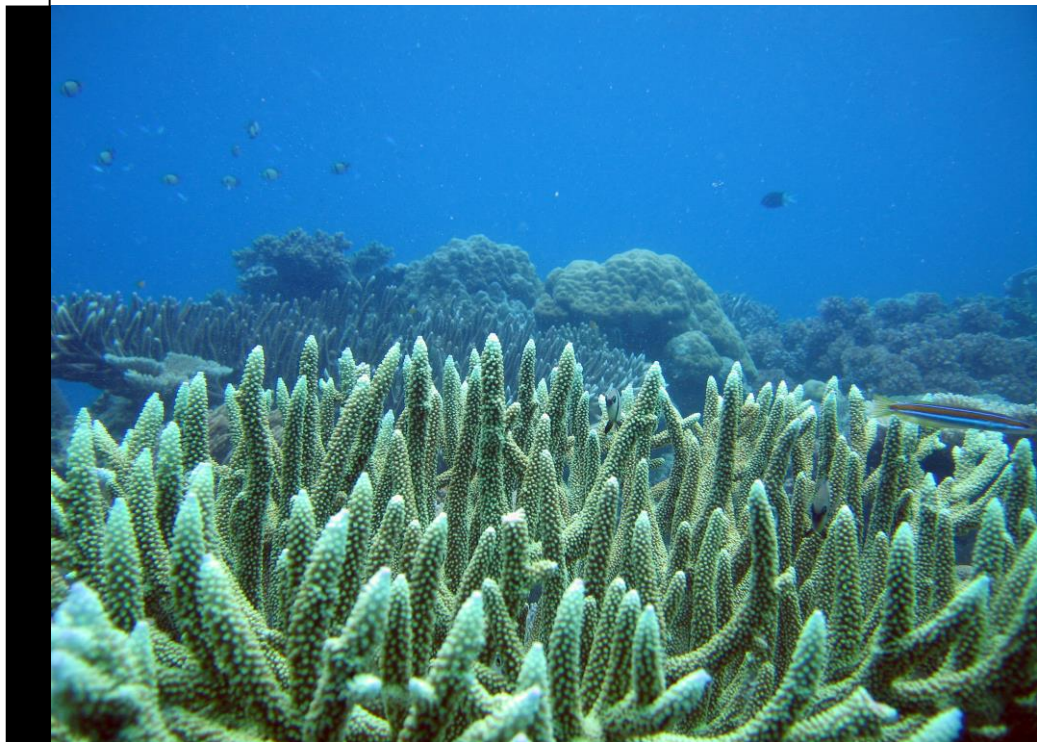


A review of the vulnerability assessment of coral taxa collected in the Queensland Coral Fishery

May 2013



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NOTE TO READER / UPDATE

This report was prepared in 2013 and is based on the management regime used in the Queensland Coral Fishery (QCF) at that point in time. Vulnerability rankings contained in this report will not take into consideration more recent changes to management or reform initiatives that have been implemented in the fishery. Similarly, this report does not take into account the *Sustainable Fisheries Strategy 2017 – 2027* which was released by the Queensland Government on 9 June 2017. This Strategy includes a detailed commitment to publish a guideline on Ecological Risk Assessments and undertake ERAs for priority fisheries or species by 2020. The methodology used to construct these ERAs may differ from that used in the QCF in 2013.

This publication has been compiled by Anthony Roelofs of Fisheries Queensland, Department of Agriculture and Fisheries.

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Front cover: Staghorn coral at Elford Reef, Queensland (photograph courtesy of Anthony Roelofs).

INTRODUCTION

This assessment provides a review of the original vulnerability assessment of the Queensland Coral Fishery (QCF) completed in 2007 (Roelofs & Silcock 2008b). This review builds on the simple, flexible framework for evaluating coral species vulnerability developed in the original assessment. By quantifying factors that influence a species vulnerability to collection by the fishery, specific management measures to mitigate fishing impacts can be developed for those coral species evaluated at moderate to high risk. The vulnerability assessment has been designed as a pre-assessment tool to review the ecological risk assessment of the QCF completed in 2007 (Roelofs 2008). The vulnerability assessment identifies key sustainability issues and species requiring further assessment in the QCF up to 2012. The more vulnerable species will be assigned levels of ecological risk by a working group consisting of industry members, scientific experts, and fisheries management and conservation agency representatives.

The framework for this study is conceptually similar to the approach taken by Ponder and Grayson (Ponder & Grayson 1998) for assessing risk to marine gastropods from collection activities and builds on methods developed for the previous Queensland Marine Aquarium Fish Fishery (MAFF) (Roelofs & Silcock 2008a). The assessment utilises a defined set of ecological values regarding distribution & accessibility, ecological niches and susceptibility to natural disturbances (e.g., coral bleaching) to determine each species level of vulnerability risk.

Fishery background

At the time of this assessment¹, the QCF is classified as a small scale, quota managed, hand harvest fishery (commercial Total Allowable Catch = 200 tonnes) with 31 licence holders (59 authorities). About 76.4 t (comprised of 28.1 t specialty coral and 48.3 t other coral [including 42.6 t live rock and 5.7 t ornamental]) were harvested during the 2011–12 season. While the fishery is small scale in global terms, it is the largest Australian fishery (Wabnitz et al. 2003).

Management arrangements

Commercial fishery

From 1 July 2006 the commercial coral fishery operated under the DPI&F "Policy for the Management of the Coral Fishery". This Policy introduced several major changes to the operation and management of the fishery:

- Roving harvest for all licence holders, in place of individual Coral Collection Areas (CCAs)
- Removal of the inappropriate 6m depth limit to allow collection in ideal habitats
- Capping the take of live coral at 30% of the commercial fishery's Total Allowable Catch (TACC), which remains at 200 tonnes
- Reporting of catch prior to landing
- More detailed logbook reporting

Additionally, the following management measures are still in place for the commercial fishery under legislation and policy:

- Limited entry: 59 Commercial Harvest Fishery Licences (CHFLs) are endorsed for the coral fishery.
- Limits on the number of boats and collectors operating under a licence at any one time.
- Collection by hand or hand-held implements only, with the aid of artificial breathing apparatus allowed.

¹ Licence conditions relating to the reporting of coral collection and quota in the QCF were amended on 1 July 2016 (see the [2016 Policy for the management of the Queensland Coral Fishery](#)). The changes strengthened accountability and transparency in the fishery. While these changes do not alter the findings of this report, a subsequent review of the ERA is recommended. Currently this is scheduled for 2019.

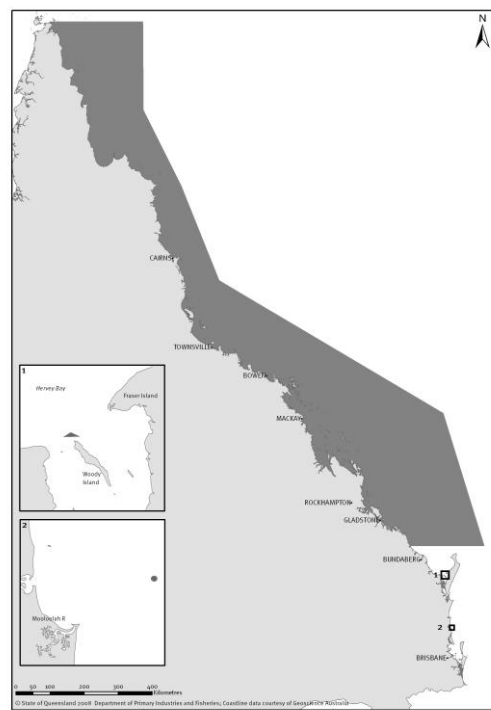


Figure 1. Map of the Queensland Coral Fishery

The policy was reviewed in 2008 and a revised policy implemented on 1 July 2009. Endorsed changes to the Policy included:

- Clearer definitions of Policy objectives including development of a separate Performance Measurement System (PMS) to monitor fishery performance in meeting its management objectives.
- Refining the intent of the policy provisions to provide for long-term resource sustainability, minimising the effects local concentrations of fishing effort, providing opportunities for economic development of the QCF, and commitment to ensuring community benefit of the coral resource is maintained.
- Refining the reporting arrangements to improve the quality of logbook reporting and minimising industry administration requirements.
- Changing references to 'live coral' to 'specialty coral' to better reflect product end use.
- Removal of the free trip allowance of LC1 coral – reporting transition period ends with the new policy.
- New catch review points (to be applied through the QCF PMS) – see Spatial trends/issues section.
- Refining the logbook to include all species identified as requiring monitoring through the Ecological Risk Assessment process.

