

Importance of the Mitchell River (Queensland, Australia) as habitat for freshwater sawfish *Pristis pristis*

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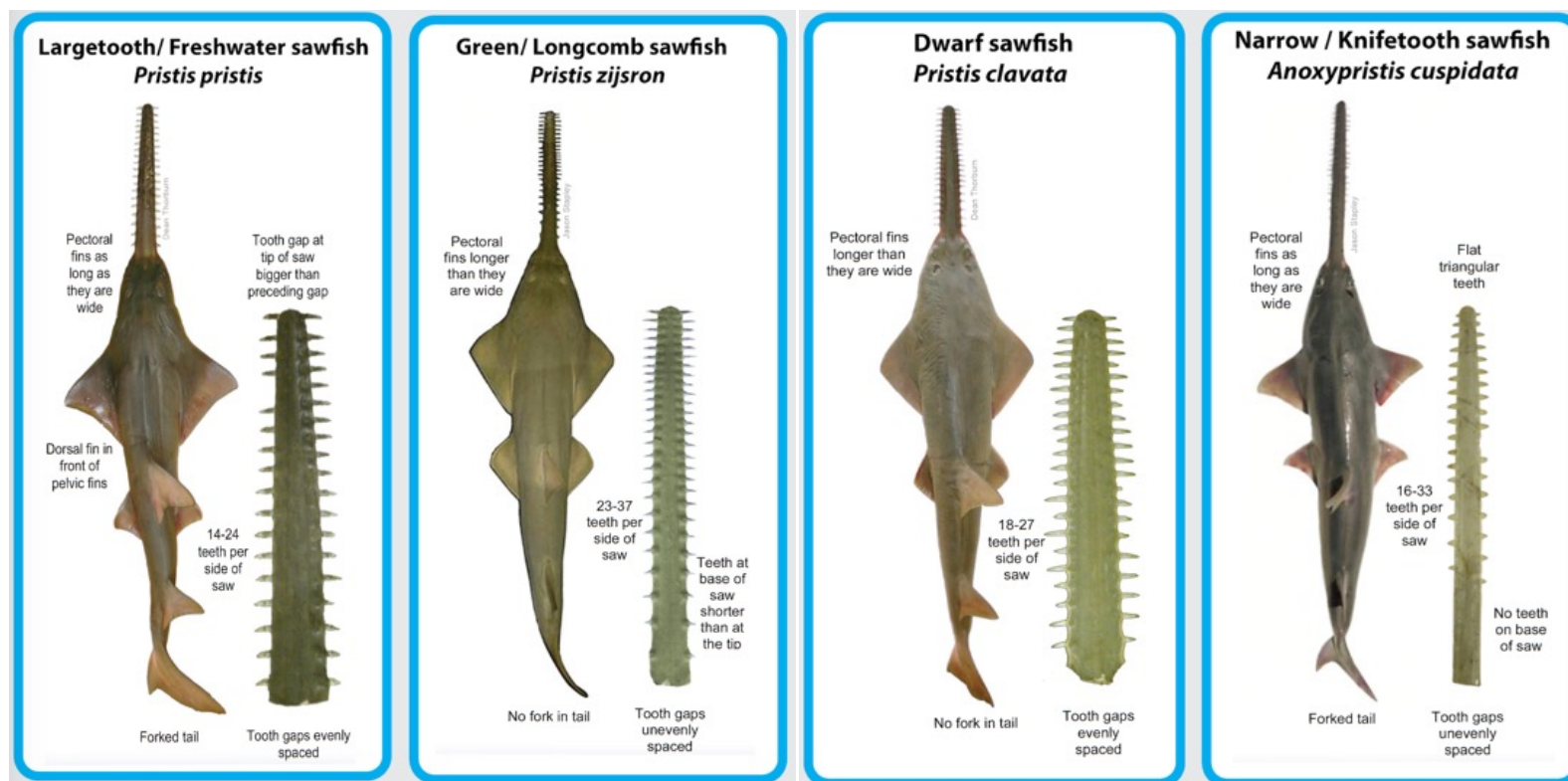


Pristidae

- 5 sp. globally, 4 in Australia
- Shark-like batoids
- Sawfish can grow to 5 – 7 m length
- All sp. Listed on IUCN Red List as (Critically) Endangered
- **Australia:** sawfish federally listed on EPBC (Environment Protection & Biodiversity Conservation) Act since 2009
- **Queensland:** sawfish are no-take species under Fisheries Act since 2009
- Possession & targeting is illegal

