Change, Energy, the Environment and Water) (2023) *Conservation Advice for* Zearaja maugeana *(Maugean skate)*, DCCEEW, Australian Government. (MS Conservation Advice 2023)

01.4: Tasmanian Threatened Species Section, NRE Tas (Department of Natural Resources and Environment Tasmania) (2022*) Listing Statement for Zearaja maugeana (Maugean skate), v2 (December 2022)*, NRE Tas, Tasmania, Hobart.

01.5: TWWHA Management Plan, 1/01/2016: DPIPWE (2016) *2016 Tasmanian Wilderness World Heritage Area Management Pla*n, DPIPWE, Hobart, Tasmania. Available at: https://nre.tas.gov.au/Documents/TWWHA_Management_Plan_2016.pdf

01.6: Environment and Communications References Committee (ECRC) (2015) *Regulation of the fin-fish aquaculture industry in Tasmania* Report to the Senate by the Environment and Communications References Committee, August 2015, Commonwealth of Australia 2015. (Senate Report, 2015)

01.7: Ross J, Wild-Allen K, Andrewartha J, Beard J and Moreno D (2020). Environmental research in Macquarie Harbour FRDC 2016/067 Understanding oxygen dynamics and the importance for benthic recovery in Macquarie Harbour, Institute for Marine and Antarctic Studies, University of Tasmania, Hobart, February

02: Letter from The Australia Institute – dated 31 July 2023

Attached to the letter

02.1: Ross, D.J, McCarthy, A., Davey, A., Pender, A., Macleod, C.M (2016) *Understanding the Ecology of Dorvilleid Polychaetes in Macquarie Harbour: Response of the benthos to organic enrichment from finish aquaculture*. FRDC Final Report Project No 2014/038.

02.2: Moreno D, Lyle J, Semmens J, Morash A, Stehfest K, McAllister J, Bowen B and Barrett N (2020) *Vulnerability of the endangered Maugean Skate population to degraded environmental conditions in Macquarie Harbour.* Report for the Fisheries Research and Development Corporation. Project No. 2016-068. Institute for Marine and Antarctic Studies, University of Tasmania, Hobart.

02.3: Ross J and MacLeod C (2017) *Environmental Research in Macquarie Harbour – Interim Synopsis of Benthic and Water Column Conditions*. Report to Environment Protection Authority and Department of Primary Industries, Parks, Water and the Environment. Institute for Marine and Antarctic Studies, University of Tasmania, Hobart, Tasmania.

02.4: Wild-Allen K, Andrewartha J, Baird M, Bodrossy L, Brewer E, Eriksen R, Skerratt J, Revill A, Sherrin K and Wild D (2020) *Macquarie Harbour oxygen process model (FRDC 2016- 067)*. Report for Fisheries Research and Development Corporation. Project No. 2016/067. Commonwealth Scientific and Industrial Research Organisation, Hobart, Tasmania.

03: Letter from Fitzgerald and Browne Lawyers on behalf of the Bob Brown Foundation Inc – dated 25 July 2023

Attached to the letter

03.1: Moreno D and Semmens J (2023) *Interim report – Macquarie Harbour Maugean Skate population status and monitoring*, Institute for Marine and Antarctic Studies, University of Tasmania, Hobart, Tasmania.

03.2: DSEWPAC (Department of Sustainability, Environment, Water, Population and Communities) (2012) *EPBC 2012-6406 Notification of referral decision, DSEWPAC, Canberra.*

Sources specified in the letter (but did not attach copies of the material)

03.3 Moreno D, Lyle J, Semmens J, Morash A, Stehfest K, McAllister J, Bowen B and Barrett N (2020) *Vulnerability of the endangered Maugean Skate population to degraded environmental conditions in*

Macquarie Harbour. Report for the Fisheries Research and Development Corporation. Project No. 2016-068. Institute for Marine and Antarctic Studies, University of Tasmania, Hobart, Tasmania.

04: Letter from The Environmental Defenders Office on behalf of the Australian Marine Conservation Society and Humane Society International Australia – dated 23 August 2023

Sources specified in the letter (but did not attach copies of the material)

04.1 Moreno D and Semmens J (2023) *Interim report – Macquarie Harbour Maugean Skate population status and monitoring*, Institute for Marine and Antarctic Studies, University of Tasmania, Hobart, Tasmania.

04.2 Moreno D, Patil J, Deagle B, and Semmens JM, (2022) *Application of environmental DNA to survey Bathurst Harbour (Tasmania) for the Endangered Maugean Skate (Zearaja maugeana),* Report to the National Environmental Science Program. Institute for Marine and Antarctic Studies, University of Tasmania, Hobart, Tasmania.

