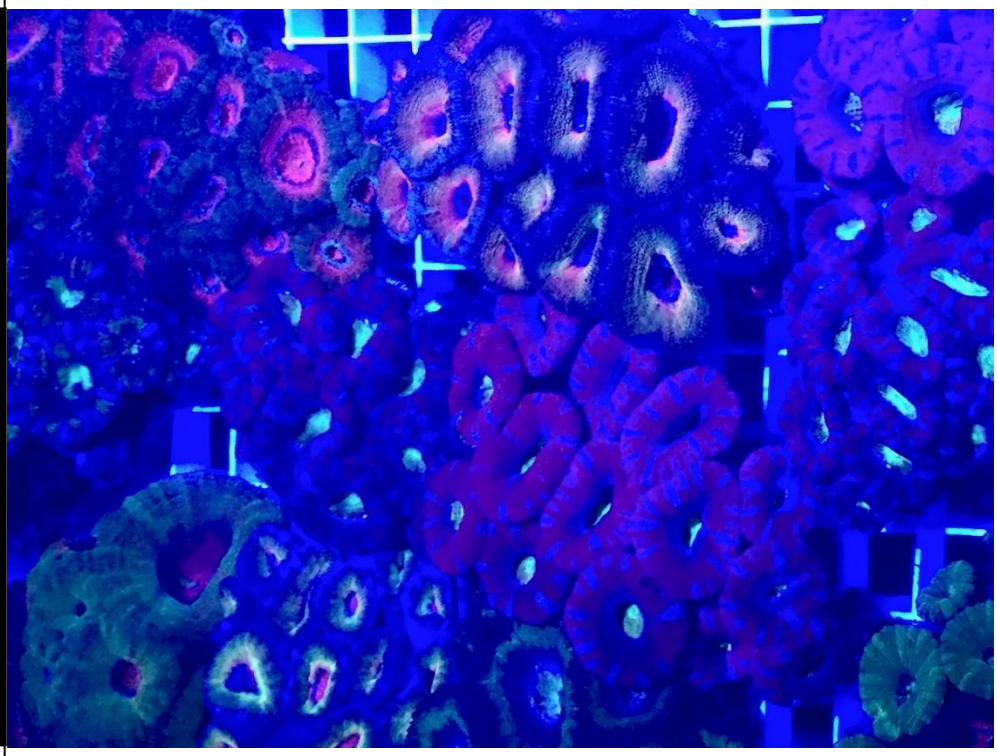
Ecological Risk Assessment of the Queensland Coral Fishery 2013

20–21 May 2013, Brisbane



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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.

Summary

This report provides a summary of risk outcomes and discussion based on an ecological risk assessment workshop for the Queensland Coral Fishery held in Brisbane on 20-21 May 2013. A total of 24 participants provided their expert knowledge of the fishery and the species it collects. Of the 80 species of sea anemone, hard and soft corals assessed at the workshop, 76 were classified as low risk and 4 as moderate risk. Mitigation measures were developed in a subsequent workshop with industry and scientists. The Queensland Coral Fishery industry implemented these practical mitigation measures through their Stewardship Action Plan in 2013 (see http://www.provisionreef.org.au/stewardship-action-plan/stewardship-action-plan-2013/).

Introduction

The Queensland Coral Fishery (QCF) is one of a range of hand collection fisheries managed by the Department of Agriculture and Fisheries (DAF). Marine aquarium coral species are marketed both domestically and internationally. There is likely some recreational collection of coral however this highly restricted due to marine park closures along the Queensland coast where corals are found. Recreational collection is not considered in this assessment.

This ecological risk assessment is a review of the original ERA of the fishery completed in 2007 (Roelofs 2008). That ERA provided an inaugural assessment of the impacts of the fishery on harvested species.

The QCF was accredited as a three-year Wildlife Trade Operation (WTO), exempting the fishery from Part 13A export controls of the *Environment Protection and Biodiversity Conservation Act 1999*. The WTO expired on 24 June 2015 (and was subsequently renewed until June 2018).

The Australia Government Department of Sustainability, Environment, Water, Population and Communities (now Department of the Environment and Energy) made a number of conditions and recommendations that form part of the WTO declaration. The recommendations are designed to address any risks or uncertainties that were identified during assessment of the fishery.

The ecological risk assessment was based on a workshop held on 20–21 May 2013 in Brisbane with key stakeholders. The stakeholders include:

- Experienced commercial collectors
- Science representatives
- Representative from GBRMPA and SEWPAC
- Environmental Non-Government Organisation representatives
- Fishery managers from Queensland, Western Australia and the Northern Territory
- DAFF Fisheries Assessment staff

A list of attendees can be found in Appendix 1.

The workshop outputs directly fed into a review of the QCF Performance Measurement System in 2013 and assisted DAF in meeting part of the Commonwealth responsibilities to maintain export accreditation for the fishery.

The objectives of the workshop are to:

- *Review the level of risk to the ecological sustainability of anemone, soft and hard coral species and 'living rock' collected in the QCF.*
- *Discuss and document potential mitigation measures for species identified as greater than low risk.*

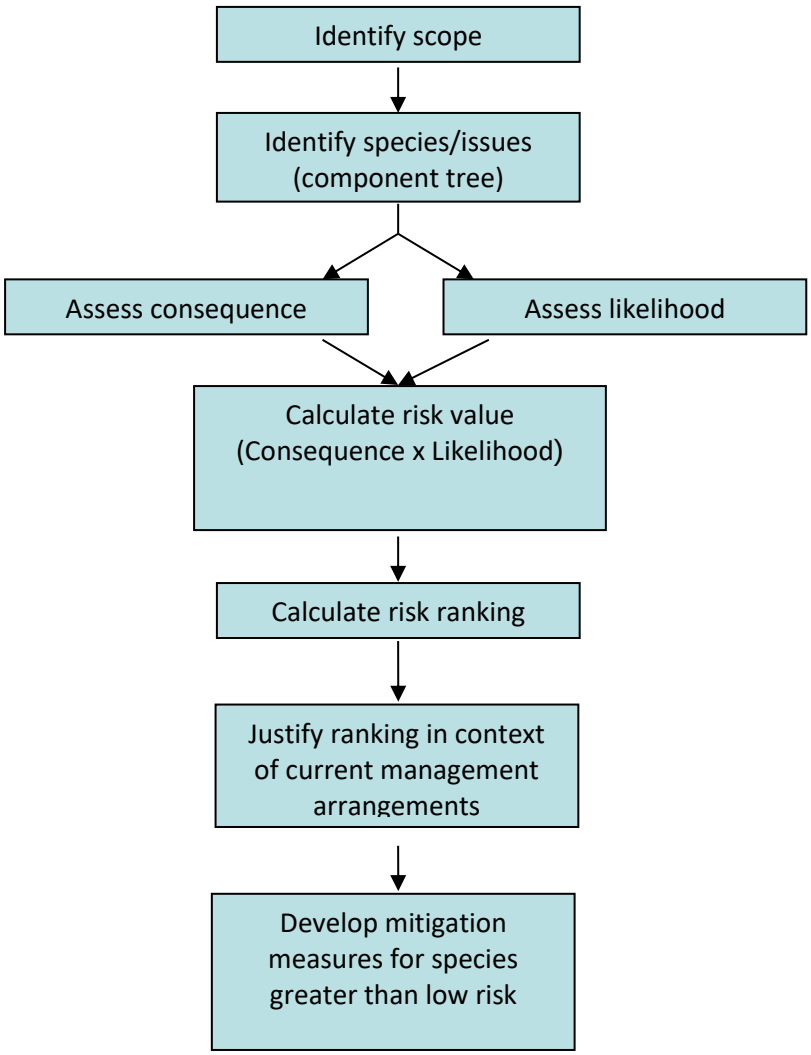

Figure 1. Risk assessment and mitigation measure development process

Process

Figure 1 provides an overview of the process that to be followed in the workshop, highlighting the importance of justifying risks and developing management responses. The risk analysis tool used in this process is based upon the AS/NZ Standard, but adapted for use within the fisheries context (Fletcher *et al*, 2002). It works by assigning a level of consequence (from negligible to catastrophic) and the likelihood of this consequence occurring (from remote to likely) for each issue/species. The overall level of risk assigned to each species was based on the group's assessment of the perceived consequence multiplied by the perceived likelihood. Further information on the process can be found in Fletcher *et al*, 2002.

