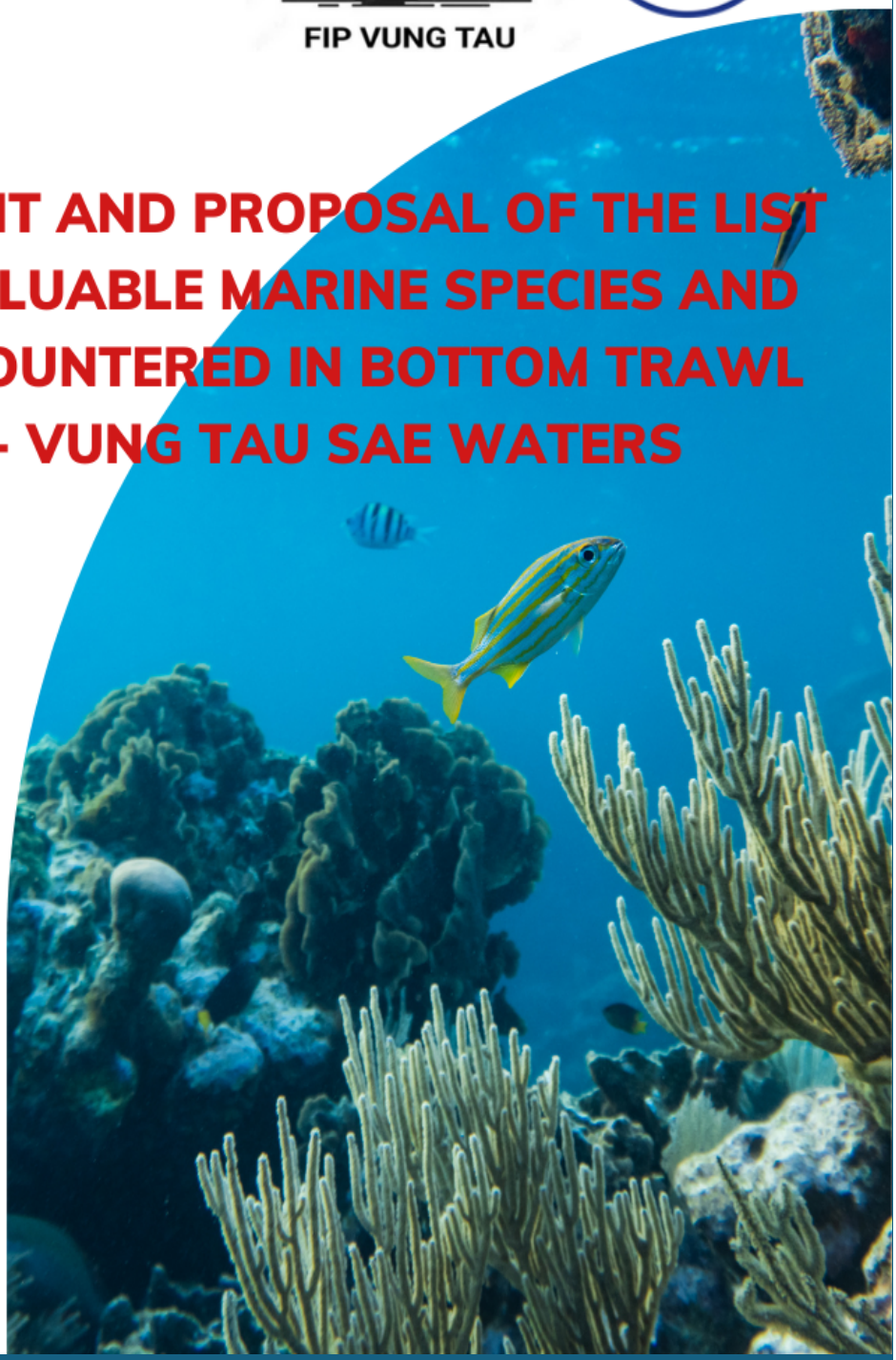
SCIENCTIFIC REPORT

FIP VUNG TAU

SORESIMF

UPDATE, SUPPLEMENT AND PROPOSAL OF THE LIST OF ECONOMICLY VALUABLE MARINE SPECIES AND RARE SPECIES ENCOUNTERED IN BOTTOM TRAWL IN THE BA RIA - VUNG TAU SAE WATERS



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CONTENTS

LIST OF FIGURES

LIST OF TABLES

LIST OF APPENDIXS

1. INTRODUCTION

Globally, the IUCN Red List (International Union for Conservation of Nature) has classified the conservation status of thousands of aquatic species (fish, crustaceans, mollusks, etc.) into endangerment levels such as Critically Endangered (CR), Endangered (EN), and Vulnerable (VU). Identifying a species such as sharks, tuna, or coral as "Endangered" (EN) compels countries to act by restricting exploitation or establishing conservation areas, demonstrating the need for a protective list.

The CITES Convention (Convention on International Trade in Endangered Species) lists species at risk of being threatened by international trade, including aquatic species. High-commercial-value species like sharks and some seahorses have also been included in CITES Appendices to control their exploitation and export, illustrating the link between commercial value and the need for protection.

Simultaneously, Regional Fisheries Management Organizations (RFMOs) also impose fishing quotas (Total Allowable Catch - TAC) for high-commercial-value, transboundary migratory species like tuna, aiming to ensure sustainable exploitation.

In Vietnam, legal documents and specialized research on this issue, such as relevant Laws, Decrees, and Decisions, have established a List of Endangered, Precious, and Rare Aquatic Species prioritized for protection. This list includes species like dolphins, sea turtles, and some endemic fish species at high risk of extinction, such as the Giant Barb and Giant Mekong Catfish (freshwater), or marine species like the Humphead Wrasse (Cheilinus undulatus). This provides the legal basis for strictly prohibiting the exploitation, transport, and trade of these species, affirming the urgent need for conservation.

The Research Institute for Marine Fisheries and other research units regularly conduct surveys and assessments of the biomass and yield of high-economic-value groups such as small pelagic fish (herrings, scads, Indian mackerel), demersal fish (lizardfish, croakers), crustaceans (shrimp, crabs), and mollusks (squid, octopus). These results are used to formulate master plans and issue regulations on fishing seasons, gear, and exploitation restrictions in certain sea areas, directly aiming to sustainably manage the exploitation of commercially valuable species. This program has set the goal of researching, artificially producing seeds, and restocking commercially valuable, endemic, and endangered, precious, and rare species, confirming the simultaneous combination of the two lists above.

These two lists complement and interact with each other to create a comprehensive management strategy. The list of commercially valuable marine species drives the economy but needs to be strictly controlled to prevent them from becoming species requiring protection. Conversely, the list of marine species facing severe decline warnings helps prevent their eradication, ensuring the ecological balance of the ocean.

In summary, developing these two lists is the foundation for balancing the goals of economic development (from marine resources) and biodiversity conservation (maintaining the richness and health of the marine ecosystem) towards sustainability. Based on the available data from the Sub-Institute of Marine Fisheries Research in the South, we compiled the report “Updating, Supplementing, and Proposing a List of Commercially Important Marine Species and Endangered, Threatened, and Protected (ETP) Species Caught by the Bottom Trawl Fishery in the Waters of Ba Ria - Vung Tau,

2025” to provide additional information that can help managers formulate appropriate development strategies for the future.

2. MATERIALS AND METHODS

2.1. Study materials

2.1.1. Study scope

The survey scope is the coastal and inshore waters of Ba Ria - Vung Tau province, defined by straight lines connecting adjacent points. This scope has been agreed upon for boundary determination and exploitation management zoning with neighboring localities (Ho Chi Minh City and Binh Thuan) and is based on Decree 26/2019/ND-CP (amended and supplemented by Decree 37/2024/ND-CP) (Figure 1).

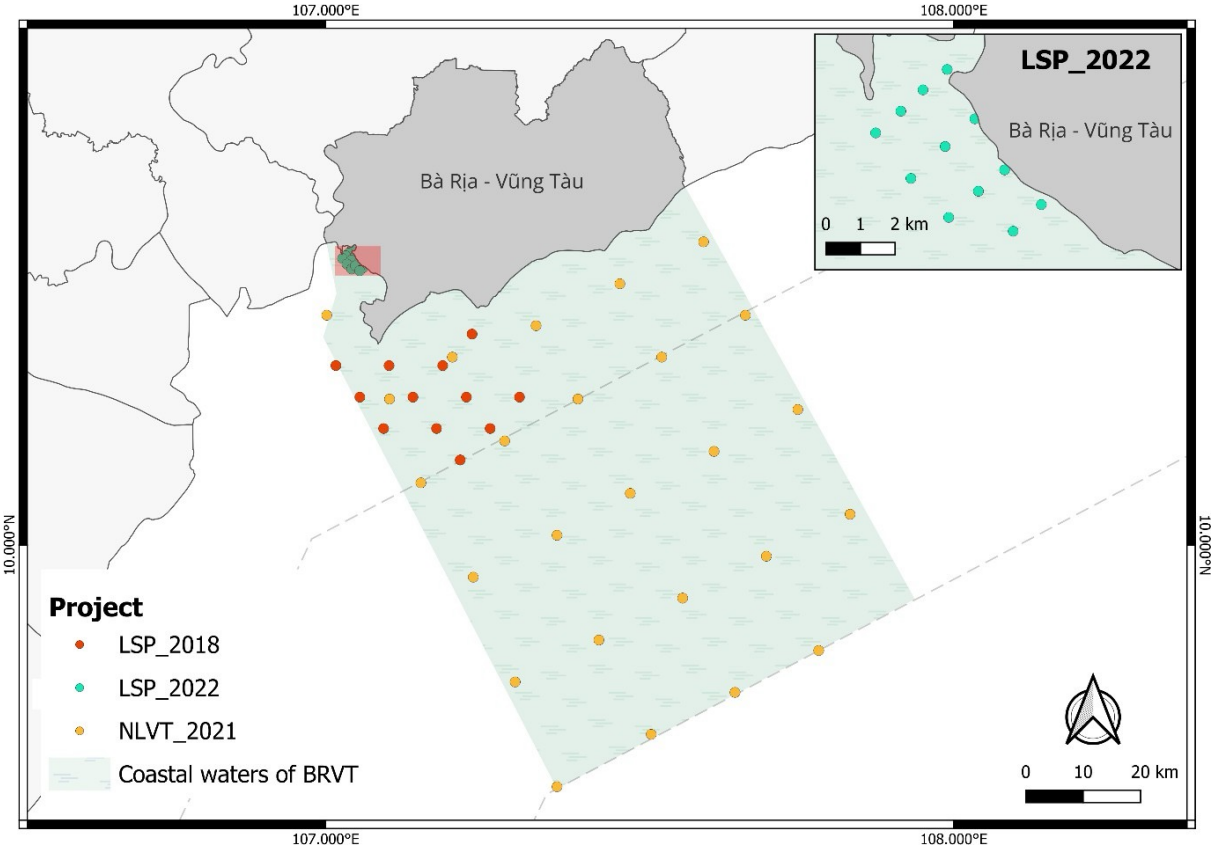

Figure 1. Diagram of investigation and survey stations in the sea area of Ba Ria - Vung Tau province (period from 2018 to 2022)

2.1.2. Data sources

The data sources in this report were collected from marine fishery resource surveys conducted in the waters of Ba Ria - Vung Tau and neighboring areas over a 5-year period (from 2018 to 2022) , belonging to research projects and programs implemented by the Sub-Institute of Marine Fisheries Research in the South. During this period, the Sub-Institute conducted 03 surveys with a total of 74 survey stations for each gear type (single fish trawl and single shrimp trawl). Specifically, the surveys included:

- The survey on the current status of marine resources in the area planned for dredged material dumping and adjacent areas (12 stations).

- The survey assessing fishery resources in the coastal and inshore waters of Ba Ria - Vung Tau province (25 stations/trip×2 trips=50 stations).

- The marine resource survey in the area of the Long Son Petrochemical Complex Port Project and adjacent areas (12 stations) (Table 1).

Table 1. Summary of investigation trips in the Ba Ria-Vung Tau sea (2018-2024)

Trip Code	Program	Time	Sea area	No. of station
LSP_2018	Survey of the current status of marine resources in the area planned for dredged material dumping and adjacent areas.	Nov 2018	Coastal waters of Ba Ria - Vung Tau province	12
NLVT_2021	Survey of the current status of marine resources in the coastal and inshore waters of Ba Ria - Vung Tau province.	Nov 2020 and Jun 2021	Coastal and inshore waters of Ba Ria - Vung Tau province	25 x 2 = 50
LSP_2022	Survey of marine resources in the area of the Long Son Petrochemical Complex Port Project and adjacent areas in Long Son commune, Vung Tau City.	Jun 2022	Coastal waters of Long Son commune, Vung Tau City.	12
Total:	**04 survey trips**			**74**

2.2. Research methods

2.2.1. Data collection methods

Investigation of marine resources by single fish trawl and single shrimp trawl (carried out continuously): After completing the investigation of marine resources by single fish trawl, investigation of marine resources by single shrimp trawl will be carried out or vice versa.

- The survey vessel used in the survey is a chartered vessel from fishermen of Ba Ria - Vung Tau province who work in trawling, ensuring safety and working space at sea.

- The equipment used in the survey is a single-bottom trawl, including a single-bottom trawl for fish (mesh size in 2a = 30 mm) and a single-bottom trawl for shrimp (mesh size in 2a = 18 mm).

At each survey station, one net was cast, each cast lasting from 45 to 60 minutes. The entire catch was classified by species, weighed and counted. In case of large catches, sub-sampling was carried out to analyze species composition. Information on coordinates, net release/retrieval time, species composition, mass,

number of fish, sample multiplication factor (if any)... were all recorded in the available data table.

The technical parameters and net materials used are shown in detail in the net drawing as shown below.