Recreational fishery

- No selling or trading of catch.
- No use of underwater breathing apparatus (i.e. SCUBA or hookah), other than a snorkel.
- No collection in State Marine Parks and the GBRMP.

No coral or coral products were reported as harvested recreationally in the [2010 Statewide Recreational Fishing Survey](#).

Fishery area

The commercial coral fishery area includes tidal waters along Queensland's east coast between the tip of Cape York and the Queensland-New South Wales border (Figure 1).

Commercial coral harvesters can harvest from all tidal waters (under Queensland jurisdiction) extending from the tip of Cape York to the southern extent of the Great Barrier Reef Marine Park (GBRMP) at a latitude of 24 degrees 30 minutes south (so long as they are open to coral harvesting under GBRMP Zoning). This is referred to as "roving harvest". Two small areas south of the GBRMP are open to harvesting under specific licences.

The fishery is 'divided' into three zones – Cairns, Keppel and Other. Catch and effort levels are monitored closely in these areas. Effort in the Keppel CCA has been trending downwards since 2006–07 while Cairns CCA has stayed reasonable stable (Figure 2). Collection from areas outside of the two CCAs ('Other') increased from 2006–07 following the introduction of the roving licence policy reaching a peak in 2010–11. This suggests that the area has been absorbing additional or transferred effort in the fishery which was the original intent of creating the CCAs. This is also demonstrated by increases in the number of operators collecting in the Other area (Figures 3 and 4).

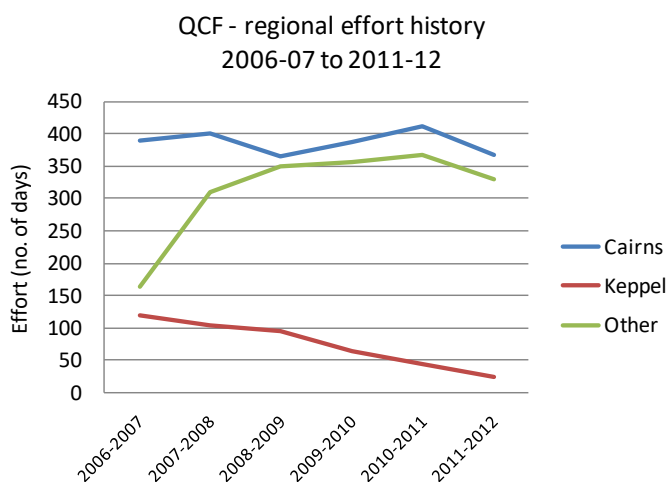


Figure 2. History of effort in the three regions of the Queensland Coral Fishery.

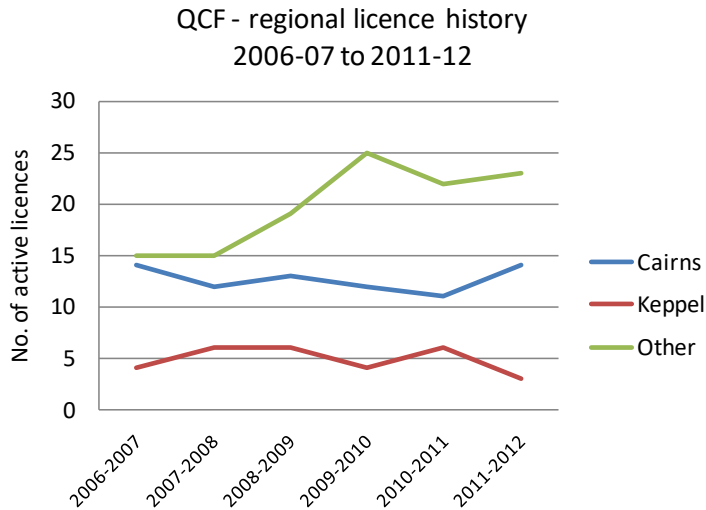


Figure 3. History of active licences accessing the three regions of the Queensland Coral Fishery.

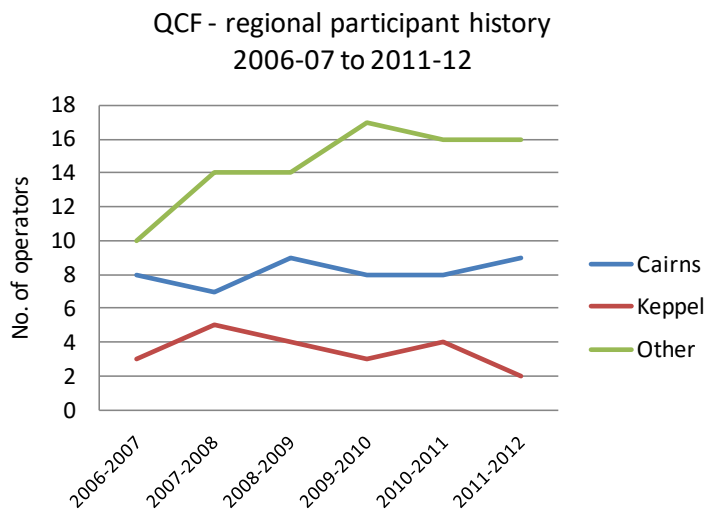


Figure 4. History of number of operators collecting in each of the three regions of the Queensland Coral Fishery.

Main target species

The commercial Coral Fishery is based on the collection of a broad range of species from the classes Anthozoa and Hydrozoa. The key components of the fishery are:

- Specialty corals (includes anemones, soft and hard corals)
- Ornamental (non-living) corals
- Living rock (i.e. dead coral skeletons with algae and other organisms living on them)
- Coral rubble (i.e. coarsely broken up coral fragments)
- Coral sand (i.e. finely ground up particles of coral skeleton) - only taken as incidental catch and may not be targeted within Marine Park waters

Due to the strong market demand for live corals for use in private aquaria, key target species are generally the small and vibrant varieties of coral. Live rock is also a major component of the fishery, due to its suitability as a substrate for the smaller, brighter corals in aquarium tanks. Anemones (Order Actinaria) are also a key target group of the coral fishery. Coral taxa from over 35 families of soft and hard corals and anemones are harvested for the live aquarium trade.

