



HEALTHY RIVERS TO  
REEF PARTNERSHIP  
MACKAY-WHITSUNDAY

# Development of Methods and Results for the Pilot Report Card Stewardship

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**Final Report**

**Technical Working Group**

**April 2016**

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## 1. Introduction

### 1.1. Background

The pilot Mackay-Whitsunday Healthy Rivers to Reef report card will report on the level of “stewardship” occurring across different industries in the region. “Stewardship” will be represented as the level of management practice implemented across the region.

Stewardship is an important aspect to include in the report card as it provides information on the voluntary actions landholders in the region are implementing (such as improved land management practices) to provide benefits to ecosystems. Stewardship activities also have a direct link to the water quality in the region (albeit, not necessarily immediate). Stewardship reporting can be used to demonstrate how on-ground activities (*responses* undertaken by landholders in the region) impact water quality (the *state* of the natural environment).

The stewardship reporting will also assist to meet various Partnership and report card objectives. In particular, the stewardship information will aid the environmental report card objective to report on the *pressures* acting upon the water quality and ecosystem health in the region’s waterways. Additionally, reporting on the stewardship levels will assist with the following Partnership objectives around effectively communicating relevant information and supporting decision making for management activities and interventions.

The level of stewardship implemented by the different sectors will be reported on in the Mackay-Whitsunday report card in terms of the amount of each sector operating under each management practice level. Stewardship reporting will be provided in the pilot report card for each of the following sectors (see Table 1):

- Horticulture;
- Grazing;
- Sugarcane;
- Ports;
- Industry (heavy industry – mining, mills, environmentally relevant activities (ERAs), licenced activities, etc.);
- Tourism; and
- Aquaculture.

It is proposed that stewardship within additional sectors is included in the report card released in 2016 (see Table 1):

- Urban (construction and operational activities under councils – sewage treatment plants (STPs), developments, etc.);
- Forestry; and
- Fishing.

**Table 1. Proposed frameworks and reporting inclusions in the Mackay-Whitsunday report card.**

<b>Sector</b>	<b>Framework used to assess stewardship</b>	<b>What will be reported</b>	<b>Timeframe for inclusion in report card</b>
Horticulture	Reef Plan Water Quality Risk Framework.	Same as Paddock to Reef reporting.	Pilot report card.
Grazing	Reef Plan Water Quality Risk Framework.	Same as Paddock to Reef reporting.	Pilot report card.
Sugarcane	Reef Plan Water Quality Risk Framework.	Same as Paddock to Reef reporting.	Pilot report card.
Ports	Currently in draft. Developed by consultants.	Percentage of activities operating under each practice level.	Pilot report card.
Industry Heavy industry – mining, mills, ERA/licenced activities, etc.	Currently in draft. Developed by consultants.	Percentage of activities operating under each practice level.	Pilot report card.
Tourism	To be developed by consultants, with alignment to ECO Tourism certification.	Percentage of activities operating under each practice level.	Pilot report card.
Aquaculture	Developed by consultants.	Percentage of aquaculture activities operating under each practice level.	Pilot report card.
Urban Construction and operational activities under councils, i.e. STPs, developments, etc.	Healthy Waterways Alliance and the Urban Think Tank ABCD framework for Mackay Whitsunday.	Percentage of urban activities operating under each practice level.	2014-15 report card.
Fishing	To be developed through the Mackay Whitsunday Fisheries RWG, in conjunction with consultants.	TBC	2014-15 report card.
TBC - Forestry	Established through the Mackay Whitsunday Forestry RWG.	TBC	In the future.

## 1.2. Purpose of this Report

The purpose of this report is to provide information on the methods and results for stewardship reporting in the pilot Mackay-Whitsunday report card. In particular, this report outlines:

- Inclusions of stewardship reporting in the pilot report card;
- Frameworks/guiding material used to assess stewardship in the different sectors;
- Data collection methods; and
- Presentation of the information.

For further information about the Partnership, the report card, or the process undertaken during the development of methods, please refer to the Program Design: Pilot Report Card document.

## 2. Management Frameworks

### 2.1. General

Available management practice frameworks will be used to provide the basis for the stewardship reporting. Frameworks that have been developed, reviewed, and endorsed by industry are currently available for grazing, sugarcane, and horticulture.

Frameworks were developed through the Gladstone Healthy Harbour partnership for industry and ports, and have been amended to make relevant to the Mackay-Whitsunday region. Additionally, through this report card process, new frameworks have been developed for the tourism and aquaculture sectors, and are reported on in the pilot report card. At this stage there are multiple frameworks for the urban sector which require some work to align and finalise. Fishing and forestry frameworks will be developed and applied in the future.

The frameworks provide a system for describing the management practices of each industry ranging from A (Aspirational/Very Effective) through to D (Dated/Ineffective) practices. The frameworks also indicate how those practices relate to impacts on water quality (see Table 2 below).

For the purposes of this report and the Mackay-Whitsunday report card, the term “Management frameworks” will be used, noting that different sectors use slightly different terminology. The Paddock to Reef reporting has been revised to refer to “Water Quality Risk frameworks” (previously “ABCD Frameworks” – see Section 2.2).

Table 2. Management practice system ABCD classes and definitions for sugarcane, horticulture, and grains (Source: Drewry J, et al., 2008).

Class	Description of practice	Farm management plan	Community and industry standard	Effect on resource condition	Effect on profitability
A	Cutting-edge practices that require further validation of environmental, social and economic costs/benefits	Yes, develops and tests innovative technology.	When validated is an acceptable practice for the long term. (May not be universally endorsed as feasible by industry and community.)	When validated, practice likely to achieve long term resource condition goals if widely adopted.	When validated, improves profitability in the medium to long term. (May reduce profitability during the transition.)
B	Currently promoted practices often referred to as 'Best Management Practices'.	Yes, and utilises common technology.	Acceptable practice for the medium term.	Practice likely to achieve medium term resource condition goals if widely adopted.	Improves profitability in the short to medium term.
C	Common practices. Often referred to as 'Code of Practice'.	Basic.	Acceptable practice today but may not be acceptable in medium term.	Practice unlikely to achieve acceptable resource condition goals if widely adopted.	Decline of profitability in the medium to long term.
D	Practices that are superseded or unacceptable by industry and community standards.	None.	Superseded or unacceptable practice today.	Practice likely to degrade resource condition if widely adopted.	Decline of profitability in the short to medium term.

## 2.2. Paddock to Reef Reporting

Paddock to Reef has developed Water Quality Risk frameworks for each agricultural industry (see Section 3). These frameworks articulate best practice in relation to the Reef Plan adoption target. Features of the Paddock to Reef water quality risk frameworks are:

- **Suites of practices relevant to each pollutant are described in the frameworks** – this does not mean all of the practices in the production system, only those practices that pose the greatest potential water quality risk through movement of sediments, nutrients, or pesticides off-farm;
- **Not all practices are equal** – the Paddock to Reef frameworks allocate a percentage weighting to each practice depending upon its relative potential influence on off-farm water quality; and
- The **'best practice'** level is that targeted by Reef Plan investments.

These practices are described now in terms of their relative water quality risk, from Low to High. This is a departure from the ABCD management practice frameworks which were the basis for prioritising and reporting investments under Reef Plan 2009. For the purpose of describing industry status and



progress in relation to the Reef Plan 2013 adoption target, best management practice is defined as the area managed under Low and Moderate-Low risk levels. For grazing systems, the framework describes management practices related to dominant sources of soil erosion; surface (hillslope), streambank, and gully erosion. For cropping systems the water quality risk frameworks describe management practices related to managing nutrients, pesticides, sediments, and water.

### 3. Methods

#### 3.1. General Data Collection and Reporting

Data on stewardship will be collected and reported in the Mackay-Whitsunday report card annually. The stewardship reporting will provide one display per sector, for the whole region; it will not be broken down to the reporting zones used in the environmental assessment, nor the local government areas (LGAs) used in the social and economic assessments.

The displays for stewardship reporting in the pilot report card vary depending on the sector being reported. In the pilot report card the agricultural sectors of grazing, sugarcane, and horticulture adopt the same display style as used in the Reef Plan report card (Figure 1), as the data and structure of assessment is identical. The bar chart represents the percentage of land under the best management practice (i.e. lowest or low-moderate risk, as defined by the water quality risk frameworks) for the specified activity (e.g. pesticide management).

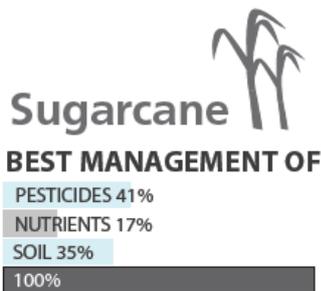


Figure 1. Example of stewardship displays for agricultural sectors.

The stewardship result displays for the other sectors (ports, tourism, industry, and aquaculture) are reported in the pilot report card as shown in Figure 2, with the arrow indicating the average operational level of the industry in the region.

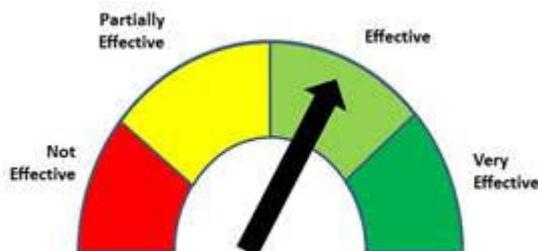


Figure 2. Example of stewardship displays for ports, tourism, industry, and aquaculture sectors.

In subsequent Mackay-Whitsunday report cards, the stewardship displays may develop and differ slightly from the pilot display.

All stewardship reporting covers the Mackay-Whitsunday natural resource management (NRM) region, with the addition of the Don Basin. The agricultural stewardship reporting includes the Don Basin and therefore the results may vary slightly from the reporting presented in the Reef Plan report card (which presents separately on the Mackay-Whitsunday region and on the Burdekin region).

It should be noted that the agricultural assessments and subsequent reported results of land under improved practices is limited to only those with direct influence or assistance from recognised service providers. It is expected that this may result in a conservative estimate of the number of growers implementing improved practices (McCosker 2013). This is relevant for the three sectors of grazing, sugarcane, and horticulture.

### 3.2. Horticulture

Growcom have established a Farm Management System (FMS) which describes management practices. The FMS is accepted as the industry best practice. It was designed to help growers identify potential areas of operation (specifically within water use efficiency, soil nutrient, water quality and energy) that could be improved, and to provide guidance on how to improve them. This is used as the Water Quality Risk framework for the horticulture industry and focuses on practices associated with the management of nutrients, herbicides, soils, and irrigation and their potential risk to water quality (Table 3).

**Table 3. Paddock to Reef classification of management practices in the cropping industries (sugarcane, bananas, grains, and horticulture).**

2013 Water Quality Risk	Low	Moderate-Low	Moderate-High	High
Description	Lowest water quality risk, commercial feasibility not well understood	Best Management Practice	Minimum Standard	Superseded
<b>Previous Reef Plan 2009 "ABCD" nomenclature</b>				
Sugarcane	A	B	C	D
Grains	A	B	C/D	
Horticulture	A	B	C/D	
Bananas	Not applicable – Bananas previously were not described (included in Horticulture).			

#### Data collection and analysis

Management practice data presented for the horticulture sector was data collected through Growcom's FMS as part of the Paddock to Reef program. In particular, the water quality module of the FMS, which allows for detailed assessment of water quality risks and the key actions to reduce those risks. The assessments were conducted between growers and Growcom or NRM bodies' officers, and aligned with the Water Quality Risk framework to estimate the proportion of growers operating within each category (from low risk to high risk) on a year-by-year basis (McCosker 2013).

The management practice assessments and subsequent reported improved practices is limited to those that successfully implemented Reef Rescue Water Quality Grants. It is expected that this may result in a conservative estimate of the number of growers implementing improved practices (McCosker 2013). Additionally, in the 2013-14 financial year the number of horticultural farmers in the Mackay-Whitsunday NRM region who implemented Reef Rescue Water Quality Grants was limited, therefore the information presented in the pilot report card is based on management practice assessments from growers in the Don Basin only.

As mentioned previously, the Reef Plan report card assessment methods were used in the pilot Mackay-Whitsunday report card, so the horticulture growers have been assessed in terms of the area of land under each of the four classified management practice levels for nutrients, herbicides, soils, and irrigation.

### 3.3. Grazing

The information collected through the Paddock to Reef program and contained in the Reef Plan report card was used as the basis to report on stewardship within the grazing industry in the Mackay-Whitsunday region. These assessments utilised the Water Quality Risk framework for grazing within the region, which focuses on practices impacting upon land condition, soil erosion, and water quality. See Table 4 for a summary of the classifications, and the link below for the full framework.

Table 4. Paddock to Reef classification of management practices in the grazing industry.

2013 Water Quality Risk	Low	Moderate-Low	Moderate-High	High
Resource condition objective	Practices highly likely to maintain land in good (A) condition and/or improve land in lesser condition	Practices are likely to maintain land in good or fair condition (A/B) and/or improve land in lesser condition	Practices are likely to degrade some land to poor (C) condition or very poor (D) condition	Practices are highly likely to degrade land to poor (C) or very poor (D) condition
Previous Reef Plan 2009 "ABCD" nomenclature	A	B	C	D

#### Data collection and reporting

The process for data collection for the grazing sector was the same as used for Reef Plan report cards. The process also included a review of data by expert (regional) panels to identify gaps and errors, and advise on interpretation of management practice change (McCosker 2013).

The Don Basin grazing results presented some difficulty for assessment, because there are a limited number of graziers within the Don Basin, and there is no Don Basin-specific benchmark within the Water Quality Risk frameworks (in the Reef Plan program, the Burdekin benchmarks are applied to the graziers within the Don Basin). Additionally, the Mackay-Whitsunday NRM and Burdekin NRM regions differ, so combining the two (and using Mackay-Whitsunday benchmarks for Don Basin data) would mean comparing a wet coastal system with a dry tropical system.

The resolution for this (and used in the pilot report card assessment) was the amalgamation of benchmarking data from the four Mackay-Whitsunday basins (Plane, Pioneer, O'Connell, Proserpine) and adding the Bowen River benchmarking data. The Bowen River is directly adjacent to the O'Connell, Proserpine, and Don Rivers and is biophysically similar to the Don River. The Bowen River benchmarks currently exist, and are suitable for use as a proxy for the Don.

The management practice levels within the grazing industry have been analysed and reported on in terms of the percentage of grazing land under each of the four classified management practice levels for hillslopes, streambanks, and gullies.

The full Water Quality Risk framework for the grazing industry can be found at:

<http://www.reefplan.qld.gov.au/measuring-success/paddock-to-reef/assets/paddock-to-reef-grazing-water-quality-risk-framework.pdf>

### 3.4. Sugarcane

The information on management practice within the sugarcane sector collected through the Paddock to Reef program (and contained in the Reef Plan report card) was used for the Mackay-Whitsunday pilot report card. The assessments utilised the Water Quality Risk framework for sugarcane within the region, which focuses on (and grades) practices associated nutrients, herbicides, soils, on-farm water management (irrigation and drainage), record keeping, and planning. See Table 3 above for a summary of the classifications, and the link below for the full framework.

#### **Data collection and reporting**

Data on management practice adoption within the sugarcane sector was collected through what is reported on from the Reef Rescue Water Quality Grants program. The management practices implemented by sugarcane farmers around Bowen and within the Don Basin align closer to those used in the Proserpine area, so the Mackay-Whitsunday benchmark was applied to these farmers for the purposes of this report card.

It should be noted that the assessments and subsequent reported number of canefarmers adopting improved practices is limited to only those with direct influence or assistance from regional NRM bodies, the Reef Rescue initiative, and the Queensland Government's *Reefocus*. It is expected that this may result in a conservative estimate of the number of growers implementing improved practices (McCosker 2013).

The full Water Quality Risk framework for the sugarcane industry can be found at:

<http://www.reefplan.qld.gov.au/measuring-success/paddock-to-reef/assets/paddock-to-reef-sugarcane-water-quality-risk-framework.pdf>

### 3.5. Urban

The 2008 Mackay Whitsunday Water Quality Improvement Plan (WQIP 2008) recognised the water quality pressures associated with urban areas and in response, a range of management actions were designed to improve water quality linked with urban land use. However, a lack of availability of funding to implement the urban components of the Great Barrier Reef (GBR) catchments' WQIPs resulted in slower progress in urban management for water quality improvement compared with improvements in the agricultural sector over the same timeframe.

In response to this situation, Reef Catchments convened the Urban Think Tank (UTT) in 2010 as one of the four organisational units of the Healthy Waterways Alliance. The UTT is made up of delegates from local, Queensland and Australian government authorities, industry and the community, representing the interests of urban, industry, and coastal development water quality initiatives,

programs and work plans. The UTT was tasked with developing innovative and practical approaches to catchment and waterway management, and the development of an Urban ABCD management framework, which has been endorsed by the regional local government authorities.

Additionally, other research and work has been undertaken within Queensland to establish a guide for developing urban ABCD frameworks within the Great Barrier Reef area (refer to Gunn et al. 2014) and to develop a generic urban ABCD framework.

The urban stewardship assessment is not included in the pilot report card as the management practice framework is still being finalised. It is planned to be incorporated in the next Mackay-Whitsunday report card, once the existing urban frameworks have been analysed and the framework to be used has been finalised.

### 3.6. Ports

A Port Management framework was developed for the Gladstone Healthy Harbour Partnership to evaluate stewardship with the ports industry. This framework and associated questionnaire was reviewed and adapted as required to be appropriate to operations and activities within the Mackay-Whitsunday region (Appendix A). A series of activities were identified which formed the basis for the development of criteria against which the management effectiveness (stewardship) could be evaluated:

- Administration
  - Extension and research projects;
  - Compliance approach;
  - Environmental management systems (EMS);
  - Training, knowledge and staff awareness;
  - Community engagement; and
  - Tenancy management.
- Operations
  - Operation and ancillary services (including all operational elements that may affect ecosystem health, such as landside waste, hazardous substance storage, refueling vehicles, quarries, loading and unloading, spill management, stock pile management); and
  - Maintenance dredging.
- Development
  - New capital development and/or significant upgrades; and
  - Capital dredging.
- Shipping
  - Movement;
  - Anchorage;
  - Discharges; and
  - Biosecurity.

### **Data collection and reporting**

Data was collected via a questionnaire from the three ports in the region (Abbot Point, Port of Mackay, and Hay Point). The questionnaire was developed to specifically address each activity listed above as well as theme (planning, implementation and outcome). This data allowed an “effectiveness” rating to be allocated to each port, based on the criteria specified in the framework. Each answer was then translated into a numerical value (very effective – 4, effective – 3, partially effective – 2, not effective – 1) to facilitate averaging of scores for each industry across the three management themes.

There is only one port authority in the Mackay-Whitsunday region (North Queensland Bulk Ports; NQBP) who manage the three ports. However, there are other companies in the region that are port tenants and undertake activities which could be classified as “port” activities, such as dredging and shipping. Thus, all activities undertaken by the port authority, and all dredging and shipping activities undertaken by any other company, were included in the port stewardship framework. For all other activities (not dredging and shipping) port tenants were included in the industry framework.

### **3.7. Industry**

An industry framework was developed specifically for the Mackay-Whitsunday region and this report card (Appendix A). For the purposes of the Mackay-Whitsunday “industry” is defined as heavy industry including mining, mills, environmentally relevant activities (ERAs), licenced activities, etc. The stewardship assessment covered the following criteria across three management themes, being planning, implementation and outcome:

- Involvement in extension and research projects related to ecosystem health;
- Compliance with environmental approvals/licences, legislation and level of engagement with regulators;
- Development and implementation of an Environmental Management System;
- Training, qualifications, knowledge and awareness of environmental management issues for key staff;
- Community engagement on programs related to ecosystem health;
- Environmental standards are in place for tenants through lease conditions (if applicable);
- Biosecurity plans and protocols are in place and well established;
- Long term strategies are in place to manage activities that may cause environmental harm, like maintenance dredging or stormwater; and
- Further development or expansion is undertaken in line with a master plan and takes into account environmental issues.

### **Data collection and reporting**

The overarching aim of the data collection process was to evaluate companies’ management effectiveness using robust data in a repeatable and transparent manner. Two potential sources of data were identified to achieve this: company data via self-reporting and compliance data from the Department of Environment and Heritage Protection (DEHP).

Data was collected primarily via questionnaires from industry organisations operating in the region (Table 5), with further rigour introduced by including compliance data from DEHP. Not all companies approached to participate in the assessment are Partners.

**Table 5. Heavy Industry companies invited to participate in the stewardship assessment.**

<b>Heavy Industry</b>	<b>Activity in the region</b>
Mackay Sugar	Sugar mills and bioethanol plant
Wilmar	Sugar mills and bioethanol plant
Queensland Sugar	Sugar mills and bioethanol plant
Sugar Australia	Terminal at Port of Mackay
Graincorp	Terminal at Port of Mackay
Shell	Facility at Port of Mackay
Caltex	Facility at Port of Mackay
BP	Facility at Port of Mackay
Sibelco	Mineral and sand storage area at the Port of Mackay
Thomas Borthwick and Sons	Meat works at Bakers Creek and terminal at the Port of Mackay
Origin Energy	Facility at the Port of Mackay
Abbot Point Bulk Coal	Coal Terminal at the Abbot Point
Hay Point Services	Coal Terminal at Hay Point
Dalrymple Bay Coal Terminal	Coal Terminal at Hay Point

Companies were asked to self-report across the range of activities relevant to their business in the Mackay-Whitsunday region. The questionnaire was developed to specifically address each activity and theme (planning, implementation, outcome) in the stewardship frameworks. The questionnaire was largely made up of multiple-choice questions, with opportunities to provide supporting text and/or links to documents.

This data allowed an “effectiveness” rating to be allocated to each company, based on the criteria specified in the framework. Each answer was then translated into a numerical value (very effective – 4, effective – 3, partially effective – 2, not effective – 1) to facilitate averaging of scores across the three management themes.

A disadvantage of the self-reporting approach is the potential perception of bias in the results. That is, companies may shape their responses to ‘make themselves look good’. This was countered by specifically tailoring questions to target issues for which ‘supporting evidence’ would be readily available (e.g. EMS ISO14001 accreditation; number of environmental incidents). This made the data largely objective rather than being merely the unsubstantiated opinion of companies (or individuals within companies). Further rigour was introduced into the data collection process by including compliance data from DEHP, based on compliance with approvals under the *Environmental Protection Act 1994* (Environmental Authorities). The intention was to use these data to populate the implementation theme for operational activities.

Compliance data for the 2014-2015 financial year were extracted from DEHP's database for all companies identified in Table 5, for their activities in the Mackay-Whitsunday region (individual companies were not identified). A proxy compliance rate was calculated by dividing the number of inspections with an 'in compliance' and 'no further action' outcome by the total number of inspections. For this dataset, the result is  $9 \div 12$  and a compliance rate of 75%. Due to the small sample size (when compared to the large range of environmental issues addressed by Environmental Authority conditions) and the potential for bias in the sample (possible non-random nature of compliance inspections) this data is considered of low reliability. This result was used as another source of information in the development of the score for operations implementation theme only.

### 3.8. Aquaculture

A management framework for the aquaculture industry was developed specifically for the Mackay-Whitsunday region and this report card (Appendix A). Guidance was taken from the Environmental Code of Practice for Australian Prawn Farmers during development of the framework. The stewardship assessment covered the following criteria across three management themes, being planning, implementation and outcome:

- Involvement in extension and research projects related to ecosystem health;
- Compliance with environmental approvals/licences, legislation and level of engagement with regulators;
- Development and implementation of an Environmental Management System;
- Training, qualifications, knowledge and awareness of environmental management issues for key staff;
- Community engagement on programs related to ecosystem health;
- Environmental standards are in place for tenants through lease conditions (if applicable);
- Biosecurity plans and protocols are in place and well established;
- Long term strategies are in place to manage activities that may cause environmental harm, like maintenance dredging or stormwater;
- Further development or expansion is undertaken in line with a master plan and takes into account environmental issues; and
- Processes are in place to monitor and manage the incidence of disease (aquaculture).

#### Data collection and reporting

Aquaculture facilities were identified through liaison with peak representative bodies (Australian Prawn Farmers Association, Australian Barramundi Growers Association, and Queensland Crayfish Farmers Association), local knowledge of the report authors and consultation with Queensland Department of Agriculture and Fisheries (DAF). A total of four prawn farms or hatcheries, one barramundi farm and one small redclaw crayfish farm were identified to be actively operating in the region (Table 6).

Table 6. Aquaculture companies invited to participate in the stewardship reporting.

Aquaculture	Activities in the Mackay-Whitsunday region
Pacific Reef Fisheries	Hatchery and proposed prawn farm at Guthalungra
Australian Prawn Farms	Prawn farm south of Mackay
Clem Jones Queensland Prawn Farm	Small prawn farm near Mackay
Monogold Prawn Farm	Small prawn farm near Mackay
Good Fortune Bay Fisheries	Barramundi farm near Bowen
Rockywater Crayfish	Red claw crayfish near Mackay

As with the industry framework, assessment of aquaculture stewardship was based primarily on completion of questionnaires, aided by compliance data from the Queensland Government.

While DEHP did not undertake any compliance inspections of aquaculture facilities in the region during the 2014/15 financial year, DAF completed a variety of inspections for compliance and biosecurity purposes under the *Fisheries Act 1994*. Of the six inspections conducted, a 100% compliance rate was achieved (no breaches of licence conditions were found). This compliance rate was used in the stewardship assessment in the same manner described for industry (contributing to the operations implementation score only).

Like the industry framework, an “effectiveness” rating was allocated to each aquaculture company, based on the criteria specified in the framework. Each answer was then translated into a numerical value (very effective – 4, effective – 3, partially effective – 2, not effective – 1) to facilitate averaging of scores across the three management themes.

DAF was also approached to provide data on compliance inspections of the Queensland Boating and Fisheries Patrol (QBFP), an operational section of the Department focussed on fisheries and marine safety compliance. While QBFP officers inspected over 50 aquaculture facilities in Queensland during the 2014/15 financial year, none of the inspections occurred at the farms identified in the Mackay-Whitsunday region.

### 3.9. Tourism

A management framework was developed to assess the level of stewardship within the tourism industry in the Mackay-Whitsunday region for this report card (Appendix A). Commercial marine tourism activities operating in the Mackay-Whitsunday region include cruises and boat tours, organised diving and snorkelling, air charters and water sport operations. For the purposes of the stewardship framework individual recreational activities and self-hire boats/yachts have been excluded as have resorts and hotels. This latter group is considered to be within the urban category for the purposes of stewardship evaluation.

The tourism industry is highly reliant on the maintenance of high water quality and ecosystem health within the region. Indeed, this is often the key experience tourist are seeking as part of their participation in tourism activities. Therefore, the stewardship assessment of the tourism industry

was focused on management efforts by tourism operators in the Mackay-Whitsunday region to maintain or improve the ecosystem health of marine and coastal waters.

The stewardship framework developed for the tourism industry is similar to those for port, heavy industry and aquaculture. This was considered important, so that different industries were assessed in a similar way, allowing reasonable comparisons among industries. The primary differences in the tourism stewardship framework, when compared with those of other industries, were:

- A focus on certification and training given that systems for the industry are well established; and
- Analysis of participation rates in such programs, given the large number of operators (>100 tourism operators) in comparison with other industries, such as ports (one port authority), heavy industry (<20 companies) and aquaculture (<10 companies).

