

Perceptions of aceh jaya fishermen regarding the conservation of *Sphyrna lewini* and *Rhynchobatus australiae* in marine protected areas, Aceh Jaya, Aceh Jaya

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Abstract. Conservation status is an indicator used to show the level of threat to a living creature. The determination of this conservation status aims to provide protection and sustainability for living creatures. The conservation status of Scalloped hammerhead (*Sphyrna lewini*) and Whitespotted guitarfish (*Rhynchobatus australiae*) is currently critically endangered. It is *S. lewini* and *R. australiae* juveniles caught by gillnet fishermen as by-catch and the lack of knowledge of fishermen regarding the protection and conservation status of *Sphyrna lewini* and *R. australiae* juveniles. This study aims to determine the perceptions of gillnet fishermen regarding the conservation status of *S. lewini* and *R. australiae* during their release and capture in marine protected area (KKPD TP). This study was conducted between February and June 2024 in Aceh Jaya regency by taking 37 respondent from three villages, viz; Lhok Patek 13 respondents, Lhok Keluang Daya 13 respondents and Lhok Rigah 11 respondents). The method used in this study was the observation and interview method using a questionnaire with descriptive analysis.. Data processing was carried out using a likert scale through Microsoft Excel. The results of the study showed that the conservation section of *S. lewini* and *R. australiae*, the score was 86% with the interpretation of very good, in the capture of *S. lewini* and *R. australiae*, the score was 52% with the interpretation of sufficient and the release of both species had a score 79% with the interpretation of good. This has occurred since the introduction of the hammerhead and cetacean shark pup protection and socialization programs.

1 Introduction

Aceh is one of the provinces located at the western tip of Indonesia surrounded by oceans and rich in biological resources, so it has the potential for development of utilization. One of the biological resources that can be utilized is shark fisheries [1, 2 and 3]. Sharks and rays caught in Aceh Province precisely in WPP 572 from 2017 to 2019 found that 45 species of

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sharks and 32 species of rays 7% of them are endangered and 30% are vulnerable based on IUCN criteria. The large number of Scalloped hammerhead (*Sphyrna lewini*) pups caught in Aceh Jaya indicates an excessive level of exploitation of the species [4]. Shark meat in Aceh Jaya itself is consumed as a specialty food shark curry, while the fins, bones and shark oil are sold outside Aceh Province.

Aceh Jaya Regency is located in the western part of Aceh Province. Astronomically, Aceh Jaya Regency is located between 04°22'-05°16' North latitude and 95°02'-96°03' East longitude with an area of 3,814 km² [5]. Generally, people in Aceh Jaya Regency depend on fisheries, agriculture and livestock activities. The main livelihood for the local community is fishing. Aceh Jaya waters are suitable as a nursery ground for shark and ray pups [6]. In general, some species of sharks and rays are bycatch using *gillnet* [7].

The large number of *S. lewini* and *R. australiae* pups caught by fishermen in Aceh Jaya District as by-catch indicates an excessive level of exploitation of these species [4]. And fishermen's knowledge of the protection and conservation status of *S. lewini* and *R. australiae* is minimal. So, it is necessary to conduct this research to inform local fishermen chiefs of the importance of knowing the protection and conservation status of *S. lewini* and *R. australiae* considering that there are still many fishermen who catch *S. lewini* and *R. australiae*.

2 Research methods

2.1 Time and place

This study was conducted on February and June 2024 located in the Marine Protected Area of the Coastal Park which includes three research sites (Lhok Keluang Daya, Lhok Patek and Lhok Rigaih) Aceh Jaya, Aceh Province, Indonesia (Fig. 1)