There have been recent shifts in collection trends with more specialty corals collected and a broadening of the range of species collected for live aquaria (Figures 5 & 6, Table 1). The driver these changes appears to be increases in the

number of small pieces of coral (reporting category LC2—hard coral pieces from 1 to 100 gm) of undifferentiated Acroporid and Pocilloporid species and *Scolymia* species (either *Scolymia vitensis* or *S. australis*) (see Tables 2–5). The trend in increased collection of Acroporid species was reported in the 2011 Annual Status Report and the 2012 Condition 7 report. Those reports noted that recent advances in the husbandry of Acroporid species have led to greater success in specimen survival during transport and has resulted in export opportunities. Reporting of the range of Acroporid and Pocilloporid species collected in the fishery is poor due to logbooks not requiring reporting at the species level for this group.

Coral families targeted for the non-living, ornamental coral trade include:

- Pocilloporidae (cauliflower/bird's nest corals)
- Acroporidae (staghorn/velvet corals)

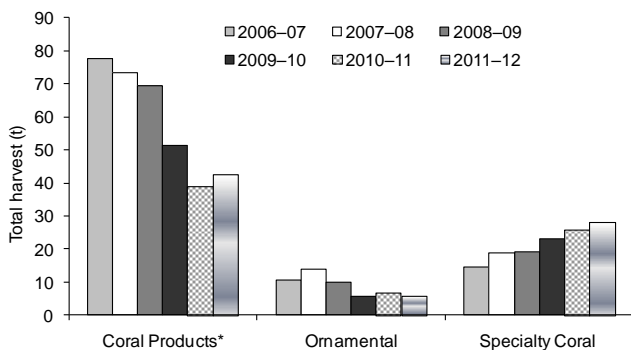


Figure 5: Catch composition (QCF Logbook categories) of all coral collected in the Queensland Coral Fishery for the quota years 2006–07 to 2011–12 (Source: Fisheries Queensland CFISH database, 17 Dec 2012). * includes Live Rock, Coral Rubble and LC1.

Table 1: Number of individual pieces and weight of Speciality Coral species collected in the Queensland Coral Fishery from 2006–07 to 2011–12 (Source: Fisheries Queensland CFISH database, 17 December 2012).

Year	No. of individual pieces	Weight (kg)
2006-07	71,827	14,422
2007-08	119,125	18,883
2008-09	150,875	19,264
2009-10	176,233	22,960
2010-11	204,112	25,747
2011-12	218,997	28,157

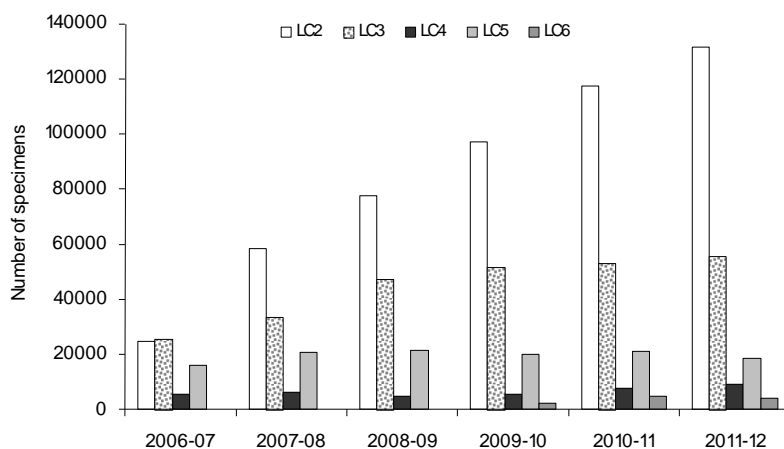


Figure 6: Number of individual pieces of Specialty Coral categories for the quota years 2006–07 to 2011–12. Note the LC6 size category has only been in use since 2009–10 (Source: Fisheries Queensland CFISH database, 17 December 2012).

Gear

Coral may only be taken by hand or by using hand-held non-mechanical implements, such as a hammer and chisel. Licence holders may also use underwater breathing apparatus (SCUBA or hookah) when taking coral. Where a chisel is used, divers endeavour to remove only the coral itself, taking great care to minimise the amount of substrate that is taken or damaged. These removal methods reduce freight costs (less weight and volume) and also limit the environmental footprint of their harvesting.

Marketing

The coral fishery focuses on the collection of coral specimens for commercial and private marine aquariums and to supply a small trade in decorative souvenirs and ornaments. Currently more than 85 per cent of all coral harvested goes into the export aquarium trade. Although a significant Australian industry, the QCF is not considered one of the major exporters of hard and soft corals and living rock on the world scale with the QCF representing about 19% of global live coral exports in 2010 (not including ornamental and live rock) (Source CITES database: Wood unpublished data) (Wabnitz et al. 2003). Given the size of harvest relative to the resource and the quota control of coral amounts being harvested, Queensland's coral fishery is one of the lowest impact coral fisheries on an international level. The emphasis of the fishery is on quality rather than quantity, which contributes to both the ecological and economic sustainability of the fishery.

Fishery impact

A Non Detriment Finding report was completed for the fishery in 2012. Many of the recommendations regarding the need for improvements to the data collection and management framework for the fishery of that report were reflected in the conditions and recommendations associated with the WTO export approval for the fishery. This included the urgent requirement for the review of the Vulnerability and Ecological Risk Assessments for the QCF which are to be completed by July 2013. The NDF report noted an important fact about the potential impact of the fishery in the following statement:

In consideration of the potential impact of this fishery it needs to be taken into account that:

- 1. Greater than 30% spatial protection is afforded by zoning in the Great Barrier Reef Marine Park plus there is a further natural protection because many sites can only rarely be dived (also, less than 1% of the GBR area is visited per year by licensed collectors);*
- 2. The scale of the fishery is small in comparison to the scale of the GBR and, with the possible exception of some localised depletion, effort is well spread. The inter-reefal area is also much larger than reefal area on the GBR and there is comparatively little competition for habitat space in the inter-reefal areas*

VULNERABILITY ASSESSMENT METHODS

The assessment ranked 220 coral and anemone genera for aspects of their biology and ecology likely to render them vulnerable to harvesting activities carried out in the QCF. The taxa list was collated using stock lists provided by a selection of QCF operators from the south, central and north regions of the fishery. The taxa list also included species of concern as identified by the Commonwealth Species Conservation section to ensure that species of concern internationally were also assessed. The taxa list therefore does not represent the entire suite of species that potentially may be collected (about 500 species in the GBR); however it comprehensively represents those that are presently collected.

A database was created in Microsoft Access® to store information related to the ranking criteria for each of the 220 coral and anemone genera considered in this study. The overall vulnerability risk for each coral taxa was determined by the average of the rankings across all criteria. Values that were not scored against a criterion for a species were not included in the averaging of the overall score.

Vulnerability Criteria

Criteria were developed to categorise targeted taxa in terms of environmental and ecological factors that influence their potential vulnerability to harvesting activities by the QCF. The methodology was based on the model for vulnerability risk assessment developed for specimen marine molluscs by Ponder & Grayson (1998). All vulnerability criteria were given the same weighting, indicating that each criterion were equally important in determining the overall risk. Rankings were scaled in increasing order of risk (i.e. 5 = higher level of risk).

Accessibility

1. Very limited accessibility – >60m; very deep water
2. Limited accessibility – 30–60m; specialist diving
3. Accessible – 10–30m; diving only (limited by dive tables)
4. Readily accessible – 5–10m; diving (no limits)
5. Readily accessible – 0–5m; free diving

Due to the nature of coral collection, divers are restricted to the same diving safety standards that they face when collecting fish species; making the level of effort that can potentially be applied similar to that of the Queensland Marine Aquarium Fish Fishery (Roelofs & Silcock 2008a).

