

TRAFFIC

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ARTISANAL FISHING IN EAST AFRICA

AN ASSESSMENT OF MARINE SPECIES TRADED AT
EAST AFRICAN ARTISANAL FISHERY LANDING SITES

Oliver Wright
Camilla Floros
Martin Andimile

TRAFFIC REPORT

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PROJECT SUPERVISORS

Camilla Floros

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DESIGN

Cressida Stevens



Madema - traditional woven fish traps

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EXECUTIVE SUMMARY

African Scad Trachurus Delagoa caught by artisanal fishers off the Tanzanian coast

Small-scale and artisanal fishers contribute significantly to global catch. This is particularly the case in tropical developing regions such as East Africa where fishing effort is concentrated near shore, and a wide variety of reef-associated species are targeted using traditional gear and methods. This is a region of abundant marine biodiversity where coastal communities are heavily dependent on marine ecosystems for food security and economic gain. Alternative livelihoods are scarce in the region, and unsustainable and destructive fishing driven by unregulated or illegal trade risks compromising the productivity of nearshore marine habitats.

This report builds on the findings of a previous rapid assessment of nearshore fisheries in Kenya and the United Republic of Tanzania through a comprehensive photographic survey of the marine species being landed and traded at artisanal fishery landing sites in the region. Trained enumerators photographed and measured fish and other marine organisms for sale at landing sites. Images of marine organisms along with taxonomic information, location, and other supplementary data were recorded in an online database for analyses.

The survey revealed a remarkable diversity of marine species being landed and traded by artisanal fishers. An estimated total of 70,755 individual marine organisms were recorded from 7,372 images at all sites during the survey period of May to November 2021. A total of 489 marine species belonging to 114 families were identified across all sample sites. These included species of shark, fish, crustacean, sea cucumber, and mollusc. Across all landing sites, the average size of most fish species (63%) was less than 30cm. The high prevalence of small catches with high species diversity is cause for concern and suggests broad-spectrum targeting of a wide diversity of marine species, with fishers using indiscriminate harvesting gear to catch as many species as possible.

Many of the species being openly landed and traded are prohibited from harvest by local

fisheries legislation, recognised as threatened with extinction by the International Union for the Conservation of Nature (IUCN), and have been placed under international trade controls by the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES), in response to trade threats to their persistence in the wild.

Examples of threatened marine species found to be landed and traded despite local harvest prohibitions include the Critically Endangered Bowmouth Guitarfish *Rhina ancylostoma* and Bottlenose Wedgefish *Rhyncobatus australiae*, Endangered Mobulid Ray *Mobula* spp, Humphead Wrasse *Cheilinus undulatus* and Black Teatfish *Holothuria nobilis* sea cucumbers, and Vulnerable Spotted Seahorses *Hippocampus kuda*, Smooth Hammerhead *Sphyrna zygaena* sharks, and White Teatfish *Holothuria fuscogilva* sea cucumbers. All of these species are under additional threat from international trade and are listed in Appendix II of CITES.

A high proportion of species which are prohibited from harvest were recorded at landing sites on the Island of Unguja in the Zanzibar Archipelago (hereafter referred to as Zanzibar), which accounted for more than double the Tanzanian mainland's records of threatened and locally protected species. This may be due to lower levels of fisheries law enforcement on Zanzibar relative to the mainland and warrants further investigation.

Artisanal fisheries in East Africa face complex challenges to ensure their future sustainability. We recommend multi-faceted fisheries management and law enforcement interventions, including legislative reviews to eliminate discrepancies between regional fisheries laws, building law enforcement capacity in the region, and educating fishers on protected species and the importance of responsible harvesting to ensure sustainable livelihoods.

RECOMMENDATIONS

TO ENSURE MARINE RESOURCES ARE NOT OVEREXPLOITED AND THAT TRADE IS NOT A THREAT TO LOCAL FOOD SECURITY AND LIVELIHOODS

This report highlights potentially unregulated and, in some cases, illegal harvest of marine species by artisanal fishers in East African nearshore waters. The most notable species recorded in this study are those prohibited from harvest by local fisheries laws, listed as threatened by the IUCN, and species for which CITES has found international trade to threaten their persistence in the wild. These international listings and local prohibitions are intended to prevent the overexploitation of species and should be considered by local fishing authorities when developing policies and strategies for fisheries regulation and the preservation of marine resources for future generations. The diversity of marine species and the high proportion of smaller individuals being landed suggests fishers are using indiscriminate fishing methods and gear, which may compromise the sustainability of the small-scale fisheries in this region.

The East African coast boasts highly productive tropical marine ecosystems that if managed appropriately can continue to support livelihoods in coastal communities. Continued monitoring and regulation of harvest and trade, and improved law enforcement are required to prevent unsustainable extraction of nearshore marine resources and ensure that trade is not a threat to local food security and livelihoods.

ADDRESS LEGISLATIVE LOOPHOLES

Discrepancies and inconsistencies in regional fisheries legislation are being exploited as loopholes for illicit trade.

Tanzania should work towards consolidating the 2003 Fisheries Act, the 2009 Fisheries Regulations, and the Zanzibar Fisheries Act of 2010 into a single, consistent and overarching set of regulations governing fishing gears, methods, and protected species on Zanzibar and the mainland.

Tanzania and Kenya should review and update locally protected marine species listed in the Tanzania Fisheries Act and the Kenya Wildlife Conservation and Management Act, and species protections aligned with international conventions such as CITES and the IUCN Red List.

BUILD LAW ENFORCEMENT AND MANAGEMENT CAPACITY

Training of local fisheries law enforcement officials on marine species identification is required, with a focus on local species that are prohibited from catch and trade.

Fisheries officials should be aware of and understand the restrictions on fishing gear and methods in their respective regions, particularly minimum mesh sizes for nets and fish traps.

Long-term monitoring programmes need to be implemented by the relevant fisheries authorities at all artisanal fishery landing sites in Kenya, Tanzania and Zanzibar, to ensure the collection of data on artisanal fisheries to inform decision-makers on trade dynamics, management effectiveness, and compliance efforts going forward.

AWARENESS RAISING

Kenyan and Tanzanian marine law enforcement agencies are encouraged to join the East Africa [Trade in Wildlife Information Exchange \(TWIX\)](#) information-sharing platform and to regularly share pertinent fisheries and marine species trade information.

Tanzanian and Zanzibari fisheries authorities are encouraged to further investigate the higher exploitation of protected marine species on Zanzibar relative to the Tanzanian mainland found in this study.

Awareness initiatives are required throughout all artisanal fisheries locations along the Kenyan, Tanzanian and Zanzibari coastlines to ensure artisanal fishers understand the importance of sustainable fishing practices and fisheries management, marine species identification, and local restrictions on catch and trade.

Fishers may be better motivated to implement sustainable fishing practices if they are made aware of and understand the negative impacts on their livelihoods that may result from unsustainable fishing practices. Awareness initiatives implemented by **Kenyan and Tanzanian fisheries authorities** should therefore aim to foster better understanding among fishers of the long-term livelihood impacts unsustainable marine harvest.

FUTURE RESEARCH AND CONSERVATION APPLICATIONS OF SURVEY DATA

Beyond this report, the data and images collected in this survey may be of great value to future fisheries and trade research. Potential future research and conservation applications of the repository of images of East African marine species and accompanying data collected in this survey should be explored, for example:

- An open-access image and data repository for continued research into East African marine fisheries and trade.
- Species images could be used to develop identification applications or to train autodetection algorithms to flag protected species photographed at landing sites.



*Colourful Eclipse Parrotfish *Scarus russelli* and Tripletail Wrasse *Cheilinus trilobatus* for sale at an East African fish landing-site*

INTRODUCTION

THE WORLD'S MARINE RESOURCES ARE UNDER INCREASING PRESSURE FROM HUMAN EXPLOITATION.

The proportion of global fish stocks fished at biologically unsustainable levels reached 35.4% in 2019 and is projected to increase as global human population growth drives the demand for seafood higher (FAO, 2022). While most global fishing pressure is attributed to industrial fishing, a significant portion of global catch comes from small-scale marine fisheries, which land an estimated 25 million tons of fish per year, contributing approximately 31% to total global marine capture fisheries production (FAO, Duke University & Worldfish, 2022; FAO, 2022).

Small-scale fisheries are important for food security, poverty eradication, and community well-being. In many African maritime states, coastal communities rely heavily on marine fish as a source of protein, and for supporting livelihoods (Chuenpagdee et al, 2018; Belhabib et al, 2019). The East African coast is a region of high marine species diversity where local people depend on marine resources for food and employment (Van der Elst et al, 2005). Inshore fishing in the region is mostly small-scale and carried out by artisanal fishers using traditional vessels and gear in the shallow coastal waters (Silas et al, 2020; Jiddawi and Öhman, 2002).

35.4%
global fish stocks
found fished at biologically unsustainable levels in 2019

Small-scale fisheries are important for:

Food security



Poverty eradication



Community well-being



There is a long-term trend of overharvesting of marine resources and the use of destructive fishing methods such as dynamite and drag nets in the region (Jiddawi & Ohman, 2002; Bi et al, 2022). Data for small-scale fisheries in East Africa have historically tended to be incomplete and underestimated actual catches, leading to increased risk of authorities over licensing fishing access and compromising marine ecosystems and food security (Jacquet et al, 2010). Fishing gears commonly used by artisanal fishers in East Africa include basket traps or “madema”, fence traps, handlines, longlines, spearguns, harpoons, gillnets (stationary, drifting, and monofilament), ring nets, seine nets, cast nets, scoop nets, and mosquito nets (Samoilys et al, 2011). These gears are generally indiscriminate in terms of the sizes and species of fish caught and potentially damaging to marine ecosystems.

East Africa’s potential for marine fisheries production is lower than other African coastal regions, as its many islands and coral reefs limit accessibility to deep sea fishing grounds (Bi et al, 2022). Coastal fisheries can drive the decline of critical marine ecosystems, particularly in developing regions such as East Africa where fishing pressure is concentrated close to shore and fishers rely on sometimes destructive low-cost gear (Thoya et al, 2020). Coral reefs are key fishing areas for artisanal fishers due to their proximity to shore, high diversity, and productivity (Shao et al, 2003). It is estimated that up to 70% of the East African region’s coral reefs have been fished to below sustainable levels (McClanahan, 2019).

In recent years, fishers in the region have reported increased fishing effort and reduced catches, and a general decline in income and welfare (Ochiewo et al, 2020). This reduced

productivity of East African inshore marine ecosystems is likely to be compounded by climate change, and growing human populations are likely to put further pressure on East African fish stocks (Bornemann et al, 2019).

Illegal unreported and unregulated (IUU) fishing represents another major threat to marine conservation in the region (Belhabib et al, 2019). Asian demand for high-value marine delicacies and traditional medicines has placed further pressure on African marine resources in recent years, with high-value marine products such as shark fins and sea cucumbers being targeted by fishers along the East African coast (Louw, 2021).

In 2019, TRAFFIC conducted a rapid assessment of nearshore fisheries along the coasts of Kenya and the United Republic of Tanzania (hereafter Tanzania) to understand potential trade threats to East African marine species. This rapid assessment highlighted issues of the unsustainable harvesting of marine resources, targeting of protected species, legal and regulatory discrepancies that were opening opportunities for illegal fishing, and limited capacity for effective law enforcement regarding artisanal catch and trade.

The rapid assessment revealed a need for a more in-depth study of the potential impact of artisanal capture fisheries and trade on Kenya and Tanzania’s marine ecosystems and species. This study builds on TRAFFIC’s earlier findings with a comprehensive photographic survey of fish landing sites and aims to gain further insight into the multiple marine conservation, law enforcement, and compliance issues in the region.

small-scale fisheries in East Africa

typically have incomplete data and underestimated catch

increased effort but reduced catch

reported by fishers in the region



Fishing nets

METHODS

Between May and November 2021, images of marine fish and invertebrates were captured at six fish landing sites on the Tanzanian mainland (four in Tanga and two in Dar es Salaam), two sites on the island of Zanzibar, and two sites in Kenya (Shimoni in Kwale County and Malindi in Kilifi County) (Figure 1). Sample size in terms of days sampled and individual records varied between sites and regions (Table 1). The largest survey took place in Tanzania, with shorter surveys in Kenya and on Zanzibar. The survey was conducted in East Africa's dry season. However, limited seasonal variability in artisanal catch is expected in the region due to year round demand for marine protein (with limited alternative livelihoods), the lack of migratory species targeted by artisanal fishers who mostly fish on coral reefs, and the tropical and therefore relatively unseasonal location of the survey sites.

FIGURE 1

Map showing landing sites and proportion of sample days at each site and region.

