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Centre of Excellence for Biosecurity Risk Analysis

CEBRA Report Cover Page

Title, ID, & Output #	*Increasing confidence in pre-border risk management, 170602, Deliverable 4, Final Report*		
Project Type	*Standard*		
DAFF Project Sponsor	*Robyn Martin (at inception Tim Chapman)*	**DAWR Project Leader/s**	*Allan Mooney*
CEBRA Project Leader	*Susie Hester*	**NZ MPI Collaborator**	*N/A*
External Collaborator	*Associate Professor Arthur Campbell, Department of Economics, Monash University*		
Project Objectives	*The objectives of this two-year project are to investigate:* • *the current behaviour of Competent Authorities (CAs) in their regulation of exporters for a range of aquatic animal-product pathways, with a view to improving the design of future import requirements;* • *the complementary role that assurance (industry and international and departmental) schemes may provide on pathways associated with CAs;* • *the evidence that could be collected (or collated) from post-arrival surveillance that would give insights into the behaviour of import supply-chain participants on these pathways; and* • *options for the department to design import requirements that would align the objectives of import supply-chain participants with those of the Australian Government.*		
Outputs	***Year 1*** *1. Scoping Document that refines and describes the nature of analysis (theory, interviews), pathways of interest and availability of data* *2. Interim Report on the investigation into compliance by CAs* ***Year 2*** *3. Confirmation of plan for stage 2 of project* *4.Final Report*		

CEBRA Workplan Budget	**Year 2017-18**	**Year 2018-19**		
	$97,000	*$107,000*		

Project Changes	*None*
Research Outcomes (Planned)	• *Improved confidence in the biosecurity performance of specific imported aquatic animal-product pathways;* • *Strengthened post-arrival surveillance capacity for detection of non-compliant goods that were certified by the CA;* • *An enhancement of the initiatives already undertaken by the department to better-manage biosecurity risk* • *Improved relationships with CA partners through communication of information related to performance.* • *An augmentation of the knowledge base within the department on the importance of considering the incentive properties of inspection rules (e.g. Carrots and Sticks projects)*
Recommendations	*1. That a targeted investigation of finfish pathway be undertaken* *2. That non-verifiable rules be identified and replaced with rules that are verifiable and provide equivalent levels of assurance* *3. That interviews with offshore CAs be undertaken* *4. That CAs be provided with regular feedback reports on certification performance* *5. That the impact of feedback reports be measured during the roll-out period.* *6. That an incentive-based mechanism for finfish be implemented to correct mis-alignment of incentives* *7. That third-party certification schemes be investigated as complements to border inspections.* *8. That inconsistencies in data entry be removed to allow for more rapid data analysis*
Related Documents	*Scoping Document (December 2017); Interim Report (June 2018); Plan for stage 2 (August 2018)*
Report Complete	*Yes, SAC Review comments incorporated.*

CEBRA Project 170602:
Increasing confidence in pre-border risk management

Final Report

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Table of Definitions

Agriculture Import Management System (AIMS): The primary import software used by the Department of Agriculture,Water and the Environment to manage biosecurity and food safety risks associated with imported cargo, track and record imported consignments and assign fees, and collect revenue on imported cargo. Entries of potential biosecurity concern are referred to AIMS from the Integrated Cargo System.

Approved arrangements: Voluntary arrangements, defined in Chapter 7 of the *Biosecurity Act 2015*, that allow persons to carry out activities to manage the biosecurity risks associated with specified goods, premises or other things. An AA can cover all biosecurity activities involving the physical handling of goods, such as storage, inspections and post-entry quarantine requirements, at one or more approved sites. It may also cover biosecurity activities that don't involve the physical handling of goods, such as documentary assessment for goods subject to biosecurity control by accredited persons or performing health-related measures to control or kill insect vectors of human diseases on aircraft. Both physical and nonphysical biosecurity activities can be grouped together under the same AA.

Aquatic Animal Health Code (Aquatic Code): Developed by the OIE and aimed at assuring the sanitary safety of international trade in aquatic animals, and their products.

ALOP (Appropriate Level of Protection): Under the Sanitary and Phytosanitary Measures Agreement, World Trade Organization members are entitled to maintain a level of protection they consider appropriate to protect life or health within their territory. Australia's ALOP is expressed as providing a high level of sanitary and phytosanitary protection aimed at reducing risk to a very low level, but not to zero.

AEP (Automatic Entry Processing): An Approved Arrangement under which accredited customs brokers or self-reporting importers perform documentation assessments for non-commodity documentation and, for selected commodities, commodity documentation on behalf of the department. Brokers using AEP enter an additional 'AEP code' when lodging a full import declaration into the Integrated Cargo System, which, when the entry is referred to AIMS, triggers the automatic application of the subsequent direction by the q-ruler. Under these arrangements, brokers undertake training and assessment, to gain 'accreditation' to assess documentation and process and lodge entries (Import Declarations) using Automatic Entry Processing (AEP) under the *Non-commodity for Containerised Cargo Clearance Scheme* and the *AEP for Commodities Scheme (AEPCOMM).*

BICON (Biosecurity Import Conditions): An online database that houses the Australian Government's biosecurity import conditions database for more than 20 000 plants, animals, minerals and biological products. It is used by importers, customs brokers and overseas suppliers to determine biosecurity conditions associated with importing a product into Australia. For example, this could include whether the product requires an import permit to be granted by the Department of Agriculture,Water and the Environment. Users of this database can also subscribe to notifications (BICON alerts) when specific entries in BICON change.

Biosecurity risk material: Material that has the potential to introduce a pest or disease to Australia. This could include, but is not limited to: live insects; seeds;

soil; dirt; clay, animal material, and plant material such as straw, twigs, leaves, roots, bark, food refuse and other debris.

Codex: the Codex Alimentarius Commission of the FAO/WHO is the international food standards setting body developed under the Joint FAO/WHO Food Standards programme.

Competent Authority: the veterinary authority or other governmental authority of an OIE member country having the responsibility and competence for ensuring or supervising the implementation of aquatic animal health and welfare measures, international health certification and other standards and recommendations in the Aquatic Code in the whole territory (OIE 2017).

Consignment: An import of goods lodged in a single Import Declaration. In general, a consignment consists of all the goods for a single consignee that arrives on the same voyage of a vessel; a single consignment can consist of many container loads of goods.

Health Status (Aquatic Animal Health Status): the status of a country, zone or compartment with respect to an aquatic animal disease in accordance with the criteria listed in the relevant chapter of the *Aquatic Code* dealing with the disease (OIE, 2017). A 'free country' fulfils the requirements for self-declaration of freedom from disease with respect to the diseases(s) under consideration in accordance with the relevant chapter(s) in the Aquatic Code (OIE, 2017)**.**

Inspection: Examination of product or systems for the biosecurity of animal, plant, food and human health to verify that they conform to requirements (Beale et al. 2008).

International Aquatic Animal Health Certificate (Health Certificate): a certificate, issued in conformity with the provisions of Chapter 5.11., describing the *aquatic animal* health and/or public health requirements that should be fulfilled prior to export of *commodity* (OIE, 2017)

Intervention: Legally enforceable obligations (through legislation or regulations) imposed by government on business and/or the community, together with government administrative processes that support the obligations. In the biosecurity context, this includes requirements related to:

- prescribing specific actions that must be completed before goods can be brought into Australia;
- giving notice of goods to be unloaded in Australian territory;
- providing information, including documents, about the goods if requested by biosecurity officers;
- allowing for the goods to be physically inspected;
- allowing for samples of the goods to be taken; and
- prescribing treatments to reduce the biosecurity risk associated with goods or conveyances.

Pathway failure: A pathway failure is any kind of non-compliance associated with a consignment on a pathway, including failures that do not necessarily represent a direct biosecurity risk e.g. inadequate documentation for a consignment is a pathway failure, as is contamination by a pest or disease.

Sanitary measure: a measure, such as those described in various chapters of the *Aquatic Code*, destined to protect aquatic animal or human health or life within the territory of the Member Country from risks arising from the entry, establishment and/or spread of a hazard (OIE Aquatic Code glossary 2017)[1].

SPS agreement: The World Trade Organisation Agreement on the Application of Sanitary and Phytosanitary Measures. The Agreement on the Application of Sanitary and Phytosanitary Measures ("SPS Agreement") entered into force with the establishment of the World Trade Organisation on 1 January 1995. It concerns the application of food safety and animal and plant health regulations. The SPS Agreement encourages governments to apply national SPS measures that are consistent with international standards, guidelines and recommendations.

World Organisation for Animal Health (OIE): The World Trade Organisation recognises the OIE as the relevant standard-setting body for sanitary measures relating to animal health and zoonoses.

World Trade Organisation (WTO): an international body that determines international trade rules, where rules are negotiated and signed by the member countries, consisting of most of the world's trading nations.

WTO Dispute Settlement Mechanism: By becoming a WTO member, countries agree that if they believe fellow-members are violating trade rules, they will use the multilateral system of settling disputes instead of taking action unilaterally. Dispute settlement is based on clearly-defined rules, with timetables for completing a case. First rulings are made by a panel and endorsed (or rejected) by the WTO's full membership. Appeals based on points of law are possible.

[1] The Department of Agriculture,Water and the Environment equivalent is a 'risk management measure'

1. Executive Summary

International trade in aquatic animal products typically relies on certification undertaken by an exporting country's 'Competent Authority' (CA) that an exporter's product meets the importing requirements of a given country, including freedom from certain pests and diseases of concern to the importing country. The CA is usually the national veterinary service or other relevant authority of the exporting country.

In Australia, the Department of Agriculture,Water and the Environment (the department) has responsibility for evaluating a prospective CA and for checking compliance of a CA with certification requirements. Non-compliance with Australia's certification requirements may be discovered during document assessments, or through routine physical inspections of goods at the border. In some cases, however, there is no requirement for a physical inspection of CA-certified goods – goods will be released from biosecurity control based only on an assessment of the documentation. Furthermore, the evaluation of a prospective CA by the department occurs only once, prior to establishment of the approval, and there is no requirement for random or routine auditing of CA procedures by Australia once the initial agreement has been established. Penalties for non-compliance, including trade suspension, are possible, but agreements do not specify penalties nor what level of non-compliance would cause them to be applied.

In essence, the authority to make decisions about the biosecurity status of a product is being delegated to the CA by the importing country. The scope and effectiveness of this delegation will be governed by how well-aligned the interests of the two parties are – delegation typically involves shifting decisions away from individuals who have the strongest incentives to act in the interests of an organisation to individuals who face weaker incentives to do so. Where delegation occurs it is therefore important to monitor whether actual decisions being taken fall within the rules and guidelines that have been prescribed.

Managing risk off-shore using certification by a CA may present a risk to achieving Australia's Appropriate Level of Protection (ALOP), especially in cases where certification by a CA is the only source of information about biosecurity standards. This project focuses on investigating the behaviour of CAs in undertaking their certification role and provides guidance on whether Australian border inspection policies should be modified in response.

Two pathways were chosen as case studies in this project: i) ornamental fish; and ii) finfish for human consumption (non-salmon and salmon finfish). Certification by CAs is routine on both pathways. Analysis involved using a mix of economic theory, data analysis and stakeholder interviews to understand the incentives facing CAs in their certification capacity.

1.1 Project outcomes and recommendations

It was hoped that analysis of available qualitative and quantitative data would allow clear conclusions to be drawn about CA behaviour and that these in turn would allow guidance on whether/how Australian border inspection policies should be modified in response. Unfortunately, while the analysis provided some useful insights into aspects of CA behaviour it did not allow for conclusions to be drawn on whether modifications of inspection protocols were required. We strongly recommend that the

required information be collected and analysed, and an an incentive-based mechanism be implemented if subsequent analysis suggested incentives are mis-aligned.

Analysis of biosecurity regulations on the chosen pathways highlighted an issue with verifiability of the rules, and the benefits that would flow from improving communication flows with CAs.

A detailed discussion of the recommendations is contained in Chapter 6. In summary, recommendations are:

1. That a targeted investigation of finfish pathway be undertaken

A targeted investigation of the finfish pathway would be used to determine baseline performance rates for each CA and whether that performance achieves ALOP for Australia. It would establish the nature of any poor performance, inform future and on-going monitoring in a more targeted fashion, and determine the scope for improving performance of any poorly performing CAs.

2. That non-verifiable rules be identified and replaced with rules that are verifiable and provide equivalent levels of assurance

There are instances where regulations imposed on imports are unverifiable, or at best verification is prohibitively expensive, for example, in cases of species substitution or misidentification. Where verification of rules is problematic, it would be beneficial to either i) impose alternative regulations that result in the same level of assurance, or ii) adopt an outcomes-based approach, where a range of verifiable measures offering equivalent assurance may be available to entities certified by CAs.

3. That interviews with offshore CAs be undertaken

Interviewing off-shore CA employees and employees of foreign embassies based in Australia would reveal information on CA governance that has been unavailable in interviews to date. This includes information about the costs of operating CAs, time frames for correcting errors, and challenges faced in meeting Australia's certification requirements. Decisions regarding interviews should be made by the department's Trade, Market Access and International Division and by Animal Division.

4. That CAs be provided with regular feedback reports on certification performance

One of the themes that emerged from stakeholder interviews is how CA performance could be improved through better communication and the provision of useful information. Providing regular feedback reports to CAs on their certification performance should lead to improved biosecurity outcomes.

5. That the impact of feedback reports be measured during the roll-out period.

Evaluating the impact of feedback reports would involve the measurement of error rates overtime following receipt of reports, supplemented with measurement of engagement with CAs on a pathway, responsiveness of the department to being contacted by CAs, and a survey of CAs regarding their experience with feedback reports.

6. That an incentive-based mechanism for finfish be implemented to correct mis-alignment of incentives.

If additional data collection confirms incentives on the finfish pathway are mis-aligned, our preliminary recommendation is to implement a mechanism that involves

a ‘sliding-scale’ of interventions that correspond to the seriousness of the non-compliance. The mechanism should be implemented in a treatment-control setting.

7. That third-party certification schemes be investigated as complements to border inspections.

Third-party certification schemes may provide an alternative means of assuring biosecurity standards at the border. In order to be considered as such, schemes would need to demonstrate i) credibility, and ii) equivalence with Australia’s existing biosecurity standards. Where this is the case, allowing such schemes to complement border inspections would potentially reduce overall system costs and improve economic efficiency.

8. That inconsistencies in data entry be removed to allow for more rapid data analysis

A significant amount of data cleaning was required before analysis could be undertaken. In summary, there were anomalous dates, records with empty fields, and variations in names caused by spelling variants, typographical errors, punctuation and spacing, and other inconsistencies.

2. Introduction

International trade in aquatic animal products is governed by the World Trade Organisation's SPS Agreement[2] to which Australia is a signatory. The trade typically relies on certification undertaken by a 'Competent Authority' (CA) to certify an exporter's product meets the importing requirements of a given country, including freedom from certain pests and diseases of concern to the importing country. In this context the World Organisation for Animal Health (OIE) defines a CA as a veterinary authority or other governmental authority[3] of a member country having the responsibility and competence for ensuring or supervising the implementation of aquatic animal health and welfare measures, international health certification and other standards and recommendations in the Aquatic Code in the whole territory (OIE 2017).

