

# Kimberley marine biota. Historical data: sponges (Porifera)

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**ABSTRACT** – A data compilation of Kimberley sponge species housed in four Australian natural science collection institutions was undertaken by the Western Australian Museum. Just under 40% of the collected data were excluded from the synthesis described here due to insufficient species identifications, however 342 species of sponges are documented. This dataset provides baseline information for future sponge investigations in the region. The majority of the known species were widespread Indo-Pacific with a number of Australian endemics. Collection effort was biased to offshore locations. Comprehensive surveys of inshore marine habitats will provide a greater understanding of sponge diversity and abundance throughout the entire region.

**KEYWORDS:** natural history collections, species inventory, Kimberley Marine Bioregion, biodiversity, NW Australia, baseline

## INTRODUCTION

The importance of utilising natural science collection datasets to provide baseline biodiversity information to inform conservation and environmental management decisions is increasingly being recognised (Pyke and Ehrlich 2010; Costello et al. 2013). Biodiversity research into the Kimberley region of Australia is of immense value as it is an area with high conservation values and with new and proposed marine parks. There are proposed developments associated with oil and gas reserves, fishing and aquaculture activities, and tourism (Department of Environment and Conservation 2009). The importance of compiling existing data to provide a baseline to assist with characterisation of the assets and values of this region was recognised by Wood and Mills (2008).

The Western Australian Museum (WAM) and other Australian natural science institutions have undertaken marine biodiversity fieldwork in the Kimberley Project Area (see Methods), which has resulted in specimen collections, but much of the data and their interpretation are either unpublished or published in specialist taxonomic literature, and thus not readily accessible to researchers and managers. To address this information gap WAM instigated an extensive data compilation of the

species known from the Kimberley Project Area. Here, we document what is currently known about sponge diversity in the Project Area.

Sponges are important as habitat formers, providing protection and food sources for other marine organisms in all oceans of the world. They have a wide range of biological associations with other organisms from microbes to vertebrates (Bell et al. 2013). They perform a variety of functional roles such as facilitating primary production, eroding carbonate reefs and filtering vast volumes of seawater (Bell 2008; Bell et al. 2013). There is increasing evidence that they are critical in nutrient cycles that occur in the oceans, for example in cycling dissolved organic matter in coral reefs (de Goeij et al. 2013), and nitrogen cycling in oligotrophic reefs (Keesing et al. 2013). A recent analysis of bioactivity in Australian marine fauna demonstrated that sponges were the most consistently bioactive phylum across all bioregions examined (Evans-Illidge et al. 2013). In recent times sponges have been recognised as a critical component of the marine benthos, but in many areas their species richness and abundance is largely unknown.

The collecting of sponges in the Kimberley Project Area is very recent, from the 1980s

**TABLE 1** Number of locations, stations, species and families of sponges (Porifera) sampled during expeditions in the Project Area, with data in reports or publications. NB: Only stations that included sponges were counted. \*recorded to species or OTU.

Survey Year	No. Locations	No. Stations	No. Species	No. Families	Reference
<b>Offshore</b>					
1981, 1986, 1987, 1992	3	32	138	38	Hooper (1994)
2006	4	45	132	31	Fromont and Vanderklift (2009)
<b>Inshore</b>					
1991	11	15	19*	11	McCauley et al. (1993)
1997	1	2	28	13	Bryce et al. (1997)
2008	5	15	52	18	Keesing et al. (2011)

onwards, with no major historical surveys to the region focussing on this group. Three sponge studies in the Kimberley have been published: Hooper (1994), Fromont and Vanderklift (2009) and Keesing et al. (2011) (Table 1). The Australian Institute of Marine Science (AIMS) Bioactivity Unit collected marine invertebrates throughout Western Australia, including sponges in the Project Area, and results were documented in an unpublished report (McCauley et al. 1993). These collections were made in 1991 between Broome and Cape Rulhieres in inshore subtidal habitats by SCUBA and intertidal collecting. They are now held in the Queensland Museum, and sponges with adequate species determinations have been included in this paper. Keesing et al. (2011) reported on the sponges collected from inshore subtidal habitats in Gourdon Bay and the Dampier Peninsula, with specimens collected utilising an epibenthic dredge in depths between 11–23 m. Along with the AIMS collection and a small diving expedition by WAM to Beagle Bay (Bryce et al. 1997), these are the major expeditions to focus on sponges in the inshore Kimberley. Other inshore sponge records in this paper are anecdotal, generally one-off collections, not undertaken by sponge experts. Hooper (1994) and Fromont and Vanderklift (2009) focussed on offshore locations, the first study at Ashmore, Cartier and Hibernia Reefs and the second at Mermaid, Scott and Seringapatam Reefs. The first expedition targeted shallow subtidal habitats on SCUBA, and the second both subtidal habitats on SCUBA and intertidal collecting. These are the only studies to date to document the sponges of the offshore reefs and atolls of the North West Shelf of WA.

The aim of this project was to collate the records of shallow water (<30 m) sponge species in the Kimberley Project Area, which are verified by specimens lodged in Australian museum collections (1880s–2009), and to comment on spatial distributions and collection gaps of this faunal group in the region.

## METHODS

### STUDY AREA AND COLLECTION SCOPE

The Kimberley Project Area is defined by the coordinates 19.00°S 121.57°E; 19.00°S 118.25°E; 12.00°S 129.00°E; 12.00°S 121.00°E. It encompasses the coast, which forms a natural inshore boundary, from south of Broome to the WA/NT border extending beyond the 1000 m bathymetric contour to include the shelf edge atolls (Figure 1). We included all classes of sponges: Hexactinellida, Calcarea, Homoscleromorpha and Demospongiae.

The methodology follows that outlined by Sampey et al. (2014). Sponge data for the region were sourced from the collection databases of WAM, Queensland Museum (QM), Australian Museum (AM) and Museum and Art Gallery of the Northern Territory (MAGNT), and species lists from three publications: Hooper (1994), Fromont and Vanderklift (2009) and Keesing et al. (2011).

Species names were checked using the online databases: World Porifera Database (Van Soest et al. 2014), the Australian Faunal Directory (ABRS 2014) and the Zoological Catalogue (Hooper and Wiedenmayer 1994) to identify the

currently accepted taxonomic name and determine biogeographic distributions.

Many of the sponges from the Project Area have only been assigned to an Operational Taxonomic Unit (OTU), or morphospecies concept, and have not been examined within the Linnaean system to determine if they are new species or have been previously described in historic taxonomic literature. OTUs are used for a number of reasons outlined in Sampey et al. (2014). In the case of sponge identifications within the Project Area they indicated one or more of the following:

- the identification was preliminary with no time to study the historic literature;
- the morphological characters differed from the published descriptions;
- the species was outside its known geographic range; and
- the taxonomic group requires substantial revision.

As the Project Area sponges have been examined by sponge experts it was assumed each OTU was consistent and represented a single species, although OTUs have not been checked between institutions for duplication. Total number of sponge species was determined using all named, cf. and OTU species. For biogeographic analyses only sponges with full species names were used.

#### SPATIAL INFORMATION, COLLECTION DETAILS AND MAPPING

Data from all sources were collated into a single database and location, and collection details were checked and verified. Full details of this methodology are outlined in Sampey et al. (2014) along with the list of locations, latitude and longitude where collections occurred in the Kimberley Project Area.

Maps of species richness and sampling effort were generated for each main location. Since species richness patterns are highly dependent on sampling effort, we calculated the number of collecting events at a location to provide an indication of relative sampling effort. A collecting event was defined by the season and year of collecting (Sampey et al. 2014).

#### BIOGEOGRAPHIC CODING

Species were coded for their known biogeographic range following the relevant categories in Spalding et al. (2007). We coded for the following five realms:

- Temperate South Africa (TSA). Found from Benguela in the west, south and east to Agulhas Bank-Natal, including Amsterdam and St. Paul in the temperate Indian Ocean.
- Western Indo-Pacific (WIP). Found throughout the Red Sea and the East African coast, Western and Central Indian Ocean.
- Eastern Indo-Pacific (EIP). Found throughout Hawaii, eastern Pacific Islands, Central and Southeast Polynesia.
- Temperate Australasia (TA). Found throughout New Zealand and temperate Australia from Shark Bay on the west coast south and east to Tweed Heads-Moreton Bay.
- Central Indo-Pacific (CIP). Here coded as the region encompassing the South China Sea, Sunda Shelf, the tropical northwestern and southwestern Pacific and coral triangle.