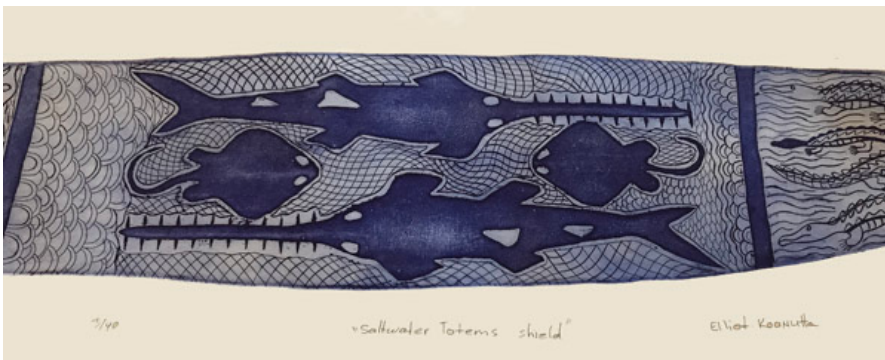


Sawfish species



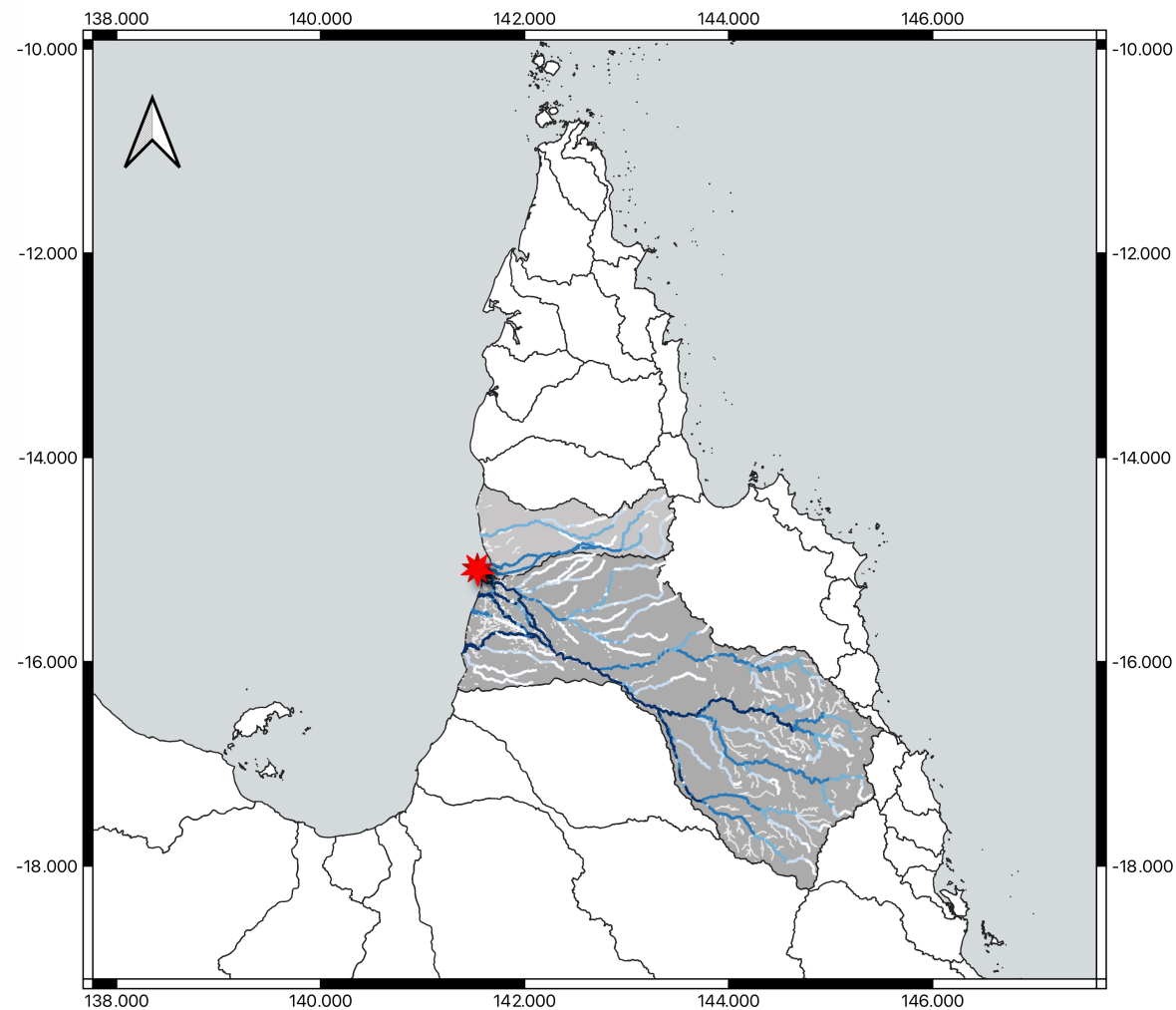
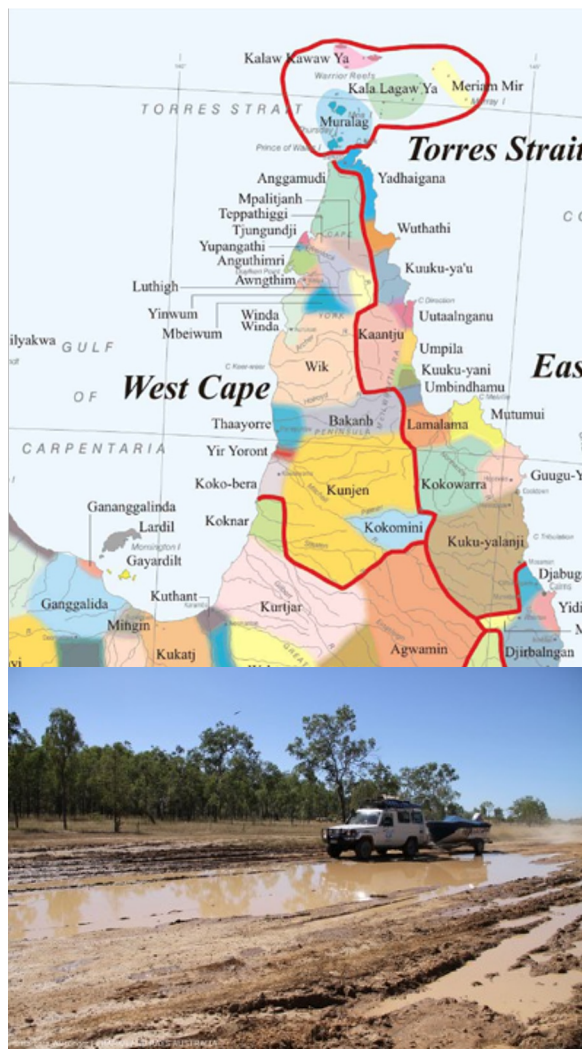
Pormpuraaw, QLD

