Chapter 3

Waterway health data

Introduction

3.1 Waterway health is a key issue for fin-fish aquaculture as the industry relies on the quality of water it uses. Waterway health is also a key issue for other stakeholders given the potential for environmental harm if aquaculture operations are not adequately regulated and monitored.

3.2 To ensure that the health of waterways is maintained, extensive monitoring of areas in which the fin-fish industry operates is undertaken both as a regulatory requirement and as part of the normal operational practices of fin-fish aquaculture companies.

3.3 Many of the submissions received by the committee expressed concern about the monitoring of waterway health in areas where fish farming occurs, in particular the adequacy and availability of data.[1] The following discussion outlines the monitoring regimes and addresses the issues raised in evidence by concerned stakeholders and the responses from the Tasmanian Government and industry stakeholders.

Adequacy and availability of data on waterway health

3.4 As discussed in chapter 2, Tasmanian marine farming operations are regulated through the *Marine Farming Planning Act 1995* (MFP Act) and the *Living Marine Resources Management Act 1995* (LMRMA). Together, these two Acts aim to achieve the well-planned sustainable development of marine farming activities and the sustainable management of Tasmania's living marine resources. The Tasmanian Government noted that, in order to achieve these goals, an adaptive management approach has been adopted so that there is an assessment of the environment where farming is to occur and an iterative process of decision making, monitoring and assessment.[2]

3.5 The pre-development and operational components of the adaptive management approach were outlined in the Tasmanian Government's submission.[3] In the pre-development phase, marine farming development plans (MFDPs) are established. In doing so, targeted zone assessments are undertaken by the Institute for Marine and Antarctic Studies (IMAS). These assess substrate type, habitat distribution, bathymetry and benthic flora and fauna. If required, additional surveys

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1 See for example, Australian Marine Conservation Society, *Submission 9*, p. 1.

2 Tasmanian Government, *Submission 35*, pp 4–5.

3 Tasmanian Government, *Submission 35*, pp 8–9; see also chapter 2.

target threatened species. The MFDPs contain management controls to manage and mitigate negative effects of marine farming operations. Management controls include provisions relating to environmental monitoring and management of marine farming operations.[4]

3.6 Licences to farm fish are required under the LMRMA. A baseline environmental survey must be undertaken prior to the commencement of marine farming operations. The licence contains specific provisions in relation to environmental monitoring and management of marine farming operations. The Tasmanian Government noted that in many cases, conditions contain specific conditions that expand on the provisions of management controls, defining environmental standards and outlining reporting and monitoring requirements. Environmental standards prescribe relevant indicators and trigger levels for ongoing environmental management.[5]

3.7 The Tasmanian Government also stated that decision making is informed not only by the outcomes of statutory monitoring and compliance assessment, but also through information provided by industry, research institutes or collected through programs within the Department of Primary Industries, Parks, Water and Environment (DPIPWE) such as the Environment Protection Authority (EPA) Division of DPIPWE.[6]

Waterway monitoring and management framework

3.8 There are two aspects of waterway monitoring: assessment of benthic condition and water quality in MFDP areas. These monitoring programs are subject to a consistent management framework. Collection and analysis of samples for monitoring is undertaken by a range of consultants employed by companies or by the companies themselves. The data from monitoring is reported to the regulator. Monitoring is also subject to auditing by the regulator.[7]

Benthic condition

3.9 Benthic condition monitoring is undertaken to assess and manage the potential effects of particulate organic waste material (fish faeces, waste fish feed and in situ cleaning effluent) on benthic health in, and around, marine farming lease areas. Environmental parameters must be monitored in the lease area, 35 metres outside the boundary of the marine farming lease area and at any control site(s) in accordance with the requirements specified in the relevant marine farming licence. In addition, a

4 Tasmanian Government, *Submission 35*, p. 9.

5 Tasmanian Government, *Submission 35*, p. 10.

6 Tasmanian Government, *Submission 35*, p. 10.

7 Tasmanian Government, *Submission 35*, pp 26–27; Dr John Whittington, Secretary, Department of Primary Industries, Parks, Water and Environment, *Committee Hansard*, 15 July 2015, p. 2.

video survey must be conducted every 12 months or in accordance with the stocking and fallowing regime of the farm.[8]

3.10 The Tasmanian Government stated that monitoring reports and underwater video footage must be reported by the lease holder pursuant to licence conditions. These are assessed by the DPIPWE against specific criteria aligned with relevant management objects and are then reported to stakeholders.

3.11 The regulator can direct the lease holder to undertake a range of management responses to mitigate any significant benthic impact attributable to marine farming operations. Where monitoring identifies effects that are unknown, or difficult to clearly attribute, research may be undertaken as part of the management framework.[9]

Water quality management framework

3.12 Water quality monitoring is undertaken to assess and manage the effects of stressors including nutrient loading and dissolved oxygen depletion associated with fish metabolic processes, respiration and biogeochemical processes within organically enriched sediment.

3.13 Results of monitoring are reported to DPIPWE, along with relevant information on feed inputs and biomass, for assessment. Where unexpected, or difficult to clearly attribute effects are identified, a range of management responses can be initiated. These include controls on nitrogen emissions, more focused monitoring or the undertaking of research. The Tasmanian Government stated that outcomes of monitoring, compliance reporting and research can then be used to inform the refinement of the program.[10]

Ongoing water quality monitoring in the southeast and Macquarie Harbour

3.14 In the Huon Estuary and D'Entrecasteaux Channel, the Broadscale Environmental Monitoring Program (BEMP) commenced in 2009 specifically to monitor the health of the wider marine environment. The intention of the BEMP was to provide:

> …a monitoring program with the capacity to detect the effects of those processes judged to be most threatening to the Huon and D'Entrecasteaux ecosystem at the whole-of-ecosystem level…to provide knowledge of how well the ecosystem is functioning with an increased nutrient load and to allow any significant temporal trend(s) in ecological indicators to be detected.[11]

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8 WWF-Australia, *Submission 13*, p. 7; see also Tasmanian Salmonid Growers Association, *Submission 33*, pp 14–15.