We separately coded for the following three provinces within this fifth realm:

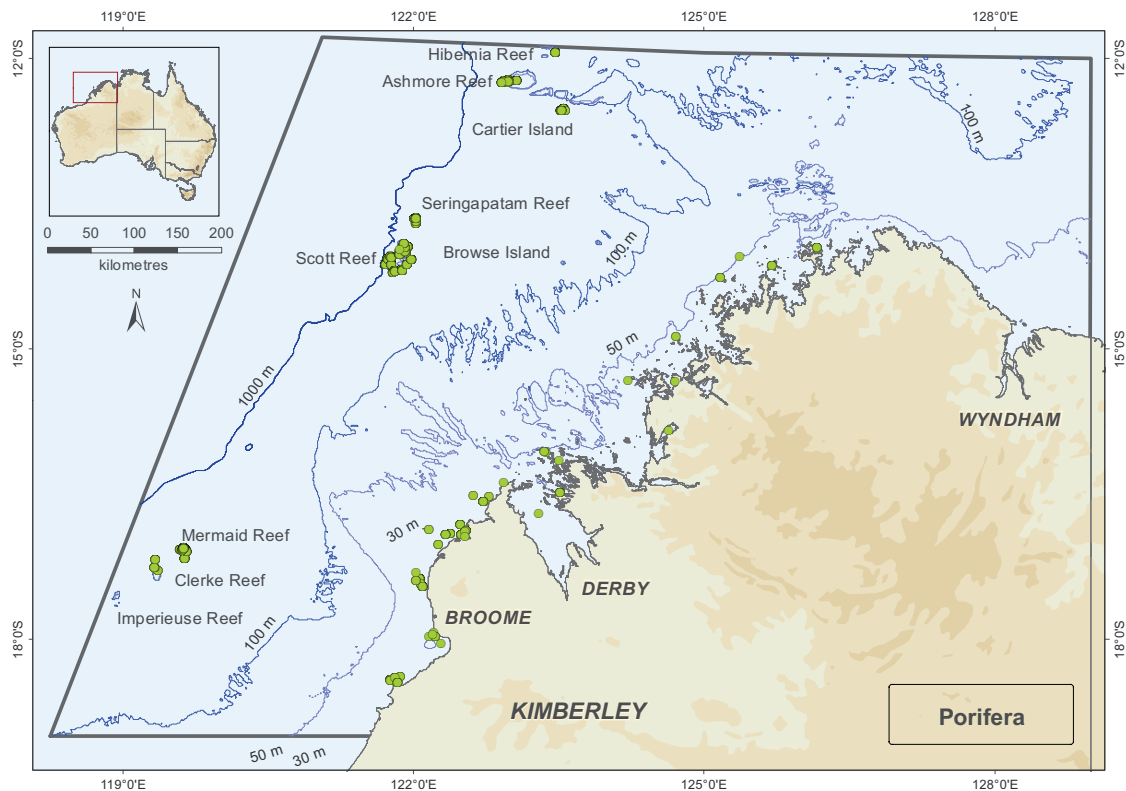
- Sahul Shelf (SS). Includes the Gulf of Papua, the Arafura Sea, Arnhem coast to Gulf of Carpentaria and Bonaparte Gulf.
- Northeast Australian Shelf (NES). Torres Strait and Great Barrier Reef.
- Northwest Australian Shelf (NWS). Broome to Ningaloo.

Within its distribution range a species may be restricted to certain habitats, however sponges are predominantly found on hard subtidal substrates, with a few adapted to soft sediments and/or intertidal habitats. The species in this study were not coded for habitat as there are limited habitat data for sponges in the area and most of the collecting was by SCUBA or intertidal surveys of hard substrates, with little to no focus on soft sediments.

## RESULTS

#### NUMBER OF SPECIMENS IN COLLECTIONS

A total of 1,071 'specimen lots' of sponges were in the combined collection databases, of these 665 were retained in the Project Area dataset as they were identified to species, cf. or OTU (Table 2). A 'specimen lot' represents one to many individuals of the same species from the same site with a unique museum registration number. QM and WAM had the highest numbers of specimen lots, followed closely by MAGNT. A high number of lots were excluded from the present dataset (406, 38%) due to insufficient species identification (Table 2).



**FIGURE 1** Locations of records of sponge species in the Project Area. The Project Area boundary is marked in grey. Map projection: GDA94, Scale: 1:6, 250,000.

The oldest records in the databases for Kimberley sponges were housed in the WAM, MAGNT and QM collections and were represented by two species *Clathria lendenfeldi* and *Axinyssa* sp. collected from Broome in 1961.

#### SPECIES RICHNESS AND COLLECTING EFFORT

A total of 343 species were recorded in the dataset. There were no glass sponges (Hexactinellida), but six species of Calcarea and seven species of Homoscleromorpha were recorded, with the remaining 330 species all Demospongiae. All major orders of sponges were represented in this synthesis. The most species rich orders, listed here from most to least species, were the Haplosclerida, Halichondrida, Poecilosclerida, Dictyoceratida, Hadromerida and Spirophorida (Table 3).

Thirty three of the species were identified as cf. taxa (i.e. to a known Linnaean species concept), and 205 to OTU-level taxa (Appendix 1a), with the remaining 105 recognised as known species. Twenty four of the known species were recorded from Kimberley inshore localities, the majority (65) from the offshore continental edge atolls with the remaining 16 species found in both areas (Appendix 1b). No sponges have been collected

from Browse Island or the midshelf shoals. The high species richness recorded for the offshore atolls is related to higher sampling effort in these locations (Tables 1 and 4). We summarised the number of offshore versus inshore locations and stations for five major studies conducted in the Project Area (Table 1). We found that while seven offshore locations had been sampled compared to 17 inshore, 77 offshore stations were sampled compared to less than half that number (32) inshore.

Overall we found sponges were recorded from 33 locations in the Project Area, seven offshore and 26 inshore localities (Table 4, Figures 1–3). Species richness varied considerably from 101 (at Scott Reef) to one (at eight inshore locations; Table 4, Figure 2). This is clearly related to sampling effort, which was highly variable, with four collecting events at Broome and only one collecting event at 29 locations (Table 4, Figure 3). Sponge species richness was higher at the seven offshore sites than at the inshore locations. For eight of the Kimberley inshore sites there was only a single species of sponge recorded from a single collecting event. No collecting has occurred at Browse Island (midshelf), or Imperieuse Reef (continental slope), nor has the eastern Kimberley been adequately sampled (Figure 1).