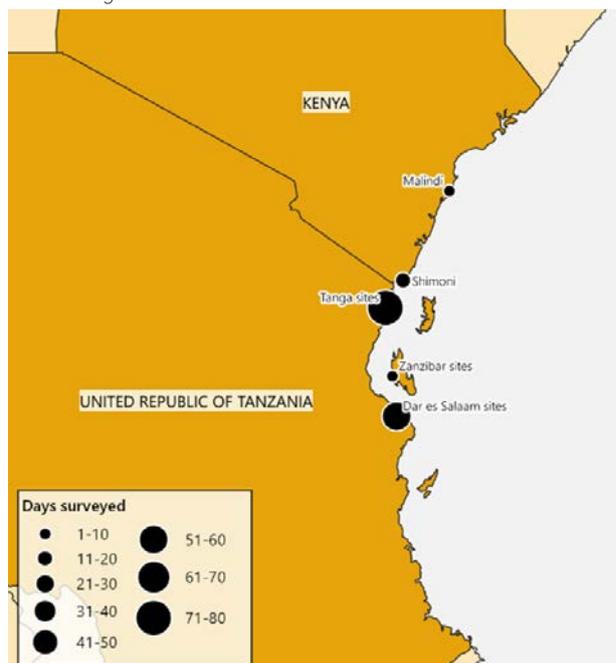


TABLE 1

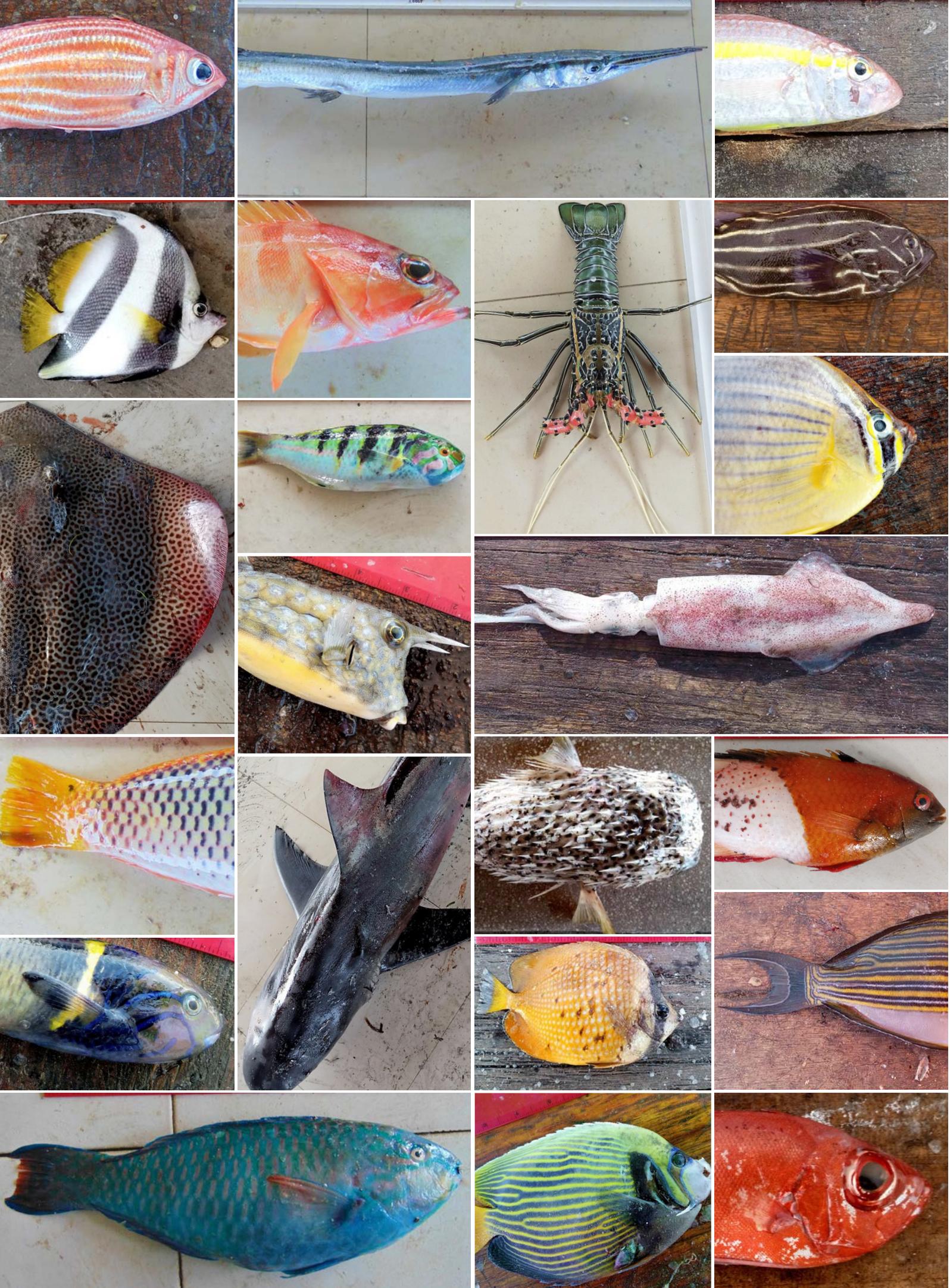
Number of sample days for each site and region.

LOCATION	DAYS SURVEYED
TANZANIA	109
Dar es Salaam	
Kivukoni	27
Kunduchi	29
Tanga	
Deep Sea	24
Kasera	24
Mchukuuni	1
Mtambwe	4
KENYA	21
Kwale	
Shimoni	17
Kilifi	
Malindi	4
ZANZIBAR	10
Mabuluu	7
Mazizini	3
TOTAL	140

Three local field enumerators received training in capturing images for marine species identification, before conducting photographic surveys at the landing sites. During the survey period, field enumerators photographed any marine species for sale at the markets and landing sites. Individual specimens were photographed next to a ruler for scale. In the case of large quantities of a particular species of similar size, one sample individual was photographed with a ruler and extrapolated as a rough estimate of size. Average size was calculated from the total size estimates for each species, and fish species were allocated to size categories based on average size. Fishing gear was also photographed, when possible, to determine fishing methods and

as an indication of compliance with gear regulations.

Specimens were identified at least to family level, and to species level wherever possible. Once a specimen was accurately identified, its taxonomic information was recorded along with its location, the date it was landed, length, conservation status, and any relevant harvest and trade restrictions. Analysis of species data was then conducted to identify any trends relating to abundance, individual size, diversity, and trading of protected, threatened, or trade-restricted species that may indicate illegal and/or unsustainable harvest and trade.





RESULTS

An estimated total of 70,755 individual marine organisms were recorded from 7,372 images at all sites over the survey period and a total of 489 marine species belonging to 114 families were identified. This comprised 11 families and 26 species of shark and ray, 79 families and 396 species of marine fish, four families and 12 species of crustacean, three families of cephalopod with one representative species each, 18 species of sea cucumber from two families, and 12 families and 14 species of mollusc (Full species list in Annex 1).

The top ten families in terms of species diversity accounted for 218 (45%) of the total recorded species (Figure 2). The highest diversity was recorded for the family Labridae (wrasses) with 42 species, followed by Serranidae (groupers) with 30 species, and Carangidae (trevallies, scads, and queenfishes) with 27 species. The top ten families accounting for 81% of the total quantity

(n=57,583) are listed in Table 2. The Clupeid family (baitfish, i.e. anchovies and herrings) accounted for 55% of the total estimated quantity (~n=38,594) due to large catches of Silver-stripe round herring (*Spratelloides gracilis*).

The average recorded size of most fish species (63%) was less than 30cm, with the largest proportion (31%) of fish species falling into the 10 to 20 cm size category (Figure 3). Only 4% of species averaged above 1m in size. If sharks and rays are excluded and only bony fishes are considered, the percentage of species exceeding an average size of 1m is reduced to 2%. Similar trends are observed when considering quantity per average size category (Figure 4). When Clupeids (baitfish) are excluded, 73% of fish by estimated quantity were less than 30cm, with the highest number of fish falling into the 20 to 30cm size range.

489 species
belonging to 114
families were
identified

TABLE 2

Top ten families by estimated quantity of individuals.

	FAMILY	QUANTITY
1	Clupeidae (Herrings, Shads, Sardines)	38,594
2	Penaeidea (Prawns)	4,410
3	Scombridae (Mackerels, Tunas, Bonitos)	2,666
4	Carangidae (Trevallies, Jacks, Pompanos)	2,269
5	Dussumieriidae (Round herrings)	2,140
6	Lutjanidae (Snappers)	2,060
7	Loliginidae (Squids)	2,000
8	Sphyrnaeidae (Barracudas)	1,321
9	Hemiramphidae (Halfbeaks)	1,217
10	Exocoetidae (Flying Fish)	905

FIGURE 2

Top ten families by number of species.

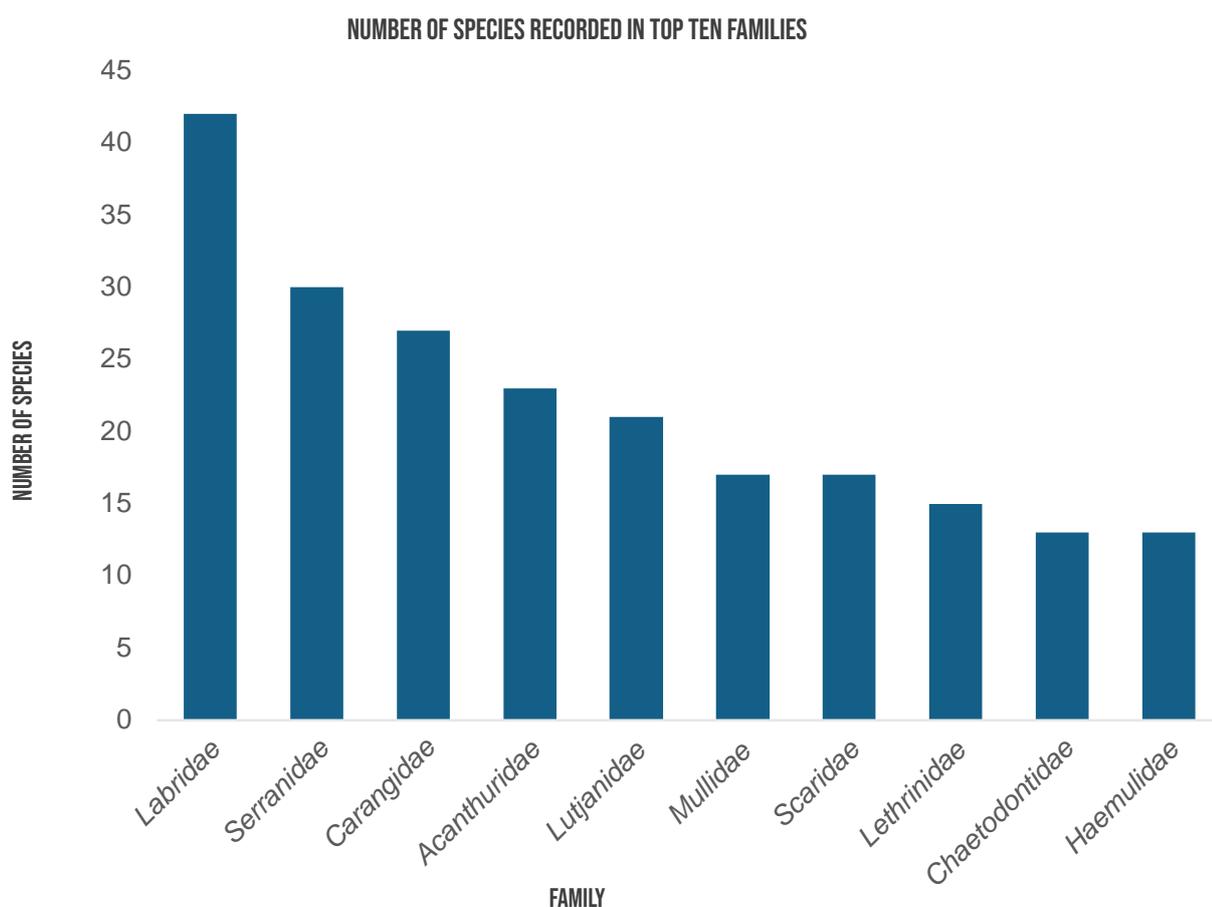


FIGURE 3

Number (A) and percentage (B) of fish species per average size category.