9 Tasmanian Government, *Submission 35*, p. 11.

10 Tasmanian Government, *Submission 35*, p. 12.

11 Institute for Marine and Antarctic Studies, *Submission 20*, p. 7.

3.15 The BEMP has both a water quality component and a sediment component which monitors sediment chemistry and invertebrate communities. Samples to test water quality are taken regularly throughout the year at multiple sites which are located outside of marine farm leases and are distributed across different areas of the Channel and lower Huon Estuary. Indicators of water quality assessed include water column nutrients, dissolved oxygen levels and salinity. Sampling for sediment condition is undertaken regularly and includes visual assessment. Assessment of phytoplankton is also undertaken.[12]

3.16 In Macquarie Harbour, the Macquarie Harbour Environmental Monitoring Plan (MHEMP) has been used since 2011 to monitor water quality. Indicators of water quality are sampled monthly and include water column nutrients, dissolved oxygen levels and salinity. The industry also undertakes additional voluntary monitoring of some water quality indicators at various sites in the harbour. Assessment of phytoplankton is also undertaken.[13]

Issues raised in relation to waterway health monitoring

3.17 The Tasmanian Government's adaptive management approach for the aquaculture industry is underpinned by an ongoing environmental monitoring program. The program is designed to inform government and industry on environmental performance and to support modification of farming practices if required. As such, submitters noted that the adequacy of the monitoring program was significant with EDO Tasmania stating:

> …adaptive management will not be effective without appropriate monitoring and enforcement activities to facilitate adaptation.[14]

3.18 The committee received evidence supporting the regulatory and monitoring framework currently in place in Tasmania. For example, while commenting on some specific concerns about the monitoring program, WWF-Australia stated that, in relation to water quality monitoring:

> WWF-Australia believes the current frameworks in place to legislate, regulate, manage and monitor finfish aquaculture operations in the State of Tasmania provides a strong foundation.
>
> Before any farming licence or approvals are awarded by the Tasmanian government to any aquaculture company or for any practices in any region, detailed baseline surveys and more recently, Environmental Impact Assessments are carried out.[15]

12 Tasmanian Government, *Submission 35*, Appendix 1, p. 27; see also Institute for Marine and Antarctic Studies, *Your Marine Values: Public Report 2013*, p. 83.

13 Tasmanian Government, *Submission 35*, Appendix 1, p. 27.

14 EDO Tasmania, *Submission 70*, p. 12.

15 WWF-Australia, *Submission 13*, p. 4.

3.19 WWF-Australia went on to state that 'the current government requirements for monitoring and reporting of benthic impacts are consistent with best practice standards'.[16]

3.20 However, a range of issues were raised in evidence in relation to the adequacy of the monitoring program, access to data and the independence of the program.

Adequacy of monitoring

3.21 A number of submitters, including Environment Tasmania, argued that the adequacy of monitoring of waterway health was poor.[17] They pointed to a range of specific matters including the lack of baseline data in the south east, the frequency of monitoring and reporting of some indicators and the lack of monitoring of some indicators.

3.22 It was argued by some submitters that there was a lack of baseline data in the south east in relation to the BEMP, which undermined confidence in the capacity of the monitoring program to identify the extent and impact of changes arising from marine farming activities.[18] Environment Tasmania noted that monitoring data collected between 2009 and 2012 'has been used to state there has been no broadscale impacts from fish farms, however, the baseline figures used for comparison are from after fish farming had already been occurring for over 15 years'.[19]

3.23 The Australian Marine Conservation Society added that although the BEMP was:

> …a good step forward in taking a holistic approach…to ensuring the cumulative impacts of aquaculture are accounted for, concerns remain about the extent of data that is collected as well as lack of adequate baseline information upon which to base an adaptive management regime.[20]

3.24 The Australian Marine Conservation Society went on to state:

> There is limited information prior to the BEMP that provides stakeholders with confidence that aquaculture impacts have not caused significant environmental effects at levels that could have consequences for marine flora and fauna and overall ecosystem health. As it is, the data recorded since 2009 should not be used as proof of no widespread impacts from aquaculture, but could be used as a reference point for future monitoring.[21]

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16 WWF-Australia, *Submission 13*, p. 7.

17 Environment Tasmania, *Submission 93*, pp 4–5.

18 Environment Tasmania, *Submission 93*, p. 5.

19 Environment Tasmania, *Submission 93*, p. 4; see also Australian Marine Conservation Society, *Submission 9*, p. 2; EDO Tasmania, *Submission 70*, p. 12.

20 Australian Marine Conservation Society, *Submission 9*, p. 2.

21 Australian Marine Conservation Society, *Submission 9*, p. 2.

3.25 While a reference site could be used in the absence of good baseline data, the Australian Marine Conservation Society stated that there were no biologically similar sites to the Huon Estuary and D'Entrecasteaux Channel that could be used for this purpose. It therefore concluded that 'overall, there are limited opportunities for identification of significant ecosystem wide impacts that would require mitigation from the industry, and action from government'.[22]

3.26 In relation to Macquarie Harbour, similar concerns were expressed about the lack of baseline data before the recent expansion of aquaculture operations was approved.[23] The Australian Marine Conservation Society commented that for Macquarie Harbour 'there is little information on basics such as bottom-water residence times, and limited information publicly as to how this lack of knowledge has been accounted for in precautionary management decisions'.[24]