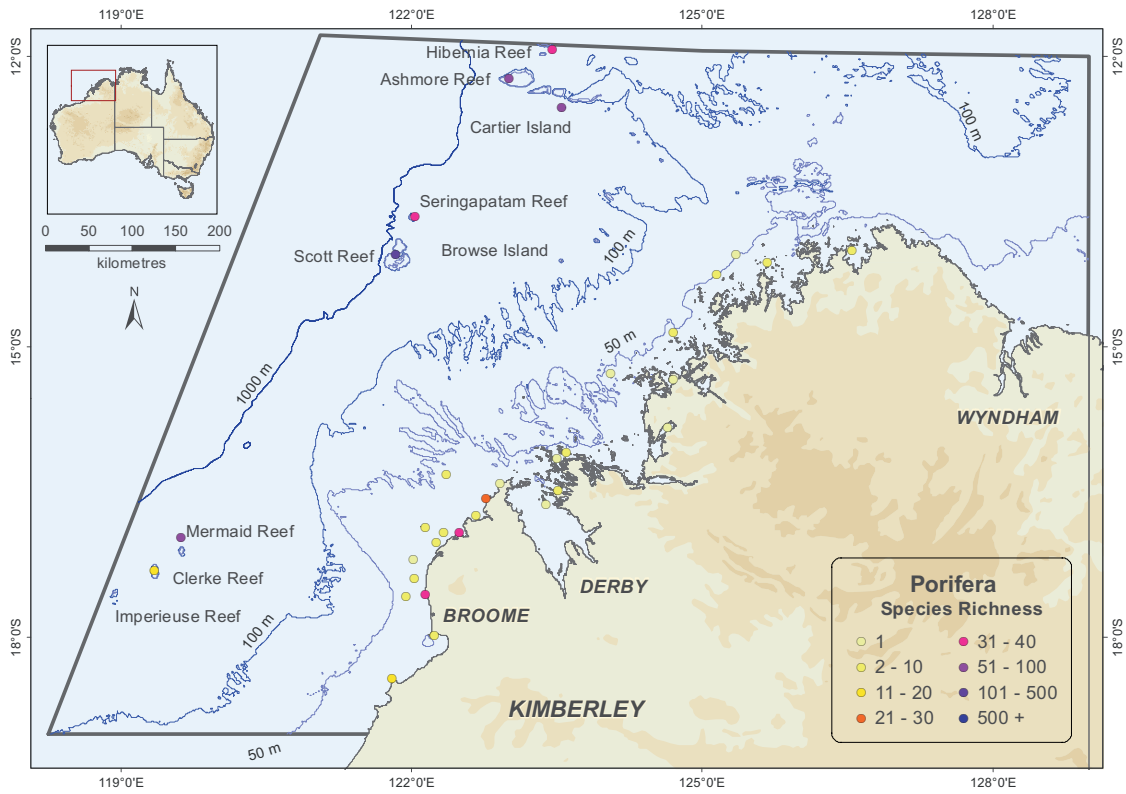


FIGURE 2 Species richness of sponges for each main location in the Project Area. Map projection: GDA94, Scale: 1:6, 250,000.

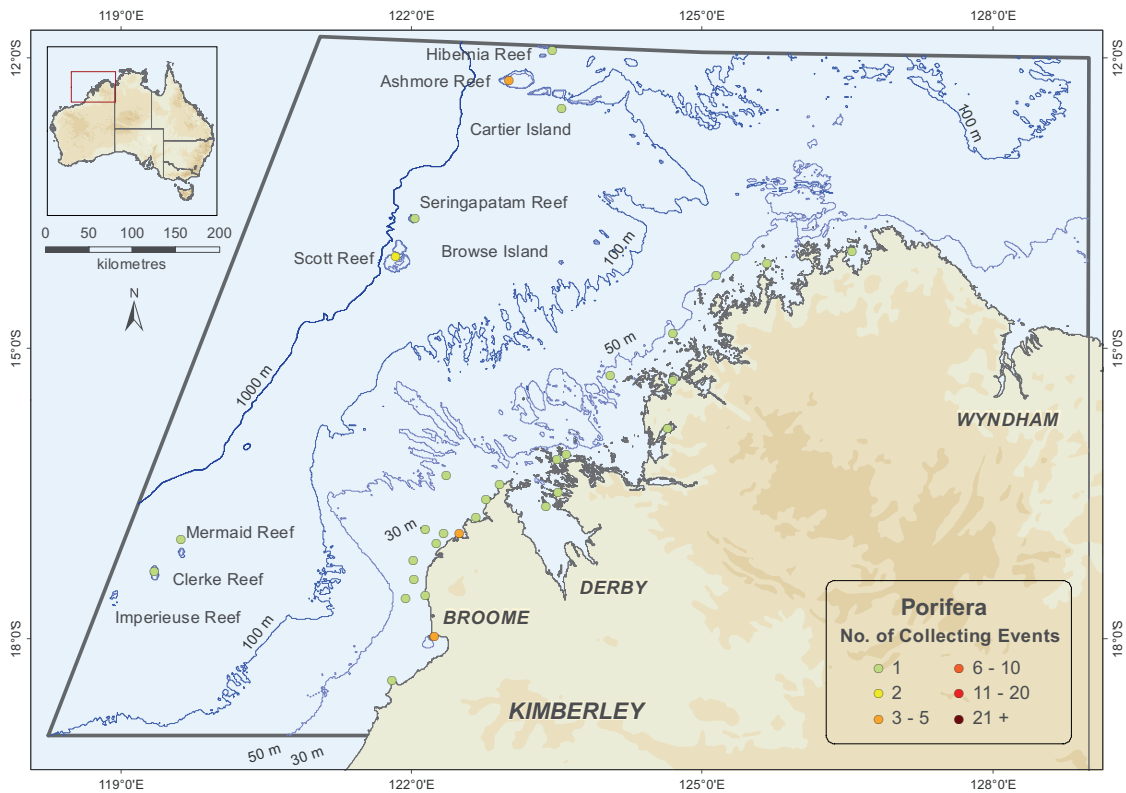


FIGURE 3 Number of collecting events for sponges at each main location for which there are collections. This was based on a count of the season code and provides an indication of sampling effort. Map projection: GDA94, Scale: 1:6, 250,000.

**TABLE 2** Number of specimen lots of Project Area sponges housed in Australian collections. Included are those lots identified to species or OTU (able to be distinguished as a separate species) and excluded are those lots incompletely identified.

Collection	Included	Excluded	Total
AM	2	9	<b>11</b>
QM	238	132	<b>370</b>
MAGNT	60	265	<b>325</b>
WAM	365	0	<b>365</b>
<b>Total</b>	<b>665</b>	<b>406</b>	<b>1071</b>

**TABLE 3** Number of species in each class and order of sponges in the Project Area.

Class/Order	No. of species
<b>Calcarea</b>	6
<b>Homoscleromorpha</b>	7
<b>Demospongiae</b>	330
Spirophorida	19
Astrophorida	15
Hadromerida	28
Chondrosida	3
Lithistids	4
Halichondrida	58
Poecilosclerida	55
Agelasida	2
Haplosclerida	84
Dictyoceratida	42
Dendroceratida	4
Verongida	16
<b>Total</b>	<b>343</b>

**TABLE 4** Species richness and number of collecting events at each location in the Project Area.

Location	Species Richness	Collecting Events
<b>Offshore</b>		
Scott Reef	101	2
Cartier Island	75	1
Mermaid Reef	59	1
Ashmore Reef	53	3
Hibernia Reef	44	1
Seringapatam Reef	39	1
Clerke Reef	15	1
<b>Inshore</b>		
Quondong Point	35	1
Beagle Bay	33	3
Packer Island	23	1
Gourdon Bay	18	1
Pender Bay	10	1
Broome	7	4
Eclipse Shoals	7	1
Cape Latouche Treville	4	1
Fenelon Island	4	1
Grey Shoal	4	1
Heritage Reef	4	1
Tangier Shoals	3	1
Lacepede Islands	2	1
Lord Mayor Shoal	2	1
Cockatoo Island	2	1
Colbert Island	2	1
Cone Bay	2	1
Vansittart Bay	2	1
Green Island	1	1
Jamieson Reef	1	1
King Sound	1	1
Talboys Rock	1	1
Cape Leveque	1	1
Champagne Island	1	1
George Water	1	1
Gibbings Island	1	1

## BIOGEOGRAPHY

Of the 105 known species reported from the Kimberley two thirds were wide ranging Indo-Pacific species with 68 (65%) in this category, and 31 species (30%) Australian endemics (Table 5). Forty six (71%) of the offshore species were widespread Indo-Pacific species, almost half of the inshore species were widespread (11 species, 46%), and the majority of those found both inshore and

offshore (11 species, 69%) were widespread Indo-Pacific species (Table 5).

Endemic Australian species were proportionally highest at the inshore locations with 12 species (50%) reported, while 14 endemic species (22%) were reported offshore including six (43%) of those species considered to be temperate Australian. Five species (31%) that occurred in both locations were Australian endemics.

TABLE 5 Number of species with each biogeographic code. Codes are defined in the Methods.