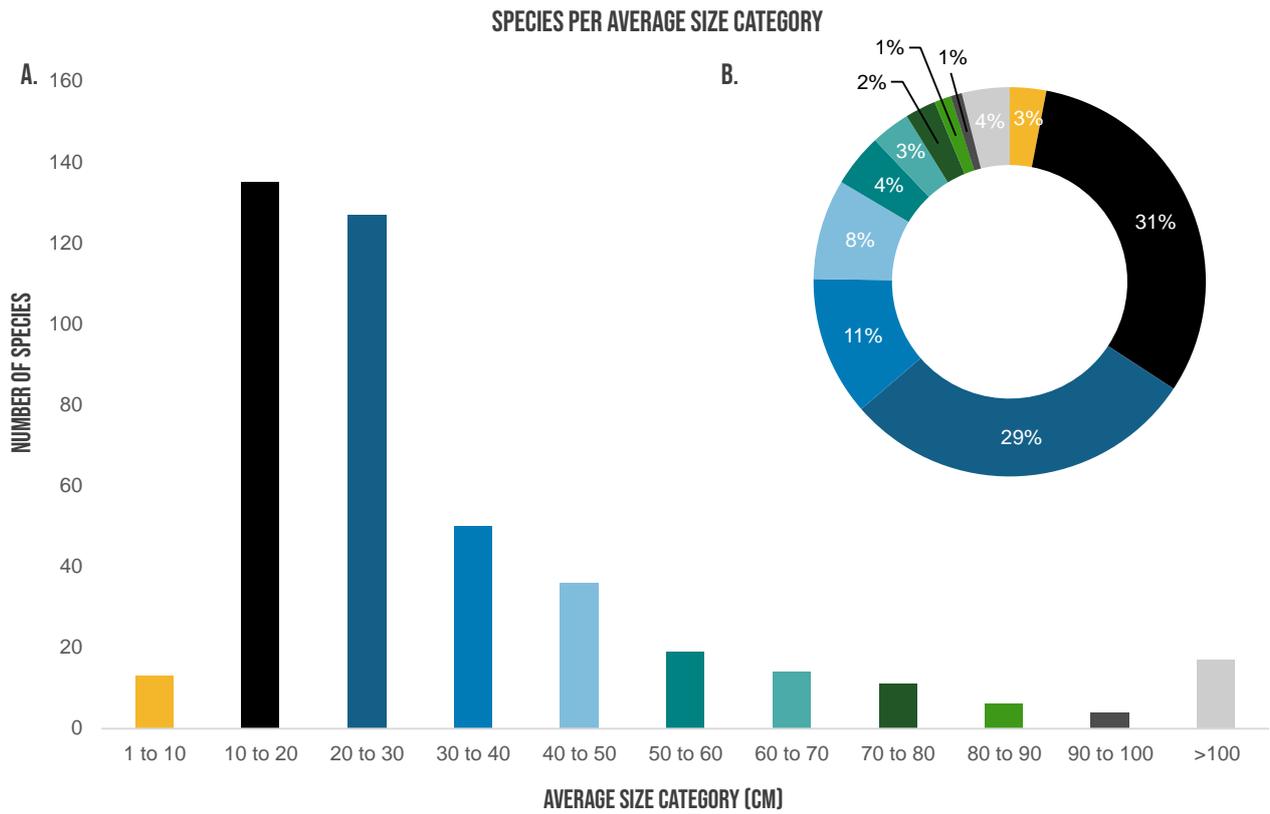
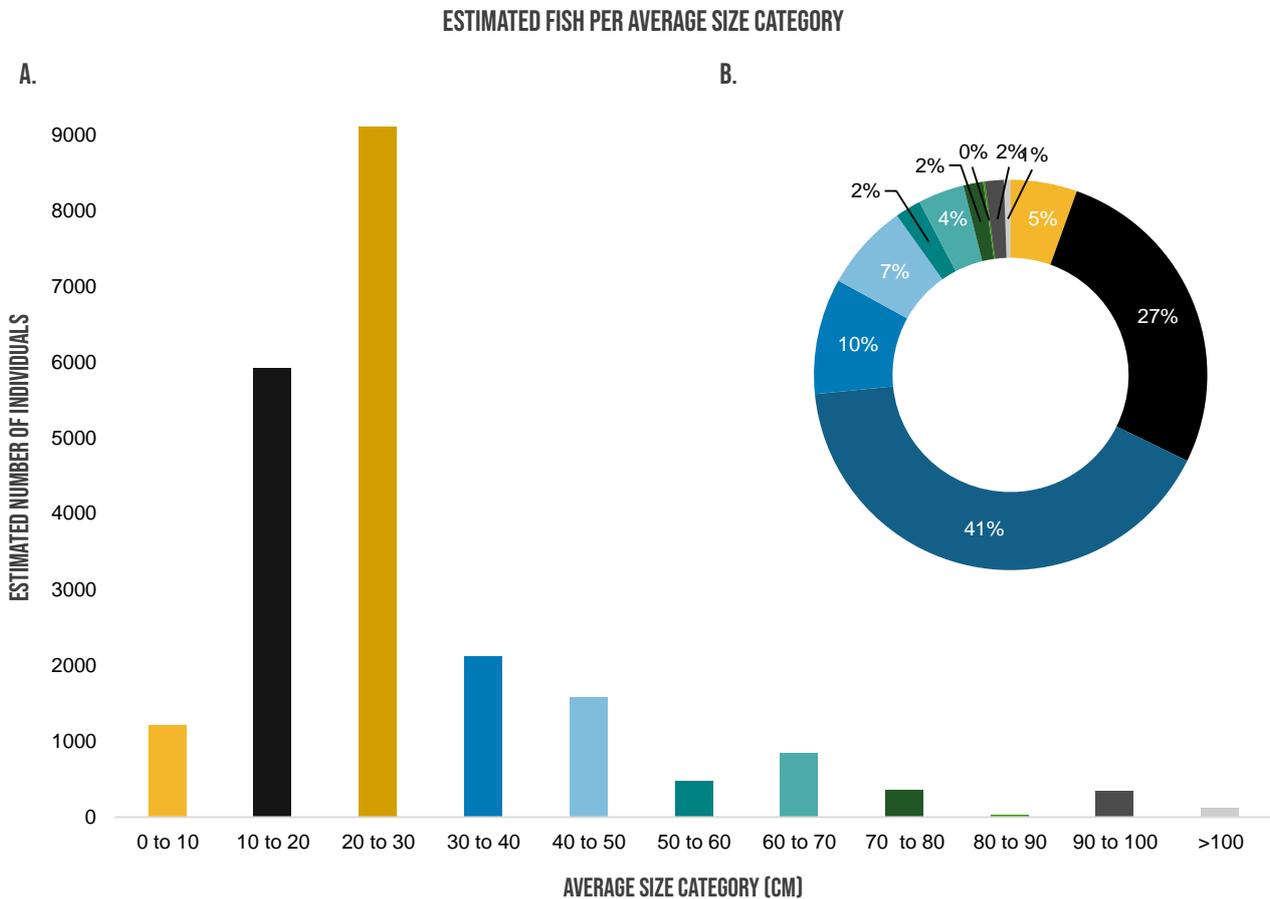


FIGURE 4

Estimated quantity (A) and percentage (B) of fish per average size category (excluding Clupeidae).



Guitarfish, Mobulid Rays, Hammerhead Sharks, Round Ribbontail Rays, Humphead Wrasse, Seahorses, Sea Cucumbers, and Giant Clams were all recorded at artisanal landing sites in this survey despite being prohibited from

capture in Kenya and Tanzania (Republic of Kenya, 2013; Republic of Tanzania, 2013). Example images from the landing site survey showing some of these threatened species are shown in Figure 5.

FIGURE 5

Images of threatened, and prohibited species captured at fish landing sites during this survey: A. Black Teatfish *Holothuria nobilis* landed at Mtambwe Octopus Landing Site, Tanga, Tanzania; B. Humphead Wrasse *Cheilinus undulatus* (inset: juvenile) landed at Mabuluu fish landing site on Zanzibar; C & D a Bottlenose Wedgefish *Rhynchobatus australiae* and a Smooth Hammerhead *Sphryna zygaena* both with fins removed, landed at Mabuluu fish landing site; E. Seahorse *Hippocampus* spp landed at Deep Sea fish landing site in Tanga, Tanzania; F. Bowmouth Guitarfish *Rhina ancylostoma* landed at Kasera fish landing site, Tanga, Tanzania.



Two species (*Rhina ancylostoma* & *Rhynchobatus australiae*) recorded in the photographic surveys are listed as Critically endangered (CR) on the IUCN Red List of Threatened Species, 12 species as Endangered (E), 16 as Vulnerable (V) and six as near threatened (NT). The remainder were either not yet evaluated (NE) for their threat status by the IUCN, were found to be data deficient (DD),

or were listed as least concern (LC) (Table 3). Nine species are listed in Appendix II of CITES¹, meaning they have been recognised as at risk of trade-related overexploitation and special permits are required to trade in these species internationally. Except for *Tridacna maxima*, the Elongated Giant Clam, all recorded CITES-listed species are also listed as threatened by the IUCN.

¹ Species listed in Appendix II of CITES can be traded commercially, but the enforcement of strict controls and permitting systems are required by CITES to ensure trade does not threaten the persistence of wild populations. Species in Appendix III are regulated through less stringent CITES trade controls at the request of a CITES party that is already regulating their trade. Commercial trade is completely prohibited for Appendix I species.
Source: <https://cites.org/eng/app/index.php>

TABLE 3

Threatened, Near Threatened, and CITES-listed species recorded at sites in mainland Tanzania (T), Zanzibar (Z), and Kenya (K).

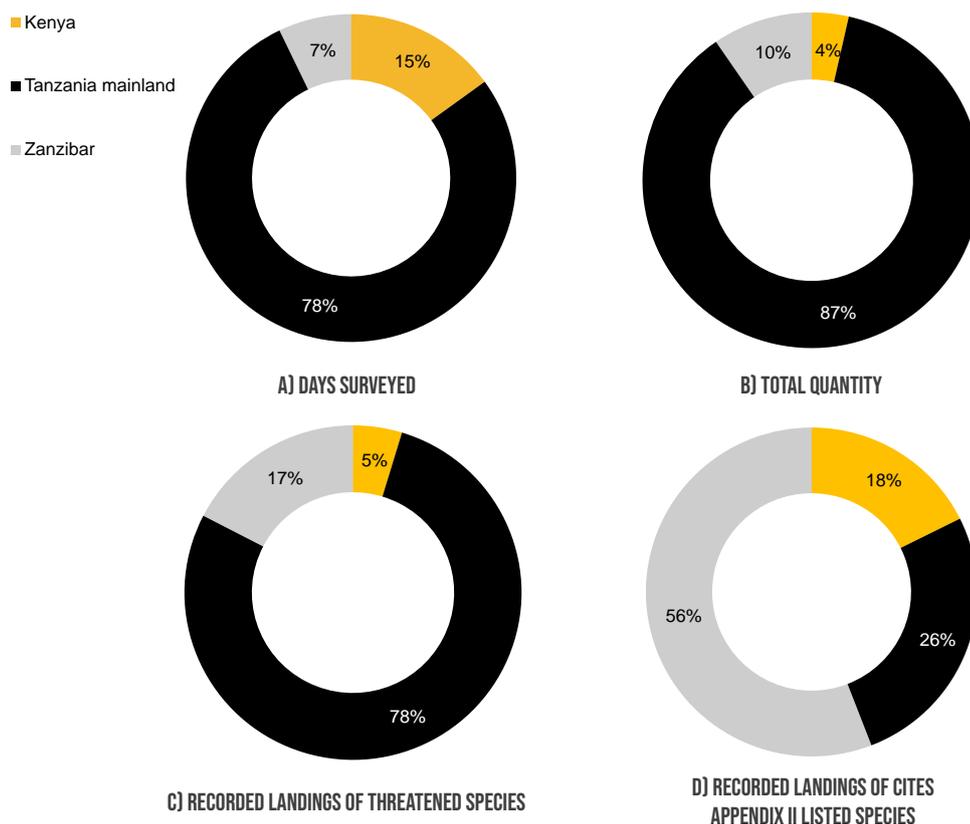
	SPECIES (* = CITES APPENDIX II)	COMMON NAME	QUANTITY (* = LOCALLY PROTECTED)			
			T	Z	K	Total
Critically Endangered (CR)	<i>Rhina ancylostoma</i> *	Bowmouth Guitarfish	2*	1	1*	4
	<i>Rhynchobatus australiae</i> *	Bottlenose Wedgefish	1	4	3*	8
Endangered (EN)	<i>Acroteriobatus leucospilus</i>	Grayspotted Guitarfish	32	7		39
	<i>Aetobatus narinari</i>	Whitespotted Eagle Ray	8	1		9
	<i>Carcharhinus obscurus</i>	Dusky Shark	1			1
	<i>Cheilinus undulatus</i> *	Humphead Wrasse	1*	2		3
	<i>Himantura uarnak</i>	Honeycomb Stingray	30	12		42
	<i>Holothuria nobilis</i> *	Black Teatfish	3*			3
	<i>Holothuria scabra</i>	Sand Fish	11	3		14
	<i>Lethrinus mahsena</i>	Sky Emperor	57	4	15	76
	<i>Mobula kuhlii</i> *	Shortfin Devil Ray		10		10
	<i>Rhinoptera javanica</i>	Flapnose Ray	9	4		13
	<i>Rostroraja alba</i>	White Skate	1			1
<i>Thelenota ananas</i>	Prickly Redfish	2*	3	7	12	
Vulnerable (V)	<i>Actinopyga echinites</i>	Deep-water Redfish	5			5
	<i>Actinopyga mauritiana</i>	Surf Redfish	2	2		4
	<i>Carcharhinus amboinensis</i>	Pigeye Shark	9	3	2	14
	<i>Carcharhinus limbatus</i>	Blacktip Shark	1			1
	<i>Dascyllus trimaculatus</i>	Threespot Dascyllus	27	5	1	33
	<i>Dasyatis pastinaca</i>	Common Stingray	1			1
	<i>Epinephelus fuscoguttatus</i>	Brown-marbled Grouper	9	8	3	20
	<i>Epinephelus polyphekadion</i>	Camouflage Grouper	19	3	2	24
	<i>Hippocampus kuda</i> *	Spotted Seahorse	1			1
	<i>Holothuria fuscogilva</i> *	White Teatfish	1	1	1*	3
	<i>Pateobatis jenkinsii</i>	Jenkins' Whipray	40	8		48
	<i>Rhizoprionodon acutus</i>	Milk Shark	1	1		2
	<i>Sphyrna zygaena</i> *	Smooth Hammerhead		2	1*	3
	<i>Stichopus herrmanni</i>	Curryfish Herrmanni	4*	8	1	13
	<i>Taeniurops meyeri</i>	Round Ribbontail Ray	2*			2
	<i>Triaenodon obesus</i>	Whitetip Reef Shark	2	1		3
Near Threatened (NT)	<i>Chaetodon trifascialis</i>	Chevron Butterflyfish	2			2
	<i>Diagramma pictum</i>	Painted Sweetlips	1		1	2
	<i>Galeocerdo cuvier</i>	Tiger Shark	4			4
	<i>Pastinachus sephen</i>	Cowtail Stingray	4			4
	<i>Scoliodon laticaudus</i>	Spadenose Shark		3		3
	<i>Scomberomorus commerson</i>	Narrow-barred Spanish Mackerel	115	6		121
Conservation Dependent (CD)	<i>Tridacna maxima</i> *	Elongate Giant Clam			1*	1

Although disproportionate sample sizes between sites make broader comparative analysis challenging, the data revealed regional trends in the amount of threatened and protected species being landed which may require further scrutiny. Figure 6 shows that

Zanzibar, despite only comprising 7% of the total days sampled and 10% of total quantity of recorded individuals, regularly accounted for much larger proportions of recorded landings of protected, threatened, and CITES-listed species.