Much of the information necessary to make informed decisions in this risk assessment was already available or had already been compiled in the document 'A review of the vulnerability assessment of coral taxa collected in the Queensland Coral Fishery' (supplied).

This information assisted in developing the Scope, Issues and the calculation of Risk Values at the workshop. The final values were validated and agreed to by all members of the workshop. A justification supporting the risk rankings was documented to support the decisions.

Scope

Issue identification (component trees)

Issue identification is an important step in any risk assessment process. The purpose of developing component trees is to assist the process of issue identification by moving through each of the ecological components of ESD in a comprehensive and structured manner, maximising consistency and minimising the chances of missing issues.

Issues and species were discussed by the Working Group and subsequently added/deleted to the generic component tree.

Risk assessment

The risk analysis tool used in this process is based upon the AS/NZ Standard, but adapted for use within the context of a fishery. It works by assigning a level of consequence (from negligible to catastrophic) and the likelihood of this consequence occurring (from remote to likely) for each issue/species. The overall level of risk assigned to each species is based on the group's assessment of the perceived consequence multiplied by the perceived likelihood.

A realistic estimate was made by the group, based upon the combined judgment of the participants, who have significant expertise or experience in the fishery. Note that recreational coral collection was not considered in this assessment.

When considering the level of consequence or likelihood, participants made an assessment in context of what existing control measures and management arrangements already in place. When assessing consequence, participants noted the consequence on a population or region, not an individual animal. The consequence and likelihood tables can be found in Appendix 2.

A risk ranking was given, based on the risk value (see Table 3 and 4 in Appendix 2). The risk ranking dictates the amount of justification required and also the extent of management likely to be needed to address the risk.

Justification of the risk values and ratings are documented in Appendix 3.

Research and monitoring needs

A range of research and monitoring ideas and needs were discussed at the workshop. Where appropriate, these were captured in the risk justification text for each species.

Appendix 1 – List of workshop attendees

Participants:

Lyle Squire Jnr	Commercial coral collector
Allan Cousland	Commercial coral collector
Ros Paterson	Commercial coral collector
Nic Dos Santos	Commercial coral collector
Don Gilson	Commercial coral collector
Dr Anna Scott	Southern Cross University
Dr Paul Muir	Queensland Museum
Dr Merrick Ekins	Queensland Museum
Russell Kelley	Independent Science representative
Michael McCabe	Capricorn Conservation Council
Mariasole Bianco	CAFNEC
Sian Breen	WWF
Petra Lundgren	Great Barrier Reef Marine Park Authority
Randall Owens	Great Barrier Reef Marine Park Authority
Bronwen Jones	SEWPAC - CITES
Karen Winfield	SEWPAC – CITES
Kerry Cameron	SEWPAC
Kerrod Beattie	Fisheries Queensland, DAFF
Phil Gaffney	Fisheries Queensland, DAFF
Anthony Roelofs	Fisheries Queensland, DAFF

Observers:

Nathan Hanna	SEWPAC
Steven Newman	WA Fisheries
Eve Bunbury	WA Fisheries
David McKey	NT Fisheries

Apologies[1]:

Morgan Pratchett	ARC Centre of Excellence for Coral Reef Studies, James Cook University

[1] Note that people unable to attend were provided with the opportunity to comment on the justifications for risk rankings.

Appendix 2 – Consequence and likelihood tables

Table 1: Detail of consequence table for retained species or species groups (to be considered over a time frame of 10 years)

Level	Ecological sustainability of retained species at the local/reef scale
Negligible (0)	Insignificant impacts to populations, (dynamics/structure/size). Unlikely to be measurable against background variability for this population.
Minor (1)	Possibly detectable, but minimal localised impact on population size and none on dynamics.
Moderate (2)	Noticeable local impact, likely minimal impact on regional populations. Short-term recruitment/dynamics not adversely impacted.
Severe (3)	Significant impacts on populations. Affecting recruitment levels of stocks/or their capacity to increase.
Major (4)	Long term local depletion if continued. Likely to cause local extinctions, if continued in longer term (i.e. probably requiring listing of species in an appropriate category of the endangered species list e.g. CITES Appendix I).
Catastrophic (5)	Local extinctions are imminent/immediate

Table 2: Detail of likelihood table for target species or species groups (to be considered over a time frame of 10 years)

Level	Descriptor
Likely (6)	Is expected to occur often
Occasional (5)	Is expected to occur moderately
Possible (4)	Is expected to occur only infrequently
Unlikely (3)	Unlikely, but has been known to occur elsewhere
Rare (2)	Happens only very rarely
Remote (1)	Never heard of, but not impossible

Table 3: Risk matrix–numbers in cells indicate risk value, the colours/shades indicate risk rankings (see Table 5 for details). Adapted from Fletcher *et al*. 2002.

		Consequence					
Likelihood		**Negligible**	**Minor**	**Moderate**	**Severe**	**Major**	**Catastrophic**
		0	1	2	3	4	5
Remote	1	0	1	2	3	4	5
Rare	2	0	2	4	6	8	10
Unlikely	3	0	3	6	9	12	15
Possible	4	0	4	8	12	16	20
Occasional	5	0	5	10	15	20	25
Likely	6	0	6	12	18	24	30

Table 4: Risk ranking definitions (according to AS/NZ Standard). Risk profiles will be used to develop appropriate mitigation measures to be implemented through the QCF Performance Measurement System and the industry Stewardship Action Plan.

RISK		**Reporting**	**Management Response**
Negligible	0	Short Justification Only	Nil
Low	1-6	Full Justification needed	None Specific
Moderate	7-12	Full Performance Report	Continue Current Management Arrangements
High	13-18	Full Performance Report	Changes to management required
Extreme	19-30	Full Performance Report	Substantial additional management needed urgently

Output from the Risk Assessment

Assessing and understanding risk is a combination of the scores generated during the assessment process and a consideration of the appropriate level of documentation/justification for the categories selected.

Considerations for the risk assessment

The workshop considered a timeframe for the ecological impact of the fishery on the sustainability of the species of 10 years.

Consequence was scored considering a fully active fishery with collection levels reflecting current trends in harvest – for eg. *Catalaphyllia jardenei* has averaged 8% of the harvest by number of pieces collected and 4% by weight. In a fully active fishery this would equate to 4% (2.6 t) of the quota (60t) potentially being collected.

The potential ecological impact of the fishery was assessed using the current management regime which includes:

- The Policy for the Management of the Coral Fishery
- The Performance Measurement System for the QCF
- The Stewardship Action Plan (in its current guise)
- The management framework for the Great Barrier Reef Marine Park and the Zoning Plan.
- The Coral Stress Response Plan for the MAFF and QCF
- The Coral Bleach Response Plan (GBRMPA)
- The collection moratorium in place for the Keppel region.

General statements about risk in the QCF from workshop discussion

Collectors do not target dull or common colour morphs of coral species. "*If it is green or brown, we don't collect it because we can't sell it*"

The science on colour morphs and whether these represent genetic differences is not clear – studies have been conducted with varying results. One study has shown that the genetic code (in one species) that produces coloured offspring is present in brown (less desirable and more abundant) individuals. These different colour individuals will cross, but it is not known which individuals to cross to get the desired colour morph individuals as offspring. It may simply be a response to environmental factors. The study also noted that there is much genetic variation across individuals of the species studied. Genetic variability is good as it leads to resilience - species are able to adapt. Genetic background in relation to colour and genetics is therefore unclear at present, but there is not a big risk of depleting any individual colour. It was suggested at the workshop that operators should keep a watching brief on whether colours become more difficult to find.