Biogeographic Code	Inshore and offshore	Inshore only	Offshore only
<b>WIDESPREAD</b>			
WIP		1	4
CIP			4
TSA/WIP/NWS/SS/NES/CIP/EIP			1
TA/WIP/NWS/SS/NES/CIP	1	1	3
TA/WIP/NWS/SS/CIP/EIP	1		
TA/WIP/NWS/NES/CIP/EIP			1
TA/WIP/NWS/SS/CIP	1		1
TA/WIP/NWS		2	
TA/WIP		2	
TA/NWS/SS/NES/CIP			1
TA/NWS/NES/CIP			2
WIP/NWS			1
WIP/NWS/SS			1
WIP/NWS/SS/NES/CIP	4	1	4
WIP/NWS/SS/CIP	1		1
WIP/NWS/NES/CIP	2		4
WIP/NWS/NES/CIP/EIP			1
WIP/NWS/CIP			4
WIP/NWS/CIP/EIP			1
WIP/NES/CIP		2	
WIP/NES			1
NWS/NES/CIP			3
NWS/CIP	1		5
NWS/SS/CIP		1	2
NWS/SS/NES/CIP		1	1
<b>Widespread Total</b>	<b>11</b>	<b>11</b>	<b>46</b>
<b>AUSTRALIAN ENDEMIC</b>			
TA/NWS/SS/NES	2		2
TA/NWS/SS	1	3	
TA/NWS		2	2
NWS/SS/NES	1		1
NWS/SS	1	3	
NWS/NES		2	1
NES			1
NWS		2	1
TA			6
<b>Endemic Total</b>	<b>5</b>	<b>12</b>	<b>14</b>
<b>OTHER</b>			
TSA			1
Other		1	4
<b>Other Total</b>		<b>1</b>	<b>5</b>
<b>Grand Total</b>	<b>16</b>	<b>24</b>	<b>65</b>

## DISCUSSION

Zoological collections are important tools for providing historical baseline biodiversity and ecological data, as well as contributing to determining biotic and human impacts on marine environments. The knowledge of the Western Australian tropical sponge fauna has increased markedly in recent years (Fromont 2003, 2004; Fromont et al. 2006; Fromont and Vanderklift 2009; Keesing et al. 2011; Schönberg and Fromont 2011), yet knowledge of the Kimberley sponge fauna has lagged behind other better studied tropical regions, such as the Pilbara and Ningaloo in WA. The specimen data collated in this study provides a historical baseline to assist current and future sponge biodiversity studies being conducted in the region.

The majority of the species collected in the Project Area were from offshore atolls, largely due to the work done by Hooper on Ashmore, Cartier and Hibernia Reefs (Hooper 1994), and by Fromont on Mermaid, Scott and Seringapatam Reefs (Fromont and Vanderklift 2009). Fewer species were reported from inshore locations due largely to sponges not being targeted for research until very recently (Bryce et al. 1997; Keesing et al. 2011). Midshelf habitats remain largely unexplored, and no sponges have been reported from these localities.

Species composition differed between offshore and onshore sites with 16 known species occurring in both areas, and the majority of the species being recorded at offshore localities. Many of the species found offshore are known coral reef species such as *Pericharax heterorhapis*, *Rhabdastrella globostellata*, *Carteriospongia foliascens* and *Clathria (Thalysias) reinwardti*. These species are also likely to be found in the more turbid inshore reef systems as effort in these locations is increased.

The differences in species richness are largely the result of collecting effort, which was not comparable between inshore and offshore locations. Although more inshore locations had sponges collected from them (26 inshore versus seven offshore), more than twice as many stations were sampled offshore compared to inshore (see Table 1) resulting in lower species diversity reported inshore.

The 342 species collated here suggest a similar high diversity in the Project Area compared to other Indo-Pacific regions (see Schönberg and Fromont 2011). High sponge species diversity has been reported across tropical Australian waters: Carnarvon Basin, WA (261 species, Schönberg and Fromont 2011), Dampier Archipelago, WA (275 species, Fromont et al. 2006), Sunshine Coast, Qld (247 species, Hooper and Kennedy 2002), Swain Reefs, Great Barrier Reef (304 species, Hooper et al. 1999), Wessel Island, NT (315 species, Hooper et al. 2002) and Darwin and Coburg Peninsula, NT

(395 species, Hooper et al. 2002; and 283 species, Przeslawski et al. 2014). Sponge diversity in the Project Area is likely to increase substantially with inshore collecting.

To date, almost two thirds of the known, described sponge species reported from the Kimberley Project Area were widespread Indo-Pacific and almost one third Australian endemics. Six of the 14 endemic species reported offshore were temperate Australian endemics (see Table 5). This is unusual, and the species require further taxonomic study to determine if they are truly this widespread or whether they represent sibling species.

The large number of sponges assigned to cf. or OTU demonstrates the enormous task of documenting these species. Hooper et al. (2013) recognised the need to compile sponge OTUs into an online workspace ([www.spongemaps.org](http://www.spongemaps.org)) where sponge taxonomists can compare and standardise this interim nomenclature at a national to ocean basin scale (Hall 2013).

Comprehensive sampling of Project Area marine habitats for sponges has only been undertaken offshore. It is anticipated this synthesis will facilitate future surveys in the region, and that current survey work documenting species from inshore locations will assist with filling collection gaps. In the future it is hoped that a more complete picture of sponge distributions and abundances in the Kimberley region will be realised.

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APPENDIX 1 All sponge taxa included in the Project Area dataset, including known species, those identified to cf. and those with a unique OTU.

Taxa	Offshore Atolls	Kimberley Coast
<b>CALCAREA</b>		
Calcareo sp. NW1	1	
Calcareo sp. NW2	1	
Calcareo sp. NW3	1	1
<b>Order: Clathrinida</b>		
<b>Family: Leucettidae</b>		
<i>Leucetta</i> sp. NW1	1	1
<i>Perichthax heteroraphis</i> Poléjaeff, 1883	1	1
<b>Family: Soleneiscidae</b>		
<i>Dendya</i> sp. 776	1	
<b>HOMOSCLEROMORPHA</b>		
<b>Order: Homosclerophorida</b>		
<b>Family: Plakinidae</b>		
<i>Corticium</i> sp. 2		1
<i>Plakina</i> sp. NW1		
<i>Plakinastrella mammillaris</i> Lendenfeld, 1907	1	
<i>Plakortis communis</i> Muricy, 2010	1	
<i>Plakortis nigra</i> Lévi, 1953	1	
<i>Plakortis</i> sp. NW1	1	
<i>Plakortis</i> sp. NW2	1	
<b>DEMOSPONGIAE</b>		
<b>Order: Spiroborida</b>		
<b>Family: Tetillidae</b>		
<i>Cinachyra</i> sp. 11		
<i>Cinachyra</i> sp. 12	1	
<i>Cinachyra</i> sp. 13		1
	Beagle Bay	
	Cape Latouche Treville	
	Cape Leveque	
	Champagny Island	
	Cockatoo Island	
	Colbert Island	
	Cone Bay	
	Eclipse Shoals	
	Fenelon Island	1
	George Water	
	Gibbings Island	
	Gourdon Bay	
	Green Island	
	Grey Shoal	
	Heritage Reef	
	Jamieson Reef	
	King Sound	
	Lacpede Islands	
	Lord Mayor Shoal	
	Packer Island	
	Pender Bay	
	Quondong Point	
	Talboys Rock	
	Tangier Shoals	
	Vansittart Bay	



Taxa	Offshore Atolls	Kimberley Coast
<b>Family: Geodiidae</b>		
<i>Erylus amissus</i> cf. Adams & Hooper, 2001	1	
<i>Erylus tendenfeldi</i> cf. Sollas, 1888	1	
<i>Geodia</i> sp.		1
<b>Family: Pachastrellidae</b>		
<i>Brachiaster</i> sp. 1 Wilson, 1925		1
<b>Order: Hadromerida</b>		
<b>Family: Clionaidae</b>		
<i>Cliona</i> sp. 17	1	
<i>Cliona celata</i> Grant, 1826	1	1
<i>Cliona dissimilis</i> Ridley & Dendy, 1886	1	1
<i>Cliona orientalis</i> Thiele, 1900	1	1
<i>Cliona</i> sp. 8		1
<i>Cliona</i> sp. K1		1
<i>Cliona</i> sp. NW1	1	
<i>Cliona tinctoria</i> cf. Schönberg, 2000	1	
<i>Pione</i> 2781		1
<i>Pione</i> 2782		1
<i>Pione lampa</i> (de Laubenfels, 1950)		1
<i>Pione velans</i> Hentschel, 1909		1
<i>Sphaciospongia papillosa</i> Ridley & Dendy, 1886	1	
<i>Sphaciospongia</i> sp. K1		1
<i>Sphaciospongia</i> sp. K2		1
<i>Sphaciospongia</i> sp. K3		1
<i>Sphaciospongia vagabunda</i> (Ridley, 1884)	1	
<b>Family: Hemiasterellidae</b>		
<i>Axos flabelliformis</i> Carter, 1879		1
<i>Hemiasterella</i> 1097	1	
	Ashmore Reef	Beagle Bay
	Cartier Island	Brome
	Hibernia Reef	Cape Latouche Treville
	Scott Reef	Cape Leveque
	Seringapatam Reef	Champagny Island
	Clerke Reef	Cockatoo Island
	Mermaid Reef	Colbert Island
		Cone Bay
		Eclipse Shoals
		Fenelon Island
		George Water
		Gibbings Island
		Gourdon Bay
		Green Island
		Grey Shoal
		Heritage Reef
		Jamieson Reef
		King Sound
		Lacpede Islands
		Lord Mayor Shoal
		Packer Island
		Pender Bay
		Quondong Point
		Talboys Rock
		Tangler Shoals
		Vansittart Bay