04.3 Wild-Allen K, Andrewartha J, Baird M, Bodrossy L, Brewer E, Eriksen R, Skerratt J, Revill A, Sherrin K and Wild D (2020) *Macquarie Harbour oxygen process model (FRDC 2016- 067)*. Report for Fisheries Research and Development Corporation. Project No. 2016/067 Commonwealth Scientific and Industrial Research Organisation, Hobart, Tasmania.

04.4 EPA (Environment Protection Authority Tasmania) (2017) *Macquarie Harbour Tasmanian Wilderness World Heritage Area Environmental Status Report,* EPA, Tasmania.

04.5 Bell JD, Lyle JM, Semmens JM, Awruch C, Moreno D, Currie S, Morash A, Ross J and Barrett N (2016) *Movement, habitat utilisation and population status of the endangered Maugean Skate and implications for fishing and aquaculture operations in Macquarie Harbour*. Fisheries Research and Development Corporation Project No. 2013/008. Institute for Marine and Antarctic Studies, University of Tasmania, Hobart, Tasmania. Antarctic Climate and Ecosystems Cooperative Research Centre, ISBN 978-1-921197-06-8, 2010.

04.6 Moreno D, Lyle J, Semmens J, Morash A, Stehfest K, McAllister J, Bowen B and Barrett N (2020) *Vulnerability of the endangered Maugean Skate population to degraded environmental conditions in Macquarie Harbour*. Report for the Fisheries Research and Development Corporation. Project No. 2016-068. Institute for Marine and Antarctic Studies, University of Tasmania, Hobart, Tasmania.

04.7 DEWHA (Department of the Environment, Water, Heritage and the Arts) (2013) *EPBC Act Policy statement - Significant Impact Guidelines 1.1 - Matters of National Environmental Significance (2013)*, DEWHA, Australian Government.

05: Letter from The Environmental Defenders Office – dated 20 September 2023

Attached to the letter

05.1: Letter from The Environmental Defenders Office - dated 23 August 2023

06: Letter from The Environmental Defenders Office – dated 20 November 2023

Attached to the letter

06.1: Letter from The Environmental Defenders Office - dated 23 August 2023

06.2: Letter from The Environmental Defenders Office – dated 20 September 2023

06.3: Letter from The Environmental Defenders Office to NRE Tasmania -dated 8 November 2023

	06.4: Letter from The Environmental Defenders Office to Hydro Tasmania – dated 8 November 2023 *Sources specified in the letter (but did not attach copies of the material)* **06.5** Ridgway, K.R. and Ling, S.D., (2023) 'Three decades of variability and warming of nearshore waters around Tasmania', *Progress in Oceanography*, 215, 103046.
C	**Commonwealth and State Minister Submissions** **01**: then Minister for Agriculture, Fisheries and Forestry, the Hon. Murray Watt – letter dated 2 February 2024 **02**: then Tasmanian Minister for Environment and Climate Change, the Hon. Roger Jaensch – letter dated 2 February 2024 **02.1:** Tasmanian Government Submission Document prepared by NRE Tas **02.2**: Attachment 1 – Conservation Action Plan for the Maugean skate **02.3**: Attachment 2 – Research and Monitoring Programs in Macquarie Harbour **02.4**: Attachment 3 – Risk Assessment **02.5**: Attachment 4 – Current Macquarie Harbour Marine Farming Licences **02.6**: Attachment 5 - Current Macquarie Harbour Environmental Licences **03:** then Tasmanian Minister for Parks and Environment, the Hon. Nick Duigan – letter dated 16 October 2024 **03.1:** Tasmanian Government Submission Addendum Document prepared by NRE Tas **03.2:** Attachment 1 - EPA (Environment Protection Authority Tasmania) (2024) *Macquarie Harbour Status update for dissolved oxygen*, dated September 2024 **03.3:** Attachment 2 - Moreno et al. (2024) Interim Report Number 2 – Macquarie Harbour Maugean skate population status and monitoring, published by the EPA and IMAS, respectively.
D	**Marine farm operator submissions** **01:** Tassal Operations – letter dated 2 February 2024 **02:** Petuna Aquaculture – letter dated 2 February 2024 **03:** Huon Aquaculture – letter dated 2 February 2024 **04**: Salmon Tasmania – letter dated 2 February 2024 (i) Schedule 1 – Macquarie Harbour salmon farming production (ii) Schedule 2 – Technical Review (iii) Schedule 3 – Nautilus Collaboration (2024) (iv) Schedule 4 – Dr Ian Wallis (2024) **05:** Salmon Tasmania – letter dated 18 June 2024 **05.1**: Supplementary Submission Requests for Reconsideration of Referral Decision: Marine Farming Expansion, Macquarie Harbour, Tasmania (EPBC 2012/6406) - dated 18 June 2024 **05.2**: Annexure A: Marine Solutions (2024) Macquarie Harbour oxygen, ammonia and nitrate data technical report: April 2024 update, prepared for Salmon Tasmania – dated May 2024
E	**Public submissions referred to in the DAR**