FIGURE 6

Comparison of proportions of (A) survey days for each country, (B) total quantities of marine species landed, (C) threatened species landed and (D) CITES App II listed species landed.



Zanzibar accounted for 56% of the recorded landings of CITES-listed species and 17% of recorded landings of threatened species. In just 10 days, 63 landings of threatened species (including 20 landings of species protected by local harvest prohibitions and listed on CITES Appendix II) were recorded on Zanzibar, compared with all sites for the Tanzanian mainland, which were surveyed over 109 days, and where 282 landings of threatened species and 9 landings of locally protected and Appendix II CITES-listed species were recorded. This raises concerns that Zanzibar may be a hotspot for the harvesting of vulnerable marine species, and supports Kagembe et al (2023) findings that illegal fishers and traders are exploiting Zanzibar as a hub for illicit trade in high value marine products, due to relatively

weak fisheries law enforcement compared to the Tanzanian mainland.

Gear types were photographed by field enumerators when surveying fish landing sites, including nets, fish traps, SCUBA gear, monofilament hand lines, wooden boats, and homemade sea kayaks. Most notable was the presence of nets with small mesh sizes (e.g. 3mm) across the landing sites, which may account for the wide-ranging sizes and diversity of species being landed by artisanal fishers. Prohibited gear such as small mesh traps and nets, SCUBA equipment, spear guns, and harpoons were found to be openly displayed at some landing sites.

Zanzibar is exploited as a hub for illicit trade in high value marine products



Artisanal fishing boats loaded with traditional gear

DISCUSSION

This study revealed a remarkable diversity of marine species being landed at artisanal fishery landing sites in Kenya and Tanzania. Many of the species being harvested are recognised as threatened, are locally and internationally protected, and carry restrictions or prohibitions on harvest and trade. The large species diversity, and the wide-ranging sizes of fish recorded in the survey suggest unsustainable targeting of marine life across a broad spectrum of species and size classes, which may lead to the reduced productivity of artisanal fisheries along the East African coast.

At least 2,200 fish species have been recorded in the Western Indian Ocean (WIO) (Van der Elst et al, 2005). In Tanzanian and Kenyan coastal waters, various estimates of the number of species have been recorded. According to Shao et al (2003), more than 500 (predominantly reef-associated) species are caught for consumption in Tanzania. FishBase (2022) lists 490 reef-associated fish species

for Kenya and 643 for Tanzania. Based on these estimates, the 422 species of marine fish (bony fishes and sharks and rays) from 90 families recorded during this survey, represents a staggering proportion of the region's marine fish diversity being landed by artisanal fishers.

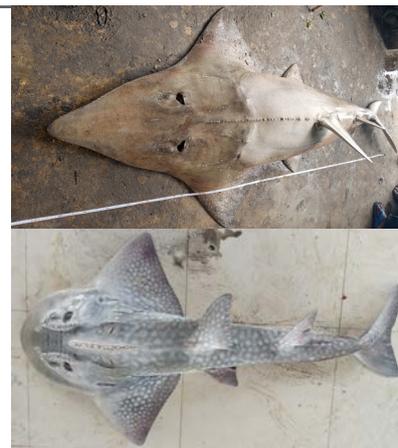
The marine species recorded in this survey included the locally-protected, internationally-threatened and CITES-listed Bowmouth Guitarfish, Bottlenose Wedgefish, Shortfin Devilray, Smooth Hammerhead, Humphead Wrasse, Spotted Seahorse, and two sea cucumber species, the White and Black Teatfish. These species have all been listed as threatened with extinction, and more specifically as either Endangered (EN) or Critically Endangered (CR) on the IUCN Red List due to their rapidly declining wild populations. Furthermore, their listings on CITES indicate that their persistence and sustainability in the wild is further placed at risk by international trade.

a staggering proportion of the region's marine diversity is being landed by artisanal fishers

BOTTLENOSE WEDGEFISH AND BOWMOUTH GUITARFISH

Bottlenose Wedgefish and Bowmouth Guitarfish, along with most species in the family Rhinidae, are at extremely high risk of extinction due to their **slow reproduction**, their **presence in shallow nearshore waters**, which are subject to intense fishing pressure, and the **demand for their high-value “white” fins** for

the shark fin trade (Kyne et al, 2020). Anecdotal accounts from fishers over the last several years suggest that Wedgefish populations throughout the East African coastline have declined due to intense fishing pressure (Pierce et al, 2008; Schaefer, 2004; Rose, 1996).



MOBULID RAYS

Mobulid rays have come under increased pressure to meet Asian **demand for their pre-branchial appendages or “gill plates” for use in traditional medicine** (Booth et al, 2020; Wu, 2016). They are particularly susceptible to targeted capture in artisanal fisheries due to

their tendency to **aggregate in large numbers** (Rigby et al, 2020). Increasing mortalities from targeted and bycatch fisheries is of global concern and catch mitigation measures are necessary to curb unsustainable Mobulid harvest for the gill plate trade (Croll et al, 2016).

HAMMERHEAD SHARKS

Smooth Hammerheads along with other hammerhead species are one of the main shark species targeted for their fins and are a **preferred species for shark fin soup** (Rigby et al, 2019). Most shark and ray species are threatened by the demand for shark fins in Asia and shark meat in Europe and South America (Sadovy de Mitcheson et al, 2018; Niedermüller et al, 2021). Being **large, long-lived, and slow**

to reach sexual maturity, sharks and rays are particularly vulnerable to trade-driven extinction (McIenachan et al, 2016). The global abundance of sharks and rays has declined by 71% since 1970, as demand for their fins and meat has driven unprecedented increases in relative fishing pressure and catch rates (Pacoureau et al, 2021).





HUMPHEAD WRASSE

Humphead Wrasse are **hermaphroditic, long-lived, and slow to mature** (Gillett, 2010; Wu and Sadovy de Mitcheson, 2016). This makes them unsuitable for intensive fishing, and means

stocks of this species are slow to recover when populations are overfished (Russel, 2004). Humphead Wrasse are prohibited from harvest in Tanzania and Kenya.

SEAHORSES

The unique biology, ecology, and life histories of all seahorses (i.e., **low mobility, small home ranges, sparse distribution, low fecundity, lengthy parental care, and mate fidelity**) make them severely vulnerable to overexploitation, and populations have declined globally due to overharvesting and habitat destruction

(Vincent et al, 2011). A lucrative and largely illegal international seahorse trade is driven by the demand for dried seahorses in traditional Asian medicine, and this impact has been felt in East Africa, with local fishers and traders reporting declining harvests (Louw & Burgener, 2020b; Mc Pherson and Vincent, 2004).



SEA CUCUMBERS

Sea cucumbers are vulnerable to unsustainable catch as they are **slow to breed and mature** but easy for artisanal fishers to harvest in nearshore waters (Louw and Burgener, 2020a). As a result of overexploitation, many African sea cucumber fisheries have collapsed, compromising the livelihoods of local people dependent on revenue from the sea cucumber trade (Bruckner et al, 2003; Torre-Castro et al., 2007). Black and White Teatfish are among the most highly valued species in the Asian

luxury seafood trade (Louw & Burgener, 2020a). Both species have been overexploited in East Africa, with both Kenya and Tanzania having experienced declines in catch, particularly in nearshore waters (Conand & Muthiga, 2007; Conand et al, 2013a & b). Harvesting of sea cucumbers has been banned in mainland Tanzania, and on Zanzibar only sea cucumbers harvested from aquaculture facilities are permitted to be exported (FAO, 2019).



Traditional "Madema" basket traps used by local fishers to catch a variety of reef species

Indiscriminate and unregulated fishing methods pose a significant threat to marine biodiversity in East African waters as these methods act as a driver of unsustainable harvesting of threatened species (Bi et al, 2022). Conserving marine biodiversity enhances the overall biomass of nearshore fisheries and is vital to maintaining resilient fish communities while stabilising marine fish production (Duffy et al, 2016). However, marine biodiversity loss is increasingly impairing the ability of the world's oceans to support food security and undermining the resilience of marine ecosystems to rapid environmental change (Worm et al, 2006). The sustained and seemingly indiscriminate harvest of diverse marine species documented in this survey may have devastating long-term impacts on the ability of marine ecosystems to support food security and livelihoods in the region.

Small-scale fisheries catch is substantially underreported in the WIO, and increased effort is required to assess the impacts of small-scale fisheries on vulnerable marine species (Temple et al, 2019). Coastal fishers in the region, particularly those from older generations, have reported a perceived decline in catch size and quality throughout their fishing careers (Katikiro, 2014; Martin and Floros 2020). The relatively low average sizes recorded for many of the fish species in this survey support the concerns of local fishers that fish size has been decreasing. Unregulated and unsustainable harvesting over time threatens local marine resources and may catalyse shifts in the local baseline for what is accepted as a sustainable fishery (Pauley, 1998; Bi et al, 2022).

As custodians of marine resources, fishers themselves play a fundamental role in ensuring responsible management and sustainable use of marine resources (FAO, 2022). However, artisanal fishers in East Africa are likely to continue to fish regardless of declining catches due to the limited alternative livelihoods available in the region (Silas et al, 2020). Lack of awareness among fishers regarding which species are vulnerable to overexploitation may act as an additional driver of unsustainable harvest and trade.

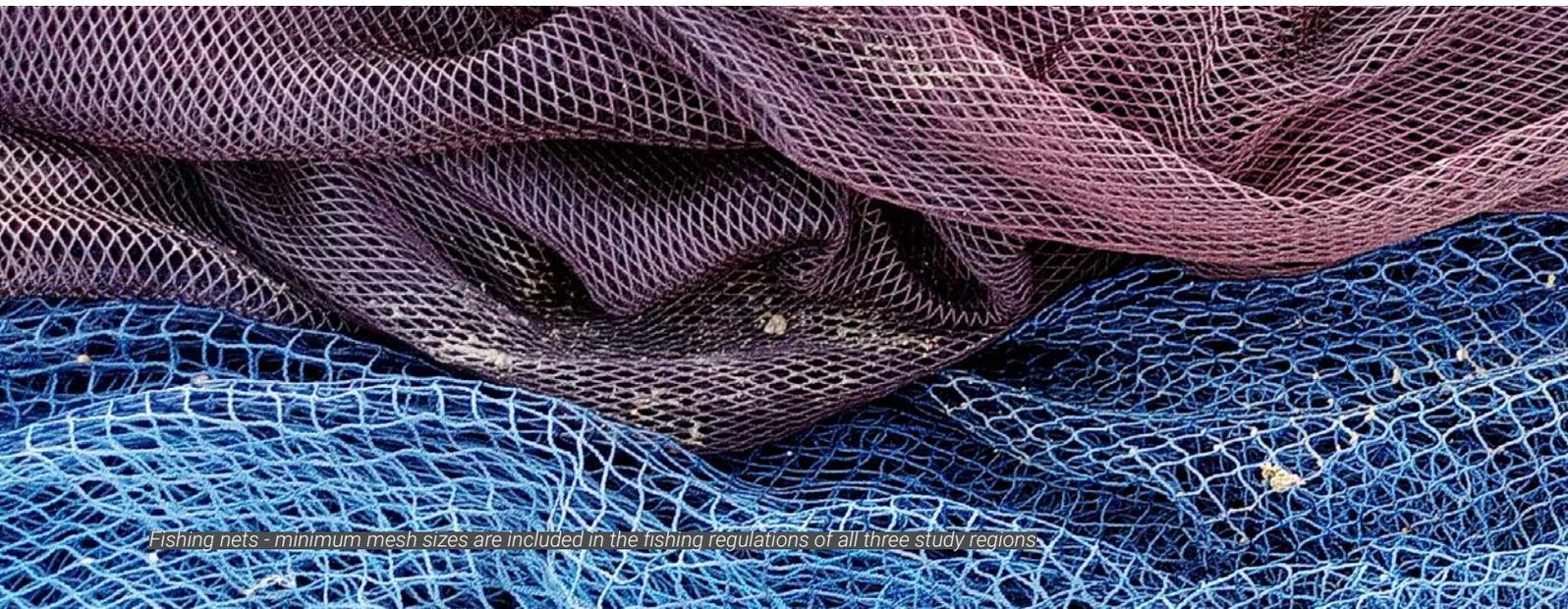
East Africa's artisanal fisheries face complex challenges. Besides already decreasing productivity, marine fisheries in tropical Africa are projected to be among the most significantly impacted by climate change-driven decreases in productivity, and targeted interventions are required to mitigate negative impacts on livelihoods and food security (FAO, 2020). Policy failures and illegal activities have further limited the sustainability of the fisheries sector in the region (Belhabib et al, 2019). East African fisheries managers face many challenges in the form of low surveillance and law enforcement capacity, the prevalence of organised criminal groups seeking to illegally exploit marine resources in the region, political instability, and corruption (Bi et al, 2022). Improved legal governance is critical to ensuring healthy marine ecosystems and the longevity of artisanal fisheries in the Indian Ocean region; however implementing fisheries laws that balance conservation with sustainable use of marine resources remains a major challenge (Techera, 2020).

local food security and livelihoods

may be devastatingly impacted by the level of harvest documented

climate change

is a further threat to fish stocks, particularly in tropical Africa



Fishing nets - minimum mesh sizes are included in the fishing regulations of all three study regions

Kenya, mainland Tanzania, and Zanzibar each have their own legislation governing gears and methods for artisanal fisheries. Fisheries management in Tanzania falls under the 2003 Fisheries Act and 2009 Fisheries Regulations, while the island of Zanzibar is managed under the Zanzibar fisheries Act of 2010. Prohibited gears and methods for Kenya are listed in Section 42 of the Kenyan Fisheries Management and Development Act of 2016. Tanzanian and Kenyan legislation includes lists of locally protected marine species in the Tanzania Fisheries Act and the Kenya Wildlife Conservation and Management Act respectively. These species lists require review, as they do not align with up to date listings of protected marine species on CITES and the IUCN Red List, and include species not known in East African waters such as Queen Conch *Strombas gigas* on the Tanzanian list and Red Coral *Corallium rubrum* on the Kenyan list. Fisheries regulations vary between the three jurisdictions in terms of the prohibitions on gears and methods and associated penalties (Annex 2). The only prohibitions common to all three jurisdictions are on beach seine nets and fishing by electrocution. The use of explosives and poisons for fishing is prohibited according to the legislation for Kenya and Zanzibar but is not mentioned for mainland Tanzania.