The QCF is based on hand collection by divers and therefore the amount of harvest effort is mostly limited by time and depth, although the type and location of collection habitat, weather conditions, turbid water and strong tidal currents also influence the amount of effort in some cases. ‘Accessibility’ refers to the level of effort that can be potentially applied to the collection of coral species. Consequently shallow waters can receive more effort than deep water habitats because of increased dive times, increasing the vulnerability/exposure of shallow water species to collection (i.e., no time limits for free diving, very long dive periods for shallow water (5–10m) SCUBA or hookah diving). Corals that are distributed predominantly below 30 metres (beyond safe dive depths) are considered to be at lower risk from over collection. Below 30 metres however we do make one distinction with ‘Limited accessibility’ referring to specialist diving activities using mixed gases and re-breathers which allows greater lengths of dive and therefore access to fish populations at depths to 60 metres. Few collectors operate with this additional diving capacity. Where a species occurred over a range of depths or accessibility criteria (not including species that are difficult to capture), each category was recorded and an average taken for the overall ranking.

Habitat/Ecological niche

2. Generalist—wide range of habitats and depth preferences; colonizing species or ‘R’ strategists
4. Specialist—taxa have a limited or defined niche; climax species or ‘K’ strategists

The generalist category recognises these species are less vulnerable due to their wide range of niches they associate with. This may provide refugia from fishery and climatic impacts which in turn could provide a source of recruitment. Generalists also include colonizing species or ‘R’ strategists referring to the species’ ability to quickly reproduce to fill disturbed areas or quickly repair following damage. The specialist category recognises that some species are more vulnerable because the niches they occupy are restricted in some way and/or the species have developed specialised behaviours/modifications to occupy particular niche habitats. These taxa are likely to be affected by limited recruitment if local populations are removed through concentrated harvesting or destroyed by catastrophic climate and weather events. Specialist coral taxa also include climax species or ‘K’ strategists that take a longer time to

establish within niches and out compete other species. They have longer regeneration times than generalist taxa. Specialist coral taxa are considered more vulnerable to over collection than generalist taxa.

Susceptibility to bleaching

1. Low
3. Moderate
5. High

A key consideration in the overall vulnerability of corals is their susceptibility to bleaching events associated with global warming. The susceptibility to bleaching criteria was adopted from Marshall and Baird (2000). Bleaching may result from high or low water temperatures, excessive ultraviolet radiation, aerial exposure, reduced salinity, high sedimentation, pollutants, or toxins (Glynn 1991; Hoegh-Guldberg & Salvat 1995; Brown 1997; Hoegh-Guldberg 1999). The response to these impacts is varied however and is not always fatal for the coral host. Coral bleaching has been interpreted as an adaptation for survival (Baker 2001). Sudden exposure to increased irradiance after upward transplantation of corals from depths can lead to adaptive changes in symbiont communities. Baker (2001) found that some reef corals have flexible associations that can switch or shuffle symbiont communities in response to environmental change.

Abundance

1. Very common
2. Common
3. Moderately common
4. Uncommon
5. Rare

The abundance of each collected coral and anemone genera is a key element in their overall vulnerability. It is likely that the more abundant a species is, then the more collection pressure the population is likely able to tolerate. And the reverse is true as well. We have determined the ranking for each genera from the literature however there are limitations to these information sources. Many estimates of abundances for the Great Barrier Reef are from relatively shallow depths (<30m deep) and inter reef areas have not been traditionally surveyed. There are therefore gaps in our knowledge on the distributions of many coral species at present. Scores were calculated using the most local scale information possible.

Growth rates

1. Colonies that are branching or plates of branchlets – corallite size ≤ 2 mm
2. Colonies with meandering ridges and valleys in any shape colony – corallites vary from 1->10 mm
3. Colonies that are massive, thick or comprise thin plates or crusts – corallites vary from <8mm to 20mm (excluding meandering corallites)
4. Corals with large, daytime expanded polyps and large tentacles with heavy skeletons (excluding *Catalaphyllia*, *Euphyllia*, and *Plerogyra*)
5. Solitary isolated or free living colonies with large polyp sizes (50 – 300 mm) (including *Catalaphyllia*, *Euphyllia*, and *Plerogyra*)

The size of individual coral polyps or corallites is negatively correlated to a species growth rate. Larger polyp sizes tend to indicate slower growth rates and longer time to maturity. It is generally known that branching corals have more perforate skeletons and grow faster than massive corals which have very dense skeleton. Free-living, solitary corals also have dense heavy skeletons and have slow growth rates. The growth categories presented here have been adapted from Kelley (2009).

Mode of reproduction

2. Hermaphroditic broadcast spawners
3. Gonochoric broadcast spawners
4. Brooders with mass release of larvae/eggs
5. Brooders with gradual release of larvae/eggs

The mode of reproduction category is presented here as a proxy for local scale depletion vulnerability. A species capacity to recover from collection or disturbance events is related to its recruitment and growth potential. Recovery can occur through regrowth and fragmentation of colonies however depleted populations are also dependent on the density of mature animals to reproduce successfully and produce enough recruits for recovery (see van Oppen et al 2008). Corals employ a variety of reproductive strategies, the most well known being the synchronised mass spawning events that occur in summer months. Not all coral species engage in this mass spawning and have developed alternate strategies for reproduction. 'Of the 428 coral species for which the mode of development has been recorded, 354 species (82.7%) are broadcast spawners, whereas 61 species (14.3%) are brooders' (Harrison 2011). These differences present different levels of vulnerability when it comes to recovery of denuded populations at the local scale (e.g. patch or reef scale). Gradual release brooder corals typically recruit within metres of the parent. While these larvae are considered robust in terms of survival the recovery of a local population is highly dependent on the fecundity, mode of reproduction, health and density of adult colonies. In this case, recruitment from wider sources is not guaranteed in the short term.

RESULTS

Vulnerability risk categories are shown in Table 1. We ranked 99 coral and anemone taxa for their vulnerability risks (Table 2). Three anemone species collected in the fishery possessed characteristics that when combined, defined it as highly vulnerable (shaded dark orange) (Table 2). A total of 81 genera of anemones (6), soft corals (15) and reef building corals (60) were considered to be at moderate risk (shaded gold) (Tables 2 to 5). A total of 16 reef building coral taxa have been identified by the commonwealth as species of concern (shaded pink) that were not scored as moderately vulnerable and will need to be discussed at the ensuing risk assessment workshop. The remaining genera were all considered to be a low vulnerability risk.

Table 1: Vulnerability risk categories for coral taxa collected in the Queensland Coral Fishery

Vulnerability Risk	Average score from criteria	Description
Very Low	<2	These taxa are not vulnerable to collection activity in the QCF.
Low	2–2.99	These taxa are at low risk from QCF collection activity.
Moderate	3–3.99	These taxa have characteristics that make them moderately vulnerable to collection by the fishery.
High	4–5	These taxa have characteristics that make them highly vulnerable to collection by the fishery.

Table 2. Vulnerability rankings for anemone taxa harvested in the Queensland Coral Fishery (taxa in dark orange are highly vulnerable; gold shaded taxa are moderately vulnerable).

