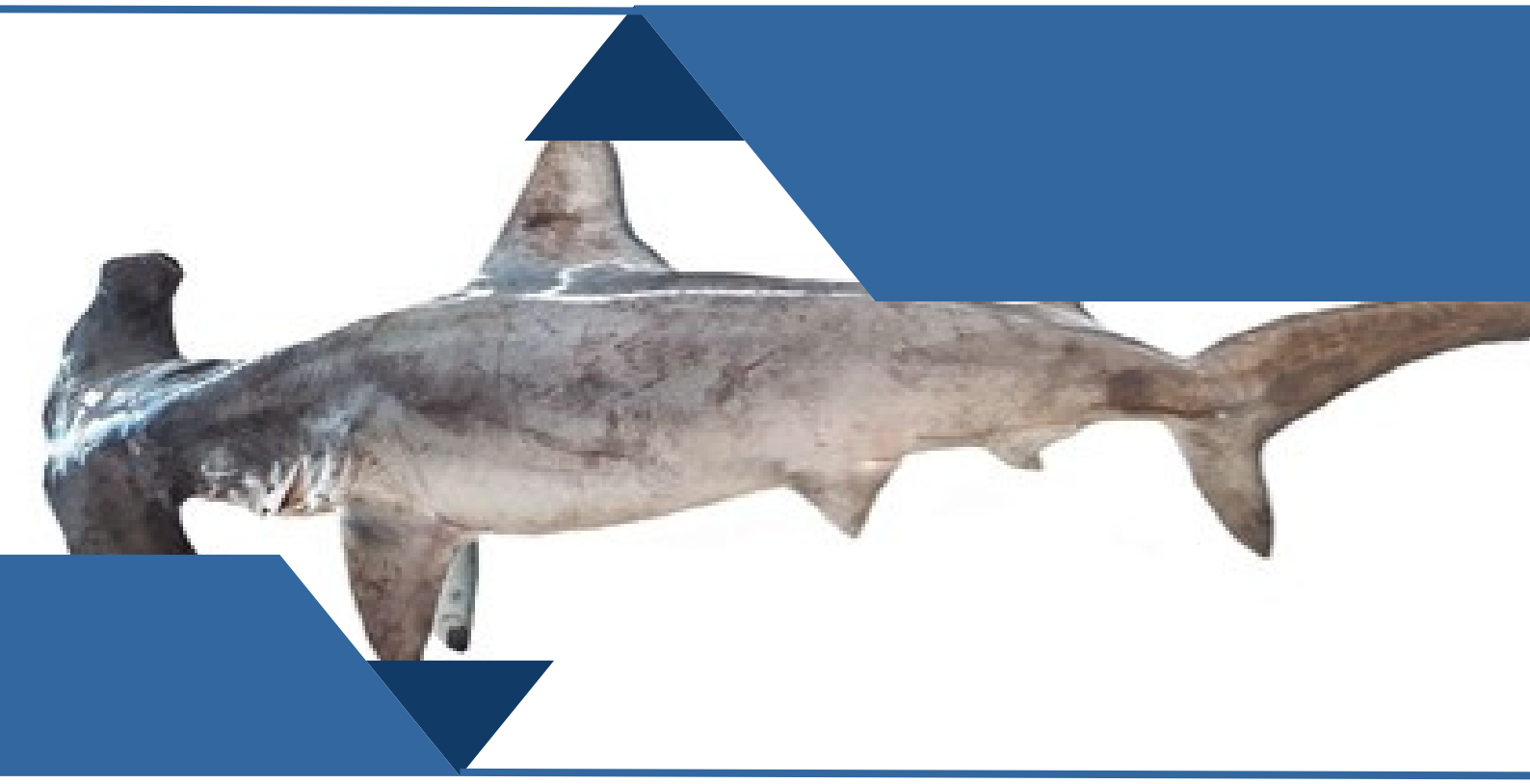
ditkkh@gmail.com
macites.aquatic@gmail.com
skikh@brin.go.id



# NON-DETRIMENT FINDINGS (NDF) FOR SCALLOPED HAMMERHEAD SHARK (*Sphyrna lewini*) FROM INDONESIAN WATERS

**Ministry of Environment and Forestry**
**Ministry of Marine Affairs and Fisheries**
**National Research and Innovation Agency**
**2024**

# 1. INTRODUCTION

## Background

The Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) is one of the international bodies controlling international trades of endangered biota. This convention regulates and restricts the international trade of numbers of wild biota by listing them in its Appendices I, II, and III. All member countries must follow all CITES rules and ensure that their export of species listed in CITES appendices meets the CITES requirements. Indonesia has become a member of CITES since 1978. Hence Indonesia is subject to CITES rules regarding the international trade of biota listed in CITES Appendices.

CITES has listed sharks in Appendix II since 2003 by including two shark species. Several sharks were then listed later, including hammerhead sharks. Since 2014, three species of hammerheads have been firmly listed in CITES Appendix II based on the CITES CoP 16 in 2013 (CITES, 2021). The main reason for the listing was that those three hammerhead sharks (*Sphyrna lewini*, *S*. *mokarran,* and *S*. *zygaena*) were caught in large numbers globally, and their sustainability has become a global concern. The conservation status of the three species of hammerheads in the International Union for Conservation of Nature's Red List (IUCN Red List) categorized *S. zygaena* as vulnerable (VU), while *S. lewini* and *S. mokarran* were classified as critically endangered (CR) (Rigby et al., 2018a; Rigby et al., 2018b; Rigby et al., 2018c). Therefore since 2014, the export of those species by CITES member countries must fulfill all CITES requirements.

The scalloped hammerhead sharks (*Sphyrna lewini*) are commonly caught in Indonesian waters. As a CITES member country, Indonesia must guarantee that exploiting those three hammerhead shark species is not detrimental to the wild populations. Therefore, the CITES Scientific Authority makes a Non-Detriment Finding (NDF) document to evaluate the harvest, stock status, and management measures for sustainable production of scalloped hammerhead sharks in Indonesia.

The NDF document follows the CITES electronic NDF portal for sharks and rays (eNDF). In general, three main aspects become considerations for determining whether or not the export can be permitted, i.e., biology and conservation concerns, pressure (fishery and trade), and existing management measures.

## Objectives

The Non-Detriment Finding (NDF) document for the scalloped hammerhead shark is an analysis document concerning Indonesia's population, utilization, and management. The CITES Scientific Authority issued this NDF document as the basic policy for the CITES

Management Authority in determining the direction of sustainable management of CITES Appendix II shark fisheries in this country.

**Scope**

The Non-Detriment Finding (NDF) document for the scalloped hammerhead shark contains up-to-date information about the biology of the *Sphyrna lewini*, fishery, utilization, and current management efforts. The data presented in this document were taken from various literature, catch data, and research findings in Indonesia.