Minimum mesh sizes for fishing nets and/or traps are included in all three sets of regulations, however, these vary regionally and regulations for Zanzibar do not specify what the minimum mesh sizes are. Penalties for contravening fisheries regulations also differ between regions. Fines for contravention of

regulations range from 100,000 to 10 million shillings (~USD700 to 70,000) depending on the offence and region, and prison sentences range from three months to five years.

Zanzibar has the most comprehensive and severe list of penalties for contravention of its fisheries Act. Kenya and Tanzania are close neighbours with shared marine resources, and legislative and regulatory inconsistencies between these regions may be vulnerable to exploitation by local fishers and traders.

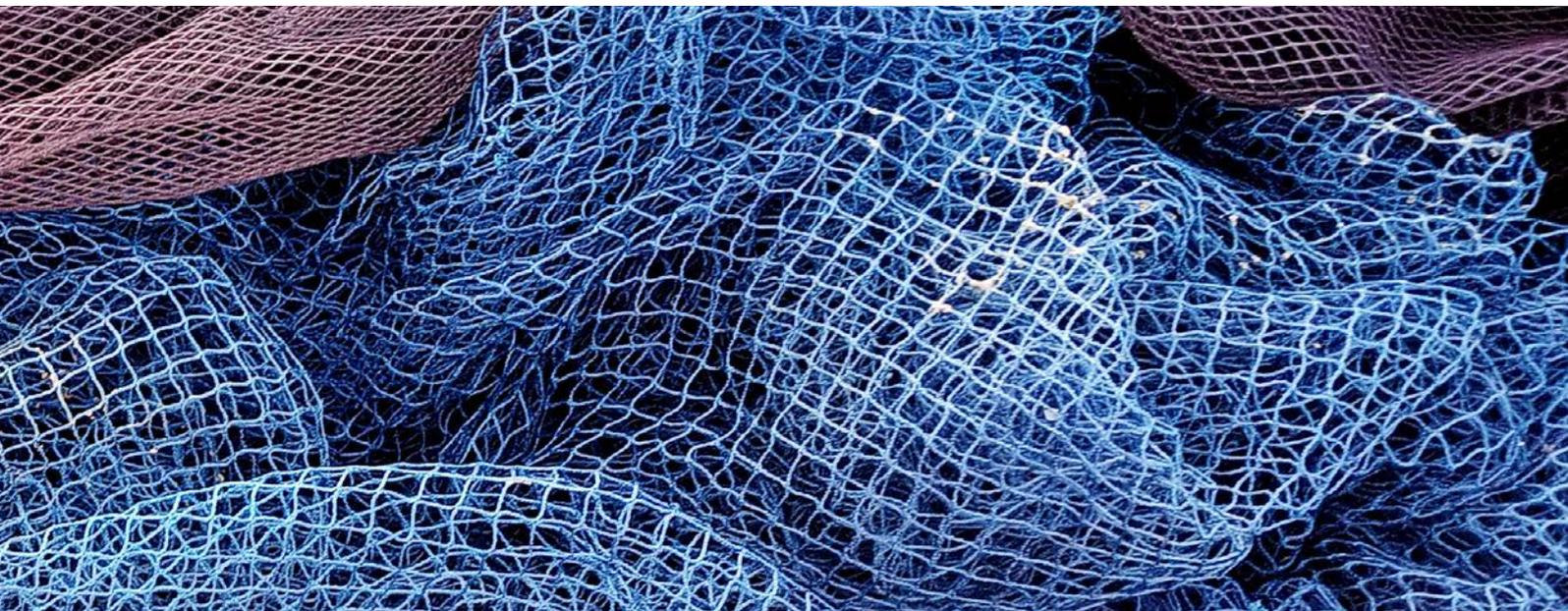
Management and law enforcement interventions are required to ensure East African fisheries and trade in marine resources are legal and sustainable (Bi et al, 2022). Management interventions such as minimum size restrictions of fish species can result in mutually beneficial outcomes for fishers and ecosystems as fish stocks are preserved for long-term food security and healthy fish populations can continue to perform critical ecosystem functions (Bozec et al, 2016). Setting minimum legal mesh sizes serves to limit the catch of immature individuals before spawning, ensuring fish stocks are replenished and fisheries can remain sustainable (Vasilakopoulos et al, 2011). Widespread implementation of more robust fisheries management measures throughout coastal East Africa could help fish stocks to recover to sustainable levels and strengthen food security in the region (McClanahan, 2019). The findings of this study suggest local fisheries management and law enforcement require improvements to ensure legal and sustainable harvest and trade in marine species.

explosives and poisons

for fishing are prohibited in Kenyan and Zanzibari law but not mentioned for mainland Tanzania

management interventions

can benefit both ecosystems and fishers



ANNEXES

ANNEX 1: LIST OF ALL SPECIES IDENTIFIED FROM PHOTOGRAPHIC SURVEYS.

FAMILY	SPECIES	COMMON NAME	IUCN	CITES	AVE SIZE (CM)	QTY
CARTILAGINOUS FISHES						
Aetobatidae	<i>Aetobatus narinari</i>	Whitespotted Eagle Ray	EN		79	9
Carcharhinidae	<i>Carcharhinus amboinensis</i>	Pigeye Shark	VU		160	14
	<i>Carcharhinus limbatus</i>	Blacktip Shark	VU			1
	<i>Carcharhinus obscurus</i>	Dusky Shark	EN		100	1
	<i>Galeocerdo cuvier</i>	Tiger Shark	NT		270	4
	<i>Loxodon macrorhinus</i>	Sliteye Shark	LC		87	2
	<i>Rhizoprionodon acutus</i>	Milk Shark	VU		100	2
	<i>Scoliodon laticaudus</i>	Spadenose Shark	NT		105	3
	<i>Triaenodon obesus</i>	Whitetip Reef Shark	VU		78	3
Dasyatidae	<i>Dasyatis pastinaca</i>	Common Stingray	VU		60	1
	<i>Himantura uarnak</i>	Honeycomb Stingray	EN		91	42
	<i>Neotrygon kuhlii</i>	Blue-spotted Stingray	DD		24	20
	<i>Pastinachus sephen</i>	Cowtail Stingray	NT		90	4
	<i>Pateobatis jenkinsii</i>	Jenkins' Whipray	VU		69	48
	<i>Taeniura lymma</i>	Ribbontail Stingray	LC		38	14
	<i>Taeniurops meyeri</i>	Round Ribbontail Ray	VU		120	2
Mobulidae	<i>Mobula kuhlii</i>	Shortfin Devil Ray	EN	APP II	115	10
Rajidae	<i>Rostroraja alba</i>	White Skate	EN			1
Rhinidae	<i>Rhina ancylostoma</i>	Bowmouth Guitarfish	CR	APP II	177	4
	<i>Rhynchobatus australiae</i>	Bottlenose Wedgefish	CR	APP II	122	8
Rhinobatidae	<i>Acroteriobatus leucospilus</i>	Grayspotted Guitarfish	EN		65	39
	<i>Rhinobatos holcorhynchus</i>	Slender Guitarfish	DD		80	3
Rhinopterae	<i>Rhinoptera javanica</i>	Flapnose Ray	EN		78	13
Sphyrnidae	<i>Sphyrna zygaena</i>	Smooth Hammerhead	VU	APP II	160	3
Squalidae	<i>Squalus megalops</i>	Shortnose Spurdog	LC		78	6
Triakidae	<i>Hypogaleus hyugaensis</i>	Blacktip Tope	LC		51	14
BONY FISHES						
Acanthuridae	<i>Acanthurus dussumieri</i>	Eyestripe Surgeonfish	LC		26	36
	<i>Acanthurus leucosternon</i>	Powderblue Surgeonfish	LC		17	6

FAMILY	SPECIES	COMMON NAME	IUCN	CITES	AVE SIZE (CM)	QTY
	<i>Acanthurus lineatus</i>	Lined Surgeonfish	LC		25	3
	<i>Acanthurus mata</i>	Elongate Surgeonfish	LC		32	34
	<i>Acanthurus nigricauda</i>	Epaulette Surgeonfish	LC		28	2
	<i>Acanthurus nigrofuscus</i>	Brown Surgeonfish	LC		23	12
	<i>Acanthurus tennentii</i>	Doubleband Surgeonfish	LC		25	2
	<i>Acanthurus triostegus</i>	Convict Surgeonfish	LC		16	103
	<i>Acanthurus xanthopterus</i>	Yellowfin Surgeonfish	LC		38	20
	<i>Ctenochaetus binotatus</i>	Twospot Surgeonfish	LC		24	3
	<i>Ctenochaetus striatus</i>	Striated Surgeonfish	LC		18	1
	<i>Ctenochaetus truncatus</i>	Indian Gold-ring Bristle-tooth	LC		18	1
	<i>Naso annulatus</i>	Whitemargin Unicornfish	LC		33	10
	<i>Naso brachycentron</i>	Humpback Unicornfish	LC		48	5
	<i>Naso brevirostris</i>	Spotted Unicornfish	LC		35	19
	<i>Naso elegans</i>	Elegant Unicornfish	LC		34	1
	<i>Naso fageni</i>	Horseface Unicornfish	LC		67	5
	<i>Naso hexacanthus</i>	Sleek Unicornfish	LC		54	11
	<i>Naso thynnoides</i>	Oneknife Unicornfish	LC		27	118
	<i>Naso vlamingii</i>	Bignose Unicornfish	LC		61	2
	<i>Zebrasoma desjardini</i>	Indian Sail-fin Surgeonfish	LC			1
	<i>Zebrasoma scopas</i>	Twotone Tang	LC		13	7
Albulidae	<i>Albula oligolepis</i>	Smallscale Bonefish	DD		51	15
Apogonidae	<i>Apogonichthyoides pseudotaeniatus</i>	Doublebar Cardinalfish	LC		10	17
	<i>Cheilodipterus macrodon</i>	Large Toothed Cardinalfish	LC		14	10
	<i>Cheilodipterus quinquelineatus</i>	Five-lined Cardinalfish	NE		10	1
	<i>Ostorhinchus flagelliferus</i>	Coachwhip Cardinal	NE		9	1
	<i>Ostorhinchus fleurieu</i>	Flower Cardinalfish	LC		12	16
	<i>Pristiapogon kallopterus</i>	Iridescent Cardinalfish	NE		10	3
	<i>Taeniamia fucata</i>	Orangelined Cardinalfish	LC		8	12
	<i>Taeniamia mozambiquensis</i>	Mozambique Cardinalfish	NE		8	154
Ariidae	<i>Arius africanus</i>	African Sea Catfish	LC		62	47
Atherinidae	<i>Atherinomorus lacunosus</i>	Wide-banded Hardyhead Silver-side	LC		10	123
Aulostomidae	<i>Aulostomus chinensis</i>	Chinese Trumpetfish	LC		52	5
Balistidae	<i>Abalistes stellatus</i>	Starry Triggerfish	NE		18	5
	<i>Balistapus undulatus</i>	Orange-lined Triggerfish	NE		23	10

