

# Chavakkad: A globally recognized breeding ground for threatened guitarfish species

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The coastal waters of Chavakkad, including Chettuva estuary located in Thrissur district, Kerala, serve as a critical habitat for the breeding and sustenance of several threatened guitarfish species. This ~10 km stretch of shallow coastal waters is linked to the Chettuva estuary, which is fed by the Karuvannur, Kecheri, and Puzhakkal rivers. The continuous freshwater influx, combined with nutrient-rich waters from convective mixing and eutrophication during the monsoon, creates an ideal environment for marine biodiversity. Recognized as an Important Shark and Ray Area (ISRA), by the IUCN Species Survival Commission (SSC), it supports diverse benthic species, including three guitarfishes facing extinction risk.

## Ecological significance of the area

The Chavakkad coastal belt, extending from inshore zones to depths of 20 meters, is characterized by:

- Sandy beaches that offer suitable substrates for benthic species.
- Mangrove ecosystems, with high biodiversity including *Rhizophora mucronata* and *Bruguiera*



Map showing Chavakkad, Kerala

*cylindrica*, which provide shelter and nursery grounds.

- Mudbanks, which form during the monsoon (June–July) and enhance primary productivity due to nutrient influx and convective mixing.

This combination of physical, chemical, and biological factors makes Chavakkad a unique ecological niche along the southeastern Arabian Sea.

## Key Guitarfish Species of Conservation Concern Along the Chavakkad Coast

The Chavakkad coast serves as an important breeding and nursery ground for three globally threatened guitarfish species, highlighting its significance for marine conservation and management.

|                                                                                     | Species                                                       | Conservation Status & Habitat                                                                                                                               | Key Significance                                                                                                                                                                                       |
|-------------------------------------------------------------------------------------|---------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|    | Stripenose Guitarfish<br>( <i>Acroteriobatus variegatus</i> ) | IUCN Status: Critically Endangered<br>Habitat: Restricted to shallow coastal waters along sandy beaches.                                                    | One of the rarest guitarfish species in the region. Frequently observed along the Chavakkad coast during the post-monsoon season, indicating its importance as a breeding and nursery habitat.         |
|   | Bengal Guitarfish<br>( <i>Rhinobatos annandalei</i> )         | IUCN Status: Critically Endangered<br>Habitat: Found in shallow and moderately deeper waters near estuarine areas                                           | A range-restricted species largely confined to the Arabian Sea Large Marine Ecosystem (LME) and the Bay of Bengal LME. The Chavakkad coast serves as an important habitat for this threatened species. |
|  | Widenose Guitarfish<br>( <i>Glaucostegus obtusus</i> )        | Wild Life (Protection) Amendment Act, 2022: Schedule I<br>IUCN Status: Critically Endangered<br>Habitat: Prefers sandy and muddy substrates near estuaries. | Critical breeding populations have been documented in the Chettuva region.                                                                                                                             |

## Reproductive patterns and field observations (2020–2022)

### Stripenose Guitarfish

- Breeding Season: November to December.
- Mature Individuals: Nine mature individuals, including eight females (65–70 cm TL), were observed. Four pregnant females with 5–6 near-term embryos.
- Habitat: Prefers the shallow coastal waters influenced by estuarine outflows.

### Bengal Guitarfish

- Breeding Season: November to December.

- Mature Females: Sixteen mature females (76–84 cm total length, TL) were recorded with 10–11 near-term embryos each.
- Neonates: Observed neonates measured 18–21 cm TL, matching the species' known size-at-birth (20 cm TL).
- Habitat: Neonates were frequently seen in shallow (0–2 m depth) sandy habitats near the Chettuva estuary.

### Widenose Guitarfish

- Breeding Season: October to December.
- Mature Individuals: Eleven mature individuals, including five pregnant females (89–92 cm

TL), were documented, each carrying 5–6 near-term embryos.

- Neonates: Two neonates (19–20 cm TL) were recorded during this period in shallow waters.
- Significance: The consistent observation of neonates indicates Chavakkad coast as a crucial nursery area.

## Global recognition and conservation implications

The Chettuva estuary and the adjacent Chavakkad coast in Thrissur district, Kerala, have gained global recognition as a critical breeding and nursery ground for threatened guitarfish species. This recognition was formalized through the publication of the *Chavakkad ISRA Factsheet*, an internationally endorsed assessment developed with substantial scientific inputs from ICAR-CMFRI (IUCN SSC Shark Specialist Group, 2023). It highlighted the global importance of protecting and conserving this unique marine ecosystem. Guitarfishes and wedgefishes contribute only 0.15% of the total elasmobranch landings in Thrissur district which includes the Chettuva region, currently under focus. Between 2020 and 2022, other elasmobranch species recorded in the landings from this area included *Scoliodon* spp., *Rhizoprionodon* spp. (Requiem sharks), *Sphyrna lewini* (Scalloped hammerhead),

*Alopias* spp. (Thresher sharks), *Himantura uarnak* (Honeycomb stingray), and *Mobula birostris* (Giant manta). The IUCN SSC Shark Specialist Group has recognized Chavakkad as an Important Shark and Ray Area (ISRA), emphasizing the need for safeguarding breeding grounds through community engagement and sustained research and monitoring. Local artisanal fishers and recreational anglers play a crucial role in monitoring guitarfish populations by regularly reporting sightings of mature and juvenile guitarfishes during the post-monsoon season, especially in areas close to the Chettuva estuary. Interviews with fishers have corroborated scientific observations, emphasizing the importance of community engagement in conservation efforts.

Effective conservation strategies hinge on long-term monitoring of guitarfish populations and their habitats along with studies on population dynamics, reproductive cycles, and habitat preferences which provide critical data to formulate protective measures. Integrating community knowledge with scientific research further strengthens the conservation framework, ensuring that strategies are both culturally appropriate and ecologically effective.

## References

IUCN SSC Shark Specialist Group., 2023. *Chavakkad ISRA Factsheet*. IUCN SSC Shark Specialist Group, Dubai.