Australia requires a CA to certify a range of imported aquatic animal goods. A CA may be *recognised* or *approved*. For trade in many aquatic animals and animal products to occur the Australian Government's Department of Agriculture,Water and the Environment (the department) must first *recognise* a country's CA. This is a less rigorous process than *approval*, and involves simply confirming the agency with the legal authority to issue the health certificate. For other aquatic animals and aquatic animal goods, like ornamental finfish, salmon and prawns , the department will only accept trade from countries with a CA the department recognises and has approved. The department grants the more rigorous *approved* status to a CA once an evaluation occurs on the capacity for the agency to comply with Australia's import requirements. The evaluation process consists of a desk-top assessment followed by an in-country verification – departmental officers visit the CA, its facilities and laboratories, to verify that the organisation has the capacity to comply with Australia's import requirements. Information about the certification process is given in Appendix A.

The evaluation of a prospective CA by the department occurs only once, prior to establishment of the approval. There is currently no requirement for random or routine auditing of CA procedures by Australia once the initial agreement has been established. Monitoring of service delivery by a CA is through self-regulation, with guidance available from the OIE Phytosanitary Veterinary Services (PVS) tool[4] (OIE 2013). Non-compliance with certification requirements may be discovered during document assessments, or through routine physical inspections at the Australian border. In some cases, however, there is no requirement for a physical inspection of CA-certified goods – goods will be released from biosecurity control based only on an assessment of the documentation.

Managing risk off-shore using certification by a CA may present a risk to achieving Australia's Appropriate Level of Protection (ALOP), especially in cases where such certification is the only source of information about biosecurity standards.

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[2] More information on the SPS agreement may be located at https://www.wto.org/english/thewto_e/whatis_e/tif_e/agrm4_e.htm

[3] A full list of the CA in each country may be located at https://bicon.agriculture.gov.au/BiconWeb4.0/ViewElement/Element/Index?elementPk=561093&caseElementPk=563440

[4] See http://www.oie.int/solidarity/pvs-evaluations/oie-pvs-tool/]

Considering the appropriate mix of on-shore and off-shore risk management for imported goods requires an investigation into the incentives for compliance provided by such rules. For its off-shore risk management the department is delegating certification authority to a third party. Economic theory on incentives, in particular delegation theory, suggest the scope and effectiveness of this delegation would usually be governed by how well-aligned the interests of the department and CA are (Holmstrom 1977 and 1984). Economic theory would also suggest the implementation of monitoring by the department is needed to ensure the actual decisions being taken by a CA fall within the rules and guidelines that have been prescribed.

This project focuses on investigating the behaviour of CAs in undertaking their certification role and provides guidance on whether Australian border inspection policies should be modified in response. The analysis involves interviews with stakeholders, analysis of import inspection data and insights from economic theory. Two aquatic-animal pathways are used in the analysis, but methodology and findings are likely to apply across a range of other pathways.

2.1 Objectives

This project focuses on investigating the behaviour of CAs in undertaking their certification role and provides guidance on whether Australian border inspection policies should be modified in response.

More specifically, the objectives of this two-year project are to investigate:

1. the current behaviour of CAs in their regulation of exporters for a range of aquatic animal-product pathways, with a view to improving the design of future CA agreements;
2. the complementary role that assurance (industry and international and departmental) schemes may provide on pathways associated with CAs in achieving ALOP;
3. the evidence that could be collected (or collated) from post-arrival surveillance that would give insights into the behaviour of import supply-chain participants (CA employees, importers, customs brokers) on these pathways; and
4. options for the department to design import requirements that would align the objectives of import supply-chain participants with those of the Australian Government.

2.2 Pathway information

Two pathways have been chosen as case studies in this project: i) ornamental fish intended for display; and ii) finfish for human consumption (non-salmon and salmon finfish)[5], defined by the BICON cases and import scenarios listed in Table 1. These pathways were chosen because of the different end-uses, and thus risks, that each

[5] Sensitivity surrounding the inclusion of salmon means this pathway will only be considered if analysis of ornamental fish and non-salmon finfish proves unsatisfactory.

poses. In most countries the CA providing certification for finfish intended for human consumption is different to that providing certification for ornamental fish.

Table 1 Relevant pathways and import scenarios for analysis in the project

Pathway	BICON Case	Import scenario
Ornamental fish	Marine aquarium fish	• Live marine fish from an approved export country
	Freshwater aquarium fish	• Approved export country for freshwater fish – Approved CA –Gouramis, cichlids or other finfish (excluding goldfish) • Approved export country for freshwater fish – Approved CA – Goldfish
Finfish	Finfish for human consumption	• Non-Salmonidae – Consumer-ready form • Non-Salmonidae – Not in a consumer-ready form – Personal use • Non-Salmonidae – Not in a consumer-ready form – Non-personal use – Finfish were caught in international waters • Non-Salmonidae – Not in a consumer-ready form – Non-personal use – Finfish were not caught in international waters • Salmonidae – Personal use • Salmonidae – Not for personal use – Sourced, processed and exported from New Zealand – Standard permit conditions • Salmonidae – Not for personal use – Sourced, processed and exported from New Zealand – Non-standard permit conditions • Salmonidae – Not for personal use – Not sourced, processed and exported from the same approved country – Non-standard permit conditions – Not sourced in an approved country

These pathways were selected during a project workshop from a range of candidate pathways where CAs routinely undertake certification. It was thought that the relatively large amount of data available for ornamental fish would allow some initial conclusions to be drawn. The absence of data for finfish would provide opportunities for improving the collection of data into the future, and the ability to increase/decrease inspection frequency to provide incentives for CA behaviour. Further, there would be ample scope to transfer findings from analysis of these two case studies to other pathways.

Both pathways have been the subject of regulatory attention and review of import requirements in the past. In November 1998, the WTO found that Australia had not complied with its obligations under the SPS Agreement with regard to the measures applying to salmon. In response, an accelerated import risk analysis (IRA) was conducted on the following products: non-viable salmonid product, non-salmonid marine finfish product, and on live, ornamental finfish (AQIS, 1999a; 1999b; 1999c).

Soon after the release of the Ornamental fish IRA the Megalocytivirus was detected four times from fish held in post-arrival quarantine during 2000–04 as part of an ornamental fish testing project commissioned by the Department of Agriculture to obtain data on disease occurrence during post-arrival quarantine (Stephens et al.

2009). An iridovirus associated with disease was also detected in farmed Murray cod (*Maccullochella peelii peelii*) in Victoria (2003), which was subsequently eradicated. The virus was later found by Go et al. (2006) to be a minor variant of dwarf gourami iridovirus (DGIV). Researchers at the University of Sydney reported the detection of an iridovirus, considered exotic to Australia, in several species of ornamental gouramis held at two Sydney pet shops (Go and Whittington 2006; Go et *al*. 2006). The origin of the fish is unknown, but presumed to have been imported, suggesting that the current pre-export and post-arrival quarantine measures may be inadequate to manage risks associated with iridoviruses of quarantine concern (Department of Agriculture, 2014). A subsequent review of the policy on the importation of freshwater ornamental fish with respect to iridoviruses was completed in 2014.

During the intervening period the Interim Inspector-General of Biosecurity, examined the effectiveness of controls used by the Department of Agriculture, Fisheries and Forestry (DAFF) to manage biosecurity risks associated with the importation of freshwater and marine ornamental fish (IIGB 2012).

The import certification requirements for the finfish for human consumption and ornamental fish pathways are listed in Table 2. This table includes the role that CAs play in certifying particular import scenarios, and additional certification requirements that are required for entry into Australia. Upon arrival in Australia, ornamental fish require document assessment and inspection, while finfish for human consumption are released from biosecurity control after an assessment of the documentation only.

Table 2 Summary of Import Certification Requirements for finfish for human consumption and ornamental fish

BICON Case	CA	IP	MD	ED	ID	HC
Consumer Ready	×	×	✓	×	×	×
Personal Use	×	×	×	×	×	×
International Waters	×	✓	×	×	✓	×
New Zealand	✓	×	×	×	×	✓
Cocos Islands	×	✓	×	✓	×	×
Eviscerated	✓	×	×	×	×	✓
Farmed	✓✓	✓	×	×	×	✓
Not eviscerated	✓	✓	×	×	×	✓
Salmon-Personal use	×	×	×	×	×	×
Salmon-NZ	✓✓	✓	×	×	×	✓
Salmon-approved country	✓✓	✓	×	×	✓	✓
Marine aquarium fish	✓✓	✓				✓
Freshwater aquarium fish	✓✓	✓				✓

CA: Competent Authority (× not recognised) (✓ recognised) (✓✓ recognised and approved); **IP**: import permit; **MD**: manufacture's declaration; **ED**: exporters declaration; **ID**: importer's declaration; **HC**: health certificate

Since 1999, Australia has used the certification services of recognised and approved CAs on imports of ornamental finfish and finfish for human consumption from various countries (Table 3).

Table 3: Products, countries and year in which CAs were first introduced on the pathway.

Product	Year of first CA	Countries
Salmon	1999	USA, Canada, New Zealand, UK, Denmark, Philippines, Poland, Thailand
Non-salmon	1999	Countries on *List of Overseas Authorities – Aquatic Animals for Import* (88 countries)
Ornamental finfish	1999	Thailand, Malaysia, Sri Lanka, China, Indonesia, Vietnam^:

^ These 6 countries have been evaluated and approved since 1999. At that time, a number of other countries were "approved" based on existing trade. For freshwater species, those countries were: Belgium; China; Federated States of Micronesia; Fiji; French Polynesia; Germany; Honduras; Hong Kong; Indonesia; Kenya; Malaysia; New Caledonia; New Zealand; Nicaragua; Philippines; Saudi Arabia; Senegal; Seychelles; Singapore; Solomon Islands; South Africa; Sri Lanka; Thailand; USA. For marine species, those countries were Bahrain; Belgium; China; Federated States of Micronesia; Fiji; French Polynesia; Germany; Hong Kong; Indonesia; Kenya; Malaysia; New Caledonia; New Zealand; Philippines; Saudi Arabia; Senegal; Seychelles; Singapore; Solomon Islands; South Africa; Taiwan; Tanzania; Thailand; USA; and Vanuatu.

2.3 Methodology

This project employed a mixed-methods approach; that is, it used two complementary data collection and analysis strategies to evaluate the behaviour of a CA in undertaking its certification role. The first involved a largely qualitative analysis of interviews with relevant biosecurity stakeholders and department staff, while the second adopted a primarily quantitative analysis of departmental import data. Insights from economic theory guided data collection and analysis.

2.3.1 Economic Theory

The relationship between the department and CAs lends itself to analysis using the theory of delegation. Delegation occurs when a party with the authority to take a decision delegates the choice of it to someone else. There are costs attached to delegation as it involves shifting decisions away from the individuals who typically have the strongest incentives to act in the interests of the organisation as a whole to individuals lower in the organisation who face weaker incentives. The implementation of effective delegation involves **monitoring** by management to ensure that the actual decisions being taken fall within the rules and guidelines that have been prescribed.

A discussion about the incentives created by the CA-department relationship, in particular how these may be 'measured' and aligned, is given in Chapter 3. Insights for economic theory guided the development of stakeholder interviews and analysis of results (see Chapter 4).

2.3.2 Interviews with stakeholders

Biosecurity system stakeholders are an important source of intelligence that could help the department better understand the various influences on the efficacy of offshore assurance processes on the ornamental and finfish pathways. Relevant

stakeholders in the current context include: CAs, the exporters they certify; department staff who facilitate CA agreements; and importers who handle the certified goods.

Semi-structured interviews were conducted with Australian-based stakeholders to elicit an understanding of:

- Issues around CA governance
- Characteristics of the CA/stakeholder relationship;
- Internal monitoring systems and incentives within a CA;
- Information on market structure; and
- Benefits/costs of avoidance for exporters/importers.

Details of the interview process and insights gained from the interviews are given in Chapter 4.

2.3.3 Data analysis

Ideally, available data would allow an examination of CA behaviour in certifying that goods (from their country on a pathway) to Australia meet particular conditions/standards. To understand whether a CA is fulfilling its role, the data must contain information on inspections/audits that Australia has carried out at the border to verify that what is being certified by a CA, when it arrives, is either true or false. In addition to these data, it will be useful to have additional information related to the characteristics of each consignment:

- Identity of the importer;
- Identity of the exporter;
- The value of the goods in $; and
- Volume of the goods (weight, number etc).

This additional information will allow us to determine whether a CA's behaviour varies systematically with any of these characteristics of a shipment. For instance, is a shipment more or less likely to be certified correctly if it is of high $ value?

The data analysis is discussed in more detail in Chapter 5. Unfortunately data were not available for finfish. A planned targeted investigation of this pathway to collect baseline data on CA performance was not able to proceed. We recommend such an investigation be undertaken in the future. Details of how such an investigation could be used to gain insights into CA behaviour are given in 5.3. A review of reports from past targeted investigations in 5.3.1 allows some common pieces of evidence of CA performance and compliance to be revealed, along with methods that are employed to deliberately evade Australian import requirements.

3. Insights from economic theory

3.1 The theory of delegation

The relationship between the department and a CA shares many similarities with the theory and practice of delegation in organisations (Mookherjee 2006). Delegation occurs when a party with the authority to take a decision delegates the choice of it to someone else. This is a common practice in many organisations where the formal authority to take actions on the organisation's behalf lie with upper management but individuals lower in the organisation are given discretion to take many of the day-to-day decisions that govern the organisation's functioning. There are a number of very good reasons why it is efficient for an organisation to do this in practice. In particular:

- Infeasible or too costly for upper management to make many of the decisions needed to run the organisation.
- Individuals lower in the organisation may have better information specific to certain types of decisions.
- Individuals lower in the organisation have different skills that allow them to make better decisions or make them more efficiently.

There are costs attached to delegation, however, as it involves shifting decisions away from the individuals who typically have the strongest incentives to act in the interests of the organisation as a whole, to individuals lower in the organisation who face weaker incentives[6]. Hence, the scope and effectiveness of delegation is often governed by how **well-aligned** the interests of the two parties are (Holmstrom 1977; 1984). Furthermore, many of the rules and processes in organisations serve to limit these costs while still facilitating some efficient delegation of decisions. For instance, the heads of divisions in an organisation may have discretion over how to spend money but are limited by a budget, or they have discretion in hiring subject to a quota and/or qualification requirements. Therefore, the implementation of delegation involves **monitoring** by management to ensure that the actual decisions being taken fall within the rules and guidelines that have been prescribed.

In the current context the department delegates to a CA the authority to certify that a product satisfies specific biosecurity requirements. It is a requirement of the CA to undertake this activity in order for the exporters from their country to be able to gain access to the Australian market. However, there is no explicit arrangement or contract that makes payments to the CA or restricts access to the Australian market contingent on the accuracy/quality of the CA's certification.

A CA is typically a foreign country's counterpart to Australia's Department of Agriculture, Water and the Environment – it is a department or ministry of that country's government. The individuals who work for the CA, and on whom Australia relies upon to provide certification activities, face a range of formal and informal

[6] Mookerjee (2006) in his review of the costs and benefits of delegated decision making in hierarchical organisations notes that "costs arise from the fact that agents that are delegated decision-making authority act in their own self-interest, rather than of the organisation as a whole or of the central designer. Accordingly, it gives rise to a problem of "loss of control" or "abuse of power."

incentives that influence their behaviour. These incentives are likely influenced by a number of factors:

- Senior politicians that oversee the CA;
- Industry stakeholders for whom the CA provides services;
- Relation of CA to other parts of the government bureaucracy; and
- Internal organisation of the CA itself.

