3

Regulatory Issues

3.1 In 2004, the Productivity Commission published a research paper entitled *Assessing Environmental Regulatory Arrangements for Aquaculture*. The Productivity Commission found that:

> Aquaculture production is subject to an unnecessarily complex array of legislation and agencies—covering marine and coastal management, environmental management, land use planning, land use tenure, and quarantine and translocation.[1]

3.2 The Productivity Commission also found that government and industry have attempted to promote the expansion of the aquaculture industry through funding research and development but that:

> At times, this focus on industry development has occurred despite the compelling prior need to establish or refine environmental regulatory arrangements for aquaculture. Without appropriate regulatory arrangements, the aquaculture industry is unlikely to realise its potential, and any government funding of industry development will be less effective than otherwise.[2]

3.3 The focus of this chapter is on the regulatory framework applied to aquaculture at both the Commonwealth and state/territory level.[3] The main regulatory instruments in place in each jurisdiction are considered as well as the use of development zones to stimulate aquaculture development. The Great Barrier Reef region, due to its World Heritage

1 Productivity Commission, *Assessing Environmental Regulatory Arrangements for Aquaculture: Productivity Commission Research Paper*, Canberra, 2004, p. xx.

2 Productivity Commission, *Assessing Environmental Regulatory Arrangements for Aquaculture: Productivity Commission Research Paper*, Canberra, 2004, p. 168.

3 In some instances the development or operation of aquaculture projects may also require the approval of Local Governments or Traditional Owner Organisations. Issues relating to approvals from these organisations are noted where appropriate.

status, has unique regulatory arrangements and this is discussed separately below.

Commonwealth Regulations

Environment Protection and Biodiversity Conservation Act

3.4 The *Environment Protection and Biodiversity Conservation Act 1999* (the EPBC Act) is the 'Australian Government's key piece of environmental legislation'.[4] The objectives of the EPBC Act include conserving Australia's biodiversity; protecting the environment, especially matters of national environmental significance; and streamlining environmental assessment and approval processes.[5]

3.5 The EPBC Act requires that all actions that will, or are likely to, have a significant impact on matters of national environmental significance must be approved by the Commonwealth Environment Minister.[6] The matters of national environmental significance with most potential relevance to aquaculture are:

- world heritage properties;…
- wetlands of international importance (often called 'Ramsar' wetlands after the international treaty under which such wetlands are listed);
- nationally threatened species and ecological communities;
- migratory species;
- Commonwealth marine areas; and
- the Great Barrier Reef Marine Park…[7]

3.6 The EPBC Act does not grant the Environment Minister the authority to act as a 'court of appeal' for those seeking to overturn a state or local government decision. The Environment Minister:

> … only has the power to make decisions in relation to matters of national environmental significance, the minister has no power to intervene in decisions of state or local governments that do not have an impact on these matters.[8]

3.7 The Northern Territory, Queensland and Western Australia have signed bilateral agreements with the Commonwealth Government that allow

4 Department of the Environment (DoE), *Submission 21*, p 1.

5 DoE, 'About the EPBC Act', https://www.environment.gov.au/epbc/about Accessed 14 October 2015.

6 DoE, *Exhibit 16b: Matters of Environmental Significance*, p. 1.

7 DoE, *Exhibit 16b: Matters of Environmental Significance*, p. 2.

8 DoE, 'EPBC Act – Frequently asked questions', https://www.environment.gov.au/epbc/publications/factsheet-epbc-act-frequently-asked-questions Accessed 14 October 2015.

projects requiring EPBC Act approval in these jurisdictions to be assessed using the relevant state or territory assessment processes. Approval from the Commonwealth Minister for the Environment is still required and the Minister has the authority to decide that a project is approved, approved with conditions, or rejected.[9]

State and Territory Regulations

Northern Territory

3.8 Proponents of potential aquaculture projects are required, under the Northern Territory *Fisheries Act*, to apply for an aquaculture license. The license application is also used to assess the project under the *Environmental Assessment Act*. The proponent is also required to submit an Environmental Management Plan, and if the project is marine based or is proposed to take place on public land, an aquaculture lease is also required.[10]

3.9 The Northern Territory Department of Primary Industries and Fisheries (NTDPIF) stated that the assistance provided to potential aquaculture developers is probably better in the Northern Territory (NT) than in most jurisdictions. The NTDPIF commented that for nearly twenty years aquaculture investors have been allocated a case manager whose role it is to 'assist clients negotiate the government approvals process.'[11]

3.10 The NTDPIF also compared the approvals process for the Guthalungra project in Queensland (discussion follows) with a 100-hectare prawn farm in the NT that was granted approval within two years in the early 2000s.[12]

Queensland

3.11 Commercial scale aquaculture projects[13] are regulated through a range of planning, fisheries and environment regulations.[14] A larger project may be

9 DoE, *Exhibit 16b: Matters of Environmental Significance*, pp 27-28.

10 Northern Territory Government, *Guide to writing a Notice of Intent for Aquaculture in the Northern Territory*, http://www.nt.gov.au/d/Content/File/p/Fishnote/Notice_of_Intent_for_Aquaculture_Guideline.pdf Accessed 5 November 2015, pp 3-5.

11 Mr Glenn Schipp, Director, Department of Primary Industries and Fisheries Northern Territory (NTDPIF), *Official Committee Hansard*, Darwin, Tuesday 14 July 2015, p. 2.

12 Mr Glenn Schipp, NTDPIF, *Official Committee Hansard*, Darwin, Tuesday 14 July 2015, p. 2.

13 Small projects that do not discharge waste, operate a hatchery, or source fish from interstate or wild stocks can be self-assessed without government approval.

14 Queensland Competition Authority (QCA), *Exhibit 1: Agriculture Regulation in Queensland Draft Report*, July 2014, Brisbane, p. 12.

declared a 'coordinated project'[15] necessitating a whole-of-government response from the Queensland Government.

3.12 A coordinated project will generally require the proponent to prepare an environmental impact statement (EIS) addressing the proposed development's environmental impact and the planned methods of avoiding, mitigating or offsetting these impacts.[16] The EIS is delivered to the Coordinator-General (CG) who will seek input from Queensland Government agencies and undertake public consultations. The CG will then prepare a report recommending the project be rejected or to proceed subject to any conditions the CG deems necessary to manage the project's environmental impacts.[17]

3.13 If the CG recommends that a project can proceed, the project still requires approval from the project's assessment manager,[18] who may also attach additional conditions to the approval.[19] Technical advice would be provided by the Department of Agriculture and Fisheries and the Department of Environment and Heritage Protection.[20]

Western Australia

3.14 Aquaculture proponents in Western Australia are required to obtain an aquaculture license and an aquaculture lease from the Western Australian Department of Fisheries (WADF). Aquaculture projects that have the potential to cause significant environmental impacts are also required to be assessed by the Environment Protection Authority. Operators are required to demonstrate ongoing environmental management by lodging a Management and Environmental Monitoring Plan annually when renewing their license.[21]

3.15 The WADF noted that gaining access to land for aquaculture developments can be challenging and that 'suitable land areas should be identified and attempts made by Governments at all levels to reduce the time and cost impost on proponents.'[22]

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15 The proponent may recommend the project be treated as a coordinated project or the Coordinator General may decide that a project will be treated as a coordinated project.

16 QCA, *Exhibit 1: Agriculture Regulation in Queensland Draft Report*, p. 13.

17 QCA, *Exhibit 1: Agriculture Regulation in Queensland Draft Report*, pp 13-14.

18 Either a Local Government or the Queensland Department of Local Government, Infrastructure and Planning.

19 QCA, *Exhibit 1: Agriculture Regulation in Queensland Draft Report*, pp 13-14.

20 QCA, *Exhibit 1: Agriculture Regulation in Queensland Draft Report,* p. 12.

21 Western Australian Department of Fisheries (WADF), 'Aquaculture management', http://www.fish.wa.gov.au/Fishing-and-Aquaculture/Aquaculture/Aquaculture-Management/Pages/default.aspx Accessed 5 November 2015.

22 WADF, *Submission 23*, p. 4.

3.16 The Western Australian Government has recently begun implementing marine aquaculture development zones to provide 'investment-ready' areas for commercial development.[23] Aquaculture development zones are discussed in more detail below. The WADF is also considering granting longer-term aquaculture licenses to provide increased certainty to aquaculture operators.[24]

Great Barrier Reef Region Regulatory Framework

3.17 The Great Barrier Reef (GBR) is managed as a 'multiple-use area that supports a range of communities and industries that depend on the Reef for recreation or their livelihoods'.[25] The GBR has a significant role in the economy of Northern Queensland supporting almost 70 000 jobs. Related tourism in the GBR region generates activity worth $5.2 billion per annum and over $40 billion of exports depart from ports in the region per annum.[26]

3.18 The management of the GBR is regulated by two key conservation zones— the Great Barrier Reef Marine Park (established 1975) and the Great Barrier Reef World Heritage Area (established 1981). The two conservation zones cover almost the same area but the Marine Park is slightly smaller due to the exclusion of Queensland's managed islands, 13 coastal zones around major cities and ports, and Queensland inland waters (including the Hinchinbrook Channel).[27]

3.19 The GBR is governed cooperatively by the Commonwealth and Queensland Governments. The framework for this cooperation is the

23 WADF, 'Aquaculture in Western Australia: Industry Overview August 2015', http://www.fish.wa.gov.au/Documents/Aquaculture/aquaculture_position_paper.pdf Accessed 5 November p. 3.

24 WADF, 'Aquaculture in Western Australia: Industry Overview August 2015', http://www.fish.wa.gov.au/Documents/Aquaculture/aquaculture_position_paper.pdf Accessed 5 November p. 7.

25 Great Barrier Reef Marine Park Authority (GBRMPA), 'How the Reef is managed', http://www.gbrmpa.gov.au/managing-the-reef/how-the-reefs-managed Accessed 14 October 2015.