## 2. BIOLOGICAL ASPECTS

Figure 1. Scalloped hammerhead *(Sphyrna lewini)*

Photo: Simeon, 2019

**Taxonomy**

| | | |
|---|---|---|
| Class | Chondrichthyes | |
| Order | Carcharhiniformes | |
| Family | Sphyrnidae | |
| Genus | *Sphyrna* | |
| Species | *Sphyrna lewini* (Griffith & Smith, 1834) | |
| Local names | English | Scalloped hammerhead |
| | Indonesian | *Hiu martil* |
| | Local language | *Hiu bingkoh, hiu capil, hiu caping, yee rimbah* |

**Morphology**

The scalloped hammerhead shark has a broad head, its width less than a third of the total length; the anterior margin of the head well arched, shallowly indented at the midline; the first dorsal fin is tall, moderately falcate; the second dorsal fin is short with a long rear tip and weakly concave posterior margin; upper precaudal pit crescentic (White et al., 2006).

**Life history characteristics**

| | |
|---|---|
| Age at maturity: | Indonesia: male 8.9 years; female 13.2 years (Drew et al., 2015)<br>Australia: male 3-9 years (Harry et al., 2011)<br>Gulf of Mexico: male 9-10 years; female 15 years (Stevens & Lyle, 1989) |
| Size at birth: | Indonesia: 32-53 cm TL (Chodrijah & Setyadji, 2015)<br>Indonesia: 33-61 cm TL (LIPI unpublished data 2020) |

| | |
|---|---|
| | Indonesia: 39-57 cm TL (White et al., 2008)<br>Australia: 45-55 cm TL (Stevens & Lyle, 1989; Baum et al., 2007) |
| Size at maturity: | Indonesia: male 165-190 cm TL; female 220-240 cm TL (White et al., 2006; White et al., 2008)<br>Australia: male 135-161 cm TL; female 200 cm TL (Stevens & Lyle, 1989)<br>Global: male 140-165 cm TL; female 212 cm TL (Compagno, 1984) |
| Maximum size: | Indonesia: 370-420 cm TL (White et al., 2006)<br>Indonesia: male 240 cm TL; female 317 cm TL (White et al., 2008)<br>Indonesia: 399 cm (Sentosa et al., 2016)<br>Indonesia: 312 cm TL (Oktaviyani et al., 2019)<br>Australia: male 301 cm TL; female 346 cm TL (Stevens & Lyle, 1989)<br>Global: 370-420 cm TL (Compagno, 1984) |
| Maximum age: | Gulf of Mexico: male 22-30 years; female 35 years (Branstetter, 1987)<br>Atlantic/Gulf of Mexico: male 26.6 years; female 38.5 years (Piercy et al., 2007)<br>Australia: male 15 years; female 21 years (Harry et al., 2011) |

**Reproductive characteristics**

| | |
|---|---|
| Gestation period: | 9-12 months (Branstetter, 1987; Stevens & Lyle, 1989) |
| Fecundity: | Indonesia: 14-41 pups (White et al., 2008)<br>Indonesia: 16-38 pups (Chodrijah & Setyadji, 2015)<br>Indonesia: 4-49 pups (LIPI unpublished data 2020)<br>Australia: 13-23 pups (Steves & Lyle, 1989) |
| Population growth rate (r): | 0.09 $year^{-1}$ (FAO's lowest productivity category (<0.14 $year^{-1}$)) (Chen & Yuan, 2006) |
| Growth coefficient (von Bertalanffy k): | West Pacific: male 0.22 $year^{-1}$; female 0.25 $year^{-1}$ (Chen et al., 1990)<br>Eastern Indian Ocean: male 0.075 $year^{-1}$; female 0.095 $year^{-1}$ (Drew et al., 2015)<br>Western Atlantic Ocean: 0.073 $year^{-1}$(Brenstetter, 1987)<br>East Pacific: male 0.13 $years^{-1}$; female 0.15 $years^{-1}$ (Tolentino & Mendoza, 2001)<br>Northwest Atlantic: male 0.13 $years^{-1}$; female 0.09 $years^{-1}$ (Piercy et al, 2007)<br>Indonesia: 0.17 $years^{-1}$ (Simeon et al., 2017) |

**Distribution**

The scalloped hammerhead (*S. lewini*) is one of the most common shark species in Indonesian waters, it is distributed in all tropical and warm temperate waters (White et al., 2006; Fahmi & Dharmadi, 2013). Its distribution in Indonesia includes the Indian Ocean, Sunda

Strait, Java Sea, South China Sea, and most of the waters around the islands of Sumatra, Kalimantan, Sulawesi, Moluccas, Nusa Tenggara and Papua (Fahmi & Dharmadi, 2013).

**Genetic connectivity**

The high diversity of the *S. lewini* populations in Indonesia showed that the species had not experienced a genetic loss because of exploitation pressure. It was recorded that Indonesia has at least three significant subdivisions of genetic diversity and a stock population that recorded a similar genetic diversity to the Western Indian Ocean. On the contrary, a separate stock was observed for Aceh waters (FMA 572) and Eastern Indonesia (FMA 717). The restricted genetic sharing detected among the species obtained from Indonesia showed unique features among these populations. Therefore, a specific collaborative action across regions is needed to promote sustainable management and conservation purposes, both in Indonesia and at the regional scale in the Western Indian Ocean area (Hadi et al., 2020).