As such, the degree to which an individual within a CA will act in/against Australia's interest is in large part determined by how well these forces create a set of incentives for it to act in a way that is aligned with the department's interests. The source of the incentives that serve to align the behaviour of a CA with the department's interests come from what the CA perceives to be the consequences of high rates of certification error that may exceed ALOP for Australia. There is no explicit contract or agreement that lays out acceptable levels of certification error and a set of consequences for exceeding these. However, provided that there is the potential for consequences from poor performance then this can serve to influence a CA's behaviour. We discuss four categories of factors that may affect CA behaviour:

1. CA's perception of the consequences (responses from department) from a high certification error rate.
2. Other costs / benefits to a CA from achieving higher / lower error rates.
3. CA's perception of the likelihood that the department will identify whether the CA's performance is acceptable.
4. Awareness of Australian import requirements and awareness of certification performance.

Information about these factors will be sourced, where possible from stakeholder interviews.

3.2 Equivalence and credibility of third-party certification in aquaculture

Certification schemes and pre-border audits of production, processing and transportation of imports have been suggested as an alternative means of assuring biosecurity standards at the border (Rossiter et al. 2016). In order to be considered as such, schemes would need to demonstrate i) credibility, and ii) equivalence with Australia's existing biosecurity standards. In cases where equivalence is demonstrated, there is potential to reduce overall system costs and improve economic efficiency by allowing such schemes to complement border inspections.

Of particular interest to the current project are the various third-party certification schemes that have developed around the production and processing of seafood. Those with embedded biosecurity standards are identified and assessed against criteria for evaluating credibility.

3.2.1 Certification

Certification (conformity assessment) is the process through which written or equivalent assurance states that a product, process or service conforms to specified requirements (Corsin et al. 2007) – certification confirms that a required standard has been met. Standards typically relate to production practices, and allow consumers and

manufacturers to differentiate products by attributes such as animal welfare, environmental sustainability and worker welfare.

A typical certification scheme contains the following elements (Corsin et al. 2007):

- A standard-setting organisation, in charge of developing standards or coordinating the standard development process;
- A clearly defined set of objectives that the scheme is aiming to achieve;
- A set of certification standards that describes the characteristics that a process or product should have, to be certified by the scheme; and
- A certification process (operated for example by one or more certification bodies) that assesses conformity of a product or process to the certification standards.

The classification of certification schemes (first-party, second-party etc) indicates the degree of independence between the certification body and the party being certified. Under first-party schemes the producer reports on their compliance to a set of standards; in second-party certification, conformity is assessed by a person or organisation that has an interest in the products; a third-party certification scheme is one where the certifying body is independent from both the supplier and consumer organisations; and a fourth-party certification scheme is one that involves government in the rule setting or monitoring/enforcement activities.

Third-party schemes, also known as ‘non-state market driven’ governance systems because there is minimal state influence in the certification process, have proliferated in recent decades with the globalisation of agrifood systems (Hatanaka et al. 2005), while fourth-party certification is not widespread due to a potential for conflicts of interest between certified parties and the certification authority (Corsin et al. 2007). At least 30 such schemes relate to aquaculture certification (Corsin et al. 2007). Several of these schemes are summarised in Section 3.2.3.

3.2.2 Evaluating credibility of third party certification schemes.

Certification is a mechanism to increase the credibility of claims related to product quality. Credibility relates to the perception and assumption that the operations of an actor or agent are trustworthy, responsible, desirable and appropriate (Bogström, 2006a). While there appears to be no exhaustive list of attributes by which to evaluate credibility of non-state, third party certification schemes, the following are typically cited as key: scientific rigour and validity; inclusiveness; transparency; independence; auditability; and impact (Bogström, 2006b; Gulbrandsen, 2008; Anders et al. 2010; Miller and Bush, 2015). Each of these criteria are described in more detail in Table 4.

Table 4. Criteria for evaluating credibitlity of third-party certification (modified from Miller and Bush, 2015).

Credibility criteria	Description
Scientific rigour	• Incorporation of scientific knowledge into principles and standards • Transparent and independent scientific process underlies standard creation and verification
Inclusiveness	• Incorporation of diverse interests in a formal structure of deliberation • Facilitation of critical engagement of groups with diverse expertise and interests, even where asymmetric power structures exist.
Transparency/openness	• Continual demonstration of capacity to practice the ideals that are embodied in their principles and standards • Degree of openness of decision making or adjudication (procedural transparency) • Accessibility of information needed to determine whether and how regulation is effective in meeting its goals (outcome transparency)
Impartiality/independence	• Organisation of information and degree of transparency • Separation of the standards and those verifying standards
Impact	• Measurable impact based on compliance provides feedback on the salience and precision of standards • Organisational capacity certification system to both long-term strategic and short-term operational improvements

3.2.3 Third-party certification schemes in aquaculture

There are at least 30 certification schemes and eight key international agreements relating to aquaculture certification (Corsin et al. 2007). These include schemes related to food safety, the environment, aquatic animal health, social and animal welfare. Initial analysis of several schemes containing standards relating to biosecurity – particularly in the areas of aquatic animal health and disease control – appear to meet credibility criteria listed in Table 4. These schemes, briefly discussed below and in Appendix B, should be investigated further in order to understand whether their biosecurity standards provide equivalent assurance with those of Australia.

Aquaculture Stewardship Council and Chain of Custody

The Aquaculture Stewardship Council (ASC) is an independent non-profit organisation which operates a third-party certification and labelling programme for aquaculture around the globe. The ASC has developed 11 standards[7], covering 17 species groups[8,] and different types, locations and scales of aquaculture production systems. In addition, the ASC uses the Marine Stewardship Council's (MSC) Chain of Custody standard to verify the origin of seafood sold as ASC certified.

The ASC's standards are science-based and biosecurity principles are an important component. The process of setting, reviewing and managing standards is inclusive, transparent and independent. Assessment of aquaculture producers for conformity

[7] See: https://www.asc-aqua.org/what-we-do/our-standards/

[8] Abalone; bivalves (clams, mussels, oyster, scallop); flatfish, freshwater trout; pangasius; salmon; seabass, seabream, meagre; seriola and cobia; shrimp; tilapia, tropical marine finfish]. There is also a joint ASC-Marine Stewardship Council standard for seaweed.

with standards is conducted by independent and accredited bodies. Certification status by country, producer name, and species is publically available through a searchable database[9]. Importantly, entities whose certification status has been revoked are clearly identifiable.

Global Aquaculture Alliance's Best Aquaculture Practices

Best Aquaculture Practices[10] (BAP) is a third-party aquaculture certification program for seafood processing plants, farms, hatcheries and feed mills. The program addresses social responsibility, animal health and welfare, food safety and traceability at each step of the aquaculture production chain. Biosecurity principles feature in many BAP standards and guidelines, including those for: on-farm production systems; area-wide management; and managing the effluent level in recirculated water systems.

Development and administration of BAP certification standards are undertaken by the Global Aquaculture Alliance. Standards are science based, publically available and continually updated by technical committees with guidance from academia, industry and conservation. Assessment of conformity with BAP standards is conducted by various accredited certification bodies. BAP certification status by country, producer type, and species is publically available via a searchable database[11], updated every two weeks. Supply-chain linkages may also be identified via the database. The database clearly shows producers with and without certification, and those aspiring to receive accreditation. Detailed information on non-compliance by stakeholders is not readily available.

GLOBALGAP

GLOBALGAP is a trademark and a set of standards for good agricultural practices (GAP). GLOBALGAP (originally EUREPGAP) started in 1997 as an initiative by retailers to help producers comply with Europe-wide accepted criteria for food safety, sustainable production methods, worker and animal welfare, and responsible use of water, compound feed and plant propagation materials [12]. Three standards are relevant for aquaculture operations: the aquaculture standard; the standard for compound feed; and the chain of custody standard. The aquaculture standard covers all aquaculture species and the entire production and distribution chain and contains detailed instructions for biosecurity practices that must be followed. Once certification is received, producers may use a global gap number (GGN) that allows their farm to be identified by consumers of their products.

Independent certifying bodies implement the GLOBAL GAP standards – the process for identifying and accrediting certifying bodies is clearly defined and involves accreditation with International Accreditation Forum [13]. Certifying bodies conduct

[9] See http://asc.force.com/Certificates/

[10] See https://bapcertification.org/About for more information about the certification program, individual standards, and the facilities across the globe that have achieved certification or that are in the process of achieving certification

[11] https://bapcertification.org/Producers

[12] See https://www.globalgap.org/uk_en/who-we-are/about-us/history/

[13] See https://www.globalgap.org/uk_en/what-we-do/the-gg-system/certification/

both announced and unannounced onsite inspections and audits throughout the year. Certification bodies themselves are monitored via additional governance bodies.

4. Interviews with stakeholders

Semi-structured interviews with key Australian-based stakeholders were undertaken in order to reveal both qualitative and quantitative information about export-country assurance in terms of processes, perceived effectiveness and cost. At a minimum, it was hoped that evidence would be obtained on the cost of offshore assurance processes, since this is an important component that could affect financial incentives for compliance.

Design of questions/topics

The project team developed three semi-structured interview templates for (name of group in parentheses)[14]:

- Importers on the ornamental and finfish pathways (importers);
- Departmental staff involved in Australia's activities as a CA (Exports); and
- Government officials from the Trade and Market Access Division (TMAD) involved in the facilitation of market access with off-shore CAs (TMAD).

Interview templates were developed for each group of interviewees (Appendices C-E). Interviews ranged in length from 15 minutes to over 60 minutes.

Selection of interviewees

Names of potential interviewees were supplied by industry organisations (for importers) or by managers within relevant departmental divisions (for TMAD and Export staff). Initial contact with potential interviewees was via email. The email contained information about the field trial, an invitation letter, Consent Form and Plain Language Statement. Stakeholders indicated their willingness to participate in the interviews by contacting the team through an email reply or during telephone contact with a member of the project team. A total of 30 stakeholders were contacted.

Interviews took place between April and June 2018 (Table 5). Interviews were undertaken via telephone or face-to-face meetings, and most interviews were digitally recorded.

Table 5. Interviewees by stakeholder type and pathway

	Importers	**Department-TMAD**	**Department - Exports**
Ornamental fish	-	5	11
Finfish for human consumption (non-salmon)	4		
Total	4	5	11

[14] University of Melbourne Human Ethics ID: 1750828.1

Selection of interviews

As discussed in section 2.3.2, four relevant groups of biosecurity stakeholders were identified as "information rich" sources of intelligence for the aims of this study: CAs, the exporters they certify, department staff who facilitate CA agreements, and importers who handle the certified goods. This type of purposive sampling is a widely used technique in qualitative and mixed methods research (Patton, 2002).

Analysis of interview data

Interviews were transcribed by a third-party transcription service using 'intelligent verbatim', and in a format suitable for analysis using the qualitative data analysis package NVivo 11 Pro (QSR International, 2015).

A thematic content analysis of the transcribed interview data was undertaken. Interview data were coded using an integrated approach, i.e. coding by predetermined themes of interest for the study but also allowing for emergent (unexpected) themes. In qualitative research, coding refers to the process of identifying or 'tagging' blocks of text that convey a unique meaning (code) across interviews (Bazeley and Jackson, 2013). Coding recontextualises data, in this case, moving the frame of analysis from the interviews to the emerging patterns or codes that link the interviews.

4.1 Insights from stakeholder interviews

In the previous chapter, we noted that the effectiveness of a delegated authority depends upon two characteristics: the first was that the goals and/or incentives of stakeholders need to be **well-aligned**, and the second was that the work function of the authority requires regular **monitoring**. The stakeholder interviews were designed to elicit information that provided grounded insight into the current character of CA certification and its effectiveness.

The following discussion centres on findings from the first set of interviews undertaken with departmental staff in the TMAD and Export functions – comprising a total of 16 interviews. It highlights the general perceptions of the effectiveness of CA certification, as well as the challenges a CA faces in maintaining consistent performance.

It was hoped interview data would provide insight into the benefits/costs of avoidance for a given exporter/importers, as well as insights into the current incentives created by industry relationships and internal organisation of the CA itself. Unfortunately, interviewees did not have sufficient knowledge in these two specific areas of interest for robust patterns to emerge. Undertaking interviews with additional importers, as well as interviews with relevant overseas CA staff and embassy staff will address this gap. This is discussed further in Chapter 6.

Alignment of CA's interest with the importing country

In general, interviewees believed that CA officials – typically government employees – are "trying to do the right thing". CAs are aware of the critical function they perform in sustaining often multi-million-dollar export markets, as well as the devastating impact inaccurate certification can have on both local industry as well as the health status of the importing market (compromising human and/or animal health). The majority of interviewees identified facilitation of trade, and the imperative to

sustain trade as the primary driver for CAs, which contrasts with the regulatory authorities of the importing country whose primary driver is maintaining an ALOP, with trade being a secondary albeit important factor.

Interviewees also described several other factors that determined the alignment of interests between a CA and the importing country, including the:

- Proportional value of the country-specific trade relationship
- Proportional value of the commodity-specific trade relationship
- Perception of the importing country as a "highly-discerning" market[15]
- Value placed on the overall international trade reputation of the country, of which the CA comprises a part
- Independence of the CA from industry influence
- Independence of the CA from undue government influence (applicable when there is a high proportion of state-owned enterprise, or state interest in the enterprise).

Essentially, the general alignment of a CA's interest with that of the importing country can be described as a sliding scale, contingent upon each of the above factors, and therefore highly individual or country-specific.

Perceptions of the consequences of poor performance by a CA

The reported consequences of poor performance by a CA varied depending on the nature of the certification error. At the most extreme end, poor performance by a CA could result in restriction and suspension of trade, with the accompanying economic consequences for exporters in that country. The high visibility of such measures were coupled with loss of reputation for the sanctioned country. Depending on the nature and reception of the sanctioned country, this could prompt retaliatory measures. Certification errors that have less serious biosecurity implications could result in the CA needing to invest in staff-training and change internal processes and systems to ensure future compliance.

Other consequences reported include additional sanctions (with potential increase in costs to exporters); human health implications; negative impact on natural environment; reduced consumer confidence in a commodity; and needless euthanasia of animals.

Capacity of a CA to maintain a high-level of performance

While the overarching alignment of interests shared between the CA and importing country might be high or very high, there were several challenges identified by interviewees that may compromise the consistency of a CA's certification. Many of these challenges are well understood, typically affect developing and least-developed countries disproportionately, and can be broadly grouped as factors affecting capacity. Interrelated factors include:

- Resource constraints imposed by insufficient government budget allocation
- Lack of sophistication and automation of systems
- Loss of oversight in regions owing to decentralisation

[15] NB: Australia is seen as a "highly-discerning" market, together with countries or trading blocs including Canada, the EU and New Zealand.

- Loss of oversight by the CA owing to a trend of outsourcing of veterinary service function to 3rd parties
- Low rewards for CA staff which impacts on individual incentives
- Ability of a country to maintain disease freedom.

Additionally, the impetus to establish a trade relationship might result in the CA demonstrating the capacity to perform the required services to meet the import conditions of a country, but often these negotiations do not account for the ability of exporters or stakeholders up the supply chain to comply with the sanitary requirements negotiated.