Order	Family	Genus	Species	Repro rank	Growth rank	Niche rank	Bleach rank	Access rank	Abundance rank	VAR
Actiniaria	Actiniidae	<i>Actinia</i>	<i>tenebrosa</i>	5		2	0	5	2	2.8
Actiniaria	Actiniidae	<i>Entacmaea</i>	<i>quadricolor</i>	3		2	5	4	2	3.2
Actiniaria	Stichodactylidae	<i>Heteractis</i>	<i>aurora</i>	3		2	3	3	2	2.6
Actiniaria	Stichodactylidae	<i>Heteractis</i>	<i>crispa</i>	3		2	3	4	2	2.8
Actiniaria	Stichodactylidae	<i>Heteractis</i>	<i>magnifica</i>	3		2	3	3.5	2	2.7
Actiniaria	Stichodactylidae	<i>Stichodactyla</i>	<i>gigantea</i>	3		2	3	3	2	2.6
Actiniaria	Stichodactylidae	<i>Stichodactyla</i>	<i>haddonii</i>	3		2	3	3	2	2.6
Actiniaria	Stichodactylidae	<i>Stichodactyla</i>	<i>mertensii</i>	3		2	3	4	2	2.8
Actiniaria	Thalassianthidae	<i>Cryptodendrum</i>	<i>adhaesivum</i>	3		2	3	4.5	2	2.9

Table 3. Vulnerability rankings for soft coral taxa harvested in the Queensland Coral Fishery (taxa in gold are moderately vulnerable).

Order	Family	Genus	Species	Repro rank	Growth rank	Niche rank	Bleach rank	Access rank	Abundance rank	VAR
Alcyonacea	Alcyoniidae	<i>Alcyonium</i>	<i>spp.</i>	3		2	3	3.5	2	2.7
Alcyonacea	Alcyoniidae	<i>Cladiella</i>	<i>spp.</i>	3		2	5	4	2	3.2
Alcyonacea	Alcyoniidae	<i>Klyxum</i>	<i>spp.</i>	3		2	5	4	3	3.4
Alcyonacea	Alcyoniidae	<i>Lobophytum</i>	<i>crassum</i>	3		2	5	3.5	2	3.1
Alcyonacea	Alcyoniidae	<i>Lobophytum</i>	<i>pauciflorum</i>	3		2	5	3.5	2	3.1
Alcyonacea	Alcyoniidae	<i>Lobophytum</i>	<i>spp.</i>	3		2	5	4	2	3.2
Alcyonacea	Alcyoniidae	<i>Paraminabea</i>	<i>spp.</i>	3		2	0	3.5	5	2.7
Alcyonacea	Alcyoniidae	<i>Rhytisma</i>	<i>spp.</i>	3.5		2	5	4	4	3.7
Alcyonacea	Alcyoniidae	<i>Sarcophyton</i>	<i>spp.</i>	3		2	5	3.5	1	2.9
Alcyonacea	Alcyoniidae	<i>Sinularia</i>	<i>spp.</i>	3.5		2	5	4	2	3.3
Alcyonacea	Briareidae	<i>Briareum</i>	<i>spp.</i>	5		2	5	3	2	3.4
Alcyonacea	Briareidae	<i>Pachyclavularia</i>	<i>spp.</i>	3		2	5	3	2	3
Alcyonacea	Clavariidae	<i>Carijoa</i>	<i>spp.</i>	3		2	0	3	4	2.4
Alcyonacea	Clavariidae	<i>Clavularia</i>	<i>spp.</i>	5		2	5	4	2	3.6
Alcyonacea	Discosomatidae	<i>Discosoma</i>	<i>spp.</i>	5		2	1	4	2	2.8
Alcyonacea	Discosomatidae	<i>Rhodactis</i>	<i>spp.</i>	3		4	1	4	2	2.8
Alcyonacea	Ellisellidae	<i>Ctenocella</i>	<i>spp.</i>	3		2	1	3	2	2.2
Alcyonacea	Ellisellidae	<i>Ellisella</i>	<i>spp.</i>	3		4	1	2.5	2	2.5
Alcyonacea	Gorgoniidae	<i>Hicksonella</i>	<i>spp.</i>			4	1	3	4	3
Alcyonacea	Gorgoniidae	<i>Various</i>	<i>spp.</i>	3		4	1	3.5	5	3.3
Alcyonacea	Helioporidae	<i>Heliopora</i>	<i>coerulea</i>	3		2	5	5	2	3.4
Alcyonacea	Melithaeidae	<i>Melithaea</i>	<i>spp.</i>	3		2	0	3	3	2.2
Alcyonacea	Nephtheidae	<i>Capnella</i>	<i>spp.</i>	3.5		2	0	3	2	2.1
Alcyonacea	Nephtheidae	<i>Dendronephthya</i>	<i>spp.</i>	3.5		4	0	2.5	4	2.8
Alcyonacea	Nephtheidae	<i>Lemnalia</i>	<i>spp.</i>	3		2	0	3.5	2	2.1
Alcyonacea	Nephtheidae	<i>Litophyton</i>	<i>spp.</i>	3		2	1	4	5	3
Alcyonacea	Nephtheidae	<i>Nephthea</i>	<i>spp.</i>	3		2	3	3.5	2	2.7
Alcyonacea	Nephtheidae	<i>Paralemnalia</i>	<i>spp.</i>	3		2	3	3.5	2	2.7
Alcyonacea	Nephtheidae	<i>Scleronephthya</i>	<i>spp.</i>	3		4	0	2.5	5	2.9
Alcyonacea	Nephtheidae	<i>Stereonephthya</i>	<i>spp.</i>	3		2	1	2.5	4	2.5
Alcyonacea	Nidaliidae	<i>Siphonogorgia</i>	<i>spp.</i>	3		4	1	2.5	4	2.9
Alcyonacea	Viguieriotidae	<i>Studeriotis</i>	<i>spp.</i>			2	0	3	2	1.8
Alcyonacea	Xeniidae	<i>Anthelia</i>	<i>spp.</i>	5		2	1	3.5	2	2.7
Alcyonacea	Xeniidae	<i>Asterospicularia</i>	<i>spp.</i>	3.5		2	1	4	2	2.5
Alcyonacea	Xeniidae	<i>Cespitularia</i>	<i>spp.</i>	5		2	1	3	2	2.6
Alcyonacea	Xeniidae	<i>Efflatounaria</i>	<i>spp.</i>	5		2	1	3.5	3	2.9
Alcyonacea	Xeniidae	<i>Sympodium</i>	<i>spp.</i>	3		2	1	3.5	2	2.3
Alcyonacea	Xeniidae	<i>Xenia</i>	<i>spp.</i>	4.5		2	1	3	2	2.5
Alcyonacea	Zoanthidae	<i>Palythoa</i>	<i>spp.</i>			2	1	3	2	2.0

Table 4. Vulnerability rankings for hard coral taxa harvested in the Queensland Coral Fishery (taxa in gold are moderately vulnerable, pink are species of concern that are less than moderately vulnerable).