3.27 The Australian Marine Conservation Society stated that marine farms are situated in dynamic environments and farming activities produce a 'seemingly high degree of unknown impacts regarding impact of the industry on marine ecosystems'. Accordingly, an adaptive management approach 'would seem to be an essential component of ensuring impacts can be mitigated'. However, the Society argued that 'the lack of baseline data on which to base an adaptive management regime means managers are unclear on what level of ecosystem health they should be managing to'. This means that an 'extremely precautionary approach should be taken'. The Society concluded that this appears not to have been the outcome with leases being approved with limited datasets on which to base decisions.[25]

3.28 Another matter raised was the frequency of monitoring of some parameters. WWF-Australia, for example, commented that, for the most part, the water quality monitoring program is consistent with the current standards of the Aquaculture Stewardship Council (ASC). However, the required frequency of sampling for some components does not meet best practice with fin-fish farms under the Tasmanian regulatory regime being required to sample fortnightly 'at best, compared to the requirement for at least weekly sampling under ASC'. WWF-Australia, however, acknowledged that some operators routinely sample on a daily basis.[26]

3.29 The requirement of video monitoring for sediment health only every 12 months was also questioned. Submitters noted the results of a study undertaken on behalf of Environment Tasmania by consultant Hugh Kirkman in 2014.[27] The study commented that the current frequency of video samples 'seems inadequate for a

22 Australian Marine Conservation Society, *Submission 9*, p. 2.

23 See Environment Tasmania, *Submission 93*, p. 5.

24 Australian Marine Conservation Society, *Submission 9*, p. 3.

25 Australian Marine Conservation Society, *Submission 9*, p. 2.

26 WWF-Australia, *Submission 13*, p. 5.

27 EDO Tasmania, *Submission 70*, p. 12; Environment Tasmania, *Submission 93*, p. 5.

meaningful assessment of impacts' and recommended that surveillance be conducted more regularly. The study concluded that 'annual monitoring will not alert managers to impacts that may do permanent damage to the benthos'.[28]

3.30 The availability of timely information was also raised by Environment Tasmania in relation to data collection in Macquarie Harbour. Environment Tasmania commented that monthly reporting 'limits both the reliability of the data and the timely usefulness of the data by the regulator'.[29] In addition to concerns about the frequency of monitoring activities, the frequency of collation of data was also raised by EDO Tasmania which noted that BEMP data is collated only every three years.[30]

3.31 The monitoring regime requires the sampling of a range of indicators, however, WWF-Australia noted the lack of turbidity monitoring. WWF-Australia stated that turbidity is a minimum standard under the ASC. While acknowledging that turbidity measurement is part of Tassal's monitoring program, WWF-Australia argued that turbidity measurement should be part of licence conditions for all operators.[31]

3.32 EDO Tasmania pointed to the limited monitoring in the D'Entrecasteaux Channel for determining whether the cumulative contribution of each lease area to the nitrogen load exceeds the cap set in the MFDP. In addition, EDO Tasmania argued that there is no ongoing assessment to determine whether the existing nitrogen cap is set at a sustainable level particularly as land-based nutrient sources contribute to the nitrogen load in the Channel.[32]

3.33 In Macquarie Harbour, the lack of an integrated approach to monitoring was criticised by the Australian Marine Conservation Society which stated that, while monitoring requirements are in place as conditions on a Marine Farming License, 'this would appear to be specific to an individual company's licence'. The Society argued that this does not establish an integrated approach to be taken by all operators.[33]

3.34 A final concern relating to the adequacy of data was the lack of monitoring of impacts beyond 35 metres outside of a lease area. The Australian Marine Conservation Society commented:

> Industry operators are only required to monitor the impacts of fin-fish farming to 35m outside of a lease area. Due to the nature of water movement, effluent from fish farms has a footprint that extends over an arbitrary 35m boundary that escapes any form of monitoring or required

28 Hugh Kirkman, *Review of Monitoring the Environmental Effects of Salmon Farming in Tasmania*, September 2014.

29 Environment Tasmania, *Submission 93*, p. 5.

30 EDO Tasmania, *Submission 70*, p. 12.

31 WWF-Australia, *Submission 13*, pp 5–6.

32 EDO Tasmania, *Submission 70*, p. 12.

33 Australian Marine Conservation Society, *Submission 9*, p. 3.

> mitigation action. 35m would appear to be based more on operational efficiency for leaseholders than having relevance for the marine environment and represents a serious lack of monitoring for the wider marine environment.[34]

3.35 This matter is addressed further in chapter 4.

Response to issues raised in evidence

3.36 The Tasmanian Government responded to general concerns about the adequacy of the monitoring system and commented that the management framework for the salmonid industry provides the means to effectively regulate and manage the industry in accordance with best practice management principles.[35]

3.37 Dr John Whittington, Secretary, DPIPWE, added that the management controls on companies have 'the force of law' and as part of the controls, monitoring it required of a range of environmental and fish health parameters. Reports are provided to DPIPWE with auditing being conducted to ensure the quality of monitoring activities. Dr Whittington concluded that 'our system of requiring reporting of environmental parameters to us is, we believe, a sound one, an efficient one and one that is, I believe, rigorous'.[36]

3.38 The Tasmanian Salmonid Growers Association (TSGA) similarly pointed to the robustness of the monitoring regime undertaken by the industry including the additional monitoring voluntarily undertaken by companies. Dr Adam Main, TSGA, commented that the data collected is transparent and 'goes well beyond meeting basic compliance needs' and that datasets are 'robust, publicly available, often independently sourced, longitudinal, peer reviewed and audited'. Dr Main added that the industry's work in this area has been internationally recognised.[37]

3.39 The TSGA went on to comment that

> With the BEMP and MHEMP, a range of quality assurance and quality control measures are prescribed by the DPIPWE to ensure that sampling activities produce environmental data that can be interpreted with a high degree of confidence, and that appropriate methodologies, procedures and processes are carried out at all of the critical control points – from sampling in the field, to laboratory analysis and finally to data interpretation.[38]

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34 Australian Marine Conservation Society, *Submission 9*, pp 2–3; see also Mr Dean Lisson, Chief Executive, Tasmanian Abalone Council, *Committee Hansard*, 16 July 2015, p. 18.