Criteria utilised for evaluating stewardship related to tourism were:

- Participation in recognised environmental industry accreditation programs:
  - % of accredited operations and/or % of high standard accredited operations; and
  - Membership of associations with Codes of Practice and auditing;
- Involvement in extension and research projects related to ecosystem health, including citizen science programs, environmental management activities (e.g. physical control of crown of thorns starfish outbreaks);
- Implementation of operational standards to protect the environment (e.g. waste management, incident response and reporting, anchoring and mooring, vessel standards and maintenance);
- Compliance with environmental licenses and cooperative engagement with regulators; and
- Training, qualifications, knowledge and awareness of environmental management issues for staff.

### **Data collection and reporting**

Data collection was undertaken through consultation with relevant stakeholders and questionnaires from tourism operators in the Mackay-Whitsunday region as well as the Great Barrier Marine Park Authority (as the industry representative body for the region). In future years it is recommended that this publically available data and interviews with key stakeholders be supplemented with the results of an industry questionnaire provided in Appendix A. Forward timeframes of 3-4 months are likely to be required to collect a representative sample from the large number of tourism operators within the region. For this reason, results for the pilot report card in 2014 were compiled without data from surveys of tourism operators.

### **3.10. Fishing**

The assessment framework and methods for stewardship within the fishing industry will be developed by a consultant through consultation with the fishing industry.

It is planned that stewardship reporting for the fishing industry will be included in future report cards, not in the pilot report card.

### **3.11. Forestry**

The assessment framework for stewardship within the forestry industry is being developed by Reef Catchments and the local Forestry Regional Working Group. It is possible that forestry may be a sector for which stewardship assessments could be included in the Mackay-Whitsunday report card in the future.

## 4. Results

### 4.1. Horticulture

The results<sup>1</sup> for horticulture presented in the pilot report card, are the stewardship results from the horticultural growers in the Don Basin for the 2013-14 reporting year. The results include samples from Bowen, Gumlu, Guthalungra, Inkerman, and Merinda, with a sample area of 11,833 ha, and 58 businesses.

The results are shown in Table 7 and Figure 3. The lowest risk and moderate to low risk categories are deemed to be the “best management practice”. The percentage of horticultural land under best management practice for sediment is 64%, pesticides 47%, nutrients 10%, and irrigation is 8%.

Table 7. Results for horticulture management practices within the Don Basin for the 2013-14 reporting year.

Management Area	Water quality risk classification (refer to Water Quality Risk framework)			
	Lowest Risk	Moderate-Low Risk	Moderate-High Risk	High Risk
Sediment	9%	55%	36%	0%
Pesticides	15%	33%	53%	0%
Nutrients	2%	8%	81%	9%
Irrigation	4%	4%	90%	2%

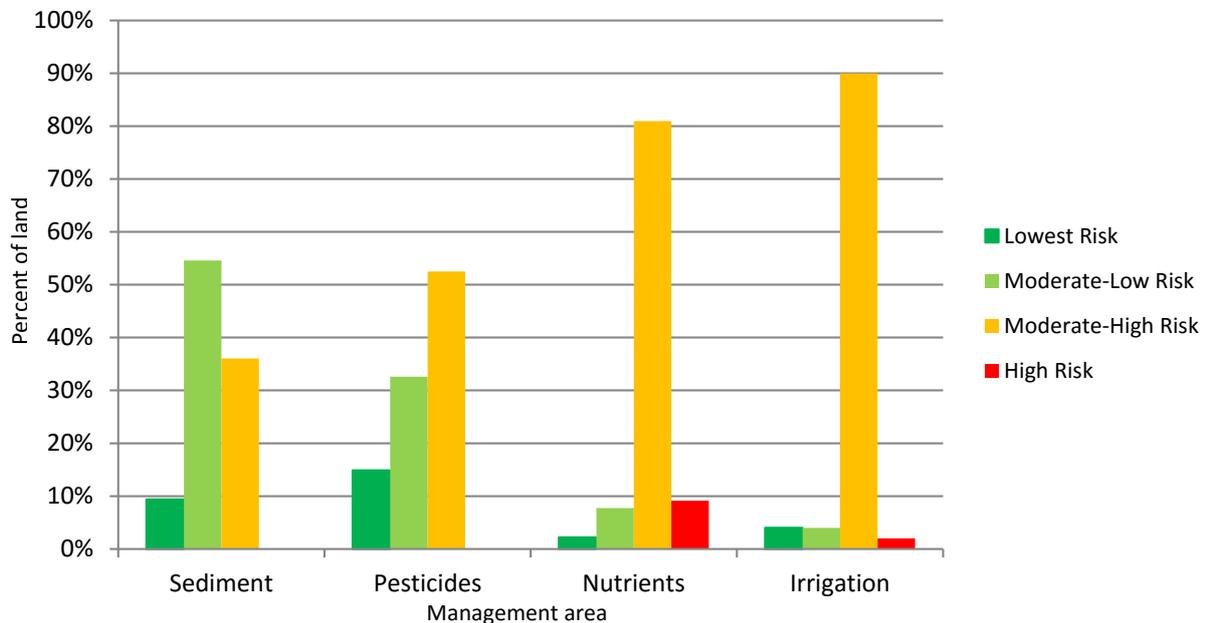


Figure 3. Results for horticulture management practices within the Don Basin for the 2013-14 reporting year.

<sup>1</sup> It is noted that the assessments and subsequent reported number of growers adopting improved practices is limited to those that successfully implemented Reef Rescue Water Quality Grants. It is expected that this may result in a conservative estimate of the number of growers implementing improved practices (McCosker 2013).

Refer to the Reef Plan report card and the technical reports for management practice for further detail on these results.

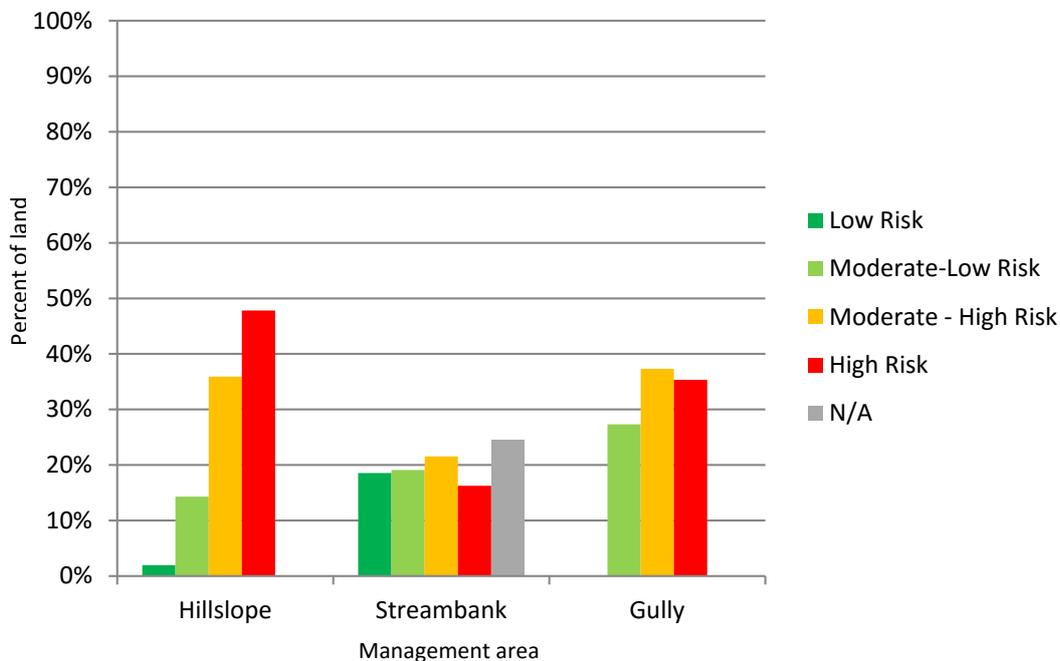
## 4.2. Grazing

The stewardship results<sup>1</sup> for grazing presented in the pilot report card, are the results from the graziers within the Plane, Pioneer, O’Connell, Proserpine, Bowen areas. The resulting sample area is approximately 303,800 ha, with 416 managers.

The results are shown in Table 8 and Figure 4. The lowest risk and moderate to low risk categories are deemed to be the “best management practice”. The percentage of grazing land under best management practice for hillslopes is 16%, streambanks is 38%, and gullies is 27%.

**Table 8. Results for grazing management practices within Plane, Pioneer, O’Connell, Proserpine, Bowen areas for the 2013-14 reporting year.**

Management Area	Water quality risk classification (refer to Water Quality Risk framework)				
	Lowest Risk	Moderate-Low Risk	Moderate-High Risk	High Risk	N/A
Hillslope	2%	14%	36%	48%	0%
Streambank	19%	19%	22%	16%	25%
Gully	0%	27%	37%	35%	0%



**Figure 4. Results for grazing management practices within Plane, Pioneer, O’Connell, Proserpine, Bowen areas for the 2013-14 reporting year.**

Refer to the Reef Plan report card and the technical reports for management practice for further detail on these results.

### 4.3. Sugarcane

The stewardship results<sup>1</sup> for the sugarcane industry presented in the pilot report card are the results from the Mackay-Whitsunday NRM region, as these results were deemed to also be representative of the few sugarcane growers in the Don Basin (refer to Section 3.4). The resulting sample area is approximately 1,360 growers managing 136,200 ha of land.

The results are shown in Table 9 and Figure 5. The lowest risk and moderate to low risk categories are deemed to be the “best management practice”. The percentage of sugarcane land under best management practice for sediment is 41%, nutrients 20%, and pesticides 37%.

Table 9. Results for sugarcane management practices within the Mackay-Whitsunday NRM region for the 2013-14 reporting year.

Management Area	2013/14 best practice
Sediment	41%
Nutrients	20 %
Pesticides	37%

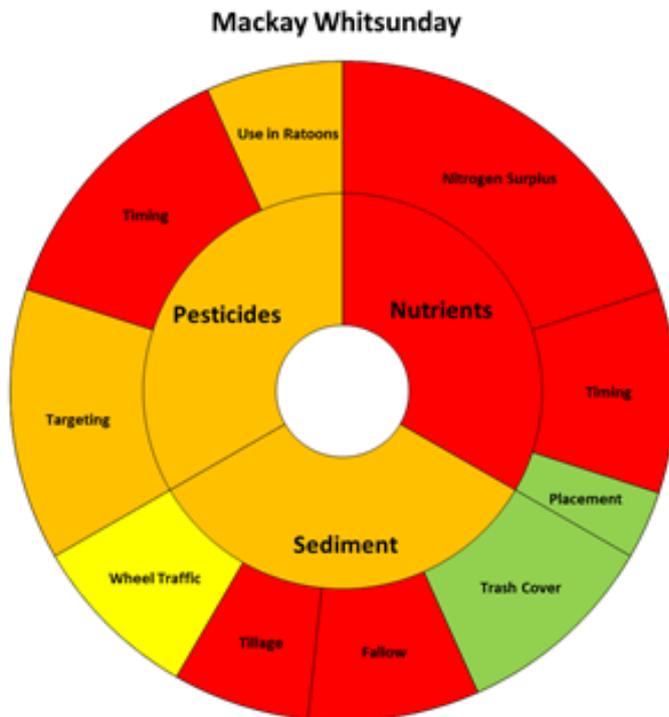


Figure 5. Results for sugarcane management practices within the Mackay-Whitsunday NRM region for the 2013-14 reporting year.

Refer to the Reef Plan report card and the technical reports for management practice for further detail on these results.

#### 4.4. Urban

Urban stewardship has not been included in the pilot report card. This stewardship assessment will be included in the next report card.

#### 4.5. Ports

The result of the stewardship assessment from the Mackay-Whitsunday port assessment was ‘effective’ (Figure 6).

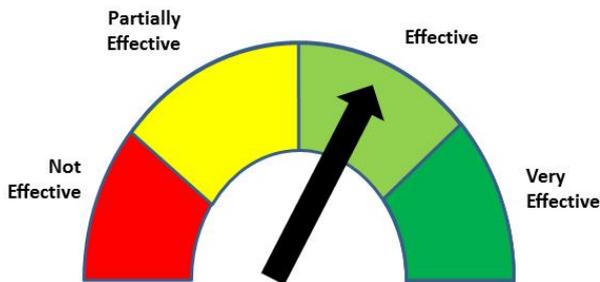


Figure 6. Result of Ports stewardship within the Mackay-Whitsunday region.

There are three ports located within the Mackay-Whitsunday region at Hay Point, Mackay and Abbot Point. All three are managed by a single port authority, North Queensland Bulk Ports Corporation. The port authority participates in numerous environmental extension activities and has an environmental management system certified to ISO14001 standards.

There are several practices in place to minimise the impact of port-related activities on ecosystem health and water quality. Those systems related to development were assessed to be highly effective. An ongoing program to monitor ambient environmental conditions has been initiated to assist with the interpretation of monitoring results during future dredging projects.

Refer for Appendix A for more detail.

#### 4.6. Industry

The result of the stewardship assessment from the Mackay-Whitsunday heavy industry assessment was ‘effective’ (Figure 7).

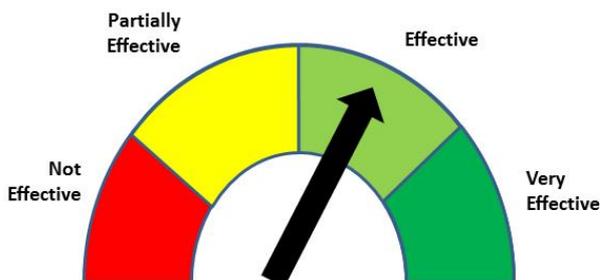


Figure 7. Result of Industry stewardship within the Mackay-Whitsunday region.

The Mackay-Whitsunday region has a large diversity of Heavy Industry activities, including coal export terminals, sugar mills, meat processing facilities and storage areas for commodities such as mineral sands, petroleum products and grain. These industries are highly regulated, and have effective environmental management practices in place to protect ecosystem health and water quality.

Environmental management staff within Heavy Industry companies have a high awareness of environmental regulations and their responsibilities to implement management systems to reduce environmental impacts. The level of participation in research and extension activities related to ecosystem health varies among companies. Innovation and a commitment to recycle waste are evident in the sugar and meat processing industries.

Refer for Appendix A for more detail.

#### 4.7. Aquaculture

The result of the stewardship assessment from the Mackay-Whitsunday aquaculture assessment was ‘very effective’ (Figure 8).

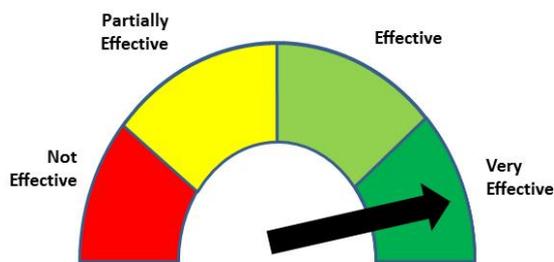


Figure 8. Result of Aquaculture stewardship within the Mackay-Whitsunday region.

The aquaculture industry of the Mackay-Whitsunday region is comprised of a small number of prawn, barramundi and red-claw crayfish farms. The industry is highly regulated, primarily in relation to waste water discharges and the management of biosecurity issues such as disease. Many of the managers of aquaculture operations within the region are highly trained, with tertiary qualifications in marine science. Extensive partnerships are also in place with research institutions.

Industry-led research and innovation into improved management practices is extensive, covering sustainable protein sources in feed and the treatment of wastewater to remove sediments and nutrients prior to discharge. Regulatory requirements for new developments involve a nil net discharge of nutrients, which is above and beyond the requirements of comparable industries in the region.

Refer for Appendix A for more detail.

#### 4.8. Tourism

The result of the stewardship assessment from the Mackay-Whitsunday tourism assessment was 'effective' (Figure 9).

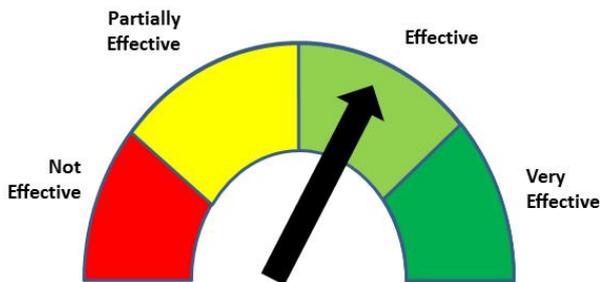


Figure 9. Result of Tourism stewardship within the Mackay-Whitsunday region.

The commercial marine tourism industry of the Mackay-Whitsunday region is comprised of a number of operations and activities, including reef cruises and boat tours, organised diving and snorkelling, boat charters, air charters and water based sports. For the purposes of this assessment commercial marine tourism excludes individual recreational activities, self-skipped boats/yachts, resorts and hotels.

The industry is closely regulated, primarily in relation to access and operations within the Marine Park and National Park islands.

A long established and productive partnership has been established between operators and the GBRMPA and a number of industry associations have been established to represent and coordinate industry consultation.

Refer for Appendix A for more detail.

#### 4.9. Fishing

Fishing stewardship has not been included in the pilot report card. It is planned to be incorporated in the next Mackay-Whitsunday report card, once appropriate indicator selection and scoring methodology has been developed.

#### 4.10. Forestry

Forestry stewardship has not been included in the pilot report card. It is planned to be incorporated in the next Mackay-Whitsunday report card, after review of available forestry frameworks and confirmation of appropriate indicators and scoring methodology.

## 5. Confidence, Limitations, and Recommendations

### 5.1. Confidence Associated with Results

The stewardship results presented in the report card and this paper have been rated in terms of the confidence surrounding the data used in the analysis. The “uncertainty” ratings developed through the Reef Plan report card have been utilised in the Mackay-Whitsunday pilot report card. The uncertainty/confidence score is based on five criteria:

- Maturity of methodology (the score is weighted half for this criteria so not to outweigh the importance of the other criteria);
- Directness of measurement;
- Spatial/temporal coverage;
- Strength of relationship between the methodology, indicator reported and measured data; and
- Measured error.

The scores for each criteria range from 1 (lowest) to 3 (highest), with the total score calculated and prescribed an overall confidence score (from 1 to 5) based on the following rules:

- 0 to <5 = one bar ranking;
- 5 to <7.5 = two bars ranking;
- 7.5 to <10 = three bars ranking;
- 10 to <12.5 = four bars ranking; and
- 12.5 to <15 = five bars ranking.

The data inputting into the agriculture stewardship assessments of sugarcane, grazing, and horticulture have been assessed as having a confidence score of 7.5, aligning with three out of five bars. Table 10 shows the breakdown of how the confidence score was generated for the agricultural stewardship results.

The data used in the ports, industry, aquaculture, and tourism stewardship assessments was assessed as having a confidence level of three out of five, generated from the ratings shown in Table 11.

**Table 10. Confidence ratings associated with agricultural stewardship data (highlighted cells indicate the relevant assessment for this data).**

<b>Maturity of methodology</b> (weighting 0.5)	<b>Directness of measurement</b>	<b>Spatial/temporal</b>	<b>Strength of relationship between Methodology, indicator reported and measured data</b>	<b>Measured error</b>
New or experimental methodology	Remote sensed data with no or limited ground truthing <b>OR</b> Modelling with no ground truthing <b>OR</b> Survey with no ground truthing	1:1,000,000 <b>OR</b> Less than 10% of population survey data	Measurement of data that have conceptual relationship to reported indicator	Error not measured <b>OR</b> >25% error
Peer reviewed method	Remote sensed data with regular ground truthing (not comprehensive) <b>OR</b> Modelling with documented validation (not comprehensive) <b>OR</b> Survey with ground-truthing (not comprehensive)	1:100,000 <b>OR</b> 10%-30% of population survey data	Measurement of data that have a quantifiable relationship to reported indicators	10-25% error
Established methodology in published paper	Remote sensed data with comprehensive validation program supporting (statistical error measured) <b>OR</b> Modelling with comprehensive validation and supporting documentation <b>OR</b> Survey with extensive on ground validation or directly measured data	1:10,000 <b>OR</b> 30-50% of population	Direct measurement of reported indicator with error	Less than 10% error
<b>1 x0.5 = 0.5</b>	<b>2</b>	<b>2</b>	<b>2</b>	<b>1</b>
<b>Total score</b>				<b>7.5</b>
<b>Number of confidence bars</b>				<b>3</b>

**Table 11. Confidence ratings associated with industry, ports, aquaculture, and tourism stewardship data (highlighted cells indicate the relevant assessment for this data).**

<b>Maturity of methodology</b> (weighting 0.5)	<b>Directness of measurement</b>	<b>Spatial/temporal</b>	<b>Strength of relationship between Methodology, indicator reported and measured data</b>	<b>Measured error</b>
New or experimental methodology	Remote sensed data with no or limited ground truthing <b>OR</b> Modelling with no ground truthing <b>OR</b> Survey with no ground truthing	1:1,000,000 <b>OR</b> Less than 10% of population survey data	Measurement of data that have conceptual relationship to reported indicator	Error not measured <b>OR</b> >25% error
Peer reviewed method	Remote sensed data with regular ground truthing (not comprehensive) <b>OR</b> Modelling with documented validation (not comprehensive) <b>OR</b> Survey with ground-truthing (not comprehensive)	1:100,000 <b>OR</b> 10%-30% of population survey data	Measurement of data that have a quantifiable relationship to reported indicators	10-25% error
Established methodology in published paper	Remote sensed data with comprehensive validation program supporting (statistical error measured) <b>OR</b> Modelling with comprehensive validation and supporting documentation <b>OR</b> Survey with extensive on ground validation or directly measured data	1:10,000 <b>OR</b> 30-50% of population	Direct measurement of reported indicator with error	Less than 10% error
<b>1 x0.5 = 0.5</b>	<b>2</b>	<b>3</b>	<b>1</b>	<b>1</b>
Total score				<b>8</b>
Number of confidence bars				<b>3</b>

## 5.2. Limitations and Recommendations

Following the release of the pilot report card, the program design, indicators, and scoring methods will be reviewed to determine any aspects that require improvement.

Particular focus for the stewardship components will be given to:

- Developing and finalising appropriate frameworks to assess the following industry's stewardship:
  - Urban
  - Forestry
  - Fishing; and
- Reviewing available targets for land management practice for agriculture land use and determine whether the next report card will adopt targets for stewardship.

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## **Appendix A – Adaptive Strategies Stewardship Assessment Report (Mackay-Whitsunday region)**

Contains Port, Heavy Industry, Aquaculture and Tourism stewardship frameworks.



# Mackay-Whitsunday Healthy Rivers to Reef Partnership

## Stewardship Reporting

Prepared for  
**Mackay-Whitsunday Healthy Rivers to Reef Partnership**

26 February 2016



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## Abbreviations

Abbreviation	Description
DAF	Queensland Department of Agriculture and Fisheries
DEHP	Queensland Department of Environment and Heritage Protection
EA	Environmental Authority (under the Queensland <i>Environmental Protection Act 1994</i> )
EMS	Environmental Management System
FY	Financial year
GBR	Great Barrier Reef
GBRMPA	Great Barrier Reef Marine Park Authority
MW Partnership	Mackay-Whitsunday Healthy Rivers to Reef Partnership
MSQ	Maritime Safety Queensland
NQBP	North Queensland Bulk Ports Corporation
SOE	State of the Environment

# Executive summary

Eco Logical Australia Pty Ltd and Adaptive Strategies Pty Ltd were commissioned by the Mackay-Whitsunday Healthy Rivers to Reef Partnership (MW Partnership) to develop stewardship reporting frameworks for ports, heavy industry, aquaculture and tourism. The stewardship reporting frameworks are designed to describe and evaluate environmental management efforts within the Mackay-Whitsunday region. The results are to be published as part of the Mackay-Whitsunday pilot report card in 2015.

Stewardship has been defined as 'responsible planning and management actions' and is intended for this purpose to capture information on management efforts by industries and port operators to maintain or improve ecosystem health of the Great Barrier Reef.

For this project, the nation-wide State of the Environment Report management effectiveness framework was used as a basis for developing stewardship frameworks tailored to industries in the Mackay-Whitsunday region. The approach was consistent with a similar stewardship reporting project completed in the Gladstone region as part of the Gladstone Healthy Harbour Partnership.

Under the stewardship frameworks, overall stewardship was rated on a scale from 'very effective' through to 'ineffective' based on a range of criteria. These criteria considered administrative, operational and development activities during various management phases (planning, implementation and outcome).

The range of data currently available to evaluate stewardship of port, heavy industry, aquaculture and tourism is relatively limited. This project has therefore relied on publicly available information and self-reporting by companies and/or industry representative bodies, supplemented with compliance data from government agencies. Surveys were completed by individual companies in all sectors except tourism, where interviews with industry peak body representatives with a good working knowledge of operators' activities were conducted.

The overall results for stewardship in the Mackay-Whitsunday region for the 2014-15 reporting period were:

- port stewardship – Effective
- heavy industry stewardship – Effective
- aquaculture stewardship – Very Effective
- tourism stewardship – Effective

Overall the results of the stewardship reporting have indicated that environmental management activities within the relevant industries are being undertaken effectively in the Mackay-Whitsunday region, across a range of activity types and management themes. This result is not surprising, given that these are highly regulated industries that are required to operate in accordance with a range of environmental approvals.

The stand-out result of this analysis has been the management activities of the aquaculture industry, which have a strong focus on research and innovation. Partnerships to develop more sustainable feed products, a 100% compliance rate from government inspections and a program to remove nutrients from wastewater using innovative algal treatment techniques scored highly in the stewardship evaluation. Additionally, the requirement by Commonwealth agencies for new or expanded farms to achieve a nil net discharge of nutrients is above and beyond the requirements of other comparable industries in the region.

Across the port, heavy industry and tourism sectors there were several noteworthy results recorded. Ports achieved a very effective rating for development aspects of their operations. Operational activities

are managed by highly qualified and experienced staff and excellent community engagement initiatives are in place. Within the heavy industry category, examples of innovation included initiatives to recycle waste water and produce electricity from agricultural waste products. The Mackay-Whitsunday region is also a hub for tourism operations, with approximately 45% of tourists visiting the Great Barrier Reef participating in activities in the region. Twenty five tourism operators in the region are accredited to a high standard, the highest number for any location on the Great Barrier Reef.

There were a number of challenges with the stewardship reporting process, with recommendations provided that are likely to improve future iterations of the stewardship reporting, particularly as new or more robust data/reporting mechanisms become available.

# 1 Introduction

Eco Logical Australia Pty Ltd (ELA) and Adaptive Strategies Pty Ltd were commissioned by the Mackay-Whitsunday Healthy Rivers to Reef Partnership (MW Partnership) to develop stewardship reporting frameworks for ports, heavy industry, aquaculture and tourism. The stewardship reporting frameworks are designed to describe and evaluate environmental management efforts of industries within the Mackay-Whitsunday region. Outputs from the frameworks are intended to inform publication of the Mackay-Whitsunday pilot report card in 2015 (MW Partnership 2015).

The Mackay-Whitsunday region (Figure 1) is located on the coast of central Queensland, and incorporates the catchments of the Don, O'Connell, Proserpine, Pioneer and Plane basins, eight estuaries and extends out to the marine environment and adjacent Great Barrier Reef. The region is bounded by the large catchments of the Fitzroy Basin to the south west, and the Burdekin Basin to the north west.