- Elder Syd Bruce Shortjoe
- “*kapainyinh*” language word for sawfish
- Loss of totem species → loss of language → loss of culture
- Mental health implications



<https://www.sharksandraysaustralia.com/cultural-importance-sawfish/>





Collaborators

- Collaboration between SARA & Kowanyama Land and Sea Rangers ongoing since 2016.
- Ongoing relationships with Kowanyama Council, PBC (Prescribed Body Corporate – holds Native Title), Traditional Owners, and local school!
- Ongoing relationships with stations managers along the Mitchell River and tributaries
- Cape York NRM, Gulf Savannah NRM
- Queensland Fisheries Boating Patrol

Data from 4 sources:

- Public sightings
- Trophy saws
- Environmental DNA
- Field surveys

Methods – Public sightings

- Submit your sighting to www.cytags.com
- Data collected includes: Date, Species, location (GPS marks), capture vs. sighting, how captured?
- Over 1400 sightings in total, 727 from Queensland.
- Various confirmation categories:
 - Highest – image with metadata (GPS & date)
 - Lowest – anonymous submission no follow up
- Every single submission is followed up!



Methods – Trophy saws

Confiscations

Donations

**Privately
owned saws**

Our data set

N = 723 saws
100 years

**Kowanyama region
/ Mitchell River**

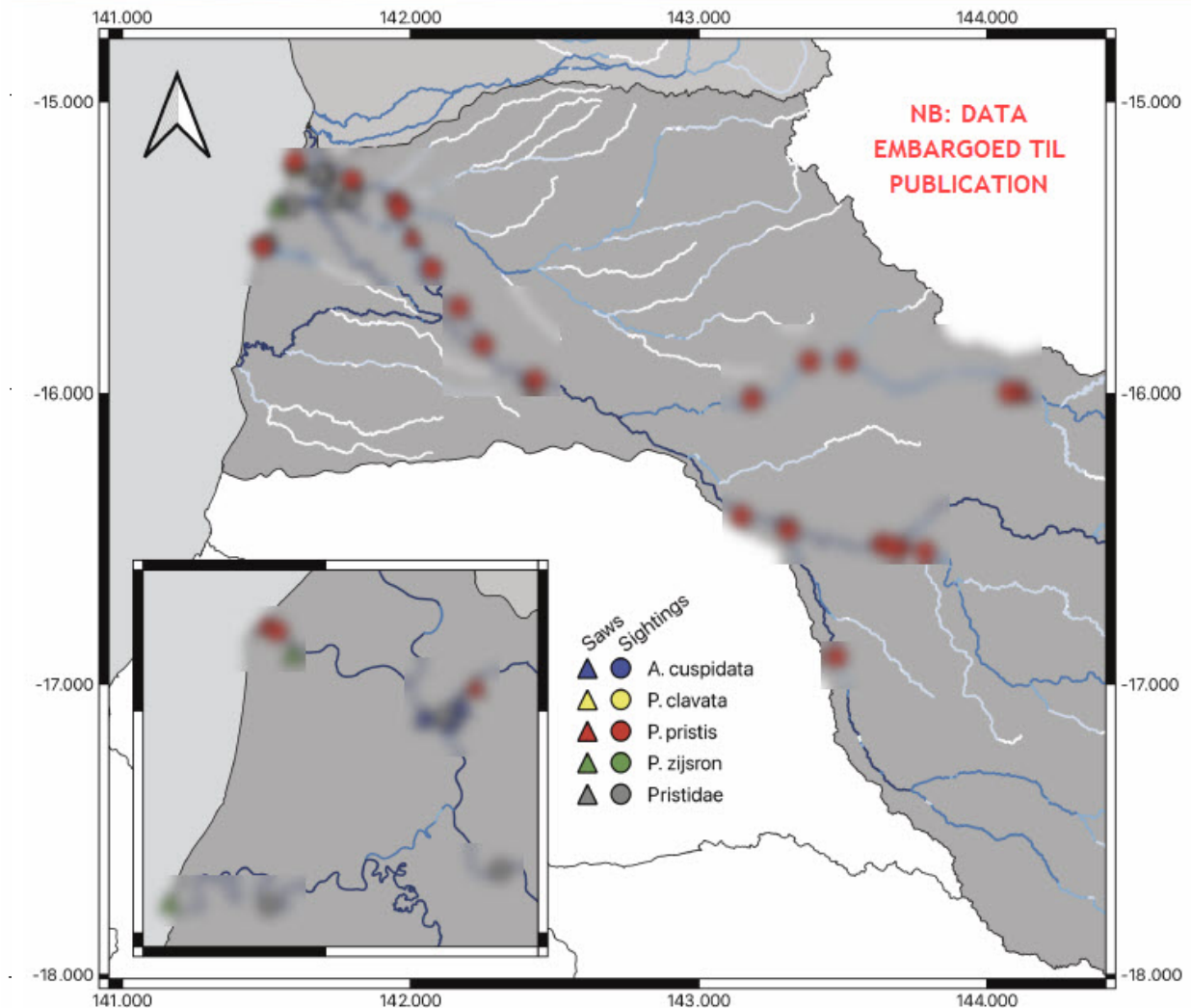
- Each saw has location & year of death available
- N = 59



See also: Wueringer BE, Biskis VN, Pinkus GA. 2023. Impacts of trophy collection and commercial fisheries on sawfishes in Queensland, Australia. *Endangered Species Research* 50:133-150.

Results – Sightings & saws

- N = 51 **sightings**, 1984 – 2022
- 2 species *P. pristis* and *A. cuspidata*
- Up to 300 km inland
- Most recent sexually mature *P. pristis* (TL 300cm) in upstream regions (Walsh River) in 2001
- N = 59 **saws**, 1970 – 2019
- N = 41 origin between Mitchell River and NT border, most *P. clavata*
- N = 9 *P. pristis* saws from commercial fishers in early 2019, mouth of the Mitchell River, TL 200 ± 13.4 cm (juvenile)



Important examples:

- SUB0739: 5 mature *A. cuspidata* finned & de-sawed at mouth of South Mitchell River, in 2005, when they were not yet protected.
- SUB808: September 2021 Kowanyama School kids spotted a small sawfish during a school trip to one of the local camping spots at dusk, 2 weeks after SARA & rangers visited the school. Whole class made the submission together.