Order	Family	Genus	Species	Repro rank	Growth rank	Niche rank	Bleach rank	Access rank	Abundance rank	VAR
Scleractinia	Acroporidae	<i>Acropora</i>	<i>aculeus</i>	2	1	2	5	4	2	2.7
Scleractinia	Acroporidae	<i>Acropora</i>	<i>acuminata</i>	2.5	1	2	5	4	2	2.8
Scleractinia	Acroporidae	<i>Acropora</i>	<i>aspera</i>	2	1	2	5	4.5	2	2.8
Scleractinia	Acroporidae	<i>Acropora</i>	<i>bushyensis</i>	2	1	2	5	4.5	5	3.3
Scleractinia	Acroporidae	<i>Acropora</i>	<i>cerealis</i>	2	1	2	5	4	1	2.5
Scleractinia	Acroporidae	<i>Acropora</i>	<i>chesterfieldensis</i>	2	1	2	5	4	3	2.8
Scleractinia	Acroporidae	<i>Acropora</i>	<i>digitifera</i>	2	1	2	5	4.5	2	2.8
Scleractinia	Acroporidae	<i>Acropora</i>	<i>echinata</i>	2	1	2	5	3.5	4	2.9
Scleractinia	Acroporidae	<i>Acropora</i>	<i>florida</i>	2	1	2	5	3.5	2	2.6
Scleractinia	Acroporidae	<i>Acropora</i>	<i>granulosa</i>	2	1	2	5	3	2	2.5
Scleractinia	Acroporidae	<i>Acropora</i>	<i>horrida</i>	2	1	2	5	3.5	3	2.8
Scleractinia	Acroporidae	<i>Acropora</i>	<i>hyacinthus</i>	2	1	2	5	4	2	2.7
Scleractinia	Acroporidae	<i>Acropora</i>	<i>latistella</i>	2	1	2	5	4	2	2.7
Scleractinia	Acroporidae	<i>Acropora</i>	<i>listeri</i>	2.5	1	2	5	4	4	3.1
Scleractinia	Acroporidae	<i>Acropora</i>	<i>loripes</i>	2	1	2	5	4	2	2.7
Scleractinia	Acroporidae	<i>Acropora</i>	<i>millepora</i>	2	1	2	5	4	2	2.7
Scleractinia	Acroporidae	<i>Acropora</i>	<i>multiacuta</i>	2	1	2	5	4	5	3.2
Scleractinia	Acroporidae	<i>Acropora</i>	<i>nana</i>	2	1	2	5	4.5	4	3.1
Scleractinia	Acroporidae	<i>Acropora</i>	<i>nasuta</i>	2	1	2	5	4	2	2.7
Scleractinia	Acroporidae	<i>Acropora</i>	<i>nobilis</i>	2	1	2	5	4	2	2.7
Scleractinia	Acroporidae	<i>Acropora</i>	<i>palmerae</i>	2.5	1	2	5	4	4	3.1
Scleractinia	Acroporidae	<i>Acropora</i>	<i>paniculata</i>	2	1	2	5	3.5	4	2.9
Scleractinia	Acroporidae	<i>Acropora</i>	<i>plana</i>	2	1	2	5	4	4	3.0
Scleractinia	Acroporidae	<i>Acropora</i>	<i>prostrata</i>	2	1	2	5	4	4	3.0
Scleractinia	Acroporidae	<i>Acropora</i>	<i>secale</i>	2	1	2	5	4	2	2.7
Scleractinia	Acroporidae	<i>Acropora</i>	<i>subglabra</i>		1	2	5	4	4	3.2
Scleractinia	Acroporidae	<i>Acropora</i>	<i>subulata</i>	2.5	1	2	5	4	2	2.8
Scleractinia	Acroporidae	<i>Acropora</i>	<i>tenuis</i>	2	1	2	5	3.5	2	2.6
Scleractinia	Acroporidae	<i>Acropora</i>	<i>tortuosa</i>	2	1	2	5	3.5	4	2.9
Scleractinia	Acroporidae	<i>Acropora</i>	<i>valida</i>	2	1	2	5	4	2	2.7
Scleractinia	Acroporidae	<i>Acropora</i>	<i>verweyi</i>	2	1	2	5	4	2	2.7
Scleractinia	Acroporidae	<i>Australogyra</i>	<i>zelli</i>	2	1	2	3	4	4	2.7
Scleractinia	Acroporidae	<i>Montipora</i>	<i>caliculata</i>	2	3	2	5	4	4	3.3
Scleractinia	Acroporidae	<i>Montipora</i>	spp.	2	2	2	5	4	2	2.8
Scleractinia	Agariciidae	<i>Leptoseris</i>	<i>explanata</i>		3	2	1	3	2	2.2
Scleractinia	Agariciidae	<i>Leptoseris</i>	<i>foliosa</i>		3	2	1	3.5	4	2.7
Scleractinia	Agariciidae	<i>Leptoseris</i>	<i>gardineri</i>		3	2	1	2.5	4	2.5
Scleractinia	Agariciidae	<i>Leptoseris</i>	<i>hawaiiensis</i>		3	2	1	3	4	2.6
Scleractinia	Agariciidae	<i>Leptoseris</i>	<i>incrustans</i>		3	2	5	3.5	4	3.5
Scleractinia	Agariciidae	<i>Leptoseris</i>	<i>mycetoseroides</i>		3	2	1	3	2	2.2
Scleractinia	Agariciidae	<i>Leptoseris</i>	<i>papyracea</i>		3	2	5	2	3	3.0
Scleractinia	Agariciidae	<i>Leptoseris</i>	<i>scabra</i>		3	2	1	3	2	2.2
Scleractinia	Agariciidae	<i>Leptoseris</i>	<i>solida</i>		3	2	1	3	4	2.6
Scleractinia	Agariciidae	<i>Leptoseris</i>	<i>yabei</i>		3	2	5	3.5	4	3.5
Scleractinia	Agariciidae	<i>Leptoseris</i>	<i>explanata</i>		3	2	1	3	2	2.2
Scleractinia	Agariciidae	<i>Pachyseris</i>	<i>rugosa</i>	3	3	2	5	4	3	3.3
Scleractinia	Agariciidae	<i>Pavona</i>	<i>cactus</i>	3	3	2	5	4	2	3.2
Scleractinia	Astrocoeniidae	<i>Stephanocoenia</i>	<i>intersepta</i>	3	3	2	5	3	2	3.0
Scleractinia	Caryophyllidae	<i>Plerogyra</i>	<i>sinuosa</i>	3	5	2	1	4	4	3.2
Scleractinia	Dendrophylliidae	<i>Dendrophyllia</i>	spp.	3	4	4	0	2	4	2.8
Scleractinia	Dendrophylliidae	<i>Balanophyllia</i>	spp.	4.5	5	4	0	3	3	3.3
Scleractinia	Dendrophylliidae	<i>Duncanopsammia</i>	<i>axifuga</i>	3	4	2	1	3	3	2.7
Scleractinia	Dendrophylliidae	<i>Heteropsammia</i>	<i>cochlea</i>	3	5	4	1	3	2	3.0
Scleractinia	Dendrophylliidae	<i>Tubastrea</i>	<i>faulkneri</i>	5	4	4	0	3.5	2	3.1
Scleractinia	Dendrophylliidae	<i>Tubastrea</i>	<i>micrantha</i>	5	4	4	0	3.5	2	3.1
Scleractinia	Dendrophylliidae	<i>Turbinaria</i>	<i>bifrons</i>	3	3	2	5	4	4	3.5
Scleractinia	Dendrophylliidae	<i>Turbinaria</i>	<i>conspicua</i>	3	3	2	1	4	5	3.0
Scleractinia	Dendrophylliidae	<i>Turbinaria</i>	<i>frondens</i>	3	3	2	1	3.5	2	2.4
Scleractinia	Dendrophylliidae	<i>Turbinaria</i>	<i>heronensis</i>	3	3	2	3	4	5	3.3