Land uses and industries within the Mackay-Whitsunday region are highly variable. Agricultural uses include extensive sugar cane and milling facilities. The Whitsunday islands and Airlie Beach areas are a focus for tourism activities. Port facilities are in place for the export and import of a range of commodities including coal, grain, sugar and mineral sands. Additionally, a small but diverse aquaculture industry exists in the region, supporting the culture of prawns, barramundi and red claw crayfish. Collectively, these industries are the focus of this report.

The objective for developing the MW Partnership is to establish a report card that provides a holistic picture of the ecosystem health of the region, supports ongoing management programs, and is consistent with other report card programs across the state (MW Partnership 2015). The key audience for the report card is the general public.

Currently there is a multitude of different programs and projects collecting and reporting on data from the Mackay-Whitsunday region. The MW Partnership and associated report card aim to integrate these data. However, the reporting of management activities and efforts (stewardship) has been limited to date. Currently, the Great Barrier Reef (GBR) Reef Report card presents information about management practices in the agricultural sector and work is being undertaken in other regions to develop similar reporting for urban land uses.

Until recently, there has been no framework for many coastal industries to report their management activities and efforts aimed at improving and maintaining ecosystem health of the GBR. In 2015, the Gladstone Healthy Harbour Partnership (GHHP) assessed environmental stewardship in the Gladstone region for the ports, heavy industry, commercial fishing and recreational fishing sectors (ELA and Adaptive Strategies 2015). Adapting and applying the GHHP stewardship assessment frameworks to some new industries (tourism and aquaculture) and a new region (the Mackay-Whitsunday region) has been the focus of this project.

Stewardship has been defined as 'responsible planning and management actions' and is intended for this purpose to capture information on management efforts by industries and port operators to maintain or improve ecosystem health of the GBR. While the level of stewardship within an industry is commonly influenced by regulation, innovative or voluntary actions that exceed the requirements of regulation have also been a major focus of the assessments completed in this project.

The outputs of the stewardship frameworks (and associated report card) will be provided to the public as transparent information about management efforts to maintain water quality and ecosystem health. The

results will also help inform future management and investment decisions by showing where leading and innovative practice is already in use and where there may be room for improvement.

It is important to note that the stewardship frameworks relate to environmental issues only, with an emphasis on whole-of-sector assessment. While the frameworks utilise information collected from individual companies, the focus of the assessment is on achieving an understanding of overall industries being evaluated. Additionally, there is an emphasis on assessing management actions, the level of effort and local, activity-related outcomes, rather than the overall health of and environmental outcomes for the GBR. While ecosystem health is influenced by stewardship (environmental management activities), but stewardship is not the only driver.

Key elements in developing the stewardship frameworks have included:

- Engagement with the MW Partnership, industry and port representatives and peak bodies
- Development of clear definitions and criteria for a tiered framework i.e. 'scores'
- Data collection, collation and analysis
- Application of criteria/scores for management actions currently being undertaken, and the provision of explanatory text
- Recommendations about data gathering, application of criteria/scores and report card interpretation

Developing the stewardship frameworks had the potential to be a challenging process, requiring careful management of issues and stakeholder expectations. A number of key principles were applied to the project to assist in meeting the needs and expectations of the MW Partnership, industry/port stakeholders, including:

- Adapting the stewardship frameworks applied for the GHHP, to achieve consistency while allowing it to be relevant to conditions and industries in the Mackay-Whitsunday region
- Obtaining industry and port authority 'buy in'. Participation was voluntary and not all industry representatives were members of the MW Partnership or familiar with its purpose.
- Placing the stewardship frameworks in the broader context of the current political, environmental and management directions relevant to the GBR. This includes the various initiatives underway relating to: development of the Reef 2050 Plan; GBR Strategic Assessment; Reef Trust; and the Queensland Sustainable Ports Bill.
- Having clear definitions of stewardship and the management and other activities which demonstrate effective stewardship. This is particularly relevant to those activities that are not easily captured through traditional mechanisms (i.e. activities that are not reported through regulation).
- Clear delineation between stewardship actions/activities and environmental health outcomes (which are reported elsewhere). The focus for stewardship is around management actions, the level of effort and local, activity-related outcomes, rather than the overall health of the Mackay-Whitsunday region (which is influenced by numerous, interacting and often external factors).
- Ensuring there is transparency in the process of developing the frameworks and their application including data capture.
- Frameworks with in-built flexibility, which allow evolution and refinement over time and which are also cost effective in their delivery.
- Developing frameworks to deliver broad stakeholder acceptance, for example, by the community.
- Maintaining the confidentiality of information provided by companies on their environmental management activities

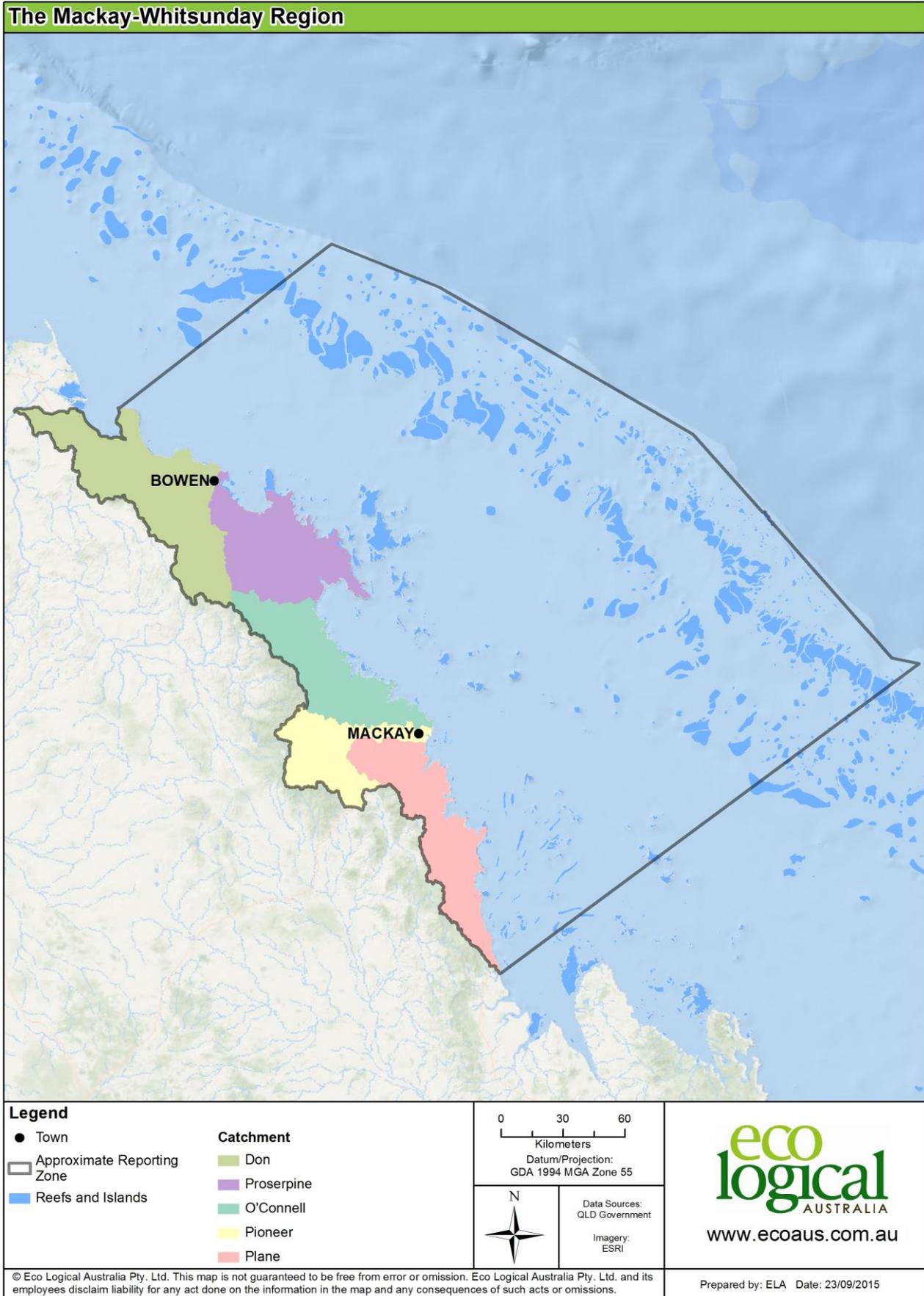


Figure 1 Map showing location of the Mackay-Whitsunday region

## 2 Method

### 2.1 General stewardship framework

#### 2.1.1 Literature review

In developing a stewardship framework for the MW Partnership it was identified that the approach would need to be designed to fit the specific scenarios, industries and environment at the Mackay-Whitsunday region, while also being based on proven methods, best practice and established mechanisms, where appropriate.

The method applied to this project was based on that developed for stewardship reporting for the GHHP (ELA and Adaptive Strategies 2015). Stewardship frameworks and questionnaires were adapted to be relevant to the Mackay-Whitsunday region including its industries and environmental issues. This was particularly the case for tourism, which was largely absent in the Gladstone region (Gladstone Harbour), but is an important industry in the Mackay-Whitsunday region.

An initial literature review and desktop research exercise was conducted to inform the development of the frameworks. This review built on the existing review of stewardship reporting practices by the Fitzroy Partnership titled: *Fitzroy Partnership for River Health Review of Stewardship Measures* (Eberhard 2013).

The desktop review for this project incorporated a range of water, environment, business and governance stewardship models and literature, including:

- Examples and analysis of national and international best practice for stewardship, in particular examples specific to ports and industries
- Environmental stewardship programs already in place related to the GBR (e.g. Reef Guardians) as well as programs in other jurisdictions
- Identification of other reviews/evaluations of management reporting
- Examples of where management reporting may already be occurring/required, for example:
  - Regulatory reporting / compliance requirements
  - Port Master Planning and reporting as required under proposed Queensland Sustainable Ports legislation
  - Monitoring and reporting elements identified in the Reef 2050 Long Term Sustainability Plan, including the proposed integrated monitoring program.

The focus of the desktop analysis was to uncover examples of management reporting and evaluation which may provide an approach that could be partially adopted or incorporated for this project. The results were used to inform the development of the preliminary framework, which was not tailored to particular industries.

A summary of the findings of the literature review is provided in Appendix A. A key finding was that the Australian State of the Environment Reporting process contains a highly relevant management effectiveness model that, with adaption, was deemed suitable as a basis for the GHHP and Mackay-Whitsunday Stewardship reporting frameworks.

The State of the Environment Report 2011 (SOE; SEWPAC 2011) was written by an independent committee of experts, appointed by the Minister for the Environment, and published by the Australian Government Department of Sustainability, Environment, Water, Population and Communities (now

Department of the Environment). The approach adopted by the SOE is based on a well-accepted evaluation framework initially established by the World Commission on Protected Areas.

The key element of SOE relevant to the Mackay-Whitsunday stewardship framework was the graded report-card style assessments of management effectiveness. In the SOE, management activities and responses aimed at mitigating environmental pressures are identified and described, then assessed according to six elements of management: understanding, planning, inputs, processes, outputs and outcomes. These six elements allow all stages and components of management to be examined, as well as the influence of those efforts on reducing pressures and improving environmental outcomes.

Elements of management effectiveness and assessment criteria used in the SOE are:

- The management context (understanding of environmental issues; adequacy of regulatory control mechanisms and policy coverage, including planning)
- Management capacity (adequacy of resources i.e. inputs, appropriateness of governance arrangements and efficiency of management processes)
- Achievements (delivery of expected products, services and impacts).

Each is assessed or 'graded' as very effective, effective, partially effective or ineffective with the framework describing what would be expected of these levels for each component of each element.

### **2.1.2 Application to Mackay-Whitsunday region**

The SOE management effectiveness model was used as a basis for developing a general model of stewardship reporting for the Mackay-Whitsunday region. The SOE model was simplified and given an ecosystem health focus. Elements of management effectiveness and assessment criteria for the Mackay-Whitsunday region were based on three themes – planning, implementation and outcome, as defined below.

The planning theme included:

- Managers have a good understanding of the environmental and socio-economic significance of harbour health, and current and emerging threats.
- Consideration of environmental factors affecting ecosystem health is a major consideration in planning and management decisions related to the GBR and its catchment.
- Regulatory controls are informed and based on environmental science and processes.
- Plans provide clarity on objectives for management actions that address major pressures and risks to ecosystem health, roles and responsibilities for managing issues, and operational procedures.

The implementation theme included:

- Financial, human and information resources are available to implement plans and operational procedures.
- Measures to comply with regulatory conditions are in place and are regularly monitored, reviewed and reported. Any non-compliance is responded to in a timely manner to correct the matter.
- A governance system is in place that provides for appropriate stakeholder engagement in decisions and implementation of management activities.
- Adaptive management for longer-term initiatives, and transparency and accountability are applied where appropriate.

The outcome theme included:

- Management objectives are being met with regard to:
  - timely delivery of products and services. There is a reduction of relevant current pressures and emerging risks to ecosystem health.
  - improvements in the resilience of water quality and ecosystem health.
  - monitoring and research actions feedback to planning and plan revisions.

Each of the above themes were further developed against effectiveness ratings (very effective, effective, partially effective, not effective; Table 1). This detailed suite of guiding criteria was then further developed to provide specific measures for the port, heavy industry, aquaculture and tourism industries (see Sections 2.2, 2.3 and 2.4), against which industries in the Mackay-Whitsunday region could be objectively evaluated for management effectiveness (i.e. their stewardship).

**Table 1: Guiding criteria for planning, implementation and outcome themes in the Mackay-Whitsunday stewardship framework**

Effectiveness rating	Theme	Guiding criteria
Very effective	Planning	Understanding of environmental factors affecting water quality and ecosystem health is good. Effective plans are in place for significant activities. Plans and operational procedures clearly establish management objectives for major risks. Responsibility for managing issues is clearly and appropriately allocated.
	Implementation	Financial and staffing resources are adequate to implement plans. Biophysical and socioeconomic information is available to inform management decisions. Well-designed management systems are being implemented to monitor or manage activities. Low instance of minor administrative non-compliances; zero non-compliance resulting in environmental harm.
	Outcome	Management responses are progressing in accordance with planned programs and are achieving their desired objectives. Targeted threats are being monitored, reported and responded to.
Effective	Planning	Understanding of environmental factors affecting water quality and ecosystem health is generally good, but there is some variability across activity. Effective plans are in place, and management responsibilities are allocated appropriately. Plans and operational procedures clearly establish management objectives and priorities for addressing major risks, but may not specify implementation procedures, objectives or other key elements.
	Implementation	Financial and staffing resources are mostly adequate to implement plans, but may not be secure. Biophysical and socioeconomic information is available to inform decisions, although there may be deficiencies in some areas. Well-designed management systems are in place or under development, but are not yet being fully implemented. Low instance of non-compliances; matters resulting in environmental harm are temporary and responded to immediately.
	Outcome	Management responses are mostly progressing in accordance with planned programs and are achieving their desired objectives. Targeted

Effectiveness rating	Theme	Guiding criteria
		threats are understood and there are measures in place to monitor and report.
Partially effective	Planning	Understanding of environmental factors affecting water quality and ecosystem health is only fair. Planning systems are not comprehensive and/or there is lack of clarity on who has management responsibility.
	Implementation	Financial and staffing resources are unable to address issues in some important areas. Biophysical and socioeconomic information is available to inform management decisions, although there are significant deficiencies in some areas. Management systems provide some guidance, but are not consistently delivering with regards to stakeholder involvement, adaptive management or reporting. Notable non-compliances resulting in environmental harm that are responded to immediately and effectively.
	Outcome	Management responses are progressing and showing signs of achieving some management objectives. Targeted threats are understood and measures are being developed to manage them. The expected impacts of management measures on improving resilience of environmental values are yet to be seen. Managed threats remain as significant factors influencing water quality and ecosystem health.
Not effective	Planning	Understanding of environmental factors affecting water quality and ecosystem health is poor. Planning systems have not been developed to address significant issues.
	Implementation	Financial and staffing resources are unable to address issues in many areas. Biophysical and socioeconomic information to support decisions is deficient in many areas. Adequate management systems are not in place. Lack of consistency and integration of management across activities is a problem for many issues. Regular non-compliances; resulting in environmental harm with limited response to address the issue.
	Outcome	Management responses are either not progressing in accordance with planned programs (significant delays or incomplete actions) or the actions undertaken are not achieving their objectives. Unmitigated or poorly understood threats remain as significant factors influencing water quality and ecosystem health.

## 2.2 Port and Heavy Industry frameworks and data collection

### 2.2.1 Framework development

The guiding criteria for each theme and effectiveness rating were used to develop frameworks that were specifically tailored to port and heavy industry activities in the Mackay-Whitsunday region. A list of key activities undertaken by ports and heavy industry that may influence ecosystem health and water quality was developed as a first step. This list was based on that developed from extensive consultation with port authority and industry personnel (primarily via the GHHP Stewardship Working Group), review of environmental authorities (EAs) and industry knowledge of this report's authors. These activities then were a basis for the development of criteria against which the management effectiveness (i.e. stewardship) of companies could be evaluated.

Key activities are:

- Administration
  - Extension and research projects
  - Compliance approach
  - Environmental management systems (EMS)
  - Training, knowledge and staff awareness
  - Community engagement
  - Tenancy management
- Operations
  - Operation and ancillary services (including all operational elements that may affect ecosystem health, such as landside waste, hazardous substance storage, refuelling vehicles, quarries, loading and unloading, spill management, stock pile management)
  - Maintenance dredging
- Development
  - New capital development and/or significant upgrades
  - Capital dredging
- Shipping
  - Movement
  - Anchorage
  - Discharges
  - Biosecurity

In the Mackay-Whitsunday region there is only one port authority (North Queensland Bulk Ports Corporation; NQBP), which operates the ports of Abbot Point, Mackay and Hay Point within the region. However several other companies are port tenants and may undertake activities that could be classified as 'port related', namely dredging and shipping. Therefore, a distinction was made such that all activities undertaken by NQBP and all dredging and shipping activities (undertaken by any company) would be included in the port stewardship framework.

For all activities other than shipping and dredging, port tenant companies were included in the heavy industry framework. Such companies trade a diversity of commodity types including agricultural, coal, petroleum and mineral sand products. While they have facilities located at a port (e.g. a loading jetty, storage yards), their environmental management and licensing arrangements are generally similar to those of heavy industry companies located further inland (or on the coast outside of ports).

The approach described above was consistent with that applied to the stewardship frameworks of the GHHP, and allows flexibility in the future if companies change their operations to include (or exclude) dredging or shipping, in that data are merely included or removed from the relevant frameworks, rather than companies themselves being reclassified as 'industry' or 'port'.

The port and heavy industry stewardship frameworks are presented in Appendix B and Appendix C respectively.

### 2.2.2 Data collection

The overarching aim of the data collection process was to evaluate companies' management effectiveness using robust data in a repeatable and transparent manner. Two potential sources of data were identified to achieve this – company data via self-reporting and compliance data from the

Queensland Department of Environment and Heritage Protection (DEHP). Each had advantages and challenges, as discussed below. The designated reporting period is the preceding financial year (i.e., in this instance the 2014-15 financial year; FY).

Accessing data from companies relied on voluntary participation of each company in the data collection process. Companies were identified primarily on the basis that their activities in the Mackay-Whitsunday region had the potential to influence ecosystem health and water quality. The following approaches were used to identify companies:

- Information from peak representative body organisations (e.g. Queensland Resources Council, Canegrowers) and MW Partnership members
- A review of reporters to the National Pollutant Inventory
- Local knowledge of the report authors
- Information from government agencies on active licences in the region

Port and heavy industry companies invited to participate in the stewardship assessment are listed in Table 2. Not all companies approached to participate in the stewardship assessment were members of the MW Partnership. In some cases, membership was not held by the company, but by a peak representative body. The suite of companies selected covers the 'major players' in the Mackay-Whitsunday region. Data from new participants can be easily included in future years.

**Table 2 Port and Heavy Industry companies invited to participate in the stewardship reporting**

<b>Port and Heavy Industry</b>	<b>Activities in Mackay-Whitsunday region</b>
NQBP	Port Authority at the Ports of Hay Point, Mackay and Abbot Point
Wilmar	Sugar mills and bioethanol plant
Mackay Sugar	Sugar mills and co-generation plant
Queensland Sugar	Terminal at Port of Mackay
Sugar Australia	Terminal at Port of Mackay
Graincorp	Terminal at Port of Mackay
Shell	Facility at Port of Mackay
Caltex	Facility at Port of Mackay
BP	Facility at Port of Mackay
Sibelco	Mineral sand storage area at Port of Mackay
Thomas Borthwick and Sons	Meat works at Bakers Creek and terminal at Port of Mackay
Origin Energy	Facility at Port of Mackay
Abbot Point Bulk Coal	Coal terminal at Abbot Point
Hay Point Services	Coal terminal at Hay Point
Dalrymple Bay Coal Terminal	Coal terminal at Hay Point

Companies were asked to self-report across the range of activities relevant to their business in the Mackay-Whitsunday region. This was done via a questionnaire, which was developed to specifically address each activity and theme (planning, implementation, outcome) in the stewardship frameworks. The questionnaire was largely made up of multiple choice questions, with opportunities to provide supporting text and/or links to documents. The questionnaire was designed to facilitate completion by site-based environment staff over a period of approximately one hour. The final questionnaires are provided in Appendix F.

A disadvantage of the self-reporting approach is the potential perception of bias in the results. That is, companies will shape their responses to 'make themselves look good'. This was countered by specifically tailoring questions to target issues for which 'supporting evidence' would be readily available (e.g. EMS ISO14001 accreditation; number of environmental incidents). This made the data largely objective rather than being merely the unsubstantiated opinion of companies (or individuals within companies).

Further rigour was introduced into the data collection process by including compliance data from DEHP, based on compliance with approvals under the *Environmental Protection Act 1994* (Environmental Authorities). The intention was to use these data to populate the implementation theme for operational activities.

Compliance data for the 2014-2015 FY were extracted from DEHP's database for all companies identified in Table 2, for their activities in the Mackay-Whitsunday region (individual companies were not identified). Review of the data highlighted some challenges in using it as a robust data set for inclusion in the stewardship reporting framework. A summary of the data and key challenges are outlined below.

- Results relate to compliance inspections only (in the 2014-15 FY there were 17 inspections).
- The impetus for undertaking the inspection is unknown (beyond whether it was proactive or reactive). This suggests the dataset may not present an unbiased sample of compliance issues e.g. inspections are not random and may relate to community complaints or be targeting areas where there were previous compliance issues.
- For most records, the environmental matter investigated is unknown and therefore may not be directly relevant to the stewardship reporting frameworks (e.g. air quality is outside the scope of the frameworks).
- The outcomes of two investigations are not yet finalised – of the 17 inspections, 2 were awaiting a response or further investigation at the time of the data analysis.
- In terms of the recorded outcomes for heavy industry, there were:
  - nine instances of the activity being reported as in compliance
  - one inspection that resulted in enforcement measures (a warning)
  - two inspections where a minor non-compliance warranting further investigation was identified.
- There were no recorded DEHP inspections for ports.

A proxy compliance rate was calculated for heavy industry by dividing the number of inspections with an 'in compliance' and 'no further action' outcome by the total number of inspections. For this dataset, the result is  $9 \div 12$  and a compliance rate of 75%. This result has been used as one source of information in the development of a stewardship rating for heavy industry (contributed to the score for operations implementation). However, the data are considered to be of low reliability, due to the issues listed above and the small sample size when compared with the large variety of environmental issues addressed by Environmental Authority conditions.

## 2.3 Aquaculture framework and data collection

### 2.3.1 Framework development

The stewardship frameworks developed for the aquaculture industry (Appendix D) were similar to those for Port and Heavy Industry. This was considered important, so that different industries were assessed in a similar manner, allowing reasonable comparisons among industries. Also one of the key areas in which aquaculture operations have the potential to influence ecosystem health of the GBR is the discharge of wastewater. Such discharges are generally licenced in a similar way to those of heavy industry, through Environmental Authorities administered by DEHP. Approvals are also required from the Department of Agriculture and Fisheries (DAF) to operate an aquaculture facility in Queensland.

The primary differences in the aquaculture stewardship framework, when compared with those of port and heavy industry were:

- Shipping was removed, as this is not relevant to the aquaculture industry
- New assessment criteria were added associated with disease management (e.g. from importing broodstock into hatcheries)
- Most aquaculture facilities are small in scale when compared with those of ports and heavy industry. These aspects of scale need to be considered when assessing some aspects of environmental management such as ISO14001 accreditation and community engagement activities. The aquaculture framework was therefore adapted to be applicable to companies of varying sizes (including small operators).

### 2.3.2 Data collection

Aquaculture facilities were identified through liaison with peak representative bodies (Australian Prawn Farmers Association, Australian Barramundi Growers Association, Queensland Crayfish Farmers Association), local knowledge of the report authors and consultation with DAF. A total of four prawn farms or hatcheries, one barramundi farm and one small redclaw crayfish farm were identified to be actively operating in the region (Table 3).

**Table 3 Aquaculture companies invited to participate in the stewardship reporting**

Aquaculture	Activities in Mackay-Whitsunday region
Pacific Reef Fisheries	Hatchery and proposed prawn farm at Guthalungra
Australian Prawn Farms	Prawn farm south of Mackay
Clem Jones Queensland Prawn Farm	Small prawn farm near Mackay
Monogold Prawn Farm	Small prawn farm near Mackay
Good Fortune Bay Fisheries	Barramundi farm near Bowen
Rockywater Crayfish	Red claw crayfish farm near Mackay

As with the port and industry frameworks, assessment of aquaculture stewardship was based primarily on completion of questionnaires (Appendix G), aided by compliance data from the Queensland Government. While DEHP did not undertake any compliance inspections of aquaculture facilities in the region during the 2014/15 financial year, DAF completed a variety of inspections for compliance and biosecurity purposes under the *Fisheries Act 1994*. Of the six inspections conducted, a 100% compliance

rate was achieved (no breaches of licence conditions were found). This compliance rate was used in the stewardship assessment in the same manner described above for heavy industry (contributed to the operations implementation score).

DAF was also approached to provide data on compliance inspections of the Queensland Boating and Fisheries Patrol (QBFP), an operational section of the Department focussed on fisheries and marine safety compliance. While QBFP officers inspected over 50 aquaculture facilities in Queensland during the 2014/15 financial year, none of the inspections occurred at the farms identified in the Mackay-Whitsunday region.

## **2.4 Tourism framework and data collection**

### **2.4.1 Tourism definition**

The tourism industry provides a large diversity of services including accommodation, restaurants, transport and recreational activities. Those aspects of the industry operating as a business 'on the water' were the focus of this stewardship assessment. Commercial marine tourism activities operating in the Mackay/Whitsundays region include cruises and boat tours, organised diving and snorkelling, air charters and water sport operations. Unsupervised recreational activities including self-hire boats/yachts were excluded from the assessment, as these are generally conducted differently to a regulated commercial tourism operation. While the commercial marine tourism activities of resorts were considered in the assessment (e.g. snorkelling, water sports), the environmental management of resort facilities on land were excluded. The management of these facilities is aligned with the urban stewardship category (beyond the scope of this report), where issues such as sewage treatment, stormwater management and master planning are evaluated.