A Non Detriment Finding report was completed for the fishery in 2012. 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*

Appendix 3 - Risk ratings

(note: comments in blue were recorded from this workshop; comments in pink are to be verified; comments in red need action; comments in green are to correct errors in the vulnerability assessment)

Order	Family	*Genus*	*Species*	Common name	Consequence	Likelihood	ERA level	Justification (comments in black are from 2007 workshop)
Actiniaria	Actiniidae	*Actinia*	*tenebrosa*	Waratah Anemone, Cherry anemone	1 (based on present)	1	1	Occur in diversity of environments – fishery accessibility only to some of these. Very abundant where they are found. Unlikely to be effected by coral bleaching given their intertidal distribution and rock pool habitat preferences. **Commercial collection limited due to low present day demand. Unknown recreational collection but could be substantial. Azooxanthellate so not affected by bleaching. Historically has been collected in large numbers but is unlikely to be targeted again due to more knowledgeable hobbyists who are likely to collect their own specimens. Asexually buds readily so good recovery capacity.**
Actiniaria	Actiniidae	*Entacmaea*	*quadricolor*	Bubble tip anemone, Bulb anenome, Premnas anemone	2 (Keppel) 1 (Cairns) 1 (Other)	3 (all regions)	6 (Keppel) 3 (Cairns) 3 (Other)	Issue in Keppel region (bleached). Shallow water colonise vulnerable to bleaching, deeper water colonies more robust during bleaching events. Majority of colonies deeper than 3m. Industry unlikely to collect from shallows. ERA scores assigned just for Keppel area. **Shows susceptibility to bleaching (particularly in shallow waters). Have been depleted in areas overseas. Not important to fishery in quantity but very important in other ways within the industry. Has been seen bleached at 30 m in Indonesia although this area is subject to deep warm water currents (phenomenon not usually seen in GBR). Spatially, might be most concentrated effort?? Not the key focus of collection on any given dive. Collectors try to avoid diving same locations for this species so effort is spread - can get an idea of reefal coverage per dive site.**
				Keppel	2	3	6	**Keppel – this region is more at risk as it has been subject to multiple natural disturbance events (floods and bleaching) and is likely to be prone to these in the future – reflected in Consequence score. Recovery period seems to stretch out. Under pressure at present. Currently not being fished. No signs of recovery. Tried to conduct surveys but weather made difficult. Likelihood reflects an open fishery but currently a moratorium in place and stewardship action plan. There are no indications to change these. The score would be higher if these were not in place.**
				Cairns	1	3	3	**Cairns – reported by industry that abundance is high with collection posing no noticeable impact on localised populations. Doesn't share same susceptibility to other regions. High level of MPA protection with lots of non-fishing zones to provide potential recruitment.**

Order	Family	*Genus*	*Species*	Common name	Consequence	Likelihood	ERA level	Justification (comments in black are from 2007 workshop)
				Other	1	3	3	**Other – as above for Cairns plus access is harder given bigger tides (in Mackay area), larger area to cover, travel times are longer and trips are weather dependent.**
Actiniaria	Stichodactylidae	*Heteractis*	*aurora*	Beaded sea anemone, Sand anemone	3	1	3	Negligible risk **Logbooks do not distinguish between anemone species (except for *E. quadricolor*). This species is not commonly seen by industry. Low abundances across reef area. However, may be abundant in certain locations (20-24 m depth – generally quite turbid). Rarely traded so likelihood is low. Solitary species and gonochoric (separate sexes). More knowledge required on reproduction. Not sort after by industry. Regional separation of risk ranking not required as not targeted (low likelihood).**
Actiniaria	Stichodactylidae	*Heteractis*	*crispa*	Leathery sea anemone, Leather carpet anemone	3	1	3	Negligible risk **More information on this species required. Industry exports minimally on special request. Indo-Pacific market much higher for this species - difficult for Industry to compete with them due to their low price point and volume traded. Collection is low but should consequence be high due to LH characteristics? Accessibility is not an issue – can see more than can collect.**
Actiniaria	Stichodactylidae	*Heteractis*	*magnifica*	Magnificant sea anemone, Ocellaris anemone	3	1	3	Negligible risk **Asexually reproduce - lesser risk than some of others because of greater recovery potential. However demand may be higher? Extremely large and most specimens are avoided because of transport logistics – demand is high for small specimens. If taken, lose clowns that are in them. Need high water supply when transporting and holding in aquaria.**
Actiniaria	Stichodactylidae	*Stichodactyla*	*gigantea*	Gigantic sea anemone, Percula anemone	2	1	2	Negligible risk **Don't have same ability as the other collected anemone species to reproduce. No regional aspect to pick up on. Not heavily traded.**
Actiniaria	Stichodactylidae	*Stichodactyla*	*haddoni*	Haddon's sea anemone, Carpet anemone, adhesive anemone	2	1	2	Negligible risk **As above**
Actiniaria	Stichodactylidae	*Stichodactyla*	*mertensii*	Mertens' sea anemone, Carpet anemone	2	1	2	Negligible risk **As above. Can get from other places.**

Order	Family	*Genus*	*Species*	Common name	Consequence	Likelihood	ERA level	Justification (comments in black are from 2007 workshop)
Actiniaria	Thalassianthidae	*Cryptodendrum*	*adhaesivum*	Pizza anemone, Adhesive sea anemone, Sticky sucker anemone.	2	1	2	**As above. Limited market.**
Alcyonacea		*Soft corals*	*General*					**The workshop decided that only soft coral species that were regularly collected would be ranked. The decision was based on the following:** **The taxonomy of many of the soft coral species is poorly understood** **Only one collector at the workshop collected soft corals in significant quantities. It was thought that this applied generally across the fishery.** **Collection pressure across the range of soft corals is low. With high reported abundances and low collection pressure, it was considered that the risk from the fishery was low.** **It is important to document the risk to the more highly collected species to demonstrate sustainable use and help maintain export approval.**
Alcyonacea	Alcyoniidae	*Cladiella*	spp.	Leather Corals, Colt coral	1	1	1	Negligible risk **Mix of zooxanthellate and azooxanthellate. Lots of confusion amongst general public. Abundant and widespread. Collected by hammer and chisel excision of a suitable sized solitary piece. Occurs down to 30m at least. Not specifically targeted (this applies to all soft corals). Easy to propagate which limits demand on wild caught specimens.**
Alcyonacea	Alcyoniidae	*Klyxum*	spp.	Leather Corals, Colt Coral, Cauliflower Coral.				Only parts of colony are removed (always some left to regenerate) so vulnerability rating is considered over-precautionary. Range extends to 10m depth. Soft coral harvest typically restricted by market demand.
Alcyonacea	Alcyoniidae	*Lobophytum*	*crassum*	Cabbage leather coral				**Not ranked – see general soft coral discussion above**
Alcyonacea	Alcyoniidae	*Lobophytum*	*pauciflorum*	Devils Hand coral				**Not ranked – see general soft coral discussion above**
Alcyonacea	Alcyoniidae	*Lobophytum*	spp.	Leather corals, Finger Coral, Devils Hand, soft coral, lobed leather coral				Negligible risk **Not ranked – see general soft coral discussion above**
Alcyonacea	Alcyoniidae	*Rhytisma*	spp.	Soft coral				Negligible risk **Not ranked – see general soft coral discussion above**

Order	Family	*Genus*	*Species*	Common name	Consequence	Likelihood	ERA level	Justification (comments in black are from 2007 workshop)
Alcyonacea	Alcyoniidae	*Sinularia*	spp.	Leather Corals, Soft corals, finger coral, scalloped leather coral, knobby leather coral	1	1	1	Northern species (north of Mackay). Fairly abundant, only select small specimens. **Not an easily collectable sp. Good demand but hard to find small examples suitable for collection. Widespread. Changes in form in shallow water.**
Alcyonacea	Briareidae	*Briareum*	spp.	Star Polyps				Negligible risk **Not ranked – see general soft coral discussion above**
Alcyonacea	Briareidae	*Pachyclavularia*	spp.	Star polyps	1	1	1	Negligible risk **Common. Tends to take over other spp (like a mat). Can be collected as a mat with your hand. Quick recovery.**
Alcyonacea	Clavulariidae	*Clavularia*	spp.	Waving hand polyps, Clove polyps	1	1	1	Negligible risk **Common. It is collected by industry. Grows 'like grass' and politicians (per Ant) – will quickly cover the face of a drop-off bommie. Prefers low turbulence areas. Collected by getting diver's hand underneath and pull a sheet off – not attached to substrate. Demand is good – hardy but whether it is collected depends on colour. Easy to propagate so reduces demand for wild caught product.**
Alcyonacea	Gorgoniidae	*Hicksonella*	spp.	Wire Coral, Sea fans				**Not ranked – see general soft coral discussion above**
Alcyonacea	Gorgoniidae	*Various*	spp.	Sea Whips, golden coral, branching coral, fan coral, Gorgonians	1	1	1	Industry would export as curio if not for confusion with black coral - common misidentification. Is exported live. Absence of knowledge about this group. Occur in deeper areas - limited accessibility. Suggested that they are so rarely disturbed by natural disturbance that collection would be likely to have impact on some of the populations (Consequence = 1, Likelihood =1) **Gorgonian corals require specialist food so there is a small domestic and export market. Overfeeding of specialist food can pollute tank – for specialist hobbyists only. Widely available worldwide in ornamental coral – not known where this product is sourced as it is not from Queensland. Hard to ship live but some species are very resilient in the wild. Mainly ornamental/curio market, not live. Depth range is 5 to 50m+. Propagation of gorgonians getting more common overseas further reducing demand for Queensland product.**