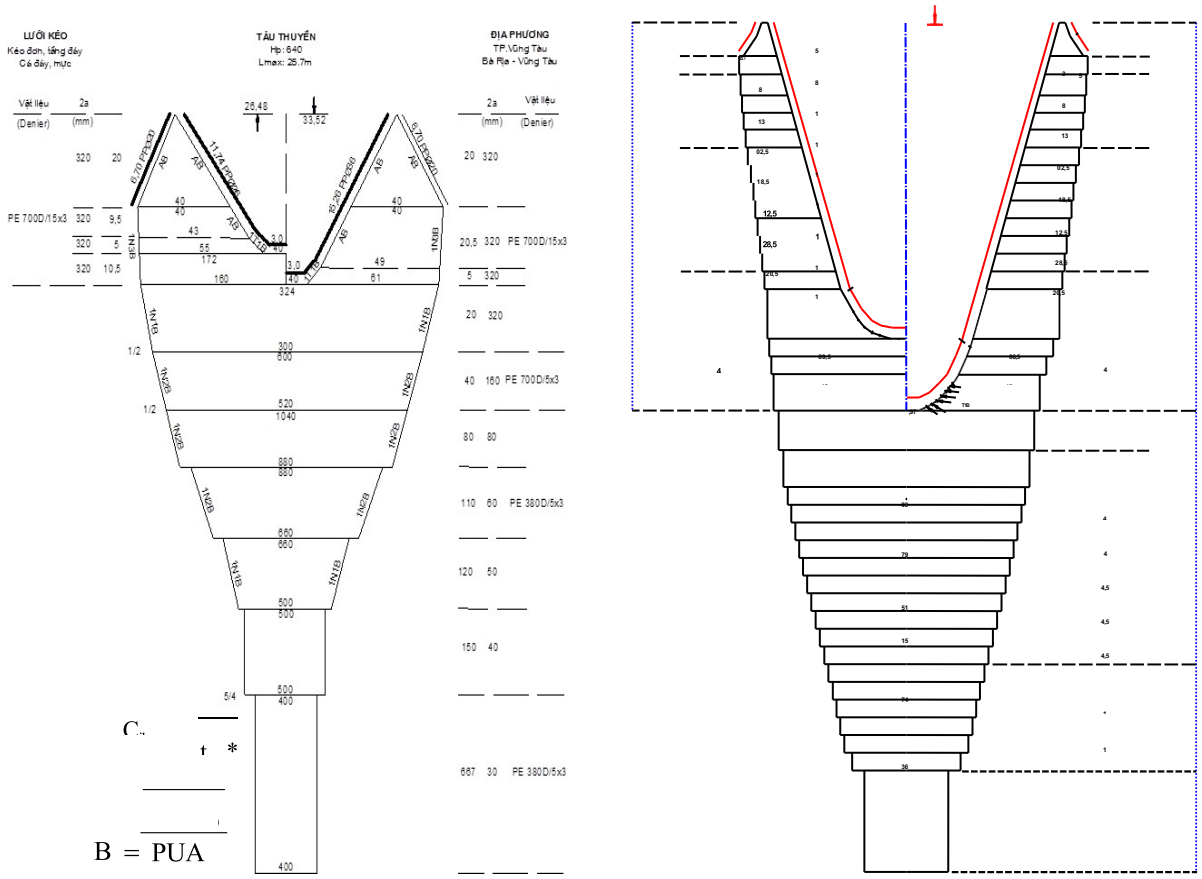

Figure 2. Types of nets used in the survey of marine resources in Ba Ria Vung Tau sea (bottom trawl for fish on the left, shrimp trawl for shrimp on the right)

2.2.2. Data analysis methods

- Species composition of seafood species is determined to species or species groups by morphological comparison method mainly based on the documents: “FAO species identification guide for fisheries purpose: The living marine resources of the Western Central Pacific” (vol 1-6) and “Fishes of Japan with pictorial keys to the species” (Nakabo, 2002).

Scientific names and ecological groups of seafood species are updated based on the websites: FishBase.org and SeaLifeBase.org. The list of fish species is arranged according to the classification system of Eschmeyer (2024).

- Species with economic value, dominant are species accounting for >1% of production.

- Species composition and production data are processed by conventional descriptive statistical methods. Production composition of each species (species group)

is estimated based on the amount of samples collected from the commercial group. The unit used for calculation is %, descriptive statistics are used to calculate this index:

$$P_i = \frac{\sum_{j=1}^{n} \text{Catch}_i}{\sum_{j=1}^{n} \text{Catch}}$$

In which: Pi is the yield component of the ith species group, n is the number of collected samples, Catchi is the yield of the ith species group in the jth sample, Catch is the total yield of the jth sample.

- ETP Species Determination: Endangered, Threatened, and Protected (ETP) species caught by the bottom trawl fishery were determined by cross-referencing with the conservation lists of the International Union for Conservation of Nature (IUCN) [1], the Convention on International Trade in Endangered Species (CITES) [2], and the Vietnam Red Bookcấp khai thác được bằng nghề lưới kéo đáy ở vùng biển thuộc tỉnh Bà Rịa - Vũng Tàu.

- Based on the criteria and content of the IUCN organization and the actual conditions of sample collection at fishing ports in Ba Ria - Vung Tau province, it is proposed that endangered species be assessed according to the classification criteria of IUCN; CITES and the Vietnam Red Book 2007. The research objects will be classified into the following groups: CR - Critically Endangered; EN - Endangered; VU - Vulnerable and NT - Near Threatened (Table 2, Figure 3).

Table 2. Criteria for identifying endangered key marine species

Criteria	Defined content		Condition	Note
A	Yield catch	Based on one of the criteria	A1 > 1%	Proactive career
			A2 > 2%	Proactive career
			A > 50%	Many
B	Economic value		B1 cao 40.000đ - 100.000đ	According to the results of the interview survey,estimation and inference during the process of collecting data.
			B2 rất cao > 100.000 đồng	
C	Number of dominant individuals		C1 ưu thế từ 2-50%	
			C2 rất ưu thế > 50%	
D	Frequency of Encounter		D1 thường xuyên 2-50%	
			D2 rất thường xuyên > 50%	

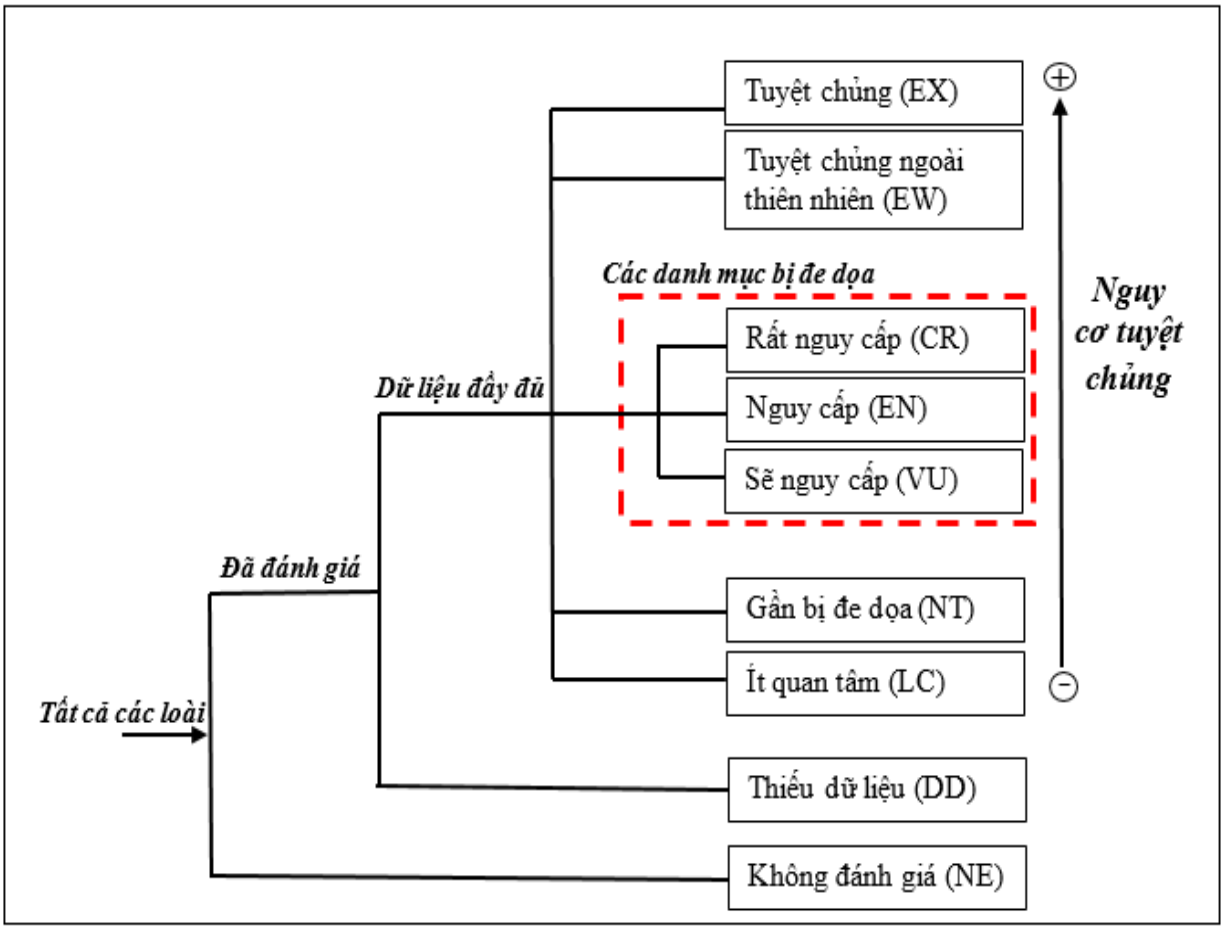

Figure 3. Structure of the ladder, classification levels of endangered species (IUCN)

Species composition and yield data were processed using conventional descriptive statistical methods..

3. RESULTS AND DISCUSSION

3.1. List of commercially important marine species

The analysis results show that the dominant species (accounting for >1.0% of the output) encountered during the survey trips were 33/367 species, this group of species only accounts for 9.0% of the total number of species but contributes up to 65.0% of the exploited output, while the remaining 334 species (81.0% of the species) only account for 35.0%. This result shows that the resource structure is highly concentrated, with a number of species playing a leading role in the exploited output (Table 3).

Table 3. Dominant species (>1.0% of production) in Ba Ria-Vung Tau sea area

TT	Tên loài	Tên tiếng Việt	Tỷ lệ sản lượng (%)
1	*Paramonacanthus japonicus* (Tilesius, 1809)	Cá bò một gai	7,2
2	*Portunus haanii* (Schmitt, 1858)*	Ghẹ đĩa	4,9
3	*Xiphonectes hastatoides* (Fabricius, 1798)	Ghẹ hasta	3,4

TT	Tên loài	Tên tiếng Việt	Tỷ lệ sản lượng (%)
4	*Uroteuthis duvaucelii* (D'Orbigny, 1835) *	Mực ống ấn độ	2,9
5	*Johnius belangerii* (Cuvier 1830) *	Cá đù vây đen	2,7
6	*Deveximentum hanedai* (Moch. & Hayashi, 1989)	Cá liệt	2,7
7	*Sepiella inermis* (Van Hasselt, 1835) *	Mực nang lỗ	2,6
8	*Amphioctopus* sp. *	Bạch tuộc	2,5
9	*Metapenaeopsis barbata* (De Haan, 1844) *	Tôm vỏ lông	2,5
10	*Trachinocephalus myops* (Forster, 1801) *	Cá mối hoa	2,2
11	*Calappa philargius* (Linnaeus, 1758)	Cua cúm	2,1
12	*Charybdis natator* (Herbst, 1794) *	Ghẹ đá	1,9
13	*Parapenaeopsis hardwickii* (Miers, 1878) *	Tôm choán	1,8
14	*Callionymus* sp.	Cá đàn lia	1,8
15	*Setipinna taty* (Valenciennes 1848)	Cá lẹp trắng	1,7
16	*Parapenaeopsis cornuta* (Kishinouye, 1900) *	Tôm cornuta	1,6
17	*Megokris sedili* (Hall, 1961) *	Tôm gậy	1,5
18	*Stolephorus commersonnii* (Lacepède, 1803)	Cá cơm thường	1,5
19	*Alcockpenaeopsis hungerfordii* (Alcock, 1905) *	Tôm mắt tre	1,4
20	*Nibea soldado* (Lacepède 1802) *	Cá đù chẽm	1,4
21	*Trachysalambria curvirostris* (Stimpson, 1860)*	Tôm gậy	1,3
22	*Saurida undosquamis* (Richardson, 1848) *	Cá mối vạch	1,3
23	*Portunus gracilimanus* (Stimpson, 1858)	Ghẹ gracilima	1,3
24	*Johnius carouna* (Cuvier 1830) *	Cá đù uốp	1,3
25	*Tonna dolium* (Linnaeus, 1758)	Ốc giấy	1,2
26	*Parapercis filamentosa* (Steindachner 1878)	Cá giả bống	1,2
27	*Uroteuthis chinensis* (Gray, 1849) *	Mực thước	1,1
28	*Sepia aculeata* Van Hasselt, 1835*	Mực nang	1,0
29	*Pennahia anea* (Bloch 1793) *	Cá đù	1,0
30	*Brevitrygon imbricata* (Bloch & Schne. 1801) *	Cá đuối ngói	1,0
31	*Portunus pelagicus* (Linnaeus, 1758) *	Ghẹ xanh	1,0
32	*Saurida tumbil* (Bloch, 1795) *	Cá mối thường	1,0
33	*Portunus sanguinolentus* (Herbst, 1783) *	Ghẹ ba chấm	1,0
	Total (33 species)		**65,0**
	Other species (334 species)		**35,0**

Note: (*) Exploitation objects have economic value.

The dominant species in the catch are distributed in three main groups: fish with 14 species, crustacean group with 13 species and mollusc group with 6 species. Of which, the most prominent is the one-spined cowfish (*P. japonicus*) accounting for 7.2% of the total production, followed by disc crab (*P. haanii*, 4.9%), and hastatoides crab (*X.*

hastatoides, 3.4%) with a production rate of >3%. In addition, there are species with significant proportions (from 2% to less than 3%) such as Indian squid (*U. duvaucelii*, 2.9%), blackfin croaker (*J. belangerii*, 2.7%), parasitic fish (*D. hanedai,* 2.7%), cuttlefish (*S. inermis*, 2.6%), octopus (*Amphioctopus* sp., 2.5%) and hairy shell shrimp (*M. barbata*, 2.5%), mullet (*T. myops*, 2.2%) and flu crab (*C. philargius*, 2.1%).

Species of high economic value include species of the Penaeidae family such as hairy shell shrimp (*M. barbata*), giant freshwater prawn (*P. hardwickii*), prawn (*P. cornuta*), stick prawn (*M. sedili, T. curvirostris*), bamboo-eyed prawn (*A. hungerfordii*); the Portunidae family, including disc crab (*P. haanii*), blue crab (*P. pelagicus*), three-spot crab (*P. sanguinolentus*) and rock crab (*C. natator*)... As for the fish group, species of the Sciaenidae family include blackfin croaker (*J. belangerii*), barramundi (*N. soldado*), croaker (*J. carouna*), flattail croaker (*P. anea*); The sardine family (Synodontidae), including: flower sardine (*T. myops*), striped sardine (*S. undosquamis*), common sardine (*S.tumbil*)... Squid species, including Indian squid (*U. duvaucelii)*, squid (*U. chinensis*), cuttlefish (*S. inermis*), white-veined cuttlefish (*S. aculeata*) and octopus (*Amphioctopus* sp.). These are typical economic objects in the group of bottom-dwelling seafood in the coastal and offshore waters of Ba Ria - Vung Tau province, and this trend is also recorded similarly in neighboring areas such as the coastal areas from Tien Giang to Soc Trang [5]; Ben Tre sea area [6]; Soc Trang - Bac Lieu coastal area [7].

In addition to species of economic value, many species are dominant but have low commercial value, mainly small fish and small crabs such as *P. japonicus, S. taty, D. hanedai, Callionymus sp., S. commersonnii, X. hastatoides* and *P. gracilimanus*. Although this group contributes a large proportion of output, it has low economic efficiency and is often classified as trash fish, used as live food for cage farming or fishmeal processing [8]. In Vietnam's coastal waters, fish caught in coastal waters mainly belong to small-sized families (10–20 cm) such as herring (Clupeidae), anchovies (Engraulidae), damselfish (Pomacentridae), Acanthuridae, Chaetodontidae, Apogonidae and Holocentridae.[9].