Order	Family	Genus	Species	Repro rank	Growth rank	Niche rank	Bleach rank	Access rank	Abundance rank	VAR
Scleractinia	Dendrophylliidae	<i>Turbinaria</i>	<i>patula</i>	3	3	2	3	3.5	4	3.1
Scleractinia	Dendrophylliidae	<i>Turbinaria</i>	<i>peltata</i>	3	3	2	1	4	2	2.5
Scleractinia	Dendrophylliidae	<i>Turbinaria</i>	<i>radicalis</i>	3	3	2	1	4	4	2.8
Scleractinia	Dendrophylliidae	<i>Turbinaria</i>	<i>reniformis</i>	3	5	2	3	4	4	3.5
Scleractinia	Dendrophylliidae	<i>Turbinaria</i>	<i>stellulata</i>	3	3	2	1	4	4	2.8
Scleractinia	Euphyllidae	<i>Catalaphyllia</i>	<i>jardinei</i>	3	5	4	1	3	3	3.2
Scleractinia	Euphyllidae	<i>Euphyllia</i>	<i>ancora</i>	3	5	3	1	3	2	2.8
Scleractinia	Euphyllidae	<i>Euphyllia</i>	<i>cristata</i>	4	5	2	1	3	5	3.3
Scleractinia	Euphyllidae	<i>Euphyllia</i>	<i>divisa</i>	3	5	2	1	3.5	3	2.9
Scleractinia	Euphyllidae	<i>Euphyllia</i>	<i>fimbriata</i>	4	5	4	1	3.5	4	3.6
Scleractinia	Euphyllidae	<i>Euphyllia</i>	<i>glabrascens</i>	5	5	2	1	3	2	3.0
Scleractinia	Euphyllidae	<i>Euphyllia</i>	<i>paraancora</i>	3	5	2	1	3.5	3	2.9
Scleractinia	Euphyllidae	<i>Physogyra</i>	<i>lichtensteini</i>	3	4	2	1	4	2	2.7
Scleractinia	Faviidae	<i>Caulastrea</i>	<i>curvata</i>	3	2	2	3	4	4	3.0
Scleractinia	Faviidae	<i>Caulastrea</i>	<i>echinulata</i>	3	2	2	3	4	4	3.0
Scleractinia	Faviidae	<i>Caulastrea</i>	<i>furcata</i>	2	2	2	3	4	2	2.5
Scleractinia	Faviidae	<i>Caulastrea</i>	<i>tumida</i>	3	2	2	3	4	3	2.8
Scleractinia	Faviidae	<i>Echinopora</i>	<i>mammiformis</i>	2	3	2	1	4	2	2.3
Scleractinia	Faviidae	<i>Echinopora</i>	<i>pacificus</i>	2	3	2	1	4	2	2.3
Scleractinia	Faviidae	<i>Favia</i>	<i>rotundata</i>	3	3	2	1	4	4	2.8
Scleractinia	Faviidae	<i>Favia</i>	<i>speciosa</i>	2	3	2	1	3.5	2	2.3
Scleractinia	Faviidae	<i>Favites</i>	<i>abdita</i>	2	3	2	1	4	2	2.3
Scleractinia	Faviidae	<i>Favites</i>	<i>flexuosa</i>	2	3	2	1	4	2	2.3
Scleractinia	Faviidae	<i>Favites</i>	<i>pentagona</i>	2	3	2	1	4	3	2.5
Scleractinia	Faviidae	<i>Goniastrea</i>	<i>aspera</i>	2	3	2	1	3.5	2	2.3
Scleractinia	Faviidae	<i>Goniastrea</i>	<i>australensis</i>	2	3	2	1	3.5	2	2.3
Scleractinia	Faviidae	<i>Goniastrea</i>	<i>edwardsi</i>	2	3	2	1	3.5	2	2.3
Scleractinia	Faviidae	<i>Goniastrea</i>	<i>favulus</i>	2	2	2	1	4	4	2.5
Scleractinia	Faviidae	<i>Goniastrea</i>	<i>minuta</i>	2	3	2	1	4	4	2.7
Scleractinia	Faviidae	<i>Goniastrea</i>	<i>palauensis</i>	2	3	2	1	4	4	2.7
Scleractinia	Faviidae	<i>Goniastrea</i>	<i>pectinata</i>	2	3	2	1	3.5	2	2.3
Scleractinia	Faviidae	<i>Goniastrea</i>	<i>retiformis</i>	2	3	2	1	4	2	2.3
Scleractinia	Faviidae	<i>Leptastrea</i>	<i>aequalis</i>	3	3	2	1	4	5	3.0
Scleractinia	Faviidae	<i>Leptastrea</i>	<i>bewickensis</i>	3	3	2	1	3	4	2.7
Scleractinia	Faviidae	<i>Leptastrea</i>	<i>inaequalis</i>	3	3	2	1	3	4	2.7
Scleractinia	Faviidae	<i>Leptastrea</i>	<i>pruinosa</i>	3	3	2	1	3	2	2.3
Scleractinia	Faviidae	<i>Leptastrea</i>	<i>purpurea</i>	3	3	2	1	3	2	2.3
Scleractinia	Faviidae	<i>Leptastrea</i>	<i>transversa</i>	3	3	2	1	3.5	2	2.4
Scleractinia	Faviidae	<i>Leptoria</i>	<i>phrygia</i>	2	2	2	1	4	2	2.2
Scleractinia	Faviidae	<i>Montastrea</i>	<i>magnistellata</i>	2	3	2	1	3.5	4	2.6
Scleractinia	Faviidae	<i>Montastrea</i>	<i>spp.</i>	2	3	2	3	3.5	3	2.8
Scleractinia	Faviidae	<i>Montastrea</i>	<i>valenciennesi</i>	2	3	2	1	3	4	2.5
Scleractinia	Faviidae	<i>Moseleya</i>	<i>latistellata</i>	5	3	2	3	4	4	3.5
Scleractinia	Faviidae	<i>Oulophyllia</i>	<i>crispa</i>	2	2	2	3	3.5	4	2.8
Scleractinia	Faviidae	<i>Platygyra</i>	<i>spp.</i>	2	2	2	3	4	4	2.8
Scleractinia	Faviidae	<i>Plesiastrea</i>	<i>versipora</i>	3	3	2	1	3.5	4	2.8
Scleractinia	Fungiidae	<i>Fungia</i>	<i>cyclolites</i>	3	5	4	1	3.5	2	3.1
Scleractinia	Fungiidae	<i>Fungia</i>	<i>fragilis</i>	3	5	2	1	3.5	3	2.9
Scleractinia	Fungiidae	<i>Fungia</i>	<i>granulosa</i>	3	5	2	1	3.5	2	2.8
Scleractinia	Fungiidae	<i>Fungia</i>	<i>repanda</i>	2	5	2	5	3.5	2	3.3
Scleractinia	Fungiidae	<i>Heliofungia</i>	<i>actiniformis</i>	3	5	2	1	4	2	2.8
Scleractinia	Fungiidae	<i>Herpolitha</i>	<i>limax</i>	3	5	2	1	3.5	2	2.8
Scleractinia	Fungiidae	<i>Polyphyllia</i>	<i>talpina</i>	3	5	2	1	4	2	2.8
Scleractinia	Fungiidae	<i>Sandalolitha</i>	<i>robusta</i>	3	5	2	1	4	2	2.8
Scleractinia	Merulinidae	<i>Hydnophora</i>	<i>actiniformis</i>	2	3	2	5	3.5	3	3.1
Scleractinia	Merulinidae	<i>Hydnophora</i>	<i>exesa</i>	2	3	2	1	4	2	2.3
Scleractinia	Merulinidae	<i>Hydnophora</i>	<i>microconos</i>	2	3	2	5	3.5	2	2.9
Scleractinia	Merulinidae	<i>Merulina</i>	<i>ampliata</i>	2	3	2	1	3.5	1	2.1
Scleractinia	Mussidae	<i>Acanthastrea</i>	<i>bowerbanki</i>	2	3	2	3	4	4	3.0
Scleractinia	Mussidae	<i>Acanthastrea</i>	<i>echinata</i>	2	3	2	3	3.5	3	2.8
Scleractinia	Mussidae	<i>Acanthastrea</i>	<i>lordhowensis</i>	2	3	2	3	3.5	3	2.8
Scleractinia	Mussidae	<i>Acanthophyllia</i>	<i>deshayesiana</i>	2	5	2	1	2.5	4	2.8