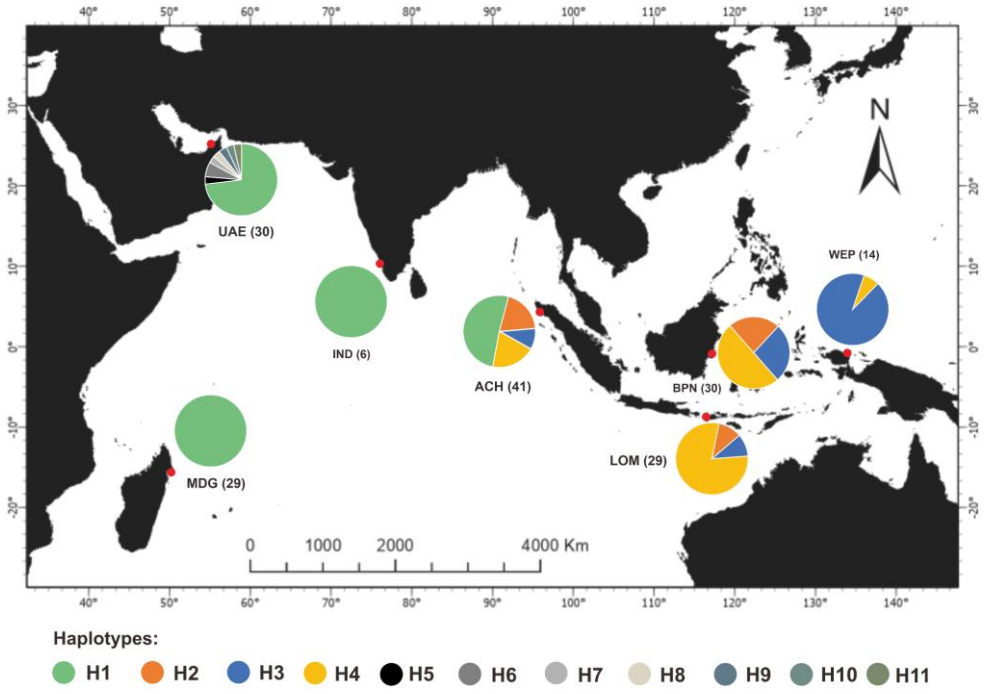



Figure 2. Distribution of the 11 haplotypes of the *S. lewini* population from Indonesia and the Western Indian Ocean at the regional scale (Hadi et al., 2020)

**Habitat**

*Sphyrna lewini* is a coastal and semi-oceanic pelagic shark. This species is often found on continental and insular shelves, from the surface and intertidal to at least 275 m depth (Compagno, 1984; White et al., 2006). Females move inshore for breeding and often use near-shore nurseries (Duncan et al., 2006). The nursery grounds of this species are in shallow coastal waters, with adults around mostly offshore (Compagno, 1984; Holland et al., 1993).

The breeding season is reported throughout the year, with a peak season from October to November (White et al., 2008).

Pups of *S. lewini* tend to live in coastal areas close to the seafloor and are often found in high concentrations in summer in estuaries and bays (Clarke, 1971; Bass et al., 1975; Castro, 1983). Newborn pups and juveniles have been found gathering in coastal spawning grounds for two years before they moved to adult shark habitats (Holland et al., 1993). They have been observed to stick strictly to several core areas during the day (Holland et al., 1993) and often form large swarms (Stevens & Lyle, 1989).

**Conservation Status**

*Sphyrna lewini* has been listed in the International Union for Conservation of Nature and Natural Resources (IUCN) Red List as Critically Endangered (CR) and it is listed in CITES Appendix II.

## 3. FISHERY ASPECTS

### a) Production

Data production for the scalloped hammerhead shark (*Sphyrna lewini*) was combined with three other species of hammerhead sharks in the national statistics of capture fisheries. However, *S. lewini* is the most common and dominant species in Indonesia and represents more than 95% of the total production of hammerhead shark species. Based on the data recorded and published from 2005 to 2015, hammerhead sharks contributed about 1.5% of the national production of sharks and rays. The average catch of scalloped hammerhead sharks in Indonesia from 2005 to 2016 was about 1,498 tons.

### b) Fishing Ground and Fishing Season

Potential fishing grounds for hammerhead sharks are in almost all Indonesian waters, ranging from the Indian Ocean, Makassar Strait, Java Sea, South China Sea, and most waters around the islands of Sumatra, Kalimantan, Sulawesi, Maluku, Nusa Tenggara, and Papua. In general, scalloped hammerhead shark fishing occurs all year round without being restricted by season, but certain months result in higher catch volumes, which indicate the fishing season. In the Indian Ocean, April to October and November to February are considered as the shark fishing seasons.

### c) Fishing Gear

In Indonesian waters, scalloped hammerhead sharks (*Sphyrna lewini*) are caught by either fishing lines or nets, including gillnet, drift net, longline, handline, troll line, purse seine, trammel net and trawl net. The vessels catching *Sphyrna lewini* are sized between 5 and 393 gross tonnage, comprising artisanal and industrial fleets.

### d) Stock assessment

Considering that Indonesian waters are vast, covering almost 5.8 million square kilometers, the stock assessments are being carried out in stages. One location where stock assessments have been conducted is the Eastern Indian Ocean. This assessment was based on landing monitoring in Tanjung Luar, which has been conducted since 2014. The Tanjung Luar Coastal Fishing Port data focused on targeted shark fishery. The stock assessment analysis has been done using length-based analysis. Based on this analysis, the fishing pressure showed that the exploitation rate (E) of scalloped hammerheads decreased after the CITES listing in 2014, ranging between 0.4 and 0.6 (Simeon et al, unpublished data). It is important to note the estimated mean length at first capture (Lc), which fluctuated from 2014

to 2021. Using the same effort (fishing gear type) in the Tanjung Luar fishery over that period, a constant Lc value is expected. The fluctuating Lc indicates some uncertainty in its value, which might bias the estimate of E. Unfortunately, the generated E value from this area cannot represent the national stock assessment. The percentage of immature individuals generally decreased in Tanjung Luar Coastal fishing port because the community agreed to conduct some management efforts such as critical habitat protection of hammerhead juveniles.

In the future, there will be additional information on stock assessments in Indonesia, given that currently there are routine monitoring and data collection activities at more than 20 landing sites, distributed across the entire Indonesian archipelago. This is being done to achieve a national stock assessment.

**e) Social-economics**

In some regions, many people depend on shark fisheries, such as fishers, collectors, middlemen, product processors, collectors, and shark products exporters. According to Fahmi & Dharmadi (2013), shark fishing in Indonesia has been increasingly incentivized by the high price of shark fins in the international market since the 1980s. Consequently, many fishers changed their catch targets to sharks, and many have survived. Some areas known to be shark landing centers in Indonesia are Tanjung Luar, Muncar, Cilacap, Aceh, Sibolga, Palabuhanratu, Indramayu, Muara Baru, and so on. Indirectly, the local community got a positive impact from shark fisheries, not only becoming the primary source of income and protein or consumption for daily needs. Nevertheless, the CITES Appendix II listing did not affect the local utilization of hammerhead sharks.

**f) Shark products**

Hammerhead sharks are utilized as fresh, frozen, dried, and smoked meat for consumption, fins for shark fin soup, skin for leather products, and livers for oil (Compagno, 1984). In Indonesia, different body parts are used for different purposes. The meat is commonly processed into salted, steamed, or grilled meat (mainly for domestic consumption) and frozen meat (for export). Meanwhile, shark fins are mostly dried entirely or prepared (peel) as the main export product. Shark fins have the highest economic value among these products and have become the main ingredient for Chinese luxury soup meals. Besides, other body parts such as teeth are utilized as souvenirs, livers for oil, dried skin for food or fashion material, cartilage for medical needs, and food supplements.