35 Tasmanian Government, *Submission 35*, p. 19.

36 Dr John Whittington, Secretary, Department of Primary Industries, Parks, Water and Environment, *Committee Hansard*, 15 July 2015, p. 2.

37 Dr Adam Main, Chief Executive Officer, Tasmanian Salmonid Growers Association, *Committee Hansard*, 15 July 2015, p. 27.

38 Tasmanian Salmonid Growers Association, *Submission 33*, p. 8.

3.40 The TSGA concluded that, currently, there is adequate and available data on waterway health in terms of quality and quantity to provide sufficient confidence for:

- industry participants to make appropriate management decisions;
- regulators to be able to monitor industry and apply regulation;
- the scientific community to research, analyse and report on data;
- other parties such as certification bodies; and
- interested parties in the community, including consumers.[39]

3.41 In coming to this view, the TSGA stated that the Tasmanian salmonid industry relies on credible, scientifically sound and reliable data about its impact on Tasmanian waterways to make management decisions. The TSGA also stated that the industry is committed to continuously improving its data collection and management and contributing to public knowledge of Tasmania's waterways. In this regard, the TSGA added that the industry has commenced the development of:

- an industry data management strategy to streamline data collection and ensure the standardisation of data collection and therefore ease of comparability; and
- an industry information strategy to guide the way data is collected and analysed to ensure it is responsive to the needs of management, researchers and the broader community.[40]

3.42 Extensive information on the contribution of scientific research to the development of the monitoring framework was provided in the submission from the IMAS. Much of this research has been undertaken in conjunction with the Tasmanian Government and industry. The IMAS commented that the first study, in 2002, was specifically aimed at supporting the development of an industry-wide monitoring program by determining the most reliable and cost effective monitoring approaches for the management of the Tasmanian industry. The findings of the study played a key role in the development of the current marine farming monitoring program regulated by DPIPWE.[41]

3.43 The IMAS added that clearly a large body of research has been undertaken with the specific purpose of establishing the effects of fin-fish farming on the marine environment. It noted that, while this research has often been specifically targeted at providing management advice and recommendations for either the industry directly or regulators, the underlying data also provides a substantial resource for understanding broader ecosystem processes and function.[42]

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39 Tasmanian Salmonid Growers Association, *Response to submissions*, p. 5.

40 Tasmanian Salmonid Growers Association, *Submission 33*, p. 13.

41 Institute for Marine and Antarctic Studies, *Submission 20*, p. 4.

42 Institute for Marine and Antarctic Studies, *Submission 20*, p. 13.

3.44 The IMAS concluded:

> …it is worth noting that the research understanding outlined in this document represents two decades of accumulated knowledge and that this has been developed through a broad range of research collaborations both with other research providers (notably CSIRO) and in collaboration with industry, government, various not for profit organisations, funding agencies (particularly FRDC, Natural HeritageTrust/National Resource Management, various CRCs), and the community. The research has been progressive, with each question answered leading quite naturally to further questions. The transition in our understanding of the interaction of marine farming (and therefore monitoring requirements) has similarly progressed from a need to understand local-scale impacts, to a need to define broader-scale impacts, to the situation where ecosystem interactions and multiple-use management are now the focus. It is to be expected that as the current research evolves other questions will need to be addressed.[43]

3.45 The TSGA also responded to the specific issues raised in evidence. In relation to comments on the availability of baseline data, the TSGA agreed that there is no broadscale baseline dataset available for existing salmon farming regions, that pre-dates farming or other human influence. However, it went on to comment that this is the case in other salmon farming regions internationally.

3.46 The TSGA noted that it is a requirement of the Tasmania Government's regulatory regime that a baseline environmental survey must be undertaken prior to the commencement of marine farming operations. Where farming operations commence in new regions, such as Storm Bay, pre-farm baseline data will be available. The TSGA added that the licensing of a lease area for fin-fish farming is contingent on assessment and approval of the baseline environmental survey report by DPIPWE.[44] The Tasmanian Government provided the list of parameters included in baseline assessments. The parameters include biological analysis, benthic infauna samples, sediment samples and targeted threatened species surveys if not covered during the zone assessment.[45]

3.47 In relation to frequency of monitoring, the TSGA stated that monthly broadscale monitoring is only undertaken in Tasmania and nowhere else internationally. In addition, companies complete voluntary surveys within the compliance period as required. In relation to video surveys, the TSGA commented that they are 'a cornerstone of our sampling and monitoring framework' and are easily comparable to everywhere in the world.[46]

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43 Institute for Marine and Antarctic Studies, *Submission 20*, p. 15.

44 Tasmanian Salmonid Growers Association, *Response to submissions*, p. 8; see also Tasmanian Government, *Submission 35*, pp 8–10.

45 Tasmanian Government, *Submission 35*, Appendix 1, p. 24.

46 Tasmanian Salmonid Growers Association, *Response to submissions*, p. 8.

3.48 The TSGA concluded that the intent of the BEMP is to monitor water and sediment quality in the system, as these measures are deemed to be the most relevant monitoring indicators for assessment of the broader ecosystem. This is consistent with the outcomes of the Aquafin CRC[47] research 'which clearly identified that water and sediment quality were the most relevant and useful indicators for such an assessment'.[48]

3.49 In relation to parameters, the TSGA noted that an extensive body of research supports the basis for the selection of parameters that are currently monitored in Tasmanian aquaculture areas.[49]

3.50 Evidence on the 35 metre zone was provided by both the TSGA and WWF-Australian. WWF-Australia submitted that the 35 metre zone was based on 'strong evidence from both international and local research'. It went on to comment that since being introduced 15 years ago, monitoring by research bodies and farms (as a part of the licence conditions) has provided the government with evidence that a 35 metre zone is a suitable distance for the farming environment.[50]