Thus, the dominant species (>1.0% of production) in the Ba Ria - Vung Tau sea area are quite diverse, but the production is mainly concentrated on a few species, the rest only account for a small proportion. Notably, the high production of low-value species reflects the decline of high-value species and the risk of ecological imbalance due to overexploitation. When exceeding the sustainable threshold, the overall production can remain “stable”, but the community structure is changed - some dominant species still exist, while many other species decline or disappear [10]. This result provides an important basis for management and proposes sustainable exploitation solutions, both protecting resources and serving local socio-economic development.

In 2020-2021, the Project "Investigation of the current status of marine resources in coastal and offshore waters of Ba Ria - Vung Tau province" conducted a survey of the main marine fishing occupations in Ba Ria - Vung Tau and recorded 58 species belonging to 46 genera and 26 families, including: 37 fish species, 15 crustacean species and 6 mollusc species. The single trawl fishery is the fishery that catches the most economic species (23 species), followed by other occupations such as trap nets and bottom nets (Table 4).

Table 4. List of economic species by fishing groups in coastal and offshore waters of Ba Ria - Vung Tau province (2020-2021)

**Note: (1) Fixed net; (2) Single bottom trawl; (3) Trap marking; (4) Bottom gillnet; (5) Pelagic gillnet; và (6) Coastal purse seine fishing.*

Scientific name	English name	Fishing group					
		(1)	(2)	(3)	(4)	(5)	(6)
A. Fish group							
1. *Ablennes hians* (Valenciennes 1846)	Flat needlefish					+	
2. *Alepes kleinii* (Bloch 1793)	Razorbelly scad	+			+		+
3. *Ariosoma anago* (Temminck & Sch. 1846)	Silvery conger		+				
4. *Chirocentrus dorab* (Forsskål, 1775)	Dorab wolf					+	
5. *Cynoglossus lingua* (Hamilton, 1822)	Long tongue sole	+					
6. *Dendrophysa russelii* (Cuvier 1829)	Goatee croaker			+	+		
7. *Eleutheronema tetradactylum* (Shaw)	Four threadfin			+			
8. *Elops hawaiensis* Regan 1909	Ladyfish				+		
9. *Encrasicholina heteroloba* (Rüpp. 1837)	Shortheadanchovy						+
10. *Encrasicholina punctifer* Fowler, 1938	Buccaneeranchovy						+
11. *Escualosa thoracata* (Valen. 1847)	White sardine	+					
12. *Harpadon nehereus* (Hamilton 1822)	Bombay-duck				+		
13. *Hilsa kelee* (Cuvier 1829)	Kelee shad					+	
14. *Ilisha melastoma* (Bloch & Schneider 1801)	Indian ilisha				+	+	
15. *Johnius belangerii* (Cuvier 1830)	Belanger's croaker	+	+	+	+		
16. *Johnius borneensis* (Bleeker 1851)	Hammer croaker		+	+	+		
17. *Johnius carouna* (Cuvier 1830)	Caroun croaker			+			
18. *Johnius plagiostoma* (Bleeker 1849)	Large-eye croaker	+	+	+	+		
19. *Johnius* sp.	Croaker			+			
20. *Megalaspis cordyla* (Linnaeus 1758)	Torpedo scad				+	+	
21. *Mugil cephalus* Linnaeus, 1758	Flathead mullet				+		
22. *Nibea soldado* (Lacepède 1802)	Soldier croaker			+			
23. *Osteomugil perusii* (Valenc. 1836)	Longfinned mullet				+		
24. *Pennahia anea* (Bloch 1793)	Donkey croaker	+					
25. *Pomadasys maculatus* (Bloch 1793)	Saddle grunt				+		

26. *Rastrelliger kanagurta* (Cuvier 1816)	Indian mackerel					+	+
27. *Sardinella fimbriata* (Valencien. 1847)	Fringescale sardine					+	+
28. *Sardinella gibbosa* (Bleeker 1849)	Goldstripe sardine					+	+
29. *Scatophagus argus* (Linnaeus 1766)	Spotted scat			+			
30. *Scomberomorus commerson* (Lacepè 1800)	Spanish mackerel				+		
31. *Selaroides leptolepis* (Cuvier 1833)	Yellowstripe scad					+	+
32. *Setipinna taty* (Valenciennes 1848)	Scaly hairfin					+	
33. *Sillago sihama* (Forsskål 1775)	Silver sillago		+	+			
34. *Stolephorus dubiosus* (Wongratan 1983)	Thai anchovy	+					
35. *Thryssa dussumieri* (Valencienes 1848)	Dussumier thryssa					+	
36. *Trachinocephalus myops* (Forster 1801)	Snakefish		+				
37. *Trichiurus lepturus* Linnaeus 1758	Largehead hairtail					+	+
B. Crustacean group							
38. *Acetes* sp.	Baby shrimp	+					
39. *Charybdis feriatus* (Linnaeus, 1758)	Crucifix crab		+	+			
40. *Charybdis japonica* (MilneEdwards, 1861)	*Japanese crab*			+			
41. *Kishinouyepenaeopsis cornuta* (Kishin)	*Greasybock shrimp*	+	+				
42. *Megokris sedili* (Hall, 1961)	*Malayan shrimp*		+				
43. *Metapenaeopsis barbata* (DeHaan,1844)	Whiskered shrimp	+	+				
44. *Mierspenaeopsis sculptilis* (Heller,1862)	Rainbow shrimp			+			
45. *Oratosquilla oratoria* (De Haan, 1844)	*Squillid shrimp*	+	+				
46. *Oratosquillina gravieri* (Manning1978)	*Squillid shrimp*	+	+	+			
47. *Parapenaeopsis hardwickii* (Miers,1878)	Spear shrimp	+	+	+			
48. *Penaeus merguiensis* De Man, 1888	White prawn	+					
49. *Portunus haanii* (Schmitt, 1858)	Red-spot crab		+				
50. *Portunus pelagicus* (Linnaeus, 1758)	Blue crab		+	+			
51. *Portunus sanguinolentus* (Herbst, 1783)	Threespot crab		+	+			
52. *Trachypenaeus* sp.	Atlantic shrimp		+				
C. Molluscs group							
53. Amphioctopus aegina (Gray, 1849)	Sandbird octopus		+				
54. Amphioctopus marginatus (Taki, 1964)	Coconut octopus		+				
55. Sepiella inermis (Van Hasselt, 1835)	Spineless cuttlefish	+	+	+	+		
56. Uroteuthis duvaucelii (D'Orbigny,1835)	Indian squid		+				
57. Uroteuthis chinensis (Gray, 1849)	Mitre Squid		+				
58. Amusium pleuronectes (Linnaeus,1758)	Asian moon scallop		+				
Total:		**15**	**23**	**18**	**14**	**12**	**8**

Comparing the species composition of economically valuable objects in Table 3 and Table 4, we see: Some species with high commercial value appear in both tables, confirming their important economic role such as *Trachinocephalus myops* (flower

mullet), *Johnius belangerii* (Blackfin croaker), *Johnius carouna* (Oyster croaker), *Nibea soldado* (Barramundi), *Pennahia anea* (Flattail croaker) - croaker species are the main exploited objects, especially in trawling. The squid group includes: *Uroteuthis duvaucelii* (Indian squid), *Uroteuthis chinensis* (Squid), *Sepiella inermis* (Cuttlefish). Crustaceans encountered: *Portunus haanii* (Discus crab), *Portunus pelagicus* (Blue crab), *Portunus sanguinolentus* (Three-spot crab), *Parapenaeopsis hardwickii* (Prawn choan), *Megokris sedili* (Stick shrimp), *Metapenaeopsis barbata* (Hair shell shrimp).

Due to the selectivity of the fishing gear (or type of fishing), single trawl fishing often shows benthic species such as *Paramonacans japonicus* and *Callionymus* sp. with high yield rates (7.2% and 1.8% respectively). This shows that the trawl fishes are close to the bottom and catch many bottom-dwelling species, Table 3 also records *Tonna dolium*.

Meanwhile, Table 4 includes species exploited by many types of fishing (bottom trawl, gillnet, trap, purse seine and bottom trawl), so there is the presence of pelagic species such as silver pomfret (*Rastrelliger kanagurta*), herring (*Sardinella* spp.), garfish (*Megalaspis cordyla)*, and mackerel (*Scomberomorus commerson*). These species are almost not dominant in the output of single trawl.

Therefore, we can see that single trawl is a general and less selective fishing, with 33 species accounting for 65% of the output and is the fishing with the most species in Table 4 (23 species). Single trawl proves to be the most destructive or least selective fishing gear, exploiting most animal groups and water layers. This puts the greatest pressure on aquatic resources, requiring strict control in terms of area and mesh size.

In addition, there is a clear stratification of resources according to fishing gear: pelagic fish (herring, silver carp) are mainly exploited by floating trawls and coastal purse seines, while bottom-dwelling fish, shrimp and squid are mainly exploited by trawls, traps and bottom-dwelling. In general, the bony fish group is the group with the greatest species diversity in economic resources. Trawling mainly exploits fish and crustaceans/mollusks, reflecting the general and less selective exploitation characteristic of this profession.

Table 5. Comparison of the number of seafood species by resource group and type of exploitation for species of economic value in the sea area of Ba Ria - Vung Tau

Group of marine resources	Trawl fishing	Summary of fishing
1. Bony fish group (fish)	18 species (54.5%)	37 species (64.9%)
2. Crustacean group (shrimp, crab, crab)	9 species (27.3%)	15 species (26.3%)
3. Molluscs (squid, octopus, snails)	6 species (18.2%)	5 species (8.8%)
Total:	**33 species (65%)**	**57 economic species recorded**

3.2. Danh mục loài nguy cấp, quý hiếm (ETP)

The listing of endangered and rare species (ETP) is to create a legal and scientific basis to prioritize conservation actions and sustainable exploitation management, especially in the fisheries sector. From there, accurately identify species that are at the

highest risk of extinction (CR, EN, VU) so that management agencies and organizations can focus finance, human resources and technology on their recovery and protection programs. Create a foundation to issue strict legal regulations such as completely banning or restricting the exploitation, transportation and trade of listed species, preventing the decline of genetic resources. Moreover, it ensures that the Country properly implements international conventions on biodiversity and wildlife trade, enhances reputation and facilitates sustainable seafood trade.

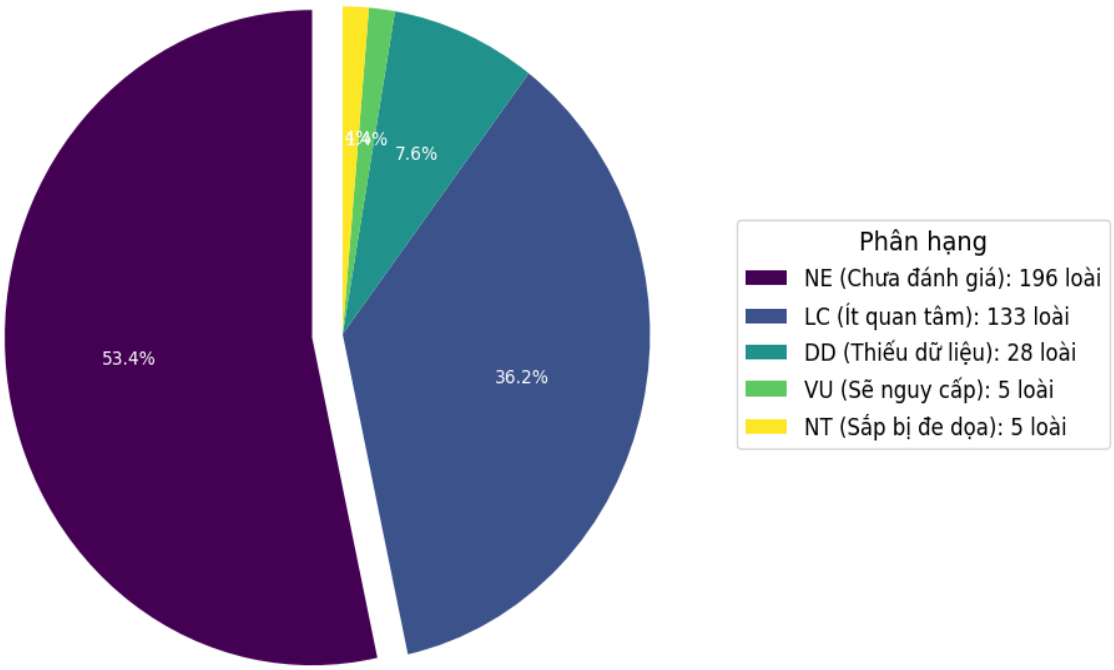

Figure 4. Rate of endangered species classified according to IUCN-redlist 2025 in Ba Ria Vung Tau sea area

From the results of bottom trawl surveys, the results of the assessment of the endangered status of 367 seafood species according to the IUCN redlist (2025) [11] show that in the waters of Ba Ria Vung Tau, the species at the direct threat level only account for 2.8%, including 5 species at the VU - Vulnerable level and 5 species at the NT - Near Threatened level. The LC - Least Concern group accounts for a fairly large proportion, with 133 species (36.2%), DD - Data Deficient (Data Deficient) 28 species (7.6%) and NE - Not Evaluated group up to 196 species (53.4%). Although the proportion of directly threatened species is not high, the fact that more than half of the species have not been assessed or lack data poses many challenges for management [12], [13] (Figure 4).

Thus, the total of 10 species encountered are endangered, threatened and protected (ETP), belonging to 6 orders and 8 families. Notably, the cartilaginous fish group (mainly rays) accounts for 50% (5 species) (Table 6). According to previous studies, in the Southeast Asian sea, up to 59% of shark and ray species are assessed as being threatened with extinction and 72.5% are in decline; rays are more threatened than sharks [14].

Table 6. List of endangered species in Ba Ria-Vung Tau sea area classified according to IUCN redlist 2025

Class/Order name	Family name	Species name	IUCN (2025)
Cartilaginous fish (Elasmobranchii)			
Myliobatiformes	Dasyatidae	1. *Brevitrygon imbricata* (Bloch & Schneider 1801)	VU
		2. *Brevitrygon walga* (Müller & Henle 1841)	NT
		3. *Hemitrygon akajei* (Müller & Henle, 1841)	NT
	Gymnuridae	4. *Gymnura poecilura* (Shaw, 1804)	VU
Torpediniformes	Narkidae	5. *Narke dipterygia* (Bloch & Schneider, 1801)	VU
Bony fish (Teleostei)			
Aulopiformes	Synodontidae	6. *Harpadon nehereus* (Hamilton, 1822)	NT
Perciformes	Haemulidae	7. *Diagramma pictum* (Thunberg, 1792)	NT
Scombriformes	Scombridae	8. *Scomberomorus commerson* (Lacepède 1800)	NT
	Stromateidae	9. *Pampus argenteus* (Euphrasen, 1788)	VU
Syngnathiformes	Syngnathidae	10. *Hippocampus trimaculatus* Leach, 1814	VU

Note: Classification according to IUCN redlist (2025) [11], VU - Vulnerable; NT - Near Threatened

Commercially valuable fish species such as *S. commerson, H. nehereus, D. pictum* and *P. argenteus* have recently been classified as threatened and need priority protection. Exploitation is identified as the main cause, with the Red List Index (RLI) of marine fish reaching 0.968 [13]. H. trimaculatus is also recorded at VU-vulnerable. Among Syngnathiformes, 6–7.9% of species are threatened, possibly up to 38%, with the most threatened group being *Hippocampus* spp. [15].