**g) Trade**

- **International trade**

There were no export activities for *Sphyrna lewini* from 2017 to 2019 due to an export ban issued by the Indonesian government. The action was one of Indonesia's efforts to meet the compliance related to the governance of utilizing CITES Appendix II commodities. However, domestic utilization was allowed. There were no exports of *Sphyrna lewini* in 2020 despite having export quotas of 8,810 individuals. In 2021, the export quota for *Sphyrna lewini* was 7,200 individuals. The export realization of *Sphyrna lewini* fin products in 2021 was only 2,208.70 kg. Thus, the quantity was below the export quota, based on permits issued and the Annual Report/CITES Trade Database. The weight of a set of fins (dorsal, caudal, anal, pelvic, and pectoral fins) on a *Sphyrna lewini* is estimated at 3% of the total weight. International trade

is monitored using the CITES export permit (called SAJI LN). These permit documents include important information, including species name, catch origin, trade destination, quantity, and product type.

- **Domestic Trade**

The most significant demand from local communities is for meat, with products sold frozen, partially prepared (e.g., dried, salted, steamed, and grilled); or cooked and prepared in local dishes, such as meatballs, fish cake, fish floss, and jerky (Muttaqin et al., 2018; Oktaviyani et al., 2019). People in some regions, such as Java, Lombok, Aceh, North Sumatra, and East Kalimantan, regularly consume shark meat (Efendi et al., 2019; Muttaqin et al., 2018; Oktaviyani et al., 2019). Meanwhile, the demand for shark fins only comes from Chinese restaurants that provide shark fin soup (Esteria et al., 2019). Skins are commonly processed into crackers or leather for fashion materials and are often used to manufacture wallets, bags, belts, bracelets, buckles, and shoes (Muttaqin et al., 2018), as well as teeth and jaws for souvenirs, commonly sold in Bali (Esteria et al., 2019).

Monitoring to domestic utilization is carried out through permits owned by traders, namely the Fish Utilization Permit (SIPJI) and the Domestic Transport Permit (SAJI DN). The SIPJI and SAJI licensing mechanism is stated in the Ministry of Marine Affairs Regulation No. 61/2018 and No. 10/2021. The Management Authority records all product utilization by SIPJI owners. The difference between the amount recorded between SAJI LN and SAJI DN indicates that the amount is only utilized to meet domestic needs. Transport permit documents (SAJI DN and SAJI LN) include important information, including species name, catch origin, trade destination, quantity, and product type. Therefore, the traceability aspect of shark utilization can be traced well and meets the criteria of CITES. In addition, monitoring of trade within the province and domestic fishing is carried out by collecting data from enumerators at priority landing sites. Efforts to add more locations for the data collection are increasing every year.

### h) Trade Chain

The trade chain of hammerhead sharks in Indonesia starts with the fishers, local collectors, local traders, intermediaries, processors, prominent collectors, until exporters to importing countries. Shark products are usually sent to big cities in Indonesia, where shark exporters are located, such as Jakarta, Surabaya, Medan, Manado, Makassar and Denpasar. Shark exporters sent their products abroad by air or sea transportation to importing countries. In 2021, hammerhead shark products were exported to Singapore, Hong Kong SAR and China (MMAF unpublished data, 2022).

## 5. CURRENT MANAGEMENT EFFORTS

### i) NPOA Shark Implementation

To adopt and implement the International Plan of Action (IPOA) for sharks and rays in 1999, the Government of Indonesia developed a National Plan of Action (NPOA) for the conservation and management of sharks and rays in Indonesia for the period 2010-2014 and 2016-2020, meanwhile for the next phase (2020-2024) the NPOA is still on finalization process. The NPOA for shark and rays 2016-2020 has nine main strategies, as follows:

(1) Development and implementation of national regulations to support sustainable shark and ray management;
(2) Review of shark and ray fisheries status at national, regional, and international levels;
(3) Strengthening of shark and ray fisheries data and information;
(4) Development of shark and ray research;
(5) Strengthening of conservation efforts for endangered sharks and rays;
(6) Strengthening of management steps;
(7) Awareness-raising on sharks and rays;
(8) Institutional empowerment; and
(9) Human resource capacity building.

In general, the Indonesian government has made significant progress in managing sharks and rays in Indonesia in the past five years, according to the nine strategies in the NPOA. Most strategies have been achieved through collaborative programs with all parties involved in shark and ray management in Indonesia. The most implemented programs for the conservation and management of sharks and rays in 2018-2021 were improving catch data on sharks and rays by placing enumerators on main landings sites and observers on tuna fishing boats. The data improvement was carried out to strengthen research on biology and fisheries, such as identifying critical habitats and estimating population status in several areas. In addition, other implemented priority programs were strengthening the protection of endangered species of sharks and rays, as well as campaign and awareness programs for all stakeholders. Concerning strengthening institutions and increasing human capacity, the ministry has facilitated the forming of working groups on shark and ray conservation at national and provincial levels.

### j) Traceability Mechanism

The MMAF, a representative Indonesian government, has established legal regulations to support the traceability system. Every fishing vessel that catches CITES-listed sharks must have a Fish Utilization Permit (SIPJI) and then fill a logbook as a catch monitoring

system. Then, a Catch Recording Certificate and Certificate of Fish Origin must be made after the fish is landed. The sellers or middlemen (persons or legal entities) are required to have a permit to utilize protected species and/or species listed in the CITES Appendix. The processor level must have a permit and Processing Eligibility Letter. A transport Permit is issued when the specimens (products or live fish) will be transported to another region or country, which is a domestic fish transport permit (SAJI-DN) for domestic or CITES export permit (SAJI-LN) for international transport. Those documents also become a basis or reference to monitor the realization of quotas given by the government and monitor domestic and international trade.

For international trade, there are additional documents that have to be completed. CITES permit is a prerequisite for the issuance of a Health Certificate (HC) and Export Approval for Natural Plants Wildlife and Fish (EA-NPWF), which are prerequisites for the issuance of Goods Export Notification (GEN) documents. The Fish Quarantine, Quality Control, and Fishery Product Safety Agency (BKIPM) issues the Health Certificate. The Directorate General issues the EA-NPWF for Foreign Trade of the Ministry of Trade, and the Directorate General issues the Goods Export Notification (GEN) for Customs of the Ministry of Finance.

**k) Data and Information Recording**

The Management Authority has improved catch data recording by adding data collection sites and routine monitoring by employing well-trained enumerators for sharks and rays to obtain accurate and reliable data. To date, there have been 23 data collection sites spread throughout Indonesia. The data collection uses a nationally agreed template and displays very detailed information. In addition, fishers are also encouraged to record their catch in a logbook. Catch monitoring is conducted by the Ministry of Marine Affairs and Fisheries (MMAF) through its Technical Implementing Units (TIUs) and the Center for Data, Statistics, and Information (CDSI/*Pusdatin*).