For example, a recent OIE-sponsored survey (Khan, 2018) of 181 country delegates found that,

> *although requests from the private sector were recognised amongst the 'triggers' for the development and review of sanitary requirements, 60% of countries stated that private sector stakeholders were not consulted systematically when setting sanitary measures. There was a marked difference in the responses of developed countries and other countries.*

Interviewees for this research project echoed this finding, noting that government/CA engagement with industry associations and exporters varied considerably between markets, and this presented a challenge when exporters find themselves unable to comply with the import requirements agreed upon when market access is being negotiated or reviewed.

Visibility of CA capacity

A challenge for importing countries is the difficulty or resource-intensity of monitoring individual CAs' ongoing capacity after the initial, resource-intensive processes through which a CA is recognised and/or approved for market access. Each importing country can negotiate agreements with trading partners that includes agreed timeframes for renewal or re-evaluation, which might include an in-country visit or other verification activity. In the case of aquatic-animal goods, the department's current practice is not to monitor CAs through additional in-country visits, although their intention is to initiate these in the future.

Overall, the ongoing ability for an importing country to assess the capacity of a CA is limited after the initial negotiation for market access is complete. The OIE's PVS assessment tool is designed to encourage voluntary engagement in regular evaluation of a CA's capacity, however, the result of this assessment is confidential. Typically, a country won't report the outcome of its PVS assessment unless the results were positive, and/or likely to not compromise their reputation.

There are reportedly very few international fora where a large number of CAs convene to share detailed information about their internal structures, governance and systems; and/or highlight and discuss best practice. Groups of countries appear to have smaller forums, for example, the Quads between Australia, USA, Canada and New Zealand. However, the general, annual OIE meeting was identified as the most widely-accessible forum if discussions related to health certification were to be reported or discussed. Codex meetings on food safety certification is reportedly a forum in which transparent information on CA activity is more regularly shared.

Awareness of certification performance/non-compliance

Many interviewees identified the lack of consistent communication between CAs as an ongoing weakness of the current CA certification process. The OIE requires member countries to report disease freedom, as well as changes to sanitary requirements that might impact trade. However, there is no requirement for governments of importing countries to regularly report non-compliances owing to CA certification error to their counterparts, unless a Health Certificate is missing or suspected as being fraudulent. Typically, non-compliance is reported to the importer, and this information may or may not eventually reach the CA through the exporter. This channel of communication depends on the nature of the relationship between the importer-exporter, as well as the incentives/ability of the exporter to easily provide feedback to their local CA.

The exceptions to this appear to be when there are long-standing and/or close trade relationships between trading partners. For example, Australian CA staff reported a high-level of regular communication with counterparts in New Zealand and the UK about certification errors, or if the commodity was considered low-risk. For example, the export of companion animals was a frequently cited case. In contrast, Australian staff reported that some export markets were considered to be "politically sensitive", and communication of even simple certification errors might require facilitation through more formal channels. Some embassies have liaison officers based in consulates for strategic markets. For Australia, these are Agricultural Councillors. In these markets, the level of information shared and visibility of a CA's capacity might be higher depending on the relationships established and maintained by the individual Councillor.

The manner and regularity with which countries currently report non-compliances to a CA also varies considerably, with interviewees noting that the severity of a breach seemed to determine this. For example, a serious breach might first be communicated through trade restriction or suspension, while incorrectly filled health certificates might be "banked" and communicated to the CA only if a pattern was detected.

Awareness of Australian import requirements

Language barriers was reported as one of the most common reasons for CA non-compliance, particularly when changes are made to import requirements. Importing countries commonly publish changes in their primary language, and may engage consulate staff to translate information into local languages. However, this is ad hoc. The impact of the language barrier should not be underestimated in a frequently-changing operating environment, with Australian CA staff reporting that more complex changes can require translation of hundreds of pages and it was not uncommon to lack the resources to translate all communication received on changes from export markets.

Australian TMAD staff and some importers we interviewed noted that the uniqueness or specificity of important conditions to a specific country typically resulted in a longer lead time before changes were understood and processes adapted to reflect them. This was exacerbated for Australia because Australian biosecurity requirements tended to be more stringent and complex than other trading partners; official documents and communication issued by Australia could sometimes be in formal language, and more difficult to be widely read by CA staff; and that the effort countries invest into translation and dissemination of information – particularly to

regional staff, and third-party service providers – can also depend upon the value of the trading relationship for the commodity. Therefore, if the Australian market share represented a relatively small overall share of the export industry, this could be reflected in the speed and accuracy with which changes are understood and operationalised.

Finally, importers and Australian CA staff noted that it was not uncommon for a CA to first discover relevant changes to import conditions through exporters. Therefore, the strength of the relationship between a CA and industry associations/exporters currently appears to determine how quickly a CA learns of changes to Australia's import requirements.

Regular feedback to CAs

Export and TMAD staff interviewed were explicitly asked to reflect on the value or reception of hypothetical policy changes, including the reception and impact on compliance if overseas CAs were provided with more regular, formalised feedback (see Q.15 and Q.10 respectively in the semi-structured interview template).

It was generally reported that for the reasons discussed above, more regular and consistent feedback to CAs would be welcome. This policy response was seen as more likely to meet with general positivity compared to increase in on-shore inspections and/or restriction or suspension of trade in response to non-compliance. It was seen as being proactive rather than reactive, as one interviewee noted, it would be "building bridges rather than putting out fires". It would also reinforce already compliant behaviour. As one interviewee observed,

> *[it is about] reciprocal respect of what CAs are trying to achieve in each country, I think they would welcome it. I would like to think that they would welcome the check to verify that systems are clean, and they want to check - they want to know that their systems are clean.*

Overwhelmingly, interviewees focussed on the engagement and content of the feedback provided to CAs, noting it needs to be:

- Agreed upon/communicated with trading partners before implemented
- Timely
- In simple language
- Culturally-appropriate
- Tailored
- Include clear timeframes or invite dialogue for corrective action
- Not seen as punitive (particularly if it was to be publicly-available).

Some interviewees noted that the drawbacks of formal versus informal feedback could include the perception that it was "showing up the lack of competence" of a CA which could damage their reputation as well as Australia's relationship with that trading partner.

With particular reference to Australia's relationship with CAs, interviewees reflected that the early response to White Spot Disease found in imported prawns was

wholescale trade suspensions.[16] For some countries, this suspension was the first time the CA learned of the discovered certification errors. As one TMAD interviewee observed,

> *[Country X] was quite frustrated around the prawns exports issue when they had found that there were numerous consignments in the past that had tested positive and the Competent Authority had never been advised of that. They [the CA] definitely have a focus from the [Country X's] Government on making sure that their exports are compliant and they do take measures when they're told they're not … they will suspend exporters or they will investigate and put in place new measures, so they do have those systems there.*

Many interviewees thought that the CAs could have been given an opportunity to "show cause" and initiate internal investigations before the trade suspension was introduced. Several interviewees noted that the subsequent monitoring under the new prawn import rules includes reporting discovered errors to the relevant CA, and is more about feedback and collaborative action.

Interviewees saw Australia as having the reputation to influence other CA performance. Australia sees itself as a global standard-setter in CA performance and governance, and the insights from interviews suggest that developing countries and least-developed countries welcome direct financial aid, as well as support notably through the OIE and FSANZ, through which it works with trading partners in the Oceania and Asian regions to improve CA capacity. In general, developing and least-developed countries appear to welcome the support of developed nations in improving their CA performance.

The EU's third-country carding process (yellow-red-green card) for Illegal, Unreported, and Unregulated (IUU) fishing was commonly cited as a transparent but ultimately effective example of influencing CA performance through feedback. The enacted legislation allowed the EU to enter into dialogue with non-EU countries assessed as not addressing identified IUU fishing effectively. In February 2016, it was reported that the EU had engaged with almost 50 countries, 20 of whom received yellow cards and four with red cards. Of these nine yellow-carded countries and one red-carded country have since been de-listed (have a green card).[17] Although the diplomatic and trade fall-out with sanctioned countries has been mixed, it is widely-acknowledged that a large number of countries have improved their systems and oversight as a result of the EU's measures.

Changes to Australia's physical on-shore assurance procedures (increase/decrease in monitoring)

Interviewees were asked to reflect on hypothetical scenarios based on the current operating environment (see Appendices B-D), one of which was the possible responses by overseas CAs to an increase/decrease in on-shore physical inspections.

Interviews overwhelmingly reported that a decrease in on-shore assurance i.e. reduced frequency of inspections would be welcomed by CAs and importers/exporters alike.

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[16] http://www.igb.gov.au/Pages/uncooked-prawn-imports-effectiveness-biosecurity-controls.aspx

[17] *The EU IUU Regulation: Building on Success. EU Progress in the Global Fight against Illegal Fishing* (EJF, 2016). Access online, 22 June 2016 at, http://www.iuuwatch.eu/wp-content/uploads/2016/02/IUU_report_090216_web.singles.pdf

Importers noted that they would welcome a decrease in on-shore inspections as a recognition of long-standing compliance.

In contrast, interviewees reported that an increase in physical inspections – particularly if not routinely undertaken, or as an uncommunicated response to non-compliance – would likely be negatively perceived by the overseas CA. Additionally, such uncommunicated measures if perceived to be unreasonable or trade restrictive might open Australia to retaliatory measures, and/or a formal WTO dispute being lodged.

As one interviewee summarised, the reception of such a change by a trading partner/overseas CA depends on:

> *... if the reasoning behind it is clearly explained and that there is evidence that if [Australia] don't check at a higher level then we're [exporting country] in danger of losing our reputation and trade status. I think it's how it's delivered is really important, not the end process. I think it would take sensitivity, again, depending on the country. Because essentially you're saying to that other country ... you're not good enough anymore, we used to accept these now we're going to check more.*

However, there was strong agreement among interviewees that a reasonable, well-communicated change to on-shore monitoring would be preferable to suspension of trade, particularly if in response to suspected or discovered non-compliance. Additionally, interviewees suggested that the results of such measures could provide useful data for a CA to examine and improve its systems. It was suggested that the daily operating environment of CAs was constantly changing, and CAs were aware of their "need to be adaptive", but "if they're uninformed and unaware, they don't even have a cause for creating an initiative [to] change".

CA's perception of the consequences from a high certification error rate

Our analysis of stakeholder interviews reveal some of the factors that align a CA's interest with the department:

- CA agreements facilitate a strong trade relationship. As one interviewee summarised,

  > *... these are people's livelihoods. There's exporters and producers and farmers over there that rely on the trade to Australia just as much as our exporters and producers and farmers rely on the trade going out of Australia.*

  This suggests the benefits from ongoing trade help to align both party's interests. The consequences of poor performance are to endanger a valuable trade relationship and this serves to provide incentives for the CA to perform well.
- For a CA their "reputation is important." A CA values how they are perceived by their counterparts such as the department. This suggests that their reputation (as a reliable certifying entity) is valuable for maintaining existing trading relationships and for establishing new trading relationships. One Australian CA staff member reflected that,

> *the certificate represents our country and our reputation for having high quality, safe product and so when they [exporters] have that certificate, that's essentially what they're saying. Is that, you can trust this product, it's from Australia which has good regulatory controls.*

Another interviewee observed of overseas CAs,

> *there's a national pride thing here as well. They want to make sure that they are exporting what they see as the best products for the world and they don't like hearing about when there are failures. When they hear that they take measures to make sure it doesn't happen again.*

The natural extension of these insights is that there is a perceived penalty from poor certification performance to trade and/or the CA's reputation. Both of which are "valuable" to the CA.

Other costs or benefits to a CA from achieving higher/lower error rates

Some of the factors that are highlighted in the stakeholder interviews that may undermine a CA's incentive to act in Australia's interest include:

- A CA may be open to industry capture whereby industry participants may be able to influence a CA or CA workers to act in their interests which may be counter to achieving ALOP.
- Lack of oversight by a CA of regions/sub-regions that may result in poor performance
- Trend to outsource certification to third parties. This may be problematic when a CA does not have the ability to monitor the performance of these third parties.
- A CA's budget may mean it lacks the resources to achieve an acceptable error rate.

CA's perception of the likelihood that the department will identify that the CA's performance is or is not acceptable.

The primary means by which the department may identify that a CA's performance is below an acceptable level is through inspections at the Australian border. It is impossible to know the perception of a CA about how likely it is that the department will identify whether or not their certification performance is acceptable. However, to the extent the CA is aware of our inspection protocols, it is influenced by how often we monitor/inspect the shipments on a given pathway. In the case of the ornamental fish pathway 100% of imports are inspected, on the other hand on the finfish pathway 0% of imports are inspected. It is thus likely that a CA's perception is that it is more likely that the department will identify poor performance on the ornamental fish pathway than the finfish pathway. Finally, regular reporting of data about CA performance, acquired through inspections at the Australian border, credibly demonstrates that the CA's performance is being monitored.

Awareness of Australian import requirements and awareness of certification performance

The ability of a CA to meet Australian import requirements may be influenced by its understanding of our import requirements. Communicating what these requirements

are and what is required to satisfy them may be a significant barrier for achieving acceptable performance. Language barriers, the uniqueness and complexity of Australia's import requirements, and speed at which dissemination of changes occurs, are all factors that appear to affect performance. Indeed more-regular and consistent feedback to CAs on their performance was overwhelmingly suggested as a likely to improve compliance.

We conclude that there are a broad range of factors that likely influence a CA's behaviour. The range and potential magnitude of these indicate that theory alone cannot identify whether a CA will behave in a way that is consistent with Australia achieving ALOP. Furthermore, these factors vary pathway by pathway and so behaviour is likely to be different across pathways from the same CA. The most direct way to determine CA behaviour is by utilizing monitoring via inspection of imports at the Australian border.

The discussion above also suggests some ways to influence CA behaviour that we discuss in the next section:

1. Credible monitoring
2. Communication and feedback
3. Explicit incentives attached to performance

5. Data analysis

5.1 Finfish

Because finfish are routinely released from biosecurity control after assessment of the documentation, existing data in AIMS only consist of basic information about volume and country of origin. The dataset would not allow conclusions to be made about whether a CA is complying with import requirements or not. A planned targeted investigation of this pathway to collect baseline data on CA performance was not able to proceed. We recommend such an investigation be undertaken in the future. Further discussion of how such investigations can inform policy with examples of past targeted investigations, is given in 5.3.

5.2 Ornamental fish

The ornamental fish database, consisting of data from the department's Agriculture Import Management System (AIMS) and regional data, was analysed for the ornamental fish pathway. Some of the dimensions assessed were:

- the level of certification failure for CA-certified products
- whether patterns of failure were different across countries with differing certification status

The data analysis was limited to the period 2011 to 2017. A significant amount of data cleaning was required to analyse the data for the purposes that the project team sought to examine. In particular, the following issues were encountered:

- Anomolous dates: This was shown by dates containing a year that was clearly outside the typical range of the data (2011-2017). Dates believed to be anomalous were corrected manually.
- Records with empty fields: Some records had NA in the 'Date.of.Consignment.Arrival' column, and no other information. We omitted these clearly spurious records. A small number records had an empty entry for one or more of the other columns – these were retained unless an entry had all columns blank. Some appear to be phantom records and these were omitted. There were also a small number of cases where a particular entry was associated with multiple records – these were amalgamated.
- Variation in names caused by:
    - Typographical errors
    - Spelling variants
    - the use of a singular or plural noun in an otherwise identical name,
    - variation in upper/lower case, or the amalgamation of two words seen in one record into one word in a variant,
    - contractions (e.g. Int'l instead of International),
    - punctuation or spacing
    - the presence or absence of a suffix indicating the nature of a company (e.g. Pty. Ltd.).