3.51 The TSGA noted that farming licence conditions provide that there must be no significant visual, chemical or biological impacts extending 35 metres from the boundary of the lease area. The industry also uses fallowing (resting the seabed by moving pens to different locations within the lease area) to ensure that the seabed is effectively managed.[51]

3.52 The TSGA concluded that:

> The adaptive management framework employed by both industry and regulator alike allows for both results of the process studies and the monitoring itself to be continually assessed and the need for new data/information identified, with its collection then incorporated into the programme itself.[52]

3.53 In addition, the committee notes that the Fisheries Research and Development Corporation has funded 19 research projects related to the adequacy and availability of data on Tasmanian waterway health.[53]

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47 The Aquafin CRC was established as a partnership between industry, government, IMAS and CSIRO.

48 Tasmanian Salmonid Growers Association, *Response to submissions*, p. 9.

49 Tasmanian Salmonid Growers Association, *Submission 33*, p. 7.

50 WWF-Australia, *Submission 13*, p. 6.

51 Tasmanian Salmonid Growers Association, *Response to submissions*, p. 22.

52 Tasmanian Salmonid Growers Association, *Response to submissions*, p. 9.

53 Fisheries Research and Development Corporation, *Submission 8*, p. 2.

Access to information

3.54 It was argued by some submitters that there is inadequate public access to data and information about the fin-fish industry. While EDO Tasmania noted that information related to applications for amendments to marine farming development plans must be published, access to other information regarding ongoing regulation of marine farming operations is extremely difficult.[54] Requests for information held by government can be made under a Right to Information request, but it was observed that this is generally a slow process and often results in a refusal on the basis of commercial-in-confidence exemptions, the volume of material that would need to be supplied or that it may impair the Government's ability to obtain information in the future.[55]

3.55 Ms Rebecca Hubbard, Environment Tasmania, gave the example of attempts to access data in relation to Huon Aquaculture's hatchery on the Russell River. Ms Hubbard commented that Environment Tasmania had engaged with the EPA over the issue of algal blooms in the river and had requested a specific core environmental baseline report. This information had not been provided. Following an internal review processes, the matter is under review by the Tasmanian Ombudsman. Ms Hubbard commented 'but that has been in process for over three months, and there are still 20 appeals in front of us'.[56]

3.56 While acknowledging that some of monitoring data may be considered commercial-in-confidence information, nonetheless submitters argued that there is a range of other data which should not be treated as such. WWF-Australia pointed to natural environment parameters and drew a parallel with wild capture fishery data and information which is made publicly available.[57] Dr Imogen Fullagar also commented on the level of data available from TasWater, while EDO Tasmania pointed to Canada where all information regarding environmental assessments undertaken must be made publicly available.[58]

3.57 WWF-Australia also commented that there appeared to be a significant variation in the amount and type of information made publicly available by the three companies with Tassal providing more information, for example, through its Sustainability Reports.[59]

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54 EDO Tasmania, *Submission 70*, p. 10.

55 EDO Tasmania, *Submission 70*, p. 10; Environment Tasmania, *Submission 93*, p. 4; see also Tasmanian Aquaculture Reform Alliance, *Submission 95*, p. 17.

56 Ms Rebecca Hubbard, Marine Coordinator, Environment Tasmania, *Committee Hansard*, 16 July 2015, p. 3.

57 WWF-Australia, *Submission 13*, p. 3.

58 Dr Imogen Fullagar, *Submission 38*, p. 2; EDO Tasmania, *Submission 70*, p. 10.

59 WWF-Australia, *Submission 13*, pp 3–4.

3.58 It was argued that the lack of publicly available monitoring data may undermine trust and confidence in the industry. For example, Ms Hubbard, Environment Tasmania, commented:

> …it is difficult to ascertain just how accurate the department claims and the industry claims regarding sustainability and lack of fish-farming impacts, because water-quality data, as well as scientific and production reports, are not released publicly and therefore cannot be verified. This is a really significant point.[60]

3.59 Ms Hubbard went on to comment that there was available expertise within environmental organisations to interpret raw data and that stakeholders can also access independent scientists to verify assessments.[61] Ms Jessica Feehely, EDO Tasmania, added:

> I absolutely acknowledge that industry is doing a lot of monitoring. The difficulty is actually accessing that information to work out how much monitoring is being done, where it is being done and where it is not being done. So absolutely if there is transparent access to that information it may be identified that there is no need for additional monitoring. But until there is public access to all of the information that has been gathered through that process it is difficult to identify where the monitoring gaps are.[62]

3.60 WWF-Australia added that transparency, availability and openness of data and information are 'paramount for any business or government striving to achieve and meet best practice governance and business frameworks for operations'.[63] WWF-Australia noted that the ASC has standards concerning availability of data; WWF-Australia argued that the Tasmanian Government should 'look to the salmon standard of the ASC, to learn from and make required changes regarding accessible data and information'.[64]

3.61 WWF-Australia also suggested that the Tasmanian Government could assist in providing greater amounts of publicly available information by releasing its own annual aquaculture report for each farming region/zone. This report could include critical data and information regarding the industry operations as well as physio-chemical, biological and visual parameters essential for healthy, responsible aquaculture production and sustainable utilisation of the marine environment.[65]

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60 Ms Rebecca Hubbard, Marine Coordinator, Environment Tasmania, *Committee Hansard*, 16 July 2015, p. 3.