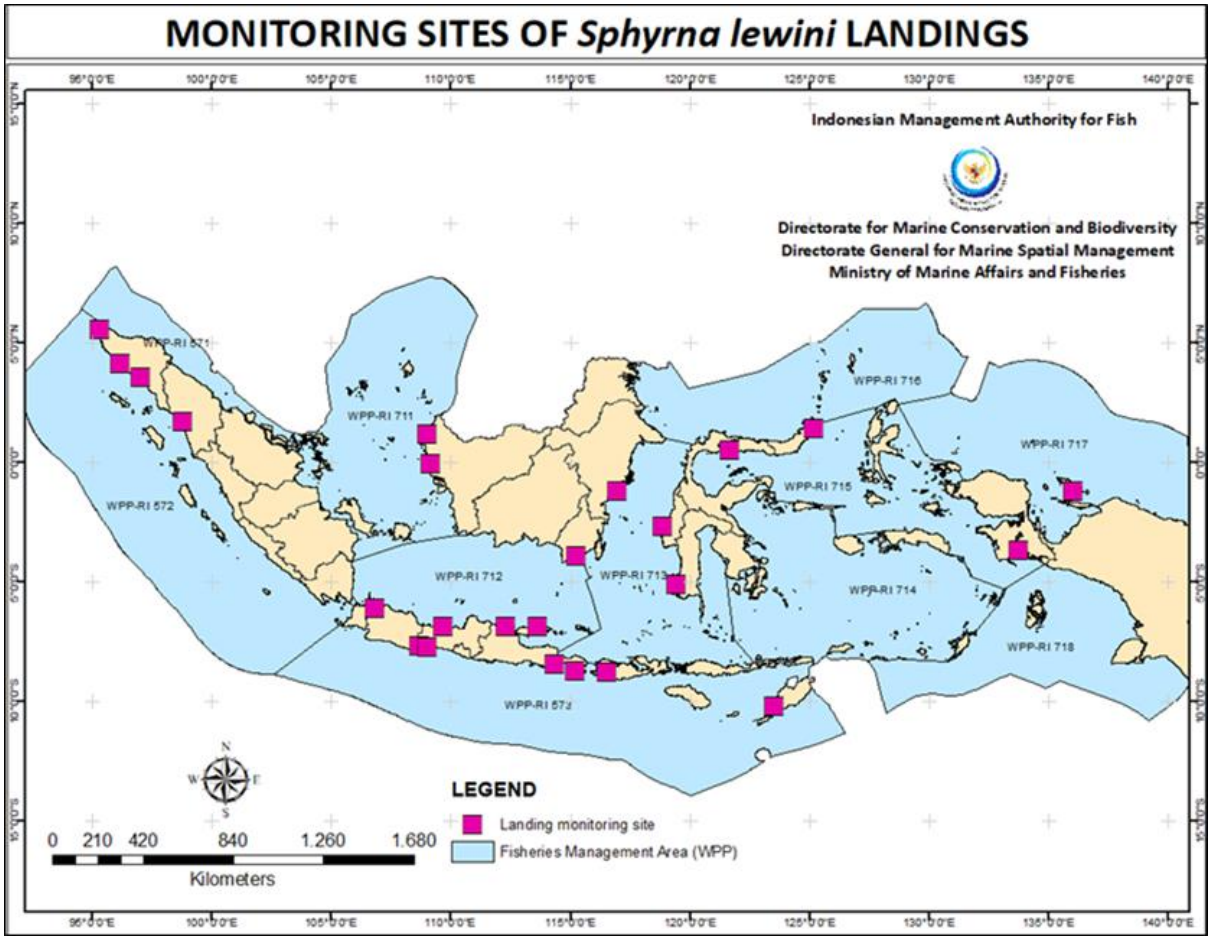



Figure 4. Map of the monitoring sites of *Sphyrna lewini* landings in Indonesia

**Collection System of Trade Data**

Along with improving catch data collection, the Indonesian government has improved trade data collection. All domestic and international trade can be tracked properly through the e-SAJI application. Through this application, it is possible to know the type of transshipped products, the origin of the product, the location or destination country, and the product amount. Through this application, each trader can monitor the amount of realization of the catch or export quota. In addition, since 2021 the Indonesian government has revised and added information to the HS Code for Appendices II shark and ray products exported from Indonesia, including for *S. lewini*. This is stated in the Minister of Trade Regulation No. 23 of 2023 concerning Export Policy and Regulation.

**l) Catch Quota System and Size Limitation**

Since 2020, the Indonesian government has set a catch quota for *S. lewin*i. Sustainable harvest for the scalloped hammerhead shark is based on a precautionary approach to ensure that exploitation does not threaten their sustainability in the wild. The initial catch quota was set at only 20% of the average hammerhead shark catch. This precautionary approach is

supported by data and information from population studies and records from several locations, as well as the species distribution, which are considered when formulating the initial catch quota. The catch quota is designed to remain stable or gradually decrease in the following years. In addition, the CITES Scientific Authority recommended the minimum size catch for *S. lewini* at a 2-meter total body length and minimum tradeable sizes of pectoral and dorsal fins. This has been incorporated into the catch and export quotas issued by the CITES Management Authority every year.

**m) Fishing and Trade Regulation**

The Indonesian government has several regulations relating to the fishing, trade, and management of CITES Appendix II species, including scalloped hammerhead sharks. These regulations are important in supporting the fulfillment of CITES criteria, related to legality, sustainability, and traceability.

**2) Minister of Marine Affairs and Fisheries Regulation No. 48 of 2014 on Fishing Log Book.**

The regulation amended the previous Minister of Marine Affairs and Fisheries Regulation No. 18 of 2010 on fishing logbooks. This regulation requires every fishing vessel over 5 GT, licensed, Indonesian-flagged and operating in Indonesian territorial waters, to have a logbook, fill it out, and hand it over to the chief of the fishing harbor. The e-logbook is developed as one improvement strategy for increasing fishing vessels' compliance in filling in and reporting the fishing logbooks.

**3) Regulation of the Director-General of Marine Space Management Number 13 of 2018 concerning Procedures for the Issuance of Shark and Ray Trading Recommendations**

The regulation specifies that the authorized officers will check every shark and ray product traded between provinces or exported. The information gathered includes shark and ray species, product name, volume, origin (landing and city), and destination. The regulation was implemented in 2015 and showed increasing compliance from related stakeholders. The monitoring mechanism ensures the traceability of the products traded domestically and internationally.