Taxa	Offshore Atolls	Kimberley Coast
<b>Family: Placospongiidae</b>		
<i>Placospongia</i> sp. 599	1	
<i>Placospongia melobesioides</i> cf. Gray, 1867	1	
<b>Family: Spirastrellidae</b>		
<i>Spirastrella</i> sp. WA1		1
<b>Family: Suberitidae</b>		
<i>Aaptos aaptos</i> (Schmidt, 1864)	1 1	
<i>Suberites</i> sp. 634	1	
<i>Suberites</i> sp. WA1		1
<b>Family: Tethyidae</b>		
<i>Anthothethya fromontae</i> Sara & Sara, 2002		1
<i>Tethya</i> sp. 939	1	
<i>Tethya</i> sp. NW1	1	
<b>Order: Chondrosida</b>		
<b>Family: Chondrillidae</b>		
<i>Chondrilla australiensis</i> Carter, 1873	1	1
<i>Chondrosia</i> sp. 1083	1	
<b>Family: Halisarcidae</b>		
<i>Halisarca tuijardini</i> Johnston, 1842	1	
<b>Order: Lithistida</b>		
<b>Family: Theonellidae</b>		
<i>Discodermia discifera</i> (Lendenfeld, 1907)		1
<i>Theonella cylindrica</i> Wilson, 1925	1 1	
<i>Theonella levior</i> Lendenfeld, 1907		1
<i>Theonella swinhoei</i> Gray, 1868	1 1	
	Ashmore Reef	Beagle Bay
	Carter Island	Broome
	Hibernia Reef	Cape Latouche Treville
	Scott Reef	Cape Leveque
	Seringapatam Reef	Champagny Island
	Clerke Reef	Cockatoo Island
	Mermaid Reef	Colbert Island
		Cone Bay
		Eclipse Shoals
		Fenelon Island
		George Water
		Gibbings Island
		Gourdon Bay
		Green Island
		Grey Shoal
		Heritage Reef
		Jamieson Reef
		King Sound
		Lacepede Islands
		Lord Mayor Shoal
		Packer Island
		Pender Bay
		Quondong Point
		Talboys Rock
		Tangler Shoals
		Vansittart Bay

Taxa	Offshore Atolls	Kimberley Coast
<b>Order: Halichondrida</b>		
<b>Family: Axinellidae</b>		
<i>Axinella</i> sp. 1089	1	
<i>Axinella</i> sp. 774	1	
<i>Axinella aruensis</i> (Hentschel, 1912)	1	
<i>Axinella labyrinthica</i> Dendy, 1889	1	
<i>Axinella</i> sp. BB1		1
<i>Axinella</i> sp. K1		1
<i>Axinella</i> sp. K2		1
<i>Axinella</i> sp. K3		1
<i>Axinella</i> sp. K4		1
<i>Axinella</i> sp. K5		1
<i>Axinella</i> sp. NW1	1	
<i>Axinella</i> sp. NW2	1	
<i>Axinella</i> sp. NW3	1	
<i>Cymbastela</i> sp. K1		1
<i>Cymbastela stipitata</i> (Bergquist & Tizard, 1967)		1
<i>Cymbastela vespertina</i> cf. Hooper & Bergquist, 1992		1
<i>Cymbastela</i> sp. BB1		1
<i>Dragmacidon australe</i> (Bergquist, 1970)	1	
<i>Dragmacidon durissimum</i> (Dendy, 1905)	1	
<i>Phakellia</i> sp. BB1		1
<i>Phakellia</i> sp. K1		1
<i>Reniochalina</i> sp. 1		1
<i>Reniochalina</i> sp. 2		1
<i>Reniochalina stalagmitis</i> Lendenfeld, 1888	1	1
	Ashmore Reef	Beagle Bay
	Cartier Island	Brome
	Hibernia Reef	Cape Latouche Treville
	Scott Reef	Cape Leveque
	Seringapatam Reef	Champagny Island
	Clerke Reef	Cockatoo Island
	Mermaid Reef	Colbert Island
		Cone Bay
		Eclipse Shoals
		Fenelon Island
		George Water
		Gibbings Island
		Gourdon Bay
		Green Island
		Grey Shoal
		Heritage Reef
		Jamieson Reef
		King Sound
		Lacepede Islands
		Lord Mayor Shoal
		Packer Island
		Pender Bay
		Quondong Point
		Talboys Rock
		Tangler Shoals
		Vansittart Bay

Taxa	Offshore Atolls	Kimberley Coast
	Ashmore Reef	
	Carter Island	
	Hibernia Reef	
	Scott Reef	
	Seringapatam Reef	
	Clerke Reef	
	Mermad Reef	
		Beagle Bay
		Broome
		Cape Latouche Treville
		Cape Leveque
		Champagny Island
		Cockatoo Island
		Colbert Island
		Cone Bay
		Eclipse Shoals
		Fenelon Island
		George Water
		Gibbings Island
		Gourdon Bay
		Green Island
		Grey Shoal
		Heritage Reef
		Jamieson Reef
		King Sound
		Lacepede Islands
		Lord Mayor Shoal
		Packer Island
		Pender Bay
		Quondong Point
		Talboys Rock
		Tangler Shoals
		Vansittart Bay
<b>Family: Desmoxiidae</b>		
<i>Higginsia</i> sp. 1059	1	
<i>Higginsia mixta</i> cf. Hentschel, 1912	1	
<i>Higginsia scabra</i> Whitelegge, 1907	1	
<i>Higginsia</i> sp. K1		1
<b>Family: Dictyonellidae</b>		
<i>Acanthella cavernosa</i> Dendy, 1922	1	
<i>Acanthella dendyi</i> (Bergquist, 1970)	1	
<i>Acanthella pulcherrima</i> Ridley & Dendy, 1886	1	
<i>Phakettia euctimena</i> (Hentschel, 1912)	1	
<i>Stylissa carteri</i> (Dendy, 1889)	1	
<i>Stylissa comulosa</i> (Dendy, 1922)	1	
<i>Stylissa flabelliformis</i> (Hentschel, 1912)	1	
<i>Stylissa massa</i> (Carter, 1887)	1	
<b>Family: Halichondriidae</b>		
<i>Axiomyssa</i> sp.?		1
<i>Ciocalypta</i> sp. BB1		1
<i>Ciocalypta</i> sp. SS3		
<i>Eppolasis</i> sp. 799	1	
<i>Halichondria</i> ( <i>Halichondria</i> ) 1101	1	
<i>Halichondria</i> ( <i>Halichondria</i> ) 778	1	
<i>Halichondria</i> ( <i>Halichondria</i> ) 786	1	
<i>Halichondria</i> ( <i>Halichondria</i> ) 802	1	
<i>Halichondria</i> ( <i>Halichondria</i> ) 805	1	
<i>Halichondria</i> ( <i>Halichondria</i> ) sp. K1		1
<i>Halichondria</i> sp. NW1	1	
<i>Halichondria</i> sp. NW2	1	
<i>Halichondria</i> sp. NW3	1	