We corrected certain common instances of variation with the R code. Other apparent name variants were processed manually due to the often novel causes of variation. To

allow for more rapid data analysis we recommend that departmental data entry systems be improved to remove inconsistencies in data entry.

5.2.1 Results

The ornamental fish database was analysed to understand levels and patterns of non-compliance by country of export, including those with an approved CA and those with a non-approved CA, and by exporter. There were four categories of non-compliance:

- Biosecurity risk material (BRM), which includes the presence of eggs and algae in a product
- Certification error, a broad term which includes various inaccuracies in documentation such as mislabelling an imported species, and inappropriate content in a shipment such as hybrid fish or non-permitted species;
- Disease; and
- Parasites.

Certification error is assumed to capture both deliberate and non-deliberate non-compliance.

Patterns of failure across countries with differing certification status

Failure rates for ornamental fish products imported into Australia show large differences in failure rates across countries[18], with approved countries not always having lower rates of non-compliance compared to countries that haven't received approval. These differences may be driven by particular characteristics of the country rather than poor CA performance, but this was not discernible from the raw data. Whether these rates are in line with acceptable performance is an issue for the department. For instance, a failure rate of 15% may or may not be consistent with the department achieving ALOP. Nonetheless, the range of values shown in this figure indicate there is **significant heterogeneity across CAs** in terms of performance.

Although the evidence is not conclusive because of the potential for confounding factors, the large differences in failure rates suggest that there is **significant scope for improvement between the worst and best performing CAs.** For example, if measures were implemented that moved failure rates of the worst performing countries towards those of the best performing. We may expect the scope for country-specific differences to be limited in the case of certification errors (unlike say disease, where in some countries the disease may be more prevalent). Certification errors were predominantly documentation errors about the type of fish in a shipment. In this case, we still saw there is a large differences across CAs ranging from less than 5% to over 15%. Hence, this is suggestive that there is scope for the poorest performing countries to improve their performance from above 15% to below 5%.

Further information that can inform the scope for CAs to improve their performance on all dimensions, and the potential hurdles for doing so, may be obtainable from interviews with CA employees.

[18] Data not shown for reasons of confidentiality.

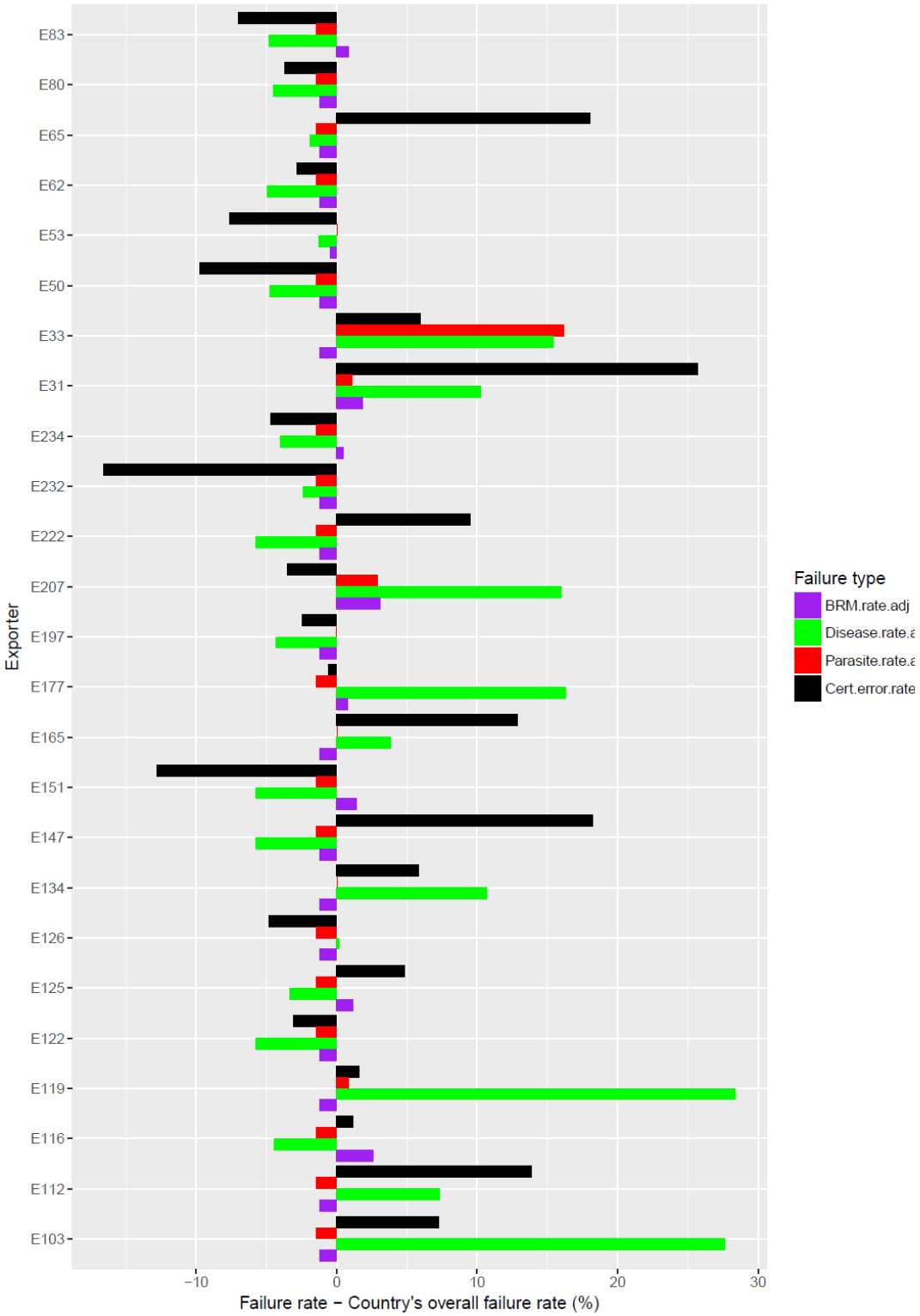

Figure 1. Failure rates by exporters* of ornamental fish with > 20 inspections, certified by a single CA, 2012-2017

*Exporter names have been removed from the figure for reasons of confidentiality

Level of non-compliance across exporters

The heterogeneous nature and level of non-compliance across exporters is shown in Figure 2. This is typical of patterns in most countries (data not shown). It would be reasonable to expect that if all exporters were being regulated equally by a CA, failure rates would be much more uniform. Again, the evidence for why there are such differences in non-compliance is not evident from the raw data. For example, it might be that the poor-performing exporters are being certified by a third party, that there is poor oversight within a sub-region of a country carrying out certification, or that some failures are not terribly costly to stakeholders. The raw data presented in Figure 2 suggest that **feedback may be useful for a CA**. For instance, if the poor performing exporters are being certified by a third party or in a sub region with poor oversight this may lead the CA to change its procedures. Importantly, the CA is the party with the best knowledge about how this information may be used in order to improve its certification performance. The information itself is a potentially useful input for the CA in designing and carrying out its functions as a certifier.

5.3 Using targeted investigations to inform policy

Targeted investigations are unannounced/random inspections of imports on a particular pathway, over a specific period of time. Such investigations are undertaken by the Compliance Division of the department. Although some insight into CA behaviour may be gained from the data collected on the ornamental fish pathway there are reasons to expect that CA/importer/exporter behaviour may be systematically different on the finfish pathway. Hence, some amount of monitoring through inspections is necessary for establishing a level of confidence in the risk management being undertaken prior to goods arriving at the Australian border.

There are a number of reasons why CA/importer/exporter behaviour is likely to be systematically different on the finfish pathway:

- The goods and the import requirements are very different across the two pathways. Moreover, it is likely that the scope for a CA to make errors will be systematically different on the two pathways as a result of these differences. That is, a CA's performance is unlikely to be the same on the finfish pathway as it is on the ornamental fish pathway; although some general patterns may exist, for instance, country A may perform better than country B on both pathways even though each country's performance is very different across pathways.
- The incentives for deliberate avoidance of Australian import requirements and the methods of avoidance are likely to be different on the finfish pathway. In particular:
    - On the finfish pathway consignments are released on documents only without further inspections. In comparison 100% of consignments are inspected on the ornamental fish pathway. A strategic actor that wishes to deliberately avoid Australian biosecurity conditions faces a lower likelihood of being detected on the finfish pathway. Hence, one might expect the scope for such strategic avoidance to be greater on the finfish pathway because deliberate avoidance is less likely to be detected.

- The differing features of demand for prohited items (quantity and value) across the pathways make the nature of avoidance quite distinct. Prohibited species of ornamental fish can be valued in the $1000s for a single fish whereas prohibited finfish are valued at much less but the quantity that can be sold is much greater. The nature of the avoidance on the ornamental fish pathway will tend to exhibit smaller quantities of high value items whereas the finfish pathway exhibit larger quantities of relatively lower value items.

The information gained from a targeted investigation can be used by the department to inform policy decisions through:

1. Establishing the current level of performance of each CA on the finfish pathway and whether that performance achieves ALOP for Australia. In the event that it does not then an explicit incentive mechanism should be implemented to address the risk. An example of such a mechanism is given in Section 6.4. In measuring CA performance this will also serve to address current uncertainty about and associated risk with a CA's performance and whether their activites enable Australia to achieve ALOP.
2. Establishing the nature of poor performance, if it is detected, can inform future and on-going monitoring in a more targeted fashion. Some examples of targeting are contained in earlier targeted investigations e.g. Operation Finfish described in Section 6.1.2 and Appendix E. In the case of Operation Finfish, information was obtained that allowed inspections to be targeted at specific importers attempting to bring in whole grouper to Australia from one particular country under documentation for whole rock cod.
3. Determining the scope for improving CA performance from devoting departmental resources towards improving the performance of poorly performing CAs. One potential outcome of monitoring is that there is a subset of CAs that perform well and another subset of CAs that perform poorly. In this case, the set of better performing CAs provides a benchmark for how much the set of poorly performing CAs can be improved through increased resource allocation by the department to achieve this. This will allow the department to determine the appropriate allocation of resources for improving the performance of poorly performaning CAs where the scope for improve is level achieved by the best performing CAs.

5.3.1 Discussion of data from past targeted investigations

While we were unable to obtain data from a targeted investigation, we were able to review reports from earlier investigations. In this section we review these reports to draw out some of the common pieces of evidence of CA performance/compliance and the methods that are employed to deliberately evade Australian import requirements. The reports we were able to review were:

- Operation finfish (16-2016)
- Cargo Compliance Verification (CCV) of undeclared frozen finfish (23-2018)
- Grouper (16-67)
- Ornamental finfish (Operation Mungo) (3-2016)
- Finfish excluding salmon (1718-079)
- Salmon (1718-080)

The first four of these reports involved inspections of particular consignments to determine whether the items satisfy Australian import requirements. A summary of these reports is given in Appendix F. The final two investigations only examined documentation issues with imported finfish.

Methods of avoidance

There were two methods of avoidance of Australian biosecurity requirements for the purpose of importing a non-permitted species described in the reports:

1. A form of mis-certification. The species of fish is certified to be a different species which is a permitted species or a species that is permitted to be imported in a particular form (whole fish in the case of the grouper investigations). On the ornamental fish pathway, where there are border inspections, the declared fish species was visually similar to the non-permitted species, thereby making it difficult for border inspectors to detect the non-compliance upon arrival in Australia. In all cases it was not known whether the certification was erroneous at the time it was made by the CA or the non-permitted species had been substituted for the permitted species prior to export but after certification by the CA.
2. Non-declaration of goods. In the investigation of frozen finfish, the non-permitted goods were dectected by a CCV inspection and were found to have no documentation.

Evidence that there is a market for whole grouper that motivates multiple entities to avoid Australian import conditions

In two separate cases, targeted investigations on the finfish pathway revealed that whole grouper was being imported to Australia. In addition to the direct evidence obtained during these investigations, the reports describe further suggestive evidence that the importers involved had previously successfully imported whole grouper and avoided Australian import requirements.

Some evidence of systematically poor performance by an individual CA across multiple cases

In two out of the three separate investigations covered by the reports (two of the reports were as a result of a single investigation) a single country was the source of the non-permitted species: one on the finfish pathway and one on ornamental pathway. This evidence suggests that there may be systematic weaknesses in the CA procedures in that country. There are likely benefits from adopting either:

- Feedback with the CA about the multiple instances of non-permitted fish being exported to Australia.
- Increased monitoring of imports from this CA
- Adopting a form of ‘sliding scale mechanism’, where biosecurity interventions range in severity, and thus provide ever-increasing incentives for improving performance for persistent poor performance (see 6.4.1).

More generally, systematic poor performance across multiple pathways by CAs suggest that there are likely benefits from:

- Internal (and potentially external) feedback reports that combine data across multiple pathways; and/or

- Remedial action (i.e. increased inspections/sliding scale mechanism) by the department that is triggered by poor performance across multiple pathways

Import requirements that are difficult / prohibitively costly for a CA and/or Australia to verify

Some import requirements are difficult or prohibitively costly for a CA and/or Australia to certify/determine if they are met, for example:

- If a fish is 'wild caught' versus 'farmed'; or
- Determining whether the species of fish or permited or not-permited to a high degree of confidence without (expensive) DNA analysis.

In instances where there is significant financial gain from avoiding Australian import requirements then these conditions pose a significant threat to Australia achieving ALOP. A general recommendation for addressing this threat is to make Australian import criteria more readily verifiable. The department could consider broadening the scope of what is not permitted, or ammending rules so that 'non-permitted' may be managed more efficiently. Two examples detailed in the targeted investigation of Operation Mungo illustrate this idea:

- "It is likely that some species of marine fish are certified as wild caught when they have actually been bred in captivity." Certain species of ornamental fish may only be exported to Australia if they are caught in the wild. The report notes that there are a number species that are highly valued (one example given was for Clarion Angel fish which fetch >$4000 per fish) by consumers in Australia and are successfully bred in aquaculture farms in a number of countries.
- "It is likely that suppliers and importers game biosecurity requirements by exploiting fish identification vulnerabilities." The report gives the example of the mistaken release of *Acrobrycon ipanquianus* because of the close resemblance with the permitted species *Boehlkea fredcochui* (Cochu's blue tetra). It notes that the difference between the permitted species and non-permitted species can be as subtle as a small dot near a dorsal fin. This makes it particularly challenging for an inspection officer to confidently distinguish between the two species.

Specific recommendation

There are instances where regulations imposed on imports are unverifiable, or at best verification is prohibitively expensive. We recommend that non-verifiable rules be identified and replaced with rules that are verifiable and provide equivalent levels of assurance. The following changes could be made:

- Consider additional criteria that are indicative of 'wild caught' versus 'farmed' that are more readily verified such as fish size[19].

[19] Generally, farmed fish are harvested to meet a specific market and given the controlled growing conditions, known age of fish, harvest method, the size of the harvested fish can be uniform. However, with wild fish, growing conditions and unknown age of fish etc and less selective harvest methods, when wild fish are harvested for market, their size maybe less uniform. It is acknowledged that these variable sized fish can be graded after harvest and before sale and export rendering the group of fish inspected at the border appear more uniform.

- If the risk of farmed fish is determined to be high then:
  - only allow importation from countries where the fish exists in the wild; or
  - evaluate cost/benefit of risk against not permitting either farmed or wild caught species.