FAMILY	SPECIES	COMMON NAME	IUCN	CITES	AVE SIZE (CM)	QTY
	<i>Balistoides viridescens</i>	Titan Triggerfish	NE		49	5
	<i>Canthidermis macrolepis</i>	Largescale Triggerfish	NE		41	3
	<i>Odonus niger</i>	Red-toothed Triggerfish	NE		52	20
	<i>Pseudobalistes flavimarginatus</i>	Yellowmargin Triggerfish	NE			1
	<i>Rhinecanthus aculeatus</i>	White-banded Triggerfish	NE		20	2
	<i>Rhinecanthus rectangulus</i>	Wedge-tail Triggerfish	NE			1
	<i>Sufflamen chrysopterum</i>	Halfmoon Triggerfish	NE		18	11
	<i>Sufflamen fraenatum</i>	Masked Triggerfish	LC		18	4
Belonidae	<i>Ablennes hians</i>	Flat Needlefish	LC		96	205
	<i>Tylosurus crocodilus</i>	Hound Needlefish	LC		70	637
Bothidae	<i>Bothus mancus</i>	Flowery Flounder	LC		20	6
	<i>Bothus pantherinus</i>	Leopard Flounder	LC		18	3
	<i>Pseudorhombus arsius</i>	Largetooth Flounder	LC		19	9
Caesionidae	<i>Caesio caerulea</i>	Blue And Gold Fusilier	LC		21	16
	<i>Caesio lunaris</i>	Lunar Fusilier	LC		26	2
	<i>Caesio xanthalytos</i>	Goldsash Fusilier	LC		19	261
	<i>Caesio xanthonota</i>	Yellowback Fusilier	LC		26	96
	<i>Dipterygonotus balteatus</i>	Mottled Fusilier	LC		9	263
	<i>Pterocaesio marri</i>	Marr's Fusilier	LC		22	1
	<i>Pterocaesio pisang</i>	Banana Fusilier	LC		14	3
	<i>Pterocaesio tile</i>	Dark-banded Fusilier	LC		24	1
Carangidae	<i>Alectis indica</i>	Indian Threadfish	LC		34	18
	<i>Alepes djedaba</i>	Shrimp Scad	LC		23	172
	<i>Atule mate</i>	Yellowtail Scad	LC		23	282
	<i>Carangoides chrysophrys</i>	Longnose Trevally	LC		30	11
	<i>Carangoides coeruleopinnatus</i>	Coastal Trevally	LC		26	4
	<i>Carangoides ferdau</i>	Blue Trevally	LC		32	20
	<i>Carangoides fulvoguttatus</i>	Yellow Spotted Trevally	LC		40	123
	<i>Carangoides gymnostethus</i>	Bludger	LC		35	1
	<i>Carangoides hedlandensis</i>	Bumpnose Trevally	LC		20	1
	<i>Carangoides malabaricus</i>	Malabar Trevally	LC		23	10
	<i>Caranx heberi</i>	Blacktip Trevally	LC		24	23
	<i>Caranx ignobilis</i>	Giant Trevally	LC		67	22
	<i>Caranx melampygus</i>	Bluefin Trevally	LC		40	41

FAMILY	SPECIES	COMMON NAME	IUCN	CITES	AVE SIZE (CM)	QTY
	<i>Caranx sexfasciatus</i>	Bigeye Trevally	LC		47	51
	<i>Decapterus macrosoma</i>	Shortfin Scad	LC		23	165
	<i>Elagatis bipinnulata</i>	Rainbow Runner	LC		49	81
	<i>Gnathanodon speciosus</i>	Golden Trevally	LC		54	86
	<i>Megalaspis cordyla</i>	Torpedo Scad	LC		32	158
	<i>Parastromateus niger</i>	Black Pomfret	LC		31	71
	<i>Pseudocaranx dentex</i>	White Trevally	LC		21	30
	<i>Scomberoides commersonianus</i>	Talang Queenfish	LC		64	13
	<i>Scomberoides tol</i>	Needlescaled Queenfish	LC		29	203
	<i>Seriola rivoliana</i>	Longfin Yellowtail	LC		52	5
	<i>Seriolina nigrofasciata</i>	Blackbanded Trevally	LC		48	33
	<i>Trachinotus blochii</i>	Snubnose Pompano	LC		38	11
	<i>Trachurus delagoa</i>	African Scad	LC		21	581
	<i>Ulua mentalis</i>	Longrakered Trevally	LC		45	53
Centriscidae	<i>Aeoliscus punctulatus</i>	Speckled Shrimpfish	DD		12	3
Chaetodontidae	<i>Chaetodon auriga</i>	Threadfin Butterflyfish	LC		15	17
	<i>Chaetodon falcula</i>	Blackwedged Butterflyfish	LC		18	1
	<i>Chaetodon interruptus</i>	Yellow Teardrop Butterflyfish	LC		12	1
	<i>Chaetodon kleinii</i>	Sunburst Butterflyfish	LC		11	21
	<i>Chaetodon leucopleura</i>	Somali Butterflyfish	LC		16	4
	<i>Chaetodon lineolatus</i>	Lined Butterflyfish	LC		25	1
	<i>Chaetodon lunula</i>	Raccoon Butterflyfish	LC		12	1
	<i>Chaetodon melannotus</i>	Blackback Butterflyfish	LC		14	3
	<i>Chaetodon trifascialis</i>	Chevron Butterflyfish	NT		12	2
	<i>Chaetodon trifasciatus</i>	Melon Butterflyfish	LC		11	14
	<i>Chaetodon xanthocephalus</i>	Yellowhead Butterflyfish	LC			1
	<i>Heniochus acuminatus</i>	Pennant Coralfish	LC		16	8
	<i>Heniochus diphreutes</i>	False Moorish Idol	NE		19	8
Chanidae	<i>Chanos chanos</i>	Milkfish	LC		56	64
Chirocentridae	<i>Chirocentrus dorab</i>	Dorab Wolfherring	LC		43	496
Cichlidae	<i>Oreochromis niloticus</i>	Nile Tilapia	LC		18	1
Cirrhitidae	<i>Cirrhitus pinnulatus</i>	Stocky Hawkfish	LC		17	1
	<i>Paracirrhites arcatus</i>	Arc-eye Hawkfish	LC		9	1
	<i>Paracirrhites forsteri</i>	Blackside Hawkfish	LC		14	11

FAMILY	SPECIES	COMMON NAME	IUCN	CITES	AVE SIZE (CM)	QTY
Clupeidae	<i>Amblygaster sirm</i>	Spotted Sardinella	LC		16	1241
	<i>Hilsa kelee</i>	Kelee Shad	LC		17	205
	<i>Sardinella albella</i>	White Sardinella	LC		13	519
	<i>Spratelloides gracilis</i>	Silver-stripe Round Herring	LC		9	36629
Congridae	<i>Conger cinereus</i>	Longfin African Conger	LC		61	5
Coryphaenidae	<i>Coryphaena hippurus</i>	Common Dolphinfin	LC		104	18
Cynoglossidae	<i>Cynoglossus lachneri</i>	Lachner's Tonguesole	LC		41	5
	<i>Cynoglossus zanzibarensis</i>	Zanzibar Tonguesole	LC		29	5
Diodontidae	<i>Diodon hystrix</i>	Spot-Fin Porcupinefish	LC		43	20
	<i>Diodon liturosus</i>	Black-blotched Porcupinefish	NE		39	3
Drepaneidae	<i>Drepane longimana</i>	Concertina Fish	NE		27	1
Dussumieriidae	<i>Dussumieria elopsoides</i>	Slender Rainbow Sardine	LC		13	2140
Echeneidae	<i>Echeneis naucrates</i>	Live Sharksucker	LC		68	14
Elopidae	<i>Elops machnata</i>	Tenpounder	LC		79	9
Engraulidae	<i>Thryssa vitirostris</i>	Orangemouth Anchovy	LC		16	3
Ephippidae	<i>Platax orbicularis</i>	Orbicular Batfish	LC		30	57
	<i>Platax teira</i>	Longfin Batfish	LC		28	11
	<i>Tripteron orbis</i>	African Spadefish	NE		38	26
Exocoetidae	<i>Cheilopogon altipennis</i>	Smallhead Flyingfish	NE		13	905
Fistulariidae	<i>Fistularia commersonii</i>	Bluespotted Cornetfish	LC		55	2
Gerreidae	<i>Gerres filamentosus</i>	Whipfin Silver-biddy	LC		17	10
	<i>Gerres longirostris</i>	Strongspine Silver Biddy	LC		22	317
	<i>Gerres macracanthus</i>	Longspine Silverbiddy	NE		16	1
Gobiidae	<i>Amblygobius albimaculatus</i>	Butterfly Goby	LC		14	4
Haemulidae	<i>Diagramma centurio</i>	Sailfin Rubberlip	LC		38	107
	<i>Diagramma pictum</i>	Painted Sweetlips	NT		18	2
	<i>Plectorhinchus chubbi</i>	Dusky Rubberlip	DD		36	8
	<i>Plectorhinchus flavomaculatus</i>	Lemonfish	NE		35	19
	<i>Plectorhinchus gaterinus</i>	Blackspotted Rubberlip	LC		27	54
	<i>Plectorhinchus gibbosus</i>	Harry Hotlips	LC		39	2
	<i>Plectorhinchus picus</i>	Painted Sweetlip	NE		35	1
	<i>Plectorhinchus plagiodesmus</i>	Barred Rubberlip	LC		39	4
	<i>Plectorhinchus vittatus</i>	Indian Ocean Oriental Sweetlips	LC		9	2
	<i>Pomadasys commersonii</i>	Smallspotted Grunter	LC		44	2

FAMILY	SPECIES	COMMON NAME	IUCN	CITES	AVE SIZE (CM)	QTY
	<i>Pomadasys maculatus</i>	Saddle Grunt	LC		16	123
	<i>Pomadasys multimaculatus</i>	Cock Grunter	LC		53	14
	<i>Pomadasys stridens</i>	Striped Piggy	LC		13	108
Hemiramphidae	<i>Hemiramphus far</i>	Black-barred Halfbeak	NE		36	839
	<i>Hyporhamphus dussumieri</i>	Dussumier's Halfbeak	NE		29	378
Holocentridae	<i>Myripristis kuntee</i>	Shoulderbar Soldierfish	LC		20	9
	<i>Myripristis murdjan</i>	Pinecone Soldierfish	NE		21	11
	<i>Neoniphon argenteus</i>	Clearfin Squirrelfish	LC		16	1
	<i>Neoniphon sammara</i>	Sammara Squirrelfish	LC		16	6
	<i>Sargocentron caudimaculatum</i>	Silverspot Squirrelfish	LC		22	22
	<i>Sargocentron diadema</i>	Crown Squirrelfish	LC		17	29
	<i>Sargocentron spiniferum</i>	Sabre Squirrelfish	LC		23	2
Istiophoridae	<i>Istiophorus platypterus</i>	Indo-Pacific Sailfish	LC		233	7
Kyphosidae	<i>Kyphosus cinerascens</i>	Blue Sea Chub	LC		40	1
	<i>Kyphosus vaigiensis</i>	Brassy Chub	LC		29	66
Labridae	<i>Anampses caeruleopunctatus</i>	Bluespotted Wrasse	LC		20	11
	<i>Anampses twistii</i>	Yellowbreasted Wrasse	LC		13	1
	<i>Bodianus anthioides</i>	Lyretail Hogfish	LC		17	1
	<i>Bodianus axillaris</i>	Axilspot Hogfish	LC		16	4
	<i>Bodianus bilunulatus</i>	Tarry Hogfish	LC		24	3
	<i>Bodianus diana</i>	Diana's Hogfish	LC		17	4
	<i>Cheilinus oxycephalus</i>	Snooty Wrasse	LC		15	2
	<i>Cheilinus trilobatus</i>	Tripletail Wrasse	LC		27	79
	<i>Cheilinus undulatus</i>	Humphead Wrasse	EN	APP II	54	3
	<i>Cheilio inermis</i>	Cigar Wrasse	LC		30	263
	<i>Choerodon robustus</i>	Robust Tuskfish	LC		17	10
	<i>Cirrhilabrus exquisitus</i>	Exquisite Wrasse	DD		11	1
	<i>Coris caudimacula</i>	Spottail Coris	LC		16	27
	<i>Coris cuvieri</i>	African Coris	LC		24	27
	<i>Coris formosa</i>	Queen Coris	LC		28	23
	<i>Cymolutes praetextatus</i>	Knife Razorfish	LC			1
	<i>Cymolutes torquatus</i>	Finescale Razorfish	LC		14	2
	<i>Epibulus insidiator</i>	Sling-jaw Wrasse	LC		21	8
	<i>Gomphosus caeruleus</i>	Green Birdmouth Wrasse	LC		21	15

FAMILY	SPECIES	COMMON NAME	IUCN	CITES	AVE SIZE (CM)	QTY
	<i>Halichoeres hortulanus</i>	Checkerboard Wrasse	LC		20	41
	<i>Halichoeres marginatus</i>	Dusky Wrasse	LC		13	1
	<i>Halichoeres nigrescens</i>	Bubblefin Wrasse	LC		13	1
	<i>Halichoeres scapularis</i>	Zigzag Wrasse	LC		16	11
	<i>Halichoeres zeylonicus</i>	Goldstripe Wrasse	LC		19	28
	<i>Hemigymnus fasciatus</i>	Barred Thicklip	LC		25	10
	<i>Hemigymnus melapterus</i>	Blackeye Thicklip	LC		33	6
	<i>Hologymnosus doliatus</i>	Pastel Ringwrasse	LC		27	12
	<i>Iniistius bimaculatus</i>	Two-spot Razorfish	LC		19	6
	<i>Iniistius melanopus</i>	Yellowpatch Razorfish	LC		20	7
	<i>Iniistius pavo</i>	Peacock Wrasse	LC		20	14
	<i>Novaculichthys taeniourus</i>	Rockmover Wrasse	LC		22	39
	<i>Novaculoides macrolepidotus</i>	Seagrass Wrasse	NE		14	8
	<i>Oxycheilinus bimaculatus</i>	Two-Spot Wrasse	LC		13	3
	<i>Oxycheilinus digramma</i>	Cheeklined Wrasse	LC		21	31
	<i>Oxycheilinus orientalis</i>	Oriental Maori Wrasse	LC		15	3
	<i>Pseudocoris heteroptera</i>	Torpedo Wrasse	LC		23	1
	<i>Pseudodax moluccanus</i>	Chiseltooth Wrasse	LC		23	3
	<i>Stethojulis interrupta</i>	Cutribbon Wrasse	LC		9	4
	<i>Thalassoma hardwicke</i>	Sixbar Wrasse	LC		15	6
	<i>Thalassoma hebraicum</i>	Goldbar Wrasse	LC		16	39
	<i>Thalassoma lunare</i>	Moon Wrasse	LC		19	15
	<i>Thalassoma purpureum</i>	Surge Wrasse	LC		24	16
Leiognathidae	<i>Deveximentum insidiator</i>	Pugnose Ponyfish	NE		9	602
	<i>Equulites leuciscus</i>	Whipfin Ponyfish	LC		12	4
	<i>Gazza minuta</i>	Toothpony	LC		12	169
	<i>Karalla daura</i>	Goldstripe Ponyfish	NE		12	5
	<i>Leiognathus berbis</i>	Berber Ponyfish	NE		11	2
	<i>Leiognathus equula</i>	Common Ponyfish	NE		15	48
Lethrinidae	<i>Gnathodentex aureolineatus</i>	Striped Large-eye Bream	LC		22	5
	<i>Gymnocranius elongatus</i>	Forktail Large-eye Bream	LC		23	88
	<i>Lethrinus crocineus</i>	Yellowtail Emperor	NE			1
	<i>Lethrinus erythracanthus</i>	Orange-spotted Emperor	LC		54	1
	<i>Lethrinus harak</i>	Thumbprint Emperor	LC		26	211