Compared with the results of the marine resources survey in the period 2017-2020 by many types of occupations, the number of endangered species that need to be protected in the entire coastal area of Vietnam is 44 species and the Southeast sea is 19 species [4] and in the coastal and offshore waters of Ba Ria - Vung Tau province is 16 species. This shows that the number of marine species exploited by bottom trawling in the Ba Ria - Vung Tau sea is 10 species with the proportion of endangered and rare species (ETP) accounting for 22.7% of the species in the Vietnam sea, 52.6% of the species in the Southeast sea and 62.5% of the species in the entire Ba Ria - Vung Tau sea (calculated for the total types of occupations). Thus, the number of endangered and rare species that need to be protected in the Ba Ria - Vung Tau sea exploited by bottom trawling is relatively high (Table 7).

Table 7. List of endangered species according to IUCN classification, Decree No. 26/1029/ND-CP and Vietnam Red Book in the sea of Ba Ria - Vung Tau province caught from various types of fishing

ID	Scientific name	English name	Levels		
			(1)	(2)	(3)
1	*Maculabatis gerrardi* (Gray, 1851)	Sharpnose stingray	EN	–	–
2	*Brevitrygon imbricata* (Bloch & Sch., 1801)	Coromandel whipray	VU	–	–
3	*Gymnura poecilura* (Shaw, 1804)	Long-tailed butterfly ray	VU	–	–
4	*Narcine timlei* (Bloch & Schneider, 1801)	Spotted numbfish	VU	–	–
5	*Pampus argenteus* (Euphrasen, 1788)	Silver pomfret	VU	–	–
6	*Pateobatis jenkinsii* (Annandale, 1909)	Jenkins whipray	VU	–	–
7	*Telatrygon zugei* (Müller & Henle, 1841)	Pale-edged stingray	NT	–	–
8	*Brevitrygon walga* (Müller & Henle, 1841)	Bengal whipray	NT	–	–
9	*Scomberomorus commerson* (Lac. 1800)	Narrow-barred Spanish mackerel	NT	–	–
10	*Harpadon nehereus* (Hamilton, 1822)	Bombay-duck	NT	–	–
11	*Hemitrygon akajei* (Müller & Henle, 1841)	Whip stingray	NT	–	–
12	*Anodontostoma chacunda* (Ham. 1822)	Chacunda gizzard shad	–	Group II	VU
13	*Charibdis feriatus* (Linnaeus, 1758)	Crucifix crab	–	–	VU
14	*Megalops cyprinoides* (Broussonet, 1782)	IndoPacific tarpon	–	Group II	VU
15	*Sepia pharaonis* (Ehrenberg, 1831)	Pharaoh cuttlefish	–	–	VU
16	*Uroteuthis chinensis* (Gray, 1849)	Mitre Squid	–	–	VU

Therefore, given the above situation, it is necessary to prioritize research, supplement data, and at the same time implement measures to manage fishing grounds and protect species in the endangered, threatened or endangered groups early to ensure the maintenance of ecological balance and sustainable aquatic resources in the future.

4. 4. CONCLUSIONS AND RECOMMENDATIONS

4.1. Conclusions

- Comparing and contrasting with the list of endangered species of IUCN, CITES, Decree 26/2019/ND-CP and the Vietnam Red Book 2007 shows that the coastal and

offshore waters of Ba Ria - Vung Tau province have 33 dominant species, accounting for 9.0% of the total number of species but contributing up to 65% of the output and 16 species are endangered (ETP) accounting for 2.8% of the total number of species.

- Comparing with the results of the survey of marine resources in the period 2017-2020, it shows that the number of endangered and rare species that need to be protected in the Ba Ria - Vung Tau sea area exploited by bottom trawling is relatively high.

4.2. Recommendations

There needs to be a solution to balance the rational exploitation of economically valuable species, serving food security and economic development (sustainable development) with the task of conserving marine biodiversity, ensuring ecosystem health and maintaining gene sources for future generations.

Continue to carry out scientific research tasks to supplement information on commercially valuable and endangered, rare (ETP) seafood species to have a sustainable protection plan.

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APPENDIX

Appendix 1. List of species found in the sea waters of Ba Ria-Vung Tau

Class/Order	Family name	Scientific name	Level IUCN (2025)
Cartilaginous fish class (Elasmobranchii)			
Myliobatiformes	Dasyatidae	1. *Brevitrygon imbricata (*Bloch & Schneider 1801)	VU
		2. *Brevitrygon walga* (Müller & Henle 1841)	NT
		3. *Dasyatis* sp.	NE
		4. *Hemitrygon akajei* (Müller & Henle, 1841)	NT
		5. *Neotrygon kuhlii* (Müller & Henle, 1841)	DD
	Gymnuridae	6. *Gymnura poecilura* (Shaw, 1804)	VU
Torpediniformes	Narkidae	7. *Narke dipterygia* (Bloch & Schneider, 1801)	VU
		8. *Narke* sp.	NE
Bony fish class (Teleostei)			
Acanthuriformes	Drepaneidae	9. *Drepane punctata* (Linnaeus 1758)	LC
	Ephippidae	10. *Proteracanthus sarissophorus* (Cantor, 1849)	NE
	Leiognathidae	11. *Deveximentum hanedai* (Mochizuki & Hayashi, 1989)	NE
		12. *Equulites elongatus* (Günther, 1874)	NE
		13. *Equulites lineolatus* (Valenc., 1835)	NE
		14. *Equulites rivulatus* (Temminck & Schlegel, 1845)	NE
		15. *Eubleekeria splendens* (Cuvier, 1829)	LC
		16. *Gazza minuta* (Bloch 1795)	LC
		17. *Karalla daura* (Cuvier, 1829)	NE
		18. *Leiognathus berbis* (Valenciennes, 1835)	NE

Class/Order	Family name	Scientific name	Level IUCN (2025)
		19. *Leiognathus equula* (Forsskål 1775)	LC
		20. *Leiognathus* sp.	NE
		21. *Nuchequula blochii* (Valenci., 1835)	NE
		22. *Nuchequula gerreoides* (Bleeker1851)	NE
		23. *Photopectoralis bindus* (Valenciennes, 1835)	DD
		24. *Secutor insidiator* (Bloch, 1787)	NE
		25. *Secutor ruconius* (Hamilton, 1822)	LC
		26. *Secutor* sp.	NE
	Scatophagidae	27. *Scatophagus argus* (Linnaeus 1766)	LC
	Siganidae	28. *Siganus canaliculatus* (Park 1797)	LC
Acropomatiformes	Champsodontidae	29. *Champsodon* sp.	NE
Anguilliformes	Congridae	30. *Ariosoma anago* (Temminck & Schlegel, 1846)	DD
		31. *Ariosoma* sp.	NE
		32. *Conger* sp.	NE
		33. *Gnathophis nystromi* (Jordan & Snyder, 1901)	NE
		34. *Uroconger lepturus* (Richardson, 1845)	NE
		35. *Uroconger* sp.	NE
	Muraenesocidae	36. *Muraenesox cinereus* (Forsskål, 1775)	NE
		37. *Muraenesox* sp.	NE
	Muraenidae	38. *Gymnothorax minor* (Temminck & Schlegel, 1846)	LC
		39. *Gymnothorax reevesii* (Richardson 1845)	NE
		40. *Gymnothorax reticularis* Bloch, 1795	NE

Class/Order	Family name	Scientific name	Level IUCN (2025)
		41. *Gymnothorax* sp.	NE
	Ophichthidae	42. *Neenchelys microtretus* (Bamber, 1915)	NE
		43. *Ophichthus* sp.	NE
		44. *Pisodonophis boro* (Hamilton 1822)	LC
Aulopiformes	Synodontidae	45. *Saurida elongata* (Temminck & Schlegel 1846)	LC
		46. *Saurida tumbil* (Bloch, 1795)	LC
		47. *Saurida undosquamis* (Richardson, 1848)	LC
		48. *Synodus hoshinonis* Tanaka, 1917	LC
		49. *Synodus variegatus* (Lacepède, 1803)	LC
		50. *Trachinocephalus myops* (Forster, 1801)	LC
		51. *Harpadon nehereus* (Hamilton, 1822)	NT
Batrachoidiformes	Batrachoididae	52. *Allenbatrachus grunniens* (Linnaeus, 1758)	LC
		53. *Batrachomoeus trispinosus* (Günther 1861)	NE
Callionymiformes	Callionymidae	54. *Callionymus curvicornis* (Valenciennes, 1837)	NE
		55. *Callionymus izuensis* (Fricke & Zaiser Brownell, 1993)	NE
		56. *Callionymus sagitta* Pallas 1770	NE
		57. *Callionymus* sp.	NE
		58. *Dactylopus dactylopus* (Valenci., 1837)	NE
Carangiformes	Bothidae	59. *Crossorhombus kanekonis* (Tanaka, 1918)	NE
		60. *Crossorhombus kobensis* (Jordan & Starks, 1906)	LC
		61. *Crossorhombus* sp.	NE

Class/Order	Family name	Scientific name	Level IUCN (2025)
		62. *Engyprosopon grandisquama* (Temminck & Schlegel, 1846)	LC
	Carangidae	63. *Alectis ciliaris* (Bloch, 1787)	LC
		64. *Alectis indica* (Rüppell, 1830)	LC
		65. *Alepes djedaba* (Forsskål, 1775)	LC
		66. *Alepes kleinii* (Bloch 1793)	LC
		67. *Alepes melanoptera* (Swainson, 1839)	LC
		68. *Alepes vari* (Cuvier, 1833)	LC
		69. *Atropus atropos* (Bloch & Schn., 1801)	LC
		70. *Atule mate* (Cuvier, 1833)	LC
		71. *Carangoides malabaricus* (Bloch & Schneider, 1801)	LC
		72. *Carangoides praeustus* (Anonymous [Bennett] 1830)	LC
		73. *Carangoides* sp.	NE
		74. *Caranx sexfasciatus* Quoy & Gaimard, 1825	LC
		75. *Decapterus maruadsi* (Temminck & Schlegel, 1843)	LC
		76. *Megalaspis cordyla* (Linnaeus, 1758)	LC
		77. *Parastromateus niger* (Bloch, 1795)	LC
		78. *Scomberoides tol* (Cuvier 1832)	LC
		79. *Selar boops* (Cuvier, 1833)	LC
		80. *Selaroides leptolepis* (Cuvier, 1833)	LC
		81. *Uraspis helvola* (Forster, 1801)	LC
		82. *Uraspis uraspis* (Günther, 1860)	NE
	Cynoglossidae	83. *Cynoglossus arel* (Bloch & Sch 1801)	DD
		84. *Cynoglossus bilineatus* (Lacepède, 1802)	LC
		85. *Cynoglossus cynoglossus* (Hamilton, 1822)	LC

Class/Order	Family name	Scientific name	Level IUCN (2025)
		86. *Cynoglossus interruptus* Günther, 1880	NE
		87. *Cynoglossus kopsii* (Bleeker, 1851)	DD
		88. *Cynoglossus lingua* (Hamilton, 1822)	LC
		89. *Cynoglossus nanhaiensis* (Wang, Munroe & Kong, 2016)	DD
		90. *Cynoglossus puncticeps* (Richardson 1846)	LC
		91. *Cynoglossus* sp.	NE
		92. *Cynoglossus trulla* (Cantor, 1849)	NE
		93. *Paraplagusia bilineata* (Bloch, 1787)	LC
	Lactariidae	94. *Lactarius lactarius* (Bloch & Schneider, 1801)	NE
	Menidae	95. *Mene maculata* (Bloch & Schneider, 1801)	NE
	Paralichthyidae	96. *Pseudorhombus arsius* (Hamilton 1822)	NE
		97. *Pseudorhombus oligodon* (Bleeker, 1854)	LC
		98. *Pseudorhombus* sp.	NE
	Polynemidae	99. *Eleutheronema tetradactylum* (Shaw 1804)	NE
		100. *Polydactylus sextarius* (Bloch & Schneider, 1801)	NE
		101. *Polynemus melanochir* (Valenciennes, 1831)	LC
	Rachycentridae	102. *Rachycentron canadum* (Linnaeus, 1766)	LC
	Soleidae	103. *Aseraggodes lateralis* Randall, 2005	DD
		104. *Brachirus orientalis* (Bloch & Schneider, 1801)	LC

Class/Order	Family name	Scientific name	Level IUCN (2025)
		105. *Pardachirus pavoninus* (Lacepède, 1802)	LC
		106. *Synaptura commersonnii* (Lacepède 1802)	LC
		107. *Zebrias zebra* (Bloch, 1787)	NE
	Sphyraenidae	108. *Sphyraena forsteri* Cuvier, 1829	NE
		109. *Sphyraena obtusata* (Cuvier, 1829)	LC
		110. *Sphyraena putnamae* Jordan & Seale, 1905	NE
		111. *Sphyraena* sp.	NE
Centrarchiformes	Terapontidae	112. *Pelates quadrilineatus* (Bloch, 1790)	NE
		113. *Terapon jarbua* (Forsskål, 1775)	LC
		114. *Terapon theraps* Cuvier, 1829	LC
Clupeiformes	Clupeidae	115. *Escualosa thoracata* (Valenciennes, 1847)	LC
		116. *Hilsa kelee* (Cuvier 1829)	LC
		117. *Sardinella fimbriata* (Valenciennes 1847)	LC
		118. *Sardinella gibbosa* (Bleeker 1849)	LC
	Engraulidae	119. *Coilia dussumieri* (Valenciennes, 1848)	LC
		120. *Coilia rebentischii* (Bleeker, 1858)	DD
		121. *Encrasicholina heteroloba* (Rüppell, 1837)	LC
		122. *Encrasicholina punctifer* Fowler, 1938	LC
		123. *Setipinna taty* (Valenciennes 1848)	LC
		124. *Stolephorus commersonnii* (Lacepède, 1803)	LC
		125. *Stolephorus dubiosus* (Wongratana, 1983)	LC

Class/Order	Family name	Scientific name	Level IUCN (2025)
		126. *Stolephorus indicus* (van Hasselt 1823)	LC
		127. *Thryssa dussumieri* (Valenciennes 1848)	LC
		128. *Thryssa mystax* (Bloch & Schneider, 1801)	LC
		129. *Thryssa* sp.	NE
	Pristigasteridae	130. *Ilisha melastoma* (Bloch & Schneider 1801)	LC
Gadiformes	Bregmacerotidae	131. *Bregmaceros japonicus* Tanaka, 1908	NE
		132. *Bregmaceros mcclellandi* Thompson, 1840	NE
		133. *Bregmaceros* sp.	NE
Gobiiformes	Butidae	134. *Butis koilomatodon* (Bleeker, 1849)	LC
	Gobiidae	135. *Acentrogobius caninus* (Valenciennes 1837)	LC
		136. *Acentrogobius* sp.	NE
		137. *Aulopareia janetae* (Smith, 1945)	NE
		138. *Brachygobius sabanus* (Inger, 1958)	LC
		139. *Cryptocentrus* sp.	NE
		140. *Myersina filifer* (Valenciennes, 1837)	LC
		141. *Oxyurichthys auchenolepis* (Bleeker, 1876)	NE
		142. *Oxyurichthys* sp.	NE
		143. *Parachaeturichthys polynema* (Bleeker, 1853)	LC
		144. *Taenioides gracilis* (Valenciennes, 1837)	LC
		145. *Taenioides nigrimarginatus* Hora, 1924	NE