A study by Arechavala-Lopez et al. (2012) demonstrated that there are morphometric differences between wild and farmed Gilthead seabream (*Sparus aurata* L.) and European seabass (*Dicentrarchus labrax*). There are techniques using otoliths (fish ear bones) that are able to distinguish fish, identify fish to a specific region (elements from the surrounding water, or from the feed etc), or if they've been farmed or wild caught (fat and or protein profile) (see for example Arechavala-Lopez et al. 2016).

6. Discussion and recommendations

This overarching objective of this project was to investigate the behaviour of CAs in undertaking their certification role on behalf of the Australian Government Department of Agriculture, Water and the Environment and to provide guidance on whether Australian border inspection policies should be modified in response. Two pathways were chosen as case studies in this project: ornamental fish; and ii) finfish for human consumption (non-salmon and salmon finfish).

Unfortunately, while the analysis provided some useful insights into aspects of CA behaviour, the available qualitative and quantitative data did not allow for conclusions to be drawn on whether modifications of inspection protocols on the finfish for human consumption pathway were required. We strongly recommend that the required information be collected and analysed, and an an incentive-based mechanism be implemented if subsequent analysis suggested incentives are mis-aligned. For completeness, an example of an explicit incentive mechanism is given in 6.4.

Analysis of biosecurity regulations on the chosen pathways highlighted an issue with verifiability of the rules, data quality and the benefits that would flow from improving communication flows with CAs.

6.1 Undertake a targeted investigation of finfish pathway

A targeted investigation of the finfish pathway would be used to determine baseline performance rates for each CA and to increase confidence in pre-border risk management on this pathway. Results will be used to address the uncertainty about how well aligned the current set of incentives facing a CA are with achieving ALOP for Australia on this pathway. The current level of performance will allow us to determine the scope for improving CA performance. One outcome may be that many CAs currently perform at a very high level on this pathway and there is little scope for improvement. On the other hand, we may find a subset of CAs perform well and another set perform poorly and so we may design our initial set of changes targeted at the set of CAs that are performing poorly. The results will provide a baseline from which to measure improvements. In establishing an initial level of performance this will allow us to measure future changes in behaviour against a benchmark for the same CA-pathway pair.

Although some insight into CA behaviour may be gained from the data collected on the ornamental fish pathway there are reasons to expect that CA/importer/exporter behaviour may be systematically different on the finfish pathway. Hence, some amount of monitoring through inspections is necessary for establishing a level of confidence in the risk management being undertaken prior to goods arriving at the Australian border.

6.1.1 Replacement of non-verifiable rules

There are instances where regulations imposed on imports are unverifiable, or at best verification is prohibitively expensive. Where this is the case it would be beneficial to either i) impose alternative regulations that result in the same level of assurance, or ii) adopt an outcomes-based approach, where a range of verifiable measures offering equivalent assurance may be available to entities certified by CAs. In summary, we

recomment that non-verifiable rules be identified and replaced with rules that are verifiable and provide equivalent levels of assurance

6.2 Stakeholder interviews

Interviewing off-shore CA employees and employees of foreign embassies based in Australia would reveal information on CA governance that has been unavailable in interviews to date. This includes information about the costs of operating the CA, time frames for correcting errors, and challenges faced in meeting Australia's certification requirements. A suggested template for interviews is given in Appendix G. We believe these interviews may inform the department about how confident it should be in the certification activity of the CA given its current governance and operation and the likely benefits from providing feedback reports.

Governance and operation of CA

The types of patterns we are interested in are those aspects of CA governance and operation in relation to the export industry that aligns or mis-align its interests with achieving ALOP for Australia in its certification activites. To the extent that the CA governance structure aligns interests of its workers with achieving ALOP for Australia, more confidence should be placed in its certification activites. In particular:

- How much of the CA's certification activity is undertaken by third-party providers?
- What measures does the CA undertake to monitor/measure the performance of its certification officers and/or third-party providers of certification?
    - What processes does the CA employ?
    - When issues arise how traceable are the causes?
- Are the wages paid to certification officers above/below/same as what they may earn elsewhere?
- How much of the costs of certification is paid for by the exporter and how much is paid by the CA?

Feedback reports

The types of patterns we are interested in are those concerning the current level of feedback from the department to the foreign CA about its certification performance. These will highlight whether and how introducing feedback reports may improve CA performance. In particular:

- Is the foreign CA aware of its certification performance?
- Are there current channels of communication that provide feedback about a CA's certification performance even if informal? Either directly from Australia or indirectly from export industry?
- Does Australia provide information that helps the CA improve its performance? If so what information is provided?
- What types of information would a CA find useful that is not currently being provided?
- What is a reasonable timeframe over which to expect changes to occur?

6.3 Implementation and evaluation of feedback reports

One of the themes that has emerged from stakeholder interviews is how we may improve CA performance through better communication and the provision of useful information. Economic theory also provides support for information provision improving CA performance. There are several reasons why we may think information can be useful for achieving ALOP:

1. Information on CA performance as measured by inspections at the Australian border can be used to identify where a CA is failing to meet an ALOP for Australia. This may be used by a CA to adjust procedures or devote additional resources to address the specific areas where its performance is poor.
2. A CA manages relationships with either its own workers or a third-party provider to undertake certification activities. As highlighted above, a key requirement for managing relationships of this kind is monitoring the performance of the person to whom the certification is being delegated. The information that Australia acquires through inspections is potentially useful to a CA in managing these relationships. In particular, it may allow it to better monitor workers or write contracts with third-party employers that stipulate specific performance criteria with respect to this kind of information.
3. A lack of awareness of Australian import requirements and what processes/procedures are necessary to certify a product may be a significant barrier for a CA to achieving an acceptable level of performance. Greater communication and feedback about actual performance can serve to identify situations where this is an issue and allow these issues to be addressed.
4. Information provision and feedback may also serve as credible indicators of Australian monitoring/inspection protocols on a pathway. One of the inferences a CA may make from receiving feedback about their performance on a pathway is that its performance is being monitored. A credible monitoring protocol therefore may serve to improve the performance of a CA. One of the important factors influencing CA behaviour is the value of the trade relationship with Australia and the value of a CA's reputation as a reliable certifier of products. However, these factors are only influential if the CA believes that the department is monitoring its performance at a sufficient frequency and accuracy to trigger a response to poor performance. Hence, a credible monitoring scheme is integral to the efficacy of the existing incentives to ensure a CA acts in a way consistent with achieving ALOP.

We therefore recommend the regular provision of feedback reports to CAs on the ornamental fish pathway, and provide a suggested format for the report in Appendix H. Key decisions in the design of feedback reports include:

- How frequently they are delivered to the CA (annual, bi-annual, quarterly), noting the trade-off between timeliness versus amount of information;
- The appropriate categories of errors and performance thresholds for acceptable and unacceptable error rates, if these are to be included in the report. There may be some need for flexibility here – the same error rate may not be appropriate for all CAs;

- Determining categories of information (categorising the reasons for failing an inspection). These should align with how the categories can better aid the CA to improve its systems; and
- Determining the baseline of acceptable performance. Communicating how to interpret the information. (An acceptable rate for ... is ... Or the average amongst other countries is ...).

6.3.1 Evaluating the performance of feedback reports

We recommend evaluating the performance of the feedback reports during their rollout on the ornamental fish pathway. In this section we make a number of recommendations regarding how to implement feedback reports in a way that will provide the greatest scope for measuring their impact. We first discuss some relevant outcome variables to measure prior to and after the rollout. Second, we discuss the benefits of creating a panel data set by holding out some countries from the rollout of feedback reports.

Outcome variables

Failure rates as detailed in the feedback report:

- Certification errors
- BRM
- Disease
- Parasite
- Other

It is likely that it will take some time for a CA to make changes to its processes and behaviours in response to feedback reports and then a period of time for this to translate into measurable changes in performance in terms of failure rates. Hence, we recommend supplementing the measurement of error rates by measuring engagement of a CA on a pathway. This evaluation could take place at regular six-monthly intervals. We recommend:

- Measuring forms of engagement by a CA:
  - requests for clarification of Australian import requirements;
  - requests for further information about details of failures – exporters, types of fish, etc.);
- Develop a statistical model that would allow the department to assess changes over time in the probability of a consignment failing an inspection based on the characteristics of the consignment (# fish, type of fish, etc.).
- Surveying CAs about their experience with the feedback reports and how useful or otherwise these have been in improving their performance.
- Following up with CAs where there has been either substantial changes in performance (to understand what changes have been made) or no improvement in poor performance despite sufficient time for this improvement to have occurred.

Create a panel data set to measure the impact of feedback reports

We recommend creating a panel dataset to measure the impact of providing feedback reports. This involves: (i) measuring outcome variables across time before and after the implementation of feedback reports, and (ii) holding out a group of CAs from the initial rollout of the feedback reports to create a control group.

First, the department should begin measuring outcome variables for each CA in both treatment and control groups. It is important to measure all CA's performance from before and after the time that feedback reports are provided to CAs. Measuring the outcome variables discussed above establishes a baseline in the period prior to an intervention for the engagement outcomes (note error rate outcomes are already being captured by virtue of the border inspections that occur on the ornamental fish pathway).

Second, we recommend holding out a number of CAs from the initial rollout of feedback reports to create a control group. This control group will be useful for estimating the impact of the feedback reports in countries that do rollout feedback reports. The performance of the control group CAs will allow the analysis to control for factors (other than the implementation of feedback reports) that are changing over time and affect the outcomes of interest. For example, if procedures at the Australian border improve and more CA errors are detected then this will impact measured errors in a before and after comparison for a single country that implements feedback reports. An ideal control group is as similar as possible to the treatement group in the number and characteristics of the CAs. Balanced against a concern for creating an ideal control group is the importance of rolling out the feedback reports to CAs in the initial stage.

One constraint on the rollout of feedback reports is that sensitivies with certain countries mean they will be excluded, at least in the first rollout, from receiving reports but will appear in the control group. We recommend including a number of other countries in the control group so as to have a control group that is a better balance with the group of countries which receive feedback reports.

6.4 Explicit Incentive Mechanisms

People make choices strategically to meet their own objectives. Economic theory provides a number of insights into how to design incentives such that an individual with a certain objective will act in a particular way. One of the challenges Australia faces when delegating some certification activities to CAs, activities that are required to meet ALOP, is that it has far less control of the systems, monitoring and processes that apply to a CA's workers than it does for its own workers. Nonetheless, economic theory tells us that if one has a measure of the output or type of activity that one wants to facilitate, **and** can influence directly or indirectly something that these workers care about, then one can affect their behaviour in a beneficial manner through rewards and punishments.

In the case of the first of these factors, Australia has the ability to measure CA performance through its own inspections/audits of arrivals into Australia. Hence, these provide a way to determine current CA performance and identify pathways or scenarios where CA performance falls below a level that is necessary for achieving ALOP.

In the case of the second, our ability to influence behaviour depends on the environment in which the CA (and workers) operates. A **key** challenge for designing incentives is understanding how the Australian protocols, such as inspection rates at the border, can be used to influence CA behaviour. Unlike an entity such as a firm, which may be approximated well as taking actions that are designed to improve profitability in a wide variety of situations, there is no clear counterpart for a CA.

Hence, a focus during the first year of the project has been to establish how responsive (in terms of improving performance) a CA is likely to be to certain types of actions and/or what can we measure in the upcoming year to improve our understanding. A theme to emerge in the stakeholder interviews was that the ongoing value of the trade relationship with Australia is an important factor aligning CA performance with achieving ALOP on a pathway for Australia. This suggests that protocols that Australia controls that can be used to influence the value of trade may be effective instruments to influence CA behaviour. Some ways to influence the value of trade for participants on a pathway include:

- additional inspections; and
- temporary suspension of trade.

There are costs associated with each of these and an important consideration in adopting an incentive mechanism is to balance the potential benefits against the associated costs that this may require. For instance, suspension of trade is the most severe of these alternatives and involves costs for Australia and the exporting country because of the loss of trade. In many instances this may be a too severe a form of penalty or a non-credible penalty to apply because of the costs involved for both sides. However, in an ongoing relationship, the future prospect of the suspension of trade may be adjusted in a more gradual manner to address this type of concern. For instance, poor performance may initially result in warnings that future action will be taken if performance does not improve. Furthermore, a scale may be implemented to communicate to a CA how close their current performance is to triggering a suspension of trade. A commonly cited example of this in our stakeholder interviews is the EU's third-country carding process (yellow-red-green card) for Illegal, Unreported, and Unregulated (IUU) fishing.[20] In this case the issuing of a yellow card is an indication to a country that their current level of performance is unacceptable and if it is not improved it will be issued a red card, thereby triggering trade restrictions. In this case, how proximate a country is to receiving a red card (either having been issued a yellow card or not) serves to scale the threat of trade restrictions for relatively small amounts of poor performance and it is only in instances of persistent poor performance that the penalties are applied.

6.4.1 Choosing an appropriate incentive-based mechanism for finfish

The incentive-based mechanism would ideally be implemented in a treatment-control setting. The form of the treatment and control will be chosen in consultation with the department (for example, across CAs or across pathways within CAs) and utilising the information gathered during the initial set of inspections that established a baseline (i.e. balancing relevant characteristics between the treatment and control groups).

The appropriate type of incentive instrument(s) used in the mechanism would be chosen in consultation with the department and appropriate stakeholders. Our preliminary recommendation is a sliding scale incentive mechanism that involves a sliding scale of interventions with some combination or all of the following features:

[20] *The EU IUU Regulation: Building on Success. EU Progress in the Global Fight against Illegal Fishing* (EJF, 2016). Access online, 22 June 2016 at, http://www.iuuwatch.eu/wp-content/uploads/2016/02/IUU_report_090216_web.singles.pdf

a. Determine a minimum rate of monitoring for all imports on the pathway (X% of shipments are inspected)
b. The outcomes from monitoring are aggregated into regular feedback about overall CA performance – both good and bad, at a specific frequency (e.g. every 3 months)
c. In response to initially detecting poor performance – issue a warning to a CA that high error rates have been detected; detail the nature of the error rate(s) that need to be improved going forward; and provide a timeframe for the improvements to occur. "We expect that in the period from now until … that the measured error rate will be below …"
d. After poor performance is initially detected increase inspection rates at the Australian border to obtain ALOP in the presence of the increased risk posed by the high error rate of that CA.
e. In the presence of persistent poor performance (continuing to exceed acceptable error rates for a specified period of time after the first warning) a CA is moved into an evaluation period with an explicit performance criterion that if not met over the course of the period will trigger a suspension of trade. This could also be accompanied with a public warning so that it is known by other countries.
f. A process of re-establishing trade in the event that a suspension of trade is triggered. This may be via either making the suspension a temporary suspension (e.g. 3 months) to allow the CA time to make changes or there is an approval process that requires the CA to demonstrate changes have been made that will allow it to improve performance.
g. Importantly, all of the above features should be communicated upfront with the CA i.e. prior to implementation of the mechanism. The incentives built into the mechanism work by being understood by the CA prior to any of the incentives being triggered. For instance, it is the prospect of trade being affected that serves to improve CA performance so that it never/rarely occurs.
h. The department should also be prepared to dedicate resources towards assisting a CA in the event of poor performance. For example, providing clarification about particular import requirements.