### **2.4.2 Framework development**

The tourism industry is highly reliant on the maintenance of high water quality and ecosystem health within the region. Indeed, this is often the key experience tourists are seeking as part of their participation in tourism activities. Therefore, the stewardship assessment of the tourism industry was focussed on management efforts by tourism operators in the Mackay-Whitsunday region to maintain or improve the ecosystem health of marine and coastal waters.

The stewardship framework developed for the tourism industry is similar to those for port, heavy industry and aquaculture. This was considered important, so that different industries were assessed in a similar way, allowing reasonable comparisons among industries. The primary differences in the tourism stewardship framework, when compared with those of other industries, are:

- A focus on certification and training given that systems for the industry are well established
- Analysis of participation rates in such programs, given the large number of operators (>100 tourism operators) in comparison with other industries, such as ports (one port authority), heavy industry (<20 companies) and aquaculture (<10 companies).

Criteria utilised for evaluating stewardship related to tourism were:

- Participation in recognised environmental industry accreditation programs:
  - % of accredited operations and/or % of high standard accredited operations
  - membership of associations with Codes of Practice and auditing.
- Involvement in extension and research projects related to ecosystem health, including citizen science programs, environmental management activities (e.g. physical control of crown of thorns starfish outbreaks).

- Implementation of operational standards to protect the environment (e.g. waste management, incident response and reporting, anchoring and mooring, vessel standards and maintenance).
- Compliance with environmental licenses and cooperative engagement with regulators.
- Training, qualifications, knowledge and awareness of environmental management issues for staff.

The stewardship framework for tourism is provided at Appendix E.

### 2.4.3 Data collection

Data collection for the 2014/15 pilot report card was based primarily on publically available data and discussions with key tourism industry stakeholders, including industry representative bodies with a strong working knowledge of operators' activities and the Great Barrier Reef Marine Park Authority (GBRMPA). In future years it is recommended that this publically available data and interviews with key stakeholders be supplemented with the results of an industry questionnaire provided in Appendix H. Forward timeframes of 3-4 months are likely to be required to collect a representative sample from the large number of tourism operators within the region. For this reason, results for the pilot report card in 2014-2015 were compiled without data from surveys of tourism operators.

## 2.5 Scoring

### 2.5.1 Port, Heavy Industry and Aquaculture

Answers for each company from the port, heavy industry and aquaculture questionnaire were given an effectiveness rating, based on the criteria specified in the respective frameworks. Each answer was then translated into a numerical value (very effective – 4, effective – 3, partially effective – 2, ineffective – 1) to facilitate averaging of scores across activity groupings (administration, operations, development and shipping - port only) and management themes (planning, implementation, outcome). Scores were then combined to produce scores (and corresponding ratings) for each company – see hypothetical example below (Table 4).

**Table 4: Example of scoring system for a hypothetical company**

Activity group	Management theme		
	Planning	Implementation	Outcome
Administration	3.7 (effective)	3.7 (effective)	2.7 (partially effective)
Operations	3.5 (effective)	3.0 (effective)	3.7 (effective)
Development	4.0 (very effective)	4.0 (very effective)	4.0 (very effective)
<b>Grand Total</b>	<b>3.7 (effective)</b>	<b>3.6 (effective)</b>	<b>3.5 (effective)</b>

Averaged scores were then assigned a stewardship rating based on the following scale:

- >3.75 very effective
- 3.00 – 3.75 effective
- 2.00 – 3.00 partially effective
- <2.00 – ineffective

The score to achieve a very effective rating was set at >3.75, as some questions were of a binary nature and had a highest score possible of 3 (achieving rather than exceeding relevant standards). Therefore it was impossible to achieve an overall score of 4, once the mean was calculated across all relevant

responses. Other stewardship ratings were not affected by this, and were referenced to average results listed above.

The above data sets for each company were combined to produce an average score across all activity groups for each management theme. This provided a ranking for each of the three management themes. No weightings were applied to these data. This was deemed appropriate for the following reasons:

- Operations, development (and shipping for port stewardship) are the activities with the potential for direct impacts on water quality and ecosystem health.
- Good administrative procedures are required to underpin successful operations and development and minimise risk of impacts to water quality and ecosystem health.
- A 'quasi-weighting' has been built in to the data analysis model in that there are many more administrative activities than operational, development or shipping activities. Rather than weight each individual activity separately, the individual activities' scores have been aggregated within overarching activity groups.

A minimum standard principle was applied in order to produce a final overall stewardship rating. That is, the overall rating awarded was the lowest (i.e. least effective) across each of the three management themes. Therefore, in order to achieve a designated stewardship rating (e.g. effective), criteria for that rating needed to be achieved or exceeded across all of the three management themes.

A scoring template was developed in Microsoft Excel and accompanies this report. Instructions for completing the template to generate scores are provided in Appendix I. Importantly, 'missing data' i.e. instances where companies did not provide a response (shipping is a good example of this) were not included in the analysis, meaning companies' results were assessed only on the number of activities for which they provided answers and not the total number of activities in each theme. This approach avoided missing data/non-responses driving stewardship scores down artificially.

The generation of a score for operations (implementation theme) using DEHP and DAF compliance data was described above. The outcome of this calculation was included in the overall scoring template and incorporated into the final stewardship scores/ratings.

### **2.5.2 Tourism**

Scoring for the tourism industry was more qualitative than the approach taken for ports, heavy industry and aquaculture. Due to time constraints the focus for 2014/15 was on publicly available information and an assessment of the industry as a whole (rather than the averaged results of individual companies within the industry).

A score from very effective to ineffective was assigned for each component of the stewardship framework. The analysis of these collective scores was completed in a similar manner to other industries to achieve an overall stewardship rating.

### **2.5.3 Reliability of ratings**

The reliability of stewardship ratings was assessed by adapting a qualitative confidence ranking system utilised in stewardship assessments for the agricultural sector under previous GBR report cards. The approach involved consideration of:

- The maturity of the stewardship assessment methodology
- Directness of the measurement
- Spatial coverage (in this case across the industry being assessed)

- Strength of relationship between the methodology, indicator reported and measured data
- Measured error

The level of confidence in stewardship ratings was reported on a five point scale from low (1) to high (5). For all four industries, a reliability rating of medium (3 out of 5) was achieved. Key aspects driving this result were the methodology based on SOE methodology, relatively high sample sizes within industry groups, only conceptual relationships between measured data and reported indicators and no quantitative measurement of error.

## 3 Results

### 3.1 Summary

#### 3.1.1 Port

The overall result for port stewardship in the Mackay-Whitsunday region was effective for the 2014-15 FY (Figure 2). This was consistent across the administration and operations themes, with the development theme scoring very effective. A notable element in achieving these results is the extra non-regulatory activities that the port authority undertakes to deliver positive outcomes for ecosystem health. The only dredging activity (maintenance dredging) was undertaken by the port authority and this activity (reported on collectively in the operations activity grouping) also achieved an effective rating.

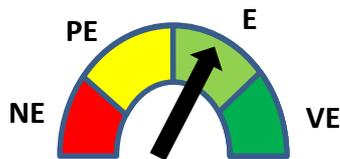


Figure 2 Port effectiveness rating 2014-15 FY

#### 3.1.2 Heavy Industry

The overall result for heavy industry stewardship in the Mackay-Whitsunday region was effective for the 2014-15 FY (Figure 3). This was consistent across the administration and operations themes, with the development theme scoring very effective. A key element in achieving the effective rating was the extra non-regulatory activities that companies undertake to deliver positive environmental outcomes. These results were generated from six companies across the sugar milling, meat processing, coal handling and mineral sands industries.



Figure 3 Heavy Industry effectiveness rating 2014-15 FY

#### 3.1.3 Aquaculture

The overall result for aquaculture stewardship in the Mackay-Whitsunday region was very effective for the 2014-15 FY (Figure 4). This was consistent across the administration, development and operations themes. The result reflects the extensive research partnerships and innovation in place within the industry,

along with the very high regulatory requirements placed on farms, particularly in relation to the expansion or development of new farms. The stewardship activities of the aquaculture industry were assessed to be above and beyond those of comparable industries where discharges to the environment occur. The result was generated from four companies and liaison with three representative bodies in the prawn, barramundi and red claw crayfish farming industries.

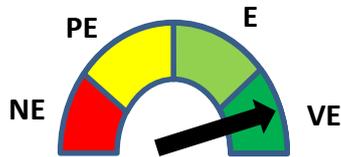


Figure 4 Aquaculture effectiveness rating 2014-15 FY

### 3.1.4 Tourism

The overall result for tourism stewardship in the Mackay-Whitsunday region was effective for the 2014-15 FY (Figure 5). The region has 25 high standard Eco Tourism accredited operations, the highest number of any single location within the GBR. The industry is closely regulated, primarily in relation to access and operations within the Marine Park and National Park islands. The industry actively participates in science programs related to ecosystem health, including the GBRMPA ‘Eye on the Reef’ and ‘Reef Guardians’ programs.

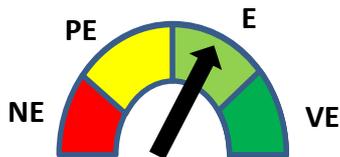


Figure 5 Tourism industry effectiveness rating 2014-15 FY

## 3.2 Detailed analysis

### 3.2.1 Port

The data collection method for port stewardship was intended to collect information from the port authority, plus other companies in relation to the shipping section of the questionnaire. However, no companies responded to the shipping questions in the survey, citing that management of the activities is the responsibility of others. This issue is discussed further below. In this context, the results for the port stewardship assessment reflect those of the port authority only for the 2014-15 FY.

Overall port stewardship was scored as very effective in Planning and Implementation and effective in Outcome (Table 5). Across the activities groupings, Administration and Operations scored effective, while development was assessed as very effective. The overall result was at the higher end of the effectiveness rating, with key findings summarised as follows:

- The port authority employs highly qualified and experienced staff to manage ecosystem health and water quality
- A comprehensive environmental management system is in place and is accredited to ISO14001
- There is a high level of community engagement by the port authority on environmental issues, with significant contributions to the environmental initiatives of port industry representative bodies, such as the Queensland Ports Association
- A program of ambient environmental monitoring has been initiated across the three ports, so that the results of monitoring activities during future dredging programs can be referred to a comprehensive environmental baseline. Such programs reflect the high level of stewardship (very effective) in relation to development activities and the implementation management theme.

**Table 5 Breakdown of port stewardship ratings**

Activity group	Management theme		
	Planning	Implementation	Outcome
Administration	3.6 (effective)	3.8 (very effective)	3.4 (effective)
Operations	4.0 (very effective)	4.0 (very effective)	3.0 (effective)
Development	4.0 (very effective)	4.0 (very effective)	4.0 (very effective)
<b>Grand Total</b>	<b>3.9 (very effective)</b>	<b>3.9 (very effective)</b>	<b>3.5 (effective)</b>

### 3.2.2 Heavy Industry

Overall heavy industry stewardship was scored as effective in all management themes – planning, implementation and outcome (Table 6). Across the activity groupings, planning and implementation of development activities were very effective and implementation of operations was partially effective. This latter score was highly influenced by the 75% compliance rate (from DEHP inspection data), which was equivalent to partially effective in the stewardship framework. All other scores were in the effective range.

There was a high variability in responses from companies on community engagement activities. Some companies undertake extensive consultation programs, while others don't have any. This likely reflects the high diversity of the business activities within the heavy industry category, and associated variability

in the approach taken within their respective markets. While all companies had an Environmental Management System in place, only two had the system accredited to ISO14001 standards.

Reduction and reuse of waste products was a highlight of the heavy industry stewardship assessment, with several companies embracing the recycling of waste products for alternative commercial purposes. Examples included the use of treated effluent to irrigate a turf farm, and the use of cane waste to produce electricity and ethanol for addition to fuel. Such practices demonstrate successful approaches to managing threats to the GBR from nutrients and climate change in a commercially viable manner.

A summary of keys findings of the stewardship assessment is provided below:

- Environmental management staff have a high awareness of environmental regulations and their responsibilities to implement management systems to reduce environmental impacts.
- The level of participation in research and extension activities related to ecosystem health varies among companies.
- Innovation and a commitment to recycle waste are evident, particularly in the sugar and meat processing industries. For example, the sugar industry implements a “Nothing is Wasted” cycle involving the production of electricity and ethanol from sugar cane waste. This approach reduces carbon emissions, one of the key threats to the reef health through climate change.
- Heavy industry terminal operators contribute to a range of environmental programs, working in partnership with the port authority.

**Table 6 Breakdown of heavy industry stewardship ratings**

Activity group	Management theme		
	Planning	Implementation	Outcome
Administration	3.2 (effective)	3.6 (very effective)	3.3 (effective)
Operations	3.5 (effective)	2.8 (partially effective)	3.7 (effective)
Development	4.0 (very effective)	4.0 (very effective)	3.5 (effective)
<b>Grand Total</b>	<b>3.5 (effective)</b>	<b>3.5 (effective)</b>	<b>3.5 (effective)</b>

### 3.2.3 Aquaculture

Overall aquaculture stewardship was scored as very effective, with seven of the nine scores in the very effective range of >3.75 (Table 7). The very effective rating primarily reflects the extensive research and development activities of the industry to minimise environmental impacts and adopt new technologies, while meeting increasing regulatory requirements of government agencies that exceed those of comparable industries. Examples of key factors which were instrumental in the very effective rating are:

- The prawn and barramundi farming industries are working closely with MBD Energy and James Cook University to develop and implement techniques for the removal of nutrients from wastewater using marine algae. A pilot scale water treatment facility has been in operation at a prawn farm with excellent results. Algae is harvested once it removes nutrients from the water and is utilised for other commercial purposes.

- The prawn farming industry has strong collaborative links with CSIRO and other research partners to develop more efficient farming practices, through feed inputs and wastewater treatment. Examples include the development of a feed product with no fish meal.
- There were six compliance inspections of aquaculture facilities in the region by DAF, to check biosecurity compliance and adherence with farm approval conditions. A compliance rate of 100% was achieved.
- Regulatory requirements of the Commonwealth Government for new or expanded developments involve a nil net discharge of nutrients. Every kilogram of nitrogen and sediment discharged to the environment needs to be offset through catchment management projects. This requirement is above and beyond that of comparable industries (e.g. agriculture) or land uses (e.g. urban) in the region.

**Table 7 Breakdown of aquaculture stewardship ratings**

Activity group	Management theme		
	Planning	Implementation	Outcome
Administration	3.6 (effective)	3.8 (very effective)	3.5 (effective)
Operations	3.8 (very effective)	4.0 (very effective)	4.0 (very effective)
Development	4.0 (very effective)	4.0 (very effective)	3.8 (very effective)
<b>Grand Total</b>	<b>3.8 (very effective)</b>	<b>3.9 (very effective)</b>	<b>3.8 (very effective)</b>

### 3.2.4 Tourism

Overall tourism stewardship was scored as effective (Table 9). Implementation is a notable strong point of the industry with planning and outcomes also assessed as effective. The 2014/15 results have been derived from an analysis of data focused on compliance, certification and participation rates as follows:

- Participation in recognised environmental industry accreditation programs:
  - approximately 85% of operators in the region have ecotourism certification
  - there are 25 operations with high standard accreditation
  - there is a high (>90%) participation in industry associations with codes of practice and auditing.
- Participation in extension and research projects is moderate to high based on GBRMPA annual reporting, particularly “Eye on the Reef”. These programs are associated with reporting the condition of ecosystem values on the GBR and taking voluntary actions to improve environmental outcomes, beyond what is required by regulation
- Marine Park licensing is comprehensive and compliance rates are very high (based on GBRMPA annual reporting)
- Few environmental incidents or serious non-compliance matters were reported in the 2014/15 period
- Training programs for tourism are available through local TAFE and applied within the industry

The 2014/15 results are based on an assessment of four of the six activity groups contained in the framework. Due to time constraints it was not possible in 2014/15 to assess individual operational activities and tourism infrastructure development. Of the four themes assessed, results ranged from effective to very effective with 10 of the 12 categories assessed as effective.

Table 8 Breakdown of tourism stewardship ratings

Activity	Management theme		
	Planning	Implementation	Outcome
Operations	-	-	-
Infrastructure development	-	-	-
Compliance	Effective	Very effective	Effective
Scheme participation	Effective	Effective	Effective
Training and awareness	Effective	Very effective	Effective
Extension programs	Effective	Effective	Effective
<b>Overall</b>	<b>Effective</b>	<b>Effective</b>	<b>Effective</b>

For future assessments it is recommended that all areas of the framework be assessed. A close collaboration with tourism industry associations and GBRMPA to obtain relevant regionally specific data will greatly enhance the rigor and application of the framework. In particular with a 3-4 month lead time it should be possible to obtain the following additional information:

1. At a regional level analysing licencing data and compliance rates for tourism permits issued by GBRMPA. This will enable an accurate assessment of overall participation numbers and high standard accreditation ratios.
2. Implement individual operator and tourism association questionnaires to gather self-reporting data on operations, applied standards and any infrastructure development or upgrades.

## 4 Discussion

### 4.1 Overview

The results of the port, heavy industry, aquaculture and tourism stewardship reporting have indicated that activities within these industries are being undertaken effectively in the Mackay-Whitsunday region across a range of activity types and management themes. This is not surprising, given that these are highly regulated industries that are required to operate in accordance with a range of environmental approvals. For all industry sectors, there are also considerations for social licence to operate.

The stand-out result of this analysis has been the aquaculture industry, which scored a very effective rating. Port stewardship was evaluated at the high end of the effective spectrum, and rated very effective for development activities. Such results are a positive outcome for ecosystem health of the Mackay-Whitsunday region.

Across port, heavy industry, aquaculture and tourism there are a number of noteworthy results, which are discussed below. Some point to the good work that companies are currently doing with respect to the protection of ecosystem health, whilst others show areas where some improvements may be made. There were also a number of challenges with the stewardship reporting process which are discussed and should be acknowledged when interpreting the results. Some refinement of the approach to stewardship assessment is recommended for future years.

### 4.2 Extension programs and leading practice activities

The stewardship frameworks for port, heavy industry, aquaculture and tourism focused heavily on regulated activities (operation and development) along with the administrative processes that are necessary to effectively support these. However, companies also make an important (and sometimes overlooked) contribution to the care and health of the Mackay-Whitsunday region through their extension programs and leading practice activities. Additionally, water quality is critical to the tourism product provided in the Mackay-Whitsunday region. Extension activities undertaken by the tourism industry include those related to certification (e.g. high standard ecotourism operations) and additional community engagement measures.

There are a large number of extension projects that are undertaken by the companies surveyed for this project and the collective contribution is considered to be as important as the effective management of everyday activities performed to operate each site or company. The majority of these initiatives are voluntary i.e. above and beyond what is required by environmental approvals, and some come with considerable financial commitment. A summary of the responses provided by companies is presented below.

There are a number and diversity of extension programs undertaken, including:

- Membership of the MW Partnership (some companies, and through peak representative bodies)
- Companies working as a group through industry representative bodies to provide a consistent approach to extension and consultation (e.g. Queensland Resources Council, Queensland Ports Association, Australian Prawn Farmers Association, Whitsunday Charter Boat Industry Association)
- Research collaborations with universities, government research institutions and private companies

- Financial support for a range of environmental management programs in the region associated with improving water quality and reef health (e.g. Mackay Regional Stormwater Monitoring Program, GBR Integrated Monitoring Working Group)
- The collection of monitoring data provided to government agencies

Questionnaire responses and a review of available data highlighted a number and diversity of leading practice examples of environmental management, including:

- Ambient marine monitoring programs for seagrass, water quality and inshore rocky reefs for extended areas around the Ports of Hay Point, Mackay and Abbot Point. These programs are above and beyond what is required by regulation.
- Using wastewater generated from a meat processing facility to irrigate a turf farm and manufacture soil conditioners
- Recycling of sugar cane waste to produce electricity and ethanol for fuels
- Use of marine algae to remove nutrients from aquaculture waste water prior to discharge
- Partnerships with CSIRO and industry to develop sustainable aquaculture feed products which are free of fish meal
- The Mackay-Whitsunday region has the highest number of high standard Eco tourism accredited operators on the GBR (25 operators)

The outcomes of all of the above programs were generally rated by companies as being successful or highly successful, with commitments to these programs generally being long-term. Collectively, these extension programs and leading practice activities make a significant contribution to the MW Partnership's vision of "healthy rivers and Reef contributing to a prosperous region where people visit, live, work and play."

### 4.3 Shipping

Shipping was included in the port stewardship framework as a number of shipping-related activities have the potential to directly influence the water quality and ecosystem health of the Mackay-Whitsunday region. Companies were asked to report on ship movements, anchoring practices, discharges and biosecurity, as they related to their own operations.

However, no companies or port authorities responded to the shipping or biosecurity questions, noting activities are ultimately the responsibility of government agencies (e.g. Reef VTS is the remit of AMSA and MSQ, biosecurity is the remit of numerous agencies and is ultimately coordinated via the National System for the Prevention and Management of Marine Pest Incursions). None of these agencies were asked to provide data or self-evaluate their practices as part of this stewardship reporting project.

Feedback from some companies during the GHHP project suggested the need for a 'government stewardship framework' to evaluate and report on activities that are ultimately the responsibility of government agencies rather than individual companies themselves (ELA and Adaptive Strategies 2015). While the system set by government agencies to regulate industries has informed the assessment of stewardship for this project, the operational activities of government agencies has not been considered.

Consequently, the evaluation of stewardship has not considered the management of shipping. Collectively, the above issues suggest that the shipping parts of the port framework could be revised to:

- remove the current activities due to ambiguities over responsibility; and

- develop a new criterion that is linked to shipping actions/objectives in the Reef 2050 Long Term Sustainability Plan and the North-east Shipping Management Plan.

#### **4.4 Partially effective ratings**

One of the benefits of stewardship reporting frameworks such as the ones developed in this project are the opportunities to identify areas for improvement. In the frameworks presented here, any activities or management themes that rate as partially or not effective represent areas where improvement may be targeted.

At a company level, there were a small number of instances where stewardship was assessed as partially effective in one of the activities within a management theme. Such scores were generally associated with companies not having any environmental extension activities, not achieving positive outcomes from community engagement activities or not having targeted environmental training programs for their staff. Such results indicate that a more structured approach to community engagement, as occurs through the MW Partnership, may assist companies to achieve more effective community engagement outcomes.

#### **4.5 Challenges with the stewardship reporting process**

The port, heavy industry, aquaculture and tourism frameworks developed for this project are considered to be representative and robust. They provide a strong overall understanding of how effectively each industry is operating in the Mackay-Whitsunday region with respect to water quality and ecosystem health. However, there were a number of challenges and these are discussed in this section.

##### **4.5.1 Assumptions of effectiveness of regulation**

The stewardship frameworks developed for this project have relied heavily (but not entirely) on compliance with the existing regulatory framework, with effective management / stewardship equating to companies fulfilling their regulatory requirements (as set out in existing legislation and applied by government agencies). The underlying assumption of this approach is that the legislation and regulatory processes themselves are adequate to provide good environmental outcomes i.e. that the regulatory framework is 'effective'. However, no direct assessment of the effectiveness of the existing regulatory environment was undertaken for this project. This would, however, be within the scope of a government stewardship framework.

##### **4.5.2 Use of compliance data**

Overall, compliance data provided by DAF and DEHP to understand compliance was useful to the evaluation of stewardship. Specific limitations have been discussed in detail in various sections above, and key points are:

- There were few compliance inspections undertaken in the 2014-15 FY compared with the number of Environmental Authority or aquaculture licence conditions, and it is unclear if these were a random and representative sample of companies' operations
- There is not currently a way to determine what environmental issues were investigated and whether these relate to water quality and/or ecosystem health

##### **4.5.3 Use of companies' self-reported data**

The majority of data used to rate port, heavy industry and aquaculture stewardship were self-reported by companies, with tourism data collected through a variety of means. As discussed above in Section 2.2.2, this introduces potential bias in the results if companies tailor their self-reporting to 'make themselves look

good'. A number of mechanisms were put in place to reduce this risk, and analysis of the results in addition to consultation with companies suggests the responses provided were generally objective.

The majority of self-reported results provided a mix of very effective and effective ratings for individual activities, with some partially effective results. Ongoing discussions with companies during this project revealed a consistent desire to have the way they operate transparently and robustly measured and reported on, provided that results for individual companies remained confidential.

Obtaining responses to the questionnaire was more difficult than originally anticipated. Despite support for the project once explained to them, company staff had trouble finding time to provide responses to questionnaires. The majority of the companies asked to participate in the survey were not members of the MW Partnership. Many environmental staff representing companies were unaware of the partnership's existence and the purpose of the pilot report card. This is understandable given that this is the first pilot report card involving a stewardship assessment for region. Encouraging greater participation in the MW Partnership is likely to be beneficial to facilitating future assessments.

However, once companies did respond to the survey, the questionnaires were completed thoroughly and with obvious careful consideration. Confidentiality of the results at a company level was important for many participants. For this reason, the results of individual companies that agreed to participate in the survey have not been identified in this report (but discussed at an industry level). Some company representatives responsible for operating port terminals (heavy industry category) thought there was some overlap with the port authority (ports category). However, this was addressed by having companies only complete questionnaires for areas within their responsibility.

A more streamlined data collection process for future years is recommended below. Despite repeated requests by phone and email, some companies declined or ignored requests to participate in the project. Increasing the participation rate in future years would add further rigour to the results.

## 5 Recommendations

The following recommendations will provide refinements to the current port, heavy industry, aquaculture and tourism frameworks.

1. Current port and heavy industry ratings of effective were influenced by the qualifications and experience of key staff and the extra non-regulatory activities that the respective companies undertake. Continued support and acknowledgement of these company-based efforts will help to maintain or improve this rating in the future.
2. Shipping parts of the port framework should be revised to:
  - remove the current activities due to ambiguities over responsibility; and
  - develop a new criterion that is linked to shipping actions/objectives in the Reef 2050 Long Term Sustainability Plan and the North-east Shipping Management Plan.
3. For tourism assessments in future years it is recommended that publically available data be supplemented with the results of GBRMPA licencing and compliance data and an industry questionnaire (Appendix H). Forward timeframes of 3-4 months are likely to be required to collect a representative sample from the large number of tourism operators within the region.

4. EHP is currently updating its compliance systems including the compliance database. It is recommended that once this process is finalised, opportunities to improve the use of EHP compliance data in the port, industry and aquaculture stewardship frameworks are explored.
5. EPBC Act and GBRMP Act compliance data should be included in future assessments (if available in a suitable format).
6. In order to streamline data collection from companies and subsequent analysis, each company could be provided with the results from the previous year and be asked to review and update with any changes, rather than completing a new questionnaire each year. Other data collection mechanisms may also be explored (e.g. Fitzroy web-based open source data collection and calculation model).

## References

Eberhand (2013). Fitzroy Partnership for River Health – Review of Stewardship Measures. Final draft report dated 20 April 2013.

ELA and Adaptive Strategies (2015). Gladstone Healthy Harbour Partnership Stewardship Reporting Project. Report prepared for the Gladstone Healthy Harbour Partnership, 20 August 2015.

MW Partnership (2015). Program Design – Pilot Report Card. Mackay-Whitsunday Healthy Rivers to Reef Partnership. June 2015.

SEWPAC (2011). State of the Environment Report 2011. Department of Sustainability, Environment, Water, Population and Communities.

# Appendix A Literature review

## 1 Purpose

An existing review – the *Fitzroy Partnership for River Health Review of Stewardship Measures (2013)* - covers a range of the literature available on measuring stewardship and management reporting frameworks. The review considered examined catchment, regional or sector-based reporting initiatives that incorporated stewardship components.