Taxa	Offshore Atolls	Kimberley Coast
<i>Halichondria</i> sp. NW4	1	
<i>Halichondria</i> sp. NW5	1	
<i>Hymeniacidon</i> sp. NW1	1	
<i>Hymeniacidon</i> sp. NW2	1	
<i>Halichondria</i> sp. NW3	1	
<b>Family: Heteroxyidae</b>		
<i>Didiscus aceratus</i> (Ridley & Dendy, 1886)	1	
<i>Myrmekioderma</i> sp. 1092	1	
<i>Myrmekioderma granulatum</i> (Esper, 1794)	1	
<i>Myrmekioderma niceum</i> (Row, 1911)	1	1
<b>Order: Poeciosclerida</b>		
<b>Family: Acarnidae</b>		
<i>Acarnus ternatus</i> Ridley, 1884		1
<i>Zyzygia criceta</i> cf. Schönberg, 2000	1	
<i>Zyzygia fuliginosa</i> cf. (Carter, 1879)	1	
<b>Family: Chondropsidae</b>		
<i>Batzella</i> sp. 1096	1	
<i>Chondropsis</i> sp. NW1	1	
<i>Chondropsis</i> sp. NW2	1	
<i>Chondropsis</i> sp. NW3	1	
<b>Family: Crambeidae</b>		
<i>Monanchora unguiculata</i> (Dendy, 1922)	1	1
<b>Family: Crellidae</b>		
<i>Crella (Yvesia) spinulata</i> (Hentschel, 1911)	1	
<b>Family: Desmaccellidae</b>		
<i>Bienna</i> sp. 793	1	
<i>Bienna fortis</i> cf. (Topsent, 1897)	1	
<i>Bienna</i> sp. NW1	1	1
	Ashmore Reef	Beagle Bay
	Carter Island	Broome
	Hibernia Reef	Cape Latouche Treville
	Scott Reef	Cape Leveque
	Seringapatam Reef	Champagny Island
	Clerke Reef	Cockatoo Island
	Mermad Reef	Colbert Island
		Cone Bay
		Eclipse Shoals
		Fenelon Island
		George Water
		Gibbings Island
		Gourdon Bay
		Green Island
		Grey Shoal
		Heritage Reef
		Jamieson Reef
		King Sound
		Lacpede Islands
		Lord Mayor Shoal
		Packer Island
		Pender Bay
		Quondong Point
		Talboys Rock
		Tangler Shoals
		Vansittart Bay



Taxa	Offshore Atolls	Kimberley Coast
<i>Bienna</i> sp. NW2	1	
<i>Desmapsammia</i> sp. 800	1 1	
<b>Family: Hymedesmiidae</b>		
<i>Hymedesmia</i> ( <i>Hymedesmia</i> ) sp. 1098	1	
<b>Family: Iotrochotidae</b>		
<i>Iotrochota baculifera</i> Ridley, 1884	1 1 1	1
<i>Iotrochota coccinea</i> (Carter, 1886)	1 1	
<i>Iotrochota coccinea</i> cf. (Carter, 1886)	1 1	
<b>Family: Isodictyiidae</b>		
<i>Coelocarteria singaporensis</i> cf. (Carter, 1883)	1	
<b>Family: Microcionidae</b>		
<i>Antho</i> ( <i>Acarنيا</i> ) <i>ridleyi</i> (Hentschel, 1912)	1	
<i>Clathria</i> ( <i>Microcionia</i> ) <i>aceratoothusa</i> (Carter, 1887)	1 1	
<i>Clathria</i> ( <i>Thalysias</i> ) <i>abietina</i> (Lamarck, 1814)		1
<i>Clathria</i> ( <i>Thalysias</i> ) <i>cactiformis</i> (Lamarck, 1814)		1
<i>Clathria</i> ( <i>Thalysias</i> ) <i>cervicornis</i> cf. (Thiele, 1903)	1	
<i>Clathria</i> ( <i>Thalysias</i> ) <i>coppingeri</i> Ridley, 1884	1	
<i>Clathria</i> ( <i>Thalysias</i> ) <i>lendenfeldti</i> Ridley & Dendy, 1886		1
<i>Clathria</i> ( <i>Thalysias</i> ) <i>reimwardti</i> Vosmaer, 1880	1 1 1	
<i>Clathria</i> ( <i>Thalysias</i> ) <i>tingens</i> Hooper, 1996	1	
<i>Clathria</i> ( <i>Thalysias</i> ) <i>toxifera</i> (Hentschel, 1912)	1 1	
<i>Clathria</i> sp. NW1		1
<i>Clathria</i> sp. NW2	1	
<i>Clathria</i> sp. NW3	1	
	Beagle Bay	
	Broome	
	Cape Latouche Treville	
	Cape Leveque	
	Champagny Island	
	Cockatoo Island	
	Colbert Island	
	Cone Bay	
	Eclipse Shoals	
	Fenelon Island	
	George Water	
	Gibbings Island	1
	Gourdon Bay	
	Green Island	
	Grey Shoal	
	Heritage Reef	
	Jamieson Reef	
	King Sound	
	Lacapede Islands	
	Lord Mayor Shoal	1
	Packer Island	
	Pender Bay	
	Quondong Point	1
	Talboys Rock	
	Tangler Shoals	
	Vansittart Bay	

Taxa	Offshore Atolls	Kimberley Coast
<i>Echinochalina</i> ( <i>Echinochalina</i> ) <i>intermedia</i> cf. (Whitelegge, 1902)	1	
<i>Echinochalina</i> ( <i>Echinochalina</i> ) sp. K1		1
<i>Echinochalina</i> sp. BB1		
<i>Echinochalina</i> sp. NW1	1	
<i>Echinoclathria</i> sp. NW1	1	
<b>Family: Mycalidae</b>		
<i>Mycalæ</i> ( <i>Arenochalina</i> ) sp. 795	1	
<i>Mycalæ</i> ( <i>Carmia</i> ) sp. 239	1	
<i>Mycalæ</i> sp. NW1	1	
<b>Family: Raspailiidae</b>		
<i>Echinodictyum cancellatum</i> (Lamarck, 1814)	1	1
<i>Echinodictyum clathrioides</i> Hentschel, 1911		1
<i>Echinodictyum meseritium</i> (Lamarck, 1814)	1	1
<i>Ectyoplasia tabula</i> (Lamarck, 1814)	1	1
<i>Ectyoplasia vanuus</i> Hooper, 1991	1	
<i>Raspailia</i> ( <i>Clathriodendron</i> ) <i>melanorhops</i> Hooper, 1991		1
<i>Raspailia</i> ( <i>Parasyringella</i> ) <i>clathrata</i> cf. Ridley, 1884		1
<i>Raspailia</i> ( <i>Parasyringella</i> ) <i>nuda</i> cf. Hentschel, 1911		1
<i>Raspailia</i> ( <i>Raspailia</i> ) <i>phakelopsis</i> Hooper, 1991		
<i>Raspailia</i> ( <i>Raspailia</i> ) <i>vestigifera</i> Dendy, 1896	1	
<i>Raspailia</i> ( <i>Raspaxilla</i> ) sp. BB1		
<i>Thrinacophora ceruicornis</i> cf. Ridley & Dendy, 1886		1
<i>Trikenrion flabelliforme</i> Carter, 1882		1
	Beagle Bay	
	Broome	
	Cape Latouche Treville	
	Cape Leveque	
	Champagny Island	
	Cockatoo Island	
	Colbert Island	
	Cone Bay	
	Eclipse Shoals	
	Fenelon Island	
	George Water	
	Gibbings Island	
	Gourdon Bay	
	Green Island	
	Grey Shoal	
	Heritage Reef	
	Jamieson Reef	
	King Sound	
	Lacepede Islands	
	Lord Mayor Shoal	
	Packer Island	
	Pender Bay	
	Quondong Point	
	Talboys Rock	
	Tangier Shoals	
	Vansittart Bay	

