

Papua New Guinea: a potential long-term refuge for endangered Indo-Pacific sawfish (Pristidae) and river shark (*Glyphis*) species



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Papua New Guinea Partners: Yolarnie Amepou (Piku Biodiversity Network) & Dr. Ralph Mana (University of Papua New Guinea)



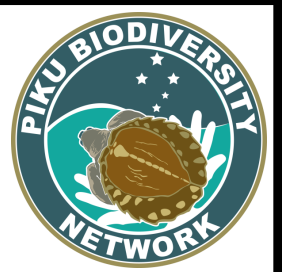
Centre for
Sustainable
Tropical Fisheries
& Aquaculture



JAMES COOK
UNIVERSITY
AUSTRALIA



save our seas
foundation





Commercial

Small-scale

Tropical Indo-Pacific



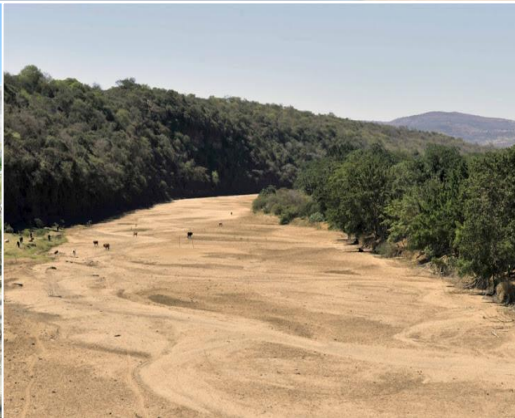
Development

Dams & weirs

Irrigation

Pollution

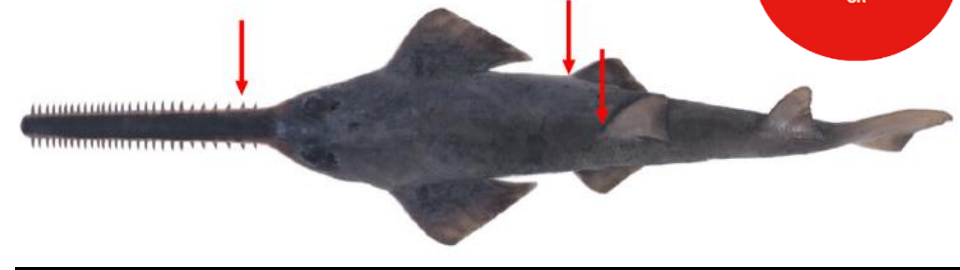
The central map shows the Tropical Indo-Pacific region, including parts of Africa, the Indian Ocean, Southeast Asia, and the Pacific Ocean. A white box highlights a specific area in Southeast Asia. The Vanuatu flag is positioned in the upper right corner of the map area.