The Fitzroy Partnership review focused on stewardship and management practices as they relate to river health, found that ‘stewardship reporting is not well established. The concept of stewardship is poorly defined. Different jurisdictions have interpreted stewardship in different ways’.

This literature review builds on the Fitzroy Partnership work to identify whether there are examples of management reporting and evaluation which may provide a framework or partial approach that can be adopted or incorporated into a stewardship reporting framework for ports and industry. Where possible, it also focuses on available examples of estuarine and marine related stewardship approaches in more detail. The review was originally completed as part of the stewardship reporting for the GHHP (ELA 2015), and is repeated here for consistency, with some refinements and observations relevant to the Mackay-Whitsunday region.

## 2 International and national standards and frameworks relating to water stewardship

### 2.1 The International Water Standard

The International Water Standard is developed and promoted by the Alliance for Water Stewardship (AWS). The AWS is:

*an alliance that aims to establish a global water stewardship program that will recognize and reward responsible water managers and users by creating opportunities for enhanced community standing and competitive advantage. It also aims to encourage continuous improvements in water stewardship.*

Water Stewardship Australia is a member of the AWS and promotes its work in Australia.

The AWS International Water Stewardship Standard (AWS Standard) is an international standard that defines a set of water stewardship criteria and indicators for how water should be stewarded at a site and catchment level in a way that is environmentally, socially, and economically beneficial. The AWS standard provides a six-step continual improvement framework that enables sites to commit to, understand, plan, implement, evaluate and communicate water stewardship actions. The AWS standard is compliant with the criteria promoted by the ISEAL Alliance, the global membership association for sustainability standards.

The AWS Standard is based on a theory of change that suggests that improved outcomes (in water governance, water balance, water quality and important water areas) that provide social, environmental and economic benefits to various stakeholders can be achieved by combining a series of inputs with a

set of good water stewardship practices (or actions).

The AWS Standard aims to realise four water stewardship outcomes:

- good water governance,
- sustainable water balance,
- good water quality status and
- healthy status of Important Water-Related Areas.

The AWS Standard is intended to be globally consistent but locally adaptable. It was developed through a four-year, multi-stakeholder, global water roundtable process that included input from business, public sector and civil society groups. The standard was launched in April 2014 and will be reviewed after two years.

## 2.2 EU Water Framework Directive

The EU adopted its Water Framework Directive (WFD) in 2000. The WFD establishes a legal obligation to protect and restore the quality of waters across Europe. Under the WFD water management is based on river basins and not on administrative or political boundaries.

River Basin Management Plans (RBMPs) for each of the 110 EU river basin districts were in place by the end of 2009. RBMPs include:

- A description of the river basin district, including maps.
- A summary of the main significant pressures and environmental impacts of human activities.
- A map of specially protected areas (e.g. drinking, natural habitats).
- A map of monitoring networks, and results of the monitoring.
- A list of environmental objectives or targets.
- A summary of the programme of measures to maintain or improve water status.
- A summary of public consultations and their influence.
- A list of competent authorities and contacts.

At a minimum, RBMPs must include measures to:

- promote efficient and sustainable water use;
- implement water-pricing policies, applying cost recovery and incentive pricing for water services;
- safeguard water quality in order to reduce the level of purification treatment required for the production of drinking water;
- control abstraction of fresh surface water and groundwater;
- control artificial recharge or augmentation of groundwater bodies;
- control point source discharges liable to cause pollution prior to authorisation of water abstraction;
- prevent or control the input of pollutants from diffuse sources;
- ensure that the hydromorphological conditions of bodies of water are consistent with required ecological status or good ecological potential; and
- prohibit direct discharges of pollutants into groundwater, subject to certain conditions.

There can be 'supplementary measures' if the minimum requirements are not sufficient to reach the objectives. These include:

- codes of good practice;
- recreation and restoration of wetlands areas;

- demand management schemes such as low water-requiring crops in areas affected by drought;
- promotion of water-efficient technologies in industry and water-saving irrigation techniques;
- desalination plants;
- rehabilitation projects;
- artificial recharge of aquifers;
- educational, research, development and demonstration projects.

### **2.3 European Water Stewardship Standard**

The EU has linked its water stewardship standard (the EWS), to the AWS. Using a standard and certification scheme, it aims to provide a practical tool for evaluating the performance of water users and acknowledging good 'Water Stewards'.

The EWS is a mechanism for assisting industry and agriculture to take action in terms of assessing, improving, maintaining and communicating sustainable water and ecosystem management in support of the objectives of the European Water Framework Directive. The EWS provides technical advice and practical guidance to identify physical, regulatory and reputational risks associated with water use and to ensure compliance with legislation.

The EWS recognises the 'specific characteristics of water management', acknowledging:

- Local impacts linked to water use which require site- specific evaluation and response.
- River basin contexts which force water users to think and act as part of a "user group".
- Complexities resulting from interlinking local, regional, national and international water legislation and administration.

### **2.4 World Water Assessment Programme UNESCO**

The World Water Assessment Programme (WWAP) is a United Nations program hosted and led by UNESCO. WWAP seeks to equip water managers and key decision-makers with the information, data, tools and skills necessary to enable them to effectively participate in the development of policies. UNESCO coordinates the work of members and partners in an annual review of the state, use and management of the world's freshwater resources, the World Water Development Report (WWDR). WWAP also monitors freshwater issues in order to provide recommendations, develop case studies, enhance assessment capacity at a national level and inform the decision-making process. This includes measuring progress towards achieving sustainable use of water resources through robust indicators.

There have been four editions of the WWDR. The latest edition now includes description of major world changes, uncertainties, and risks and their links to water resources.

### **2.5 Corporate Water Strategy - Pacific Institute and Business for Social Responsibility Approach**

A framework for proactive corporate action put forward in work undertaken by the Pacific Institute & Business for Social Responsibility in 2007 suggested that, in order to gain regulatory and community goodwill, improve reputation and mitigate risks, companies would need to consider innovation, investment and collaboration. This type of corporate water strategy would include innovation to 'significantly increase value chain and product eco-efficiency' but would also invest in the restoration of ecological systems impacting on water flows and engage in collaborative strategies for maintaining

The framework encourages companies to be proactive in their water strategies by innovating to increase

‘value chain and product eco-efficiency’, investing in the restoration of ecological systems that impact on water flows and engaging in collaborative strategies to maintain water resources over time. The framework notes that this then goes ‘far beyond tracking inputs and outputs’. It then provides guidance to companies in how to develop and implement such a corporate water strategy.

## **2.6 Global Programme of Action for the Protection of the Marine Environment from Land-based Activities**

The United Nations Environment Programme (UNEP) was established in 1972. UNEP acts as a catalyst, advocate, educator and facilitator to promote the wise use and sustainable development of the global environment. UNEP’s Global Programme of Action for the Protection of the Marine Environment from Land-based Activities (GPA) was adopted by the international community in 1995 and ‘aims at preventing the degradation of the marine environment from land-based activities by facilitating the realization of the duty of States to preserve and protect the marine environment’.

The GPA notes that it is the only global initiative directly addressing the connectivity between terrestrial, freshwater, coastal and marine ecosystems.

# **3 Corporate water reporting and water footprint tools**

## **3.1 CDP Global Water Report**

The CDP Global Water Report states that it:

*holds the largest and most comprehensive set of publicly reported corporate water information – spanning 112 countries, 91 industry sub-sectors - providing insights into corporate water risk exposure and mitigation strategies.*

The CDP Global Water Report provides summaries covering risks in direct operations and supply chain as well as progress on management and governance and opportunities for seven sectors:

- Consumer Discretionary
- Consumer Staples
- Energy
- Health Care
- Industrials
- Information Technology Materials
- Utilities

The report is aimed at shareholders and investors in companies.

The CDP Global Water Report 2013 notes that there is no internationally agreed definition of water stewardship but that work continues to ‘define what responsible corporate water use and engagement means on a practical level’. It goes on to say that it is agreed that ‘it goes beyond reducing water use to reducing impact on resources’.

The CDP report explains that ‘emerging corporate water stewardship frameworks’ cover a much broader range of actions. Going beyond direct operations, companies are encouraged to consider supply chain and watershed management; collective action; public policy; and community and stakeholder engagement.

### 3.2 CEO Water Mandate

The CEO Water Mandate was launched in 2007 by the UN Secretary-General. It is overseen by the UN Global Compact and implemented in partnership with the Pacific Institute.

The CEO Water Mandate is voluntary and aspirational but is a commitment to action. Its structure covers six key areas and is designed to assist companies in developing a comprehensive approach to water management. The six areas are: Direct Operations, Supply Chain and Watershed Management, Collective Action, Public Policy, Community Engagement and Transparency.

Businesses pledge to take actions against each of these areas. In particular, in relation to their direct operations they pledge to:

- Conduct a comprehensive water-use assessment to understand the extent to which the company uses water in the direct production of goods and services.
- Set targets for operations related to water conservation and waste-water treatment, framed in a corporate cleaner production and consumption strategy.
- Seek to invest in and use new technologies to achieve these goals.
- Raise awareness of water sustainability within corporate culture.
- Include water sustainability considerations in business decision making – e.g., facility-siting, due diligence, and production processes.

There is a list of companies that have made the commitment at:

<http://ceowatermandate.org/about/endorsing-companies/>

The CEO Water Mandate also works to provide guidance on how companies can:

- measure their water performance;
- assess conditions in the river basins where they operate;
- understand their water-related challenges and opportunities ;
- develop effective water management strategies; and
- communicate these issues to stakeholders.

The CEO Water Mandate’s Corporate Water Disclosure Guidelines offer a common approach to disclosure. They put forward metrics that can begin to harmonise practice and also provide guidance for defining what to report.

### 3.3 Water Footprint Assessment for the Hertfordshire and North London Area

A water footprint assessment of the Hertfordshire and North London area was undertaken by the UK Water Footprint Network in collaboration with the Environment Agency. The project developed tools and provided results to assist water resources and water quality regulators in managing the quantity and quality of water resources.

The assessment noted that water footprint response strategies needed to be developed for each specific case but that, in general, industrial water users should be encouraged to implement better or best

technologies to reduce evaporation loss (blue WF) in production processes and minimise the pollution load (grey WF) (p.59)

### 3.4 Veolia's Water Impact Index

Water Impact Index is an indicator that enables 'a comprehensive assessment of the impact of human activity on water resources'. It has been developed as a tool that councils and companies can use to plan long-term projects and better understand sustainable approaches to ensure lasting water supplies and healthy water ecosystems.

The Water Impact Index looks at: quantity of water used, level of stress upon water resources and overall water quality. It encompasses both direct and indirect influences of an activity from "cradle to grave". Veolia notes that the index:

*enables evaluation of how other water usages (both human and natural through ecosystems) could potentially be affected through mismanagement of water or wastewater systems.*

### 3.5 Water Accounting Framework for the Minerals Industry

The Minerals Council of Australia (MCA), in conjunction with the Sustainable Minerals Institute of the University of Queensland, developed a water accounting framework for the minerals industry in 2012.

The MCA Water Accounting Framework (WAF) allows sites to 'account for, report on and compare site water management practices in a rigorous, consistent and unambiguous manner that can easily be understood by non-experts'. It aligns with the frameworks for the Global Reporting Initiative (GRI) and Australian Water Accounting Standard (AWAS).

The WAF presents a business case regarding the advantages for sites adopting the WAF, provides details on how to create a water account and provides examples and case studies. The WAF also provides guidance on who to use the WAF to report according to the GRI and the AWS Standards.

## 4 Other frameworks for environmental reporting

### 4.1 Australian State of the Environment Report 2011

The approach adopted by the State of the Environment Report is based on a well-accepted evaluation framework initially established by the World Commission on Protected Areas.

Management activities and responses aimed at mitigating environmental pressures are identified and described, then assessed according to six elements of management: understanding, planning, inputs, processes, outputs and outcomes. These six elements allow all stages and components of management to be examined, as well as the impacts of those efforts on reducing pressures and improving environmental outcomes.

Elements of management effectiveness and assessment criteria are:

- the management context (understanding of environmental issues; adequacy of regulatory control mechanisms and policy coverage, including planning)
- management capacity (adequacy of resources i.e. inputs, appropriateness of governance arrangements and efficiency of management processes)
- achievements (delivery of expected products, services and impacts).

Each is assessed or 'graded' as very effective, effective, partially effective or ineffective with the framework describing what would be expected of these levels for each component of each element (Table 9).

**Table 9: Grading management effectiveness, from SOE 2011, available at: <http://www.environment.gov.au/science/soe/2011-report/1-approach/3-reading-each-chapter/3-3-management-effectiveness#s3-3>**

Elements of management effectiveness and assessment criteria	Grades
<b>Management context (understanding of environmental issues; adequacy of regulatory control mechanisms and policy coverage)</b>	
<p><u>Understanding of context</u></p> <p>Decision-makers and environmental managers have a good understanding of:</p> <ul style="list-style-type: none"> <li>• environmental and socioeconomic significance of environmental values, including ecosystem functions and cultural importance</li> <li>• current and emerging threats to values.</li> <li>• environmental considerations and information have a significant impact on national policy decisions across the broad range of government responsibilities.</li> </ul>	<p>Very effective: Understanding of environmental and cultural systems and factors affecting them is good for most management issues</p> <p>Effective: Understanding of environmental and cultural systems and factors affecting them is generally good but there is some variability across management issues</p> <p>Partially effective: Understanding of environmental and cultural systems and factors affecting them is only fair for most management issues</p> <p>Ineffective: Understanding of environmental and cultural systems and factors affecting them is poor for most management issues</p>
<p><u>Planning</u></p> <p>Policies and plans are in place that provide clarity on:</p> <ul style="list-style-type: none"> <li>• objectives for management actions that address major pressures and risks to environmental values</li> <li>• roles and responsibilities for managing environmental issues</li> </ul>	<p>Very effective: Effective legislation, policies and plans are in place for addressing all or most significant issues. Policies and plans clearly establish management objectives and operations targeted at major risks. Responsibility for managing issues is clearly and appropriately allocated</p> <p>Effective: Effective legislation, policies and plans are in place, and management responsibilities are allocated appropriately, for addressing many significant issues. Policies and plans clearly establish management objectives and priorities for addressing major risks, but may not specify implementation procedures</p>

<ul style="list-style-type: none"> <li>operational procedures, and a framework for integration and consistency of planning and management across sectors and jurisdictions.</li> </ul>	<p>Partially effective: Legislation, policies and planning systems are deficient, and/or there is lack of clarity on who has management responsibility, for a number of significant issues</p> <p>Ineffective: Legislation, policies and planning systems have not been developed to address significant issues</p>
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**Management capacity (adequacy of resources, appropriateness of governance arrangements and efficiency of management processes)**

<p><u>Inputs</u></p> <p>Resources are available to implement plans and policies, including:</p> <ul style="list-style-type: none"> <li>financial resources</li> <li>human resources</li> <li>information.</li> </ul>	<p>Very effective: Financial and staffing resources are largely adequate to address management issues. Biophysical and socioeconomic information is available to inform management decisions</p> <p>Effective: Financial and staffing resources are mostly adequate to address management issues, but may not be secure. Biophysical and socioeconomic information is available to inform decisions, although there may be deficiencies in some areas</p> <p>Partially effective: Financial and staffing resources are unable to address management issues in some important areas. Biophysical and socioeconomic information is available to inform management decisions, although there are significant deficiencies in some areas</p> <p>Ineffective: Financial and staffing resources are unable to address management issues in many areas. Biophysical and socioeconomic information to support decisions is deficient in many areas</p>
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<p><u>Processes</u></p> <p>A governance system is in place that provides for:</p> <ul style="list-style-type: none"> <li>appropriate stakeholder engagement in decisions and implementation of management activities</li> <li>adaptive management for longer term initiatives</li> <li>transparency and accountability.</li> </ul>	<p>Very effective: Well-designed management systems are being implemented for effective delivery of planned management actions, including clear governance arrangements in place, appropriate stakeholder engagement, active adaptive management and adequate reporting against goals</p> <p>Effective: Well-designed management systems are in place, but are not yet being fully implemented</p> <p>Partially effective: Management systems provide some guidance, but are not consistently delivering around implementation of management actions, stakeholder engagement, adaptive management or reporting</p> <p>Ineffective: Adequate management systems are not in place. Lack of consistency and integration of management activities across jurisdictions is a problem for many issues</p>
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**Achievements (delivery of expected products, services and impacts)**

<p><u>Outputs</u></p> <p>Management objectives are being met with regard to:</p>	<p>Very effective: Management responses are mostly progressing in accordance with planned programs and are achieving their desired objectives. Targeted threats are being demonstrably reduced</p> <p>Effective: Management responses are mostly progressing in accordance with planned programs and are achieving their desired</p>
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<ul style="list-style-type: none"> <li>• timely delivery of products and services</li> <li>• reduction of current pressures and emerging risks to environmental values.</li> </ul>	<p>objectives. Targeted threats are understood and there are measures in place to manage them</p> <p>Partially effective: Management responses are progressing and showing signs of achieving some objectives. Targeted threats are understood and measures are being developed to manage them</p> <p>Ineffective: Management responses are either not progressing in accordance with planned programs (significant delays or incomplete actions) or the actions undertaken are not achieving their objectives. Threats are not actively being addressed</p>
<p><u>Outcomes</u></p> <p>Management objectives are being met with regard to improvements to resilience of environmental values.</p>	<p>Very effective: Resilience of environmental values is being maintained or improving. Values are considered secured against known threats</p> <p>Effective: Resilience of environmental values is improving, but threats remain as significant factors affecting environmental systems</p> <p>Partially effective: The expected impacts of management measures on improving resilience of environmental values are yet to be seen. Managed threats remain as significant factors influencing environmental systems</p> <p>Ineffective: Resilience of environmental values is still low or continuing to decline. Unmitigated threats remain as significant factors influencing environmental systems</p>

#### 4.2 Enduring Value – the Australian Minerals Industry Framework for Sustainable Development

The Enduring Value framework seeks to translate the Principles of Sustainable Development into practices that ensure that industry operates in a manner which is in line with community expectations, working to maximise the long-term benefits to society via effective management of Australia’s natural resources.

Commitment to the Enduring Value framework imposes a number of obligations on participants, broadly:

- progressive implementation of the ICMM Principles and Elements;
- public reporting of site level performance, on a minimum annual basis, with reporting metrics self-selected from the Global Reporting Initiative (GRI), the GRI Mining and Metals Sector Supplement or self-developed; and
- assessment of the systems used to manage key operational risks.

The Enduring Value Self-assessment Protocol measures performance against each of the ten ICMM Principles in the Enduring Value Framework and provides guidance as to how the principles can be implemented. It provides examples of the policies, practices and standards a company might have in place to meet the requirements of Enduring Value. The Self-Assessment Protocol uses an evidence based assessment system.

### 4.3 The Global Reporting Initiative (GRI) Sustainability Reporting Guidelines

The G4 version has a new focus on 'materiality' with respect to reporting on activities that promote or support sustainability. The preface to the guidelines notes that:

While organizations may monitor and manage a far wider array of sustainability-related topics due to their everyday management activities, this new focus on materiality means that sustainability reports will be centred on matters that are really critical in order to achieve the organization's goals and manage its impact on society.

### 4.4 National Harmonised Regulatory Framework for Natural Gas from Coal Seams

The National Harmonised Regulatory Framework for Natural Gas from Coal Seams (the framework) was endorsed by the Standing Council on Energy and Resources (SCER) in 2013. The Framework delivers on a commitment by Australian governments to put in place a suite of leading practice principles, providing guidance to regulators in the management of natural gas from coals seams and ensuring regulatory regimes are robust, consistent and transparent across all Australian jurisdictions.

The framework focuses on four key areas of operations covering the lifecycle of Coal Seam Gas development: well integrity, water management and monitoring, hydraulic fracturing and chemical use. It aims to provide assurance for communities and farmers that concerns in relation to protecting and managing both underground and surface water resources in particular are taken seriously by government and are being effectively regulated.

The framework has developed a set of 18 leading practices to mitigate the potential impacts associated with the development of natural gas from coals seams and build a robust national regulatory regime for the industry (Table 10). The leading practices are framed in a way that is compatible with a risk-based approach to regulation.

**Table 10: Summary of leading practices under National Harmonised Regulatory Framework for Natural Gas from Coal Seams**

Leading practice		Well integrity	Water mgmt	Hydraulic fracturing	Chemical use
1	Undertake a comprehensive environmental impact assessment, including rigorous chemical, health and safety and water risk assessments	✓	✓	✓	✓
2	Develop and implement comprehensive environmental management plans or strategies which demonstrate that environmental impacts and risks will be as low as reasonably practicable	✓	✓	✓	✓
3	Apply a hierarchy of risk control measures to all aspects of the project	✓	✓	✓	✓
4	Verify key system elements, including well design, water management and hydraulic fracturing processes, by a suitably qualified person	✓	✓	✓	✓

Leading practice		Well integrity	Water mgmt	Hydraulic fracturing	Chemical use
5	Apply strong governance, robust safety practices and high design, construction, operation, maintenance and decommissioning standards for well development	✓	✓	✓	✓
6	Require independent supervision of well construction	✓			
7	Ensure the provision and installation of blowout preventers informed by a risk assessment	✓			
8	Use baseline and on-going monitoring for all vulnerable water resources		✓		
9	Manage cumulative impacts on water through regional-scale assessments		✓		
10	Ensure co-produced water volumes are accounted for and managed		✓		
11	Maximise the recycling of produced water for beneficial use, including managed aquifer recharge and virtual reinjection		✓		
12	Require a geological assessment as part of well development and hydraulic fracturing planning processes	✓	✓	✓	
13	Require process monitoring and quality control during hydraulic fracturing activity			✓	✓
14	Handle, manage, store and transport chemicals in accordance with Australian legislation, codes and standards			✓	✓
15	Minimise chemical use and use environmentally benign alternatives			✓	✓
16	Minimise the time between cessation of hydraulic fracturing and flow back, and maximise the rate of recovery of fracturing fluids			✓	✓
17	Increase transparency in chemical assessment processes and require full disclosure of chemicals by the operator in the production of natural gas from coals seams			✓	✓
18	Undertake assessments of the combined effects of chemical mixtures, in line with Australian legislation and internationally accepted testing methodologies			✓	✓

Key: ✓ Leading practice primarily applies to this core area and is discussed within its respective chapter  
 ✓ Leading practice is also relevant to this core area

## 5 Examples of coastal and river catchment reporting

### 5.1 Gippsland Lakes Report Card

The Gippsland Lakes Report Card uses A to E ratings to assess the current condition of each indicator. There is a generic description of the ratings that applies across all indicators and a specific description for each individual indicator. The report card provides a condition rating for the indicators water quality, algal blooms, wetlands, birds, fish and seagrass.

### 5.2 Darwin Harbour

The Darwin Harbour Strategy provides a shared vision for the Darwin Harbour region, as well as founding principles to underpin its stewardship. It contains goals and guidelines that outline the management approach needed to maintain the region's residential, recreational, cultural, urban, economic, environmental and scenic values. The strategy is intended inform all decisions regarding activities affecting the region.

As part of the Darwin Harbour Water Quality Protection Plan 2014, in consultation with stakeholders, more than one hundred broad management actions have been identified. Many of these actions cover more than one on-ground activity, and include initiatives to reduce soil erosion, minimise off-site sediment transport, protect native vegetation alongside waterways, improve management of wastewater and stormwater, reduce runoff, remove or control potential pollutant sources, improve the design and operation of infrastructure and monitor potential environmental impacts.

The actions are listed under three themes:

- land management,
- water management (including stormwater and wastewater), and
- infrastructure management.

The specific actions and organisations responsible are listed in the tables at the end of the plan.

### 5.3 Port of Koper, Slovenia

The Port of Koper in Slovenia was referred to in the GPA Third meeting (2012) papers as an example of mainstreaming successes for marine and coastal ecosystems.

Through its "Living with the Port" initiative, in order to demonstrate a responsible attitude towards the environment to its community and stakeholders, the port monitors environmental indicators and develops and introduces new environmental technologies.

A good list of port activities and attempts to reduce impact is in the Port of Koper's Environmental Report 2012 <http://ftp.luka-kp.si/Emas%202012-updated/eng/index.html#/48/>

### 5.4 Mabou Harbour Stewardship Plan

The Mabou Harbour (Canada) Stewardship Plan was a two-year planning project undertaken in 2007 and 2008. It aimed to address water, coastal and aquatic resource issues in the Mabou Harbour Watershed. The main goals of the plan were to ensure that a clean water supply and a healthy watershed were maintained to support all users (including the agricultural, fishing and forestry sectors, residential users

and wildlife). This was to have been achieved by bringing together community stakeholders to work together, but the plan does not seem to have provided a long term framework for continued stewardship of the harbour watershed.

### **5.5 Central West Catchment Management Authority (NSW) Dashboard report 2012**

The June 2012 dashboard report referred to by the Fitzroy partnership review is no longer available on the CW website. There was a later dashboard report (December 2012) with a different format. As this document has now been archived, it seems that dashboard reporting for the catchment may have ceased.

### **5.6 Waikato River Health and Wellbeing Reporting**

In 2010 the New Zealand National Institute of Water and Atmospheric Research Ltd undertook the Waikato River Independent Scoping Study.

The study stated that one lesson of restoration projects is that monitoring is essential and that:

*the community needs to be involved in the monitoring process and see the results of their actions. Everyone needs to learn from monitoring (adaptive management).*

The study extended a report card approach and used it to suggest a framework that would score the current state of the health and wellbeing of the Waikato River so that scenarios for future action could be compared with the current state, summarise and report predictions of the likely effect of bundles of actions on river health and wellbeing and communicate the information to and engage the community in restoration.

The Waikato River approach is to map the current situation with the river, formulate aspirations for the health and wellbeing of the river across social, cultural, economic and environmental dimensions. It then assesses potential restorative actions, including the benefits and co-benefits that will accrue, where the actions should be carried out, how much they cost, and any risks or unintended consequences associated with implementation. The approach recognises that 'achieving restoration goals requires an appropriate mix of actions to enhance engagement, knowledge sharing (maatauranga Maaori, social, economic and biophysical sciences, practical experience), monitoring to allow adaptive management, supporting governance structures (institutions and policies) and financial incentives or resources'.

There are two levels of assessment under the Waikato River approach aggregation and reporting. Here are report cards for each of the identified aspirations for the health and wellbeing of the river and an overall report card for the river. A to E ratings are used to summarise the 'complex data' for each indicator with a score being aggregated and presented in the report card.

### **5.7 Health-e-Waterways**

Previously Health-e-Waterways was the SEQ Ecosystem Health Monitoring Program (EHMP).

The Health-e-Waterways project goals are to:

- assist decision-making by providing scientists, urban planners and policy-makers with fast, web-based access to data and models describing all water-related data,
- develop frameworks and services that provide streamlined access to real-time, near-real-time and static datasets with collaborative tools that will establish an online "community of practice", and
- bring together Queensland's water information, making it universally accessible and useful.

Since 2000, Healthy Waterways has produced an annual Report Card for the health of South East Queensland's waterways. Ecosystem health is assessed against relevant benchmarks, resulting in a single grade ('A' to 'F') for each freshwater, estuarine and marine system.