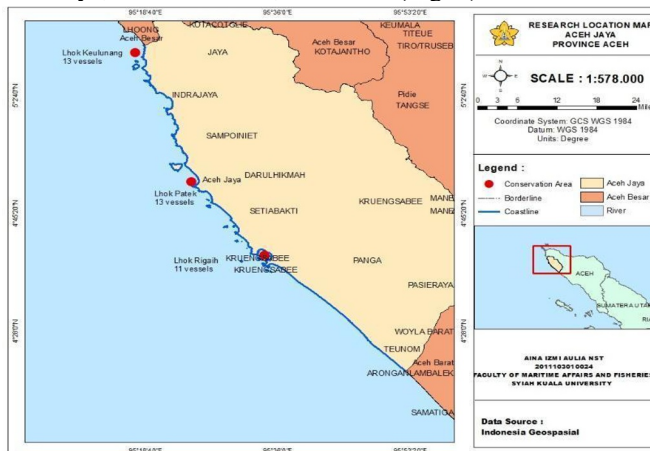


Fig. 1. Research location

2.1 Data capture method

The method used in this study is a survey with data collection methods using observation and interviews using questionnaires, while for the collection of respondents using techniques in the form of a census by taking all *gillnet* fishermen as many as 37 respondents consisting of (Lhok Patek 13 respondents, Lhok Keluang Daya 13 respondents and Lhok Rigaih 11 respondents).

Data analysis

The data analysis used in the research is descriptive with a scale using a Likert scale which will then be analyzed through Microsoft Excell.

Table 1. Likert scale

No.	Alternative answer	Likert Scale
1.	Strongly agree (SS)	5
2.	Agree (S)	4
3.	Disagree less (KS)	3
4.	Disagree (TS)	2
5.	Strongly disagree (STS)	1

After calculating the total score using Likert scale weighting, it will be continued by finding the ideal score using the formula:

$$Total\ Score = T \times Pn \quad (1)$$

Description:

T = Total number of respondents who chose

Pn = Likert scale number options

To find the ideal score as follows:

X = Lowest likert score x number of respondents

Y = Highest likert score x number of respondents

After knowing the total number of answer scores and ideal scores, then proceed to analyze the existing interval data by calculating the average number of answers based on the scoring of each answer from respondents using the following index formula:

$$\% = \frac{Total\ Score}{Ideal\ sum\ of\ score} \times 100 \quad (2)$$

Then the last step is continued by interpreting the results of the respondents' answers (*gillnet* fishermen). The following are the criteria for interpreting Likert scale scores [8]:

Table 2. Likert scale score interpretation criteria

No.	Percentage	Criteria
1.	0% - 20%	Very Bad
2.	21% - 40%	Bad
3.	41% - 60%	Enough
4.	61% - 80%	Good
5.	81% - 100%	Very Good

3 Results and discussion

Perception comes from the word 'perception' which was later adopted into Indonesian as perception, which means vision, response, understanding, or responding to something that begins with sensing and then transferred to the brain. Meanwhile, according to [9], [10] and [11], perception is a process by which individuals organize and interpret their sensory impressions in order to give meaning to their environment.

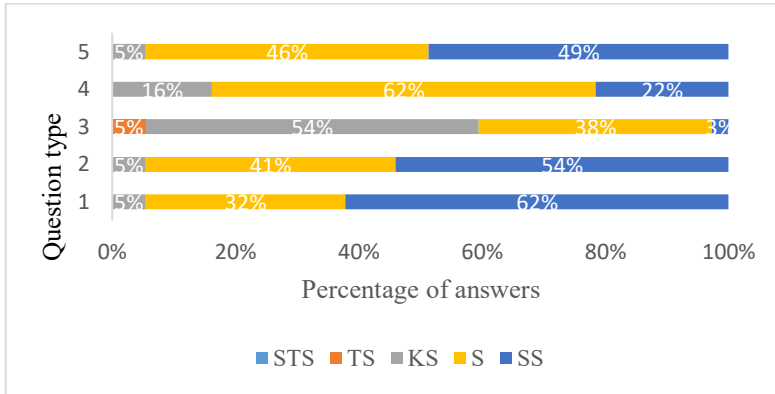


Fig. 2. Fishermen's perception scores related to *S. lewini* and *R. australiea* conservation

Description:

1. Fishermen are responsible for protecting the ocean.
2. Knowledge of *S. lewini* and *R. australiea* protection.
3. Knowledge of current conservation status 'critically endangered/crisis'.
4. Conservation status can reduce the risk of extinction.
5. The importance of public knowledge regarding the conservation status of *S. lewini* and *R. australiea*.