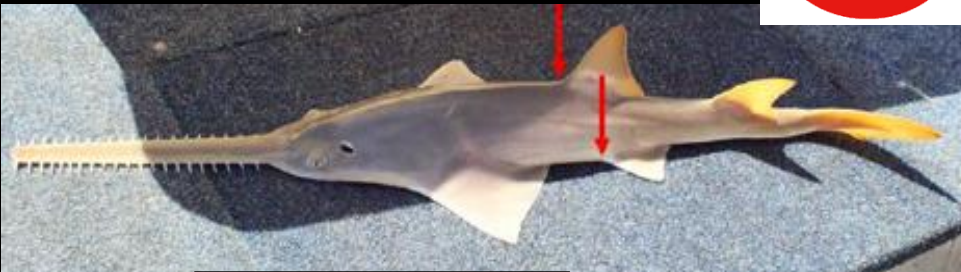
Narrow sawfish
Anoxypristis cuspidata



Green sawfish
Pristis zijsron



Largetooth sawfish
Pristis pristis



Dwarf sawfish
Pristis clavata



Freshwater

Estuaries/ Mangroves

Marine

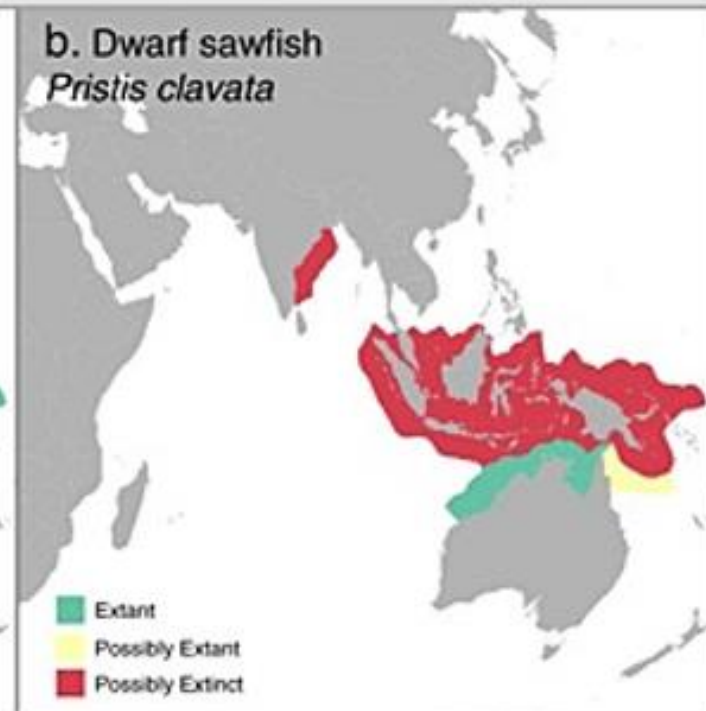


Dulvy et al. 2016

Extant

Uncertain

Possibly
extinct



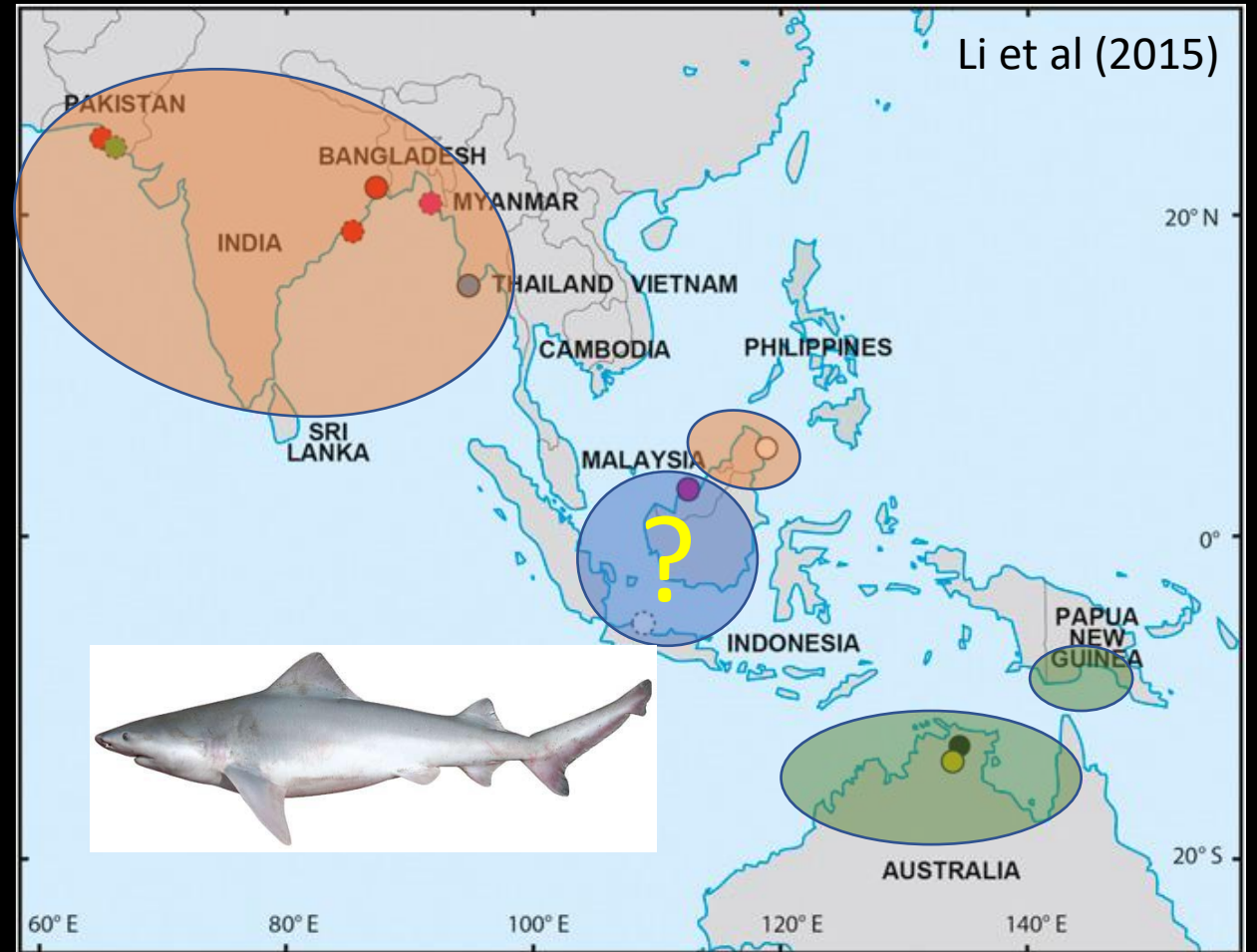
Ganges River Shark *Glyphis gangeticus*
synonyms *Glyphis fowlerae* & *Glyphis Siamensis*

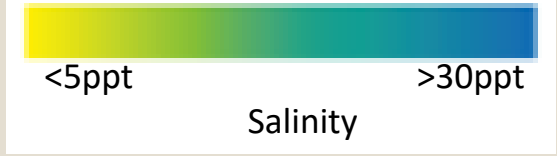
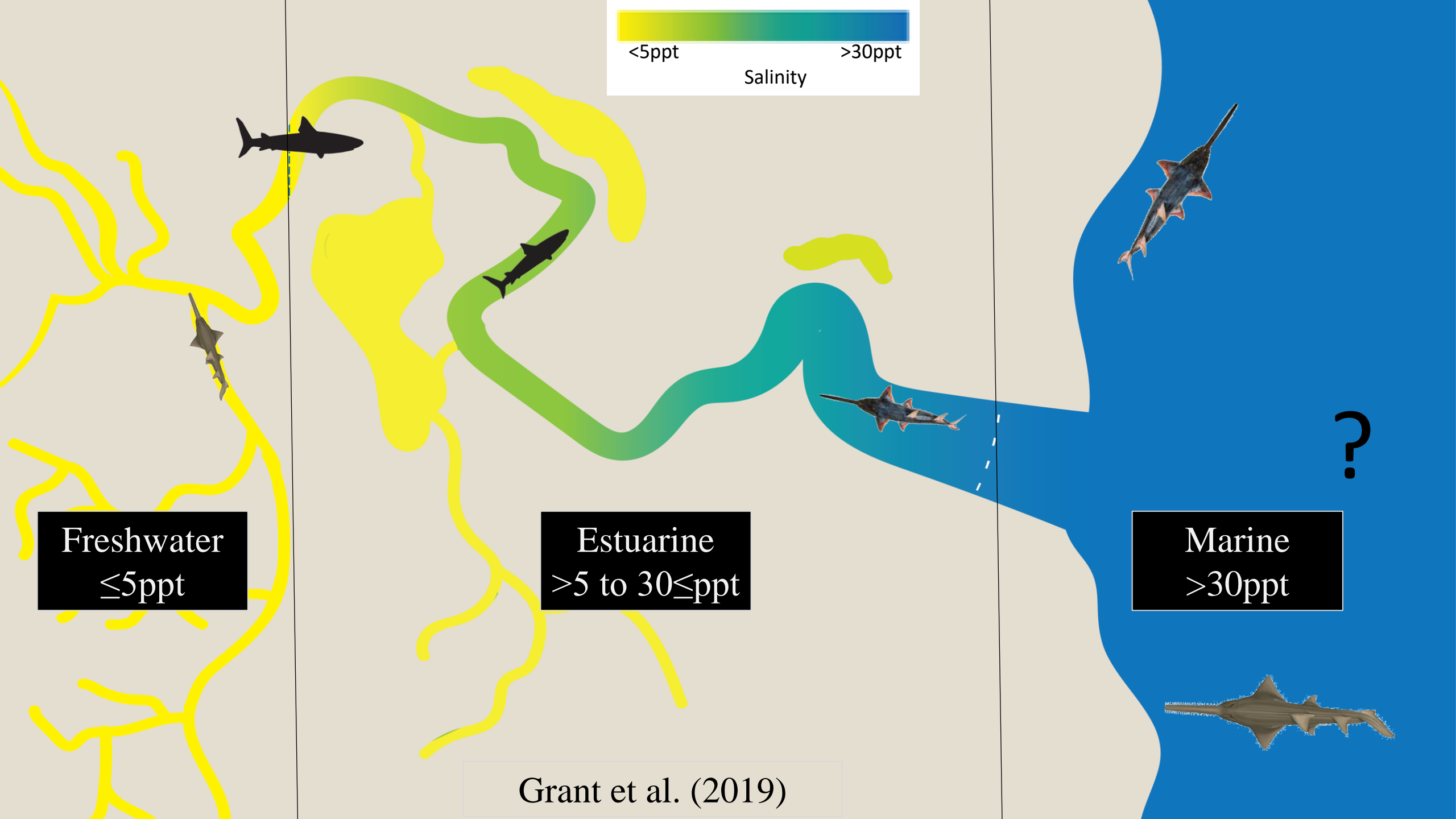