Order	Family	*Genus*	*Species*	Common name	Consequence	Likelihood	ERA level	Justification (comments in black are from 2007 workshop)
Alcyonacea	Helioporidae	*Heliopora*	*coerulea*	Blue coral	1	1	1	Negligible risk **Collected by ornamental industry but hard to collect (crest of reef so need glass out weather conditions). Appears susceptible to cyclone damage with poor recovery. 1st collection trip after Yasi (in 2012?) showed no bounce back from this impact - so was not collected. Minor species for live coral collectors. Not uncommon – found in a range of habitat. Not observed/collected in the south. Hard to keep – loses colour in aquaria.**
Alcyonacea	Nephtheidae	*Litophyton*	spp.	Nepthea coral, Broccoli coral, cauliflower coral, neon green tree coral				Potential export group. Require extra care to extend travelling time over 30hrs. Literauture suggests rare on GBR, industry suggest more locally abundant than this. Harvested in a grazing manner - only a few taken despite high abundance (as with other soft corals). Have to detach soft corals from substrate, which forces selective harvesting. **Not ranked – see general soft coral discussion above**
Alcyonacea	Xeniidae	*Efflatounaria*	spp.	Waving Hand Coral, Pulsing coral, soft coral				Negligible risk **Commonly collected – pretty and pulsating. Grows back well after floods. Quite hardy in natural environment but requires careful handling. Common and wide range of habitats – generalist which knocks VAR to 2.9. Therefore not evaluated for consequence and likelihood.**
Scleractinia	Acroporidae	*Acropora*	Spp.					***Acropora general comments:*** ***Fast growing, widespread and abundant. Ornamental collectors focus on Acropora – probably far outweighs live collection. Number of pieces has been going up. Very popular for aquarists – easily propagated in tanks. Identification very hard (even for experts) so may be misidentification going on. Only report to genus level for US Fish and Wildlife so spp not misidentified and rejected (they aren't qualified taxonomists). Time taken to tank-harden varies with area the coral was collected from – inshore Acropora is a lot hardier and responds more quickly (used to environmental variation).***
Scleractinia	Acroporidae	*Acropora*	*acuminata*		2	1	2	**Easiest *Acropora* to ID – a broken piece on the boat goes black. Not good identification method for live coral though. Researchers indicate it is moderately common on the GBR. Collected inshore and offshore. Mostly live collection but often found in dull colouration so not much is collection worthy. Considered rare to find in a decent colour by industry. Not right shape and too brittle for ornamental coral collection. Cross reference to IUCN?? On the US EPA potential list as 'threatened'. Abundance rank changed to 2.**

Order	Family	*Genus*	*Species*	Common name	Consequence	Likelihood	ERA level	Justification (comments in black are from 2007 workshop)
Scleractinia	Acroporidae	*Acropora*	*aspera*	Staghorn coral	2	1	2	**Common. Found in shallow water. Not a popular live collection coral because of colour (browns and greens). Not a popular ornamental coral because of growth form – grows interwoven so half shaded. Good specimens hard to find. Abundance rank changed to 2.**
Scleractinia	Acroporidae	*Acropora*	*bushyensis*		5	1	5	**Easy to misidentify – hard to distinguish from *A. digitifera*. Found inshore in central region in different colours. Restricted in its distribution. Very hardy. Collected for ornamental use but not targeted. May be being collected but noting the ID issues, and that this species is rare, this is unlikely to be the case.**
Scleractinia	Acroporidae	*Acropora*	*chesterfieldensis*		2	1	2	**Easy to misidentify. Moderately common on GBR but more offshore and restricted distribution. Also found on Lord Howe Island. Probably not collected live (likely to be a different species). Change abundance rating to 3.**
Scleractinia	Acroporidae	*Acropora*	*digitifera*		2	1	2	**Considered common by industry and science. High growth rate. May be collected but easy to misidentify as *A. bushyensis*. Ornamental – would be collected. Not collected in large numbers. Collection methods – may take fragments (live) or whole colonies (curio). Change abundance rating to 2**
Scleractinia	Acroporidae	*Acropora*	*horrida*		2	1	2	**Moderately common – on reef and inshore islands (change abundance range to 3). No ID issues with species. Found at large number of sites. Blue colour morph is targeted. Colonies are large. Collect by pruning around the edges (anecdotally colonies haven't been affected). Industry reports that have been taking from same colony for more than 5 years with no change**
Scleractinia	Acroporidae	*Acropora*	*hyachinthus*		2	1	2	**Common species inshore and offshore. Commonly collected for live coral – not ornamental. Tabular coral. Can take portions and it regrows or whole smaller colonies (live). One industry reports that about 80% of the specimens they collect are small (fist) sized. Similar to *A. prostata* (which has been lumped in with another species) but reasonable industry confidence in ID.**
Scleractinia	Acroporidae	*Acropora*	*listeri*		3	1	3	**Considered uncommon by industry and science on GBR but not restricted to any areas. Not commonly collected. Ornamental – may be collected but may be ID issues. Live – not targeted. Not EPA listed. Consequence score based on abundance.**
Scleractinia	Acroporidae	*Acropora*	*millepora*		2	1	2	**Collected extensively by industry due to bright colours. Considered common by industry and science. Target small perfect colonies but if large, take small frags (live). Targeting small colonies is more biologically sound than big colonies due to larger fecund colonies remaining intact.**
Scleractinia	Acroporidae	*Acropora*	*multiacuta*		3	2	6	**Considered uncommon by industry and science – more common southern to central areas of the GBR. Collected (live). Not commonly collected (ornamental) and ID issues (confused with *A. loripes*). (Abundance to be changed to 5?)**

Order	Family	*Genus*	*Species*	Common name	Consequence	Likelihood	ERA level	Justification (comments in black are from 2007 workshop)
Scleractinia	Acroporidae	*Acropora*	*nana*		3	2	6	Not common but reported around Mackay and Northern regions. Only comes in a couple of colours – only collect colourful variants (live). Very similar to *Acropora aculeus* and there may be ID issues. Need to discuss whether collector's reports of inshore abundance are correct or whether there are ID issues (drives ERA level). Need to supply specimens to museum for identification.
Scleractinia	Acroporidae	*Acropora*	*palmerae*		3	1	3	Uncommon in general but found on exposed reef fronts (may be ID issues with *A. robusta*). Potentially Threatened on the US EPA list. An encrusting coral. Individual corals about fist size. Pink colour specimens collected live (individual colonies) on smallest piece of substrate possible (peels off along line of coralline algae). Performs well in aquaria. Good survival after collection.
Scleractinia	Acroporidae	*Acropora*	*paniculata*		3	1	3	Only a VAR 2.9 but is on the potential US EPA list – uncommon in the wild but is locally common around Mackay (in 20-30m). Found in deep water. Not collected for curios. Traded live but not commonly collected at present.
Scleractinia	Acroporidae	*Acropora*	*plana*					Considered common by industry and science. Tabular coral. Commonly collected (live) but not for ornamental trade. Been synonymised with another species (*A. tenuis*). Not assessed as *A. tenuis* for risk - the vulnerability for this species was assessed as Low.
Scleractinia	Acroporidae	*Acropora*	*prostrata*		2	1	2	Common inshore. Commonly collected (live) but not for curios. Been synonymised with another species (*A. millepora*). Scores for this species used here.
Scleractinia	Acroporidae	*Acropora*	*subglabra*		3	1	3	Moderately common but restricted distribution. Not a good coral for long haul transportation and not collected much as live coral. Ornamental collect a bottlebrush coral that may be this species but there are ID issues. This could mean it is exported as *A. echinata*. Need to supply specimens to museum for identification.
Scleractinia	Acroporidae	*Acropora*	*verweyi*		2	1	2	Common. Hard to ID. May be ID issues in collection data (i.e., confused with *A. formosa*). Targeted for live and ornamental trade. Need to supply specimens to museum for identification.
Scleractinia	Acroporidae	*Montipora*	*caliculata*		2	1	2	May be species ID issues. Hard to identify between *M. tubulara* and *M. venosa* (requires microscope to differentiate species). Collected live but not commonly traded. Not collected for ornamental trade. Potential US EPA listing as Threatened.
Scleractinia	Agariciidae	*Leptoseris*	*incrustans*		3	1	3	Not common but widely distributed (although this is hard to quantify). Not popular for collection. May be collected if a good colour (orange). Propagated overseas. Generally found offshore. Only 80 specimens exported in last 2 years from Queensland.
Scleractinia	Agariciidae	*Leptoseris*	*papyracea*		2	1	2	Scientists state this is the most common of the Lepto's. Collected but not targeted. Research required on reproduction but not a priority for this fishery. Not an ornamental coral.