Conservation status is an indicator used to show the level of threat of living species from conservation. The determination of conservation status aims to provide protection and sustainability to living things [12]. Based on the diagram in Fig. 1, the perception section related to the conservation status of *S. lewini* and *R. australiea* consists of 5 questions. Of the 37 respondents, 23 people (62%) of them strongly agreed that fishermen are responsible for protecting the sea. However, 20 people (54%) respondents answered strongly agree regarding their knowledge of the protection and conservation status of the two species. There were 20 people (54%) respondents who answered disagree or did not know that the current protection status of both species is in crisis. A total of 23 people (62%) respondents gave an answer in the form of agree in addition, 18 people (49%) respondents gave an answer in the form of strongly agree.

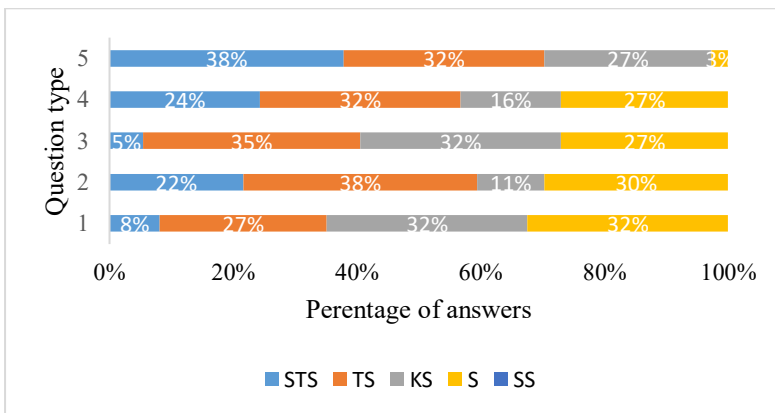


Fig. 3. Perception scores during *S. lewini* and *R. australiea* catches

Description:

1. When catching *S. lewini* pups
2. When others catch and take-home *S. lewini* pups
3. When catching *R. australiae* pups;
4. When someone else catches and brings home a cetacean *R. australiae* pups.
5. When bringing home *S. lewini* and *R. australiae* pups alive.

Shark fishing is still rampant in Indonesia. This is because the demand for sharks is very high. One of the sharks that experience fishing pressure is the *S. lewini* [13]. The fishing activity is carried out using *gillnet* fishing gear [1]. Based on the diagram above, there are 5 questions related to the capture of *S. lewini* and *R. australiae*. A total of 12 people (32%) of respondents gave agree and disagree answers to catching *S. lewini* pups. A total of 14 people (38%) respondents gave answers in the form of disagreement when other people caught *S. lewini* pups and took them home. Then 13 people (35%) disagree when catching *R. australiae* pups. A total of 12 people (32%) disagree when other people catch and takehome *R. australiae* pups. In addition, 14 people (38%) strongly disagreed.

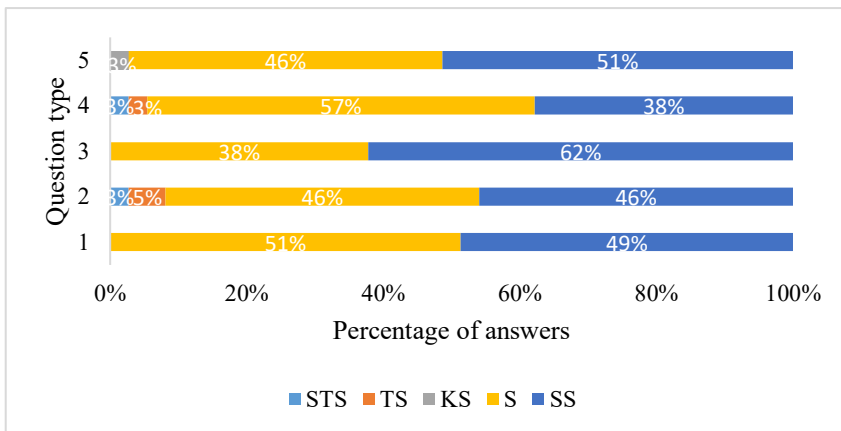


Fig. 4. Fishermen's perception score at the time of *S. lewini* and *R. australiae* release

Description:

1. When releasing a *S. lewini*.
2. When other people release *S. lewini* pups alive.
3. When releasing *R. australiae* pups
4. When other people release cetacean *R. australiae* pups alive.
5. Releasing both species can reduce extinction.