Northern River Shark *Glyphis garricki*



Spear-tooth Shark *Glyphis glyphis*





Freshwater
 $\leq 5\text{ppt}$

Estuarine
 $>5 \text{ to } 30\leq\text{ppt}$

Marine
 $>30\text{ppt}$

Grant et al. (2019)



- Low population density
- Low human impacts
- Large, free flowing flood plain rivers



How did it all start?



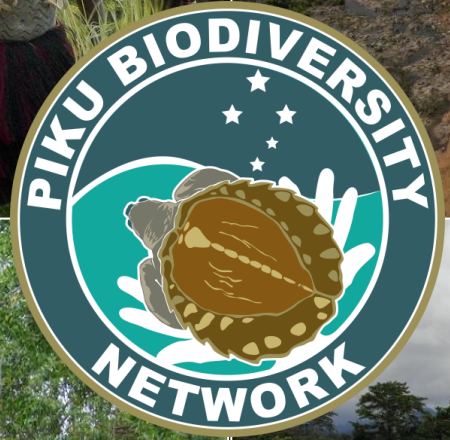
Dr. Jonathan Smart (left) Katatai Village fishermen (middle) Dr. William White (right)



White et al (2017)



White et al (2015)







Data Collection Guide For Shark and Ray Catch In Papua New Guinea



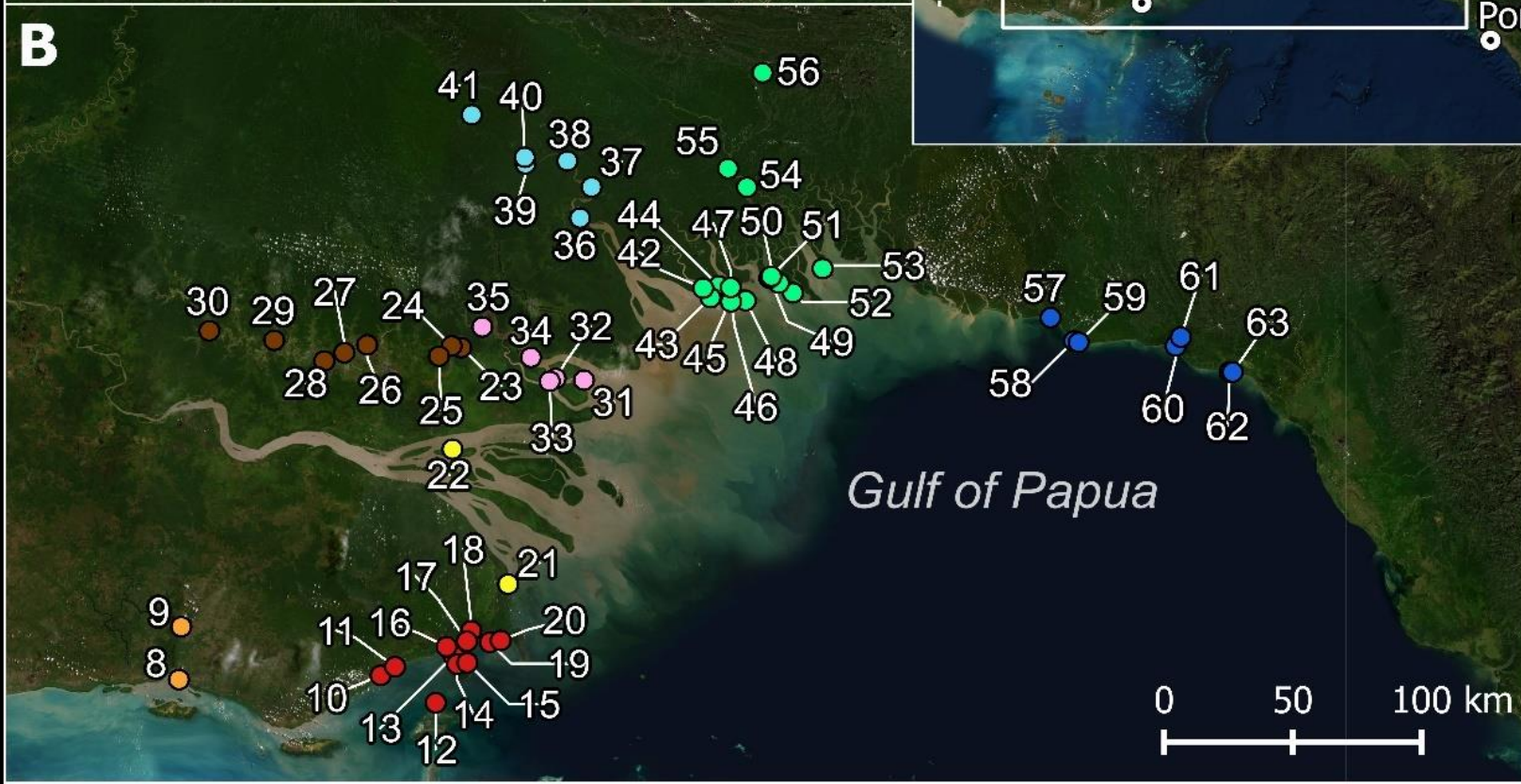
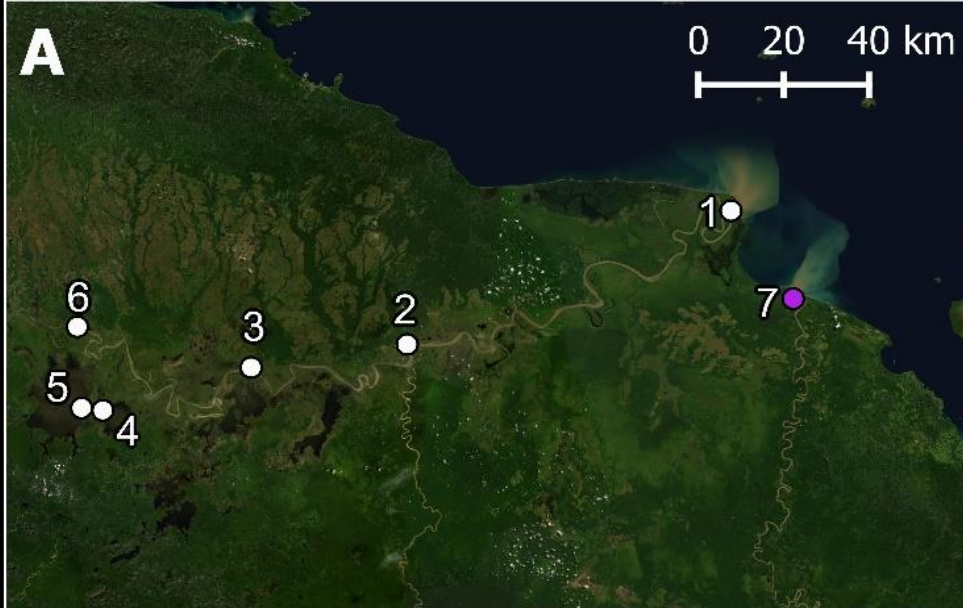
Data collection required