61 Ms Rebecca Hubbard, Marine Coordinator, Environment Tasmania, *Committee Hansard*, 16 July 2015, p. 3.

62 Ms Jessica Feehely, Principal Lawyer, EDO Tasmania, *Committee Hansard*, 16 July 2015, p. 58.

63 WWF-Australia, *Submission 13*, p. 3.

64 WWF-Australia, *Submission 13*, p. 4.

65 WWF-Australia, *Submission 13*, p. 4.

Response to issues raised in evidence

3.62 Both the Tasmanian Government and industry stakeholders responded to concerns about the level of publicly available information. Dr Whittington, DPIPWE, pointed to the numerous peer reviewed papers and reports available on the Tasmanian salmonid industry. He went on to note that the companies themselves provide extensive amounts of public information:

> They have websites that have, for example, sustainability dashboards. They produce sustainability reports. So there is considerable information available on the industry.[66]

3.63 DPIPWE provides information on its own website, for example, a review by IMAS of monitoring data collected between 2009 and 2012. This review was commissioned by DPIPWE and represents a comprehensive summary of both the water and sediment quality data collected as part of the BEMP.[67] Dr Whittington also stated that DPIPWE would like to further investigate the provision of online reporting of some of the environmental data that it receives and this will be considered over the coming year.[68]

3.64 The TSGA stated that the industry recognised the public interest in fin-fish farming's environmental performance and how the industry's activities relate to waterway health. The TSGA pointed to the range of information on waterway health and other aspects of environmental performance made publicly available by the regulator, the industry, the scientific community and certification bodies.[69] In addition, it noted that each company employs community engagement officers who are able to facilitate access to data and information where readily available and appropriate.[70]

3.65 Similarly, the Tasmanian Seafood Industry Council commented that the extensive amount of waterway health data collected by the salmon industry is shared with, and used by, a diverse array of stakeholder groups and organisations, including the industry, regulatory bodies and third-party certification organisations. In addition, waterway health data and information is publicly available online.

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66 Dr John Whittington, Secretary, Department of Primary Industries, Parks, Water and Environment, *Committee Hansard*, 15 July 2015, p. 7.

67 J Ross & C Macleod, *Evaluation of Broadscale Environmental Monitoring Program (BEMP) data from 2009–2012*, IMAS, 2013 http://dpipwe.tas.gov.au/Documents/Ross---Macleod-BEMP-Data-Review-2009-2012-.pdf (accessed 5 August 2015).

68 Dr John Whittington, Secretary, Department of Primary Industries, Parks, Water and Environment, *Committee Hansard*, 15 July 2015, p. 8.

69 See for example, Huon Aquaculture *Sustainability Dashboard* which provides monthly average dissolved oxygen readings for Hideaway Bay and Macquarie Harbour, http://dashboard.huonaqua.com.au/

70 Tasmanian Salmonid Growers Association, *Response to submissions*, p. 6.

Mr Julian Harrington, Tasmanian Seafood Industry Council, concluded that 'this open and transparent sharing and access to data ensures data quality and quality control'.[71]

3.66 Other witnesses also responded to calls for the release of raw data from monitoring activities. Marine Solutions Tasmania pointed to the risks of the use of raw data and commented that it:

> …understands one of the risks to the industry and to the environment is that raw data collected from a variety of sources is interpreted selectively, in isolation, or to address issues which it was not designed to address. With this in mind, [Marine Solutions Tasmania] believes strongly that raw data should be interpreted and presented by those who have an understanding of why the data was collected, how the data was collected, the limitations of the data, and provide an explanation of the interpretation.[72]

3.67 Mr Sean Riley, Aquenal Pty Ltd, also stated that the raw data needs to be evaluated in terms of the context and interpreted in a meaningful way.[73]

3.68 Similarly, Dr Catriona Macleod, IMAS, commented that the main issue with making raw data publicly available is quality control, interpretation and contextualisation of the data. Dr Macleod added:

> I work with a number of monitoring issues and areas…In a lot of cases it is not so much the need for the raw data, I think, that people have concerns about; it is that they truly understand how the interpretation is being derived. A lot of people talk about real term data and the transparency with that. Having had a lot of experience with data, that can generally mean an awful lot of numbers to wade through. I, personally, unless it is a project I am working on, would rather have that data in association with the interpretation, so I can actually contextualise it—
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> …and review it to see if that interpretation is correct, rather than the raw data per se. So, in principle, no. But I think the problems that you have with something like that is the fact that if you do not understand aspects of how the data was collected, or what the data is being interpreted into then you can get misinterpretations.[74]

3.69 However, Dr Macleod commented that IMAS considered it was very important that its research is understood by all stakeholders involved and that it is relevant to the issues that it has been asked to address. Dr Macleod went on to note that IMAS had undertaken the *Our Marine Values* project which had been important in understanding 'where the research findings and outputs, particularly as they relate to

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71 Mr Julian Harrington, Project Manager, Tasmanian Seafood Industry Council, *Committee Hansard*, 15 July 2015, p. 47.

72 Marine Solutions Tasmania, *Submission 16*, p. 5.

73 Mr Sean Riley, General Manager, Aquenal Pty Ltd, *Committee Hansard*, 16 July 2015, p. 22.

74 Dr Catriona Macleod, Head, Fisheries and Aquaculture Centre, Institute for Marine and Antarctic Studies, *Committee Hansard*, 15 July 2015, p. 41.

environmental monitoring, relate back to the concerns—whether they be industry concerns, government concerns or community concerns'. The report, published in early 2014, highlighted the concerns and issues which will underpin research proposed into issues in a multi-stakeholder environment.[75]

Independence of monitoring activities, analysis and research

3.70 The Tasmanian Government submission sets out information on who collects data for each stage of the regulatory process. For example, data from ongoing benthic monitoring is collected by contractors employed directly by the companies and/or by the companies themselves. Water quality monitoring data is collected by consultants on behalf of companies. This data is provided to DPIPWE for environmental assessment and management.[76] Analysis and research is undertaken by consultants and by research bodies including CSIRO and IMAS.