Order	Family	*Genus*	*Species*	Common name	Consequence	Likelihood	ERA level	Justification (comments in black are from 2007 workshop)
Scleractinia	Agariciidae	*Leptoseris*	*yabei*		3	1	3	**Exported on a regular basis by few collectors (live) – the rest minor. Reported under 'other hard corals' on QCF logbooks and export list. Not a popular ornamental coral.**
Scleractinia	Agariciidae	*Pachyseris*	*rugosa*	Castle coral, Serpent coral, Elephant skin coral, groove coral, corduroy coral.	2	1	2	**Moderately common on GBR. See a lot around Mackay. See it but don't collect it but colour (brown) is an issue. A little bit in ornamental but not desired. If collected, small frags from large colony although whole colony will be harvested for live if found at a small enough size. Change abundance rank to 3**
Scleractinia	Agariciidae	*Pavona*	*cactus*		2	1	2	**Common. Collected and exported. Popular in the US. Curios – take small bits. Live sold predominantly on domestic market.**
Scleractinia	Astrocoeniidae	*Stephanocoenia*	*intersepta*	Star coral, Blushing star coral				**Common but not reported in Australia. May be misreported – may be *Lecastria aqualius*. Not scored.**
Scleractinia	Caryophylliidae	*Plerogyra*	*sinuosa*	Bubble coral, Grape coral	3 (elsewhere) 4 (Keppel)	1	3 (elsewhere) / 4 (Keppel)	Not very popular in aquarium trade. Industry suggests locally abundant **Reported as uncommon but industry believe more common than this. Found north of the Keppels to Cape York. Where it occurs, it is highly abundant. Market demands green and that colour is not common (comes in green and brown). Take small colonies, not large ones. Predominantly a domestic species. Mainly collected around Cairns – Keppel only minor. Found both inshore (even in dirty bays) and at the reef. Growth habits vary across range. Slow growth to maturity reported but disputed by collectors - check. Disparity between export records and logbook records (WA corals may be being exported under Qld WTO?).**
Scleractinia	Dendrophylliidae	*Balanophyllia*	*europaea*	Flower coral, orange coral, sun coral	3	1	3	Solitary; bottom dwelling; with or without zooxanthellae **This species not reported as found in Australia in literature. Industry report a Balanophyllia species is collected and is common inshore in dirty areas. May be ID issues at a species level (there are 400 Balanophyllia spp– may be *B. bairdiana*). Not collected in quantities. Hard to keep – has to be fed. Low market demand. Hard to collect due to high current environment where it is found. Not much demand at present. Need to supply specimens to museum for identification.**

Order	Family	*Genus*	*Species*	Common name	Consequence	Likelihood	ERA level	Justification (comments in black are from 2007 workshop)
Scleractinia	Dendrophylliidae	*Dendrophyllia*	spp.	Cup corals, Golden coral, orange coral	2	1	2	**Has shown an increase in export but off a low base. Common where found (locally abundant). Found in turbid water – hard to dive for because of depth and turbidity. Collectors estimate that they take 5% of what is available at sites. Collectors don't frag it – take small amount of what is around. Whole colonies collected at a preferred size (LC3). Needs to be fed in aquaria so limits market demand. Reported it is collected from Moreton Bay to Townsville. Growth forms vary so there can be ID issues (e.g. US Customs have seized shipments confusing the species with Tubastrea). Clarifying taxonomy may help understand US Fish and Wildlife ID issues – Smithsonian paper on genus vs Veron 2000. Propagated by aquarists in US. May be slow growing (azooxanthellate) - need to clarify.**
Scleractinia	Dendrophylliidae	*Duncanopsammia*	*axifuga*	Whisker coral	(Keppel - 3) / (Cairns - 2) / other - 2	(Keppel - 2) / (Cairns - 1) / other -1	(Keppel - 6) / (Cairns - 2) / other - 2	Industry suggests more abundant than described in the Vulnerability assessment. Occurs in inter-reefal habitat to 30m (majority of collection) and as shallow as 2m in coastal waters. Eco-niche more generalist than specialist. Important to industry and on international radar. **Reported to be globally rare but industry reports that it is not rare in areas where they collect – check literature. Not found in areas where researchers tend to dive. Usually only find isolated pieces on the reef proper. Larger colonies tend to be found on the sand off the reef so easily missed if swimming only over reef. Prefers turbid water. Propagated by aquarists overseas. Two growth habits – has been discussion about hybridisation with *Turbinaria* but industry report plasticity in captivity as an alternative hypothesis (they have found same growth morph on single colony). Inshore ~ Turbinaria-like with tightly packed polyps, offshore ~ more branching form. Appears to be ID confusion in Asia. Can harvest compact bits over time from the same large clump (farm-able). Grows back from collection after a year fallow. One operator stated they have worked the same spot for 12-15 years. Responds well to aquarium lighting (tough, hardy and green fluoro). Demand varies amongst collectors but catch trend increasing (Keppel catch and effort decreasing). Limited colour range. (change abundance score from rare to medium)**
Scleractinia	Dendrophylliidae	*Heteropsammia*	*cochlea*	Button coral	2	1	2	Negligible risk **Common. Not harvested very much anymore. Was popular for aquaria, now less so. Not a fussy feeder – easy to keep in aquaria.**

Order	Family	*Genus*	*Species*	Common name	Consequence	Likelihood	ERA level	Justification (comments in black are from 2007 workshop)
Scleractinia	Dendrophylliidae	*Turbinaria*	*bifrons*		2	1	2	**Among least common of Turbinarias (*T. beltada* is most common but not reported here). Reported as uncommon and widespread in literature but industry report common in hard rock areas at 5-15m around edges of islands in central region. Little live demand because a similar species is widely propagated in aquaria. Has to be the right size and shape – not desirable in frag form – operators look for a good shaped individual – this means they leave large reproductive colonies intact. Larger colonies are left intact. This species is popular with the ornamental sector, and may be collected in a significant quantity and stockpiled –managed by industry as a precaution.**
Scleractinia	Dendrophylliidae	*Turbinaria*	*conspicua*		2	1	2	***Turbinaria* species are not commonly collected in the industry. Species risk is ranked as low.**
Scleractinia	Dendrophylliidae	*Turbinaria*	*frondens*	Yellow cup coral	2	1	2	**Low vulnerability**
Scleractinia	Dendrophylliidae	*Turbinaria*	*heronensis*		3	1	3	**Rare.**
Scleractinia	Dendrophylliidae	*Turbinaria*	*mesenterina*	Pagoda coral	2	1	2	**Low vulnerability**
Scleractinia	Dendrophylliidae	*Turbinaria*	*patula*		2	1	2	**Uncommon**
Scleractinia	Dendrophylliidae	*Turbinaria*	*reniformis*	Scroll coral, Yellow scroll coral	2	1	2	**Most exported species (but still low). All states combined harvest was approx 1000 pieces. Whole small colonies taken but very rare to find in appropriate sizes**