The aim is to collect data on all of the sharks and rays caught.

We require the following pieces of information for each specimen:

1. Date
2. Location and depth
3. Total length (sharks), disc width (rays)
4. Sex
5. Photo of specimen
6. Where possible, 6-8 vertebrae should also be retained
7. Fishing gear used (e.g. Gill net/hook and line/spear etc.)





North coast (Map A)

□ Sepik River

■ Ramu River

South coast (Map B)

■ Mia Kussa River

■ South Fly Coast

■ Fly River

■ Aramia River

■ Bamu River

■ Turama River

■ Kikori River

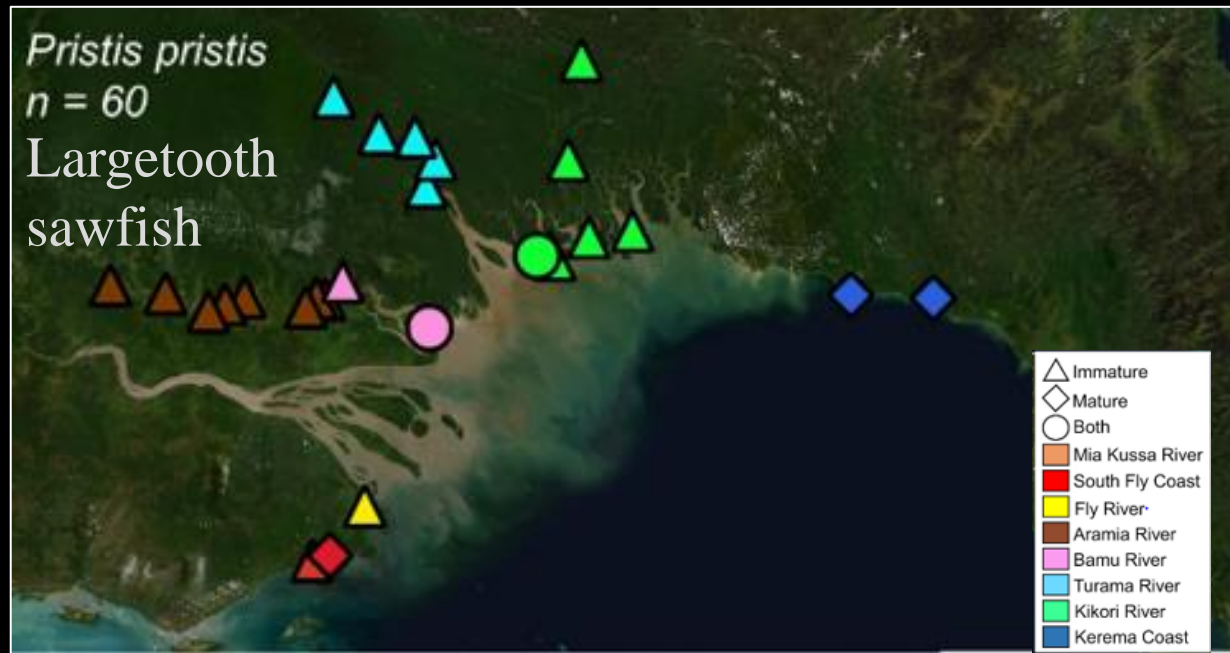
■ Kerema Coast

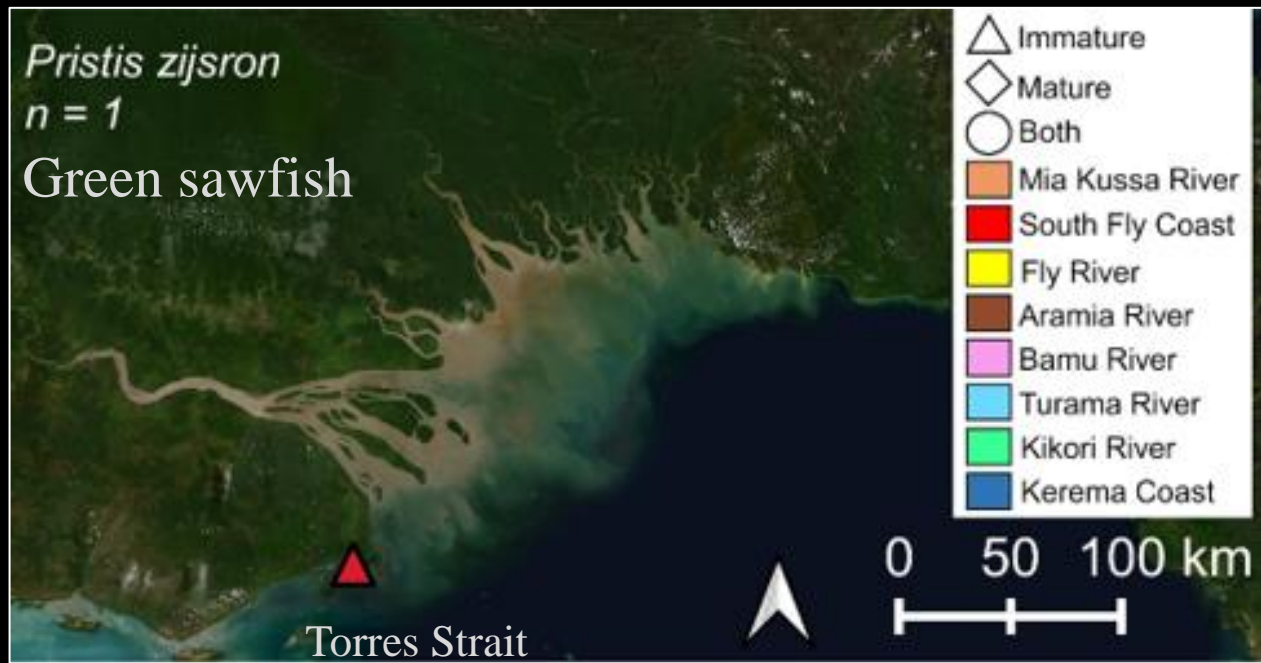
Anoxypristis cuspidata
 $n = 52$
Narrow sawfish