- A = Excellent: Conditions meet all set ecosystem health values. All key processes are functional and all critical habitats are in near pristine condition.
- B = Good: Conditions meet all set ecosystem health values in most of the reporting region. Most key processes are functional and most critical habitats are intact.
- C = Fair: Conditions meet some of the set ecosystem health values in most of the reporting region. Some key processes are functional and some critical habitats are impacted.
- D = Poor: Conditions meet few set ecosystem health values in most of the reporting region. Many key processes are not functional and many critical habitats are impacted.
- F = Fail: Conditions do not meet set ecosystem health values. Most key processes are not functional and most critical habitats are severely impacted.

Healthy Waterways measures waterway health against a broad range of biological, physical and chemical indicators of ecosystem health. A total of 135 freshwater sites are monitored biannually, and 254 estuarine and marine sites are monitored monthly across South East Queensland and Moreton Bay.

The Healthy Waterways website notes that it has been working to expand its monitoring program to include social and economic indicators and that monitoring had started to capture data for inclusion in the Report Card from 2015 onwards.

## 6 Environmental stewardship programs in place on the GBR

### 6.1 Reef Plan Water Quality Risk Framework – Grazing (October 2013)

This framework aims to manage soil erosion & water quality risk associated with grazing land management. It outlines high-level and supporting actions for a number of performance indicators (for example, retention of adequate pasture and groundcover at the end of the dry season) and assesses what 'very low' through to 'moderate to high' level risk practice would look like for each listed activity.

### 6.2 Reef Plan Water Quality Risk Framework – Sugarcane (November 2013)

This framework manages water quality risk from sugar cane farming activities such as soil management, nutrients, herbicides etc. It sets priorities within each set of activities for particular 'management tactics', attaches a water quality assessment rating (a weighting as a percentage) and then describes each indicative practice level from 'high' to 'lowest'. These risk levels are then classed:

High Risk	Superseded
Moderate Risk	Minimum
Moderate - Low Risk	Best Practice

Lowest WQ Risk, commercial feasibility unproven	Innovative
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### 6.3 Urban Land Use in GBR Water Quality Improvement Plans: ABCD Reporting Framework for Considered Guidance

This framework provides background information required to gain a better understanding of water quality issues associated with urban areas, including urban water quality improvement management practices associated with:

- erosion (prevention) and sediment (movement) control (ESC);
- water sensitive urban design (WSUD);
- stormwater system management and retrofits;
- planning instruments development assessment processes;
- communications and behaviour change;
- monitoring and modelling; and
- total water cycle and catchment planning.

It provides an urban ABCD management practice classification and reporting framework.

A	Innovative, exceeds Best Practice and regulatory requirements
B	Best Practice and meets all regulatory requirements including for planning, implementation and reporting
C	Meets regulatory requirements for planning and development assessment. Some Best Practice but inconsistent implementation and reporting
D	Little or no Best Practice and significant regulatory issues

### 6.4 Paddock to Reef Program

The program combines monitoring and modelling at paddock through to catchment and reef scales. It aims to provide evidence of links between land management activities, water quality and reef health. Evidence 'lines' used are:

- the effectiveness of management practices to improve water quality;
- the prevalence of management practice adoption and change in catchment indicators;
- long-term monitoring of catchment water quality;
- paddock and catchment modelling to provide a relative assessment of progress towards meeting targets; and
- marine monitoring of GBR water quality and reef ecosystem health.

The paper outlines the first four lines of evidence.

### 6.5 Reef Guardians

The Great Barrier Reef Marine Park Authority's (GBRMPA) Reef Guardian program recognises environmental work undertaken by communities and industries to protect the Great Barrier Reef. It

receives funding from the Australian Government. It began with schools and has now expanded to include local government (Reef Guardian Councils) and industries connected to the reef (Reef Guardian Fishers and Reef Guardian Farmers and Graziers).

The program involves working closely with those who use and rely on the Reef or its catchment for their recreation or business to help build a healthier and more resilient Reef. Reef Guardians take voluntary actions beyond what is required by law and share information.

## **6.6 Pro-vision Reef**

Pro-vision Reef Inc represents the marine aquarium industry on the Great Barrier Reef. The industry supplies tropical reef fish, corals and invertebrates to the Australian and international aquarium display markets. Provision Reef seeks to engender community and market confidence in the industry through commitment to the highest standards of environmental performance in fisheries.

In collaboration with project partners from Fisheries Queensland, Great Barrier Reef Marine Park Authority, Queensland Parks and Wildlife Service and the Australian Research Council Centre of Excellence for Coral Reef Studies it has established a Stewardship Action Plan 2013: Mitigating Ecological Risk in a Changing Climate. The plan was funded under the Australian Government's Caring For Our Country program and is supported by WWF Australia.

The action plan establishes standards to be implemented by industry that will mitigate fishery risks that are identified through the Ecological Risk Assessment.

The action plan is to be complemented by an Environmental Management System that will identify environmental risk through all aspects of operation. It will establish individual benchmarks that can be improved upon and measured.

## **6.7 Reef Report Cards**

Annual reef report cards measure progress from the 2009 baseline towards Reef Water Quality Protection Plan targets. The latest available report card assesses the combined results of all Reef Plan actions up to June 2013.

## **6.8 Marine Monitoring Program**

The Marine Monitoring Program is a component of the Reef Plan and a collaborative effort between the government, community, scientists and managers. It assesses water quality and the condition of seagrass and coral reefs in the inshore Great Barrier Reef lagoon.

The Great Barrier Reef Marine Park Authority manages the Marine Monitoring Program in partnership with the Australian Institute of Marine Science, University of Queensland, James Cook University and the CSIRO. These organisations monitor and work together to assess water quality, seagrass condition and coral reefs condition.

## **6.9 Eye on the Reef Program**

The Eye on the Reef program brings together four assessment and monitoring programs that collect valuable information about reef health, marine animals and incidents. Through the program anyone who visits the Great Barrier Reef can contribute to its long-term protection. Marine Park rangers, marine tourism staff, scientist, fishers, tourists and other reef users can report their Reef sightings and observations to the Great Barrier Reef Marine Park Authority.

The information collected through the Eye on the Reef program is combined in a single data management and reporting system that can be accessed online by participants. The up-to-date information on reef health status and trends, the distribution of protected and iconic species, and early warnings of environmental impacts can then be used by Marine Park managers and researchers.

The Eye on the Reef program is run by the Great Barrier Reef Marine Park Authority. The Reef Health and Impact Survey sub-program is run in partnership with the Queensland Parks and Wildlife Service.

#### **6.10 eReefs Marine Water Quality Dashboard**

The eReefs Project is five year project implemented by the Bureau of Meteorology, commencing in 2012. The program uses the latest technologies to collate data, develop new and integrated modelling and provide powerful visualisation, communication and reporting tools. The information is intended to inform decision making 'spanning the entire Great Barrier Reef spectrum – from catchment to ocean – across space and time'. It provides information for the Reef similar to that provided by the Bureau of Meteorology for weather.

The Marine Water Quality Dashboard provides timely access to water quality information essential to maintain the reef ecosystem. The dashboard provides access to near real-time data on sea surface temperatures, chlorophyll levels, sediments and light for the entire Great Barrier Reef.

The eReefs Project is a collaboration between the Great Barrier Reef Foundation, Bureau of Meteorology, CSIRO, Australian Institute of Marine Science and the Queensland Government, supported by funding from the Australian Government's Caring for our Country initiative, the BHP Billiton Mitsubishi Alliance, the Queensland Government and the Science and Industry Endowment Fund.

#### **6.11 Gladstone Healthy Harbour Partnership**

The GHHP is a forum to bring together parties to maintain and improve the health of Gladstone Harbour. GHHP began with the community's vision that Gladstone has a healthy, accessible working harbour. The guiding principles of the Partnership are open, honest and accountable management; annual reporting of the health of Gladstone Harbour and management recommendations, action based rigorous science and strong stakeholder engagement. An environmental stewardship program was developed for GHHP and this has been the basis of that described in this report for the Mackay-Whitsunday Partnership.

## Appendix B Port stewardship framework

# Port Stewardship Framework

Activity	Criteria	Criteria Descriptions – minimum standards apply. Overall score for each activity cannot be higher than the minimum score for Implementation or outcome		
		Planning	Implementation	Outcome
<b>Administration</b>				
<u>Extension and Research Projects:</u> Note these cover water quality and ecosystem health related issues only.	Very Effective	There is planned involvement in several extension (community or industry) activities/programs that are focussed on research, monitoring or managing ecosystem health.	There is active involvement or support for extension programs relevant to ecosystem health, with long term commitments.	Highly successful outcomes of extension programs (e.g. support for the program, programs maintained in long-term or environmental goals achieved).
	Effective	There is planned involvement in more than one extension (community or industry) activities/programs that are focussed on research, monitoring or managing ecosystem health.	There is active involvement or support for extension programs relevant to ecosystem health, with annual commitments.	Successful outcomes of extension programs (e.g. support for the program, programs maintained in long-term or environmental goals achieved).
	Partially Effective	There is planned involvement in at least one extension (community or industry) activities/programs that are focussed on focussed on research, monitoring or managing ecosystem health.	There is sporadic active involvement or support for extension programs relevant to ecosystem health.	Some successful outcomes of extension programs (e.g. support for the program, programs maintained in long-term or environmental goals achieved).
	Not Effective	There is no planned involvement in extension (community or industry) activities/programs that are focussed on focussed on research, monitoring or managing ecosystem health.	There is limited or no involvement or support for extension programs relevant to ecosystem health with long term commitments.	Few successful outcomes of extension programs (e.g. support for the program, programs maintained in long-term or environmental goals achieved).
<u>Compliance approach:</u> Note that these apply to water quality and ecosystem health related authorities only	Very Effective	NA	Requirements of all authorities are implemented, monitored and reported on, with regular voluntary/industry led engagement with regulators.	The results/learnings from incidents and near misses always feed into further development and update of management systems and operations.
	Effective	All site operational procedures/protocols are developed to fully comply with all aspects of environmental approvals (e.g. EAs, permits)	Requirements of all authorities are implemented, monitored and reported on, with some voluntary/industry led engagement with regulators.	The results/learnings from incidents and near misses mostly feed into further development and update of management systems and operations
	Partially Effective	NA	Requirements of all authorities are implemented, monitored and reported on, with regulator-instigated engagement only.	The results/learnings from incidents and near misses sometimes feed into further development and update of management systems and operations
	Not Effective	Not all site operational procedures/protocols developed to fully comply with all aspects of environmental approvals (e.g. EAs, permits)	Requirements of the few authorities are implemented, monitored and reported on and lack of engagement.	The results/learnings from incidents and near misses rarely feed into further development and update of management systems and operations
<u>EMS</u>	Very Effective	EMS developed and certified to ISO 14001 standard. EMS addresses relevant major pressures and risks to water quality and ecosystem health.	EMS fully implemented, monitored and reviewed.	EMS certification maintained, frequently reviewed and updated.
	Effective	EMS developed to ISO 14001 standard, though no certification. EMS addresses relevant major pressures and risks to water quality and ecosystem health.	EMS implemented, monitored and reviewed.	EMS maintained, regularly reviewed and updated.
	Partially Effective	EMS developed, though not certified or to ISO 14001 standard. EMS addresses relevant major pressures and risks to water quality and ecosystem health.	Most but not all elements of EMS implemented, monitored and reviewed.	EMS maintained, review and updating of EMS.
	Not Effective	EMS not developed.	Few elements of EMS implemented, monitored and reviewed.	EMS not maintained or reviewed.

<u>Training, Knowledge and Awareness</u>	Very Effective	Relevant staff are adequately qualified and highly experienced in environmental management. Further training or education around ecosystem health forms part of the professional development goals of key staff.	Environmental management training is provided to all staff, with more specific internal and external environmental training made available for environmental management staff.	All training development goals met.
	Effective	Relevant staff are adequately qualified and/or highly experienced in environmental management.	Environmental management training is provided to all staff, with more specific internal environmental training made available for environmental management staff.	Most training development goals met.
	Partially Effective	Relevant staff are not adequately qualified, though have adequate experience in environmental management.	Environmental management training is provided to key staff.	Some training development goals met
	Not Effective	Relevant staff are not adequately qualified or experienced.	Environmental management is not provided, or is out of date and/or missing important information.	No training development goals met.
<u>Community Engagement:</u> Note these cover water quality health related issues only.	Very Effective	There is planned involvement to engage with the community on all aspects of operational activities and future development activities that relate to managing ecosystem health, as part of a broader strategy of environmental management or stakeholder engagement.	There is active involvement and support for community engagement programs relevant to ecosystem health, with a long term commitment.	There is a high participation rate and strong positive feedback from the community on the level of engagement provided.
	Effective	There is planned involvement to engage with the community on some aspects of operational activities and/or future development activities that relate to managing ecosystem health, as part of a broader strategy of environmental management or stakeholder engagement.	There is active involvement and support for community engagement programs relevant to ecosystem health, with annual commitments.	There is a high participation rate with generally positive feedback from the community on the level of engagement provided.
	Partially Effective	There is planned involvement to engage with the community on aspects of operational activities and/or future development activities, but without a broader strategy of environmental management or stakeholder engagement.	There is active involvement and support for community engagement programs relevant to ecosystem health on an ad hoc or as needs basis.	There is a moderate participation rate with mixed feedback from the community on the level of engagement provided.
	Not Effective	There is no planned involvement to engage with the community on aspects of operational activities and/or future development activities.	There is limited or no involvement for community engagement programs relevant to ecosystem health.	There is a low participation rate and negative (or an absence of) feedback from the community on the level of engagement provided.
<u>Tenancy management</u>	Very Effective	Lease contains specific and clear environmental management conditions for all relevant environmental aspects. These measures cover commencement, operation and termination of the lease. Environmental Standards for all tenants in place.	Regular inspections of tenant operations are undertaken and issues appropriately addressed in a timely manner. Joint initiatives established where demonstrated to be beneficial, feasible and practical.	Tenants fully comply with lease requirements and Environmental Standards (where they exist). Majority of tenants participate in joint initiatives where established.
	Effective	Lease contains few and high level environmental management conditions for key environmental aspects. These measures cover commencement, operation and termination of the lease. Environmental Standards exist but may not yet be fully applied.	Occasional inspections of tenant operations are undertaken and issues appropriately addressed in a timely manner.	Tenants mostly comply with lease requirements and Environmental Standards (where they exist). Some tenants participate in joint initiatives where established.
	Partially Effective	Lease contains unclear or very few environmental management conditions for only a few of the relevant environmental aspects. These measures cover commencement, operation and termination of the lease. No Environmental Standards.	Few inspections of tenant operations are undertaken and issues appropriately addressed at some point.	Tenants partially comply with lease requirements and Environmental Standards (where they exist). Few tenants participate in joint initiatives where established.
	Not Effective	Lease contains no environmental management conditions and there are no Environmental Standards	Inspections of tenant operations are not undertaken.	Tenants regularly do not comply with lease requirements and Environmental Standards (where they exist). Tenants do not participate in joint initiatives where established.
<b>Shipping</b>				

<b><u>Movement:</u></b> Vessels entering port limits and moving to and from berths. Issues include routes, speeds	Very Effective	REEF VTS and local vessels monitoring systems (incl. Harbour Master) are in place and integrated into all relevant operational plans.	REEF VTS and local vessels monitoring systems are fully operational and have secure long term funding.	No shipping incidents or near misses.
	Effective	REEF VTS and local vessels monitoring systems (incl. Harbour Master) are in place and integrated into most relevant operational plans.	REEF VTS and local vessels monitoring systems are fully operational and have secure medium term funding.	No shipping incidents. Few near misses.
	Partially Effective	REEF VTS and/or local vessels monitoring systems (incl. Harbour Master) not fully in place.	REEF VTS and local vessels monitoring systems are partially operational and/or lack funding security.	No shipping incidents. Many near misses.
	Not Effective	REEF VTS and/or local vessels monitoring systems (incl. Harbour Master) not in place.	REEF VTS and local vessels monitoring systems are not operational.	One or more shipping incidents. Many near misses.
<b><u>Anchorage:</u></b> Anchoring offshore (not portside)	Very Effective	Designated anchorage areas are charted, with location informed primarily by environmental constraints.	Anchoring always occurs within designated areas.	No harm caused to environmentally sensitive receptors from anchoring.
	Effective	Designated anchorage areas are charted, with location partially informed by environmental constraints.	Anchoring occurs designated area, except in exceptional circumstances.	Minimal and reversible harm to environmentally sensitive receptors from anchoring.
	Partially Effective	Some identification and charting of designated anchorage area, but not comprehensive.	Anchoring mostly occurs within designated areas.	Moderate and long-term harm to environmentally sensitive receptors from anchoring.
	Not Effective	Designated anchorage areas not identified.	Anchoring often occurs outside designated areas.	Significant harm to environmentally sensitive receptors from anchoring.
<b><u>Discharges:</u></b> bilge/ballast, shipping waste, antifoul	Very Effective	MARPOL and local regulatory requirements well understood by all users.	Discharge practices exceed international and local requirements.	No pollution incidents.
	Effective	MARPOL and local regulatory requirements well understood by management staff.	Discharge practices meet international and local requirements.	Few, minor pollutions incidents.
	Partially Effective	MARPOL and local regulatory requirements partially understood by management staff.	Discharge practices partially meet international and local requirements.	Regular, minor pollution incidents.
	Not Effective	MARPOL and local regulatory requirements not understood by management staff.	Discharge practices do not meet international and local requirements.	Continual, minor pollution incidents and/or one (or more) major pollution incident.
<b><u>Biosecurity:</u></b> Introduced Marine Pests (IMPs)	Very Effective	Biosecurity plans and protocols are well established by relevant agencies.	IMP monitoring is undertaken as part of a long-term program. IMPs are detected soon after invasion and eradication/management measures implemented immediately post-detection.	Any existing IMP populations significantly reducing. No new IMP establishments.
	Effective	Biosecurity plans and protocols are established by relevant agencies.	IMP monitoring is undertaken. IMPs are detected and eradication/management measures implemented post-detection.	Any existing IMP populations stable. No new IMP establishments.
	Partially Effective	Biosecurity plans and protocols are partially established by relevant agencies.	Limited IMP monitoring is undertaken. IMPs are detected and ad hoc measures implemented post-detection.	Any existing IMP populations increasing. No new IMP establishments.
	Not Effective	Biosecurity plans and protocols are not established	No IMP monitoring is undertaken. IMPs are detected/ known to occur though there are no measures implemented to manage the issue post-detection.	Any existing IMP populations increasing. One or more new IMP establishments.

Port operations				
<u>Operational and Ancillary activities:</u> Includes all operational elements that may affect ecosystem health, such as: landside waste, hazardous substance storage, refuelling vehicles, quarries, loading and unloading, spill management	Very Effective	All regulatory requirements (e.g. permits, EAs, Management Plans/procedures) are in place, plus innovation is shown	Activities are undertaken with very high levels of compliance with regulatory requirements (>90%).	Very few environmental incidents.
	Effective	All regulatory requirements (e.g. permits, EAs, Management Plans/procedures) are in place	Activities are undertaken with high levels of compliance with regulatory requirements (80-90%).	Few, minor environmental incidents.
	Partially Effective	NA	Activities are undertaken with moderate levels of compliance with regulatory requirements (60-80%).	Regular, minor environmental incidents.
	Not Effective	Not all regulatory requirements (e.g. permits, EAs, Management Plans/procedures) are in place.	Activities are undertaken with poor levels of compliance with regulatory requirements (<60%).	Continual, minor environmental incidents and/or one (or more) major environmental incident.
<u>Maintenance dredging</u>	Very Effective	All regulatory requirements (e.g. permits, EAs, Dredging Management Plan) are in place. A long-term maintenance dredging strategy has been developed to minimise dredge volumes and frequencies.	Activities are always undertaken in line with regulatory requirements.	No harm caused to environmentally sensitive receptors from dredging.
	Effective	All regulatory requirements (e.g. permits, EAs, Dredging Management Plan) are in place. A long-term maintenance dredging strategy has not been developed to minimise dredge volumes and frequencies	Activities are undertaken in line with regulatory requirements, except in exceptional circumstances.	Minimal and reversible harm to environmentally sensitive receptors from dredging.
	Partially Effective	NA	Activities are mostly undertaken in line with regulatory requirements.	Moderate and long-term harm to environmentally sensitive receptors from dredging.
	Not Effective	Not all regulatory requirements (e.g. permits, EAs) are in place.	Activities are not undertaken in line with regulatory requirements.	Significant harm to environmentally sensitive receptors from dredging.
Port Development				
<u>Capital dredging:</u> Dredging and disposal	Very Effective	NA	Activities are always undertaken in line with regulatory requirements.	No harm caused to environmentally sensitive receptors from dredging.
	Effective	All regulatory requirements (e.g. permits, EAs, Dredging Management Plan) are in place, and meet regulatory requirements.	Activities are undertaken in line with regulatory requirements, except in exceptional circumstances.	Minimal and reversible harm to environmentally sensitive receptors from dredging.
	Partially Effective	NA	Activities are mostly undertaken in line with regulatory requirements.	Moderate and long-term harm to environmentally sensitive receptors from dredging.
	Not Effective	Not all regulatory requirements (e.g. permits, EAs, Dredging Management Plan) are in place.	Activities are not undertaken in line with regulatory requirements.	Significant harm to environmentally sensitive receptors from dredging.
<u>New port</u>	Very Effective	All regulatory requirements (e.g. permits, EAs, approvals) are in	Activities are always undertaken in line with regulatory requirements.	No harm caused to environmentally sensitive receptors from

<u>development or significant upgrades:</u> New / significant upgrades to infrastructure (jetties, channels etc.), services, facilities, operators		place. Port development is fully informed and undertaken in line with legislated land use plans and/or port master plans, which have been developed taking all environmental values into account.		development.
	Effective	All regulatory requirements (e.g. permits, EAs, approvals) are in place, Port development is mostly informed and undertaken in line with legislated land use plans and/or port master plans, which have been developed taking major environmental values into account.	Activities are undertaken in line with regulatory requirements, except in exceptional circumstances.	Minimal and reversible harm to environmentally sensitive receptors from development.
	Partially Effective	All regulatory requirements (e.g. permits, EAs, approvals) are in place. Port development is not guided by land use plans and/or port master plans.	Activities are mostly undertaken in line with regulatory requirements.	Moderate and long-term harm to environmentally sensitive receptors from development.
	Not Effective	Not all regulatory requirements (e.g. permits, EAs, approvals) are in place.	Activities are not undertaken in line with regulatory requirements.	Significant harm to environmentally sensitive receptors from development.

# Appendix C Heavy Industry stewardship framework

# Heavy Industry Stewardship Framework

Activity	Criteria	Criteria Descriptions – minimum standards apply. Overall score for each activity cannot be higher than the minimum score for Implementation or outcome		
		Planning	Implementation	Achievement
<b>Administration</b>				
<u>Extension and Research Projects:</u> Note these cover water quality and ecosystem health related issues only.	Very Effective	There is planned involvement in several extension (community or industry) activities/programs that are focussed on research, monitoring or managing ecosystem health.	There is active involvement or support for extension programs relevant to ecosystem health, with long term commitments.	Highly successful outcomes of extension programs (e.g. support for the program, programs maintained in long-term or environmental goals achieved).
	Effective	There is planned involvement in more than one extension (community or industry) activities/programs that are focussed on focussed on research, monitoring or managing ecosystem health.	There is active involvement or support for extension programs relevant to ecosystem health, with annual commitments.	Successful outcomes of extension programs (e.g. support for the program, programs maintained in long-term or environmental goals achieved).
	Partially Effective	There is planned involvement in at least one extension (community or industry) activities/programs that are focussed on focussed on research, monitoring or managing ecosystem health.	There is sporadic active involvement or support for extension programs relevant to ecosystem health.	Some successful outcomes of extension programs (e.g. support for the program, programs maintained in long-term or environmental goals achieved).
	Not Effective	There is no planned involvement in extension (community or industry) activities/programs that are focussed on focussed on research, monitoring or managing ecosystem health.	There is limited or no involvement or support for extension programs relevant to ecosystem health, with long term commitments.	Few successful outcomes of extension programs (e.g. support for the program, programs maintained in long-term or environmental goals achieved).
<u>Compliance approach:</u> Note that these apply to water quality and ecosystem health related authorities only	Very Effective	NA	Requirements of all authorities are implemented, monitored and reported on, with regular voluntary/industry led engagement with regulators.	The results/learnings from incidents and near misses always feed into further development and update of management systems and operations.
	Effective	All site operational procedures/protocols are developed to fully comply with all aspects of environmental approvals (e.g. EAs, permits)	Requirements of all authorities are implemented, monitored and reported on, with some voluntary/industry led engagement with regulators.	The results/learnings from incidents and near misses mostly feed into further development and update of management systems and operations
	Partially Effective	NA	Requirements of all authorities are implemented, monitored and reported on, with regulator-instigated engagement only.	The results/learnings from incidents and near misses sometimes feed into further development and update of management systems and operations
	Not Effective	Not all site operational procedures/protocols developed to fully comply with all aspects of environmental approvals (e.g. EAs, permits)	Requirements of the few authorities are implemented, monitored and reported on and lack of engagement.	The results/learnings from incidents and near misses rarely feed into further development and update of management systems and operations
<u>EMS</u>	Very Effective	EMS developed and certified to ISO 14001 standard. EMS addresses relevant major pressures and risks to water quality and ecosystem health.	EMS fully implemented, monitored and reviewed.	EMS certification maintained, frequently reviewed and updated.
	Effective	EMS developed to ISO 14001 standard, though no certification. EMS addresses relevant major pressures and risks to water quality and ecosystem health.	EMS implemented, monitored and reviewed.	EMS maintained, regularly reviewed and updated.
	Partially Effective	EMS developed, though not certified or to ISO 14001 standard. EMS addresses relevant major pressures and risks to water quality and ecosystem health.	Most but not all elements of EMS implemented, monitored and reviewed.	EMS maintained, review and updating of EMS.
	Not Effective	EMS not developed.	Few elements of EMS implemented, monitored and reviewed.	EMS not maintained or reviewed.