	01: Requestors **01.1:** The Australia Institute – letter dated 2 February 2024 **01.2:** The Environmental Defenders Office on behalf of the Australian Marine Conservation Society and Humane Society International Australia – letter dated 2 February 2024 **01.3:** The Bob Brown Foundation – portal submission dated 30 January 2024 ***Commonwealth and state government departments*** **02:** National Indigenous Australians Agency – email dated 22 December 2023 **03:** EPA Tasmania – letter dated 2 February 2024 **03.1:** EPA Tasmania submission (v) Attachment 1: Feed input, standing biomass and relevant biomass caps (vi) Attachment 2: DO management conditions (November 2023) (vii) Attachment 3: Waste capture trial (Tassal) (viii) Attachment 4: Overview of relevant research reports **04: Elected representatives** **04.1:** West Coast Council Mayor – letter dated 15 January 2024 **04.2**: Rebecca White MP and Janie Finlay MP - letter dated 2 February 2024 **04.3:** Senator Anne Urquhart – letter dated 2 February 2024 **05: Industry representatives** **05.1:** Seafood Industry Tasmania – letter dated 2 February 2024 **05.2:** Seafood Industry Australia – letter dated 31 January 2024
F	**Other information referred to in the DAR** **01: Additional new information the department has considered of its own initiative** **01.1:** Black K, Tett P, Reinhardy H (2022) Review of broad-scale environmental monitoring programs: Macquarie Harbour. A report by SAMS Enterprise for EPA Tasmania **01.2:** Cradle Coast Authority NRM (2018) *Macquarie Harbour Shoreline Clean-up: discussion report* issued by the Cradle Coast Authority, Issuu Inc. **01.3:** EPA (Environment Protection Authority Tasmania) (2022) Statement of Reasons for TPDNO Determination and Apportionment in Macquarie Harbour, 31 August 2022. **01.4:** EPA (Environment Protection Authority Tasmania) (2023) Circumstances for Consideration Under S42(T)(5) **01.5:** Grant MI, Moreno D, Semmens J and Simpfendorfer C (2023) *Population viability analysis of the Maugean Skate Zearaja maugeana*. Report prepared for the Australian Government Department of Climate Change, Energy, the Environment and Water. **01.6:** Kirkpatrick, JB, Kriwoken, LK, and Styger J (2019) The reverse precautionary principle: science, the environment and the salmon aquaculture industry in Macquarie Harbour, Tasmania, Australia. *Pacific Conservation Biology*, 25(1), 26-33.

	01.7: Maxey JD, Hartstein ND, AMH and Barrenger M (2020) Dissolved oxygen consumption in a fjord-like estuary, Macquarie Harbour, Tasmania. Estuarine, *Coastal and Shelf Science*, Volume 246: 107016. **01.8:** MHDOWG (Macquarie Harbour Dissolved Oxygen Working Group) (2014) *Final Report to the Tasmanian Salmonid Growers Association (TSFA).* Published October, 2014. **01.9:** Morash A, Lyle J, Currie S, Bell J, Stehfast K and Semmens J (2020) The endemic and endangered Maugean Skate (*Zearaja maugeana*) exhibits short-term severe hypoxia tolerance. *Conservation Physiology,* Vol 8 2020. **01.10:** Ross J, Beard J, Wild-Allen K, Stehfest K, Durand A, Semmens J, Davey A, Hortle J, Pender A, Quigley B, Macleod C and Moreno D (2021). *Understanding oxygen dynamics and the importance for benthic recovery in Macquarie Harbour (FRDC Project no. 2016-067).* **01.11:** Ross J, Moreno D, Bell J, Mardones J and Beard J (2022) *Assessment of the Macquarie Harbour Broadscale Environment Monitoring Program (BEMP) data from 2011 – 2020.* Institute for Marine and Antarctic Studies, University of Tasmania, Hobart, Tasmania. **01.12:** Weltz K, Lyle JM, Semmens JM and Ovenden JR (2018) Population genetics of the endangered Maugean Skate (*Zearaja maugeana*) in Macquarie Harbour, Tasmania. *Conservation Genetics* 19(6), 1505-1512. **02 Other information** **02.1**: DCCEEW (Department of Climate Change, Energy, the Environment and Water) *Species Profile and Threat Database Zearaja maugeana – Maugean skate, Port Davey Skate,* Species Profile and Threat Database website, accessed 21 August 2024. https://www.environment.gov.au/cgi-bin/sprat/public/publicspecies.pl?taxon_id=68451 **02.2**: 2024 Tasmanian Regulatory Framework for Finfish Aquaculture **02.3**: Environmental Standards for Tasmanian Marine Finfish Farming **02.4**: DEWHA (Department of the Environment, Water, Heritage and the Arts) (2008) *Approved Conservation Advice for Raja sp. L (Maugean skate)*, 3 July 2008, DEWHA, Australian Government. (MS Conservation Advice (2008)) **02.5**: DEWR (Department of the Environment and Water Resources) Commonwealth, *Gazette Special*, No S 99, 21 May 2007 **02.6:** Threatened Species Scientific Committee (2004). *Commonwealth Listing Advice on* Raja *sp. L (Maugean Skate)*. Available from: http://www.environment.gov.au/biodiversity/threatened/species/maugean-skate.html. In effect under the EPBC Act from 04-Mar-2004.
G	**Additional correspondence** **01**: Professor Barry Brook – dated 2 September 2024 **02:** Salmon Tasmania – letter dated 30 September 2024 **02.1:** Salmon Tasmania submission to TSSC uplisting consultation • Attachment A: Response to consultation questions for Zearaja maugeana (Maugean skate) • Attachment B: IUCN Listing Criteria Assessment • Attachment C: Brook B (2024) Briefing Report: Conservation Status Overview of the Maugean Skate (*Zearaja maugeana*). Unpublished.