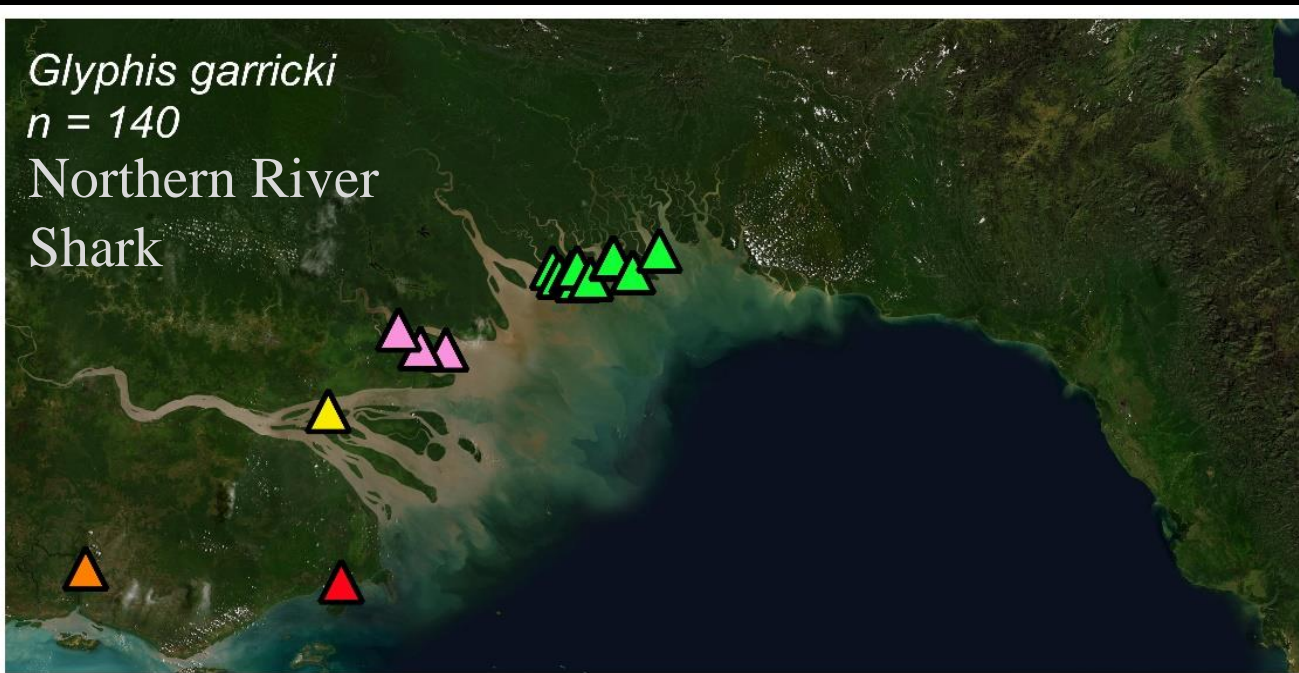
Pristis clavata
 $n = 9$
Dwarf sawfish



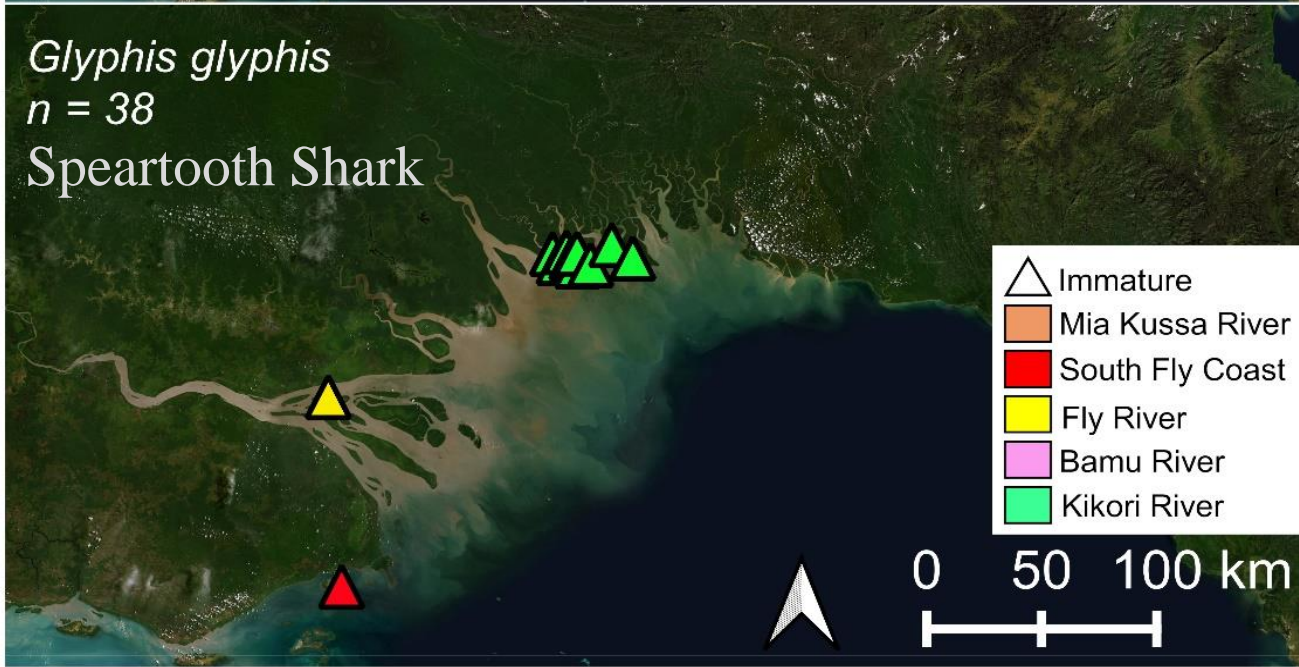