26 Commonwealth of Australia, *Reef 2050 Long-Term Sustainability Plan*, 2015, p. 1.

27 DoE, *Exhibit 16a: EPBC Act referral guidelines for the Outstanding Universal Value of the Great Barrier Reef World Heritage Area*, p 33; QCA, *Exhibit 1: Aquaculture Regulation in Queensland Draft Report*, p. 75; Great Barrier Reef Marine Park Authority (GBRMPA), 'Area statement for the Great Barrier Reef Marine Park', http://www.gbrmpa.gov.au/__data/assets/pdf_file/0010/14122/area_statement_082010_updated_WebVersion.pdf Accessed 4 November 2015.

Great Barrier Reef Intergovernmental Agreement (Intergovernmental Agreement) which was most recently updated in June 2015.[28]

3.20 The recent update to the Intergovernmental Agreement describes the *Reef 2050 Long-Term Sustainability Plan* (Reef 2050 Plan), released in 2015, as the 'overarching strategy for management of the Great Barrier Reef' through to 2050.[29]

3.21 The Reef 2050 Plan states that it is 'very clear the Reef is under pressure',[30] and that one of the key threats to the Reef is from land-based run-off; primarily nutrients, sediments, and pesticides. Land-based run-off has been linked to increased frequency of crown-of-thorns outbreaks, increased algal blooms, and increased the impact of temperature stress on corals.[31] To address the impact of land-based run-off, the Reef Plan 2050 includes an objective that:

> Over successive decades the quality of water in or entering the Reef from all sources including industry, aquaculture, port (including dredging), urban waste and stormwater sources has no detrimental impact on the health and resilience of the Great Barrier Reef.[32]

3.22 The Reef 2050 Plan also includes water quality targets including a 50 per cent reduction in end-of-catchment dissolved nitrogen by 2018 and a 20 per cent reduction in end-of-catchment particulate nutrient loads in priority areas.[33]

Application of the EPBC Act

3.23 The EPBC Act lists all World Heritage Areas, and additionally the GBR Marine Park, as matters of national environmental significance.[34] Any action that is likely to have a significant impact on the GBR Marine Park or is likely to result in one of the GBR's world heritage attributes[35]

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28 This updated the 2009 Great Barrier Reef Intergovernmental Agreement, which was preceded by the 1979 Emerald Agreement. See: DoE, 'Great Barrier Reef Intergovernmental Agreement', http://www.environment.gov.au/marine/gbr/protecting-the-reef/intergovernmental-agreement Accessed 4 November 2015.

29 Commonwealth of Australia, *Reef 2050 Long-Term Sustainability Plan*, 2015, p. 3; Commonwealth of Australia & State of Queensland, *Great Barrier Reef Intergovernmental Agreement 2015*, p. 6.

30 Commonwealth of Australia, *Reef 2050 Long-Term Sustainability Plan*, 2015, p. 13.

31 Commonwealth of Australia, *Reef 2050 Long-Term Sustainability Plan*, 2015, p. 24.

32 GBRMPA, Submission 12, p. 1.

33 GBRMPA, Submission 12, p. 2.

34 DoE, *Exhibit 16b: Matters of National Environmental Significance*, p. 2.

35 The Great Barrier Reef was declared a World Heritage Area under Criteria vii, viii, ix, and x.

being lost, degraded, altered or diminished therefore triggers the EPBC Act.

3.24 There are a number of criteria which are used to assess whether an action is likely to have a significant impact on the GBR Marine Park. The criteria potentially most relevant to aquaculture states that the action is likely to have a significant impact if there is the possibility the action will:

> Result in a substantial change in air quality or water quality (including temperature) which may adversely impact on biodiversity, ecological health or integrity or social amenity or human health.[36]

3.25 The *EPBC Act referral guidelines for the Outstanding Universal Value of the Great Barrier Reef World Heritage Area* state that aquaculture could potentially impact upon any of the GBR's four world heritage attributes.[37] The guidelines state that:

> Aquaculture developments may result in the discharge of high concentrations of suspended solids and nutrients with potential impacts on the water quality and other associated ecological processes of the Great Barrier Reef.[38]

Role of Great Barrier Reef Marine Park Authority

3.26 The GBR Marine Park is managed by the Great Barrier Reef Marine Park Authority (GBRMPA), a Commonwealth statutory agency within the environment portfolio that reports directly to the Minister of the Environment and advises the minister on the 'control, care and development of the Marine Park'.[39]

3.27 The GBRMPA has regulatory authority over aquaculture projects that are located within the GBR Marine Park or discharge aquaculture waste directly into the GBR Marine Park.

3.28 When assessing the impacts of aquaculture projects GBRMPA is guided by its *Position Statement on Aquaculture within the Great Barrier Reef Marine Park* (Position Statement). In this Position Statement GBRMPA differentiates between two types of aquaculture; extensive aquaculture,

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36 DoE, *Exhibit 16b: Matters of National Environmental Significance*, p. 24.

37 Commonwealth of Australia, *Exhibit 16a: EPBC Act referral guidelines for the Outstanding Universal Value of the Great Barrier Reef World Heritage Area,* 2014, pp 21-25.

38 Commonwealth of Australia, *Exhibit 16a: EPBC Act referral guidelines for the Outstanding Universal Value of the Great Barrier Reef World Heritage Area,* 2014, p. 17.

39 GBRMPA, *Great Barrier Reef Region Strategic Assessment: Strategic Assessment Report*, 2014, Townsville, pp 1-6.

which does not include the addition of feed; and intensive aquaculture, which does include the addition of feed.[40]

3.29 Extensive aquaculture generally involves the farming of filter-feeder organisms, the Position Statement notes that pearl oyster farming is already undertaken within the GBR Marine Park and that existing GBRMPA regulations and policies are 'adequate for the assessment of extensive aquaculture operations'.[41]

3.30 The GBRMPA stated that intensive aquaculture does not currently occur within the GBR Marine Park and that:

> … the ecological risks associated with this type of aquaculture (at the current level of technological development) are likely to be unacceptable in the GBR Marine Park.
>
> Consequently, it is likely that permissions for intensive aquaculture in General Use Zones in the GBR Marine Park would be granted only if the applicant can demonstrate, to the satisfaction of the GBRMPA, that there have been operational and technological advances that substantially mitigate ecological risk.[42]

The Great Barrier Reef Marine Park (Aquaculture) Regulations

3.31 On 23 February 2000, the Commonwealth Government enacted the Great Barrier Reef Marine Park (Aquaculture) Regulations 2000 (Cwlth) (the Aquaculture Regulations).

3.32 Previously GBRMPA was only involved in the regulation of land–based aquaculture projects if they discharged waste directly into the GBR Marine Park. The Aquaculture Regulations extended GBRMPA's regulatory role to include indirect discharge into the GBR Marine Park. A GBRMPA permit was required for any new aquaculture development that was located up to five kilometres inland and discharged waste into rivers and creeks that flowed into the GBR Marine Park.[43]

3.33 On 2 March 2005, Queensland law was accredited for granting approvals under the Aquaculture Regulations so long as Queensland law continues to provide the 'requisite degree of protection for the Marine Park environment'.[44] As long as this accreditation remains active, the Aquaculture Regulations are effectively 'switched off' and GBRMPA

40 GBRMPA, *Position Statement on Aquaculture within the Great Barrier Reef Marine Park*, p. 2.

41 GBRMPA, *Position Statement on Aquaculture within the Great Barrier Reef Marine Park*, p. 3.

42 GBRMPA, *Position Statement on Aquaculture within the Great Barrier Reef Marine Park*, p. 4.

43 Minister of the Environment and Heritage, 'Great Barrier Reef Marine Park (Aquaculture) Regulations 2000: Explanatory Statement', http://www.austlii.edu.au/au/legis/cth/num_reg_es/gbrmpr20002000n6522.html Accessed 15 October 2015.

44 Great Barrier Reef Marine Park (Aquaculture) Regulations 2000, s. 4.

approval is not required. Since 2005, GBRMPA 'has had no regulatory involvement in land-based aquaculture decisions except where they discharge directly to the Great Barrier Reef Marine Park.'[45]

3.34 In its *Regulatory Plan 2014-2015* GBRMPA states that it intends to revoke the Aquaculture Regulations.[46] The GBRMPA states that the timing of this amendment is 'dependent on the Queensland review of aquaculture controls'.[47]

Guthalungra Prawn Farm – Case Study

In January 2001 Pacific Reef Fisheries (a commercial prawn farm) proposed a new 259 hectare aquaculture farm in Guthalungra, Northern Queensland. The project is expected to generate revenue of approximately $50 million per annum and to employ approximately 100 full time and 100 casual employees.[48]

Regulatory Timeline

The project has been assessed under both Queensland and Commonwealth regulatory processes. To date lodging and consideration of the applications has taken 14 years at a cost of approximately $3 million.[49] In January 2008 the Queensland Government recommended that the project proceed and in March 2010 the Commonwealth Department of the Environment approved the project subject to 19 conditions.[50] In December 2015 Pacific Reef received a permit from GBRMPA for the project's discharge into the GBR Marine Park. Pacific Reef is currently awaiting approval from the Whitsunday Shire Council and expects to receive this approval by June 2016.[51] The regulatory process used to approve the project is summarised below.

Date	Regulatory Process
Jan 2001	Referral to the Commonwealth under the EPBC Act.
Jul 2001	Accreditation of Queensland regulations, meaning that the development and assessment of an environmental impact statement (EIS) would take place using Queensland processes.

45 Mr Bruce Elliot, General Manager Biodiversity Conservation and Sustainable Use, GBRMPA, *Official Committee Hansard*, Townsville, 26 July 2015, p. 19.

46 The GBRMPA *Regulatory Plan 2014-2015* stated that it intended to make this amendment during 2014-2015. As yet the Aquaculture Regulations have not been revoked.

47 GBRMPA, Regulatory Plan 2014-2015, p. 13, http://elibrary.gbrmpa.gov.au/jspui/bitstream/11017/2854/1/Annual%20Regulatory%20Plan%202014-15.pdf Accessed 16 October 2015.

48 Mr John Moloney, General Manger, Pacific Reef Fisheries (Pacific Reef), *Official Committee Hansard* Brisbane, 27 August 2015, p. 32; Pacific Reef, *Submission 6*, p. 1.