Order	Family	Genus	Species	Repro rank	Growth rank	Niche rank	Bleach rank	Access rank	Abundance rank	VAR
Scleractinia	Mussidae	<i>Blastomussa</i>	<i>merleti</i>	3	3	4	1	4	3	3.0
Scleractinia	Mussidae	<i>Blastomussa</i>	<i>wellsi</i>	3	3	4	1	4	3	3.0
Scleractinia	Mussidae	<i>Cynarina</i>	<i>lacrymalis</i>	2	5	4	1	3.5	4	3.3
Scleractinia	Mussidae	<i>Lobophyllia</i>	<i>corymbosa</i>	2	2	2	1	3.5	2	2.1
Scleractinia	Mussidae	<i>Lobophyllia</i>	<i>diminuta</i>	2	2	2	1	4.5	5	2.8
Scleractinia	Mussidae	<i>Lobophyllia</i>	<i>hataii</i>	2	5	2	1	3.5	2	2.6
Scleractinia	Mussidae	<i>Lobophyllia</i>	<i>hemprichii</i>	2	5	2	1	3.5	1	2.4
Scleractinia	Mussidae	<i>Lobophyllia</i>	<i>pachysepta</i>	2	5	2	1	3.5	4	2.9
Scleractinia	Mussidae	<i>Lobophyllia</i>	<i>robusta</i>	2	5	2	1	3.5	2	2.6
Scleractinia	Mussidae	<i>Micromussa</i>	<i>amakusensis</i>	3		2	5	3.5	4	3.5
Scleractinia	Mussidae	<i>Mussa</i>	<i>angulosa</i>	4	5	2	1	3.5	4	3.3
Scleractinia	Mussidae	<i>Scolymia</i>	<i>australis</i>	3	5	4	1	3.5	3	3.3
Scleractinia	Mussidae	<i>Scolymia</i>	<i>vitiensis</i>	2	5	4	1	3.5	4	3.3
Scleractinia	Mussidae	<i>Symphyllia</i>	<i>agaricia</i>	2	2	2	1	3.5	2	2.1
Scleractinia	Mussidae	<i>Symphyllia</i>	<i>radians</i>	2	2	2	1	3.5	2	2.1
Scleractinia	Mussidae	<i>Symphyllia</i>	<i>recta</i>	2	2	2	1	3.5	1	1.9
Scleractinia	Mussidae	<i>Symphyllia</i>	<i>valenciennessii</i>	2	2	2	1	3.5	2	2.1
Scleractinia	Oculinidae	<i>Galaxea</i>	<i>astrea</i>	2	3	2	3	3.5	2	2.6
Scleractinia	Oculinidae	<i>Galaxea</i>	<i>fascicularis</i>	2.5	3	2	3	4	2	2.8
Scleractinia	Pectinidae	<i>Pectinia</i>	<i>spp.</i>	2		2	3	3.5	4	2.9
Scleractinia	Pectiniidae	<i>Echinophyllia</i>	<i>aspera</i>	2	3	2	3	2.5	2	2.4
Scleractinia	Pectiniidae	<i>Echinophyllia</i>	<i>spp.</i>	2	3	2	3	3	2	2.5
Scleractinia	Pectiniidae	<i>Mycedium</i>	<i>elephantotus</i>	2	3	2	3	3.5	2	2.6
Scleractinia	Pectiniidae	<i>Oxypora</i>	<i>lacera</i>	2	3	2	3	3.5	2	2.6
Scleractinia	Pectiniidae	<i>Pectinia</i>	<i>lactuca</i>	2	2	2	3	4	2	2.5
Scleractinia	Pocilloporidae	<i>Pocillopora</i>	<i>damicornis</i>	2	1	2	1	4	2	2.0
Scleractinia	Pocilloporidae	<i>Pocillopora</i>	<i>eydouxii</i>	2	1	2	1	4	2	2.0
Scleractinia	Pocilloporidae	<i>Pocillopora</i>	<i>spp.</i>	2		2	5	4	2	3.0
Scleractinia	Pocilloporidae	<i>Pocillopora</i>	<i>verrucosa</i>	2	1	2	1	3.5	2	1.9
Scleractinia	Pocilloporidae	<i>Seriatopora</i>	<i>caliendrum</i>	5	1	2	5	3.5	3	3.3
Scleractinia	Pocilloporidae	<i>Seriatopora</i>	<i>spp.</i>	5		2	5	3	3	3.6
Scleractinia	Pocilloporidae	<i>Stylophora</i>	<i>pistillata</i>	5		2	3	4	2	3.2
Scleractinia	Pocilloporidae	<i>Stylophora</i>	<i>spp.</i>	4		2	5	3.5	2	3.3
Scleractinia	Poritidae	<i>Alveopora</i>	<i>gigas</i>	5	4	2	1	3.5	4	3.3
Scleractinia	Poritidae	<i>Alveopora</i>	<i>spp.</i>	5	4	2	1	2	4	3.0
Scleractinia	Poritidae	<i>Goniopora</i>	<i>eclipsensis</i>	3	4	2	1	4	4	3.0
Scleractinia	Poritidae	<i>Goniopora</i>	<i>spp.</i>	4	4	2	1	4	2	2.8
Scleractinia	Poritidae	<i>Goniopora</i>	<i>stokesi</i>	3	4	4	1	3.5	4	3.3
Scleractinia	Poritidae	<i>Porites</i>	<i>cylindrica</i>	3	1	2	5	4	2	2.8
Scleractinia	Poritidae	<i>Porites</i>	<i>lichen</i>	5	3	2	1	4	2	2.8
Scleractinia	Poritidae	<i>Porites</i>	<i>nigrescens</i>	5	5	2	3	4	4	3.8
Scleractinia	Poritidae	<i>Porites</i>	<i>spp.</i>	4		2	1	4	2	2.6
Scleractinia	Siderastreaeidae	<i>Pavona</i>	<i>spp.</i>	3	3	2	1	4	4	2.8
Scleractinia	Stylasteridae	<i>Distichopora</i>	<i>spp.</i>	3		2	1	3	4	2.6
Scleractinia	Trachyphyllidae	<i>Trachyphyllia</i>	<i>geoffroyi</i>	3	5	4	1	2.5	3	3.1

Table 5. Vulnerability rankings for other taxa harvested in the Queensland Coral Fishery (taxa in gold are moderately vulnerable).

Order	Family	Genus	Species	Repro rank	Growth rank	Niche rank	Bleach rank	Access rank	Abundance rank	VAR
Stolonifera	Tubiporidae	<i>Tubipora</i>	<i>musica</i>	3		2	5	3.5	2	3.10
Zoanthidea	Zoanthidae	<i>Zoanthus</i>	<i>spp.</i>	2		2	1	4	2	2.20
Ceriantharia	Cerianthidae	<i>Cerianthus</i>	<i>spp.</i>	2		4	1	2.5	2	2.30
Corallimorpharia	Discosomatidae	<i>Amplexidiscus</i>	<i>fenestrafer</i>	2		2	1	3	2	2.00
Corallimorpharia	Richordeidae	<i>Ricordea</i>	<i>yuma</i>	3		2	1	4.5	2	2.50
Halichondria	Axinellidae	<i>Phakellia</i>	<i>spp.</i>	3		4	1	2.5	4	2.90

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