Glyphis garricki
n = 140
Northern River
Shark

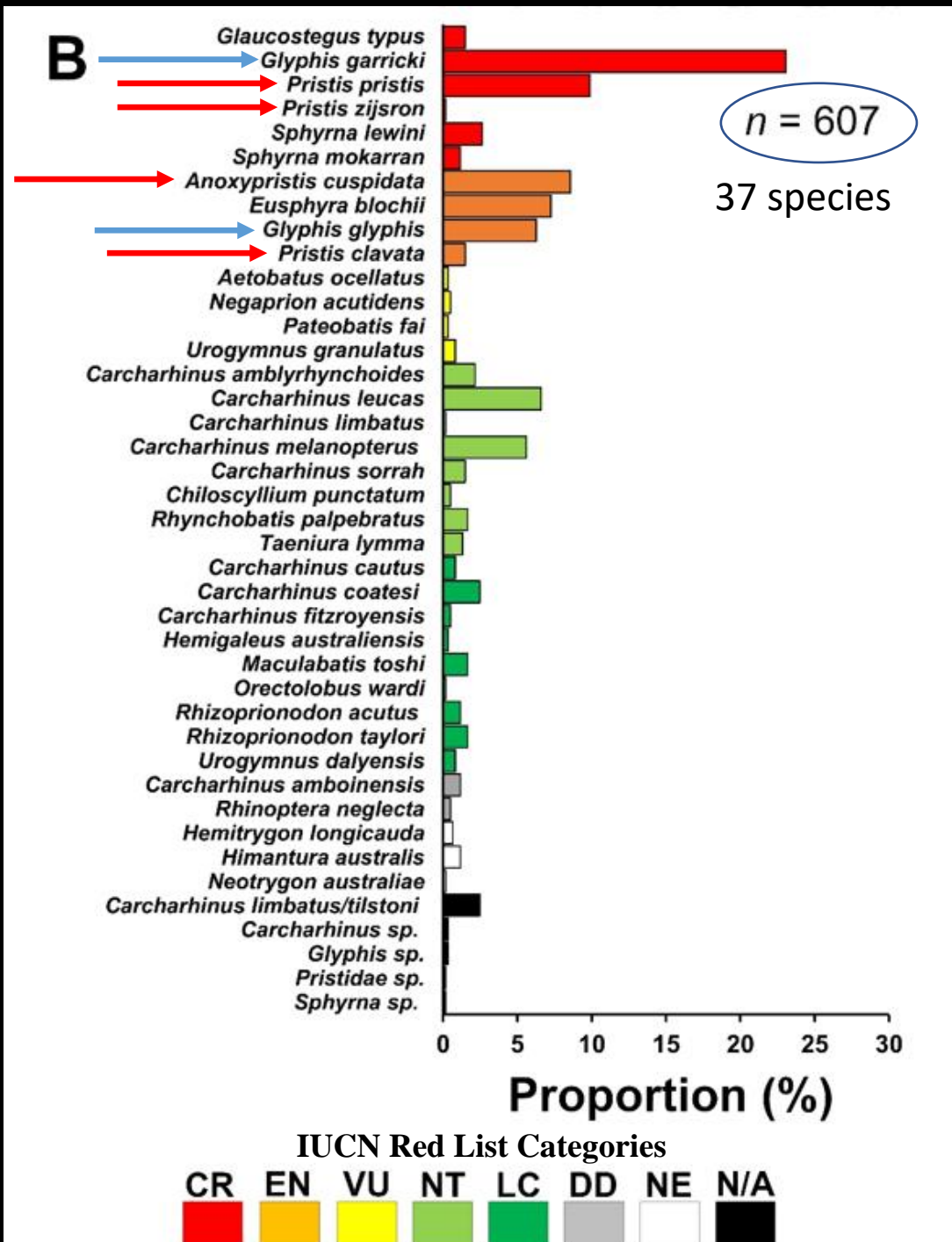
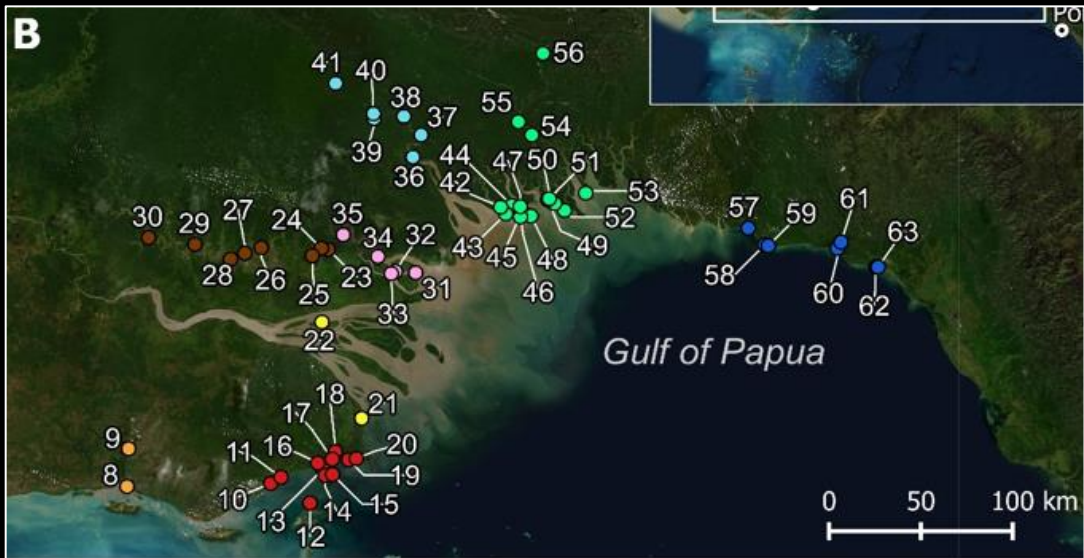