49 Mr John Moloney, Pacific Reef, *Official Committee Hansard*, p. 31.

50 The conditions of the March 2010 approval included that there was to be no net increase in the background levels of nutrients and suspended solids. In November 2011 a variation to the approval was granted increasing the number of conditions to 21 and allowing limited nutrient discharge so long as these were offset.

51 Pacific Reef, *Submission 6.1*, p. 1.

Jun 2002	Queensland Coordinator-General releases terms of reference for the EIS.
Oct 2003	EIS prepared by Pacific Reef is released to the public.
Mar 2004	The Queensland Coordinator-General asks Pacific Reef to prepare a supplementary EIS in response to issues raised in public submissions.
Jan 2007	Pacific Reef submits a supplementary EIS.
Jan 2008	The Queensland Coordinator-General submits final report on the EIS to the Commonwealth Environment Minister recommending project proceeds subject to 199 conditions including offset requirements for discharges.
Mar – May 2008	The Commonwealth engages CSIRO and the Australian Institute of Marine Science to undertake an independent review of the Queensland report on the EIS.
Mar 2010	The Commonwealth releases final conditions of approval which stipulate that there can be no increase in discharges to Abbot Bay.
Nov 2011	The Commonwealth releases varied conditions of approval to allow for discharges that are offset.
Nov 2011 – Jan 2015	Discussions with GBRMPA to gain approval for discharges into Abbot Bay.
Jan 2015	Pacific Reef submits plans for offsets to GBRMPA.[52]
Dec 2015	GBRMPA approves the Guthalungra prawn farm project and Pacific Reef applies to the Whitsunday Shire Council for development approval.[53]

Source QCA, Exhibit 1: Agriculture Regulation in Queensland Draft Report, pp. 93-95

Project Details

The project is planned to be constructed in three stages over six years. The construction of the second and third stages will begin when previous stages have been in operation for a year and have met the approved environmental management conditions.[54]

The facility will discharge water to Abbot Bay via a pipeline that will extend 520m into the Bay beyond the high tide mark.[55] The pipeline will be situated so that the discharge location is away from seagrass beds in the bay.[56]

The waste water will be filtered using settlement ponds, sand filtration and algal filtration before it is discharged into Abbot Bay. The algal filtration, developed through a partnership between James Cook University, MBD Energy and Pacific Reef, has been trialled at Pacific Reef's existing farm and will be implemented on a large scale for the first time at Guthalungra. The algae removes nitrogen and phosphorous from the water and can be sold as a food item into Asia.[57] Whilst

52 Mr John Moloney, Pacific Reef, *Official Committee Hansard*, p. 32.

53 Pacific Reef, *Submission 6.1*, p. 1.

54 Pacific Reef, *Information Pack: Proposal to construct and operate the Guthalungra Prawn Farm at Abbot Bay*, December 2014, p. 9.

55 Pacific Reef, *Information Pack: Proposal to construct and operate the Guthalungra Prawn Farm at Abbot Bay*, December 2014, p. 10.

56 QCA, *Exhibit 1: Agriculture Regulation in Queensland Draft Report,* p. 92.

57 James Cook University, *Submission 14a*, pp 7-8.

algae does not remove all of the nutrients from the water, trials suggest that the discharged water will have lower nitrogen than the ocean water in Abbot Bay.[58]

Offset Requirements

The nutrient levels in Abbot Bay already exceed water quality guidelines and so it is considered to have no capacity to assimilate extra nutrients. Therefore, Guthalungra's EPBC approval requires that the project offsets all nutrient discharges so that there is no net increase in nutrient levels.[59]

Pacific Reef's preferred offset strategy involves restoring 230 hectares of riparian zones and wetlands and, via the Reef Trust, funding cane growers in the Don and Burdekin River catchments to improve their land management practices. The Reef Trust is currently developing its offset programme and until this is complete accurate offset costings are unavailable.[60] Jacobs SKM, however, provisionally estimated that Pacific Reef could offset Guthalungra's annual nitrogen discharge through improvements to 1680 hectares of cane land at a cost of $95 304.[61]

Guthalungra and 'Zero Net Discharge'

3.35 Pacific Reef Fisheries (Pacific Reef) has proposed a 259 hectare prawn farm at Guthalungra, between Ayr and Bowen. The Commonwealth Minister for the Environment, Heritage and the Arts approved the project in 2010 subject to the condition that the project did not result in a 'net increase in the background levels of nutrients and suspended solids being discharged into Abbot Bay.'[62] The conditions to the approval were amended in November 2011 to allow discharges above background levels, [63] so long as these discharges were completely offset.[64]

3.36 The condition not allowing discharge of nutrients beyond background levels, generally referred to as 'zero net discharge', has been criticised by

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58 Pacific Reef, *Information Pack: Proposal to construct and operate the Guthalungra Prawn Farm at Abbot Bay*, December 2014, pp 13, 16.

59 Mr Bruce Elliot, GBRMPA, *Official Committee Hansard*, Townsville, 26 August 2015, p. 20.

60 Department of the Environment, 'Reef Trust News', http://www.environment.gov.au/marine/gbr/reef-trust Accessed 20 October 2015.

61 Jacobs SKM, *Guthalungra Prawn Farm: Nutrient Offset Strategy*, Pacific Reef, May 2014 pp 13, 17.

62 Department of the Environment, Water, Heritage and the Arts, 'Approval: Guthalungra Aquaculture Facility, north of Bowen, Queensland (EPBC 2001/138)', http://www.environment.gov.au/epbc/notices/assessments/2001/138/approval-decision.pdf Accessed 2 November 2015.

63 Maximum daily discharge limits were set at: 6.59 kilograms/hectare of total suspended solids, 0.49 kilograms/hectare of total nitrogen, and 0.05 kilogram/hectare of total phosphorus.

64 Department of Sustainability, Environment, Water, Population, and Communities, 'Variation to approval conditions: Guthalungra Aquaculture Facility, north of Bowen, Queensland (EPBC 2001/138)', http://www.environment.gov.au/epbc/notices/assessments/2001/138/2001-138-variation.pdf Accessed 2 November 2015.

representatives of the scientific community. The Commonwealth Scientific and Industrial Research Organisation (CSIRO) stated that there 'is no scientific basis for imposing a constraint of zero net nutrient or suspended solids'.[65]

3.37 Further, the CSIRO stated that it was the opinion of international experts that 'there was no prawn farm operating anywhere in the world'[66] that could achieve zero net discharge and that 'in effect this is a ban on the development of aquaculture in coastal regions adjacent to the Great Barrier Reef.'[67] The Australian Institute of Marine Science (AIMS) commented that zero net discharge was theoretically possible but stated that the 'economic penalty is usually too steep to contemplate' and that under these regulations aquaculture 'currently represented a non-viable option'.[68]

3.38 The GBRMPA rejected the proposition that there was a regulatory standard of zero discharge for all aquaculture operations, stating:

> We do not have such a policy and never have. The issue for zero net discharge did arise for one farm—[Guthalungra]—because of the condition of the local bay …[69]

3.39 The Department of the Environment (DoE) supported the position of GBRMPA that the zero net discharge was a condition that applied specifically to Guthalungra rather than a standard that applied broadly to aquaculture. The DoE added:

> It is not uncommon practice for proponents in one sector of the economy to take a look at how other proponents have been treated in terms of their conditions of approval and then to infer that that means a standard. But … I want to be very clear that the conditions that were put in place for [Guthalungra] were specific to the conditions at that time for that location.[70]

3.40 The GBRMPA advised that it was confident that future aquaculture proposals on the coast adjacent to the GBR would not involve as protracted an approvals process as that experienced by Pacific Reef. The GBRMPA stated that the improvements in technology, regulator learning and legislative changes would all assist in streamlining the process. The

65 Commonwealth Scientific and Industrial Research Organisation (CSIRO), *Submission 17*, p. 5.

66 Dr Nigel Preston, Research Director, Aquaculture, CSIRO, *Official Committee Hansard*, Canberra, 15 September 2015, p. 27.

67 CSIRO, *Submission 17*, p. 4.

68 Australian Institute of Marine Science (AIMS), *Submission 31*, p. 3.

69 Dr Russell Reichelt, GBRMPA, *Official Committee Hansard*, p. 1.

70 Mr Dean Knudson, First Assistant Secretary, Environment Standards Division, DoE, *Official Committee Hansard*, Canberra, 15 September 2015, p. 17.

GBRMPA stated that Pacific Reef had lengthened its approval process by choosing to apply for its EPBC and GBRMPA permits separately. Following amendments to the EPBC Act in 2009 this would no longer be possible and the two permits would be processed in parallel.[71]

Offsets

3.41 The Australian Government allows offsets to be used as a tool in managing matters of national environmental significance under the EPBC Act. The DoE defines environmental offsets as 'measures that compensate for the residual adverse impacts of an action on the environment.'[72]

3.42 The GBRMPA stated that all new developments must 'demonstrate how they will contribute to the successful delivery of the targets and objectives described in the Reef 2050 Long-Term Sustainability Plan'.[73] The principles of the Reef 2050 Plan state that decision-making should ensure that:

> Impacts are avoided and residual impacts mitigated. Offsets are considered only where impacts cannot be avoided or mitigated.[74]

3.43 In 2012, the Commonwealth Government developed an offsets policy for projects assessed under the EPBC Act. Offsets must be 'tailored specifically to the attribute that is being impacted',[75] for example if a project was releasing a nutrient that was impacting water quality then the offset should find an alternative means of reducing levels of that same nutrient in the local environment being impacted.

3.44 Despite this policy, Pacific Reef, the proponent of the proposed Guthalungra prawn farm, stated that:

> Unfortunately, we are not given too much guidance on how we achieve those offsets. We are basically told we have to come back to the department and explain to them how we are going to achieve them. I think if offsets are to be used as a management tool for development in general there has to be a solid framework for that as well, without developers having to go off on their own.[76]

3.45 The GRRMPA's 2014 *Strategic Assessment Report* recognised that a 'weakness' in the regulatory regime governing the GBR was that there was

71 Dr Russell Reichelt, GBRMPA, *Official Committee Hansard*, Canberra, 10 November 2015, pp 6-7.

72 Department of Environment, *Exhibit 16: Environment Protection and Biodiversity Conservation Act 1999: Environmental Offsets Policy*, October 2012, p. 7.