3.71 The committee received evidence which called into question the independence of the monitoring activities, analysis of data and research undertaken. EDO Tasmania, for example, submitted that there is currently limited independent monitoring of marine farming operations and noted that DPIPWE relies largely on reports and video surveillance submitted by the operators themselves.[77] The Australian Marine Conservation Society added:

> While data on chemical and biological parameters is clearly being collected by operators, there is no opportunity for independent analysis of the extent of change in critical parameters such as [dissolved oxygen], and no transparency in holding operators to account for condition breaches. It remains unclear what action was taken regarding condition breaches, which leaves little public trust in the way the Harbour is being managed.[78]

3.72 Ms Hubbard, Environment Tasmania, commented on funding of scientific assessment and research and stated:

> …what makes it difficult for the scientists here is they do receive a lot of funding from the industry and for the management of the industry. It makes it difficult for them to be critical. That is a very honest statement, and they would say the same thing…These are critical environments for other commercial species and protected species. It is really about being able to give those scientists the space to be able to make fair, objective,

75 Dr Catriona Macleod, Head, Fisheries and Aquaculture Centre, Institute for Marine and Antarctic Studies, *Committee Hansard*, 15 July 2015, p. 40.

76 Tasmanian Government, *Submission 35*, pp 24–27.

77 EDO Tasmania, *Submission 70*, p. 12; see also Tasmanian Conservation Trust, *Submission 92*, p. 10; Environment Tasmania, *Submission 93*, p. 4; Ms Christine Materia, President, Tasmanian Aquaculture Reform Alliance, *Committee Hansard*, 16 July 2015, p. 4.

78 Australian Marine Conservation Society, *Submission 9*, p. 3.

> independent and critical assessment and recommendations without fear of reprisal.[79]

3.73 EDO Tasmania also commented on concerns about the reliance of industry funding for research and stated:

> These research organisations continue to provide excellent research outcomes and direction on improved sustainability. However, the need for industry funding to sustain these research programmes risks a level of capture in terms of the research agenda, outcomes of such research and availability of research data.[80]

Response to issues raised in evidence

3.74 The committee received responses from the Tasmanian Government, industry, consultants and scientists in relation to concerns about independence of monitoring, assessment, analysis and research activities.

3.75 Dr Whittington, DPIPWE, noted that the companies use a range of consultants with accredited laboratories to undertake collection and analysis of that work. Dr Whittington also noted that DPIPWE has auditing processes in place.[81]

3.76 In relation to monitoring activities, the TSGA commented that a third party undertakes collection of data and, although hired by industry, is independent of the industry. The TSGA went on to state that:

> A third party contractor acts autonomously but is given a very strict set of procedures to follow (often set out in regulation or license conditions). The third party has no power to adapt, change or delete any part of the methodology. The second party equally has no ability to adapt, change or delete any part of the methodology.[82]

3.77 The data collected by contractors complements other evidence gathered by the Tasmanian Government. However, the TSGA noted that 'it is still the role of the government to make the judgement about whether procedures have been followed and compliance has been achieved'. The TSGA concluded:

> Involving another party in the collection of evidence allows the Tasmanian Government (first party) and the industry (second party) to gather authentic and valid evidence under specific circumstances in a cost-effective way.[83]

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79 Ms Rebecca Hubbard, Marine Coordinator, Environment Tasmania, *Committee Hansard*, 16 July 2015, p. 9.

80 EDO Tasmania, *Submission 70*, p. 7.

81 Dr John Whittington, Secretary, Department of Primary Industries, Parks, Water and Environment, *Committee Hansard*, 15 July 2015, p. 2.

82 Tasmanian Salmonid Growers Association, *Response to submissions*, pp 5–6; see also Dr Adam Main, Chief Executive Officer, *Committee Hansard*, 15 July 2015, p. 36.

83 Tasmanian Salmonid Growers Association, *Response to submissions*, p. 6.

3.78 The companies undertaking monitoring and assessment activities were similarly of the view that there is independence in monitoring and research and went on to note that they did not only work for fish farming companies but for a range of stakeholders. Stakeholders include environmental organisations with Mr Sean Riley, General Manager, Aquenal Pty Ltd, stating that the company had added further resources to ensure that a project commissioned by Environment Tasmania was completed to a high standard.[84]

3.79 Mr Sam Ibbott, Director, Marine Solutions, commented that:

> The broad range of clients who we work with includes ENGOs and aquaculture, and also GBEs and the government. To say that there would be a lack of independence I think would not be fair across the broad range of those clients. We are certainly not putting a slant on anything. Also important is the way that we collaborate with IMAS and with CSIRO for project development…we have open and frank discussions to make sure that the science that we are providing is robust, peer reviewed and developed in a manner that has the correct stakeholder input to make sure that it is actually targeted...[85]

3.80 Dr Neil Harstein, Project Manager, Aquadynamic Solutions, noted that information collected by the company in Macquarie Harbour aligned with that collected by the EPA and argued that this pointed to the independence of the data collection:

> …the information that we have been collecting has been backed up, if we can put it like that, by EPA as well. So the types of data that we have been collecting have been matching the EPA dataset very well. I think that is a good show-and-tell, in terms of having regard to an independent dataset collection, that we are conducting.[86]

3.81 Dr Macleod also commented on the independence of environmental monitoring of the fin-fish industry and noted that the protocols for that monitoring are fairly well specified. She went on to comment:

> I do not think it really matters who does the monitoring, whether it is paid for by government, by industry, by wherever. It is more important that the monitoring that is getting done is right and that the specifications are clear, so that you can have confidence that what is getting done is what you think is getting done and it is getting done where you think it is getting done.[87]

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84 Mr Sean Riley, General Manager, Aquenal Pty Ltd, *Committee Hansard*, 16 July 2015, p. 21.