6.5 Biosecurity equivalence of third-party certification schemes

Certification schemes and pre-border audits of production, processing and transportation of imports have been suggested as an alternative means of assuring biosecurity standards at the border (Rossiter et al. 2016). In order to be considered as such, schemes would need to demonstrate i) credibility, and ii) equivalence with Australia's existing biosecurity standards. Characteristics of credible schemes are around scientific rigour and validity; inclusiveness; transparency; and independence. In cases where equivalence and credibility is demonstrated, there is potential to reduce overall system costs and improve economic efficiency by allowing such schemes to complement border inspections.

Several third-party certification schemes were discussed in this report. These schemes appear to be credible. We recommend that these schemes, and others, be investigated

more deeply with a view to establishing whether credibility and equivalence of biosecurity measures may be established.

6.6 Inconsistencies in data entry

A significant amount of data cleaning was required to analyse the data for the purposes that the project team sought to examine. To allow for more rapid data analysis we recommend that departmental data entry systems be improved to remove inconsistencies in data entry.

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8. List of Figures

9. List of Tables

10. Appendix A: Process for CA approval

The standard process for CA approval, with some of the later steps occurring concurrently, is as follows:

- The department receives a market access request;
- The request is prioritised against other similar requests, and also considering the departmental work plan and resources;
- A questionnaire is sent to the country seeking approval;
- A desk-top assessment is undertaken using information from the questionnaire, and from any additional information the department requests the CA to provide (questionnaires are based on the OIE PVS tool available at http://www.oie.int/solidarity/pvs-evaluations/oie-pvs-tool/]);
- An in-country verification visit is undertaken to validate the information in the audit table;
- A draft report is sent to the CA for review and correction of any factual errors;
- A final report of the evaluation (desk-top assessment and in-country verification visit and non-compliances/recommendation) is produced;
- Corrective Action plan received by CA on how they plan to correct non-compliances and respond to recommendations, which the department assesses and approves to ensure it would meet departmental requirements;
- Corrective actions are approved, their systems now have capacity to comply with the department's import requirements;
- Health certificate negotiated;
- Approval letter sent to CA with finalised health certificate; and
- Import conditions are updated into BICON, trade can now occur.

11. Appendix B: Third-party certification schemes in aquaculture

11.1 Aquaculture Stewardship Council and Chain of Custody

The Aquaculture Stewardship Council (ASC) is an independent non-profit organisation which operates a third-party certification and labelling programme for aquaculture around the globe. The ASC was established in 2010 as a partnership between the World Wide Fund for Nature (WWF) and the Sustainable Trade Initiative based in the Netherlands. Through certification and implementation of its standards, the ASC aims to transform aquaculture towards environmental sustainability and social responsibility.

The ASC has developed 11 standards[21], covering 17 species groups[22,] and different types, locations and scales of aquaculture production systems. Standards were developed during dialogue between conservationists, academics, non-governmental organisations and industry leaders. Meetings were open to the public and notes from the meetings were publically available. ASC has developed standards that aim to be science-based, performance-based and metrics-based. In addition to its 11 aquaculture standard, the ASC uses the Marine Stewardship Council's (MSC) Chain of Custody (CoC) standard to verify the origin of seafood sold as ASC certified. COC certification assures that ASC-certified seafood in supply chains originates from a farm certified by ASC.

Governance of ASC is via a Supervisory Board, advised by a Technical Advisory Group which focuses standards, chain of custody and certification and accreditation requirements. ASC standards are reviewed and managed according to ISEAL codes of practice[23]. Standards are reviewed every three to five years; reviews are open to the public.

Assessment of conformity with standards is conducted by independent conformity assessment bodies (CAB) accredited by Assurance Service International[24]. All fees for the audit process are agreed between the ASC and the CAB and are paid directly to the auditors. The ASC receives income from certified stakeholders if they choose to use the ASC logo.

Certification status by country, producer name, and species is publically available through a searchable database[25]. Importantly, 'certificate status' is listed under the following headings: cancelled; certified; expired; failed audit; in assessment; suspended; and withdrawn – entities whose certification status has been revoked are clearly identifiable.

[21] See: https://www.asc-aqua.org/what-we-do/our-standards/

[22] Abalone; bivalves (clams, mussels, oyster, scallop); flatfish, freshwater trout; pangasius; salmon; seabass, seabream, meagre; seriola and cobia; shrimp; tilapia, tropical marine finfish]. There is also a joint ASC-Marine Stewardship Council standard for seaweed.

[23] See https://www.isealalliance.org/credible-sustainability-standards/iseal-codes-good-practice

[24] See http://www.asi-assurance.org/s/find-a-cab

[25] See http://asc.force.com/Certificates/

Biosecurity principles feature heavily in all standards. For example, the salmon standards[26] include the following:

- Evidence of a fish health management plan, approved by the designated veterinarian, for the identification and monitoring of fish diseases and parasites
- Percentage of fish that are vaccinated for selected diseases that are known to present a significant risk in the region and for which an effective vaccine exists
- Evidence that unexplained and increased mortality is reported to the appropriate regulatory authority, leads to increased monitoring and surveillance and that findings are made public.

11.2 Global Aquaculture Alliance's Best Aquaculture Practices

Best Aquaculture Practices[27] (BAP) is third-party aquaculture certification program for seafood processing plants, farms, hatcheries and feed mills. The program addresses social responsibility, animal health and welfare, food safety and traceability at each step of the aquaculture production chain. Over 2000 aquaculture facilities across 33 countries had received BAP certification by the end of 2018[28] (The Fish Site, 2019).

Development and administration of BAP certification standards are undertaken by the Global Aquaculture Alliance (GAA), a non-profit trade organisation founded in 1997. BAP standards are publically available and are continually updated by technical committees with guidance from a 12-member Standards Oversight Committee (SOC) comprising an equal representation of members from conservation, academia and industry. After review by the SOC, standards may be modified, and will be subsequently published for public comment. Public comments are subsequently published online.

Assessment of conformity with BAP standards is conducted by various certification bodies that have been accredited by the International Accreditation Forum (IAF)[29]. The process for identifying and accrediting certifying bodies is clearly defined[30]; and the cost of applying for approval to certify is (non-refundable) $10,000 USD. The cost to facilities of becoming BAP-certified is unclear, but takes between 120 and 150 days once an initial application is made.

[26] See https://www.asc-aqua.org/wp-content/uploads/2019/12/ASC-Salmon-Standard_v1.3_Final.pdf

[27] See https://bapcertification.org/About for more information about the certification program, individual standards, and the facilities across the globe that have achieved certification or that are in the process of achieving certification

[28] In recent years BAP has been benchmarked against the Global Food Safety Initiative (2015), Global Social Compliance Programme (2017) and Global Sustainable Seafood Initiative (2017).

[29] The International Accreditation Forum is the world association of Conformity Assessment Accreditation Bodies and other bodies interested in conformity assessment in the fields of management systems, products, services, personnel and other similar programmes of conformity assessment. See https://www.iaf.nu/ for more details.

[30] https://bapcertification.org/WhatWeDo/ProgramIntegrity

BAP certification status by country, producer type, and species is publically available via a searchable database[31], updated every two weeks. Supply-chain linkages may also be identified via the database. The database clearly shows producers with and without certification, and those aspiring to receive accreditation. Information on non-compliance by stakeholders is not readily available. The following categories are used to describe certification status:

- Certified producers – these are facilities whose BAP certifications are currently valid. The expiration date of the certificate is provided, along with whether a facility accepts unannounced audits.
- Renewals in process – these are facilities actively engaged in the re-certification process
- New to process – these are facilities new to the BAP Program and which have begun the process towards achieving certification;
- iBAP Producers – these are facilities that have made a commitment to become BAP certified and are following a defined, time-bound improvement process toward certification; and
- Fallow – these are previously certified sites that temporarily stopped cultivation and are expected to re-apply for certification.

Biosecurity principles feature in many BAP standards and guidelines, including those for:

- on-farm production systems. These focus on preventing the introduction and/or spread of disease agents and disease on the farm, and include guidelines for regular disease surveillance, sanitation of equipment and personnel, quarantine of diseased animals and controlled movement of personnel and equipment.
- area-wide management, which focus primarily on the prevention and control of pathogenic organisms and the diseases they cause through the implementation of cohesive area-wide management; and
- Managing the effluent level in water where recirculated systems are used.

BAP is benchmarked by internationally recognised third parties: the Global Sustainable Seafood Initiative (GSSI), the Global Food Safety Initiative (GFSI), and the Global Social ComplianceProgramme (GSCP).

11.3 GLOBALGAP

GLOBALGAP is a trademark and a set of standards for good agricultural practices (G.A.P.). GLOBALGAP. (originally EUREPGAP) was established in 1997 as an initiative by retailers to help producers comply with Europe-wide accepted criteria for food safety, sustainable production methods, worker and animal welfare, and responsible use of water, compound feed and plant propagation materials[32.]. Technical

[31] https://bapcertification.org/Producers

[32] See https://www.globalgap.org/uk_en/who-we-are/about-us/history/

Committees, consisting of industry experts from the entire supply-chain, are responsible for developing, maintain and reviewing standards.

Three standards are relevant for aquaculture operations: the aquaculture standard; the standard for compound feed; and the chain of custody standard. The aquaculture standard covers all aquaculture species and the entire production and distribution chain – broodstock, seedlings and feed suppliers to farming, harvesting and processing. Biosecurity principles are available for downloading once a user registers with the website. A cursory view of the relevant documents indicates detailed instructions regarding disease prevention and use of medicines. Under the compound feed standard, producers are required to source the compound feed used at the aquatic farming and hatchery levels from reliable suppliers. Using the chain of custody standard a producer is able to identify the status of their product throughout the entire supply-chain.

Certification is undertaken by independent and accredited approved certification bodies[33]. These bodies conduct both announced and unannounced onsite farm inspections and audits throughout the year, and will provide certificates to producers who have successfully implemented the GLOBALGAP standard. Certification bodies themselves are monitored and evaluated by the Integrity Surveillance Committee (ISC), an independent body that makes the final decision on a certification body's approval status. The ISC is constituted by industry experts with a local legal background. The ISC reviews cases where the certification body may not be operating according to specific compliance criteria, and will suggest corrective measures and sanctions that are then enforced by the GLOBALGAP parent company FoodPLUS GmbH. FoodPLUS GmbH, also manages the standard setting process and the database, and is the legal entity holding the international copyright for GLOBALG.A.P and GGN[34].

Producers who have received GLOBALGAP. certification may also use the GGN label. The GGN (Global Gap Number) is a thirteen-figure identification number that allows consumers to identify the farms that have produced the product.

[33] Certification bodies are accredited with accreditation bodies that have signed an MOU with GLOBALGAP. A full list of accreditation bodies is available at https://www.globalgap.org/uk_en/what-we-do/the-gg-system/certification/list-of-accreditation-bodies/index.html

[34] More details about governance and ownership can be found at https://www.globalgap.org/uk_en/who-we-are/governance/index.html

12. Appendix C: Interview questions–Importers

General information

1. How long have you been importing aquatic-animal goods into Australia?
2. What are the main three aquatic-animal products that your business has brought into Australia most frequently over the past year?
3. Which are the main countries that these products are sourced from?

Information on market structure

4. Over the past year, how many different suppliers have you used? *(name of supplier and/or country?)*
5. Why did your business choose to use that many suppliers?
6. For the next few questions, we would like to focus on your principal supplier; that is, the supplier you have used most in the past 12 months. What role does your principal supplier play in the supply chain? [*Prompt: direct producer of the goods you import; an intermediary that aggregates products from various producers; something else; don't know*]
7. Does your principal supplier have direct control over the supply chain for the products they supply to you?

Characteristics of the exporter (supplier)/importer relationship?

8. Could you describe what you understand to be Australia's quarantine clearance methods for the main aquatic-animal product that you import?
9. Thinking about the supplier you have used most in the past 12 months:
    a) How frequently do you speak with them about Australian biosecurity requirements?
    b) How often and under what circumstances do you discuss the results of any onshore biosecurity inspections with them?
    c) How often and under what circumstances does your principal supplier discuss the results of certification by overseas CAs with you?
    d) In the past 12 months, have you been made aware of any changes to production processes, quality assurance procedures or transportation arrangements instigated by this supplier?
10. Over the past 12 months, have you changed suppliers? If so, what was the reason?

Characteristics of the CA/exporter/importer relationship?

11. Are you aware whether offshore (overseas) certification of [ornamental fish or finfish product] that takes place before it leaves country Y [use one country given in Q3] If yes, ask for explanation:
    a) Can you explain what you understand the process of certification in country Y?
    b) Who is responsible for arranging the offshore certification process? (e.g. overseas supplier / importer / industry association)

c) Are you aware of how much time it takes for certification to occur? If yes, how much?

d) Is there a cost involved? If so, who pays for it?

e) Has one of your suppliers who sources product from country Y ever failed an offshore certification inspection? [If yes] Could you describe to me what you understand to be the circumstances behind the most recent certification failure for country Y?

f) How effective do you perceive the offshore certification process to be in meeting biosecurity requirements? Could you describe why you gave that assessment?

Experience with biosecurity system

12. Thinking about product XXX, could you estimate the minimum/maximum and typical time it takes for a 'clean' consignment to clear biosecurity?
13. Thinking about product XXX, could you estimate the minimum/maximum and typical time it takes for a consignment that required testing, treatment or another form of rectification to clear biosecurity?
14. In the past year, have you experienced delays in clearing customs and/or biosecurity for the shipments of xxx you provide broking services for? If yes:
    a. In the most recent instance when you experienced delays, what was the cause of these delays? [Prompt: customs/biosecurity/paperwork/offshore certification]. [If offshore certification, please give details]
    b. In that instance, how was the delay resolved?

Cost of offshore vs onshore assurance

15. Are you aware of the costs of going through offshore assurance via a CA versus undertaking onshore assurance at the Australian border? If yes, could you please describe:
    a. Cost of offshore assurance via a CA?
    b. Cost of onshore assurance at the Australian border?

Other comments

16. Are there any other comments you would like to make about the offshore certification or onshore inspection process, or importing aquatic-animal goods into Australia in general?

13. Appendix D: Interview questions – TMAD

Issues around CA governance

1. Could you describe to me the 'standard' process through which an overseas agency is 'approved' or 'recognised' as a 'Competent Authority' by Australia?
    a. Does this process vary for different types of products and/or for different countries?
    b. *[If yes to one or both options]* Could you describe some circumstances under which the 'standard' process differs?
    c. How can the process differ in these circumstances?
2. In your experience, which organisation or organisations fund CAs? [*Prompt: Government, industry association, combination, other?]*
    a. Does the funding source for CAs tend to differ by country and/or the type of product? If so, how?
    b. Is information on the source of funding and the amount of funding provided to a CA each year usually publicly available? If so, could you describe the range of arrangements you are familiar with?
3. Typically, how does a CA relate to other parts of the government bureaucracy?
4. Typically, how does a CA relate to industry associations or other non-government bodies that promote trade?
5. Who is ultimately responsible for a CA's performance and who do they answer to? [*Depending on answer to 4. May need to itemise out answers by type of CA relationships]*
    a. How is this person/people rewarded?
6. Does the person/people ultimately responsible for a CA's performance have other responsibilities? If yes, what are they? [*Prompt: for example, trade promotion*].