Class/Order	Family name	Scientific name	Level IUCN (2025)
		146. *Tomiyamichthys russus* (Cantor, 1849)	NE
		147. *Trypauchen vagina* (Bloch & Schneider 1801)	LC
	Trichonotidae	148. *Trichonotus setiger* Bloch & Schneider, 1801	LC
Kurtiformes	Apogonidae	149. *Apogon* sp.	NE
		150. *Apogonichthyoides niger* (Döderlein, 1883)	NE
		151. *Jaydia poeciloptera* (Cuvier, 1828)	LC
		152. *Jaydia striata* (Smith & Radcliffe, 1912)	NE
		153. *Jaydia carinatus* (Cuvier, 1828)	NE
		154. *Jaydia ellioti* (Day, 1875)	NE
		155. *Ostorhinchus fasciatus* (White, 1790)	NE
		156. *Ostorhinchus kiensis* (Jordan & Snyder, 1901)	NE
		157. *Ostorhinchus notatus* (Houttuyn, 1782)	NE
Mugiliformes	Mugilidae	158. *Osteomugil perusii* (Valenciennes 1836)	LC
		159. *Planiliza subviridis* (Valenciennes, 1836)	LC
Mulliformes	Mullidae	160. *Mulloidichthys vanicolensis* (Valenciennes, 1831)	LC
		161. *Parupeneus heptacanthus* (Lacepède, 1802)	LC
		162. *Upeneus japonicus* (Houttuyn, 1782)	NE
		163. *Upeneus subvittatus* (Temminck & Schlegel, 1843)	NE
		164. *Upeneus tragula* (Richardson, 1846)	LC

Class/Order	Family name	Scientific name	Level IUCN (2025)
		165. *Upeneus vittatus* (Forsskål, 1775)	LC
Perciformes	Ambassidae	166. *Ambassis* sp.	NE
	Apistidae	167. *Apistus carinatus* (Bloch & Schneider, 1801)	LC
	Aploactinidae	168. *Erisphex pottii* (Steindachner, 1896)	NE
	Gerreidae	169. *Gerres erythrourus* (Bloch 1791)	LC
		170. *Gerres limbatus* (Cuvier, 1830)	LC
	Haemulidae	171. *Diagramma pictum* (Thunberg, 1792)	NT
		172. *Plectorhinchus cinctus* (Temminck & Schlegel, 1843)	NE
		173. *Pomadasys maculatus* (Bloch, 1793)	LC
	Labridae	174. *Iniistius trivittatus* (Randall & Cornish, 2000)	DD
	Lutjaninae	175. *Lutjanus lutjanus* Bloch, 1790	LC
		176. *Lutjanus russellii* (Bleeker, 1849)	LC
		177. *Lutjanus vitta* (Quoy & Gaimard, 1824)	LC
	Nemipteridae	178. *Nemipterus furcosus* (Valenciennes, 1830)	LC
		179. *Nemipterus japonicus* (Bloch, 1791)	LC
		180. *Nemipterus nemurus* (Bleeker, 1857)	LC
		181. *Scolopsis affinis* Peters, 1877	LC
		182. *Scolopsis taenioptera* (Cuvier, 1830)	LC
	Pinguipedidae	183. *Parapercis filamentosa* (Steindachner 1878)	NE
	Platycephalidae	184. *Cociella crocodilus* (Cuvier 1829)	LC
		185. *Grammoplites knappi* (Imamura & Amaoka, 1994)	NE
		186. *Inegocia japonica* (Cuvier, 1829)	LC

Class/Order	Family name	Scientific name	Level IUCN (2025)
		187. *Platycephalus indicus* (Linnaeus 1758)	DD
		188. *Rogadius asper* (Cuvier, 1829)	LC
		189. *Rogadius patriciae* Knapp, 1987	LC
		190. *Rogadius* sp.	NE
	Pomacentridae	191. *Pristotis* sp.	NE
	Priacanthidae	192. *Priacanthus macracanthus* Cuvier, 1829	LC
		193. *Priacanthus tayenus* Richardson, 1846	LC
	Sciaenidae	194. *Chrysochir aureus* (Richardson, 1846)	LC
		195. *Dendrophysa russelii* (Cuvier 1829)	LC
		196. *Johnius belangerii* (Cuvier 1830)	LC
		197. *Johnius borneensis* (Bleeker 1851)	LC
		198. *Johnius carouna* (Cuvier 1830)	LC
		199. *Johnius novaehollandiae* (Steindachner 1866)	NE
		200. *Johnius plagiostoma* (Bleeker, 1849)	LC
		201. *Johnius* sp.	NE
		202. *Johnius trachycephalus* (Bleeker, 1851)	LC
		203. *Nibea soldado* (Lacepède 1802)	LC
		204. *Otolithes ruber* (Bloch & Schneider, 1801)	LC
		205. *Panna microdon* (Bleeker, 1849)	LC
		206. *Pennahia anea* (Bloch 1793)	LC
		207. *Pennahia argentata* (Houttuyn, 1782)	LC

Class/Order	Family name	Scientific name	Level IUCN (2025)
		208. *Pennahia macrocephalus* (Tang, 1937)	NE
		209. *Pennahia pawak* (Lin, 1940)	LC
		210. *Pennahia* sp.	NE
	Scorpaenidae	211. *Scorpaenopsis diabolus* (Cuvier, 1829)	NE
	Serranidae	212. *Epinephelus areolatus* (Forsskål, 1775)	LC
		213. *Epinephelus coioides* (Hamilton, 1822)	LC
		214. *Epinephelus* sp.	NE
	Sillaginidae	215. *Sillago ingenuua* (McKay, 1985)	NE
		216. *Sillago sihama* (Forsskål 1775)	LC
		217. *Sillago* sp.	NE
Scombriformes	Centrolophidae	218. *Psenopsis anomala* (Temminck & Schlegel, 1844)	NE
	Scombridae	219. *Rastrelliger kanagurta* (Cuvier, 1816)	DD
		220. *Scomberomorus commerson* (Lacepède 1800)	NT
		221. *Scomberomorus guttatus* (Bloch & Schneider, 1801)	DD
	Stromateidae	222. *Pampus argenteus* (Euphrasen, 1788)	VU
	Trichiuridae	223. *Trichiurus cristatus* Klunzinger, 1884	NE
		224. *Trichiurus lepturus* Linnaeus 1758	LC
Scorpaeniformes	Synanceiidae	225. *Leptosynanceia asteroblepa* (Richardson, 1844)	NE
		226. *Minous inermis* (Alcock, 1889)	NE
		227. *Minous monodactylus* (Bloch & Schneider, 1801)	NE

Class/Order	Family name	Scientific name	Level IUCN (2025)
		228. *Minous* sp.	NE
Siluriformes	Ariidae	229. *Arius maculatus* (Thunberg, 1792)	NE
		230. *Osteogeneiosus militaris* (Linnaeus, 1758)	LC
	Plotosidae	231. *Plotosus canius* Hamilton 1822	NE
		232. *Plotosus lineatus* (Thunberg, 1787)	LC
Syngnathiformes	Centriscidae	233. *Centriscus cristatus* (De Vis, 1885)	DD
	Syngnathidae	234. *Hippocampus* sp.	NE
		235. *Hippocampus trimaculatus* Leach, 1814	VU
Tetraodontiformes	Diodontidae	236. *Chilomycterus reticulatus* (Linnaeus, 1758)	LC
		237. *Diodon hystrix* Linnaeus, 1758	LC
	Monacanthidae	238. *Aluterus monoceros* (Linnaeus, 1758)	LC
		239. *Anacanthus barbatus* Gray, 1830	LC
		240. *Paramonacanthus japonicus* (Tilesius, 1809)	LC
	Tetraodontidae	241. *Arothron immaculatus* (Bloch & Schneider, 1801)	LC
		242. *Dichotomyctere nigroviridis* (Marion de Procé 1822)	NE
		243. *Lagocephalus inermis* (Temminck & Schlegel, 1850)	LC
		244. *Lagocephalus lunaris* (Bloch & Schneider 1801)	LC
		245. *Lagocephalus spadiceus* (Richardson, 1845)	NE
		246. *Lagocephalus wheeleri* Abe, Tabeta & Kitahama, 1984	NE

Class/Order	Family name	Scientific name	Level IUCN (2025)
		247. *Takifugu niphobles* (Jordan & Snyder, 1901)	LC
		248. *Takifugu oblongus* (Bloch, 1786)	LC
Gastropod class (Gastropoda)			
Littorinimorpha	Naticidae	249. *Natica vitellus* (Linnaeus, 1758)	NE
		250. *Polinices didyma* (Röding, 1798)	NE
Neogastropoda	Buccinidae	251. *Babylonia areolata* (Link, 1807)	NE
	Muricidae	252. *Indothais lacera* (Born, 1778)	NE
		253. *Murex trapa* Röding, 1798	NE
	Volutidae	254. *Cymbiola nobilis* ([Lightfoot], 1786)	NE
Neotaenioglossa	Cassidae	255. *Phalium glaucum* (Linnaeus, 1758)	NE
		256. *Phalium* sp.	NE
	Ficidae	257. *Ficus subintermedia* (Orbigny, 1852)	NE
	Tonnidae	258. *Tonna dolium* (Linnaeus, 1758)	NE
		259. *Tonna* sp.	NE
Cephalopoda			
Octopoda	Octopodidae	260. *Amphioctopus aegina* (Gray, 1849)	LC
		261. *Amphioctopus fangsiao* (D'Orbigny, 1839-1841)	NE
		262. *Amphioctopus ovulum* (Sasaki, 1917)	LC
		263. *Amphioctopus marginatus* (Taki, 1964)	LC
		264. *Amphioctopus* sp.	NE
Sepiida	Sepiadariidae	265. *Sepiadarium kochi* Steenstrup, 1881	LC
	Sepiidae	266. *Sepia aculeata* Van Hasselt, 1835	DD
		267. *Sepia brevimana* Steenstrup, 1875	DD
		268. *Sepia esculenta* Hoyle, 1885	DD
		269. *Sepia lycidas* Gray, 1849	DD
		270. *Sepia pharaonis* Ehrenberg, 1831	DD
		271. *Sepia recurvirostra* Steenstrup, 1875	DD

Class/Order	Family name	Scientific name	Level IUCN (2025)
		272. *Sepiella inermis* (Van Hasselt, 1835)	DD
Sepiolida	Sepiolidae	273. *Euprymna morsei* (Verrill, 1881)	DD
Teuthida	Loliginidae	274. *Aestuariolus noctiluca* (Lu, Roper & Tait, 1985)	DD
		275. *Loligo* sp.	NE
		276. *Loliolus beka* (Sasaki, 1929)	DD
		277. *Sepioteuthis lessoniana* Férussac, 1831	DD
		278. *Uroteuthis chinensis* (Gray, 1849)	DD
		279. *Uroteuthis duvaucelii* (D'Orbigny, 1835)	DD
		280. *Uroteuthis edulis* (Hoyle, 1885)	DD
Crustaceans (Malacostraca)			
Decapoda	Alpheidae	281. *Alpheus* sp.	NE
	Calappidae	282. *Calappa calappa* (Linnaeus, 1758)	NE
		283. *Calappa philargius* (Linnaeus, 1758)	NE
		284. *Cycloes granulosa* De Haan, 1837	NE
		285. *Matuta planipes* Fabricius, 1798	NE
	Dorippidae	286. *Dorippe* sp.	NE
	Epialtidae	287. *Doclea canalifera* Stimpson, 1857	NE
		288. *Doclea* sp.	NE
	Euryplacidae	289. *Eucrate alcocki* Serène & Lohavanijaya, 1973	NE
	Galenidae	290. *Galene bispinosa* (Herbst, 1783)	NE
		291. *Halimede ochtodes* (Herbst, 1783)	NE
	Majidae	292. *Hyastenus* sp.	NE
	Palaemonidae	293. *Palaemon* sp.	NE
	Pandalidae	294. *Heterocarpus sibogae* (De Man, 1917)	NE

Class/Order	Family name	Scientific name	Level IUCN (2025)
	Parthenopidae	295. *Parthenope longimanus* (Linnaeus, 1758)	NE
	Penaeidae	296. *Alcockpenaeopsis hungerfordii* (Alcock, 1905)	NE
		297. *Kishinouyepenaeopsis cornuta* (Kishinouye, 1900)	NE
		298. *Marsupenaeus japonicus* (Bate, 1888)	NE
		299. *Marsupenaeus japonicus* (Bate, 1888)	NE
		300. *Megokris sedili* (Hall, 1961)	NE
		301. *Metapenaeopsis barbata* (De Haan, 1844)	NE
		302. *Metapenaeopsis lamellata* (De Haan, 1844)	NE
		303. *Metapenaeopsis mogiensis* Rathbun, 1902	NE
		304. *Metapenaeopsis* sp.	NE
		305. *Metapenaeopsis stridulans* (Alcock, 1905)	NE
		306. *Metapenaeus affinis* (Milne-Edwards, 1837)	NE
		307. *Metapenaeus brevicornis* (Milne-Edwards, 1837)	NE
		308. *Metapenaeus ensis* (De Haan, 1844)	NE
		309. *Metapenaeus lysianassa* (De Man, 1888)	NE
		310. *Metapenaeus* sp.	NE
		311. *Metapenaeus tenuipes* (Kubo, 1949)	NE
		312. *Mierspenaeopsis sculptilis* (Heller, 1862)	NE

Class/Order	Family name	Scientific name	Level IUCN (2025)
		313. *Parapenaeopsis cornuta* (Kishinouye, 1900)	NE
		314. *Parapenaeopsis gracillima* (Nobili, 1903)	NE
		315. *Parapenaeopsis hardwickii* (Miers, 1878)	NE
		316. *Parapenaeopsis tenella* (Bate, 1888)	NE
		317. *Penaeus indicus* Milne-Edwards, 1837	NE
		318. *Penaeus merguiensis* (De Man, 1888)	NE
		319. *Penaeus monodon* Fabricius, 1798	NE
		320. *Trachypenaeus* sp.	NE
		321. *Trachysalambria curvirostris* (Stimpson, 1860)	NE
	Portunidae	322. *Charybdis affinis* Dana, 1852	NE
		323. *Charybdis anisodon* (De Haan, 1850)	NE
		324. *Charybdis feriatus* (Linnaeus, 1758)	NE
		325. *Charybdis hellerii* (A. Milne-Edwards, 1867)	NE
		326. *Charybdis japonica* (A. Milne-Edwards, 1861)	NE
		327. *Charybdis lucifera* (Fabricius, 1798)	NE
		328. *Charybdis natator* (Herbst, 1794)	NE
		329. *Charybdis* sp.	NE
		330. *Charybdis truncata* (Fabricius, 1798)	NE
		331. *Charybdis variegata* (Fabricius, 1798)	NE
		332. *Lupocyclus rotundatus* Adams & White, 1849	NE