85 Mr Sam Ibbott, Director, Marine Solutions, *Committee Hansard*, 16 July 2015, p. 21.

86 Dr Neil Harstein, Project Manager, Aquadynamic Solutions, *Committee Hansard*, 16 July 2015, p. 21.

87 Dr Catriona Macleod, Head, Fisheries and Aquaculture Centre, Institute for Marine and Antarctic Studies, *Committee Hansard*, 15 July 2015, p. 41.

3.82 On the more general issue of scientific independence, the IMAS submitted that:

> The Australian Code for the Responsible Conduct of Research (the Code) is a statement of principles aimed to guide institutions and researchers in responsible research practices and the promotion of research integrity. Knowledge of the principles outlined in the Code is essential for both the conduct and support of research by researchers. From a compliance perspective, the University of Tasmania endorses and adopts the principles and practices of responsible research outlined in Part A of the Code.[88]

3.83 The TSGA concluded by stating:

> The industry absolutely rejects the comment that it intimidates scientists. The industry respects their right to interpret science based on their experience and recognises that on occasion there is vigorous debate amongst scientists as to interpretation.
>
> IMAS and CSIRO scientists represent organisations that have international reputations for the quality of their work, they participate in international collaborations in fields of expertise and a significant number of participants over the 30 years of applied research around the industry in a number of clearly different sectors.[89]

Committee comment

3.84 The committee considers that the Tasmanian Government has instituted a comprehensive and robust monitoring regime on which to base its management of the fin-fish aquaculture industry. The committee believes the regime currently used in Tasmania is comparable to world's best practice.

3.85 The committee agrees that adaptive management, particularly in the dynamic environment where fin-fish farming activities occur, must be based on sound data collection and analytical regimes and facilitate the effective incorporation of identified improvements into management practices. In this regard, the committee notes that monitoring of fin-fish farming operations has long been required in Tasmania and extensive datasets are now available.

3.86 These datasets are used by the Tasmanian Government to inform the on-going adaptive management of the industry to safeguard the marine environment. Research undertaken by various bodies over the last two decades, notably the Institute for Marine and Antarctic Studies, has contributed to the development of the fin-fish industry regulatory regime as well the understanding of the environmental effects of fin-fish operations. As the industry has grown, this research has assisted to refine the monitoring so that emerging issues are addressed and the monitoring regime meets the needs of increasing production in the industry

88 Institute for Marine and Antarctic Studies, *Answer to question on notice*, No. 2.

89 Tasmanian Salmonid Growers Association, *Response to submissions*, p. 28.

3.87 While there were concerns about possible compromise of the monitoring regime because the industry participants collect the data (or pay for its collection) and research organisations rely on funding from industry, the committee strongly considers that this is not the case. The committee received extensive evidence that underscores the independence of those undertaking monitoring activities and research. In addition, the Tasmanian Government prescribes how monitoring is to be conducted and has in place an audit program to ensure the robustness and accuracy of monitoring information. The committee also notes the evidence that outcomes of monitoring programs conducted by consultants align with those of the Environment Protection Authority.

3.88 In relation to the specific issues raised in evidence, the committee notes in particular the calls for more frequent monitoring of some parameters. The committee acknowledges that some companies conduct monitoring more frequently than at the intervals prescribed by the government. In some instances, more frequent monitoring is a requirement of a certification program, for example the Aquaculture Stewardship Council. The committee considers that this shows the commitment of the industry to ensure that a robust monitoring system of their operations is in place. The committee therefore encourages both industry and the government to provide more extensive information on where monitoring by industry exceeds the prescribed requirements.

3.89 Some submitters called for greater access to information, including raw data from monitoring activities. The committee notes evidence about the possible risks of misinterpretation and lack of context should raw data be made publicly available and, therefore, does not support access to raw data.

3.90 Currently, there is an extensive range of information available publicly from multiple sources including government, companies and research bodies related to many aspects of the salmonid industry. Nonetheless, the committee considers that the Tasmanian Government should consider providing more information about the outcomes of the monitoring regime including audit activities and compliance. In particular, the committee notes the suggestion from WWF-Australia that the government should publish an annual aquaculture report for each farming region/zone. The committee also notes the comments from Dr Whittington indicating that consideration will be given over the next year to providing online reporting of some environmental data.[90]

3.91 The committee believes that greater access to information would improve transparency of the regulatory regime, ensure that interested stakeholders can come to an informed position on areas of concern and allay fears that the community is not being adequately informed about the impacts on the marine environment of Tasmania.

90 Dr John Whittington, Secretary, Department of Primary Industries, Parks, Water and Environment, *Committee Hansard*, 15 July 2015, p. 8.

Recommendation 1

3.92 The committee recommends that the Tasmanian Government support the greater provision of environmental information and data relating to the fin-fish industry by the Department of Primary Industries, Parks, Water and Environment.

3.93 Finally, the committee was gravely concerned about inferences of lack of independence of, or constraints to, research and monitoring related to the fin-fish aquaculture industry including inland river hatcheries. The committee believes that the scientists and consultants who undertake research and monitoring of aquaculture work to the highest ethical standards. Research by scientists at the IMAS, and other organisations, is peer reviewed and acknowledged to be world class. In addition, scientists and consultants work with a range of stakeholders including environmental organisations. The committee, therefore, considers the comments regarding lack of independence to be without foundation.

3.94 In particular, the committee notes concerns about possible conflict of interest and lack of independence of scientific research in relation to the report on the impacts of salmonid farming on abalone undertaken by Professor Colin Buxton.[91] The committee received a response from Professor Buxton to this evidence.[92] The response addressed these concerns and the committee is satisfied that Professor Buxton's appointment did not present issues regarding a conflict of interest or a lack of independence.

91 Mr Dean Lisson, Chief Executive, Tasmanian Abalone Council, *Committee Hansard*, 16 July 2015, p. 12.

92 Professor Colin Buxton, *Response to evidence from public hearing, 16 July 2015.*