Characteristics of the CA/stakeholder relationship for aquatic-animal arrangements

7. Can you explain the process of certification of an exporter for aquatic-animal goods?
    a. Is certification by specific export lot on a case-by-case basis or does an exporter achieve certification for a whole season?
    b. Does a CA deal directly with an exporter or industry?
8. Are there any benefits to a country's export industry from having a CA certify its products? If yes, what are they? [*e.g. more $, easier access to particular markets*]

Internal monitoring systems and incentives within a CA

9. Given that a CA must design the internal systems for its employees or agents to carry out the relevant activities to ensure that their certification is compliant with Australia's requirements, for a particular country–aquatic-animal combination**:**

    [**Country–aquatic-animal combination:**]:

a. How much are CA agents/workers paid, relative to other employees with similar skills/experience levels?

b. How are CA workers monitored?

c. Is the performance of individuals/teams within the CA generally traceable? (e.g. if something goes wrong, can the CA pinpoint who was responsible in the organisation?

d. What information/capability would a CA typically have that would allow it to enforce compliant behaviour by its own employees?

[*Follow-up]* Do you think this is sufficient for internal compliance monitoring?

10. In your opinion, could greater feedback of information to the CA about consignments that fail in Australia after being certified by the CA improve compliance? [If yes] What forms of feedback do you think CAs would find useful?

11. In your opinion, could onshore procedures undertaken in Australia that impose benefits/costs on exporters in response to good/poor performance by the CA improve compliance? [If yes, details]

    a. In your opinion, would an increase in the frequency of verification activities in Australia in response to poor CA performance improve their future performance? [If yes, elaborate on why]
    b. In your opinion, are there discernible differences in attitudes across different CAs that could affect implementation of offshore biosecurity policies?

Factors resulting in non-compliance by CAs

12. Could you please give your general impression of how reliable CA certification is?

13. In your opinion, what factors or circumstances typically result in a CA's certification being non-compliant with Australian standards? [*Prompts: lack of requisite knowledge/skills, poor monitoring of CA worker performance, exporters using money or influence to get certification.]*

Cost of offshore assurance processes

14. What is the cost to an exporter of having a product/shipment certified by a CA for the country–aquatic-animal product nominated in Q9?

    a. Does this vary by size of shipment, type of product, or by some other measure?

    b. Does this cost to the exporter reflect the true cost of the CA certification services? [Yes, no, don't know] *[If yes or no]* Could you please explain why you believe that to be the case? [e.g. government subsidies for the purpose of trade promotion]

Other comments

15. Are there any other comments you would like to make about the offshore certification process undertaken by CAs?

14. Appendix E: Interview questions – Exports

CA governance

1. Which Australian export industries require certification of their products by Australian authorities before leaving the country? Under what circumstances would export certification be required?
    a. Is certification required for aquatic-animal products exported by Australia?
2. Could you describe the typical process by which the department has been 'approved' or 'recognised' as a CA for a given export market? In your experience, what variations on this typical process have you observed? [Nominated export market/s:]
3. Is there an international body that reviews CA activities? [If yes] Could you describe which organisation/s are involved?
4. Is information around CA activities every shared in international fora? [*Prompt: in the Quads?]* [If yes] What information is typically shared between countries on their respective competent authorities?
5. Do you have any understanding or awareness about CA behaviour in counterpart agencies? [If yes] How was this knowledge gained?
    a. Is there any sort of KPI reporting by overseas CAs? [If yes] What type of information tends to be conveyed through KPIs?
6. Do you communicate on a regular basis with other countries about certification procedures and processes? [If yes] What type of information is exchanged through these conversations?
7. What is your general impression of how reliable CA certification is?
8. Are there any other comments you would like to make about CA governance in general?
    a. In Australia?
    b. Overseas?

Characteristics of the CA/exporter relationship

9. Can you explain the process of certification of an Australian exporter?
    a. Does the department as CA deal directly with an exporter or industry body?
10. Is the the department paid for the certification it provides? If so, by whom [*Prompt: individual exporter; industry?*],
    a. How is the cost of the department certification calculated? [does it reflect the true cost of certification]
    b. Does this vary by pathway/commodity?
    c. Is payment per certificate or per volume or per some other measure?
11. Are there any benefits to Australian exporters from having the department to certify products? If yes, what are they?

Internal monitoring systems and incentives within a CA

12. Does the the department ever receive feedback from an overseas country about whether the exported products do or do not meet other countries' import conditions as certified? [If yes, please give details and examples – if negative feedback was received, what would next steps be?]
    a. Are you aware of any instances of Australia losing its CA status, or market access being revoked for particular goods that was related to CA performance?
13. Are internal reviews of the department as a CA ever undertaken? [If yes] What do these reviews cover? For the most recently completed review, could you describe any changes to CA operations that resulted from the review?
14. What are the possible consequences of poor performance as a CA? Could you describe any negative consequences that you are aware the department has faced as a result of past performance?
15. This question relates to how overseas CAs may react to policy changes implemented by Australia. We would like you to answer these questions by drawing on your experience working within the department. In your opinion, what do you think the response of a CA would be, if any, to the following policies:
    a. An increase or decrease in frequency of routine on-arrival inspection in response to compliant or non-compliant behaviour. [e.g. increasing onshore assurance from 0 to 5 or 10 per cent of consignments]
    b. Suspension in trade of goods to Australia from specific countries;
    c. Changes to import conditions that result in increases or decreases in costs imposed on exporters/importers in clearing goods through Australia's biosecurity checks.
    d. Formalised feedback to a CA about non-compliant consignments;
    e. Publishing performance of CA on a publicly available website [as is the case with the Imported Food Inspection Scheme];
    f. For future CA agreements vary the certification tasks delegated to the CA.

Other comments

16. Are there any other comments you would like to make about the department as a CA or about CA behaviour in general?

15. Appendix F: Summary of past targeted investigations

15.1 Operation finfish (16-2016)

Trigger point of investigation

- This activity was developed after the department identified that whole farmed grouper exported from a country had been illegally imported using the goods description and import permits for whole rock cod.

Aim

1. To verify the compliance of imported fresh finfish species from this country against the import permit conditions in the air cargo pathway.
2. To verify if supplied certification accurately reflects the species of finfish in the consignment.

Inspection activity undertaken

- verified the compliance of commodity pathway as not normally subjected to inspection through verification of the imported goods against commercial import documentation to confirm the contents were as declared.
- verified the imported finfish species against the import documentation.
- where anomalies were identified between the declared and actual finfish species, DNA analysis was undertaken.

Results

- Variations in the finfish species declared as ‘whole coral rock cod’ on commercial documentation. DNA analysis confirmed that the whole fish product in both consignments was of *Epinephelus* spp (grouper) and not the declared coral rock cod (*Cephalopolis miniata*)
- Various descriptions were used to describe the targeted finfish species which included, but was not limited to ‘rock cod, grouper, Epinephelus, other fillets and Chilled Fillets’.

Policy Implications

- Opportunity exists for higher risk finfish to be substituted for low risk or risk species and bypass biosecurity requirements.
- The department does not have a current diagnostic capability for DNA testing.
- Due to the cost of external DNA testing to inform non-compliance decision making in target operations, there is an ongoing need to consider the best return on investment for this expenditure.

15.2 Cargo Compliance Verification of undeclared frozen finfish (23-2018)

Trigger point of investigation

- the detection of misdeclared and undeclared frozen foodstuffs at a Cargo Compliance Verification (CCV) inspection.

Aim

1. Tactical targeting assessment

Inspection activity undertaken

- Analysis of ICS and AIMS data for the previous 12 months prior to this detection of mis-declared and undeclared foodstuff at a CCV.

Results

- Of the 65 CCV inspections on refrigerated Full Container Load consignments, there were only 4 recorded non-compliances, including the consignment that instigated this targeting assessment
- Three non-compliances relate to packing failure declarations.
- The fourth non-compliance was one misdeclared line and eleven undeclared lines of foodstuffs totalling 93 packages. The undeclared goods included durian, whole baby grouper, Indian mackerel cutlets, whole Indian mackerel, eviscerated Icefish, mini glutinous riceballs, kingfish steaks, meat dumplings wrapped in leaves
- There have been multiple imports with the same importer and supplier supply-chain.

Policy Implications

- If not for the CCV inspection, the consignment would otherwise have only had an Imported Food Test and Hold inspection, which is not seals intact, and would have been released on documents for Biosecurity.
- Some plausible scenerios
    a. There is a market for illegally imported frozen finfish, including grouper
    b. An entity operating under and Approved Arrangement (AA) is importing undeclared frozen foodstuffs, including whole finfish and durian, from a supplier
    c. A supplier is supplying undeclared frozen goods to other importers
    d. An AA is importing undeclared and mis-declared food products in other consignments

15.3 Grouper (16-67)

Trigger point of investigation

- The department received a report from the public of potentially illegaly imported whole grouper. The grouper were often of a similar size leading to speculation that they are from aquacultured facilities, not wild caught, which must be at least head-off, gilled and eviscerated.

Aim

1. To test and verify this information and to test the extent to which the wild-caught / farmed vulnerability is being exploited.

Inspection activity undertaken

- Inspect consignments of fresh chilled fish arriving as air cargo imported by the importer suspected of this illegal activity. To conduct DNA testing to identify the species.
- Assessment of ICS, AIMS, the importer's Import Permits, invoices and health certificates.

Results

- The Import Permit is for Giant grouper (*Epinephelus lanceolatus*), which requires fish being gilled and gutted. The fish inspected were whole; with gills and guts.
- A number of anomalies were detected on the health certificates
  - All health certificates have an amendement on box numbers and weight which are endorsed
  - All health certificate attachments always specify the fish as "fresh chilled fillets deboned, skin less / skin on, with belly flap, gut and gilled removed", but have been detected as being whole with guts and gills.
- There were other importers that also use the same supplier and other producers from the same country.

Policy Implications

- Vulnerabilities have been identified through the import supply chain as there are separate conditions based on country of origin and culture method (farmed or wild-caught).
- The anomalies on the health certificate would not ordinarily be detected by a document assessor as they would deem the product as meeting import requirments and release them on presentation of documentation ie. No inspection required.
- The anomalies detected with invoices would not be easily determined by a document assessor as they would not be processing entries for all importers of finfish from the same country at the same time

15.4 Ornamental finfish (Operation Mungo) (3-2016)

Trigger point of investigation

- In response to multiple investigations into Class 7.1 entities, including a recent regulatory investigation into a Class 7.1 AA that further identified broader concerns with this class of premises, the import trade of this commodity and a previous assessment by Enforcement.

Aim

1. Investigate the compliance of the live fish trade as regulated via Class 7.1 Approved Arrangements

Inspection activity undertaken

- An assessment of the current pre-border, border and post entry and Approved Arrangement controls for live imported finfish using a range of open and closed sources.

Results

- Two invoices from an overseas supplier were found for the same consignment. One was titled ‘invoice’, while the second was titled ‘actual invoice.
- A declared expensive species of fish was presented with a lower value than expected invoice values of only a few dollars per fish. The importer agreed to onshore testing which would cost at least double the invoiced value of the consignment which appears counter intuitive for a profit driven trade.
- Health certificate statement declaring Clarion Angel fish was wild-caught, but is not found in the wild from that country.
- The number of other marine species which are able to be successfully captive bred is constantly growing with several large companies promoting an investment of long term research intp captive marine aquaculture.
- Marine fish were significantly more commonly seized than freshwater species at the initial inspection point for being non-permitted or unidentifiable
- There were 16 attempts by an importer to import non-permitted species of Gobies
- There were repeated attempts by an importer to import the non-permitted speceies, *Meicanthus smithii* (Discvo Blenny), which was invoiced as a permitted species of the same genus, *M. astrodorsalis* (Forktail Blenny).
- On two occasions, the nonpermitted species *Opistotgnathus randalli* (Jawfish) was invoiced as *Ecsenius midas* (Midas Blenny), which has a very different appearance.

Policy implications

- Document assessment controls are unable to detect non-permitted species due to non-compliant behaviour manifesting as undeclared or mis-declared species.
- It is operationally difficult to enforce current live fish import requirements regading aquarium fish being wild caught as compared to captive/tank bred.
- It is likely that two methodologies may be utilised by industry supply chain participants to evade biosecurity controls for live fish:
    - Non-declared included non-permitted species

  - And/or substitution of permitted species with non-permitted specis
- That the motivators for the above behaviours are both profit driven and collector driven.

16. Appendix G: Interview questions – third-country CA employees

Interview Questions. *Below is a list of questions we plan to ask each participant during the interview. All interviews are 'semi-structured', which means that we may need to ask a participant to elaborate on a point to elicit as much detailed information as possible. However, we will endeavour to adhere to the script described here as closely as possible.*

[These questions will relate to a particular country's Competent Authority/ies]

General questions

1. Could you please give the name/s of the organisations responsible for certification of aquatic-animal products?
2. Could you please describe your role/experience working with [*the CA*]?

CA governance

3. What is the relationship between [*the CA*] and industry associations or other non-government bodies that promote trade?
4. Are the CA's certification roles ever undertaken by a third party?
    a. If yes, can you give examples of when this would occur, and by whom?
    b. Does the CA measure or monitor the performance of the 3rd party? If yes, how does it do so?
    c. Has the CA encountered performance issues with 3rd parties? If yes, how are these resolved?

Characteristics of the CA/stakeholder relationship for aquatic-animal arrangements

5. Does the CA have regular channels through which it seeks feedback or consults with exporters on its performance? If yes, can you provide some examples
6. Does the export industry ever provide input or feedback to the CA regarding procedures and processes for certification? If yes can you provide some examples of the type of input that is provided

Cost of offshore assurance processes

7. Does an exporter incur a cost from having a product/shipment certified by a CA?
    d. If yes, does this vary by size of shipment, type of product, or by some other measure?
    e. Does this cost to the exporter reflect the true cost of the CA certification services? [Yes, no, don't know] *[If yes or no]* Could you please explain why you believe that to be the case? [e.g. government subsidies for the purpose of trade promotion]

Internal monitoring systems and incentives within a CA

8. Does [*the CA*] have regular internal monitoring of performance against certification standards?
9. For a particular country–aquatic-animal combination**:**

    [**Country–aquatic-animal combination:**]:

a. How much are CA agents/workers paid, relative to other employees with similar skills/experience levels?

b. How is the performance of CA workers responsible for certification of an export evaluated?

c. Is the performance of individuals/teams within the CA generally traceable? (e.g. if something goes wrong, can the CA pinpoint who was responsible in the organisation?)

10. In your experience what is the typical length of time it takes for the CA to change its processes and procedures in response to a change in the certification requirements of a country? For example, the length of time from the first notification of an upcoming change until the new procedures are implemented?

Factors resulting in non-compliance by a CA

11. In your experience, what factors or circumstances might result in CA-certified exports being non-compliant with Australian standards?
12. What are the biggest challenges facing a CA in meeting Australian standards?

Feedback

13. In your experience, is [*the CA*] informed about the **compliance** or **non-compliance** of exports with Australia's biosecurity rules, where those exports were certified by [*the CA*]? [*if yes*]:

    a. How is this information received? [*Prompt: official feedback; from exporters…*].

    b. Who would receive this information?

    c. Is this information provided in English?

    d. How often is this information received?

14. In your experience, how does a CA respond to information that certification was **non-compliant**? Could you please give an example? [*Prompt for how long this would take*]
15. In your opinion, would additional feedback of information to [the CA] about consignments that fail in Australia after being certified, be helpful?

    a. [*If yes*] What additional information do you think CAs would find useful?

    b. [*if yes*] In what form would you prefer to receive this information?

Other comments

16. Are there any other comments you would like to make about the CA certification process in general, or about the relationship between [*the CA*] and DAWR?

17. Appendix H: Feedback reports

A confidential feedback report template has been provided to the department.