FAMILY	SPECIES	COMMON NAME	IUCN	CITES	AVE SIZE (CM)	QTY
	<i>Lethrinus lentjan</i>	Pink Ear Emperor	LC		26	273
	<i>Lethrinus mahsena</i>	Sky Emperor	EN		29	76
	<i>Lethrinus microdon</i>	Smalltooth Emperor	LC		35	53
	<i>Lethrinus nebulosus</i>	Spangled Emperor	LC		38	10
	<i>Lethrinus obsoletus</i>	Orange-Striped Emperor	LC		28	16
	<i>Lethrinus olivaceus</i>	Longface Emperor	LC		37	17
	<i>Lethrinus rubrioperculatus</i>	Spotcheek Emperor	LC		30	3
	<i>Lethrinus variegatus</i>	Slender Emperor	LC		16	29
	<i>Monotaxis grandoculis</i>	Humpnose Big-eye Bream	LC		53	3
	<i>Monotaxis heterodon</i>	Redfin Emperor	LC		22	5
Lobotidae	<i>Lobotes surinamensis</i>	Tripletail	LC		48	6
Lutjanidae	<i>Aphareus rutilans</i>	Rusty Jobfish	LC		40	23
	<i>Aprion virescens</i>	Green Jobfish	LC		50	27
	<i>Lutjanus argentimaculatus</i>	Mangrove Red Snapper	LC		56	73
	<i>Lutjanus bohar</i>	Two-spot Red Snapper	LC		26	18
	<i>Lutjanus ehrenbergii</i>	Ehrenbergs's Snapper	LC		15	7
	<i>Lutjanus fulviflamma</i>	Dory Snapper	LC		21	200
	<i>Lutjanus fulvus</i>	Blacktail Snapper	LC		23	7
	<i>Lutjanus gibbus</i>	Humpback Snapper	LC		22	23
	<i>Lutjanus gilcheri</i>	Yellowfin Red Snapper	LC		38	16
	<i>Lutjanus kasmira</i>	Common Bluestripe Snapper	LC		19	36
	<i>Lutjanus lutjanus</i>	Bigeye Snapper	LC		17	1539
	<i>Lutjanus notatus</i>	Bluestriped Snapper	LC		21	1
	<i>Lutjanus octolineatus</i>	Whitebelly Snapper	LC		17	8
	<i>Lutjanus rivulatus</i>	Blubberlip Snapper	LC		42	7
	<i>Lutjanus russelli</i>	One-spot Snapper	LC			2
	<i>Lutjanus sanguineus</i>	Humphead Snapper	LC		41	18
	<i>Lutjanus sebae</i>	Emperor Red Snapper	LC		45	19
	<i>Macolor niger</i>	Black And White Snapper	LC		27	20
	<i>Paracaesio sordida</i>	Dirty Ordure Snapper	LC		37	9
	<i>Paracaesio xanthura</i>	Yellowtail Blue Snapper	LC		29	2
	<i>Pristipomoides filamentosus</i>	Crimson Jobfish	LC		39	5
Malacanthidae	<i>Malacanthus brevisrostris</i>	Quakerfish	NE		22	9
	<i>Malacanthus latovittatus</i>	Blue Blanquillo	NE		43	2

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Menidae	<i>Mene maculata</i>	Moonfish	NE		15	26
Monacanthidae	<i>Aluterus monoceros</i>	Unicorn Leatherjacket Filefish	LC		48	24
	<i>Aluterus scriptus</i>	Scribbled Leatherjacket Filefish	LC		40	3
	<i>Cantherhines dumerilii</i>	Whitespotted Filefish	LC		16	5
	<i>Cantherhines fronticinctus</i>	Spectacled Filefish	LC		16	5
	<i>Cantherhines pardalis</i>	Honeycomb Filefish	LC		17	9
	<i>Pervagor janthinosa</i>	Blackbar Filefish	LC		12	1
	<i>Stephanolepis aurata</i>	Porky	LC		11	2
Monodactylidae	<i>Monodactylus argenteus</i>	Silver Moony	LC		15	3
	<i>Monodactylus falciformis</i>	Full Moony	LC		14	9
Mugilidae	<i>Mugil cephalus</i>	Flathead Grey Mullet	LC		33	135
Mullidae	<i>Mulloidichthys ayliffe</i>	Indian Mimic Goatfish	LC		27	10
	<i>Mulloidichthys flavolineatus</i>	Yellowstripe Goatfish	LC		27	28
	<i>Mulloidichthys vanicolensis</i>	Yellowfin Goatfish	LC		25	19
	<i>Parupeneus barberinus</i>	Dash-and-dot Goatfish	LC		28	115
	<i>Parupeneus cyclostomus</i>	Gold-saddle Goatfish	LC		24	23
	<i>Parupeneus fraserorum</i>	Parupeneus Fraserorum	LC		23	39
	<i>Parupeneus indicus</i>	Indian Goatfish	LC		32	17
	<i>Parupeneus macronemus</i>	Longbarbel Goatfish	LC		20	42
	<i>Parupeneus pleurostigma</i>	Sidespot Goatfish	LC		21	34
	<i>Parupeneus rubescens</i>	Rosy Goatfish	LC		35	1
	<i>Parupeneus trifasciatus</i>	Doublebar Goatfish	LC		23	3
	<i>Upeneus heemstra</i>	Heemstra Goatfish	LC		18	29
	<i>Upeneus indicus</i>	Tall-fin Goatfish	DD		13	1
	<i>Upeneus moluccensis</i>	Goldband Goatfish	LC		15	14
	<i>Upeneus pori</i>	Pors Goatfish	LC		15	6
	<i>Upeneus suahelicus</i>	Swahili Goatfish	LC		14	221
	<i>Upeneus vittatus</i>	Yellowstriped Goatfish	LC		17	26
Muraenesocidae	<i>Muraenesox bagio</i>	Common Pike Conger	NE		113	25
Muraenidae	<i>Gymnothorax favagineus</i>	Laced Moray	LC		108	12
	<i>Gymnothorax flavimarginatus</i>	Yellow-edged Moray	LC		88	2
	<i>Gymnothorax javanicus</i>	Giant Moray	LC		86	6
	<i>Gymnothorax meleagris</i>	Turkey Moray	LC		51	1
	<i>Gymnothorax rueppelliae</i>	Banded Moray	LC		65	1

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	<i>Gymnothorax undulatus</i>	Undulated Moray	LC		73	21
	<i>Strophidon sathete</i>	Slender Giant Moray	NE		113	6
Nemipteridae	<i>Nemipterus bipunctatus</i>	Delagoa Threadfin Bream	LC		23	28
	<i>Nemipterus randalli</i>	Randall's Threadfin Bream	LC		23	36
	<i>Nemipterus zysron</i>	Slender Threadfin Bream	LC		21	65
	<i>Scolopsis bimaculata</i>	Thumbprint Monocle Bream	LC		20	99
	<i>Scolopsis ghanam</i>	Arabian Monocle Bream	LC		19	79
	<i>Scolopsis vosmeri</i>	Whitecheek Monocle Bream	LC		16	61
Opistognathidae	<i>Opistognathus margaretae</i>	Halfscaled Jawfish	DD		18	1
	<i>Opistognathus muscatensis</i>	Robust Jawfish	LC		21	2
	<i>Opistognathus nigromarginatus</i>	Bridled Jawfish	LC		20	6
	<i>Opistognathus spp</i>	Jawfish species	NE		13	1
Ostraciidae	<i>Lactoria cornuta</i>	Longhorn Cowfish	NE		26	17
	<i>Ostracion cubicus</i>	Yellow Boxfish	LC		17	10
	<i>Ostracion meleagris</i>	Whitespotted Boxfish	NE		15	3
	<i>Ostracion rhinorhynchos</i>	Horn-nosed Boxfish	NE		41	1
Pempheridae	<i>Parapriacanthus ransonneti</i>	Golden Sweeper	NE		7	10
	<i>Pempheris schwenkii</i>	Silver Sweeper	NE		11	2
	<i>Pempheris vanicolensis</i>	Vanikoro Sweeper	NE		14	3
Pinguipedidae	<i>Parapercis alboguttata</i>	Whitespot Sandsmelt	LC		17	1
	<i>Parapercis hexophthalma</i>	Speckled Sandperch	LC		19	32
	<i>Parapercis punctulata</i>	Spotted Sandperch	NE		14	3
	<i>Parapercis schauinslandii</i>	Redspotted Sandperch	NE		14	1
	<i>Parapercis xanthozona</i>	Yellowbar Sandperch	LC		14	1
Platycephalidae	<i>Cociella heemstrai</i>	Yellowtail Flathead	LC		21	13
	<i>Papilloculiceps longiceps</i>	Tentacled Flathead	LC		45	12
	<i>Platycephalus indicus</i>	Bartail Flathead	DD		26	7
Plotosidae	<i>Plotosus lineatus</i>	Striped Eel Catfish	LC		19	531
Polynemidae	<i>Polydactylus plebeius</i>	Striped Threadfin	NE		36	1
Pomacanthidae	<i>Centropyge multispinis</i>	Dusky Angelfish	LC		10	1
	<i>Pomacanthus chrysurus</i>	Goldtail Angelfish	LC		17	1
	<i>Pomacanthus imperator</i>	Emperor Angelfish	LC		26	14
	<i>Pomacanthus maculosus</i>	Yellowbar Angelfish	LC		48	2
	<i>Pomacanthus semicirculatus</i>	Semicircle Angelfish	LC		21	12

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	<i>Pygoplites diacanthus</i>	Regal Angelfish	LC		21	4
Pomacentridae	<i>Abudefduf sparoides</i>	False-eye Sergeant	LC		14	8
	<i>Abudefduf vaigiensis</i>	Indo-Pacific Sergeant	LC		16	247
	<i>Amblyglyphidodon leucogaster</i>	Yellowbelly Damselfish	LC		11	1
	<i>Amphiprion allardi</i>	Twobar Anemonefish	LC		13	14
	<i>Chromis viridis</i>	Blue Green Damselfish	NE		8	1
	<i>Chromis weberi</i>	Weber's Chromis	NE		13	2
	<i>Dascyllus trimaculatus</i>	Threespot Dascyllus	VU		11	33
	<i>Plectroglyphidodon leucozonus</i>	Singlebar Devil	NE		14	3
	<i>Pristotis cyanostigma</i>	Bluedotted Damsel	NE		10	1
	<i>Stegastes limbatus</i>	Ebony Gregory	NE			1
Priacanthidae	<i>Heteropriacanthus cruentatus</i>	Glasseye	LC		25	206
	<i>Priacanthus hamrur</i>	Moontail Bullseye	LC		30	40
Psettodidae	<i>Psettodes erumei</i>	Indian Halibut	DD		41	27
Rachycentridae	<i>Rachycentron canadum</i>	Cobia	LC		80	22
Scaridae	<i>Calotomus carolinus</i>	Carolines Parrotfish	LC		24	45
	<i>Calotomus spinidens</i>	Spinytooth Parrotfish	LC		16	2
	<i>Cetoscarus ocellatus</i>	Spotted Parrotfish	LC		47	7
	<i>Chlorurus atrilunula</i>	Bluemoon Parrotfish	LC		28	33
	<i>Chlorurus Sordidus</i>	Daisy Parrotfish	LC		25	12
	<i>Chlorurus strongylocephalus</i>	Steephead Parrotfish	LC		35	3
	<i>Hipposcarus harid</i>	Candelamoia Parrotfish	LC		32	12
	<i>Leptoscarus vaigiensis</i>	Marbled Parrotfish	LC		22	329
	<i>Scarus festivus</i>	Festive Parrotfish	LC		34	1
	<i>Scarus frenatus</i>	Bridled Parrotfish	LC		25	3
	<i>Scarus ghobban</i>	Blue-barred Parrotfish	LC		29	90
	<i>Scarus niger</i>	Dusky Parrotfish	LC		25	9
	<i>Scarus psittacus</i>	Common Parrotfish	LC		25	19
	<i>Scarus rubroviolaceus</i>	Ember Parrotfish	LC		34	31
	<i>Scarus russelii</i>	Eclipse Parrotfish	LC		27	2
	<i>Scarus scaber</i>	Fivesaddle Parrotfish	LC		27	1
	<i>Scarus tricolor</i>	Tricolour Parrotfish	LC		24	10
Sciaenidae	<i>Atrobuca marleyi</i>	African Blackmouth Croaker	DD		29	4
	<i>Otolithes ruber</i>	Tigertooth Croaker	LC		28	5