Class/Order	Family name	Scientific name	Level IUCN (2025)
		333. *Monomia argentatus* (A. Milne-Edwards, 1861)	NE
		334. *Podophthalmus vigil* (Fabricius, 1798)	NE
		335. *Portunus gladiator* Fabricius, 1798	NE
		336. *Portunus gracilimanus* (Stimpson, 1858)	NE
		337. *Portunus haanii* (Schmitt, 1858)	NE
		338. *Portunus pelagicus* (Linnaeus, 1758)	NE
		339. *Portunus sanguinolentus* (Herbst, 1783)	NE
		340. *Portunus* sp.	NE
		341. *Thalamita crenata* (Milne-Edwards, 1834)	NE
		342. *Xiphonectes hastatoides* (Fabricius, 1798)	NE
	Scyllaridae	343. *Scyllarus rugosus* H. Milne Edwards, 1837	LC
		344. *Scyllarus* sp.	NE
		345. *Thenus orientalis* (Lund, 1793)	LC
	Sergestidae	346. *Acetes* sp.	NE
	Solenoceridae	347. *Solenocera crassicornis* (Milne-Edwards, 1837)	NE
Stomatopoda	Lysiosquillidae	348. *Lysiosquillina maculata* (Fabricius, 1793)	NE
	Odontodactylidae	349. *Odontodactylus scyllarus* (Linnaeus, 1758)	NE
	Squillidae	350. *Anchisquilla fasciata* (de Haan, 1844)	NE
		351. *Carinosquilla multicarinata* (White, 1848)	NE

Class/Order	Family name	Scientific name	Level IUCN (2025)
		352. *Clorida decorata* Wood-Mason, 1875	NE
		353. *Dictyosquilla foveolata* (Wood-Mason, 1895)	NE
		354. *Erugosquilla woodmasoni* (Kemp, 1911)	NE
		355. *Harpiosquilla harpax* (de Haan, 1844)	NE
		356. *Harpiosquilla japonica* Manning, 1969	NE
		357. *Harpiosquilla raphidea* (Fabricus, 1798)	NE
		358. *Harpiosquilla* sp.	NE
		359. *Miyakea nepa* (Latreille, 1828)	NE
		360. *Oratosquilla oratoria* (De Haan, 1844)	NE
		361. *Oratosquilla* sp.	NE
		362. *Oratosquillina gravieri* (Manning, 1978)	NE
Bivalvia			
Mytilida	Mytilidae	363. *Perna viridis* (Linnaeus, 1758)	LC
Pectinida	Pectinidae	364. *Amusium pleuronectes* (Linnaeus, 1758)	NE
		365. *Mimachlamys sanguinea* (Linnaeus, 1758)	NE
		366. *Mimachlamys* sp.	NE
Merostomata			
Xiphosura	Limulidae	367. *Carcinoscorpius rotundicauda* (Latreille, 1802)	DD

** Fish orders are classified according to the Eschmeyer system (2024)*

Appendix 2. Images of some endangered species in the sea of Ba Ria-Vung Tau

Brevitrygon walga (Müller & Henle 1841)_ **NT – Near Threatened**

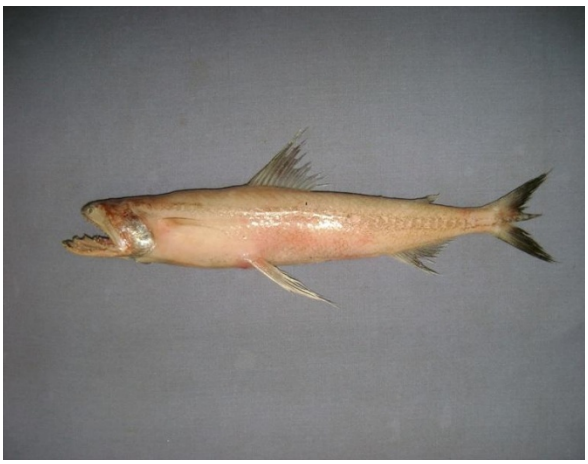
Brevitrygon imbricata (Bloch & Schneider 1801) _ **VU – Vulnerable**

Hemitrygon akajei (Müller & Henle, 1841) _ **NT – Near Threatened**

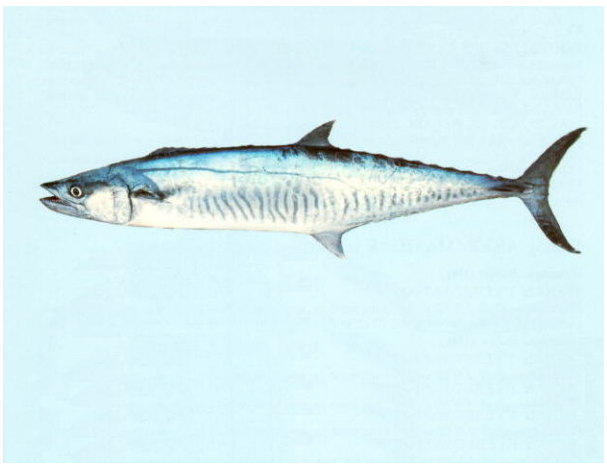
Gymnura poecilura (Shaw, 1804) _ **VU – Vulnerable**

Narke dipterygia (Bloch & Schneider, 1801) _ **VU – Vulnerable**

Diagramma pictum (Thunberg, 1792) _ **NT – Near Threatened**



Harpadon nehereus (Hamilton, 1822) _ **NT – Near Threatened**



Scomberomorus commerson (Lacepède 1800) _ **NT – Near Threatened**

Hippocampus trimaculatus Leach, 1814_ **VU – Vulnerable**

Pampus argenteus (Euphrasen, 1788) _ _ **VU – Vulnerable**

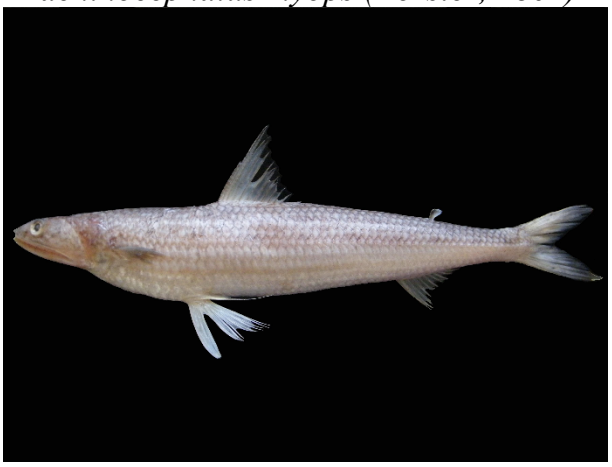
Nguồn: *Fishbase.org*

Appendix 3. Images of some economically valuable species in the sea of BR-VT

Nibea soldado (Lacepède 1802) *

Trachinocephalus myops (Forster, 1801) *

Pennahia anea (Bloch 1793) *



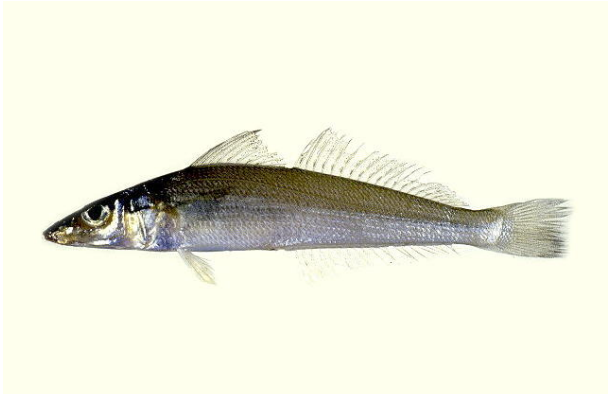
Saurida tumbil (Bloch, 1795) *

Johnius carouna (Cuvier 1830) *

Saurida undosquamis (Richardson, 1848) *

Johnius belangerii (Cuvier 1830) *

Decapterus maruadsi (Temminck & Schlegel, 1843) *

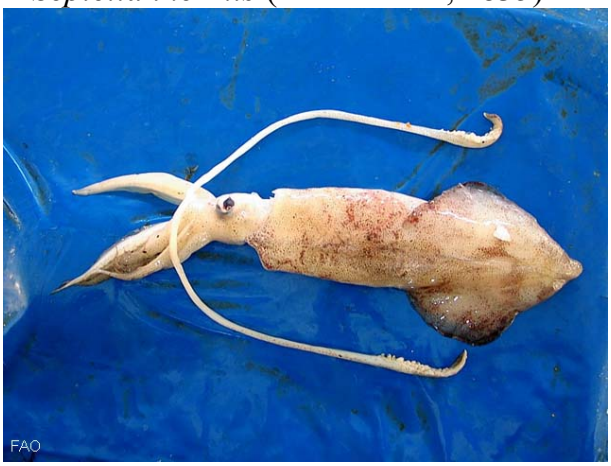


*Sillago sihama (Fabricius, 1775) **

*Trichiurus lepturus Linnaeus, 1758 **

Sepiella inermis (Van Hasselt, 1835)**

Uroteuthis chinensis (Gray, 1849)**



Uroteuthis duvaucelii (D'Orbigny, 1835)**

Sepia aculeata Van Hasselt, 1835 **

Charybdis natator (Herbst, 1794)**

Portunus haanii (Schmitt, 1858)***

Portunus sanguinolentus (Herbst, 1783) ***

Portunus pelagicus (Linnaeus, 1758) ***

Parapenaeopsis hardwickii (Miers, 1878)***

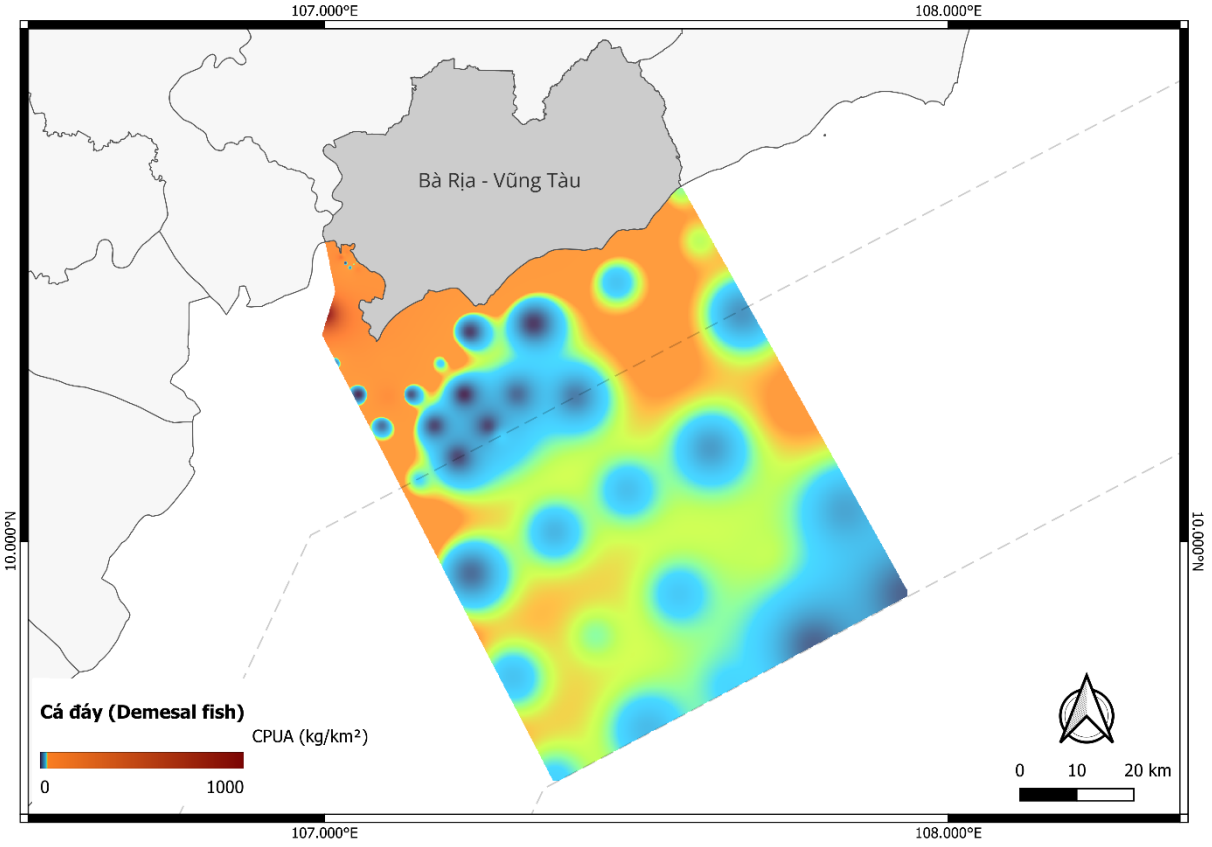
Kishinouyepenaeopsis cornuta (Kishinouye, 1900)****

Penaeus monodon Fabricius, 1798***

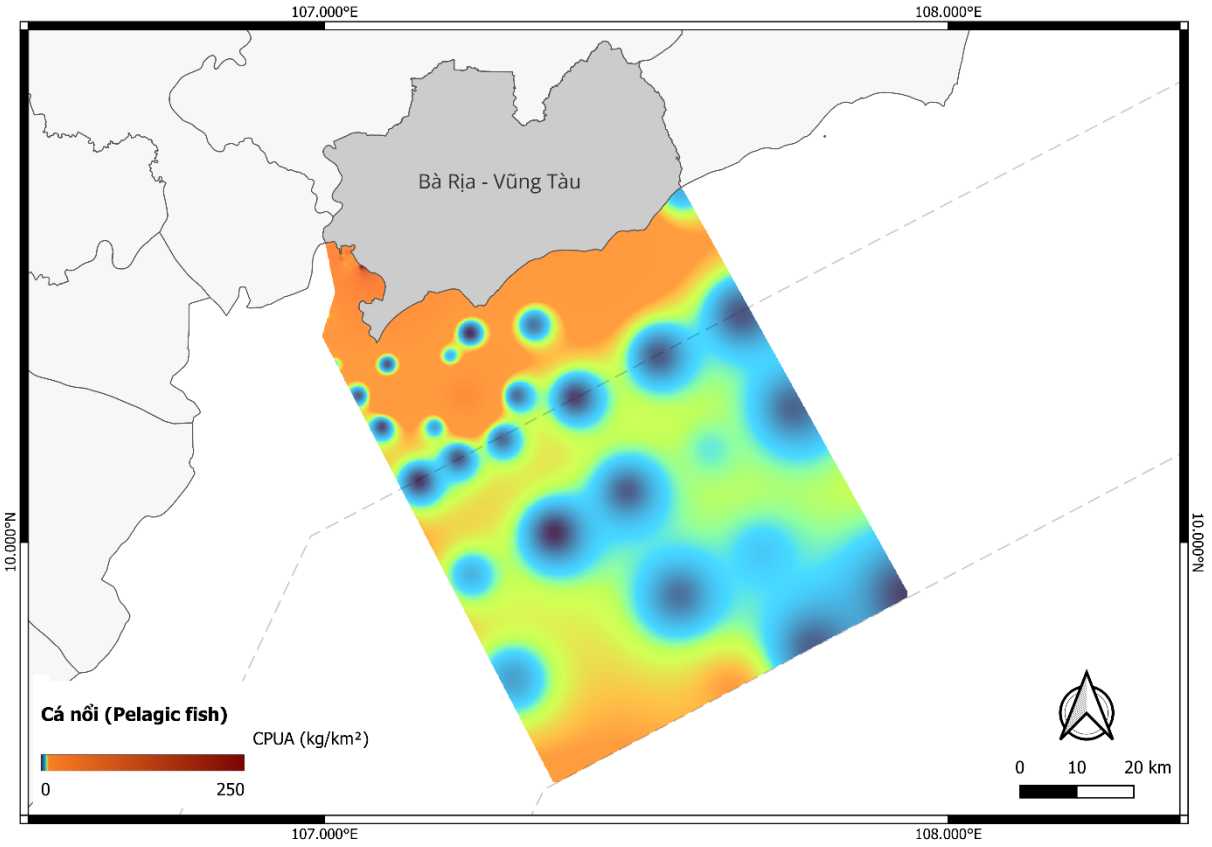
Penaeus merguiensis De Man, 1888****

Source: *(*) fishbase.org; (**) sealifebase.org; (***) crabdatabase.info; (****) Internet.*