<u>Training, Knowledge and Awareness</u>	Very Effective	Relevant staff are adequately qualified and highly experienced in environmental management. Further training or education around ecosystem health forms part of the professional development goals of key staff.	Environmental management training is provided to all staff, with more specific internal and external environmental training made available for environmental management staff.	All training development goals met.
	Effective	Relevant staff are adequately qualified and/or highly experienced in environmental management.	Environmental management training is provided to all staff, with more specific internal environmental training made available for environmental management staff.	Most training development goals met.
	Partially Effective	Relevant staff are not adequately qualified, though have adequate experience in environmental management.	Environmental management training is provided to key staff.	Some training development goals met
	Not Effective	Relevant staff are not adequately qualified or experienced.	Environmental management is not provided, or is out of date and/or missing important information.	No training development goals met.
<u>Community Engagement:</u> Note these cover water quality and ecosystem health related issues only.	Very Effective	There is planned involvement to engage with the community on all aspects of operational activities and future development activities that relate to managing ecosystem health, as part of a broader strategy of environmental management or stakeholder engagement.	There is active involvement and support for community engagement programs relevant to ecosystem health, with a long term commitment.	There is a high participation rate and strong positive feedback from the community on the level of engagement provided.
	Effective	There is planned involvement to engage with the community on some aspects of operational activities and/or future development activities that relate to managing ecosystem health, as part of a broader strategy of environmental management or stakeholder engagement.	There is active involvement and support for community engagement programs relevant to ecosystem health, with annual commitments.	There is a high participation rate with generally positive feedback from the community on the level of engagement provided.
	Partially Effective	There is planned involvement to engage with the community on aspects of operational activities and/or future development activities, but without a broader strategy of environmental management or stakeholder engagement.	There is active involvement and support for community engagement programs relevant to ecosystem health on an ad hoc or as needs basis.	There is a moderate participation rate with mixed feedback from the community on the level of engagement provided.
	Not Effective	There is no planned involvement to engage with the community on aspects of operational activities and/or future development activities.	There is limited or no involvement for community engagement programs relevant to ecosystem health.	There is a low participation rate and negative (or an absence of) feedback from the community on the level of engagement provided.
<b>Industry operations</b>				
<u>Operational and Ancillary activities:</u> Includes all operational elements that may affect ecosystem health, such as: stormwater management, discharges, landside waste, stockpile management, hazardous substance storage, refuelling vehicles, spill management	Very Effective	All regulatory requirements (e.g. permits, EAs, Management Plans/procedures) are in place, plus innovation is shown	Activities are undertaken with very high levels of compliance with regulatory requirements (>90%).	Very environmental incidents.
	Effective	All regulatory requirements (e.g. permits, EAs, Management Plans/procedures) are in place	Activities are undertaken with high levels of compliance with regulatory requirements (80-90%).	Few, minor environmental incidents.
	Partially Effective	NA	Activities are undertaken with moderate levels of compliance with regulatory requirements (60-80%).	Regular, minor environmental incidents.
	Not Effective	Not all regulatory requirements (e.g. permits, EAs, Management Plans/procedures) are in place.	Activities are undertaken with poor levels of compliance with regulatory requirements (<60%).	Continual, minor environmental incidents and/or one (or more) major environmental incident.

Site/facility Development				
<u>Site development or significant upgrades:</u> New / significant upgrades or expansion (site expansion, new buildings, services, facilities).	Very Effective	All regulatory requirements (e.g. permits, EAs, approvals) are in place. Development is fully informed and undertaken in line with legislated land use plans and/or site master plans, which have been developed taking all environmental values into account.	Activities are always undertaken in line with regulatory requirements.	No harm caused to environmentally sensitive receptors from development.
	Effective	All regulatory requirements (e.g. permits, EAs, approvals) are in place. Development is mostly informed and undertaken in line with legislated land use plans and/or site master plans, which have been developed taking major environmental values into account.	Activities are undertaken in line with regulatory requirements, except in exceptional circumstances.	Minimal and reversible harm to environmentally sensitive receptors from development.
	Partially Effective	All regulatory requirements (e.g. permits, EAs, approvals) are in place. Development is not guided by land use plans and/or site master plans.	Activities are mostly undertaken in line with regulatory requirements.	Moderate and long-term harm to environmentally sensitive receptors from development.
	Not Effective	Not all regulatory requirements (e.g. permits, EAs, approvals) are in place.	Activities are not undertaken in line with regulatory requirements.	Significant harm to environmentally sensitive receptors from development.

# Appendix D Aquaculture stewardship framework

# Appendix C Aquaculture Stewardship Framework

Activity	Criteria	Criteria Descriptions – minimum standards apply. Overall score for each activity cannot be higher than the minimum score for Implementation or outcome		
		Planning	Implementation	Achievement
<b>Administration</b>				
<u>Extension and Research Projects:</u> Note these cover water quality and ecosystem health related issues only.	Very Effective	There is planned involvement in several extension (community or industry) activities/programs that are focussed on research, monitoring or managing ecosystem health.	There is active involvement or support for extension programs relevant to ecosystem health, with long term commitments.	Highly successful outcomes of extension programs (e.g. support for the program, programs maintained in long-term or environmental goals achieved).
	Effective	There is planned involvement in more than one extension (community or industry) activities/programs that are focussed on focussed on research, monitoring or managing ecosystem health.	There is active involvement or support for extension programs relevant to ecosystem health, with annual commitments.	Successful outcomes of extension programs (e.g. support for the program, programs maintained in long-term or environmental goals achieved).
	Partially Effective	There is planned involvement in at least one extension (community or industry) activities/programs that are focussed on research, monitoring or managing ecosystem health.	There is sporadic active involvement or support for extension programs relevant to ecosystem health.	Some successful outcomes of extension programs (e.g. support for the program, programs maintained in long-term or environmental goals achieved).
	Not Effective	There is no planned involvement in extension (community or industry) activities/programs that are focussed on focussed on research, monitoring or managing ecosystem health.	There is limited or no involvement or support for extension programs relevant to ecosystem health, with long term commitments.	Few successful outcomes of extension programs (e.g. support for the program, programs maintained in long-term or environmental goals achieved).
<u>Compliance approach:</u> Note that these apply to water quality related authorities only	Very Effective	NA	Requirements of all authorities are implemented, monitored and reported on, with regular voluntary/industry led engagement with regulators.	The results/learnings from incidents and near misses always feed into further development and update of management systems and operations.
	Effective	All site operational procedures/protocols are developed to fully comply with all aspects of environmental approvals (e.g. EAs, permits)	Requirements of all authorities are implemented, monitored and reported on, with some voluntary/industry led engagement with regulators.	The results/learnings from incidents and near misses mostly feed into further development and update of management systems and operations
	Partially Effective	NA	Requirements of all authorities are implemented, monitored and reported on, with regulator-instigated engagement only.	The results/learnings from incidents and near misses sometimes feed into further development and update of management systems and operations
	Not Effective	Not all site operational procedures/protocols developed to fully comply with all aspects of environmental approvals (e.g. EAs, permits)	Requirements of the few authorities are implemented, monitored and reported on and lack of engagement.	The results/learnings from incidents and near misses rarely feed into further development and update of management systems and operations
<u>EMS</u>	Very Effective	Detailed EMS developed. EMS addresses relevant major pressures and risks to water quality and ecosystem health.	EMS fully implemented, monitored and reviewed.	EMS certification maintained, frequently reviewed and updated.
	Effective	EMS developed. EMS addresses relevant major pressures and risks to water quality and ecosystem health.	EMS implemented, monitored and reviewed.	EMS maintained, regularly reviewed and updated.
	Partially Effective	EMS developed, though only to a basic level. EMS addresses relevant major pressures and risks to water quality and ecosystem health.	Most but not all elements of EMS implemented, monitored and reviewed.	EMS maintained, review and updating of EMS.
	Not Effective	EMS not developed.	Few elements of EMS implemented, monitored and reviewed.	EMS not maintained or reviewed.
<u>Training</u>	Very Effective	Relevant staff are adequately qualified and highly experienced in	Environmental management training is provided to all staff, with	All training development goals met.

<u>Knowledge and Awareness</u>		environmental management. Further training or education around ecosystem health forms part of the professional development goals of key staff.	more specific internal and external environmental training made available for environmental management staff.	
	Effective	Relevant staff are adequately qualified and/or highly experienced in environmental management.	Environmental management training is provided to all staff, with more specific internal environmental training made available for environmental management staff.	Most training development goals met.
	Partially Effective	Relevant staff are not adequately qualified, though have adequate experience in environmental management.	Environmental management training is provided to key staff.	Some training development goals met
	Not Effective	Relevant staff are not adequately qualified or experienced.	Environmental management is not provided, or is out of date and/or missing important information.	No training development goals met.
<u>Community Engagement:</u> Note these cover water quality and ecosystem health related issues only.	Very Effective	There is planned involvement to engage with the community on all aspects of operational activities and future development activities that relate to managing ecosystem health, as part of a broader strategy of environmental management or stakeholder engagement.	There is active involvement and support for community engagement programs relevant to ecosystem health, with a long term commitment.	There is a high participation rate and strong positive feedback from the community on the level of engagement provided.
	Effective	There is planned involvement to engage with the community on some aspects of operational activities and/or future development activities that relate to managing ecosystem health, as part of a broader strategy of environmental management or stakeholder engagement.	There is active involvement and support for community engagement programs relevant to ecosystem health, with annual commitments.	There is a high participation rate with generally positive feedback from the community on the level of engagement provided.
	Partially Effective	There is planned involvement to engage with the community on aspects of operational activities and/or future development activities, but without a broader strategy of environmental management or stakeholder engagement.	There is active involvement and support for community engagement programs relevant to ecosystem health on an ad hoc or as needs basis.	There is a moderate participation rate with mixed feedback from the community on the level of engagement provided.
	Not Effective	There is no planned involvement to engage with the community on aspects of operational activities and/or future development activities.	There is limited or no involvement for community engagement programs relevant to ecosystem health.	There is a low participation rate and negative (or an absence of) feedback from the community on the level of engagement provided.
<b>Aquaculture operations</b>				
<u>Operational and Ancillary activities:</u> Includes all operational elements that may affect ecosystem health, such as: stormwater management, discharges, landside waste, stockpile management, hazardous substance storage, refuelling vehicles, spill management	Very Effective	Operations exceed regulatory requirements by applying the results of innovative research	Activities are undertaken with very high levels of compliance with regulatory requirements (>90%).	Very few environmental incidents.
	Effective	All regulatory requirements (e.g. permits, EAs, Management Plans/procedures) are in place	Activities are undertaken with high levels of compliance with regulatory requirements (80-90%).	Few, minor environmental incidents.
	Partially Effective	NA	Activities are undertaken with moderate levels of compliance with regulatory requirements (60-80%).	Regular, minor environmental incidents.
	Not Effective	Not all regulatory requirements (e.g. permits, EAs, Management Plans/procedures) are in place.	Activities are undertaken with poor levels of compliance with regulatory requirements (<60%).	Continual, minor environmental incidents and/or one (or more) major environmental incident.
<b>Aquaculture Development</b>				

<u>Site development or significant upgrades:</u> New / significant upgrades or expansion (site expansion, new buildings, services, facilities).	Very Effective	All regulatory requirements (e.g. permits, EAs, approvals) are in place. Development is fully informed and undertaken in line with legislated land use plans and/or site master plans, which have been developed taking all environmental values into account.	Activities are always undertaken in line with regulatory requirements.	No harm caused to environmentally sensitive receptors from development.
	Effective	All regulatory requirements (e.g. permits, EAs, approvals) are in place. Development is mostly informed and undertaken in line with legislated land use plans and/or site master plans, which have been developed taking major environmental values into account.	Activities are undertaken in line with regulatory requirements, except in exceptional circumstances.	Minimal and reversible harm to environmentally sensitive receptors from development.
	Partially Effective	All regulatory requirements (e.g. permits, EAs, approvals) are in place. Development is not guided by land use plans and/or site master plans.	Activities are mostly undertaken in line with regulatory requirements.	Moderate and long-term harm to environmentally sensitive receptors from development.
	Not Effective	Not all regulatory requirements (e.g. permits, EAs, approvals) are in place.	Activities are not undertaken in line with regulatory requirements.	Significant harm to environmentally sensitive receptors from development.

# Appendix E Tourism stewardship framework

## Tourism Stewardship Framework – Mackay Whitsunday

Activity	Criteria			
	Planning	Implementation	Achievement	
<b>Operational and management standards</b>				
Operational activity (includes all operational elements that may affect ecosystem health, such as: vessel movements, emissions, sewage discharge etc)	Very Effective	All regulatory requirements (e.g. permits, authorities, management plans/procedures) are in place. Business planning and operational procedures incorporate the full range of Responsible Reef Practices.	Activities are undertaken with very high levels of compliance with regulatory requirements (>90%).	Very few, to no, environmental incidents.
	Effective	All regulatory requirements (e.g. permits, authorities, management plans/procedures) are in place. Business planning and operational procedure incorporates some Responsible Reef Practices.	Activities are undertaken with high levels of compliance with regulatory requirements (80-90%).	Few, minor environmental incidents.
	Partially Effective	All regulatory requirements (e.g. permits, authorities, management plans/procedures) are in place. No documented business planning.	Activities are undertaken with moderate levels of compliance with regulatory requirements (60-80%).	Regular, minor environmental incidents.
	Not Effective	Not all regulatory requirements (e.g. permits, authorities, management plans/procedures) are in place.	Activities are undertaken with poor levels of compliance with regulatory requirements (<60%).	Continual, minor environmental incidents and/or one (or more) major environmental incident.
Tourism infrastructure development  (New/significant upgrades or expansion eg private moorings, diving pontoons, marinas/berths etc)	Very Effective	Planning for new or upgrades to infrastructure include environmental impact assessment and a process to avoid, mitigate or offset environmental risks.	Activities are always undertaken in line with regulatory approval requirements and leading practice risk management practices.	No significant harm caused to environmentally sensitive receptors from development.
	Effective	Planning for new or upgrades to infrastructure include environmental impact assessment and a process to avoid, mitigate or offset environmental risks.	Activities are undertaken in line with regulatory requirements, except in exceptional circumstances.	Minimal and reversible harm to environmentally sensitive receptors from development.
	Partially Effective	Planning for new or upgrades to infrastructure is undertaken in accordance with standard permit approval process.	Activities are mostly undertaken in line with regulatory requirements.	Moderate permanent impact to environmentally sensitive receptors from development.
	Not Effective	Not all regulatory requirements (e.g. permits, approvals) are in place.	Activities are not undertaken in line with regulatory requirements.	Significant harm to environmentally sensitive receptors from development.

Activity	Criteria			
	Planning	Implementation	Achievement	
<b>Accreditation and compliance</b>				
Compliance	Very Effective	All operational procedures/protocols of the business are developed to fully comply with all aspects of environmental approvals.	Requirements of all authorities are implemented, monitored and reported on, with regular voluntary/industry led engagement with regulators.	The results/learnings from incidents and near misses always feed into further development and update of management systems and operations.
	Effective	All operational procedures/protocols of the business are developed to fully comply with all aspects of environmental approvals.	Requirements of all authorities are implemented, monitored and reported on, with regulator-instigated engagement only.	The results/learnings from incidents and near misses mostly feed into further development and update of management systems and operations.
	Partially Effective	Minimum planning and procedures in place to meet regulatory requirements.	Requirements of all authorities are implemented, monitored and reported.	The results/learnings from incidents and near misses sometimes feed into further development and update of management systems and operations.
	Not Effective	Not all procedures/protocols of the business are developed to fully comply with all aspects of environmental approvals.	Very few requirements of authorities are implemented, monitored and reported on, and there is lack of engagement with regulators.	The results/learnings from incidents and near misses rarely feed into further development and update of management systems and operations.
Participation in recognised scheme (currently only the Ecotourism certification scheme)	Very Effective	Environmental strategy or plan developed and certified to recognised scheme standard. Strategy or plan addresses relevant major pressures and risks to water quality and ecosystem health.	Strategy or plan fully implemented, monitored and reviewed. There is >90% industry participation in recognized scheme.	Participation in industry lead audit process. Certification under recognised scheme maintained, frequently reviewed and updated.
	Effective	Environmental strategy or plan developed to recognised scheme standard but not certified. Strategy or plan addresses relevant major pressures and risks to water quality and ecosystem health.	Strategy or plan implemented, monitored and reviewed. There is 80-90% industry participation in recognised scheme.	Environmental strategy or plan maintained, regularly reviewed and updated.
	Partially Effective	Environmental strategy or plan developed though not certified or to recognised scheme standard. Strategy or plan addresses relevant major pressures and risks to water quality and ecosystem health.	Most but not all elements of strategy or plan implemented, monitored and reviewed. There is 60-80% industry participation in recognized scheme.	Environmental strategy or plan infrequently maintained, reviewed and updated.
	Not Effective	Environmental strategy or plan not developed.	Few elements of strategy or plan implemented, monitored and reviewed. There is <60% industry participation in recognized scheme.	Environmental strategy or plan not maintained or reviewed.

Activity	Criteria			
	Planning	Implementation	Achievement	
<b>Staff training and operational engagement</b>				
Training, knowledge and awareness	Very Effective	Relevant staff are adequately qualified and highly experienced in ecotourism operations and interpretation (including all responsible reef practices). Further training or education forms part of the professional development goals of key staff.	Ecotourism and interpretation (including all responsible reef practices) training is provided to all staff, with more specific internal and external environmental training made available for key staff.	All training development goals met.
	Effective	Relevant staff are adequately qualified and/or highly experienced in ecotourism operations and interpretation (including all responsible reef practices).	Ecotourism and interpretation (including all responsible reef practices) training is provided to all staff.	Most training development goals met.
	Partially Effective	Relevant staff are not adequately qualified, although have adequate experience in ecotourism operations and interpretation (including all responsible reef practices).	Ecotourism and interpretation (including all responsible reef practices) training is made available and provided to some staff.	Some training development goals met
	Not Effective	Relevant staff are not adequately qualified or experienced.	Ecotourism and interpretation (including all responsible reef practices) training is not provided, or is out of date and/or missing important information.	No training development goals met.
Extension and research activity (Note these cover water quality and ecosystem health related issues only.)	Very Effective	There is planned involvement in several extension activities/programs that are focused on research, monitoring or managing ecosystem health.	There is active involvement or support for extension programs relevant to ecosystem health, with long term commitments.	Highly successful outcomes of extension programs (e.g. support for the program, programs maintained in long-term or environmental goals achieved).
	Effective	There is planned involvement in more than one extension activities/programs that are focused on research, monitoring or managing ecosystem health.	There is active involvement or support for extension programs relevant to ecosystem health, with annual commitments.	Successful outcomes of extension programs (e.g. support for the program, programs maintained in long-term or environmental goals achieved).
	Partially Effective	There is planned involvement in at least one extension activities/programs that are focused on research, monitoring or managing ecosystem health.	There is sporadic active involvement or support for extension programs relevant to ecosystem health.	Some successful outcomes of extension programs (e.g. support for the program, programs maintained in long-term or environmental goals achieved).
	Not Effective	There is no planned involvement in extension activities/programs that are focused on research, monitoring or managing ecosystem health.	There is limited or no involvement or support for extension programs relevant to ecosystem health, with long term commitments.	Few successful outcomes of extension programs (e.g. support for the program, programs maintained in long-term or environmental goals achieved).

# Appendix F Questionnaire – port and heavy industry

# Questionnaire – port/industry framework

## PART 1 - INTRODUCTION

Important notes:

The consultants are available to explain and provide background to the survey as needed.

All information will be kept confidential and will not be reported on directly.

The survey applies to the 2014/2015 financial year – which is referred to as “in the last year”.

Respondents are asked provide links or references to supporting information, either in the form of published papers or reports, websites or data. There is no need to attach this supporting information, just reference.

The survey is designed so that respondents can provide short (quick) answers where possible, it is not necessary to provide long explanations or justification. The survey is a self-assessment and accuracy of response will be assumed.

As this is a combined questionnaire for ports and all industries (including refining, manufacture, milling and port terminals) some questions or elements of questions may not be applicable. Please indicate these with a N/A to ensure reporting accurately reflects relevant activities.

Q1	What company are you representing?	[open text response or provide attachment]
Q2	What is your role?	[open text response or provide attachment]
Q3	What is your experience and qualifications	[open text response or provide attachment]

## PART 2 – ADMINISTRATION AND EXTENSION/RESEARCH ACTIVITIES

### Section 2.1: Extension Activities

Q4	<p>Please provide details of any environmental extension or research programs relevant to ecosystem health that your company is involved in beyond regulatory requirements. This may include activities such as:</p> <ul style="list-style-type: none"> <li>• NRM/catchment group</li> <li>• Community science monitoring programs</li> <li>• Science and development research (e.g. University sponsorships/partnerships, GBR Foundation etc)</li> </ul> <p>Please provide brief details on the activity, groups involved, website links, years of involvement/future commitment, program timeframes (e.g. long/short term), success of outcomes against planned goals.</p> <p>If possible or appropriate, please provide an indication of overall funding investment per annum.</p>	[open text response or provide attachment]
Q5	<p>Please provide a short description of any leading practice examples of environmental management that you wish to share, such as rehabilitation programs, use of technology and innovation to improve outcomes, adaptive management (note: with your permission, these may be used as case studies in future reports).</p>	[open text response or provide attachment]
Q6	<p>For the programs listed in Q4 and Q5 above, is the commitment:</p> <ol style="list-style-type: none"> <li>a) long-term (i.e. &gt;1 year)</li> <li>b) year-to-year</li> <li>c) sporadic</li> <li>d) NA – there are no program</li> </ol>	[Choose one]
Q7	<p>The outcomes of the programs listed in Q4 and Q5 above are best described as (noting that outcomes may include level of support for the program, maintenance of the program in the long-term or achievement of environmental goals):</p> <ol style="list-style-type: none"> <li>a) Highly successful outcomes</li> <li>b) Successful outcomes</li> <li>c) Some successful outcomes</li> <li>d) Few successful outcomes</li> </ol>	[Choose one]

**Section 2.2: Compliance Monitoring**

Q8	<p>Are all site operational procedures/protocols developed to fully comply with all aspects of environmental approvals (e.g. EAs, permits)?</p> <p>Yes</p> <p>No</p>	Yes/No
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Q9	Do you have internal systems or mechanisms in place (or in preparation) to identify, monitor and report environmental authority compliance, incidents and near misses? Yes No	Yes/No
Q10	Engagement with regulators regarding any incidents is: a) Always instigated by your company in a timely manner b) Mostly instigated by your company in a timely manner c) Instigated by regulators d) There is no engagement with regulators	[Choose one]
Q11	Do the results/learnings from incidents and near misses feed into further development and update management systems and operations? a) Always b) Mostly c) Sometimes d) Rarely	[Choose one]

### Section 2.3: Environmental Management Systems (EMS)

Q12	Does your company have a formal EMS currently in place for all operations? a) Yes – certified to ISO14001 b) Yes – though not certified to ISO14001 c) Yes – prepared though not yet rolled out d) No – not prepared or implemented e) Other – (please provide brief explanation)	[Choose one]
Q13	In the context of your company's operations, please list what risks to water quality and ecosystem health are managed in the EMS (or alternative system if an EMS is not in place) e.g. discharges, stormwater, oil spills, commodity spills	[open text response or provide attachment]
Q14	How often is the EMS audited by external and/or internal parties?	[open text response or provide attachment]

Q15	<p>Based on external (or internal, if not certified EMS), was the EMS fully implemented, monitored and reviewed?</p> <ul style="list-style-type: none"> <li>a) Yes – fully implemented, monitored and reviewed</li> <li>b) Yes – though some minor elements were not fully implemented, monitored or reviewed</li> <li>c) Yes, mostly, but not all elements were implemented, monitored or reviewed</li> <li>d) No, few elements of the EMS were implemented, monitored or reviewed</li> <li>e) Not applicable</li> <li>f) Other – (please provide brief explanation)</li> </ul>	[Choose one]
Q16	<p>Do the results of any audit feed into further development and update of the EMS?</p> <p>Yes</p> <p>No</p> <p>Not applicable</p>	[Choose one]

**Section 2.4: Staff and Training**

Q17	<p>The team responsible for managing the environmental impact of operations is qualified and highly experienced.</p> <ul style="list-style-type: none"> <li>a) Strongly agree</li> <li>b) Agree</li> <li>c) Partially agree</li> <li>d) Disagree</li> <li>e) Other (please provide brief explanation)</li> </ul>	[Choose one]
Q18	<p>Training and education around ecosystem health as part of the professional development goals of key environmental management staff is valued by staff and management:</p> <ul style="list-style-type: none"> <li>a) Strongly agree</li> <li>b) Agree</li> <li>c) Partially agree</li> <li>d) Disagree</li> <li>e) Other (please provide brief explanation)</li> </ul>	[Choose one]
Q19	<p>Please outline briefly how internally and externally delivered environmental training is made available to environmental management staff.</p>	[open text response or provide attachment]

Q20	<p>In the context of ecosystem health, professional development and training goals are always met:</p> <ul style="list-style-type: none"> <li>a) Strongly agree</li> <li>b) Agree</li> <li>c) Partially agree</li> <li>d) Disagree</li> <li>e) Other (please explain)</li> </ul>	[Choose one]
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**Section 2.5: Community Engagement**

Q21	<p>The community is considered a key stakeholder in the management of ecosystem health. Consultation with the community for new or existing operations can provide important information and strengthen community relations. Does your company:</p> <ul style="list-style-type: none"> <li>a) Have a formalised <u>on-going</u> strategy and/or program to engage with the community</li> <li>b) Plan to develop a formalised <u>on-going</u> strategy and/or program to engage with the community</li> <li>c) Only engage with the community as part of regulatory processes or when new infrastructure developments or changes are proposed</li> <li>d) Do not engage with the community</li> <li>e) Other</li> </ul>	[Choose one]
Q22	<p>Is your company's commitment to community engagement:</p> <ul style="list-style-type: none"> <li>a) Long-term</li> <li>b) Year to year</li> <li>c) Sporadic</li> <li>d) No involvement</li> </ul>	[Choose one]



Q25	<p>Operations have resulted in:</p> <ul style="list-style-type: none"> <li>a) Very few environmental incidents (related to water quality or ecosystem health)</li> <li>b) Few, minor environmental incidents (related to water quality or ecosystem health)</li> <li>c) Regular, minor environmental incidents (related to water quality or ecosystem health)</li> <li>d) Continual, minor environmental incidents and/or one (or more) major environmental incident (related to water quality or ecosystem health)</li> </ul>	[Choose one]
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**PART 3 – SITE / FACILITY DEVELOPMENT AND EXPANSION**

Q26	<p>For any new site developments and/or significant upgrades, were all environmental approvals (e.g. EAs, permits, management plans) in place prior to works commencing?</p> <p>Yes</p> <p>No</p> <p>NA – no development (skip to Part 4)</p>	[open text response or provide attachment]
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Q27	<p>Which statement below best describes how development is planned:</p> <ul style="list-style-type: none"> <li>a) development is fully informed and undertaken in line with land use plans and/or port/site master plans, which have been developed taking all environmental values into account</li> <li>b) development is mostly informed and undertaken in line with land use plans and/or port/site master plans, which have been developed taking all environmental values into account</li> <li>c) development is not guided land use plans and/or port/site master plans</li> </ul>	[Choose one]
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Q28	<p>Development or site upgrades are:</p> <ul style="list-style-type: none"> <li>a) always undertaken in line with regulatory requirements</li> <li>b) undertaken in line with regulatory requirements, except in exceptional circumstances</li> <li>c) mostly undertaken in line with regulatory requirements</li> <li>d) not undertaken in line with regulatory requirements</li> </ul>	[Choose one]
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Q29	<p>What were the environmental outcomes from development or site upgrades:</p> <ul style="list-style-type: none"> <li>a) No harm caused to environmentally sensitive receptors from development.</li> <li>b) Minimal and reversible harm to environmentally sensitive receptors from development.</li> <li>c) Moderate and long-term harm to environmentally sensitive receptors from development.</li> <li>d) Significant harm to environmentally sensitive receptors from development.</li> </ul>	[Choose one]
<b>PART 4: TENANCY MANAGEMENT</b>		
Q30	<p>Does your company manage tenants</p> <p>Yes</p> <p>No (skip to Part 5)</p>	Yes/No
Q31	<p>Do you have Environmental Standards for tenants to follow:</p> <ul style="list-style-type: none"> <li>a) Yes and these are in place for all tenants</li> <li>b) Yes but these are not in place for all tenants</li> <li>c) No</li> </ul>	[Choose one]
Q32	<p>Tenants are inspected:</p> <ul style="list-style-type: none"> <li>a) Regularly</li> <li>b) Occasionally</li> <li>c) Rarely</li> <li>d) Not inspected</li> </ul>	[Choose one]
Q33	<p>The lease contains measures covering the commencement, operation and termination of the lease which are:</p> <ul style="list-style-type: none"> <li>a) Specific and clear environmental management conditions for all relevant environmental aspects.</li> <li>b) Few and high level environmental management conditions for key environmental aspects.</li> <li>c) Unclear or very few environmental management conditions for only a few of the relevant environmental aspects.</li> <li>d) No environmental management conditions.</li> <li>e) Not applicable</li> <li>f) Other (please provide brief explanation)</li> </ul>	[Choose one]
Q34	Tenants:	[Choose one]