73 GBRMPA, Submission 12, p. 2.

74 Commonwealth of Australia, *Reef 2050 Long-Term Sustainability Plan*, 2015, p. 35.

75 Department of the Environment, *Exhibit 16: Environmental Protection and Biodiversity Conservation Act 1999: Environmental Offsets Policy*, October 2012, p. 8.

76 Mr John Moloney, Pacific Reef, *Official Committee Hansard*, p. 32.

'uncertainty for proponents and the public regarding offsetting requirements'. The Strategic Assessment Report recommended that GBRMPA:

> Develop a policy and supporting mechanisms to facilitate strategic and collaborative implementation of offsets across jurisdictions.[77]

3.46 The Australian and Queensland Governments have recently established the Reef Trust to deliver funding to projects addressing threats to the GBR. 'A component of Reef Trust funds will be derived from the pooling of offsets funds to compensate for residual significant impacts on the Great Barrier Reef.'[78] The Reef Trust is currently developing the approach and methodology it will use to calculate offset payments.[79] Pacific Reef indicated that its preferred means of offsetting the impacts of its proposed Guthalungra prawn farm is to fund, via the Reef Trust, improved land management practices on cane farms.[80]

Aquaculture in the Great Barrier Reef Region

3.47 The largest aquaculture industry in area adjacent to the GBR is prawn farming. Australia produced 3774 tonnes of farmed prawns in 2013-14, valued at over $66 million.[81] The majority of Australian farmed prawn production is undertaken by two North Queensland producers, Seafarms Group (approximately 1100 tonnes per year), and Pacific Reef (approximately 1000 tonnes per year).[82]

3.48 Barramundi is also farmed in the coastal region adjacent to the GBR. The GFB Fisheries produce 1000 tonnes of Barramundi per annum from two land based facilities in Bowen and Townsville.[83] A sea cage Barramundi farm previously operated in the Hinchinbrook Channel but this farm closed in 2011 following significant damage caused by Cyclone Yasi.[84]

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77 GBRMPA, *Great Barrier Reef Strategic Assessment: Strategic Assessment Report*, 2014, Townsville, pp 12—17.

78 Dutson, G., Bennun, L., Maron, M., Brodie, J., Bos, M., Waterhouse, J., 'Determination of suitable contributions as offsets within the Reef Trust', The Biodiversity Consultancy, February 2015, p. 5, https://www.environment.gov.au/system/files/resources/19eccee2-f9d2-4722-8f58-a11d81b5ff59/files/reef-trust-offsets.pdf Accessed 23 October 2015.

79 Department of the Environment, 'The Reef Trust', https://www.environment.gov.au/marine/gbr/reef-trust Accessed 23 October 2015.

80 Mr John Moloney, Pacific Reef, *Official Committee Hansard*, p. 32.

81 Australian Prawn Farmers Association (APFA), Submission 10, p. 3.

82 Seafarms Group, *Submission 4*, p. 1; Mr John Moloney, Pacific Reef, *Official Committee Hansard*, p. 33.

83 GFB Fisheries, *Submission 29*, p. 1.

84 QCA, *Exhibit 1: Aquaculture Regulation in Queensland Draft Report*, p. 2.

3.49 Pacific Reef suggested that the North Queensland coastline has 'numerous features that make it ideal for further aquaculture development.' These include:

- climate (extremely important from a biological viewpoint);
- large regional coastal areas suitable for development;
- existing transport infrastructure;
- existing power infrastructure;
- proximity to markets; and
- proximity to labour supply.[85]

3.50 The aquaculture industry in Queensland has been growing at a compound growth rate of 4 per cent per annum. This has been achieved through production improvements in existing aquaculture projects. Despite the potential for growth there have been no new aquaculture projects approved for development in the last decade.[86]

Impact of Regulations on the Aquaculture Industry in the Great Barrier Reef Region

3.51 Several stakeholders in the aquaculture sector were concerned that the regulatory environment in Northern Queensland was deterring further investment in the aquaculture industry in the region. James Cook University (JCU) stated that:

> The industry itself is the most sustainable and has the world's best practice in terms of environmental management. It has an interesting history, given that there were initially very few regulations and now there is very tight regulation. I think it is the lack of clarity of the regulation itself that hinders the growth.[87]

3.52 Overlapping regulations between the Queensland and Commonwealth Governments can result in approval processes being duplicated. The Australian Prawn Farmers Association (APFA) stated:

> Where there are conflicting environmental interests and requirements from State(s) and Federal government, these need to be resolved so that investors have confidence in applying for any new development.[88]

85 Pacific Reef, *Submission 6*, p. 2.

86 QCA, *Exhibit 1: Aquaculture Regulation in Queensland Draft Report*, p. 6.

87 Prof Rocky de Nys, Professor of Aquaculture, James Cook University (JCU), *Official Committee Hansard*, Townsville, 26 August 2015, p. 5.

88 APFA, *Submission 10*, p. 4.

3.53 Pacific Reef highlighted the duplication of processes it has experienced in attempting to have the Guthalungra approved and the impact that this process has had on the wider industry.

> The licencing process for the Guthalungra proposal has been long and complicated. Legislation and administrative processes have changed during this time and the process has been replicated with various federal and state departments…
>
> It will be critical for future investment to occur that this process be rationalised and streamlined. The issues we have had with obtaining approval for the Guthalungra facility have been widely publicised and this has deterred potential new investors.[89]

3.54 The CSIRO described current regulatory arrangements for aquaculture as creating a 'catch 22' situation where:

> … potential investors do not have the required certainty to invest in new aquaculture development projects and the lack of project proposals means that the regulatory requirements are yet to be developed and implemented. Where development has been stimulated and new projects are proposed the environmental requirements can be unclear.[90]

3.55 The Reef and Rainforest Research Centre (RRRC), whose representative had previously worked for GBRMPA and had been involved in developing the Aquaculture Regulations, believed that GBRMPA's policy position in relation to aquaculture has gone beyond the intent of the Aquaculture Regulations:

> The regulations are quite clear in their intent. That is to limit or constrain pollution or products that may harm plants and animals in the marine park. The policy that has gone around those regulations I think is very harsh, probably too harsh for the intent … I think the fact that it has constrained the industry totally is problematic, because we asked them to do a job; we asked them to change; they have changed, and I think that needs to be recognised.[91]

Aquaculture Regulation Relative to Other Industries

3.56 JCU stated that aquaculture that made up 'much, much less' than one per cent of the total nutrient load being discharged into GBR water. Given

89 Pacific Reef, *Submission 6*, p. 1.

90 CSIRO, *Submission 17*, pp 3-4.

91 Ms Sheriden Morris, Director, Reef and Rainforest Research Centre (RRRC), *Official Committee Hansard*, Cairns, 24 August 2015, p. 6.

this, JCU questioned the fairness of the strict regulatory framework for aquaculture stating:

> … a big issue here is the level playing field. An analogy often used is that if you want to set up a new aquaculture facility you have to meet the zero net discharge of nutrients and suspended solids, but a very new cane farm can be set up and operate without any sort of oversight.[92]

3.57 The Aquaculture Association of Queensland also questioned the strictness of regulations encountered by aquaculture in comparison to other industries stating:

> I am in the middle of the coal seam gas industry—I have seen things that they have been able to do when they apply for their environmental permits. It is not zero. It is never a zero issue. It is always: 'What is the local community happy with?' … I find it amazing that when we talk about our industries and the environment we talk about zero … but [the] mining industry can have something completely different.[93]

3.58 The GFB Fisheries highlighted that other agricultural industries, such as cane farms and banana farms, were greater sources of nutrient run-off into the GBR but that the Commonwealth Government has no regulatory powers over these industries. The Commonwealth only had regulatory power over aquaculture and GFB Fisheries has suggested it had used this to place a 'blanket ban on aquaculture development'.[94]

3.59 The GBRMPA stated that, while they were very concerned about the state of GBR waters, it accepted that aquaculture had not caused deterioration in water quality.[95]

3.60 The CSIRO, reflecting on the outcome of its research program into the environmental impacts of prawn aquaculture stated:

> Having successfully introduced the world's best pond-management practices and contributing less than one per cent of the biologically-based input into the GBR, there was an expectation by some in industry that they might be exempt from further restrictions and that more focus would be placed on

92 Professor Dean Jerry, Head of Aquaculture and Fisheries, JCU, *Official Committee Hansard*, Townsville, 26 August 2015, p. 6.

93 Mr Robert Bartley, President, Aquaculture Association of Queensland, *Official Committee Hansard*, Brisbane, 27 August 2015, p. 14.

94 Dr Kenneth Chapman, Director, GFB Fisheries, *Official Committee Hansard*, Cairns, 24 August 2015, p. 18.

95 Dr Russell Reichelt, , GBRMPA, *Official Committee Hansard*, Canberra, 10 November 2015, p. 3.

> improving the environment management of the sectors responsible for the other 99 per cent of the inputs.[96]

3.61 The RRRC noted that the inshore reef is 'clearly still under threat' and that aquaculture should have been a positive example of an industry that has adapted its processes to reduce environmental impacts.[97] The RRRC was concerned, however, that aquaculture would instead be seen as a negative example by other industries stating:

> I worry … about the fact that the [aquaculture] industry still seems under so much pressure and has had a tighter and tighter policy framework placed across it. For any group that cannot see the light at the end of the tunnel, where they are not meeting expectations no matter what they do, I think that sends really quite a poor message. We are going to be asking the sugar industry, the banana industry, the horticulture industry and the grazing industry to be making those substantive changes also. If we cannot give a message that it is possible, that you can make those changes, I think we have a very hard lot to push up a hill.[98]

Research into Environmental Impacts of Prawn Farming

3.62 Between 1995 and 2002, in Queensland and New South Wales, a program of research involving over 30 researchers was undertaken to study the environmental management of prawn farming. The research program was led by the CSIRO but also included representatives of a number of universities, research institutes and government departments.[99] The research program was a 'multidisciplinary study of intensive prawn pond ecosystems, their ecological impacts on downstream environments and the development of cost-effective effluent treatment systems'.[100]

3.63 The research program resulted in the production of 42 peer-reviewed publications and four final reports.[101] Major outputs of the program included: the development of techniques to track and quantify nutrients

96 Dr Nigel Preston, CSIRO, *Official Committee Hansard*, Canberra, 15 September 2015, p. 24.

97 Ms Sheriden Morris, RRRC, *Official Committee Hansard*, Cairns, 24 August 2015, p. 4.

98 Ms Sheriden Morris, RRRC, *Official Committee Hansard*, Cairns, 24 August 2015, p. 5.

99 Organisations involved in the research included: CSIRO; AIMS; University of Queensland; Queensland Department of Environment and Heritage; New South Wales Environment Protection Authority; Griffith University; University of Sydney; University of Technology Sydney; Marine and Freshwater Resources Institute, Victoria; and the University of Maryland, U.S.A.