Order	Family	*Genus*	*Species*	Common name	Consequence	Likelihood	ERA level	Justification (comments in black are from 2007 workshop)
Scleractinia	Euphyllidae	*Catalaphyllia*	*jardinei*	Elegance coral, Wonder coral	Keppel – 3 Other - 3	Keppel –1 Other - 1	Keppel – 3 (need evidence of the resource) Other - 3	Quite widely distributed through Indo-Pacific. Can be found in high current waters but generally in turbid waters so is not particularly specialised in niche requirements. Found in areas of large tidal movement in WA and Mackay. Collected to 15—20m but extends below 30m. Locally abundant. Large pieces can be segmented so only part of colony removed. Whole small colonies also taken. Rarer in southern waters. In north, some evidence of decline in heavily fished areas. Other areas have exhibited no noticeable decline over many years of collection. **Abundant in the right areas – not found on top of reef. Harvested in purple tip, pink tips and other forms. Common in appropriate habitats. Collectors can predict where to find it based on sea bed contours.** **Southern region collector finds it quite in quite different assemblages to the North – similar habitat to *Ducanopsammia*.** **Found in large beds hundreds of metres longin the South – almost nothing in these areas except continuous *Catalaphyllia*.** **Central region collectors report that it often occurs in barren sandy areas. Noted that it rolls around on soft sand, easily disturbed and displaced by storms.** **Northern region collectors report abundant near the coast, with larger specimens found inshore. Some beds repeatedly worked for close to 15 years with no signs of depletion. Try to spread effort and leave areas close to Cairns alone, only harvesting these in periods of poorer weather which limits access to further offshore areas. One operator can collect 500 pieces in 2 x 20 min dives.** **Now have 5 years of GPS logbook data to corroborate industry reports of distribution, abundance and resilience. Holds well in shore facilities so can collect spasmodically. Beds can be revisited after 6 months. Can also be found off edge of reef in 10-12 m with huge beds of little else. Purple tip and pink tip colour variants most common so look for other colour variants. Can live near the mouth of rivers which flood regularly. Industry finds it very hardy. Wide range of habitats and depth. Questions over reproductive mode that might require research.**
Scleractinia	Euphyllidae	*Euphyllia*	*ancora*	Ancor coral	Keppel – 3 Other - 2	Keppel – 2 Other - 1	Keppel – 6 Other - 2	**Low vulnerability rank only. Identification issues between *E. fimbriata* and *E. ancora*. Common but off reef and less found on outer reef. Found as far south as Norfolk and Lord Howe Island. Greens more popular than browns but also get pink and peach colours. Brown colour morph is more abundant than other colours and is not collected. Commonly traded live. Less vulnerable due to growth habits. Growth form is generally large, so less vulnerable to harvest. Take different size colonies – large colonies are partially harvested only.** **Niche rank needs to be changed from 3 – check literature.** **Need to supply specimens to museum for identification.**

Order	Family	*Genus*	*Species*	Common name	Consequence	Likelihood	ERA level	Justification (comments in black are from 2007 workshop)
Scleractinia	Euphyllidae	*Euphyllia*	*cristata*	Grape coral, Fat tentacle torch coral	Keppel – 3 Other - 3	Keppel – 2 Other - 2	Keppel – 6 Other - 6	Desire to export but not specifically on export list. **Don't see big beds of this species. Polyps appear like a bunch of grapes. Colonies are not as large as *E. ancora*, and therefore may be more vulnerable. May be ID issues between *cristata* and *divisa* in Central region. Only one operator in the North collects this in significant quantities.** **Need to supply specimens to museum for identification.**
Scleractinia	Euphyllidae	*Euphyllia*	*divisa*	Frogspawn coral	Keppel – 3 Other - 2	Keppel – 2 Other - 1	Keppel – 6 Other - 2	**Low vulnerability rank only.** **May be ID issues between *cristata* and *divisa* in central.** **Need to supply specimens to museum for identification.**
Scleractinia	Euphyllidae	*Euphyllia*	*fimbriata*	Hammer coral, Bean coral, Anchor coral, Frogspawn coral	Keppel – 3 Other - 2	Keppel – 2 Other - 1	Keppel – 6 Other - 2	**More rare than *E. cristata*. ID issues between *E. fimbriata* and *E. ancora*.** **Need to supply specimens to museum for identification.**
Scleractinia	Euphyllidae	*Euphyllia*	*glabrascens*	Torch coral	Keppel – 3 Other - 2	Keppel – 2 Other - 1	Keppel – 6 Other - 2	Industry suggests very common in certain areas, particularly inter-reefal areas. Important species to QLD fishery and subject to some global concerns. **Common. Found on inshore reefs and not inter-reefal, except juveniles (does it survive or are these another species). Popular live coral and is targeted. Popular for export and this high demand is likely to continue. Not inter-reefal – found on the reefs mostly. Found in the form of small colonies, so operators harvest the whole thing. A lot of brown colour morph specimens present in the fishery area which aren't collected. As a result collectors believe they won't ever collect everything. Operators also don't take the bigger specimens (although still pretty small), because they break in transport. Leave larger colonies alone. Not all colours are marketable so leave a lot. No recent harvest in the Keppels but AIMS LTMP found no *Euphyllia* recruitment in the Keppels in 2011.**
Scleractinia	Euphyllidae	*Euphyllia*	*paraancora*	Branching Hammer Coral, Green hammer coral	3	1	3	Desire to export but not specifically on export list. **Moderately common. Reported collection in Cairns, far north to Cape York and south to Whitsundays. Collected as a by-product. Found in inshore/turbid waters. Propagated overseas so reduces demand. Very crumbly so specimens are usually single 'sticks'.** **Taxonomy to be confirmed by Lyle**
Scleractinia	Euphyllidae	*Euphyllia*	*paradivisa*		3	1	3	**High density where this is found – turbid inshore northern waters. Collected in north. Need to clarify taxonomy. Not on the species vulnerability list.** **Industry to provide specimens to taxonomists. Industry to clarify southern distribution – Lyle. Note – this species is proposed on the US EPA list.**

Order	Family	*Genus*	*Species*	Common name	Consequence	Likelihood	ERA level	Justification (comments in black are from 2007 workshop)
Scleractinia	Faviidae	*Caulastrea*	*curvata*		2	1	2	Not a rare coral and not restricted in niche. Industry is focused on C.furcata (this is the more common species). **Reported as uncommon in literature but industry report it is common in dirty waters. Don't collect much as it most often found in brown colour morph.**
Scleractinia	Faviidae	*Caulastrea*	*echinulata*	Trumpet coral	3	1	3	Not a rare coral and not restricted in niche. Industry is focused on *C.furcata* (this is the more common species). **Uncommon. Less abundant than *C. curvata*. Threatened on US EPA list. Generally taken in small quantities and reported under Faviidae in logbooks. Not found on the reef, but on deeper edges or sand flats off the reef. Heavily propagated overseas so now not viable for significant collection and export from Australia.**
Scleractinia	Faviidae	*Caulastrea*	*furcata*	Candy cane coral	2	1	2	**Low vulnerability rank only. Common. Larger stands are more fragile and take up too much room on the boat so collect smaller specimens only. Larger specimens left behind to reproduce which reduces risk.**
Scleractinia	Faviidae	*Favites*	*abdita*		2	1	2	**Low vulnerability rank only. Very heavily collected live.**
Scleractinia	Faviidae	*Favites*	*flexuosa*	Larger star coral	2	1	2	**Low vulnerability rank only. Common and widespread. ID is difficult. Collected live. Take new growth edges so large colonies remain mostly intact. Some ornamental collection. Three other *Favites* spp share top spot.**
Scleractinia	Faviidae	*Favites*	*pentagona*	Larger star coral	2	1	2	**Low vulnerability rank only. Common. Very common in Mackay. Commonly collected live. Popular in the US.**
Scleractinia	Faviidae	*Goniastrea*	*australensis*		2	1	2	**Low vulnerability rank only. Scientists suggest this is very common. Collected from reef to inshore to marina. Need to find individual pieces – hard to collect otherwise and breaks. Some collectors frag colonies post harvest , some take whole individuals.**
Scleractinia	Faviidae	*Leptastrea*	*aequalis*					**Can be confused with (check earlier notes). Not in Australia. Catch is reported to genus level only in export.**
Scleractinia	Faviidae	*Moseleya*	*latistellata*	Corrallimorph coral	3	1	3	Negligible risk **Listed in literature as uncommon but higher densities inshore according to industry. Not collected to a large extent – mainly opportunistic harvest. Small to medium sized specimens collected leaving larger one behind. Does not fragment well. Fast grower and regrows in collection areas post harvest. Brown or greenish brown but colour can be changed post harvest by altering habitat. Some brown ones are used in ornamental but have to be the right shape.**