Based on the diagram in Fig. 3 above, there are 5 questions related to the release of *R. australiae*. There were 19 people (51%) respondents who gave the answer agree when releasing *S. lewini* pups. As many as 17 people (46%) respondents agreed and strongly agreed when other people released *S. lewini* pups and as many as 23 people (62%) respondents strongly agreed when releasing pups into the sea and as many as 21 people (57%) respondents agreed when other people released *R. australiae* pups. Then 19 people (51%) respondents strongly agreed that the release of both species can prevent extinction. The following are the results of the final score calculation related to the perceptions of *gillnet* fishermen regarding the conservation status of *S. lewini* and *R. australiae* at the time of capture and release presented in the diagram in figure 4 below.

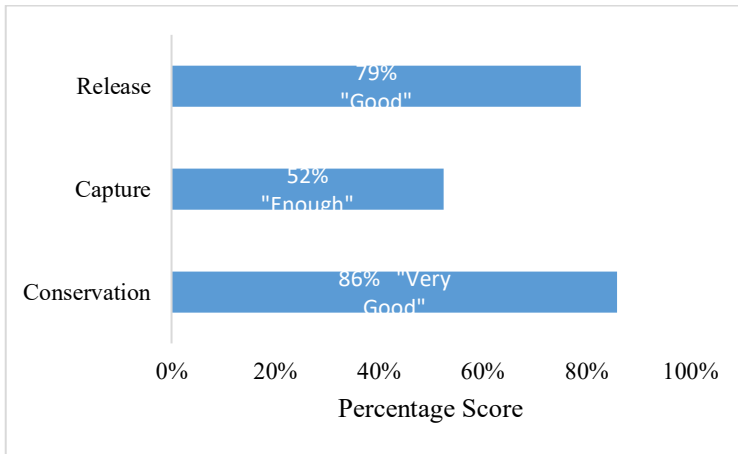


Fig. 5. Final score of fishermen's perceptions regarding the conservation, catch and release of *S. lewini* and *R. australiae*.

Figure 4. above shows the final score of the respondents' assessment of the questions that have been given. In the perception of *gillnet* fishermen related to the conservation of *S. lewini* and *R. australiae* obtained a score of 86% (very good). Meanwhile, research conducted by [14] related to fishermen's perceptions of shark conservation status in Badung Regency is classified as 'good'. This is different due to differences in the scoring scale used in the two studies. The capture obtained a final score of 52% (sufficient). This is in accordance with research [15] regarding the release and capture of endangered species with neutral / sufficient results. Likewise, research conducted by [16] when fishermen are willing to release both species alive and get compensation fishermen must also pay disincentives (fines) if they still catch *S. lewini* and *R. australiae*. Meanwhile, the final score for release was 79% (good). This is different from what was stated by [15] regarding the release and capture of endangered species with a final score of negative release. This is also stated by [16] regarding the release of the two species alive, Aceh Jaya regency fishermen are willing to release the two species and replace them by providing compensation (incentives). This research is expected to provide an overview of the protection of *S. lewini* and *R. australiae* species to prevent extinction and can implement the release of both species if they are caught alive.

4 Conclusion

Based on the results of the research and discussion above, the conclusions obtained in this study regarding the perceptions of gillnet fishers in Aceh Jaya regarding the conservation of *Sphyrna lewini* and *Rhynchobatus australiae* are generally very good (86%) and for the capture of *Sphyrna lewini* and *Rhynchobatus australiae* pups is sufficient (52%) while the release of the two species is good (79%). This has occurred since the introduction of the hammerhead and cetacean shark pup protection and socialization programs.

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