100 APFA, *Submission 10b: 'The environmental management of prawn farming in Queensland – world's best practice'*, p. 1.

101 APFA, *Submission 10b: 'The environmental management of prawn farming in Queensland – world's best practice'*, p. 1.

discharged from prawn farms; a synthesis of the ecological processes taking place in prawn farms and surrounding environments; and the development of nutrient treatment processes based on settlement ponds and sedimentation processes.[102]

3.64 The research analysed untreated discharge from the Seafarms prawn farm and found that the discharge 'resulted in levels of elevated nutrients that were only transiently detectable for a short distance (2 kilometres) from the points of discharge and there were no obvious effects on downstream sediment processes.'[103]

3.65 The CSIRO state that contemporary prawn farms would be expected to have less environmental impact than the ones studied stating:

> I would emphasise that our studies were based on untreated discharge. Since then and because of the results of our research, every Australian prawn farm treats its discharge prior to either releasing it into adjacent environments or recirculating it. At the time, the largest prawn farm in Australia, Seafarms, was discharging into a tidal creek.[104]

3.66 The GBRMPA did not dispute the findings of the CSIRO research; however it questioned the applicability of the research to the environmental conditions at Guthalungra.[105]

3.67 The GBRMPA reported that the Seafarms site studied by CSIRO, in common with all other prawn farms, discharged into a creek. In contrast, the Guthalungra project proposed to discharge, via a pipeline, directly into the ocean at Abbot Bay.[106]

3.68 The creek that the Seafarms site discharged into flowed into the mangrove estuaries of the Hinchinbrook Channel. The GBRMPA highlighted the difference between the assimilative capacity of the waters in the Hinchinbrook Channel and at Abbot Bay. The Hinchinbrook Channel does not have coral and, due to the high quantity of mangroves, has a high capacity to assimilate nitrogen. By contrast, Abbot Bay is a system comprised of seagrass beds and coral. The GBRMPA advised that nutrient levels of the water in Abbot Bay are approximately double the levels recommended in GBRMPA's water quality guidelines. Consequently,

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102 APFA, *Submission 10b: 'The environmental management of prawn farming in Queensland – world's best practice'*, p. 1.

103 CSIRO, *Submission 17*, p. 4.

104 Dr Nigel Preston, CSIRO, *Official Committee Hansard*, Canberra, 15 September 2015, p. 23.

105 GBRMPA, *Submission 12.1*, p. 2.

106 Dr Russell Reichelt, GBRMPA, *Official Committee Hansard*, Canberra, 10 November 2015, p. 2.

Abbot Bay is considered to have an extremely limited capacity to assimilate further nutrients.[107]

3.69 The CSIRO asserted that's its research was relevant to the fate of nutrients in the marine environment of the GBR lagoon, stating:

> Our paper describes how the effluent, which we were able to track using isotope tracking techniques, changed in nature, and then, when it reached the marine park proper, in the Hinchinbrook Channel, the ability to detect the presence of that material only extended for a narrow zone, at maximum two kilometres.
>
> So this is also an in relation to statements that our work had not encompassed the lagoon. Because this material did reach the lagoon and we were tracking its fate in that lagoon, that statement is incorrect.[108]

3.70 The GBRMPA also questioned whether the assimilation of nitrogen, as found in the CSIRO research, necessarily indicated that there would be no impact on the GBR. The GBRMPA stated:

> We certainly do not dispute that the nitrogen is assimilated into the ecosystem, but that does not mean it does not end up in the marine park. Once it is taken up as dissolved nitrogen, it then turns into other forms of nitrogen such as particulate nitrogen in the form of algae or flocks of marine muddy snow—it is a sticky substance where nutrients bond and form what looks like a very fine snow, which can fall into the marine environment. It has got nutrients in it and it can stick to things like corals. We do not dispute the findings, but it did not cover the whole picture in terms of nutrients that could go into the marine environment.[109]

3.71 The RRRC explained the impact that marine snow can have on the ecosystem of the GBR, stating that fine particle nutrients from aquaculture can:

> … form a thing called marine snow, which is sticky stuff in the water—sticky biological material in the water. That can actually come down and form a bit of a blanket or impact the ecological system, like the benthos, corals and seagrass. We see a change in some of the discharge creeks from a diatom based system to a dinoflagellate type system, where bigger, healthier phytoplankton go down, which you think would be a good thing except that it

107 Dr Russell Reichelt, GBRMPA, *Official Committee Hansard*, Canberra, 10 November 2015, pp 2-3; GBRMPA, *Submission 12.1*, p. 2.

108 Dr Nigel Preston, CSIRO, *Official Committee Hansard*, Canberra, 15 September 2015, p. 23.

109 Mr Bruce Elliot, GBRMPA, *Official Committee Hansard*, Canberra, 15 September 2015, p. 23.

> allows some of our pests and other things to survive much more frequently and it gives bigger algal blooms, and some of those algal blooms can be toxic.[110]

3.72 The CSIRO, however, disputed the contention that aquaculture waste could be resuspended as marine snow and impact the GBR stating:

> So our observations … are that … beyond that two-kilometre zone you could not detect the presence of material on the reef. So the contention that it somehow gets resuspended and forms biological flocks and could reach coral reefs or seagrasses is not supported by the research in the real environments that we did over those seven years.[111]

3.73 In relation to the overall impact of aquaculture on the GBR the CSIRO stated that 'there have been no adverse environmental impacts on the GBR from the discharge of prawn farms for 30 years.'[112] This view was supported by JCU, which stated:

> Amongst the scientific community, the CSIRO and the universities, there is a very strong consensus that it is very, very, very, very difficult to find any impact of aquaculture on the Great Barrier Reef.[113]

Planning for Aquaculture

3.74 The CSIRO has identified that the Northern Territory, Queensland and Western Australia each have over 500 000 hectares of land that is potentially suitable for pond aquaculture development. The CSIRO also states that a 'lack of clarity in the zoning of this land means that investment in it for aquaculture purposes poses a high risk.'[114]

3.75 Several stakeholders highlighted that land and sea tenure issues in Northern Australia can create difficulties for aquaculture proponents to find suitable sites for farms. These issues included land tenure arrangements on State, Commonwealth, and Aboriginal and Torres Strait

110 Ms Sheriden Morris, RRRC, *Official Committee Hansard*, Cairns, 24 August 2015, p. 3.

111 Dr Nigel Preston, CSIRO, *Official Committee Hansard*, Canberra, 15 September 2015, p. 23.

112 Dr Nigel Preston, CSIRO, *Official Committee Hansard*, Canberra, 15 September 2015, p. 23.

113 Prof Rocky de Nys, JCU, *Official Committee Hansard*, Townsville, 26 August 2015, p. 6.

114 CSIRO, *Submission 17*, p. 3.

Islander owned land; and competition for land from growing urban areas, and sea and port areas from the oil and gas industries.[115]

3.76 As previously discussed, developing new aquaculture projects has proven difficult in environmentally sensitive areas such as in or adjacent to the GBR.

3.77 The greater use of zoning and spatial planning was identified as a potential means of stimulating growth in the aquaculture industry while minimising any negative impacts of development. The use of planning and zoning in the aquaculture sector was supported by representatives of the aquaculture industry,[116] regulators,[117] government agencies,[118] research institutes,[119] and environmental organisations.[120]

3.78 Issues relating to undertaking research to build up the baseline data needed to inform spatial planning and the implementation of development zones are further discussed below.

Development Zones

3.79 Aquaculture development zones aim to streamline approval processes and reduce the risk for potential investors by identifying suitable sites and providing clear and predictable regulatory requirements for setting up aquaculture operations.[121]

3.80 The use of marine aquaculture development zones is well established in South Australia and Tasmania, each of which have approximately 11 000 hectares of leasable development zone area.[122] The Western Australian Government has provided funding of $1.85 million for the establishment of two development zones; one in the Kimberley and one in the Abrolhos Islands region of the Mid West Coast of Western Australia.[123] No terrestrial aquaculture development zones have been created in these states.[124]

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115 NTDPIF, *Submission 13*, p. 3; Aquaculture Council of Western Australia, *Submission 8*, p. 4; Mr Chris Mitchell, Executive Officer, Regional Development Australia and Councillor, Shire of Broome, *Official Committee Hansard*, Broome, , 9 June 2015, p. 3; Mr Patrick Moase, General Manager, Clipper Pearls, *Official Committee Hansard*, Broome, 9 June 2015, p. 14.