Taxa	Offshore Atolls	Kimberley Coast
<b>Family: Rhaderemiidea</b>		
<i>Rhaderemia indica</i> cf. Dendy, 1905	1	
<b>Family: Tedaniidae</b>		
<i>Tedania (Tedania) anhelans</i> cf. (Lieberkühn, 1859)	1	
<b>Order: Agelasida</b>		
<b>Family: Agelasidae</b>		
<i>Agelas mauritiana</i> (Carter, 1883)	1 1 1 1	
<b>Family: Astrocleridae</b>		
<i>Astroclera willeyana</i> Lister, 1900	1 1	
<b>Order: Haplosclerida</b>		
<b>Family: Callyspongiidae</b>		
<i>Arenosclera</i> sp. K1		1
<i>Callyspongia (Callyspongia) 102</i>		
<i>Callyspongia (Callyspongia) 755</i>	1	
<i>Callyspongia (Callyspongia) 791</i>	1	
<i>Callyspongia (Callyspongia) 803</i>	1	
<i>Callyspongia (Callyspongia) 938</i>	1	
<i>Callyspongia (Callyspongia) confederata</i> (Ridley, 1884)		1
<i>Callyspongia (Callyspongia) sp. K1</i>		1 1
<i>Callyspongia (Cladochalina) cf. aerizusa</i> Desqueyroux-Faúndez, 1984	1 1	
<i>Callyspongia (Toxochalina) schulzei</i> (Kieschnick, 1900)	1	
<i>Callyspongia (Toxochalina) sp. K1</i>		1 1
<i>Callyspongia sp. NW1</i>	1	
<i>Callyspongia sp. NW2</i>	1	
	Beagle Bay	Cape Latouche Treville
	Broome	Cape Leveque
	Champagny Island	Cockatoo Island
	Colbert Island	Cone Bay
	Eclipse Shoals	Fenelon Island
	George Water	Gibbings Island
	Gourdon Bay	Green Island
	Grey Shoal	Heritage Reef
	Jamieson Reef	King Sound
	Lacapede Islands	Lord Mayor Shoal
	Packer Island	Pender Bay
	Quondong Point	Talboys Rock
	Tangler Shoals	Vansittart Bay

Taxa	Offshore Atolls	Kimberley Coast
<i>Callyspongia</i> sp. NW3	1	
<i>Callyspongia</i> sp. NW4	1	
<i>Callyspongia</i> sp. NW5	1	
<i>Callyspongia</i> sp. NW6	1	
<b>Family: Chalinidae</b>		
<i>Chalinula confusa</i> (Dendy, 1922)		
<i>Haliclona</i> ( <i>Celliulus</i> ) <i>amboinensis</i> (Lévi, 1961)	1	
<i>Haliclona</i> ( <i>Celliulus</i> ) <i>cymaeformis</i> (Esper, 1794)	1	1
<i>Haliclona</i> ( <i>Haliclona</i> ) sp. 1022	1	
<i>Haliclona</i> ( <i>Haliclona</i> ) sp. 384	1	
<i>Haliclona</i> ( <i>Haliclona</i> ) sp. 945	1	
<i>Haliclona</i> ( <i>Reniera</i> ) sp. 789	1	
<i>Haliclona</i> ( <i>Reniera</i> ) sp. 801	1	
<i>Haliclona</i> ( <i>Reniera</i> ) sp. NW2	1	1
<i>Haliclona</i> ( <i>Reniera</i> ) sp. NW6	1	
<i>Haliclona</i> ( <i>Reniera</i> ) sp. NW7	1	
<i>Haliclona</i> ( <i>Reniera</i> ) sp. NW8	1	
<i>Haliclona korenella</i> de Laubenfels, 1954	1	
<i>Haliclona</i> sp. NW1	1	
<i>Haliclona</i> sp. NW10	1	
<i>Haliclona</i> sp. NW3	1	
<i>Haliclona</i> sp. NW4	1	
<i>Haliclona</i> sp. NW5	1	
<i>Haliclona</i> sp. NW9	1	
<i>Haliclona viola</i> cf. Hoshino, 1981	1	
<b>Family: Niphatidae</b>		
<i>Amphimedon lamellata</i> Fromont, 1993		1
<i>Amphimedon paracirridis</i> Fromont, 1993		1
	Beagle Bay	
	Cape Latouche Treville	
	Cape Leveque	
	Champagny Island	
	Cockatoo Island	
	Colbert Island	
	Cone Bay	
	Eclipse Shoals	
	Fenelon Island	
	George Water	
	Gibbings Island	
	Gourdon Bay	
	Green Island	
	Grey Shoal	
	Heritage Reef	
	Jamieson Reef	
	King Sound	
	Lacapede Islands	
	Lord Mayor Shoal	
	Packer Island	
	Pender Bay	
	Quondong Point	
	Talboys Rock	
	Tangler Shoals	
	Vansittart Bay	



Taxa	Offshore Atolls	Kimberley Coast
<i>Petrosia (Strongylophora) strongylata</i> Thiele, 1903	1	
<i>Petrosia</i> sp. NW3	1	
<i>Petrosia</i> sp. NW4	1	
<i>Petrosia</i> sp. NW5	1	
<i>Petrosia</i> sp. NW6	1	
<i>Xestospongia bergquistia</i> cf. Fromont, 1991	1	1
<i>Xestospongia</i> sp. NW1	1	
<i>Xestospongia</i> sp. NW2	1	
<i>Xestospongia testudinaria</i> (Lamarck, 1815)	1	1
<b>Family: Phloeodictyidae</b>		
<i>Siphonodictyon mucosum</i> Bergquist, 1965	1	
<i>Siphonodictyon paratypicum</i> cf. (Fromont, 1993)	1	
<i>Siphonodictyon</i> sp. 1102	1	
<i>Siphonodictyon</i> sp. 332	1	
<i>Siphonodictyon</i> sp. K1		1
<i>Siphonodictyon</i> sp. K2		1
<i>Siphonodictyon</i> sp. NW1		1
<i>Siphonodictyon</i> sp. NW2	1	
<i>Oceanapia amboinensis</i> Topsent, 1897	1	
<i>Oceanapia macrotoxa</i> (Hooper, 1984)	1	
<i>Oceanapia ramsayi</i> Lendenfeld, 1888	1	1
<i>Oceanapia</i> sp. NW1	1	
<b>Order: Dictyoceratida</b>		
<b>Family: Dysideidae</b>		
<i>Dysidea</i> sp. 111	1	
<i>Dysidea arenaria</i> Bergquist, 1965	1	
<i>Dysidea granulosa</i> Bergquist, 1965	1	
<i>Dysidea granulosa</i> cf. Bergquist, 1965	1	
		Beagle Bay
		Broome
		Cape Latouche Treville
		Cape Leveque
		Champagny Island
		Cockatoo Island
		Colbert Island
		Cone Bay
		Eclipse Shoals
		Fenelon Island
		George Water
		Gibbings Island
		Gourdon Bay
		Green Island
		Grey Shoal
		Heritage Reef
		Jamieson Reef
		King Sound
		Lacapede Islands
		Lord Mayor Shoal
		Packer Island
		Pender Bay
		Quondong Point
		Talboys Rock
		Tangler Shoals
		Vansittart Bay









APPENDIX 2 Known species of sponges recorded from the Project Area, the locations where they were reported, and their biogeographic coding.

Taxa	Offshore	Inshore	Temp Aus	Temp Sth Africa	Western Indo-Pac	NW Aust Shelf	Sahul Shelf	NE Aust Shelf	Central Indo-Pac	Eastern Indo-Pac	Comments
<b>CALCAREA</b>											
<b>Order: Clathrinida</b>											
<b>Family: Leucettidae</b>											
<i>Pericharax heteroraphis</i> Poléjaeff, 1883	•			1	1	1	1	1	1	1	
<b>HOMOSCLEROMORPHA</b>											
<b>Order: Homosclerophorida</b>											
<b>Family: Plakinidae</b>											
<i>Plakinastrella mammillaris</i> Lendenfeld, 1907	•		1								
<i>Plakortis communis</i> Muricy, 2010	•		1			1		1		1	
<i>Plakortis nigra</i> Lévi, 1953	•				1						
<b>DEMOSPONGIAE</b>											
<b>Order: Spiroborida</b>											
<i>Cinachyrella australiensis</i> Carter, 1886	•	•	1		1	1	1		1		
<i>Cinachyrella enigmatica</i> (Burton, 1934)	•							1			
<i>Cinachyrella schulzei</i> (Keller, 1891)	•				1			1			
<i>Cinachyrella tarentina</i> (Pulitzer-Finali, 1983)	•										Temp Nth Atlantic; Trop Atlantic
<b>Order: Astrophorida</b>											
<i>Metoplus sarasinorum</i> Thiele, 1899	•					1	1	1	1		
<i>Rhabdastrella globostellata</i> (Carter, 1883)	•		1		1	1	1	1	1		
<i>Stelletta clavosa</i> Ridley, 1884	•		1		1	1	1	1	1		
<i>Stelletta splendens</i> Tanita, 1965	•										Temp Nth Pacific (Sea of Japan)
<b>Order: Hadromerida</b>											
<b>Family: Clionaidae</b>											
<i>Cliona celata</i> Grant, 1826	•			1							Temp Nth Atlantic, Trop Atlantic
<i>Cliona dissimilis</i> Ridley & Dendy, 1886	•	•	1			1	1				