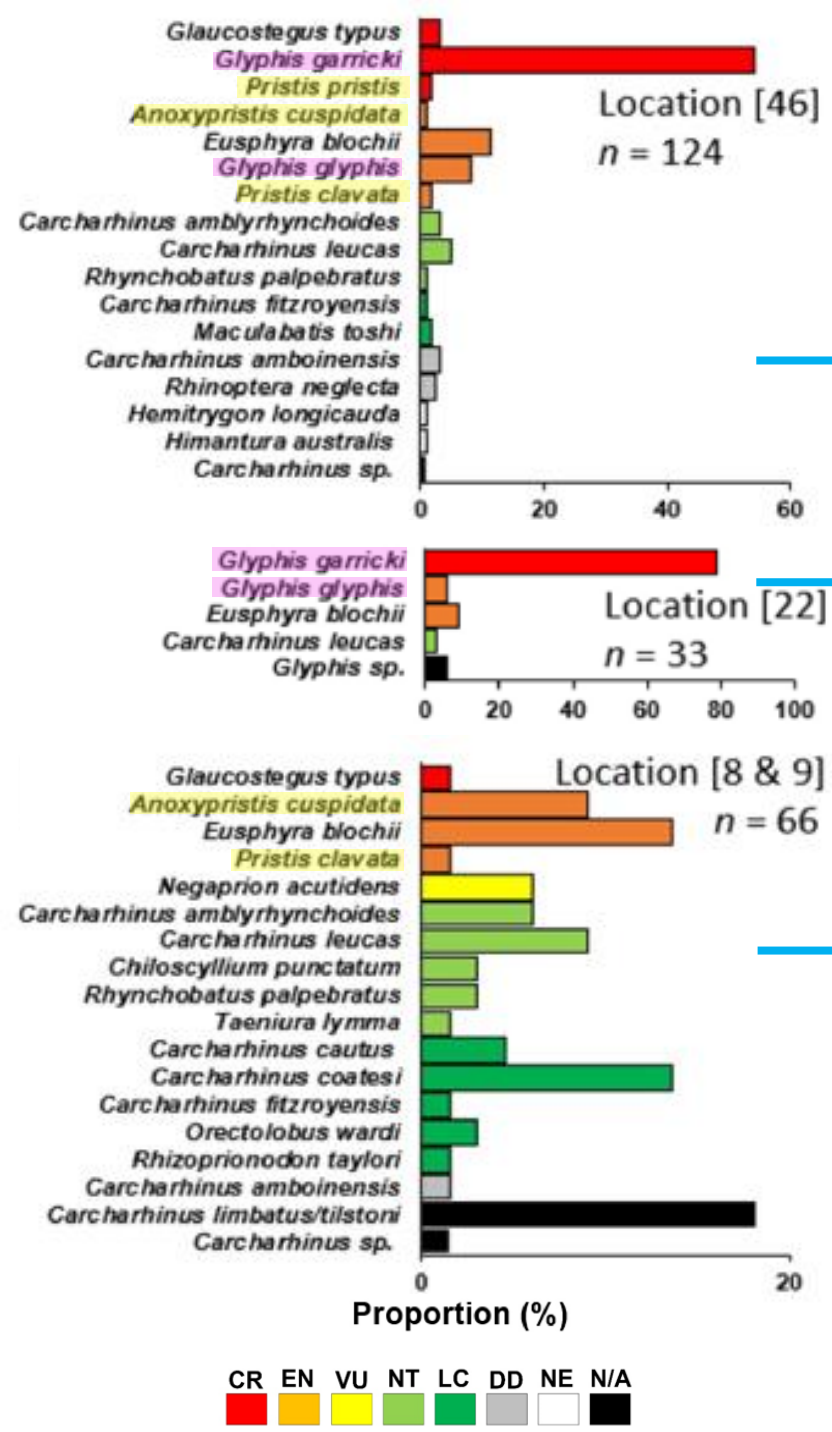
Glyphis glyphis
n = 38
Spear-tooth Shark



50.2% of observations were *Glyphis* (29.7%) or sawfish (20.5%)

Most observed
Glyphis garricki $n = 140$
Pristis pristis $n = 60$
Anoxypristis cuspidata $n = 52$





Kikori River Delta – *Glyphis* 62.1% of catch
 Fly River – *Glyphis* 84.9% of catch
 Mia Kussa River – Sawfish 10.6% of catch

The management issue...

Swim bladder – Jewfish & Barramundi

Up to \$1400 PGK (~\$600 AUD) per Kilogram

Gulf Prov. Fisheries (2020)