	• Attachment D: Nautilus collaboration • Attachment E: Recent Maugean skate photos • Attachment F: Dr Ian Wallis (2024) • Attachment G: Heavy metals literature review **03:** Salmon Tasmania – letter dated 6 November 2024 **04:** Group of scientists, Frusher *et al.* – dated 21 October 2024 **05:** The Secretary of Department of Natural Resources and Environment Tasmania to Secretary of DCCEEW - dated 12 November 2024 **05.1:** Attachment 1: IMAS 2024 interim report *Moreno et al.* 2024 **05.2:** Attachment 2: Revised risk assessment (Nov 2024) **06:** The Secretary of Department of Natural Resources and Environment Tasmania to Secretary of DCCEEW - dated 6 December 2024 **07**: Tasmanian Premier to the PM – dated 16 September 2023 **08**: Tasmanian Premier to the PM– dated 8 February 2024 **08.1:** Attachment: West Coast Salmon – Social and economic impact of ceasing salmon production in Macquarie Harbour **09**: Tasmanian Premier to the PM – dated 26 August 2024 **10:** Tasmanian Premier to the PM – dated 29 November 2024 **11:** Four West Coast Tasmania Mayors to the PM – dated 12 December 2024 **12:** Marine farm executives to the PM – dated 20 December 2024
H	**Compliance Review** **01**: Case Assessment Report 2012 6406 Redacted – dated 5 July 2024 **01.1:** Attachment A: 2012 6406 Referral Decision **01.2:** Attachment B: Correspondence from Environmental Defenders Office (EDO) **01.3:** Attachment C: Review of compliance with Particular Manners undertaken in November 2023 **01.4:** Attachment Di: Monitoring of dissolved oxygen in Macquarie Harbour. Available at: **01.5:** Attachment Dii**:** Environmental Licence Number 9930/3 **01.6:** Attachment Diii**:** EPA Tasmania - Industry Regulation Website. Available at: https://epa.tas.gov.au/business-industry/regulation/salmon-aquaculture/industry-regulation **01.7:** Attachment Div: List Map of Licenced entities by the EPA. Available at: https://maps.thelist.tas.gov.au/listmap/app/list/map?bookmarkId=327335 **01.8**: Attachment E: Statement of Reasons – TPNDO Determination – 1 September 2022 to 31 August 2027 **01.9:** Attachment F: Ross et al. 2022 Assessment of the Macquarie Harbour BEMP data from 2011 to 2020.pdf (utas.ed.au) **02:** Case Assessment Report 2012 6406 Redacted – dated 29 November 2024 **02.1:** Attachment A: 2012 6406 Referral Decision

	02.2: Attachment B: NPRD Request for Advice Redacted **02.3:** Attachment C: 14 November 2024 ACS Site Inspection Report Redacted **02.4:** Attachment Di: Monitoring of dissolved oxygen in Macquarie Harbour **02.5:** Attachment Dii: Environmental Licence Number 9930/3 **02.6:** Attachment Diii: EPA Tasmania - Industry Regulation Website. Available at: https://epa.tas.gov.au/business-industry/regulation/salmon-aquaculture/industry-regulation **02.7:** Attachment Div: List Map of Licenced entities by the EPA. Available at: https://maps.thelist.tas.gov.au/listmap/app/list/map?bookmarkId=327335 **02.8:** Attachment E: Statement of Reasons – TPNDO Determination – 1 September 2022 to 31 August 2027 **02.9:** Attachment F: Review of NCA-PM Requirements