116 Mr John Moloney, Pacific Reef, *Official Committee Hansard*, Brisbane, 27 August 2015, p. 30.

117 GBRMPA, *Submission 12*, p. 2.

118 Department of Agriculture (DoA), *Submission 11*, p. 4.

119 CSIRO, *Submission 17*, p. 3.

120 Pew Charitable Trusts, *Submission 24*, p. 2.

121 QCA, *Exhibit 1: Draft Report Aquaculture Regulation in Queensland*, July 2014, p. 37.

122 QCA, *Exhibit 1: Draft Report Aquaculture Regulation in Queensland*, July 2014, pp 20, 22.

123 WADF, *Submission 23*, p. 1.

124 QCA, *Exhibit 1: Draft Report Aquaculture Regulation in Queensland*, July 2014, p. 19.

3.81 Prior to the implementation of a development zone, state government agencies will undertake an environmental impact assessment and work with the Commonwealth Government to obtain EPBC Act approval if necessary.[125] BMT Oceanica stated that under normal approval processes many proponents, especially smaller businesses, did not have the knowledge or budget to undertake environmental impact assessments and this increased delays and uncertainty. In comparison, development zones required less specialist knowledge from proponents, were less costly, and provided greater certainty for investors.[126]

3.82 Pacific Reef stated that when governments considered potential sites for development zones it was critical that they considered 'not just the … environmental or regulatory factors, but also biological and economic factors'.[127]

Kimberley Aquaculture Development Zone

3.83 In August 2014, the Western Australia Government established the Kimberley Aquaculture Development Zone (KADZ) in the Cone Bay region of the Kimberley. The KADZ is Western Australia's, and Northern Australia's, first aquaculture zone. The KADZ encompasses an area of almost 2000 hectares and permits up to 20 000 tonnes of finfish production annually.[128]

3.84 Marine Produce Australia's (MPA) barramundi farm at Cone Bay is located within the KADZ. The MPA started farming barramundi in Cone Bay in 2004, originally with a permit to produce 1000 tonnes per annum. The MPA successfully petitioned for an extension of the permit to 2000 tonnes per year in 2012. Discussions with the WA Government in relation to further expansion provided the impetus for the creation of the KADZ with a 20 000 tonne limit and the potential for multiple operators. The MPA currently has a permit for 7000 tonnes of barramundi per annum.[129]

3.85 The Western Australian Office of the Environmental Protection Authority (EPA) supported the development of aquaculture zones such as the KADZ stating that they were of benefit to the 'agency, … the environment, and I

125 QCA, *Exhibit 1: Draft Report Aquaculture Regulation in Queensland*, July 2014, pp 20, 22.

126 Mr Mark Bailey, Co-Managing Director, BMT Oceanica, *Official Committee Hansard*, Perth, 11 June 2015, pp 9-10.

127 Pacific Reef, *Submission 6*, p. 2.

128 WADF, 'Frequently asked questions – Kimberley Aquaculture Development Zone', http://www.fish.wa.gov.au/Fishing-and Aquaculture/Aquaculture/Aquaculture%20Zones/Pages/Frequently-asked-questions-KADZ.aspx Accessed 30 October 2015.

129 Dr Desiree Allen, Managing Director, Marine Produce Australia Ltd (MPA), *Official Committee Hansard*, Perth 11 June 2015, pp 50-51.

think they benefit proponents and de-risk projects'.[130] The EPA added that in the development of the zone the WA Government went through:

> … a site selection process. You are essentially deciding if there are any fatal flaws for that activity occurring in that area … So it was not a particular company, it was a state government proponent … It is a very streamlined process. There is no sort of de novo assessment. The primary assessment has been undertaken at a strategic level, and the subsequent one, so long as it fits within those criteria, should be relatively straightforward. That is the intent of strategic assessments of strategic proposals. Basically a new proponent can come along and … they have to get a licence through the Department of Fisheries [to] occupy a site within that, so long as they meet those criteria.[131]

3.86 The process for approving leases to potential proponents was yet to be announced at the time of the Committee's public hearings in Broome and Perth and several stakeholders expressed confusion surrounding the process of approving leases within the KADZ.[132] Since that time, the WA Government has released its guidelines for the approvals processes to be used in all aquaculture development zones. Potential proponents will be required to apply to the WADF for both a license to operate and a physical lease. The process used to assess the license will 'generally predominate and consequentially be used to determine the outcome of the process.' [133]

3.87 Assessment of license applications will consider issues including: the proponent's previous aquaculture experience; business viability; employment and economic benefits; and environmental and biosecurity risks. Leases will be assessed by the Minister for Fisheries using similar criteria but also considering whether the proponent will make, or has made, effective use of the lease site. If multiple proponents are applying for the same lease area their applications will be assessed competitively.[134]

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130 Dr Ray Masini, Manager Marine Ecosystems Branch, Office of the Environmental Protection Authority (EPA), *Official Committee Hansard*, Perth, 11 June 2015, p. 6.

131 Dr Ray Masini, EPA, *Official Committee Hansard*, Perth, 11 June 2015, p. 3.

132 Mr Stephen Gash, Chief Executive Officer, Shire of Derby/West Kimberley, *Official Committee Hansard*, Broome, 9 June 2015, pp 3-4; Mr Steven Gill, General Manager, Maxima Opportunity, *Official Committee Hansard*, Perth 11 June 2015, p. 45.

133 WADF, *Aquaculture Development Zones in Western Australia: Policy principles relating to considerations for aquaculture licenses and leases*, September 2015, p. 3.

134 WADF, *Aquaculture Development Zones in Western Australia: Policy principles relating to considerations for aquaculture licenses and leases*, September 2015, pp 4-6.

Development Zones in the Northern Territory

3.88 The NTDPIF 'has long recognised that planning for both land-based and marine aquaculture is a key factor supporting the future long-term sustainable development of the aquaculture industry.'[135]

3.89 The NTDPIF is planning to analyse the availability of resources to support aquaculture businesses in the regions surrounding Darwin and Nhulunbuy, with a long term objective of establishing aquaculture zones in these regions.[136]

Development Zones in Queensland

3.90 The greater use of planning to identify suitable aquaculture sites in the GBR region was supported by both regulators and industry stakeholders. The GBRMPA recommended that any expansion of aquaculture in the GBR should be underpinned by planning that includes:

- A review of the ecosystem health and sustainability science as it applies to the aquaculture industry in the Great Barrier Reef Region;
- Development of assessment guidelines to determine the assimilative capacity of waterways in the Great Barrier Reef Region to accept the discharge of aquaculture wastewaters (particularly sediment and nutrient loads); and
- A site selection process for the location of new aquaculture facilities in the Great Barrier Reef Region based on the assimilative capacity of the receiving waterways.[137]

3.91 These objectives were supported by the APFA[138] and Pacific Reef, which in response to the GBRMPA objectives stated:

> There is an urgent need for this to be done rigorously and transparently. The CSIRO Marine and Atmospheric Research department already has a coastal environmental modelling team. An adaptation of their existing modelling work could deliver these outcomes that we require.[139]

3.92 Pacific Reef's support was due, in part, to its perception that in the absence of evidence on assimilative capacity regulators tended to assume it was already exceeded.[140] Pacific Reef stated that the GBRMPA's three requirements would form the basis of:

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135 NTDPIF, *Submission 13*, p. 5.

136 NTDPIF, *Submission 13*, p. 5.

137 GBRMPA, *Submission 12*, p. 2.

138 APFA, *Submission 10*, p. 3.

139 Mr John Moloney, Pacific Reef, *Official Committee Hansard*, Brisbane, 27 August 2015, p. 30.

140 Mr John Moloney, Pacific Reef, *Official Committee Hansard*, Brisbane, 27 August 2015, p. 30.

> … a good framework around which to manage our industry. Currently they do not have that framework. It is left in the hands of individual bureaucrats that try to basically create their own framework each time.[141]

3.93 The GBRMPA suggested that developing a spatial planning framework for aquaculture should involve industry and all relevant government agencies. The spatial planning framework should identify areas, potentially including development zones, where specific activities have been pre-analysed for risk and approvals can be expedited.[142]

3.94 The GBRMPA also recommended that the spatial planning framework be based in legislation and able to harmonise the impacts of existing relevant Commonwealth and Queensland legislation.[143]

3.95 The CSIRO highlighted the success of Gold Coast City Council in sustainably expanding its prawn farming industry and suggested this had been based on the use of a spatial planning framework to support the selection of appropriate sites for aquaculture developments.[144]

3.96 The Queensland Competition Authority's (QCA) draft recommendations from its review of aquaculture regulation included a recommendation for the state government to implement development zones enabling 450 hectares of aquaculture operations within two years. The QCA emphasised that the Queensland Department of Agriculture, Fisheries and Forestry has already undertaken preliminary investigations into suitable areas for aquaculture and that there were also approved but unused sites that could allow for the 'early identification of development areas'.[145]

3.97 The QCA recommended that development applications for projects within the aquaculture zones should be assessed using a planning code which would consider: impacts on groundwater; permitted species; nutrient and sediment discharge limits; offsets; location of intake and discharge structures; the impact of construction on acid sulphate soils, vegetation, and threatened species; operational restrictions relating to biosecurity, and impacts on local residents.[146]

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141 Mr John Moloney, Pacific Reef, *Official Committee Hansard*, Brisbane, 27 August 2015, p. 30.

142 Dr Russell Reichelt, GBRMPA, *Official Committee Hansard*, Canberra, 10 November 2015, pp 5, 7.

143 Dr Russell Reichelt, GBRMPA, *Official Committee Hansard*, Canberra, 10 November 2015, p. 7.

144 CSIRO, *Submission 17,* p. 5.

145 QCA, *Exhibit 1: Draft Report Aquaculture Regulation in Queensland*, July 2014, p. ix.

146 QCA, *Exhibit 1: Draft Report Aquaculture Regulation in Queensland*, July 2014, p. ix.

Other Regulatory Issues

Convention on the International Trade in Endangered Species

3.98 Trade in endangered species is regulated using the Convention on the International Trade in Endangered Species (CITES).[147] The DoE stated that species listed under CITES always required a CITES export permit because 'the primary aim of CITES was to ensure that international trade in wild flora and fauna is legal, sustainable and traceable and does not threaten species' survival.'[148]

3.99 Hartley's Creek Crocodile Farming Company (Hartley's) reported that the time taken to get CITES export permits from the Australian Government was having a detrimental impact on its business. Hartley's stated that despite the application for an export permit being completed online, the government had eight weeks to process the form. Hartley's tanned some of its skins overseas and brought them back to Australia for manufacture. Hartley's explained that the eight week wait for processing occurred in both the exporting and importing stages.[149]

3.100 Hartley's also reported that the eight week wait for export permits applied to single manufactured items and that this time lag was acting as a barrier to it selling its goods online.[150]

3.101 Conversely, Koorana Crocodile Farm (Koorana) did not consider CITES permits to be a problem stating that 'with the Australian multi-use permits I can go home and write out a permit tomorrow, just on the computer, and that is approved and ready to go'. Koorana added that it supported CITES as a 'very important aspect of international regulation'.[151]

3.102 Both Hartley's and Koorana stated they tanned their crocodile skins overseas due to a lack of suitable tanneries in Australia. Both companies noted that they paid import duties on the skins as they came back into Australia despite retaining ownership of the skins during the whole process. Koorana stated that the addition of GST and the import duty made its tanned skins 'non-competitive on the international market'.[152]

147 In Australia it is also regulated via the EPBC Act.

148 Department of the Environment, *Submission 21*, p. 3.

149 Mrs Angela Freeman, Co-Owner, Hartley's Creek Crocodile Farming Company (Hartley's), *Official Committee Hansard,* Cairns 24 August 2015, p. 12.