Shark fin

\$2–70 PGK per kg in domestic markets

Shark meat

\$1–25 PGK per piece or whole small animal

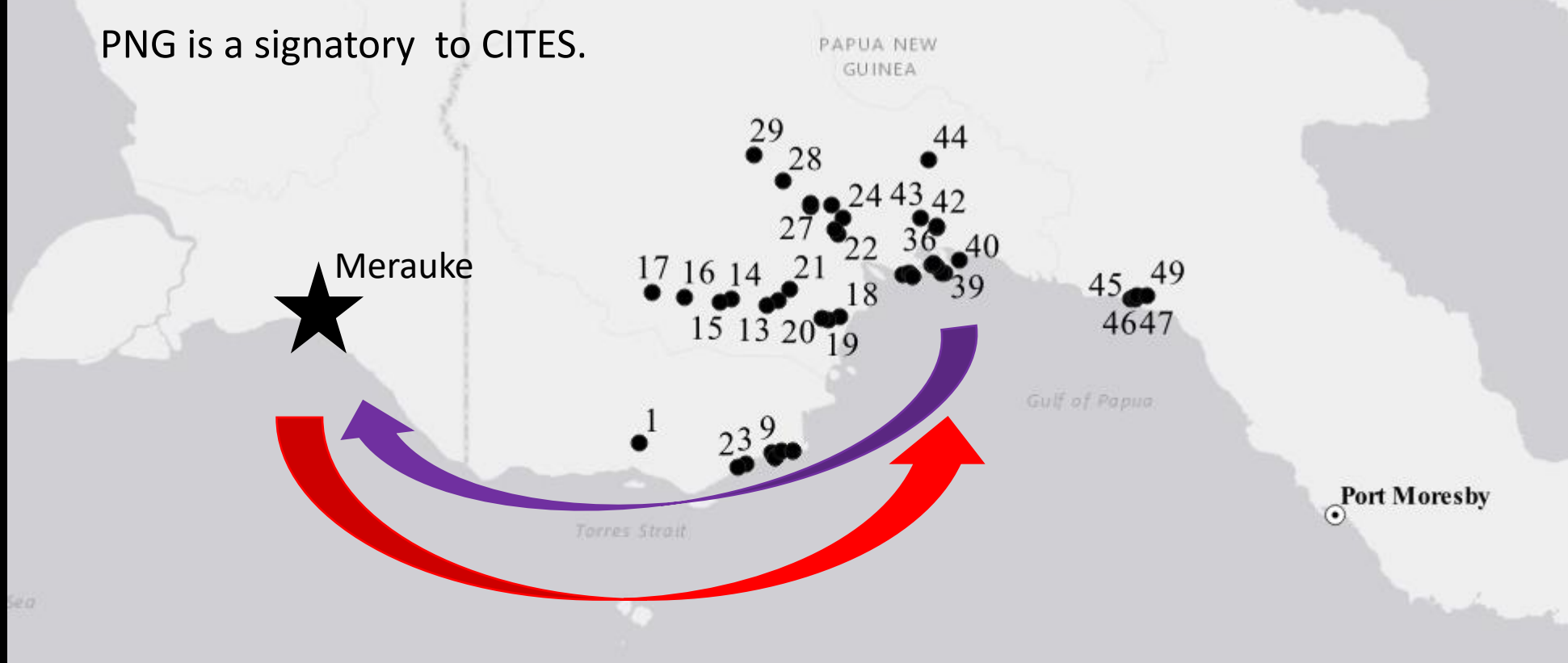
Grant et al, (Unpubl data)



Fishers fetch higher prices for swim bladder and shark fin in Indonesia, compared to domestic markets

Sawfish are listed on Appendix I of the Convention on International Trade of Endangered Species of Flora and Fauna (CITES)

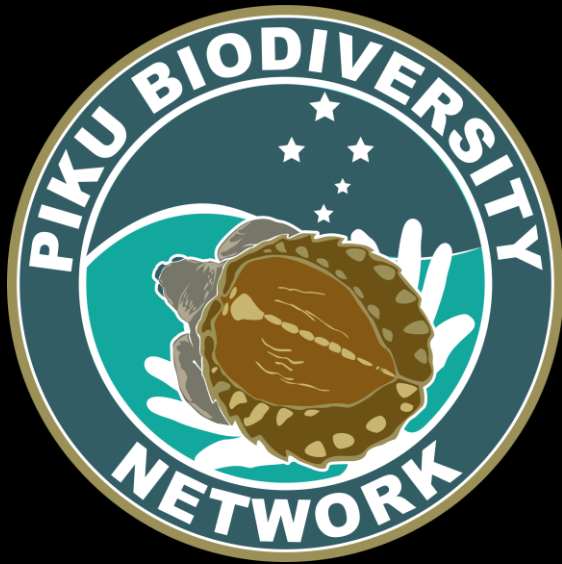
PNG is a signatory to CITES.



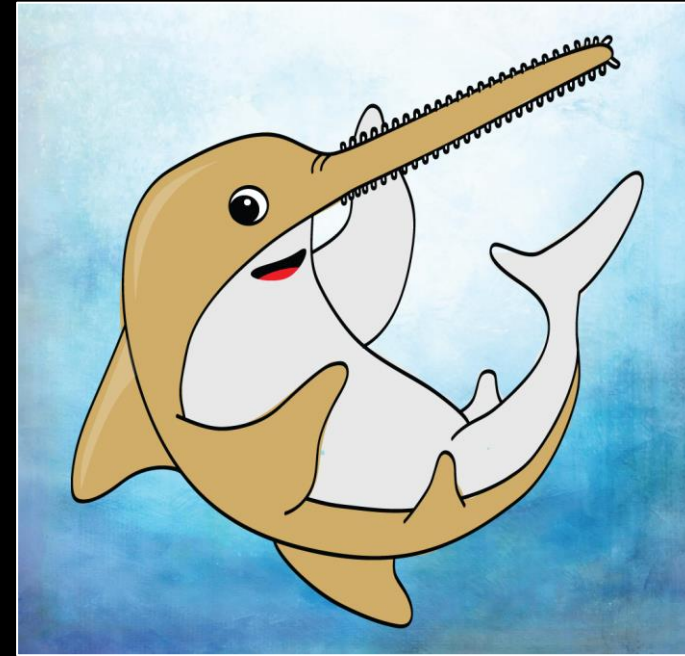
Moving toward refuge status...



National authorities



Community Engagement



Education & Outreach



Encouraging live release

Dr. Andrew Chin (JCU)
Prof. Colin Simpfendorfer (JCU)
Dr. William White (CSIRO)
Dr. Peter Kyne (CDU)
Dr. Carla Eisemberg (CDU)
Dr. Madeline Green (CSIRO/UTAS)
Floriaan Devloo-delva (CSIRO/UTAS)
Dr. Pierre Feutry (CSIRO)
Dotty Ibana (Gulf Prov. Fisheries)
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Melissa Joyce (JCU)
Sushmita Mukherji (JCU)
Dr. Stacy Bierwagon (JCU)
Darcy Roeger (JCU)
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Dr. John Carlson (NOAA)
Mathew Young (UOC)
Prof. Arthur Georges (UOC)
Nigel Mapmani (UPNG)
Dr. Ralph Mana (UPNG)
Dr. Nicole Phillips (USM)
Anthony Nagul (WCS)
Stanely & Dick Jogo (West Prov. Fisheries)
Jagara Page (Katatai Village)
Sampson & Baera Nawia (Daru Island)
Obiri Bottu, Nagai Thomas, Aikuru Ba'au, Baibai, Max Aimari, Kenneth Korokai (Goare Village)