	<ul style="list-style-type: none"> <li>a) Fully comply with lease requirements and Environmental Standards (where they exist)</li> <li>b) Mostly comply with lease requirements and Environmental Standards (where they exist).</li> <li>c) partially comply with lease requirements and Environmental Standards (where they exist)</li> <li>d) regularly do not comply with lease requirements and Environmental Standards (where they exist).</li> <li>e) Not applicable</li> <li>f) Other (please provide brief explanation)</li> </ul>	
Q35	<p>Are there any joint environmental management initiatives between tenants? (E.g. centralised waste collection or by-product reuse).</p> <p>Yes</p> <p>No</p> <p>Not applicable</p>	Yes/No

**PART 5 – SHIPPING (particularly for port and terminal operators and managers)**

**Section 5.1: Movement**

Q36	<p>REEF VTS and local vessel traffic monitoring system implementation (incl. Harbour Master) are in place and integrated into all relevant operational plans.</p> <ul style="list-style-type: none"> <li>a) Strongly agree</li> <li>b) Agree</li> <li>c) Partially agree</li> <li>d) Disagree</li> <li>e) Not applicable</li> </ul>	[Choose one]
Q37	<p>REEF VTS and local vessels traffic monitoring systems are:</p> <ul style="list-style-type: none"> <li>a) Fully operational and have secure long term funding.</li> <li>b) Fully operational and have secure medium term funding.</li> <li>c) Partially operational and/or lack funding security.</li> <li>d) Not operational.</li> <li>e) Not applicable</li> </ul>	[Choose one]

Q38	<p>How many shipping incidents occurred in the last year:</p> <ul style="list-style-type: none"> <li>a) No incidents or near misses</li> <li>b) No incidents, few near misses</li> <li>c) No incidents, many near misses</li> <li>d) One or more shipping incidents</li> <li>e) Not applicable</li> </ul>	[Choose one]
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### Section 5.2: Anchorage

Q39	<p>Designated anchorage areas:</p> <ul style="list-style-type: none"> <li>a) Are identified and charted.</li> <li>b) Have some identification and charting, but this is not comprehensive</li> <li>c) Are not charted or identified.</li> <li>d) Not applicable</li> <li>e) Other (please explain)</li> </ul>	[Choose one]
Q40	<p>In addition to safety considerations, the locations of designated anchorage areas are:</p> <ul style="list-style-type: none"> <li>a) Informed primarily by environmental constraints.</li> <li>b) Partially informed by environmental constraints.</li> <li>c) Not informed by environmental constraints.</li> <li>d) Have not been identified.</li> <li>e) Not applicable</li> </ul>	[Choose one]
Q41	<p>How are anchoring practises best described?</p> <ul style="list-style-type: none"> <li>a) Anchoring always occurs within designated areas</li> <li>b) Anchoring occurs designated area, except in exceptional circumstances</li> <li>c) Anchoring mostly occurs within designated areas</li> <li>d) Anchoring often occurs outside designated areas</li> <li>e) Not applicable</li> </ul>	[Choose one]
Q42	<p>What were the environmental outcomes from anchoring:</p> <ul style="list-style-type: none"> <li>a) No harm caused to environmentally sensitive receptors from anchoring.</li> </ul>	[Choose one]

	<ul style="list-style-type: none"> <li>b) Minimal and reversible harm to environmentally sensitive receptors from anchoring.</li> <li>c) Moderate and long-term harm to environmentally sensitive receptors from anchoring.</li> <li>d) Significant harm to environmentally sensitive receptors from anchoring.</li> <li>e) Not applicable</li> </ul>	
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**Section 5.3: Maritime Discharges**

Q43	<p>Ship waste disposal services are provided at anchorage or when alongside terminals.</p> <p>Yes No Not applicable</p>	Yes/No
Q44	<p>MARPOL and other vessel related regulatory requirements:</p> <ul style="list-style-type: none"> <li>a) are well understood by all relevant users</li> <li>b) are well understood by management staff only</li> <li>c) are partially understood by management staff only</li> <li>d) are not well understood by management staff</li> <li>e) Not applicable</li> <li>f) Other (please explain)</li> </ul>	[Choose one]
Q45	<p>Ship discharge practices generally:</p> <ul style="list-style-type: none"> <li>a) Exceed international and local requirements</li> <li>b) meet international and local requirements</li> <li>c) partially meet international and local requirements</li> <li>d) do not meet international and local requirements</li> <li>e) Not applicable</li> <li>f) Other (please explain)</li> </ul>	[Choose one]
Q46	<p>How many pollutions (from shipping) incidents occurred in the last year:</p> <ul style="list-style-type: none"> <li>a) No pollution incidents</li> <li>b) Few, minor pollutions incidents</li> <li>c) Regular, minor pollution incidents</li> </ul>	[Choose one]

	<ul style="list-style-type: none"> <li>d) Continual, minor pollution incidents and/or one (or more) major pollution incident</li> <li>e) Not applicable</li> </ul>	
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#### Section 5.4: Introduced Marine Pests

Q47	<p>Biosecurity plans and protocols are:</p> <ul style="list-style-type: none"> <li>a) well established by relevant agencies</li> <li>b) established by relevant agencies</li> <li>c) partially established by relevant agencies</li> <li>d) not established</li> <li>e) Not applicable</li> </ul>	[Choose one]
Q48	<p>What level of IMP monitoring is undertaken:</p> <ul style="list-style-type: none"> <li>a) Comprehensive as part of a long-term strategy</li> <li>b) Comprehensive but not as part of a long-term strategy</li> <li>c) Limited</li> <li>d) None</li> <li>e) Not applicable</li> </ul>	[Choose one]
Q49	<p>If IMPs are detected, which statement best describes the response:</p> <ul style="list-style-type: none"> <li>a) IMPs are detected soon after invasion and eradication/management measures implemented immediately post-detection.</li> <li>b) IMPs are detected and eradication/management measures implemented post-detection.</li> <li>c) IMPs are detected and ad hoc measures implemented post-detection.</li> <li>d) IMPs are detected/ known to occur though there are no measures implemented to manage the issue post-detection.</li> <li>e) Not applicable</li> </ul>	[Choose one]
Q50	<p>In the last year, what was the status of any IMP populations and establishments:</p> <ul style="list-style-type: none"> <li>a) Any existing IMP populations significantly reducing; no new IMP establishments.</li> <li>b) Any existing IMP populations stable, no new IMP establishments.</li> <li>c) Any existing IMP populations increasing, no new IMP establishments.</li> <li>d) Any existing IMP populations increasing, one or more new IMP establishments.</li> <li>e) Not applicable</li> </ul>	[Choose one]

**PART 6 – DREDGING**

Q51	Was any dredging undertaken in the previous year: a) maintenance b) capital c) No dredging (please submit questionnaire)	[select applicable]
Q52	For any dredging (maintenance or capital) that was undertaken during the year, please outline briefly what environmental planning and approvals processes were undertaken (e.g. planning studies, environmental impact assessment) and how issues relevant to ecosystem health were integrated.	[open text response or provide attachment]
Q53	Has a long-term maintenance dredge strategy been developed? a) Yes b) No c) Not applicable	[Yes/No]
Q54	For any dredging (maintenance or capital) that was undertaken during the year, activities were: a) always undertaken in line with regulatory requirements b) undertaken in line with regulatory requirements, except in exceptional circumstances c) mostly undertaken in line with regulatory requirements d) not undertaken in line with regulatory requirements e) Not applicable	[Choose one]
Q55	What were the environmental outcomes from dredging: a) No harm caused to environmentally sensitive receptors from dredging. b) Minimal and reversible harm to environmentally sensitive receptors from dredging. c) Moderate and long-term harm to environmentally sensitive receptors from dredging. d) Significant harm to environmentally sensitive receptors from anchoring. e) Not applicable	[Choose one]
Q56	If answers to the above differ across campaigns, please describe.	[Free text]

## Appendix G Questionnaire – aquaculture

# Questionnaire – aquaculture framework

## PART 1 - INTRODUCTION

Important notes:

The consultants are available to explain and provide background to the survey as needed.

All information will be kept confidential and will not be reported on directly.

The survey applies to the 2014/2015 financial year – which is referred to as “in the last year”.

Respondents are asked to provide links or references to supporting information, either in the form of published papers or reports, websites or data. There is no need to attach this supporting information, just reference.

The survey is designed so that respondents can provide short (quick) answers where possible, it is not necessary to provide long explanations or justification. The survey is a self-assessment and accuracy of response will be assumed.

Some questions or elements of questions may not be applicable. Please indicate these with a N/A to ensure reporting accurately reflects relevant activities.

Q1	What company are you representing?	[open text response or provide attachment]
Q2	What is your role?	[open text response or provide attachment]
Q3	What is your experience and qualifications	[open text response or provide attachment]

## PART 2 – ADMINISTRATION AND EXTENSION/RESEARCH ACTIVITIES

### Section 2.1: Extension Activities

Q4	<p>Please provide details of any environmental extension or research programs relevant to health of the Mackay Whitsunday region that your company is involved in beyond regulatory requirements. This may include activities such as:</p> <ul style="list-style-type: none"> <li>• NRM/catchment group</li> <li>• Community science monitoring programs</li> <li>• Science and development research (e.g. University sponsorships/partnerships, GBR Foundation, CSIRO etc)</li> </ul> <p>Please provide brief details on the activity, groups involved, website links, years of involvement/future commitment, program timeframes (e.g. long/short term), success of outcomes against planned goals.</p> <p>If possible or appropriate, please provide an indication of overall funding investment per annum.</p>	[open text response or provide attachment]
Q5	<p>Please provide a short description of any leading practice examples of environmental management that you wish to share, such as rehabilitation programs, use of technology and innovation to improve outcomes, adaptive management (note: with your permission, these may be used as case studies in future reports).</p>	[open text response or provide attachment]
Q6	<p>For the programs listed in Q4 and Q5 above, is the commitment:</p> <ol style="list-style-type: none"> <li>a) long-term (i.e. &gt;1 year)</li> <li>b) year-to-year</li> <li>c) sporadic</li> <li>d) NA – there are no program</li> </ol>	[Choose one]
Q7	<p>The outcomes of the programs listed in Q4 and Q5 above are best described as (noting that outcomes may include level of support for the program, maintenance of the program in the long-term or achievement of environmental goals):</p> <ol style="list-style-type: none"> <li>a) Highly successful outcomes</li> <li>b) Successful outcomes</li> <li>c) Some successful outcomes</li> <li>d) Few successful outcomes</li> </ol>	[Choose one]

**Section 2.2: Compliance Monitoring**

Q8	<p>Are all site operational procedures/protocols developed to fully comply with all aspects of environmental approvals (e.g. Environmental Authorities, Fisheries licences, GBRMPA permits)?</p> <p>Yes</p> <p>No</p>	Yes/No
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Q9	<p>Do you have internal systems or mechanisms in place (or in preparation) to identify, monitor and report approval compliance, incidents and near misses?</p> <p>Yes</p> <p>No</p>	Yes/No
Q10	<p>Engagement with regulators regarding any incidents is:</p> <p>a) Always instigated by your company in a timely manner</p> <p>b) Mostly instigated by your company in a timely manner</p> <p>c) Instigated by regulators</p> <p>d) There is no engagement with regulators</p>	[Choose one]
Q11	<p>Do the results/learnings from incidents and near misses feed into further development and update management systems and operations?</p> <p>a) Always</p> <p>b) Mostly</p> <p>c) Sometimes</p> <p>d) Rarely</p>	[Choose one]

### Section 2.3: Environmental Management Systems (EMS)

Q12	<p>Does your company have a formal Environmental Management System (EMS) currently in place for all operations?</p> <p>a) Yes – certified to ISO14001</p> <p>b) Yes – though not certified to ISO14001</p> <p>c) Yes – prepared though not yet rolled out</p> <p>d) No – not prepared or implemented</p> <p>e) Other – (please provide brief explanation)</p>	[Choose one]
Q13	<p>In the context of your company's operations, please list what risks to water quality and ecosystem health are managed in the EMS (or alternative system if an EMS is not in place) e.g. quality of water discharges, disease issues, sediment quality, stormwater, spills.</p>	[open text response or provide attachment]
Q14	<p>How often is the EMS audited or reviewed by external and/or internal parties?</p>	[open text response or provide attachment]

Q15	<p>Based on external (or internal, if not certified EMS) audits or reviews, was the EMS fully implemented, monitored and reviewed?</p> <ul style="list-style-type: none"> <li>a) Yes – fully implemented, monitored and reviewed</li> <li>b) Yes – though some minor elements were not fully implemented, monitored or reviewed</li> <li>c) Yes, mostly, but not all elements were implemented, monitored or reviewed</li> <li>d) No, few elements of the EMS were implemented, monitored or reviewed</li> <li>e) Not applicable</li> <li>f) Other – (please provide brief explanation)</li> </ul>	[Choose one]
Q16	<p>Do the results of any audit or review feed into further development and update of the EMS?</p> <p>Yes</p> <p>No</p> <p>Not applicable</p>	[Choose one]

**Section 2.4: Staff and Training**

Q17	<p>The staff responsible for managing the environmental impact of operations are qualified and highly experienced.</p> <ul style="list-style-type: none"> <li>a) Strongly agree</li> <li>b) Agree</li> <li>c) Partially agree</li> <li>d) Disagree</li> <li>e) Other (please provide brief explanation)</li> </ul>	[Choose one]
Q18	<p>Training and education around ecosystem health as part of the professional development goals of key staff is valued by staff and management:</p> <ul style="list-style-type: none"> <li>a) Strongly agree</li> <li>b) Agree</li> <li>c) Partially agree</li> <li>d) Disagree</li> <li>e) Other (please provide brief explanation)</li> </ul>	[Choose one]
Q19	<p>Please outline briefly how internally and externally delivered environmental training is made available to relevant staff.</p>	[open text response or provide attachment]

Q20	<p>In the context of ecosystem health, professional development and training goals are always met:</p> <ul style="list-style-type: none"> <li>a) Strongly agree</li> <li>b) Agree</li> <li>c) Partially agree</li> <li>d) Disagree</li> <li>e) Other (please explain)</li> </ul>	[Choose one]
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**Section 2.5: Community Engagement**

Q21	<p>The community is considered a key stakeholder in the management of ecosystem health. Consultation with the community for new or existing operations can provide important information and strengthen community relations. Does your company:</p> <ul style="list-style-type: none"> <li>a) Have a formalised <u>on-going</u> strategy and/or program to engage with the community</li> <li>b) Plan to develop a formalised <u>on-going</u> strategy and/or program to engage with the community</li> <li>c) Only engage with the community as part of regulatory processes or when new infrastructure developments or changes are proposed</li> <li>d) Do not engage with the community</li> <li>e) Other</li> </ul>	[Choose one]
Q22	<p>Is your company's commitment to community engagement:</p> <ul style="list-style-type: none"> <li>a) Long-term</li> <li>b) Year to year</li> <li>c) Sporadic</li> <li>d) No involvement</li> </ul>	[Choose one]



Q26	<p>Operations have resulted in:</p> <ul style="list-style-type: none"> <li>a) Very few environmental incidents (related to water quality or ecosystem health)</li> <li>b) Few, minor environmental incidents (related to water quality or ecosystem health)</li> <li>c) Regular, minor environmental incidents (related to water quality or ecosystem health)</li> <li>d) Continual, minor environmental incidents and/or one (or more) major environmental incident (related to water quality or ecosystem health)</li> </ul>	[Choose one]
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**PART 3 – SITE / FACILITY DEVELOPMENT AND EXPANSION**

Q27	<p>For any new site developments and/or significant upgrades, were all environmental approvals (e.g. EAs, permits, management plans) in place prior to works commencing?</p> <p>Yes</p> <p>No</p> <p>NA – no development (skip to Part 4)</p>	[open text response or provide attachment]
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Q28	<p>Which statement below best describes how development is planned:</p> <ul style="list-style-type: none"> <li>a) development is fully informed and undertaken in line with land use plans and/or site master plans, which have been developed taking all environmental values into account</li> <li>b) development is mostly informed and undertaken in line with land use plans and/or site master plans, which have been developed taking all environmental values into account</li> <li>c) development is not guided by land use plans and/or site master plans</li> </ul>	[Choose one]
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Q29	<p>Development or site upgrades are:</p> <ul style="list-style-type: none"> <li>a) always undertaken in line with regulatory requirements</li> <li>b) undertaken in line with regulatory requirements, except in exceptional circumstances</li> <li>c) mostly undertaken in line with regulatory requirements</li> <li>d) not undertaken in line with regulatory requirements</li> </ul>	[Choose one]
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Q30	<p>What were the environmental outcomes from development or site upgrades:</p> <ul style="list-style-type: none"><li>a) No harm caused to environmentally sensitive receptors from development.</li><li>b) Minimal and reversible harm to environmentally sensitive receptors from development.</li><li>c) Moderate and long-term harm to environmentally sensitive receptors from development.</li><li>d) Significant harm to environmentally sensitive receptors from development.</li></ul>	[Choose one]
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## Appendix H Questionnaire – tourism

# Questionnaire – commercial marine tourism industry framework

## PART 1 - INTRODUCTION

### Important notes:

All information will be kept confidential and will not be reported on directly.

The survey applies to the 2015/2016 financial year – which is referred to as “in the last year”.

Respondents are asked provide links or references to supporting information, either in the form of published papers or reports, websites or data. There is no need to attach this supporting information, just references.

The survey is designed so that respondents can provide short (quick) answers where possible. It is not necessary to provide long explanations or justification. The survey is a self-assessment and accuracy of response will be assumed.

Some questions or elements of questions may not be applicable to your operations. Please indicate these with a N/A and a short explanation to ensure reporting accurately reflects relevant activities.

Q1	What company are you representing?	[open text response or provide attachment]
Q2	What is your role?	[open text response or provide attachment]
Q3	What is your experience and qualifications	[open text response or provide attachment]

## PART 2 – OPERATIONAL AND MANAGEMENT STANDARDS

### Section 2.1: Operational activity

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Q4	Does your operation have in place all the relevant approvals (e.g. permits) and management plans/procedures for activities undertaken in the GBR?	Yes/No/NA
Q5	Does your operation's business and/or environmental planning or operational procedures cover all Responsible Reef Practices relevant to your operation? If no, please list those practices your planning or procedures do cover.	Yes/No [open text response or provide attachment]
Q6	Operations have resulted in: a) Very few environmental incidents b) Few, minor environmental incidents c) Regular, minor environmental incidents d) Continual, minor environmental incidents and/or one (or more) major environmental incident	[Choose one]

## Section 2.2: Tourism infrastructure development

Q7	For any new site developments and/or significant upgrades, were all environmental approvals (e.g. permits, impact assessment approvals) in place prior to works commencing? Yes No NA – no development (skip to next part)	Yes/No/NA
Q8	Which statement below best describes how development is planned: a) development is fully informed and undertaken in line with management zoning plans, which have been developed taking all environmental values into account b) development is mostly informed and undertaken in line with management zoning plans, which have been developed taking all environmental values into account c) development is not guided by management zoning plans.	[Choose one]

Q9	<p>Development or site upgrades are:</p> <p>a) always undertaken in line with regulatory requirements</p> <p>b) undertaken in line with regulatory requirements, except in exceptional circumstances</p> <p>c) mostly undertaken in line with regulatory requirements</p> <p>d) not undertaken in line with regulatory requirements</p>	[Choose one]
Q10	<p>What were the environmental outcomes from development or site upgrades:</p> <p>a) No harm caused to environmentally sensitive receptors from development.</p> <p>b) Minimal and reversible harm to environmentally sensitive receptors from development.</p> <p>c) Moderate permanent harm to environmentally sensitive receptors from development.</p> <p>d) Significant harm to environmentally sensitive receptors from development.</p>	[Choose one]

### PART 3 – ACCREDITATION AND COMPLIANCE

#### Section 3.1: Compliance Monitoring

Q11	<p>Are all business operational procedures/protocols developed to fully comply with all aspects of environmental approvals (e.g. permits) and Responsible Reef Practices?</p> <p>Yes</p> <p>No</p>	Yes/No
Q12	<p>Do you have internal systems or mechanisms in place (or in preparation) to identify, monitor and report environmental authority compliance, incidents and near misses?</p> <p>Yes</p> <p>No</p>	Yes/No
Q13	<p>Engagement with GBRMPA or other authorities regarding any incidents is:</p> <p>a) Always instigated by your company in a timely manner</p> <p>b) Mostly instigated by your company in a timely manner</p> <p>c) Instigated by regulators</p> <p>d) There is no engagement with regulators</p>	[Choose one]

Q14	<p>Do the results/learnings from incidents and near misses feed into further development and updated management systems and operations?</p> <p>a) Always b) Mostly c) Sometimes d) Rarely</p>	[Choose one]
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### Section 3.2: Recognised certification scheme

Q15	<p>Does your company have Ecotourism certification?</p> <p>a) Yes – certified to Advanced level b) Yes – though not certified to Advanced level c) No – in process for obtaining certification d) No e) Other – (please provide brief explanation)</p>	[Choose one]
Q16	<p>In the context of your tourist operation, please list what Responsible Reef Practices are managed in your business or environmental plan e.g. regarding anchoring, diving etc. If this is all practices relevant to your operation please note 'All relevant' in your answer.</p>	[open text response or provide attachment]
Q17	<p>In addition to Ecotourism certification, is your tourist operation a member of an official (e.g. incorporated) industry association that implements a code of practice, certification and/or independent audit system?</p> <p>a) Yes b) No c) Other – (please provide brief explanation)</p>	[Choose one]
Q18	<p>Do the results of any audit feed into further development and update of your business/environmental plan or operational procedures?</p> <p>Yes No Not applicable</p>	Yes/No/NA

### PART 4 – STAFF TRAINING AND OPERATIONAL ENGAGEMENT

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**Section 4.1: Staff training, knowledge and awareness**

Q19	<p>The team responsible for managing the tourist operation is qualified and highly experienced.</p> <p>a) Strongly agree b) Agree c) Partially agree d) Disagree e) Other (please provide brief explanation)</p>	[Choose one]
Q20	<p>Further environmental training and education as part of the professional development goals of key operational staff is valued by staff and management:</p> <p>a) Strongly agree b) Agree c) Partially agree d) Disagree e) Other (please provide brief explanation)</p>	[Choose one]
Q21	<p>Please outline briefly how internally and externally delivered ecotourism and environmental training is made available to staff.</p>	[open text response or provide attachment]
Q22	<p>In the context of ecotourism management and Responsible Reef Practices, professional development and training goals are always met:</p> <p>a) Strongly agree b) Agree c) Partially agree d) Disagree e) Other (please explain)</p>	[Choose one]

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**Section 4.2: Extension and research activities**

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Q23	<p>Please provide details of any environmental extension or research programs relevant to GBR health and management that your company is involved in beyond regulatory requirements. This may include activities such as:</p> <ul style="list-style-type: none"><li>• Eye on the Reef</li><li>• Reef Guardians</li><li>• Crown of Thorns control programs</li><li>• other monitoring programs</li><li>• science and development research (e.g. University sponsorships/partnerships, GBR Foundation etc)</li></ul> <p>Please provide brief details on the activity, years of involvement/future commitment, program timeframes (e.g. long/short term). If possible or appropriate, please provide an indication of overall funding investment per annum (including in-kind contributions).</p>	[open text response or provide attachment]
Q24	<p>Please provide a short description of any leading practice examples of environmental management that you wish to share, such as use of technology and innovation to improve outcomes, adaptive management, new business practices (note: with your permission, these may be used as case studies in future reports).</p>	[open text response or provide attachment]

# Appendix I Instructions for populating scoring templates

MS Excel spreadsheets have been developed in order to derive stewardship scores from the above questionnaire. There are four spreadsheets:

- Scoring template – port stewardship
- Scoring template – heavy industry stewardship
- Scoring template – aquaculture stewardship
- Scoring template – tourism stewardship

For each reporting period, the following steps should be completed to derive stewardship scores. It is assumed that the same suite of companies will be surveyed with the same questions. If additional companies and/or questions are included in subsequent years, then the automatic calculation of overall formulas will need to be updated. Instructions for adding/deleting companies are provided below.

To derive port stewardship scores use the spreadsheet entitled 'Scoring template – port stewardship' and:

- Enter all responses for each company into their own labelled sheet into columns F and G by:
  - Type a brief summary of the responses into column F to provide an overview
  - Allocate a score in column G as per the instructions in column E. Very effective – 4, effective – 3, partially effective 2, not effective 1
  - If the response is NA, type NA into column F and leave column G blank (very important for formulas to calculate overall scores correctly)
- Enter all responses from other companies into relevant sheets as per above.
- Enter EHP/DAF compliance rate data where indicated in each sheet (highlighted in blue).
- Final evaluations for each company will auto populate in the 'Final evaluation' section (cells J1 to M6).
- Go to the scoring sheet to see a summary of all companies' results
- To derive overall scores for port stewardship, right-click in cell I1 and 'refresh'.
- Blank scoring sheets for additional companies are provided as 'master' sheets.
- If new sheets are completed or current companies do not respond, then the following steps should be undertaken to update the scoring sheet:
  - For new additions – copy appropriate 'master sheet' and complete as instructed above. Name the new sheet with the company name (e.g. New company).
  - For current company non-responses – delete their existing sheet
  - Go to scoring sheet and add or delete companies in columns A-E to mirror current format
  - To populate columns C-D, use the following formulae. It is very important that the company name in the formula below is exactly the same as it appears on the data entry sheet – the worked example relies on all sheets and formula using 'New company' as the name.

New company	Administration	= 'New company'!K24	= 'New company'!L24	= 'New company'!M24
	Operations	= 'New company'!K25	= 'New company'!L25	= 'New company'!M25
	Development	= 'New company'!K26	= 'New company'!L26	= 'New company'!M26
	Shipping	= 'New company'!K27	= 'New company'!L27	= 'New company'!M27

- Once data entry is complete, delete data from any cells in columns C-D that display #DIV/0! and delete all data in columns I to L.
- Highlight columns A-E
- Go to Insert – PivotTable – Pivot Table
- Click 'Existing Worksheet' and then click I1 (this should now populate with cell I1 in the location box)
- Click OK. This will create a pivot table, which will summarise results.
- In the Pivot Table Field List (will appear on the right), check the Activity Group box (and ensure this appears under Row Labels)
- Check the Planning, Implementation and Outcome boxes. These will auto-populate to Row Labels. Click on each and drag across to  $\Sigma$  Values.
- These will default to the count of each. Click on each, chose Value Field Settings, click Average.
- Click in any blank cell to hide pivot table control panel (or click on cell I1 to make it re-appear).
- Scores in the pivot table are the port stewardship scores for each activity group / management theme.

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