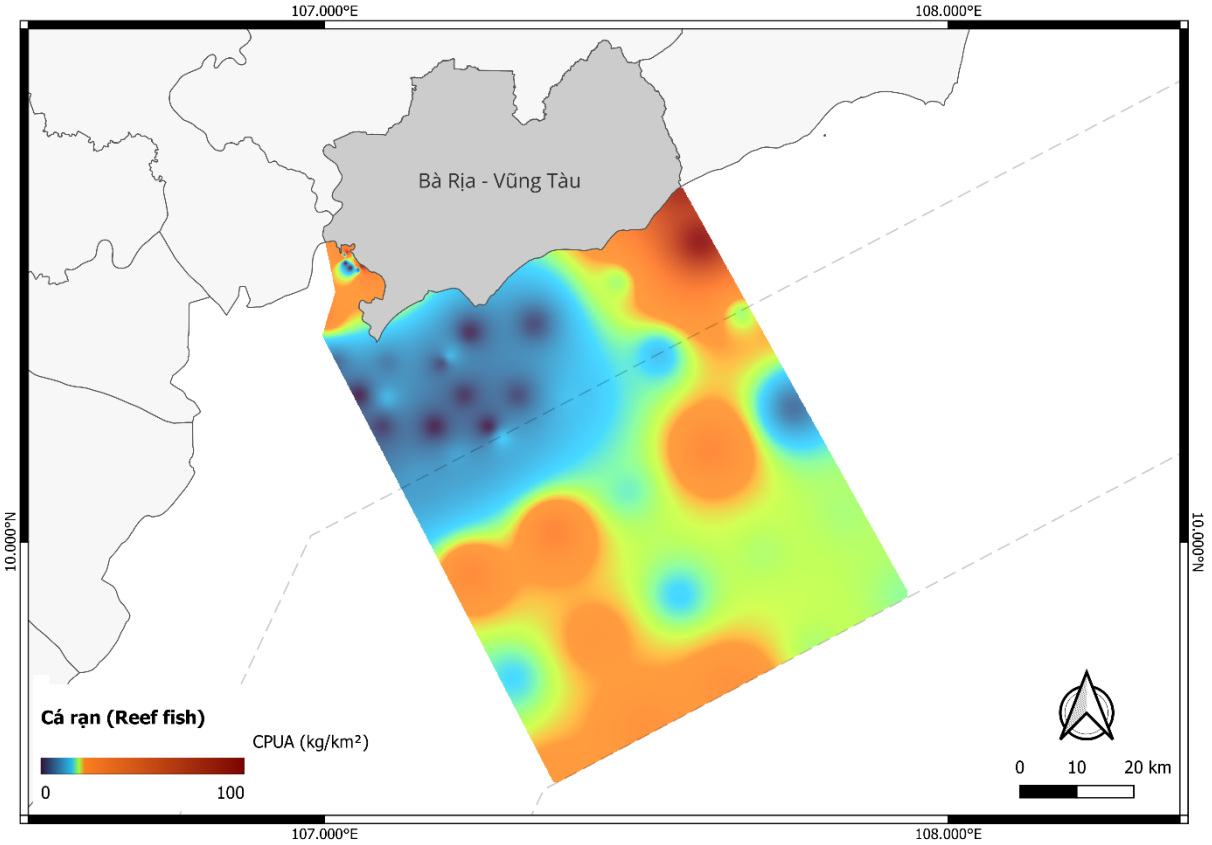
Appendix 4. Map of distribution of bottom fish resources in Ba Ria-Vung Tau sea



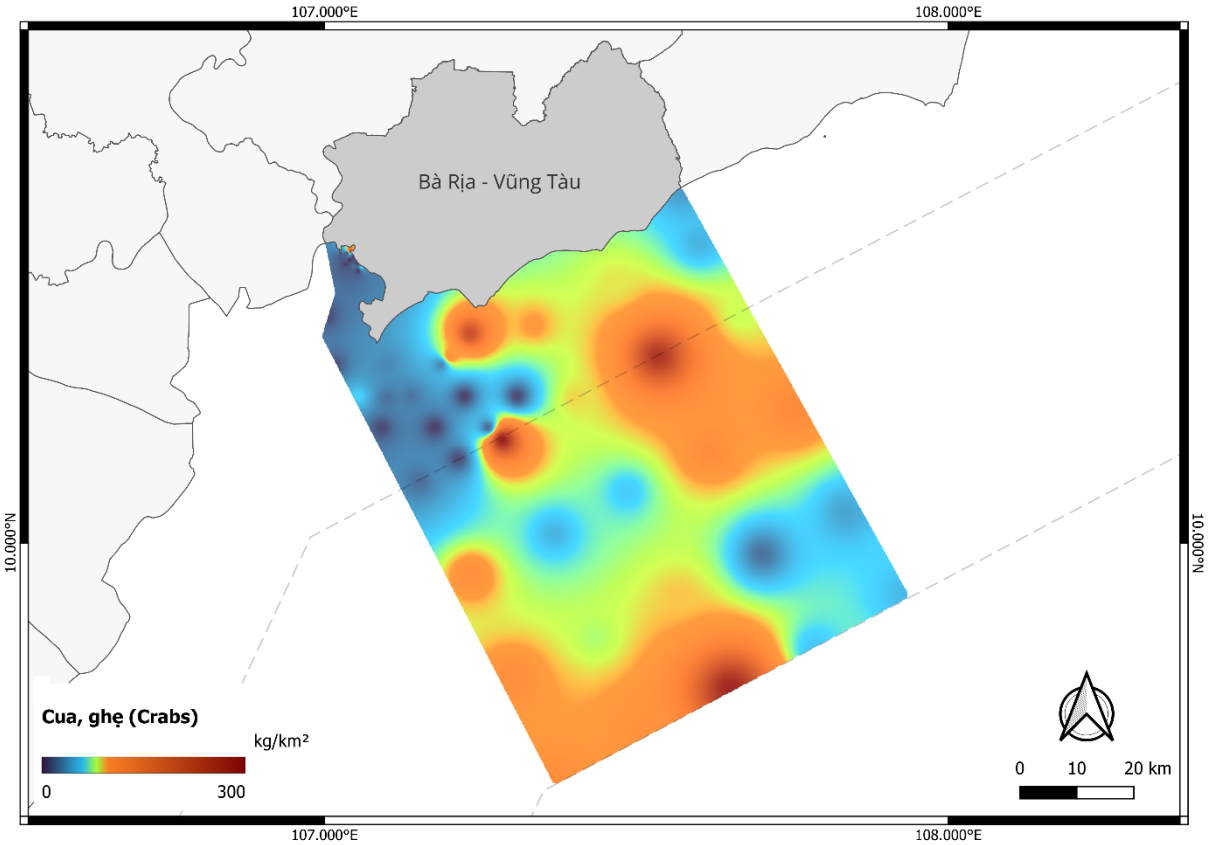
Appendix 5. Map of distribution of pelagic fish resources in Ba Ria-Vung Tau sea



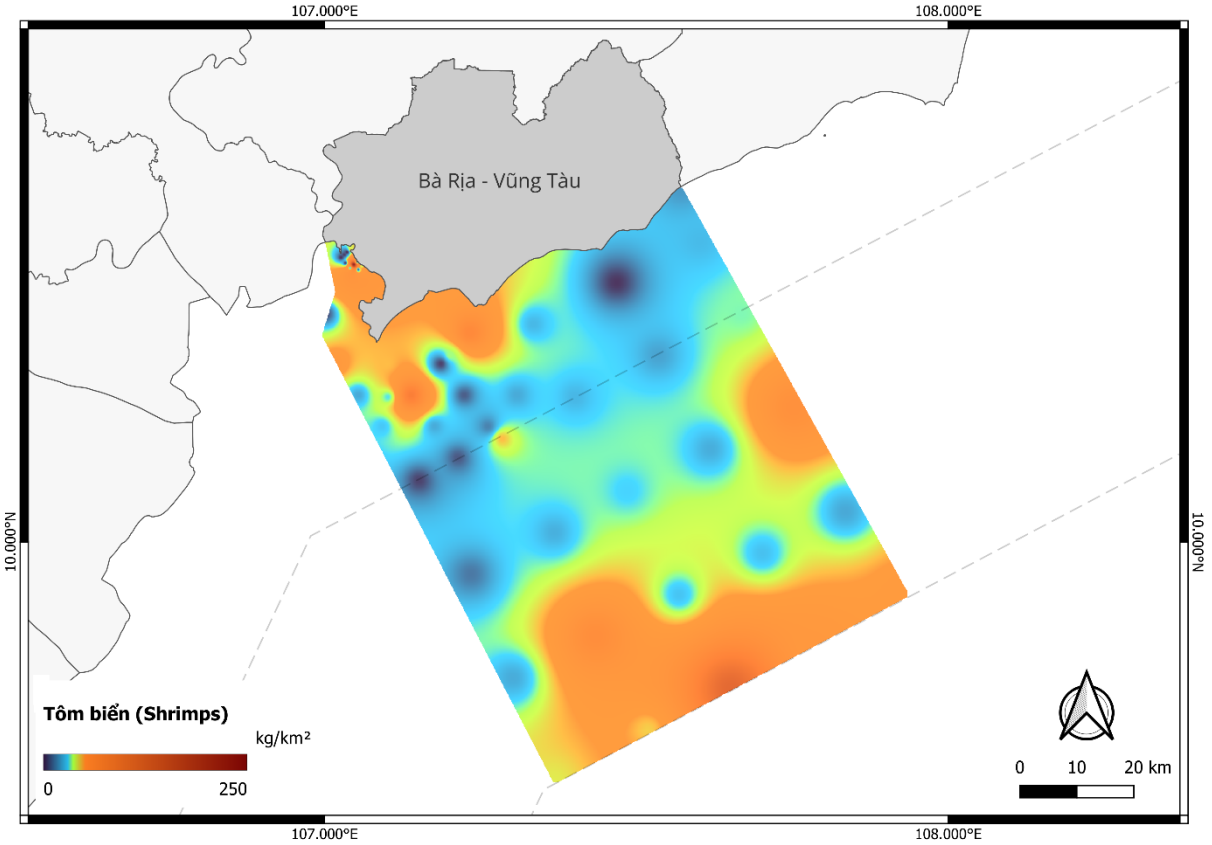
Appendix 6. Distribution map of reef fish resources in Ba Ria-Vung Tau sea area



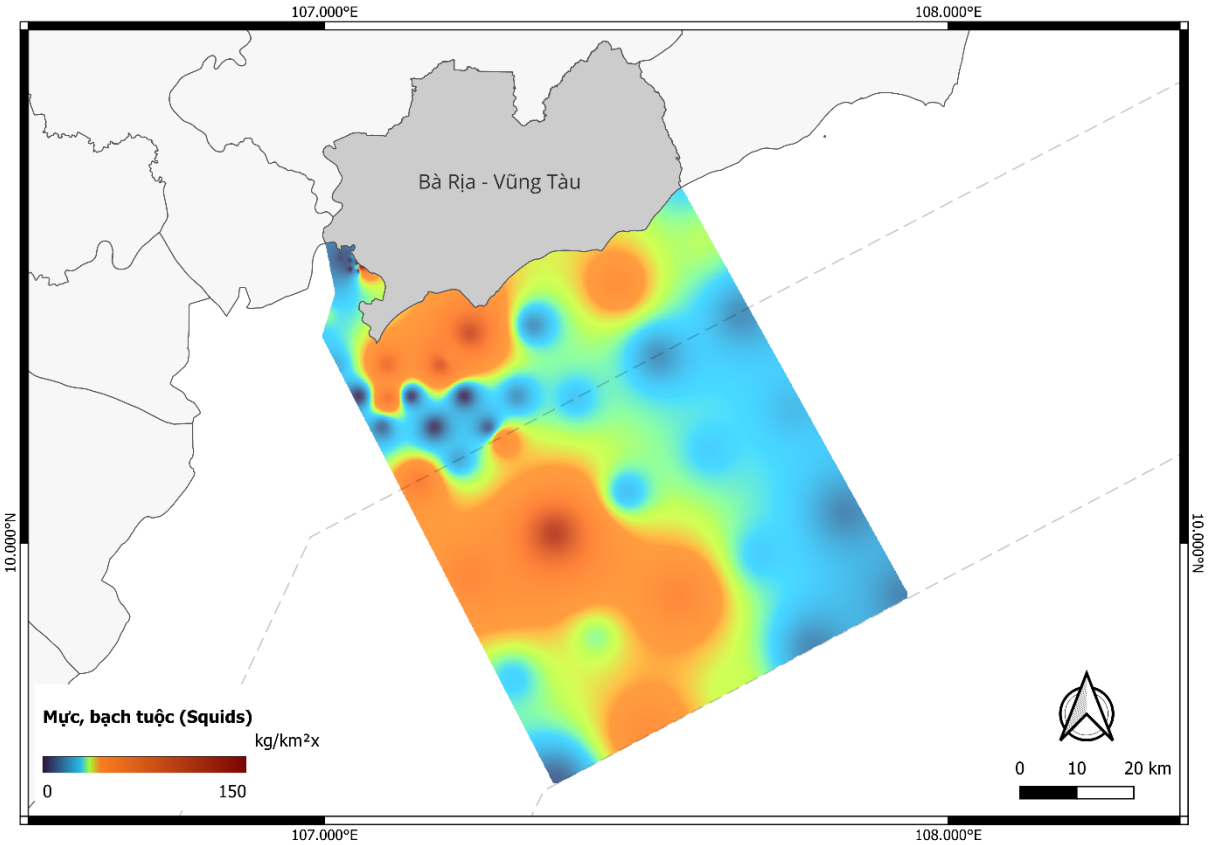
Appendix 7. Map of crab resources distribution in Ba Ria-Vung Tau sea area