150 Mrs Angela Freeman, Hartley's, *Official Committee Hansard*, Cairns, 24 August 2015, p. 12.

151 Mr John Lever, Owner, Koorana Crocodile Farm (Koorana), *Official Committee Hansard*, Brisbane, 27 August 2015, p. 26.

152 Mr John Lever, Koorana, *Official Committee Hansard*, Brisbane, 27 August 2015, p. 27.

Crocodile Egg Harvesting

3.103 Crocodile numbers in the NT declined to about 3000 in the 1960s and 1970s, but since that time a combined program of conservation and commercialisation had seen numbers recover to around 100 000.[153] The collection of crocodile eggs from the wild for use in farming has been an important element in the successful conservation and commercialisation of crocodiles in the NT. Wildlife Management International explained the link between the egg collection and the conservation of the species, stating:

> The landowners all know that the eggs are valuable, how many eggs they have and that we can collect something like 50 000 or 60 000. It is an asset. There are still problems with crocs but the public see them as a commercial asset. They see them generating real money for people who do not have many other sources. So it has worked—our population has recovered—but we had to change the paradigm. We see this with predators and conservation all the time. The efforts made to rebuild predator numbers are great, but what are you going to do when you rebuild them? You have got to have a second part of the plan: if the conservation works, how you are then going to consolidate. That is what we did here.[154]

3.104 Crocodile eggs are not able to be collected from the wild in either Queensland or Western Australia. Queensland crocodile farmers reported that there is little research justifying the ban on egg collection. Koorana stated that the numbers of crocodiles and eggs was unknown because 'there has never been a proper survey done', although they believed there was currently a researcher working for the state government undertaking research in Cape York.[155]

3.105 Queensland crocodile farmers believed that eggs could be collected in Queensland sustainably, noting that less than one per cent of eggs in the wild successfully grow into adult crocodiles with most being destroyed in seasonal floods. Koorana reported that egg collection had not had a detrimental impact on wild crocodile numbers in the NT stating:

> What they found in the Northern Territory is that it does not matter how many eggs you collect, the population in the Northern

153 Mr Michael Burns, Managing Director, Porosus, *Official Committee Hansard*, Darwin 14 July 2015, p. 41; Professor Grahame Webb, Director, Wildlife Management International, *Official Committee Hansard*, Darwin 14 July 2015, p. 39.

154 Professor Grahame Webb, Wildlife Management International, *Official Committee Hansard*, Darwin 14 July 2015, p. 40.

155 Mr John Lever, Koorana, *Official Committee Hansard*, Brisbane, 27 August 2015, p. 24.

> Territory is still going up by 15 per cent a year simply because you never get all of the eggs.[156]

3.106 The ban on crocodile egg collection makes it very difficult for new producers to enter the industry. The rights to collect eggs in the NT are wholly allocated to established farmers with no capacity for new producers. Hartley's described the challenges to entering the industry as 'insurmountable' stating:

> Where are you going to get 30, 40, or 50 breeding pairs of crocodile from? It takes 10 years before the females can even start producing eggs.[157]

A large breeding saltwater crocodile

Aquaculture Licences and Permits

Pearl Licenses

3.107 Clipper Pearls described the cost of lease and licensing fees in the pearl industry as 'exorbitant'.[158] Cygnet Bay Pearls suggested the current environment where the pearl industry in Australia was rapidly declining in value was the perfect time to undertake deregulation of the industry. Cygnet Bay Pearls stated that the potential risk to the industry from deregulation is 'currently minimal and all opportunities to reduce unnecessary cost to the industry need to be implemented to allow the industry to adapt to the current circumstances'.[159]

156 Mr John Lever, Koorana, *Official Committee Hansard*, Brisbane, 27 August 2015, p. 24.

157 Mrs Angela Freeman, Hartley's, *Official Committee Hansard*, Cairns 24 August 2015, p. 13.

158 Clipper Pearls, *Submission 20*, p. 2.

159 Cygnet Bay Pearls, *Submission 27*, p. 6.

Trepang Licenses

3.108 The NT Government issued six licenses for the fishing of trepang in the NT waters. These licenses were all purchased by Tasmanian Seafoods on the open market during the period from the late 1980s until 1993.[160]

3.109 Fishing levels are currently very low (29.5 tonnes in 2013) relative to the peak harvest of 285 tonnes in 1999.[161] The recent low harvest rates were primarily due to the difficulties of attracting divers due to the potential dangers of crocodiles and jellyfish and the competition for labour due to the oil and gas boom.[162]

3.110 Trepang fishing licenses are renewed annually and are not contestable despite the fact that Tasmanian Seafoods is not currently actively using all the licenses.[163]

3.111 From 2012, the NT Government made available three licenses for sea ranching trepang. Sea ranching involves collecting juveniles which are reared in a hatchery and then released into the wild to mature and eventually be harvested.

3.112 Tasmanian Seafoods, Tropical Aquaculture Australia (TAA), and the NTDPIF currently hold one sea ranching license each.[164] TAA stated it had previously approached Tasmanian Seafoods to consider a partnership but Tasmanian Seafoods had declined. TAA had then spent 10 years working towards being granted an aquaculture license, which occurred in 2012.[165] To date TAA has not started commercially operating the license due to the inability to attract financing for the project.[166]

3.113 Tasmanian Seafoods stated that they were not using all the licenses due to concerns about potential overfishing. Trepang move extremely slowly (approximately 400 metres per year) and the ease with which they can be

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160 Mr Chauncey Hammond, Commercial Advisor, Tasmanian Seafoods, *Official Committee Hansard*, Darwin 14 July 2014, p. 53.

161 DoE, 'Northern Territory Trepang Fishery – 2014', May 2014, https://www.environment.gov.au/system/files/pages/03d85b1d-e015-4e61-a278-1bba4c8f54df/files/application-2014-progress-report.pdf Accessed 28 October 2015; NTDPIF, Trepang Fishery Status Report 2012, http://www.nt.gov.au/d/Content/File/p/Fish_Rep/12_FR113_Trepang.pdf Accessed 28 October 2015.

162 Mr Chauncey Hammond, Tasmanian Seafoods, *Official Committee Hansard*, Darwin 14 July 2014, p. 53.

163 Mr Glenn Schipp, Director, Fisheries and Aquaculture, NTDPIF, *Official Committee Hansard*, Darwin, Tuesday, 14 July 2015, pp 4–6.

164 Mr Chauncey Hammond, Tasmanian Seafoods, *Official Committee Hansard*, Darwin 14 July 2014, p. 53; Mr Philip Elsegood, Director, Tropical Aquaculture Australia (TAA), *Official Committee Hansard*, Darwin, 14 July 2015., p. 47.

165 Mr Philip Elsegood, Director, TAA, *Official Committee Hansard*, Darwin, 14 July 2015, pp 47, 51.

166 Mr Philip Elsegood, TAA, *Official Committee Hansard*, Darwin, 14 July 2015, pp 47–51.

caught has previously led to the collapse of trepang fisheries in areas such as the Torres Strait, Papua New Guinea and the Pacific.[167] Tasmanian Seafood stated:

> If we could use all six licences, we would be using them fully … We think that if all six licences were working, there would not be a fishery—because you would actually fish it out: it would be a competitive fishery, which means it would be first in, best dressed; those that got out there and fished the hardest and caught the most. Well, this species is easily exploitable. We have seen that all around the world. So we are actually very much about controlling it and making sure that a sustainable amount is taken out. If we took out more than that, on just a commercial basis, we could probably make a lot of money for one or two years, and that would be it.[168]

3.114 Despite not actively using all of its fishing licenses Tasmanian Seafoods had been investing in research for over ten years. The research focussed on the productivity of the fishery, diving patterns, and the genetic analysis of the wild trepang population in Northern Australia.[169]

Committee members with Mr Grant Leeworthy, Tasmanian Seafoods, at the Darwin Aquaculture Centre inspecting cultured trepang

167 Mr Philip Elsegood, TAA, *Official Committee Hansard*, Darwin, 14 July 2015, pp 49, 50.

168 Mr Chauncey Hammond, Tasmanian Seafoods, *Official Committee Hansard*, Darwin, 14 July 2015, p. 56.

169 Tasmanian Seafoods, *Submission 16*, p. 2.

Biosecurity

3.115 The RRRC stated that part of the driver for greater regulation of the aquaculture industry in the period from 2000 was due to the biosecurity and disease risk, primarily to the industry itself, caused by aquaculture pollution.[170] The CSIRO commented that whilst the intensive nature of aquaculture did pose disease risks that the 'stringent' biosecurity regime reduced these risks and that there were no examples of aquaculture operations causing diseases to spread to adjacent environments.[171]

3.116 The AIMS noted that biosecurity risks were higher for aquaculture operations in Northern Australia than Southern Australia, both due to greater proximity to Asia and due to the increased danger from diseases in tropical climates.[172]