Order	Family	*Genus*	*Species*	Common name	Consequence	Likelihood	ERA level	Justification (comments in black are from 2007 workshop)
Scleractinia	Fungiidae	*Cycloseris*	*cyclolites*	Domed mushroom coral	2	3	6	Only Genus considered - Negligible risk **Check name is correct –*Fungia cyclolites* is now recognised by CITES. Common according to industry. Found in inter reefal areas in 'plague' levels. Collected as by-product of *Catalaphyllia jardenei*. Not collected much in the south as mainly found in dull colours. A report that they are now less abundant in recent years and found at a smaller size (one collector reports localised depressed population in highly visited areas in Cairns) but doesn't show same trend elsewhere. Can grow from a frag in aquaria and appears to be fast growing.**
Scleractinia	Fungiidae	*Diaseris*	*fragilis*	Fragile razor coral,fragile mushroom coral	1	1	1	Only Genus considered - Negligible risk **Recognised as Fungia fragilis in CITES. Moderately common according to industry and locally abundant where it is found. (change abundance to 3). Is found in large quantities where wave action has fragmented individuals.**
Scleractinia	Fungiidae	*Fungia*	*repanda*	Disk coral, Mushroom coral	2	1	2	Only Genus considered - Negligible risk **Common. Can propagate from a fragment but collect whole from wild. Common on exposed bommies. Find them where there is a high water movement. Find them falling down the slope. Collect whole colonies but not targeted - pick up occasional small, green one. Most are brown and are left alone. Sequential hermaphrodite; broadcast spawners. Change reproduction rate to 2.**
Scleractinia	Fungiidae	*Heliofungia*	*actiniformis*	Tentacled mushroom, Mushroom coral, disk coral, plate coral	2	1	2	Negligible risk **Low vulnerability rank only. Common. Only targeted as a small whole piece. Leave large ones behind. Show budding and generally see lots of juvenile colonies surrounding larger ones. In top 10 traded world-wide. Both export and domestic live markets. Found in large quantities in Gove/Darwin.**
Scleractinia	Merulinidae	*Hydnophora*	*actinoformis*	Carpet coral, Spine coral, knob coral				Hard to get specimens suitable for sale/collection. Collect small colonies mainly of species exesor. Not only found in protected habitats/areas **Not known in Australia according to literature but reported by industry. They report that it is collected both live and for ornamental market but not a target. Not assessed due to not recognised in Australia.**

Order	Family	*Genus*	*Species*	Common name	Consequence	Likelihood	ERA level	Justification (comments in black are from 2007 workshop)
Scleractinia	Mussidae	*Homophyllia*	*bowerbanki*	Starry cup coral	3	3	9	Not common. Most are dull-coloured colonies and are not taken. **Not common. Have to go looking for it in species environments (at end of dive, eg). Spread across wide area (concentrated in Capricorn) but only in shallow, high wave action areas. Found predictably at certain depth levels, but is definitely not common. Very selective in what is taken – many too large to take and lots found in the wrong colour. Operators harvest pieces about plate size, and then cut up post-harvest. Always leave fragments and these have been observed to re-grow in the wild. Might be ID issues with similar species (eg *A. hillea* – check sp). Need to supply specimens to museum for identification.**
Scleractinia	Mussidae	*MIcromussa*	*lordhowensis*	Starry cup coral	Keppel – 3 Other - 3	Keppel – 2 Other - 2	Keppel – 6 Other - 6	Market demand for multi-coloured specimens so plain varieties not collected. Quite common. **Moderately common but can find areas of high abundance. Wide range from Whitsundays to Sydney. Comes in thousands of colours. Brown / greens not desirable but reds, rainbows, yellows etc are very desirable. Take 40-60% of what is seen but miss a lot because habitat is dirty water. Always leave fragmentation the rock. Current science is unsure whether colours are genetic or whether it is plasticity – studies of other species have not shown speciation at the genetic level. Crosses show no predictability in colour. On the CITES species of concern list. Colours are random but seem to stick to the colour they express. Appears to be low risk of depleting a colour but worth industry monitoring trends. Some collectors are moving from virgin territory and will soon be revisiting previously harvested ground – the low risk of depletion will need to be tested. Heavily propagated so demand may fall - one of the most fragged corals, 1 polyp grows to 30/40 polyps in a month, fast growth. Very hardy coral. This species has been misreported as *Micromussa*. Not presently harvesting in the Keppels. ERA is probably conservative to reflect harvest levels and predicted harvest patterns. Keppel ERA level needs Keppel input from local operator.**

Order	Family	*Genus*	*Species*	Common name	Consequence	Likelihood	ERA level	Justification (comments in black are from 2007 workshop)
Scleractinia	Mussidae	*Acanthophyllia*	*deshayesiana*	Meat coral, (Indo-Pacific Scolymia), Flat cup coral, fancy donut coral	3	4	12 (based on most intensively worked area)	Cynarina deshayesiana considered in ERA **Maybe a synonym for *Cynarina deshayesiana*? Various names used in different countries add to export confusion – *Acanthophyllia deshayesiana* recognised by US, but *C. lacrymalis* in the EU. Solitary coral that lives in the sand in depths >15 m with higher densities deeper (collected down to 35 m). Note – check database that has been provided. Not targeted – by product of *Catalaphyllia* collection. Can be abundant in some areas. Probably a northern species. Reported by one operator as being less abundant off Cairns (but conflicting reports among industry). Were exported in good quantities from Cairns but not now (see proviso on abundance reports). Given localised depletion has already been noticed, and the fishery is not fully utilised, the chances of continued localised depletion with current or full utilisation pressure is high.**
Scleractinia	Mussidae	*Blastomussa*	*merleti*	Pineapple coral, Branched cup coral, Blasto	2	1	2	Found in large colonies. Moderately common. Commonly in 15—20m reef edge but also inter-reefal hard substrate. Mostly on hard substrate but forms bommies on soft sediment. **Common. Inshore reefs and inner barrier reefs in turbid areas. Ranges from at least Mackay, north to Cape York. Not seen in the south. Some collection but market is very colour dependent. Not as popular as *B. wellsi* so collection levels lower.**
Scleractinia	Mussidae	*Blastomussa*	*wellsi*	Swollen brain coral, Branched cup coral, Blasto	Keppel – 3 Cairns – 3 Other - 2	Keppel – 1 Cairns – 1 Other - 1	Keppel – 3 Cairns – 3 Other -2	Generally found in turbid, deeper water habit (>12m, typically 16—35m+). More common on reef but extends to inter-reefal shoals. Requires consolidated substrate. Not common in large colonies. Moderately common in deep waters. EU concern and problems in Indo. **Literature says uncommon. Industry report it is found in deep, turbid, high current and high wave action areas (hard to access and not dived by science). Observed as occurring in big colonies. A by-product species. Leave lots behind because of colour and size selectivity dictated by the market. Found in coastal areas at shallower depths. On the reef there is more at depth. Found on solid strata. Place frags back on strata. Industry have self-imposed minimum size (what is this size?). Frag readily in aquaria and medium-fast growers. Appears to be different growth habits/rates between north and south. Polyps may fall off and then regrow if left.** **One operator in Cairns areas reports the species is becoming harder to find in the areas he frequents (should likelihood for Cairns be a 2?).**