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Scombridae	<i>Acanthocybium solandri</i>	Wahoo	LC		120	3	
	<i>Auxis thazard</i>	Frigate Tuna	LC		32	42	
	<i>Euthynnus affinis</i>	Kawakawa	LC		49	484	
	<i>Gymnosarda unicolor</i>	Dogtooth Tuna	LC		70	1	
	<i>Katsuwonus pelamis</i>	Skipjack Tuna	LC		60	67	
	<i>Rastrelliger kanagurta</i>	Indian Mackerel	DD		22	1843	
	<i>Sarda orientalis</i>	Striped Bonito	LC		48	1	
	<i>Scomberomorus commerson</i>	Narrow-Barred Spanish Mackerel	NT		78	121	
	<i>Scomberomorus plurilineatus</i>	Kanadi Kingfish	DD		77	12	
	<i>Thunnus albacares</i>	Yellowfin Tuna	LC		92	92	
	Scorpaenidae	<i>Dendrochirus brachypterus</i>	Dwarf Lionfish	LC		10	1
		<i>Pterois miles</i>	Devil Firefish	LC		28	6
		<i>Scorpaenopsis possi</i>	Poss's Scorpionfish	LC		18	1
Serranidae	<i>Aethaloperca rogae</i>	Redmouth Grouper	LC		27	44	
	<i>Cephalopholis argus</i>	Peacock Hind	LC		27	22	
	<i>Cephalopholis boenak</i>	Chocolate Hind	LC		17	53	
	<i>Cephalopholis leopardus</i>	Leopard Hind	LC		16	6	
	<i>Cephalopholis miniata</i>	Coral Hind	LC		26	25	
	<i>Cephalopholis nigripinnis</i>	Blackfin Grouper	LC		18	31	
	<i>Cephalopholis polleni</i>	Harlequin Hind	LC		25	1	
	<i>Cephalopholis sonnerati</i>	Tomato Rockcod	LC		49	6	
	<i>Dermatolepis striolata</i>	Smooth Grouper	LC		63	3	
	<i>Epinephelus areolatus</i>	Areolate Grouper	LC		29	3	
	<i>Epinephelus chlorostigma</i>	Brownspotted Grouper	LC		24	55	
	<i>Epinephelus coeruleopunctatus</i>	Whitespotted Grouper	LC		36	10	
	<i>Epinephelus coioides</i>	Orange-Spotted Grouper	LC		52	41	
	<i>Epinephelus fasciatus</i>	Blacktip Grouper	LC		19	55	
	<i>Epinephelus flavocaeruleus</i>	Blue And Yellow Grouper	LC		37	22	
	<i>Epinephelus fuscoguttatus</i>	Brown-Marbled Grouper	VU		46	20	
	<i>Epinephelus lanceolatus</i>	Giant Grouper	DD		69	5	
	<i>Epinephelus longispinis</i>	Longspine Grouper	LC		23	7	
	<i>Epinephelus macrospilos</i>	Snubnose Grouper	LC		24	3	
<i>Epinephelus malabaricus</i>	Malabar Grouper	LC		45	55		
<i>Epinephelus merra</i>	Honeycomb Grouper	LC		18	26		

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	<i>Epinephelus morrhua</i>	Comet Grouper	LC		17	1
	<i>Epinephelus poecilonotus</i>	Dot-Dash Grouper	LC		23	3
	<i>Epinephelus polyphekadion</i>	Camouflage Grouper	VU		45	24
	<i>Epinephelus spilotoceps</i>	Foursaddle Grouper	LC		24	5
	<i>Epinephelus tauvina</i>	Greasy Grouper	DD		22	1
	<i>Grammistes sexlineatus</i>	Goldenstriped Soapfish	LC		12	3
	<i>Plectropomus laevis</i>	Blacksaddled Coralgrouper	LC		49	9
	<i>Plectropomus punctatus</i>	Marbled Coralgrouper	LC		57	7
	<i>Variola louti</i>	Yellow-edged Lyretail	LC		37	29
Siganidae	<i>Siganus stellatus</i>	Brown-spotted Spinefoot	LC		26	34
	<i>Siganus sutor</i>	Shoemaker Spinefoot	LC		25	400
Sillaginidae	<i>Sillago sihama</i>	Silver Sillago	LC		19	65
Sparidae	<i>Acanthopagrus berda</i>	Goldsilk Seabream	LC		21	1
	<i>Argyrops spinifer</i>	King Soldier Bream	LC		24	7
	<i>Crenidens crenidens</i>	Karanteen Seabream	LC		20	3
Sphyraenidae	<i>Sphyraena barracuda</i>	Great Barracuda	LC		52	40
	<i>Sphyraena forsteri</i>	Bigeye Barracuda	LC		34	119
	<i>Sphyraena jello</i>	Picklehandle Barracuda	LC		83	18
	<i>Sphyraena obtusata</i>	Obtuse Barracuda	LC		25	1062
	<i>Sphyraena putnamae</i>	Sawtooth Barracuda	LC		47	18
	<i>Sphyraena qenie</i>	Blackfin Barracuda	LC		46	64
Syngnathidae	<i>Hippocampus kuda</i>	Spotted Seahorse	VU	APP II	6	1
	<i>Syngnathoides biaculeatus</i>	Alligator Pipefish	LC		18	2
	<i>Trachyrhamphus bicoarctatus</i>	Double-Ended Pipefish	LC		22	1
Synodontidae	<i>Synodus sageneus</i>	Speartoothed Grinner	LC		28	44
	<i>Synodus variegatus</i>	Variegated Lizardfish	LC		19	40
	<i>Trachinocephalus myops</i>	Snakefish	LC		21	51
Terapontidae	<i>Pelates quadrilineatus</i>	Fourlined Terapon	LC		13	5
	<i>Terapon jarbua</i>	Jarbua Terapon	LC		17	237
	<i>Terapon theraps</i>	Largescaled Terapon	LC		13	2
Tetraodontidae	<i>Arothron hispidus</i>	White-spotted Puffer	LC		31	3
	<i>Chelonodon patoca</i>	Milkspotted Puffer	LC		6	1
	<i>Lagocephalus inermis</i>	Smooth Blasop	LC		14	3
Trichiuridae	<i>Trichiurus lepturus</i>	Largehead Hairtail	LC		74	140

FAMILY	SPECIES	COMMON NAME	IUCN	CITES	AVE SIZE (CM)	QTY
Triglidae	<i>Dactyloptena orientalis</i>	Oriental Flying Gurnard	LC		35	1
Triodontidae	<i>Triodon macropterus</i>	Threetooth Puffer	NE		38	1
Veliferidae	<i>Velifer hypselopterus</i>	Sailfin Velifer	LC		32	1
Xiphiidae	<i>Xiphias gladius</i>	Swordfish	LC		223	2
Zanclidae	<i>Zanclus cornutus</i>	Moorish Idol	LC		16	10
CEPHALAPODS						
Loliginidae	<i>Loligo</i> spp	Squid species			42	2000
Octopodidae	<i>Octopus</i> spp	Octopus species			83	244
Sepiidae	<i>Sepia</i> spp	Cuttlefish species			56	76
CRUSTACEANS						
Palinuridae	<i>Panulirus longipes</i>	Longlegged Spiny Lobster	LC		27	13
	<i>Panulirus ornatus</i>	Ornate Spiny Lobster	LC		28	26
	<i>Panulirus</i> spp	Spiny lobster species	LC			80
	<i>Panulirus versicolor</i>	Painted Spiny Lobster	LC		26	20
Penaeidea	<i>Penaeus</i> spp	Prawn species			13	4410
Portunidae	<i>Charybdis natator</i>	Ridged Swimming Crab	NE		9	4
	<i>Portunus armatus</i>	Blue Swimmer Crab	NE		9	396
	<i>Portunus sanguinolentus</i>	Threespot Swimming Crab	NE			15
	<i>Scylla serrata</i>	Indo-Pacific Swamp Crab	NE		11	4
Scyllaridae	<i>Scyllarides squammosus</i>	Blunt Slipper Lobster	LC		28	2
	<i>Scyllarides tridacnophaga</i>	Clamkiller Slipper Lobster	LC		21	1
	<i>Thenus orientalis</i>	Flathead Lobster	LC		22	18
MOLLUSCS (SEASHELLS)						
Arcidae	<i>Anadara</i> spp		NE		4	1
Cassidae	<i>Cassis cornuta</i>	Horned Helmet	NE		27	5
	<i>Cypraeassis rufa</i>	Bullmouth Helmet	NE		15	22
Conidae	<i>Conus</i> spp					1
Cypraeidae	<i>Cypraea tigris</i>	Tiger Cowrie	NE		8	22
Fasciolaridae	<i>Pleuroploca trapezium</i>	Trapezium Horse Conch	NE			14
Melongenidae	<i>Volema pyrum</i>	Pear Melongena	NE		5	6
Muricidae	<i>Chicoreus brunneus</i>	Adusta Murex	NE		12	15
	<i>Chicoreus ramosus</i>	Ramose Murex	NE		14	3
	<i>Vokesimurex dolichourus</i>	Vokesimurex Dolichourus	NE		7	150
Nassariidae			NE			2

FAMILY	SPECIES	COMMON NAME	IUCN	CITES	AVE SIZE (CM)	QTY
Potamididae	<i>Terebralia</i> spp					2
Ranellidae	<i>Monoplex</i> spp		NE		16	6
Strombidae	<i>Lambis truncata</i>	Giant Spider Conch	NE		41	14
Tridacnidae	<i>Tridacna maxima</i>	Elongate Giant Clam	CD	APP II	13	1
SEA CUCUMBERS						
Holothuriidae	<i>Actinopyga echinites</i>	Deep-water Redfish	VU		16	5
	<i>Actinopyga lecanora</i>	White-bottomed Sea Cucumber	DD		31	3
	<i>Actinopyga mauritiana</i>	Surf Redfish	VU		26	4
	<i>Actinopyga</i> spp				14	16
	<i>Bohadschia atra</i>	Dole	DD		33	10
	<i>Bohadschia vitiensis</i>	Brown Sandfish	DD		35	14
	<i>Holothuria fuscogilva</i>	White Teatfish	VU	APP II	25	3
	<i>Holothuria fuscopunctata</i>	Elephant Trunkfish	LC		40	3
	<i>Holothuria nobilis</i>	Black Teatfish	EN	APP II	24	3
	<i>Holothuria scabra</i>	Sand Fish	EN		22	14
	<i>Holothuria</i> sp. (type 'Pentard')	Pauni Kaki	NE		40	2
	<i>Holothuria</i> spp				18	1
	<i>Pearsonothuria graeffei</i>	Blackspotted Sea Cucumber	LC		26	2
Stichopodidae	<i>Stichopus herrmanni</i>	Curryfish Herrmanni	VU		41	13
	<i>Stichopus horrens</i>	Selenka's Sea Cucumber	DD		21	200
	<i>Stichopus pseudohorrens</i>	Stichopus Pseudohorrens	DD		31	3
	<i>Stichopus</i> spp				40	6
	<i>Thelenota ananas</i>	Prickly Redfish	EN		36	12

ANNEX 2: COMPARISON OF ARTISANAL FISHERIES LEGISLATION IN KENYA, MAINLAND TANZANIA AND ZANZIBAR.

JURISDICTION	KENYA	MAINLAND TANZANIA	ZANZIBAR
Legislation	Fisheries Management and Development Act, 2016	Tanzanian Fisheries Act, 2003 Tanzanian Fisheries Regulations, 2009	Zanzibar Fisheries Act, 2010
Prohibited gears and methods	<ul style="list-style-type: none"> • Beach seine nets • Electrical shock devices • Explosives • Firearms • Monofilament nets • Poison or “noxious substances” • Seine nets below the minimum mesh size of 45mm • Unlicensed fish aggregating devices • “Dangerous substances” 	<ul style="list-style-type: none"> • Beach seine nets • Electrocutation • Gill nets with mesh size less than 3 inches (76.2mm) • Madema traps with mesh size less than 3 inches (76.2mm) • Monofilament nets • Nets with mesh size less than 10mm in marine waters • SCUBA – unless for sport fishing, live capture of • aquarium finfish and research • Spear guns/harpoons • Stakes and weirs • “Katuli” - or other methods of fish disturbance • “Modified” seine nets 	<ul style="list-style-type: none"> • Beach seine nets • Catching of immature fish – below the minimum prescribed size for particular species (minimum sizes not provided) • “Diving devices” • “Electrical devices” • Explosives • Fishing weirs • Nets or traps with mesh sizes below the prescribed minimum mesh size for the area (minimum mesh sizes not provided) • Poisons or “noxious substances” • Spearguns • “Other fishing gears prohibited in that area”
Penalties	Fine up to KES100,000 and/or three months imprisonment	Fine of TZS2 million and/or imprisonment of three years	<ul style="list-style-type: none"> • Use of explosives or noxious substances: fine of TZS100,000 – 10M and/ or three months to five years imprisonment • Use of prohibited gear: fine of TZS200,000 – 1M and/ or imprisonment of six months to three years • Use of beach seine nets, spearguns, explosives and electrical or diving devices: fine of TZS100,000 – 5m and/ or imprisonment of three months to five years

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TRAFFIC
+44(0)1223 331 997
traffic@traffic.org
traffic.org