**4) Minister of Marine Affairs and Fisheries Regulation No. 61 of 2018 on the Utilization of Protected Fish Species and/or Fish Species Listed in the CITES Appendix**

The regulation was revised through the Minister of Marine Affairs and Fisheries Regulation No. 44 of 2019 concerning the Amendment to the Minister of Marine Affairs and Fisheries Regulation No. 61 of 2018. The regulation stipulates the procedures for

using protected fish species and CITES-listed species. Every person or legal entity must have a permit to utilize protected species and/or species listed in the CITES Appendix. The permit is then used as a legal basis to implement the quota mechanism (catch and export quota) to ensure the utilization does not detriment the population.

5) **Minister of Marine Affairs and Fisheries Regulation No. 58 of 2020 on Capture Fisheries Business**

This regulation requires every fishing vessel operating in the RFMO-managed area and gaining bycatch (ecologically related to the tuna fisheries) to take conservation actions. The conservation action is the same as the Ministerial Regulation No. 12 of 2012.

6) **Minister of Marine Affairs and Fisheries Regulation No. 22 of 2021 on Fisheries Management Plan and Fisheries Management Governance**

The regulation explains fisheries management plans (FMP) in each fisheries management area (FMA) in Indonesia, including economically important fishery resources, endangered and protected species, CITES-listed species, and endemic species.

7) **Government Regulation of the Republic of Indonesia Number 85 of 2021 concerning Types and Tariffs on Types of Non-Tax State Revenue Applicable to the Ministry of Maritime Affairs and Fisheries**

This Government Regulation stipulates the type and rates of non-tax state revenues applicable to the Ministry of Maritime Affairs and Fisheries, including revenues from the utilization of protected and/or restricted sh species and administrative fines.

8) **Regulation of the Minister of Maritime Affairs and Fisheries of the Republic of Indonesia Number 31 of 2021 concerning the Imposition of Administrative Sanctions in the Field of Maritime Affairs and Fisheries**

The purpose of this regulation is to maintain the sustainability of marine and fisheries resources, as well as ensure compliance with existing regulations. This regulation regulates various types of violations related to marine and fisheries, such as illegal fishing, fishing using prohibited tools, fishing that exceeds specified catch limits, and fisheries business activities that do not have a license.

9) **Regulation of the Minister of Maritime Affairs and Fisheries of the Republic of Indonesia Number 8 of 2022 concerning Types of Commodities Required to Check Fish Quarantine, Quality, and Safety of Fishery Products**

Every Entry or Expenditure of Carrier Media and/or Fishery Products that are required to be examined for Fish Quarantine, quality and safety of Fishery Products completes a Fish Quarantine action document, in the form of an Approval Letter for Expenditure of Carrier Media and/or Fishery Products from the Place of Entry (SPKTM) or Certificate (SPL).

10) **Regulation of the Minister of Trade of the Republic of Indonesia Number 12 of 2022 concerning the Third Amendment to Regulation of the Minister of Trade Number 19 of 2021 concerning Export Policy and Regulation**

This regulation covers the provisions and requirements that must be met to export goods, including administrative requirements, registration procedures, and export licenses. For export activities of certain goods, this Ministerial Regulation stipulates the obligation to fulfill other documents that must be fulfilled by the Exporter following the provisions of laws and regulations. Exporters must have a Business License for Export from the Minister, consisting of Registered Exporters and/or Export Approval. Business Licenses for Export are used as complementary customs documents required in the submission of Customs Declaration of Export of Goods to the customs office. Transportation of fish species included in the CITES list requires a CITES export (SAJI-LN) as a requirement in the issuance of Export Approval for Natural Plants, Wildlife and Fish (PE TASLI).

11) **Minister of Finance Regulation Number 155 of 2022 concerning Customs Provisions in the field of exports**

This regulation includes detailed procedures for customs declaration, export clearance, and the management of export duties and taxes. The regulation also emphasizes the importance of compliance with national and international trade standards to facilitate smooth and efficient export processes. Additionally, it aims to enhance the transparency and accountability of customs operations in the export sector.

12) **Regulation of the Minister of Trade No. 23 of 2023 on Export Policies and Arrangements**

This regulation addresses policies and arrangements regarding exports in Indonesia. It establishes guidelines for export activities, including export quotas, licensing requirements, and monitoring procedures to ensure compliance with both national and international trade regulations. The regulation aims to enhance Indonesia's export competitiveness while promoting sustainable trade practices. It also includes provisions for the regular collection and analysis of export data to support policy-making and enforcement efforts.

**13) Decree of the Minister of Manpower and Transmigration No. 26 of 2023 on the Enactment of the National Competency Standards for the Category of Agriculture, Forestry and Fisheries in the Main Group of Fisheries for Managing and Utilizing Sharks and Rays**

The decree aims to ensure that professionals in the fisheries sector are equipped with the necessary skills and knowledge to manage and utilize sharks and rays sustainably. This includes adherence to both national and international conservation and management regulations.

**a) Critical Habitat Protection**

It is generally understood that coral reefs, seagrass beds, and mangrove forests are critical habitats for various types of fish as nursery, spawning, feeding, mating, and foraging areas. To protect critical habitats for marine fauna, including *S. lewini,* the government of Indonesia established Marine Protected Areas (MPAs). As of 2023, the total area of MPAs reached 29.2 million hectares, distributed all over the country. Based on the managing institution, Indonesian MPAs are classified into three: 1) National MPAs managed by the Ministry of Marine Affairs and Fisheries (MMAF); 2) National MPAs managed by the Ministry of Environment and Forestry; and 3) Local MPAs managed by the provincial government. Although the managing institutions vary, all of the MPAs aim to protect and conserve marine and coastal resources. The conservation targets include coral reefs, seagrass, mangroves, marine turtles, marine mammals, reef fishes, sharks, and rays. Three MPAs particularly target hammerhead sharks as their conservation priorities, namely Aceh Jaya MPA (Aceh Province), Damer MPA (Maluku Province), and Romang Islands MPA (Maluku Province) (Figure 5). Indonesia has also identified seven Important Shark and Ray Areas (ISRAs) that serve as aggregation areas for *S. lewini*. These seven areas have the potential to become MPAs in the future.