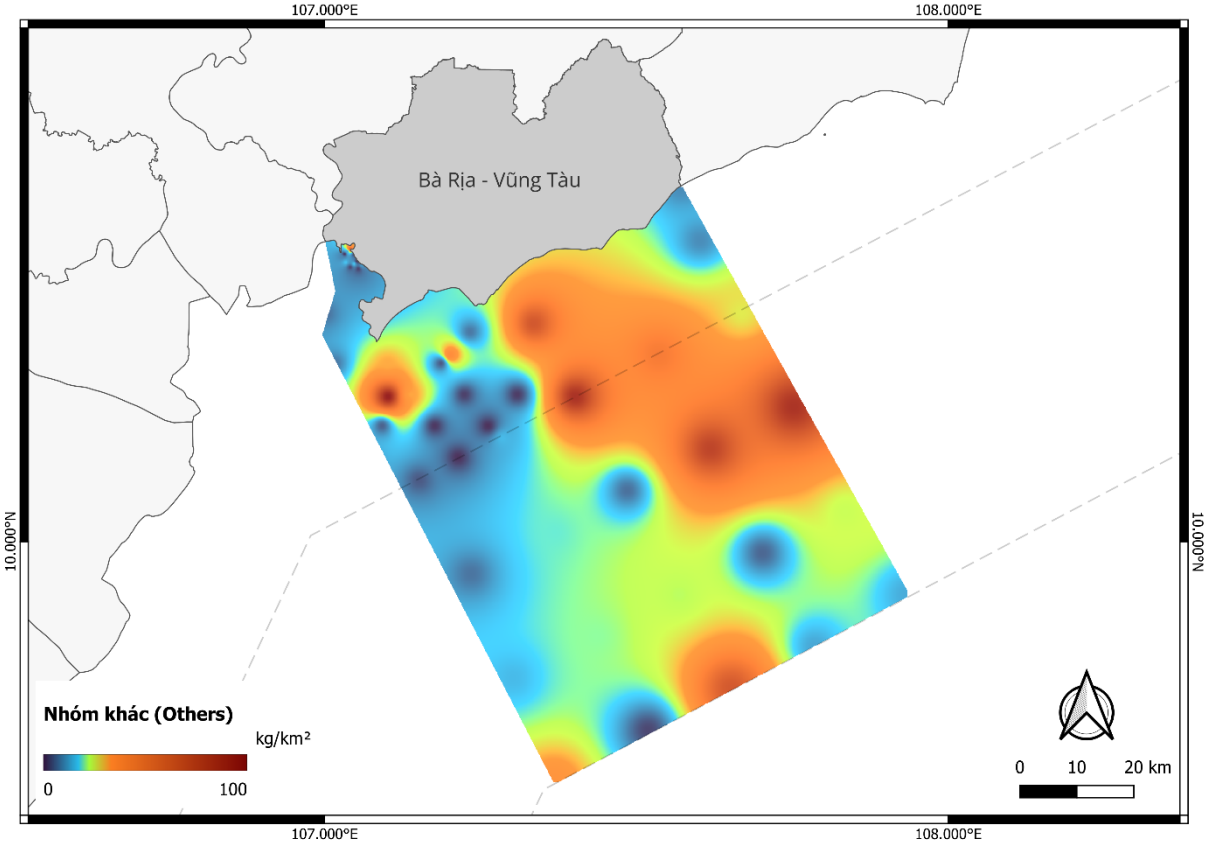
Appendix 8. Map of shrimp resource distribution in Ba Ria-Vung Tau sea area



Appendix 9. Map of distribution of squid and octopus resources in Ba Ria-Vung Tau sea area



Appendix 10. Map of distribution of other resources (clams, snails...) in the sea of Ba Ria-Vung Tau



Appendix 11. Summary data of Long Son project resource investigation trip 2018 (LSP_2018)

Loại lưới kéo	Mùa gió	Trạm	Tổng số loài	Số cá thể	Tổng khối lượng (kg)	CPUE (kg/giờ)	CPUA (kg/km2)
Kéo cá	TN	2	34	872	6,3	12,2	198,8
Kéo cá	TN	4	30	151	2,4	5,0	82,3
Kéo cá	TN	5	48	2.730	22,3	25,7	421,0
Kéo cá	TN	6	46	1.022	18,0	18,0	294,0
Kéo cá	TN	9	12	103	0,7	0,7	11,1
Kéo cá	TN	10	12	5.675	11,1	11,5	187,6
Kéo cá	TN	11	19	113	2,8	3,4	55,7
Kéo cá	TN	12	17	130	2,0	2,1	35,6
Kéo cá	TN	14	24	537	2,5	2,5	40,1
Kéo cá	TN	15	20	202	0,9	1,0	15,6
Kéo cá	TN	16	17	238	1,1	1,1	17,9
Kéo cá	TN	19	22	384	2,7	2,7	44,3
Kéo Tôm	TN	2	59	2.148	7,7	8,4	151,1
Kéo Tôm	TN	4	46	2.667	8,4	9,2	163,4
Kéo Tôm	TN	5	40	1.926	15,8	24,4	435,1
Kéo Tôm	TN	6	42	1.343	5,7	7,4	132,3
Kéo Tôm	TN	9	28	978	3,7	4,0	71,7
Kéo Tôm	TN	10	42	7.414	12,3	14,1	253,1
Kéo Tôm	TN	11	16	1.065	4,5	6,6	117,5
Kéo Tôm	TN	12	19	3.665	5,2	5,2	93,3
Kéo Tôm	TN	14	15	755	2,8	3,1	55,1
Kéo Tôm	TN	15	30	902	4,9	5,2	92,5
Kéo Tôm	TN	16	21	3.570	7,7	7,5	133,8
Kéo Tôm	TN	19	17	1.743	3,0	3,1	54,1

Appendix 12. Summary data of Long Son project resource investigation trip 2022

Loại lưới kéo	Mùa gió	Trạm	Tổng số loài	Số cá thể	Tổng khối lượng (kg)	CPUE (kg/giờ)	CPUA (kg/km2)
Kéo cá	ĐB	1	24	921	4,6	11,6	178,4
Kéo cá	ĐB	2	32	7.769	14,5	19,3	348,6
Kéo cá	ĐB	3	26	292	1,7	5,0	69,3
Kéo cá	ĐB	4	28	5.801	13,3	26,5	440,4
Kéo cá	ĐB	5	32	592	3,8	7,7	118,1
Kéo cá	ĐB	6	28	256	2,7	8,2	121,9
Kéo cá	ĐB	7	13	186	0,8	1,4	22,8
Kéo cá	ĐB	8	23	130	1,7	2,6	48,8
Kéo cá	ĐB	9	16	135	1,0	1,9	39,7
Kéo cá	ĐB	10	7	357	4,1	4,7	63,0
Kéo cá	ĐB	11	17	8.472	34,9	45,5	674,9
Kéo cá	ĐB	12	29	3.044	13,2	17,6	243,1
Kéo Tôm	ĐB	1	40	1.994	22,9	54,9	991,1
Kéo Tôm	ĐB	2	31	2.077	7,9	15,2	225,8
Kéo Tôm	ĐB	3	29	114	1,9	3,3	59,7
Kéo Tôm	ĐB	4	17	1.223	7,2	12,3	213,5
Kéo Tôm	ĐB	5	21	418	4,1	7,0	93,9
Kéo Tôm	ĐB	6	9	23	0,9	1,6	30,1
Kéo Tôm	ĐB	7	40	1.110	9,0	17,9	371,5
Kéo Tôm	ĐB	8	54	1.310	13,6	21,5	330,6
Kéo Tôm	ĐB	10	29	727	4,6	5,5	71,6

Appendix 13. Summary data of the 2021 Ba Ria-Vung Tau aquatic resources survey trip (NLVT_2021)

Loại lưới kéo	Mùa gió	Trạm	Tổng số loài	Số cá thể	Tổng khối lượng (kg)	CPUE (kg/giờ)	CPUA (kg/km2)
Kéo cá	ĐB	1	25	630	5,8	6,4	120,0
Kéo cá	ĐB	2	18	129	3,5	3,5	58,1
Kéo cá	ĐB	3	15	101	3,5	3,9	76,5
Kéo cá	ĐB	4	7	33	1,7	1,8	29,1
Kéo cá	ĐB	5	12	798	22,1	33,2	827,2
Kéo cá	ĐB	6	16	1.019	3,9	4,1	71,8
Kéo cá	ĐB	7	20	83	5,3	6,6	149,5
Kéo cá	ĐB	8	26	128	3,2	4,2	95,3
Kéo cá	ĐB	9	15	73	2,4	2,9	55,9
Kéo cá	ĐB	10	20	280	1,6	2,1	49,2
Kéo cá	ĐB	11	13	93	1,3	1,4	26,1
Kéo cá	ĐB	12	23	143	3,9	4,2	76,3
Kéo cá	ĐB	13	38	283	7,6	9,9	205,4
Kéo cá	ĐB	14	36	291	7,2	9,7	242,9
Kéo cá	ĐB	15	28	230	4,9	6,1	157,6
Kéo cá	ĐB	16	35	224	5,7	7,5	167,1
Kéo cá	ĐB	17	19	75	3,3	4,2	90,3
Kéo cá	ĐB	18	18	89	2,8	3,5	72,9
Kéo cá	ĐB	19	25	351	10,3	12,2	237,4
Kéo cá	ĐB	20	13	346	2,3	2,9	59,3
Kéo cá	ĐB	21	32	316	7,9	11,5	280,2
Kéo cá	ĐB	22	40	375	5,4	7,2	165,7
Kéo cá	ĐB	23	28	267	9,6	12,0	249,1
Kéo cá	ĐB	24	23	131	5,8	7,8	153,7
Kéo cá	ĐB	25	23	307	6,3	8,0	176,5
Kéo cá	TN	1	21	437	12,1	13,2	248,9

Loại lưới kéo	Mùa gió	Trạm	Tổng số loài	Số cá thể	Tổng khối lượng (kg)	CPUE (kg/giờ)	CPUA (kg/km2)
Kéo cá	TN	2	22	262	4,7	5,1	96,3
Kéo cá	TN	3	14	670	3,6	3,8	74,4
Kéo cá	TN	4	26	555	4,0	4,4	86,8
Kéo cá	TN	5	10	85	1,5	6,0	412,4
Kéo cá	TN	6	21	403	8,5	9,3	174,8
Kéo cá	TN	7	15	180	2,8	3,3	72,5
Kéo cá	TN	8	19	456	4,6	4,6	80,3
Kéo cá	TN	9	21	376	3,9	3,9	66,9
Kéo cá	TN	10	14	482	3,0	3,0	54,3
Kéo cá	TN	11	20	295	5,2	5,2	89,1
Kéo cá	TN	12	13	157	2,9	3,2	59,5
Kéo cá	TN	13	24	130	4,5	4,5	81,4
Kéo cá	TN	14	10	161	2,9	3,2	62,3
Kéo cá	TN	15	25	631	7,8	7,4	121,6
Kéo cá	TN	16	20	1.236	5,5	5,5	95,8
Kéo cá	TN	17	20	628	16,2	17,7	348,2
Kéo cá	TN	18	16	494	6,6	7,9	170,8
Kéo cá	TN	19	18	694	9,1	9,1	163,7
Kéo cá	TN	20	9	252	30,2	60,3	2.003,2
Kéo cá	TN	21	24	553	3,3	7,2	265,3
Kéo cá	TN	22	25	1.405	9,2	8,2	127,6
Kéo cá	TN	23	20	338	5,7	5,7	102,0
Kéo cá	TN	24	25	278	5,6	5,8	103,5
Kéo cá	TN	25	17	479	6,8	6,3	96,4
Kéo Tôm	ĐB	1	33	1.044	5,7	6,4	143,6
Kéo Tôm	ĐB	2	27	2.901	10,9	12,1	242,2

Loại lưới kéo	Mùa gió	Trạm	Tổng số loài	Số cá thể	Tổng khối lượng (kg)	CPUE (kg/giờ)	CPUA (kg/km2)
Kéo Tôm	ĐB	3	30	2.685	18,4	24,4	539,0
Kéo Tôm	ĐB	4	38	464	5,1	9,5	297,1
Kéo Tôm	ĐB	5	22	451	11,9	13,0	255,4
Kéo Tôm	ĐB	6	39	1.244	10,3	26,8	1.262,7
Kéo Tôm	ĐB	7	37	2.208	15,9	17,3	356,6
Kéo Tôm	ĐB	8	29	404	7,0	7,6	172,9
Kéo Tôm	ĐB	9	26	755	7,1	7,4	143,8
Kéo Tôm	ĐB	10	33	5.090	20,1	21,9	368,1
Kéo Tôm	ĐB	11	32	389	14,0	15,2	344,8
Kéo Tôm	ĐB	12	41	211	5,8	6,6	163,0
Kéo Tôm	ĐB	13	39	1.683	18,9	19,9	435,4
Kéo Tôm	ĐB	14	39	6.425	70,3	70,3	1.327,1
Kéo Tôm	ĐB	15	40	7.228	27,7	27,7	574,7
Kéo Tôm	ĐB	16	24	2.254	16,5	15,7	258,6
Kéo Tôm	ĐB	17	31	1.224	16,6	16,6	275,3
Kéo Tôm	ĐB	18	24	2.496	16,0	16,0	266,0

Loại lưới kéo	Mùa gió	Trạm	Tổng số loài	Số cá thể	Tổng khối lượng (kg)	CPUE (kg/giờ)	CPUA (kg/km2)
Kéo Tôm	ĐB	19	13	777	18,0	19,0	377,0
Kéo Tôm	ĐB	20	17	133	1,1	1,7	41,1
Kéo Tôm	ĐB	21	49	2.653	16,6	17,5	382,5
Kéo Tôm	ĐB	22	34	1.024	26,7	9,3	61,3
Kéo Tôm	ĐB	23	31	596	19,2	20,6	366,0
Kéo Tôm	ĐB	24	32	205	7,5	11,2	388,1
Kéo Tôm	ĐB	25	51	2.370	32,3	35,2	569,0
Kéo Tôm	TN	2	26	697	7,3	5,8	83,9
Kéo Tôm	TN	3	23	2.005	14,1	13,0	217,0
Kéo Tôm	TN	4	27	2.018	13,9	13,9	250,5
Kéo Tôm	TN	5	14	334	11,3	16,9	421,8
Kéo Tôm	TN	6	32	621	11,5	12,1	230,4
Kéo Tôm	TN	7	28	543	17,2	17,2	310,1
Kéo Tôm	TN	8	30	1.584	21,0	14,0	168,5
Kéo Tôm	TN	9	37	2.142	16,6	18,1	357,2
Kéo Tôm	TN	10	32	994	15,3	16,7	314,5

Loại lưới kéo	Mùa gió	Trạm	Tổng số loài	Số cá thể	Tổng khối lượng (kg)	CPUE (kg/giờ)	CPUA (kg/km2)
Kéo Tôm	TN	11	23	1.233	21,6	20,0	332,8
Kéo Tôm	TN	12	32	1.874	21,5	20,5	352,0
Kéo Tôm	TN	13	33	682	13,6	13,6	255,7
Kéo Tôm	TN	14	26	3.235	25,2	43,3	1.283,0
Kéo Tôm	TN	15	32	186	4,9	4,7	72,7
Kéo Tôm	TN	16	34	11.397	37,6	41,0	807,2
Kéo Tôm	TN	17	31	1.197	14,7	26,0	826,8
Kéo Tôm	TN	18	24	50.879	37,7	37,7	679,9
Kéo Tôm	TN	19	18	860	4,5	4,3	74,3
Kéo Tôm	TN	20	30	890	22,4	20,7	330,7
Kéo Tôm	TN	21	15	292	2,2	2,3	43,0
Kéo Tôm	TN	22	30	449	5,7	5,9	105,5
Kéo Tôm	TN	23	14	595	7,7	7,6	129,0
Kéo Tôm	TN	24	29	528	8,4	11,0	248,1
Kéo Tôm	TN	25	24	1.742	12,1	11,3	183,5