Order	Family	*Genus*	*Species*	Common name	Consequence	Likelihood	ERA level	Justification (comments in black are from 2007 workshop)
Scleractinia	Mussidae	*Cynarina*	*lacrymalis*	Doughnut coral, Solitary cup coral	Cairns – 3 Other - 3	Cairns – 2 Other - 1	Cairns – 6 (reflects red colour variety) Other – 3 (reflects red colour variety)	Negligible risk **Collected in North (live) on inshore GBR. Target specific desirable colours only (eg red). Red is less common (usually found inshore) and may be becoming harder to find around Cairns. This is disputed by another operator who has not observed any local depletion. In the Central region, lots of colours are available and red is more common offshore than inshore.**
Scleractinia	Mussidae	*Micromussa*	*amakusensis*		Keppel – 3 Other - 3	Keppel – 2 Other - 2	Keppel – 6 Other - 6	Only Genus considered - Negligible risk **Uncommon – prefers turbid environments. Find it around Mackay but don't target it. Reportedly could be misidentified as *A. lordhowensis*. Export has increased. There are naming issues to do with exporting to other countries (US as M*icromussa* then confiscated a load, then went to shipping as A*canthastrea*). CITES recognised name is *Acanthastrea amakusensis***
Scleractinia	Mussidae	*Mussa*	*angulosa*	Spiny flower coral				**Only found in Florida and India. Not assessed.**
Scleractinia	Mussidae	*Scolymia*	*australis*	Doughnut coral, Button coral, sea button coral, cat's eye coral	3	4	12 (based on desirable coral and colours)	Occurs on solid substrate (reefal walls and solid inter-reefal shoal). Can occur in shallow waters where overhangs are present (i.e. shade). Mostly 12-20m. Moderately common. Solitary disc-shaped colonies. Selected for colour. Collected pieces are mostly red and green, striped varieties in southern waters however majority of corals are brown and are not collected. Chiseled or levered from substrate but substrate left intact (this is the case with all corals growing on solid structure). **Moderately common. Find it as shallow as 3 m and down past 32 m. Widely spread but better colours, size and numbers in some areas. Largest concentrations found in turbid areas. Where found, can be in big numbers and unpopular colours are left behind. Lower value now so has become a by-product. Collectors are becoming more selective. Start as a little spat and grow out. Some grow as extremely flat pancakes on rocks and can't be harvested, so they have to be left regardless of colour. Relatively hardy. Slow maturing. Avoid taking ones from hard to extract areas. Don't tend to get good colours around Keppels historically. Industry would like to flag this as a species for attention in the Stewardship Action Plan.**

Order	Family	*Genus*	*Species*	Common name	Consequence	Likelihood	ERA level	Justification (comments in black are from 2007 workshop)
Scleractinia	Mussidae	*Scolymia*	*vitiensis*	Doughnut coral, Button coral, sea button coral, cat's eye coral	2	1	2	Name often interchangeable with Cynarina deshayesiana. Inter-reefal soft bottom, 15—30m. Small monocentric (solitary) colonies (lawn bowl sized - smaller ones not valuable). Moderately common in ideal habitat (around 20m depth) - abundant where Catalaphyllia not so abundant. Selected for colour, not size. Variety of colours occur together. Typically byproduct. No observed detriment from collection over 10+yrs. **ID issues with *A. deshayesiana*. Find most nice ones in turbid waters. Not sought after by collectors. Less common in the Keppels. Same score as *A. deshayesiana*.**
Scleractinia	Mussidae	*Symphyllia*	*radians*	Sinuous cup coral, Brain coral, Greater brain coral				Only Genus considered - Negligible risk **NOT CONSIDERED IN ASSESSMENT**
Scleractinia	Pectiniidae	*Oxypora*	*lacera*	Porous lettuce coral, Dessert plate coral, elephant nose coral				**NOT CONSIDERED IN ASSESSMENT**
Scleractinia	Pocilloporidae	*Pocillopora*	spp.	Cauliflower cora, wart corals, Birds nest coral, brush coral, bush coral				**NOT CONSIDERED IN ASSESSMENT**
Scleractinia	Pocilloporidae	*Seriatopora*	*caliendrum*	Birdsnest coral				Only Genus considered - Negligible risk **NOT CONSIDERED IN ASSESSMENT**
Scleractinia	Pocilloporidae	*Seriatopora*	spp.	Birds nest coral, Needle coral, brush coral. Needle coral, spiny coral.				Negligible risk **NOT CONSIDERED IN ASSESSMENT**
Scleractinia	Pocilloporidae	*Stylophora*	*pistillata*	Smooth cauliflower coral				Only Genus considered - Negligible risk **NOT CONSIDERED IN ASSESSMENT**
Scleractinia	Pocilloporidae	*Stylophora*	spp.	Finger coral, Custer coral				Negligible risk **NOT CONSIDERED IN ASSESSMENT**
Scleractinia	Poritidae	*Alveopora*	*gigas*					Only Genus considered - Negligible risk **NOT CONSIDERED IN ASSESSMENT**

Order	Family	*Genus*	*Species*	Common name	Consequence	Likelihood	ERA level	Justification (comments in black are from 2007 workshop)
Scleractinia	Poritidae	*Alveopora*	spp.	Daisy coral, Ball coral, net coral				Only Genus considered - Negligible risk **NOT CONSIDERED IN ASSESSMENT**
Scleractinia	Poritidae	*Goniopora*	*eclipsensis*	Anemone coral				Only Genus considered - Negligible risk **NOT CONSIDERED IN ASSESSMENT**
Scleractinia	Poritidae	*Goniopora*	*stokesi*	Anemone coral				Only Genus considered - Negligible risk **NOT CONSIDERED IN ASSESSMENT**
Scleractinia	Poritidae	*Porites*	*nigrescens*					Only Genus considered - Negligible risk **NOT CONSIDERED IN ASSESSMENT**
Scleractinia	Trachyphyllidae	*Trachyphyllia*	*geoffroyi*	Open brain coral, nudibranch coral	Cairns – 3 Keppel –1 Other - 2	Cairns – 3 Keppel –1 Other -1	Cairns –9 Keppel –1 Other -2	Found in narrow inlets, off Arlington lagoon bommies (15—30m depth, common in 18m+). Similar habit to Catalaphyllia but possibly more generalist/widespread. Not observed in southern waters. Locally prolific. Size and colour selected. Max about lawn bowl sized, average baseball-sized. Approx 5-10% of cover of this species will be colourful enough for collection. No observed decline in abundance in regularly dived sites over long time period (e.g. 10yrs). Inter-reefal habitats have ephemeral algal growth that can camouflage coral. **Moderately common but not in the south. Not being caught around Keppels. Harder to find around Cairns (conflict in industry reports – needs further investigation) but not in more remote northern areas. Catch as a by-product of *Catalaphyllia* collection. Only take bright colours. Don't harvest around Mackay - north catch higher.**
Stolonifera	Tubiporidae	*Tubipora*	*musica*	Organ pipe coral			0	Negligible risk **NOT CONSIDERED IN ASSESSMENT**

References

Department of Fisheries Western Australia, 2005, *Final Application to the Australian Government Department of Environment and Heritage on the WA Specimen Shell Managed Fishery Against the Guidelines for the Ecologically Sustainable Management of Fisheries for Consideration Under Part 13A of the Environment Protection and Biodiversity Conservation Act 1999*

Fletcher, W, Chesson, J, Fisher, M, Sainsbury, K, Hundloe, T, Smith, A & Whitworth, B 2002, *National ESD Reporting Framework for Australian Fisheries: The 'How To' Guide for Wild Capture Fisheries. FRDC Project 2000/145*, Canberra, Australia.

Ponder, WF and Grayson, JE 1998, *The Australian marine molluscs considered to be potentially vulnerable to the shell trade*. A report prepared for Environment Australia.

Roelofs A, 2007, *Annual status report. Marine Aquarium Fish Fishery. March 2007*, Department of Primary Industries and Fisheries, Brisbane,.

Roelofs, AJ and Silcock, R 2008, *A vulnerability assessment of coral species collected in the Queensland Coral Collection Fishery*, Department of Primary Industries & Fisheries, Brisbane.

Roelofs, A 2008, *Ecological Risk Assessment of the Queensland Coral Fishery*, Department of Primary Industries & Fisheries, Brisbane.