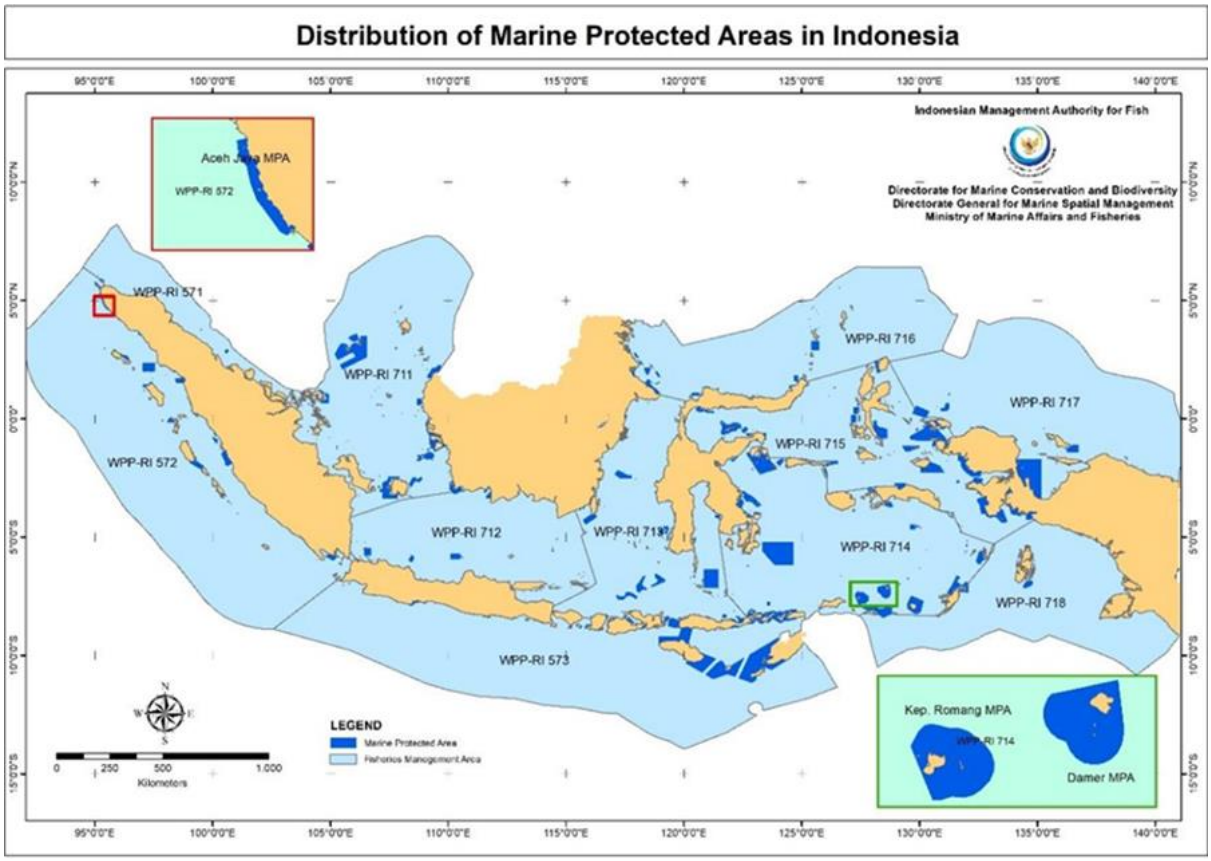



Figure 5. Map of Marine Protected Areas and Fisheries Management Areas in Indonesia.

**b) Local Government Regulations**

Local governments issued several regulations to manage and protect sharks and rays in their jurisdictions. However, those regulations are mostly general and apply to all species, as follows:

1. Government Regulation of Raja Ampat Regency Number 9 of 2012 prohibits the fishing for sharks, manta rays, and certain types of fish in the waters of Raja Ampat, Papua Province.
2. Government Instruction of West Manggarai Regency Number DKPP/1309/VII/2013 prohibits fishing for sharks, manta rays, Napoleon wrasse, and other marine biotas in West Manggarai waters, East Nusa Tenggara Province.
3. Governor Instruction of DKI Jakarta Number 78 of 2014 stipulates the prohibition of consuming sharks and manta rays and their derivative products for officials and employees of the DKI Jakarta government.
4. Governor Regulation of South Sumatra Number 27 of 2015 prohibits consuming, capturing, and trading sharks, manta rays, and/or their derivative products.

5. Bupati Regulation of Kaur of Bengkulu Province Number 104 of 2018 concerning control of fishing for sharks in the waters of Kaur Regency.
6. Local Regulation of Berau Regency Number 16 of 2019 concerning protecting sharks (whale shark, nurse shark, grey reef shark, and white tip reef shark), manta rays, and certain coral reef species.
7. Governor Decree of West Nusa Tenggara Province Number 55 of 2020 concerning management action plan of shark and ray fisheries in West Nusa Tenggara Province from 2020-2025.

**c) Law Enforcement and Evaluation of Management**

The Indonesian government has implemented all regulations related to fisheries, trade, and management of *S. lewini*. If any violations occur, they will be dealt with by the Directorate General of Marine and Fisheries Resource Surveillance. In addition, since 2021 Indonesia has also developed a tool to evaluate the Management Effectiveness of Protected Fish Species and/or listed in the CITES Appendix (called EPANJI), including for *S. lewini*. The assessment shows that the management of *S. lewini* is in the optimum criteria or good category. It means that the planned and implemented management efforts have produced positive outcomes.

## 6. CLOSING

The assessment results using eNDF showed that the NDF for scalloped hammerhead sharks is positive, which means that international trade is not detrimental to the scalloped hammerhead shark population in the wild. Indonesia has also made serious efforts to meet CITES criteria related to legality, traceability, and sustainability on the utilization of CITES Appendix II species, including scalloped hammerhead sharks.

## REFERENCE


Bass, J., D'Aubrey, J.D. & Kistnasamy, N. (1975). *Sharks of the east coast of southern Africa 3 The families Carcharhinidae (excluding Mustelus and Carcharhinus) and Sphyrnidae.* Oceanographic Research Institute; Investigational report. Durban South African: Assoc. for Marine Biol. Research 1975, 38: 1-100.

Baum, J., Clarke, S., Domingo, A., Ducrocq, M., Lamónaca, A.F., Gaibor, N., Graham, R., Jorgensen, S., Kotas, J.E., Medina, E., Martinez-Ortiz, J., Monzini Taccone di Sitizano, J., Morales, M.R., Navarro, S.S., Pérez-Jiménez, J.C., Ruiz, C., Smith, W., Valenti, S.V. & Vooren, C.M. (2007). *Sphyrna lewini*. In: IUCN 2012. IUCN Red List of Threatened Species. Version 2012.2. <www.iucnredlist.org>. Downloaded on 28 February 2013.

Branstetter, S. (1987). Age, growth, and reproductive biology of the silky shark *Carcharhinus falciformis* and the scalloped hammerhead, *Sphyrna lewini*, from the northwestern Gulf of Mexico. *Environmental Biology of Fishes*, 19 (3): 161 – 174.

Castro, J.I. (1983). *The Sharks of North American Waters*.College Station, USA: Texas A. and M. University Press.

Chen, P., & Yuan, W. (2006). Demographic analysis based on the growth parameter of sharks. *Fisheries Research*, 78: 374 – 379.

Chen, C. T., Leu, T. C., Joung, S. J., & Lo, N. C. H. (1990). Age and growth of the scalloped hammerhead, *Sphyrna lewini*, in northeastern Taiwan waters. *Pacific Science,* 44: 156-170.