3.117 The DoA stated that one of the biosecurity risks it was attempting to address was the risk of diseases spreading into the food chain through the use of imported prawns as fishing bait.[173] Finfish Enterprise highlighted the ornamental fish trade as a biosecurity risk, describing it as 'poorly regulated' and highlighting that last year a virus had entered Australia through this trade.[174]

3.118 The Australian Barramundi Farmers Association (ABFA) described Australia's relatively low disease levels as a 'competitive edge'.[175] The ABFA reported that the Southeast Asian barramundi industry was affected by serious diseases such as iridovirus, which it described as the aquatic equivalent of foot and mouth disease. Iridovirus could be devastating for the local aquaculture industry and local wild barramundi populations and if the disease entered Australia it would be very difficult to contain.[176]

3.119 Humpty Doo Barramundi expressed concern that not enough was being done to protect Australia's biosecurity. Humpty Doo Barramundi pointed to the recent impact of disease outbreaks in horticultural industries as an example of the risk that poor biosecurity could pose to agricultural

170 Ms Sheriden Morris, RRRC, *Official Committee Hansard*, Cairns, 24 August 2015, p. 1.

171 CSIRO, *Submission 17*, p. 4.

172 AIMS, *Submission 31*, p. 2.

173 Mr Ian Thompson, First Assistant Secretary, DoA, *Official Committee Hansard*, Canberra, 15 September 2015, p. 2.

174 Dr Richard Knuckey, General Manager, Finfish Enterprise, *Official Committee Hansard*, Cairns, 24 August 2014, p. 34

175 Australian Barramundi Farmers Association (ABFA), *Submission 3*, p. 2.

176 Mr Marty Phillips, President, ABFA, *Official Committee Hansard*, Cairns, 24 August 2015, p. 24.

industries and recommended greater investment in inspections and risk assessments.[177]

3.120 Mainstream Aquaculture currently grows out barramundi in Singapore (using Australian fingerlings), processes the fish in Singapore, and then imports fillets back into Australia. Mainstream Aquaculture would like to import whole fish into Australia, for processing in a plant in Darwin, as this would improve the shelf life of its product. Currently, the importation of whole fish is prohibited; however Mainstream Aquaculture has applied to the DoA to have its Singapore premises audited to potentially allow exportation to Australia.[178]

Concluding Comment

3.121 The successful melding of science and technology within the aquaculture industry has the potential to make an extraordinarily valuable contribution to the economy of Northern Australia and, more broadly, the nation.

3.122 The Committee recognises that long-term constraints to aquaculture development are increasingly being resolved by new technology such as algal treatment systems. The Committee, when it visited James Cook University's macroalgae research facility observed the successful application of various algae species to treat waste water and produce a potentially valuable and commercial by-product.

Great Barrier Reef Region Regulatory Framework

3.123 The Committee recognises that the Great Barrier Reef is a significant environmental asset and ensuring its long term health is of central importance to the economy of Northern Queensland and more broadly Australia.

3.124 Reducing nutrient run-off from existing developments is a difficult environmental management challenge for regulators and it is understandable that high standards of environmental management need to be placed on new developments. Nevertheless, the regulation of aquaculture appears to have impeded the development of the industry to a degree not commensurate with its projected impact on the health of the Great Barrier Reef.

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177 Mr Robert Richards, Managing Director, Humpty Doo Barramundi, *Official Committee Hansard*, Darwin, 14 July 2015, pp 35–36.

178 Mr Boris Musa, Managing Director, Mainstream Aquaculture, *Official Committee Hansard*, Townsville, 26 August 2015, pp 38–39.

3.125 Pacific Reef Fisheries had been seeking approval for its proposed Guthalungra prawn farm for over 14 years before receiving approval from the Great Barrier Marine Park Authority in December 2015. Full development approval from the relevant local shire council which is expected by June 2016 will enable the project to proceed.[179] The Committee believes that the example provided by this project has deterred investment in aquaculture in Northern Queensland by demonstrating that meeting environmental requirements is overly onerous and economically unviable.

3.126 The Committee accepts that the zero net discharge condition placed on the Guthalungra project was never intended as a standard to be applied to all new aquaculture developments. Yet the regulatory framework for aquaculture in Northern Queensland remains complex and unclear.

3.127 The Committee is of the view that the most pressing need for the aquaculture industry in Northern Queensland is regulatory clarity.

3.128 The Committee supports the intention of Great Barrier Reef Marine Park Authority to revoke the Great Barrier Reef Marine Park (Aquaculture) Regulations 2000 (Cwlth). These regulations have been not been used for a decade due to the accreditation of Queensland regulations. The potential for them to be 'switched on', however, contributes to regulatory uncertainty.

3.129 The Committee believes that relevant scientific organisations such as the Commonwealth Scientific and Industrial Research Organisation, the Australian Institute of Marine Science, and James Cook University should undertake a review of the science underpinning the environmental impacts of aquaculture. This should expand upon, rather than replace, the previous work undertaken by these organisations and their collaborators in the period from 1995 to 2002. As a matter of course, the review should aim to be comprehensively informed by the science needs of the aquaculture industry and its regulators.

3.130 The Committee acknowledges that if implemented effectively, the use of offsets to compensate for the environmental impacts of developments can provide flexibility for developers while still maintaining environmental outcomes. Currently in the GBR region, however, the policy framework is inadequate and is placing an inordinate burden on proponents. The Committee welcomes the work of the Reef Trust in developing a framework for offsets in the region. The framework should be intuitive and transparent for prospective developers. It is essential for business planning that developers are able to predict the quantity of offsets required, their costs, and the method of implementing them.

179 Pacific Reef, *Submission 6.1* , p. 1.

Planning for Aquaculture

3.131 The Committee is heartened by the degree to which there is common ground amongst stakeholders as to how to resolve the development impasse occurring in Northern Queensland. Greater collaboration between industry, regulators, and the scientific community should be encouraged. The Australian Prawn Farmers Association's proposed Stewardship Action Plan is one example of such collaboration. The Commonwealth and Queensland Governments will need to play a key role in facilitating this collaboration.

3.132 The greater use of planning mechanisms, including development zones, is supported by almost all stakeholders. In the Great Barrier Reef region, key criteria for identifying aquaculture zones should include the assimilative capacity of nearby waterways. By identifying waterways with assimilative capacity it will be possible for aquaculture projects to discharge nutrients at levels that are necessary for economic viability but also minimise any impacts on the environment. The criteria for aquaculture zones should also include economic criteria such as infrastructure and workforce availability.

3.133 The Committee supports the draft recommendation of the Queensland Competition Authority that identifying 450 hectare aquaculture zones within two years is achievable.

3.134 The Western Australian Government is moving forward with developing aquaculture development zones. The Northern Territory Government too is moving in this direction by undertaking an initial survey of infrastructure and services with the long term objective of implementing aquaculture zones in the Darwin and Nhulunbuy regions.

3.135 The Committee believes that the capacity of emerging technologies to address the environmental concerns related to aquaculture should be considered when assessing viable locations to implement aquaculture development zones.

Other Regulatory Issues

3.136 The ban on crocodile egg harvesting in Queensland is an impediment to the entrance of new farms into the Queensland crocodile industry. The number of crocodile eggs in Queensland, and whether there is a sufficient supply to enable sustainable harvesting, is unknown. The Committee believes a survey should be undertaken to assess crocodile egg numbers and determine the sustainability of possible crocodile egg harvesting.

3.137 The Committee supports the development of an Aboriginal and Torres Strait Islander managed trepang industry. Consideration should be given to the process for allocating aquaculture licenses for trepang and also to

the level of government support which could assist the development of the industry.

State Government Engagement

3.138 The Committee is disappointed that the Queensland and Western Australia Governments did not appear at the Committee's public hearings. The Committee would have valued the opportunity to discuss with the Western Australian Government its insights into the challenges encountered in implementing aquaculture development zones. The Committee is keenly interested in the issue of aquaculture developments in the GBR region and it was unfortunate that a key stakeholder such as the Queensland Government was unable to contribute to the Inquiry.

Recommendations

Recommendation 2

3.139 **The Committee recommends that the Department of the Environment, in collaboration with the Queensland Government, fund a program to review and expand the science relating to the environmental impact of aquaculture in areas adjacent to the Great Barrier Reef. The review should include research organisations with recognised expertise in this area including, but not limited to: the Commonwealth Scientific and Industrial Research Organisation, the Australian Institute of Marine Science, and James Cook University.**

The research should be an examination of:

- **the capacity of new technologies and management techniques to treat water to a standard that effectively eliminates nutrient discharge into the surrounding ecosystem;**
- **the capacity of different ecosystems to absorb and assimilate any residual nutrient discharges; and**
- **the relative environmental impacts of aquaculture farming of different species, and using different farming techniques (e.g. land-based, sea cage, ranching, recirculating systems).**

Recommendation 3

3.140 **The Committee recommends that the Department of the Environment and the Great Barrier Reef Marine Park Authority support the Queensland Government in determining the need for and the positioning of special aquaculture development zones. These zones should be identified using criteria, considering:**

- **the capacity of new technological developments to address nutrient discharge;**
- **the ability of nearby waterways to assimilate nutrient discharges to ensure that extra nutrients do not reach the Great Barrier Reef; and**
- **economic considerations including access to necessary infrastructure and labour force, and the biological suitability of sites for targeted aquaculture species.**

Recommendation 4

3.141 **The Committee recommends that the Great Barrier Reef Marine Park Authority, in accordance with the planned actions outlined in its Regulatory Plan 2014-2015, revoke the Great Barrier Reef Marine Park (Aquaculture) Regulations 2000 (Cwlth).**

Recommendation 5

3.142 **The Committee recommends that the Department of the Environment ensures the framework for developing offsets in the Great Barrier Reef is comprehensive, transparent and accessible for potential aquaculture investors. The framework should allow potential investors to accurately estimate:**

- **the quantity of offsets required;**
- **the cost of the required offsets; and**
- **how the offsets will be implemented.**

Recommendation 6

3.143 **The Committee recommends that the Queensland Government conduct a survey of crocodile egg numbers in Northern Queensland to determine the sustainability of crocodile egg harvesting.**