Taxa	Offshore	Inshore	Temp Aus	Temp Sth Africa	Western Indo-Pac	NW Aust Shelf	Sahul Shelf	NE Aust Shelf	Central Indo-Pac	Eastern Indo-Pac	Comments
<i>Cliona orientalis</i> Thiele, 1900	•	•			1	1	1	1	1		
<i>Pione lampa</i> (de Laubenfels, 1950)		•									Trop Atlantic
<i>Pione velans</i> Hentschel, 1909		•	1			1	1				
<i>Spheticospongia papillosa</i> Ridley & Dendy, 1886	•		1								
<i>Spheticospongia vagabunda</i> (Ridley, 1884)	•	•		1	1	1		1	1		
<b>Family: Hemiasterellidae</b>											
<i>Axos flabelliformis</i> Carter, 1879		•				1		1			
<b>Family: Suberitidae</b>											
<i>Aaptos aaptos</i> (Schmidt, 1864)	•										Temp Nth Atlantic
<b>Family: Tethyidae</b>											
<i>Anthothethya fromontae</i> Sara & Sara, 2002		•						1			
<b>Order: Chondrosida</b>											
<b>Family: Chondrillidae</b>											
<i>Chondrilla australiensis</i> Carter, 1873	•		1		1	1	1	1	1		
<b>Family: Halisarcidae</b>											
<i>Halisarca diujardini</i> Johnston, 1842	•										Temp Nth Atlantic
<b>Order: Lithistida</b>											
<b>Family: Theonellidae</b>											
<i>Discodermia discifera</i> (Lendenfeld, 1907)		•	1		1	1					
<i>Theonella cylindrica</i> Wilson, 1925	•										1
<i>Theonella levior</i> Lendenfeld, 1907		•	1			1					
<i>Theonella swinhoei</i> Gray, 1868	•				1						1



Taxa	Offshore	Inshore	Temp Aus	Temp Sth Africa	Western Indo-Pac	NW Aust Shelf	Sahul Shelf	NE Aust Shelf	Central Indo-Pac	Eastern Indo-Pac	Comments
<b>Order: Poecilosclerida</b>											
<b>Family: Acarnidae</b>											
<i>Acarinus ternatus</i> Ridley, 1884		•			1			1	1		
<b>Family: Crambeidae</b>											
<i>Monanchora unguiculata</i> (Dendy, 1922)	•				1	1			1		Trop Atlantic
<b>Family: Crellidae</b>											
<i>Crella (Yvesia) spinulata</i> (Hentschel, 1911)	•		1			1					
<b>Family: Iotrochotidae</b>											
<i>Iotrochota baculifera</i> Ridley, 1884	•	•	1		1	1	1		1	1	
<i>Iotrochota coccinea</i> (Carter, 1886)	•		1								
<b>Family: Microcionidae</b>											
<i>Antho (Acarria) ridleyi</i> (Hentschel, 1912)	•					1			1		
<i>Clathria (Microciona) acertoobtrusa</i> (Carter, 1887)	•		1		1	1		1	1		
<i>Clathria (Thalysias) abietina</i> (Lamarck, 1814)		•			1	1	1	1	1		
<i>Clathria (Thalysias) cactiformis</i> (Lamarck, 1814)		•	1		1	1					
<i>Clathria (Thalysias) coppingeri</i> Ridley, 1884	•		1			1	1	1			
<i>Clathria (Thalysias) lendenfeldi</i> Ridley & Dendy, 1886		•	1		1	1	1	1	1		
<i>Clathria (Thalysias) reinwardti</i> Vosmaer, 1880	•				1	1	1	1	1		
<i>Clathria (Thalysias) tingens</i> Hooper, 1996	•					1	1	1			
<i>Clathria (Thalysias) toxifera</i> (Hentschel, 1912)	•					1	1		1		
<b>Family: Raspailiidae</b>											
<i>Echinodictyum cancellatum</i> (Lamarck, 1814)	•	•	1			1	1	1			
<i>Echinodictyum clathrioides</i> Hentschel, 1911		•	1			1					
<i>Echinodictyum mesenterinum</i> (Lamarck, 1814)	•	•	1			1	1	1			
<i>Ectyoplasia tabula</i> (Lamarck, 1814)	•	•	1			1	1	1			
<i>Ectyoplasia vannus</i> Hooper, 1991		•				1	1	1			



Taxa	Offshore	Inshore	Temp Aus	Temp Sth Africa	Western Indo-Pac	NW Aust Shelf	Sahul Shelf	NE Aust Shelf	Central Indo-Pac	Eastern Indo-Pac	Comments
<i>Neopetrosia exigua</i> (Kirkpatrick, 1900)	•	•		1	1	1		1	1		
<i>Petrosia (Petrosia) nigricans</i> Lindgren, 1897	•			1	1	1			1		
<i>Petrosia (Strongylophora) strongylata</i> Thiele, 1903	•							1	1		
<i>Xestospongia testudinaria</i> (Lamarck, 1815)	•	•		1	1	1	1	1	1		
<b>Family: Phloeodictyidae</b>											
<i>Siphonodictyon mucosum</i> Bergquist, 1965	•			1	1	1		1	1		
<i>Oceanapia amboinensis</i> Topsent, 1897	•			1	1	1			1		
<i>Oceanapia macrotaxa</i> (Hooper, 1984)	•	•		1	1	1	1				
<i>Oceanapia ramsayi</i> Lendenfeld, 1888		•	1		1						
<b>Order: Dictyoceratida</b>											
<b>Family: Dysideidae</b>											
<i>Dysidea arenaria</i> Bergquist, 1965	•	•			1	1			1		
<i>Dysidea granulosa</i> Bergquist, 1965	•				1	1			1		
<i>Lamellodysidea herbacea</i> (Keller, 1889)	•				1	1		1	1		
<b>Family: Spongiidae</b>											
<i>Hyattella intestinalis</i> (Lamarck, 1814)		•	1		1						
<b>Family: Thorectidae</b>											
<i>Aplysinopsis elegans</i> Lendenfeld, 1888	•		1		1	1		1	1		Temp Nth Pacific
<i>Carterospongia flabellifera</i> (Bowerbank, 1877)	•				1	1		1	1		
<i>Carterospongia foliascens</i> (Pallas, 1766)	•		1		1	1		1	1		1
<i>Dactylospongia elegans</i> (Thiele, 1899)	•				1	1			1		
<i>Fascaplysinopsis reticulata</i> (Hentschel, 1912)	•				1	1	1	1	1		
<i>Hyrtios erectus</i> (Keller, 1889)	•				1	1			1		
<i>Phyllospongia papyracea</i> (Esper, 1794)	•				1	1		1	1		

Taxa	Offshore	Inshore	Temp Aus	Temp Sth Africa	Western Indo-Pac	NW Aust Shelf	Sahul Shelf	NE Aust Shelf	Central Indo-Pac	Eastern Indo-Pac	Comments
<b>Order: Verongida</b>											
<b>Family: Aplysinellidae</b>											
<i>Suberea ianthelliformis</i> (Lendenfeld, 1888)	•		1		1						
<b>Family: Ianthellidae</b>											
<i>Ianthella basta</i> (Pallas, 1766)		•			1	1	1	1	1		
<i>Ianthella flabelliformis</i> (Pallas, 1766)	•		1		1	1	1	1	1		
<i>Ianthella quadrangulata</i> Bergquist & Kelly-Borges, 1995	•		1								
<b>Total species</b>	<b>81</b>	<b>40</b>	<b>34</b>	<b>2</b>	<b>47</b>	<b>76</b>	<b>39</b>	<b>45</b>	<b>56</b>	<b>5</b>	