Chodrijah, U., & Setyadji, B. (2015). Some biological aspects of scalloped hammerhead sharks (*Sphyrna lewini* Griffith & Smith, 1834) caught from coastal fisheries in the Eastern Indian Ocean. *Indonesian Fisheries Research Journal*, 21(2): 91-97.

CITES. (2021). History of CITES listing of sharks (Elasmobranchii). Accessed on 01 July 2022.

Clarke, T.A. (1971). The ecology of the scalloped hammerhead, *Sphyrna lewini*, in Hawaii. *Pacific Science,* 25: 133–144.

Coelho, R., Carvalho, J. F., Amorim, S., Santos, M. N. (2011). Age and growth of the smooth hammerhead shark, *Sphyrna zygaena*, in the Eastern Equatorial Atlantic Ocean, using vertebral sections. *Aquatic Living Resources,* 24: 351 – 357.

Compagno, L.J.V. (1984). FAO jenis catalogue. Vol. 4. Sharks of the world. An annotated and illustrated catalogue of sharks jenis known to date. Part 1. Hexanchiformes to Lamniformes. *FAO Fish. Synop*. 125(4):1: 249.

Drew, M., White, W.T., Dharmadi, Harry, A. V., & Huveneers C. (2015). Age, growth and maturity of the pelagic thresher *Alopias pelagicus* and the scalloped hammerhead *Sphyrna lewini*. *Journal of Fish Biology*, 86: 333–354

Duncan, K.M., Martin, A.P., Bowen, B.W., & Couet, H.G.D. (2006). Global phylogeography of the scalloped hammerhead shark (*Sphyrna lewini*). *Molecular Ecology,* 15: 2239–2251.

Efendi, H.P., Alkadrie, S.I.T., Dhewi, R.T. & Ricky. (2019). Jejaring pemanfaatan hiu da pari di Balikpapan. Prosiding Simposium Nasional Hiu Pari Indonesia Ke-2 Tahun 2018. 255-263.

Esteria, G., Yuneni, R.R., & Pinandita, L.K. (2019). Pemanfaatan Produk Hiu Dan Distribusinya Di Provinsi Bali. Prosiding Simposium Nasional Hiu Pari Indonesia Ke-2 Tahun 2018: 215-225

Fahmi & Dharmadi. (2013). *Tinjauan Status Perikanan Hiu dan Upaya Konservasinya di Indonesia*. Jakarta: Direktorat Konservasi Kawasan dan Jenis Ikan Direktorat Jenderal Kelautan, Pesisir dan Pulau-Pulau Kecil.

Hadi, S., Andayani, N., Muttaqin, E., Simeon, B. M., Ichsan, M., Subhan, B & Madduppa, H. (2020). Genetic connectivity of the scalloped hammerhead shark *Sphyrna lewini* across Indonesia and the Western Indian Ocean. *PLoS ONE,* 15 (10): e0230763.

Harry, A.V., Macbeth, W.G., Gutteridge, A.N., & Simpfendorfer, C.A. (2011). The life histories of endangered hammerhead sharks (Carcharhiniformes, Sphyrnidae) from the east coast of Australia. *Journal of Fish Biology,* 78: 2026–2051.

Holland, K.N., Wetherbee, B.M., Peterson, J. D. & Lowe, C.G. (1993). Movements and distribution of hammerhead shark pups on their natal grounds. *Copeia*: 495 - 502.

Mutaqqin, E., Simeon, B., Ichsan, M., Dharmadi, Prasetyo, A., Booth, H., Yulianto, I., & Friedman, K. (2018). *The Scale, Value, and Importance of Non-Fin Shark and Ray Commodities in Indonesia*. FAO, 66 pp.

Okes, N., & Sant, G. (2019). An overview of major shark traders catchers and species. Cambridge, UK: TRAFFIC. 32 pp.

Oktaviyani, S., Simeon, B.M., Dharmadi, Prasetyo, A.P., Sudarisman, R., Prabowo, Muttaqin, E., Setiono, Ichsan, M., Sari, R.P., Giyanto, Fahmi & Suharsono. (2019). *Guideline of Non- Detriment Findings for Sharks in Indonesia*. Bogor: PT Media Sains Nasional. 59 pp.

Piercy, A.N., Carlson, J.K., Sulikowski, J.A., & Burgess, G.H. (2007). Age and growth of the scalloped hammerhead shark, *Sphyrna lewini,* in the north-west Atlantic Ocean and Gulf of Mexico. *Marine and Freshwater Research*, 58: 34–40.

Rigby, C.L., Dulvy, N.K., Barreto, R., Carlson, J., Fernando, D., Fordham, S., Francis, M.P., Herman, K., Jabado, R.W., Liu, K.M., Marshall, A., Pacoureau, N., Romanov, E., Sherley, R.B. & Winker, H. 2019. *Sphyrna lewini*. *The IUCN Red List of Threatened Species* 2019: e.T39385A2918526. Accessed on 01 June 2024.

Sentosa, A.A., Dharmadi, & Tjahjo, D.W.H. (2016). Population parameters of scalloped hammerhead shark (*Sphyrna lewini* Griffith & Smith, 1834) caught from southern Nusa Tenggara Waters. *Jurnal Penelitian Perikanan Indonesia,* 22(4): 253-262

Simeon, B. M., Agustina, S. Muttaqin, E. Yulianto, I. Ichsan, M. Muhsin. (2017). Technical Report: Sharks and Rays Landing Monitoring, West Nusat Tenggara Provice. Bogor, Indonesia: Wildlife Conservation Society- Indonesia Program.

Stevens, J.D. & Lyle, J.M. (1989). Biology of three Hammerhead Sharks (*Eusphyra blochii, Sphyrna mokarran* and *S. lewini*) form Northern Australia. *Australian Journal of Marine and Freshwater Research,* 40:129 - 146.

Tolentino, V. A., & Mendoza, C.R. (2001). Age and growth for the scalloped hammerhead shark, *Sphyrna lewini* (Griffith and Smith, 1834) along the Central Pacific Coast of Mexico. *Ciencias Marinas*, 27(4): 501–520.

White, W. T., Last, P. R., Stevens, J. D., Yearsley, G. K., Fahmi., & Dharmadi. (2006). Economically important sharks and rays of Indonesia (Hiu dan pari yang bernilai ekonomis penting di Indonesia). ACIAR monograph series; no. 124. Canberra: Australian Centre for International Agricultural Research.

White, W.T., Bartron, C., & Potter, I.C. (2008). Catch composition and reproductive biology of *Sphyrna lewini* (Griffith & Smith) (Carcharhiniformes, Sphyrnidae) in Indonesian waters. *Journal of Fish Biology*, 72: 1675–1689.