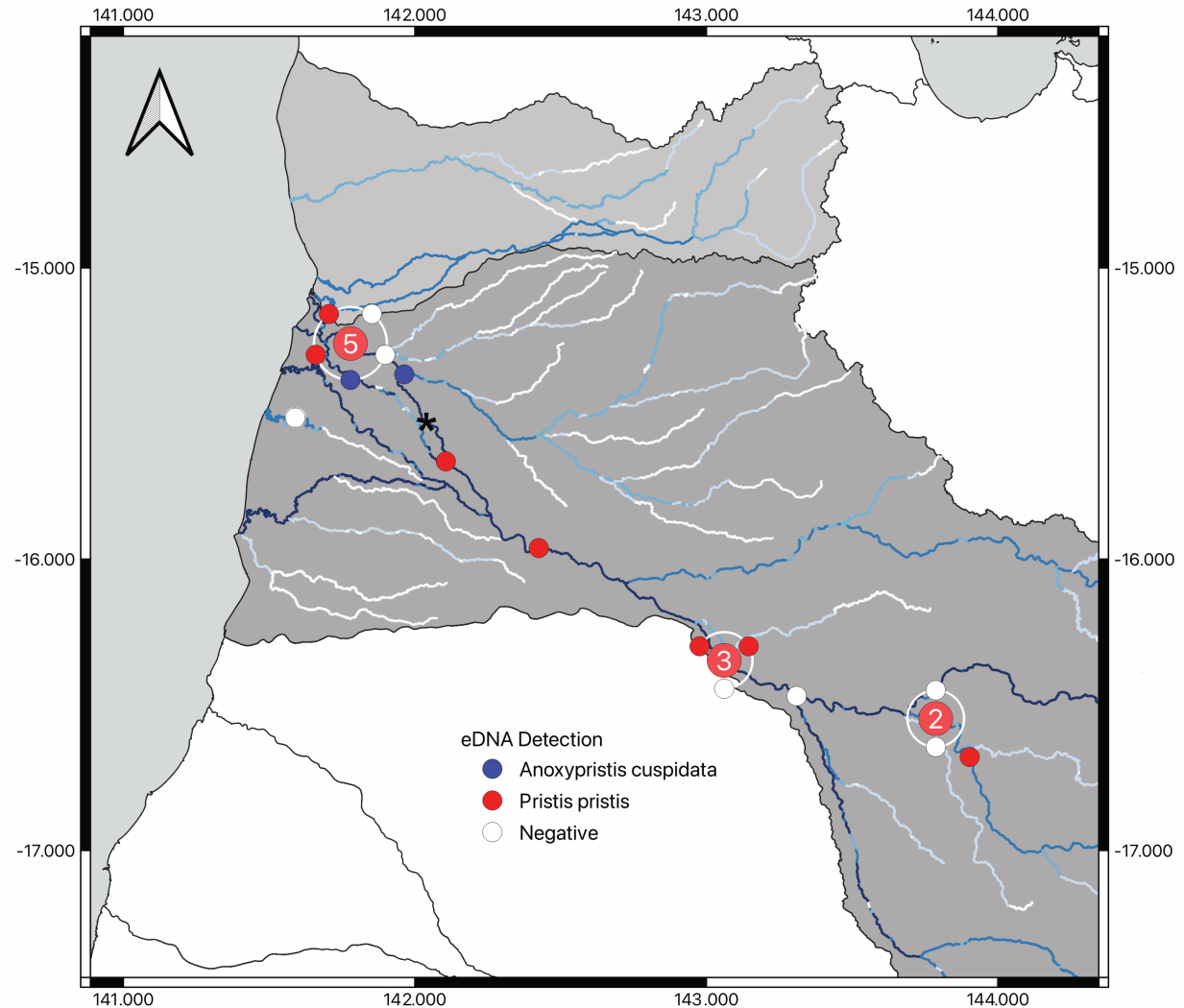


Methods – collection of eDNA

- Target is mitochondrial DNA suspended in water
- 4 sp. up to 100 km inland, then 1 sp.
- Water is filtered on site – we ♥ buckets 😊
- 1 EC, 5 replicates (3-10l each)
- Filter (20 μ m in pore size, $\varnothing$ 4.7 mm)
- Preserved in Longmire Solution
- Sample analysis by JCU TropWater
- Extraction & qPCR replication protocol after Cooper (2021)

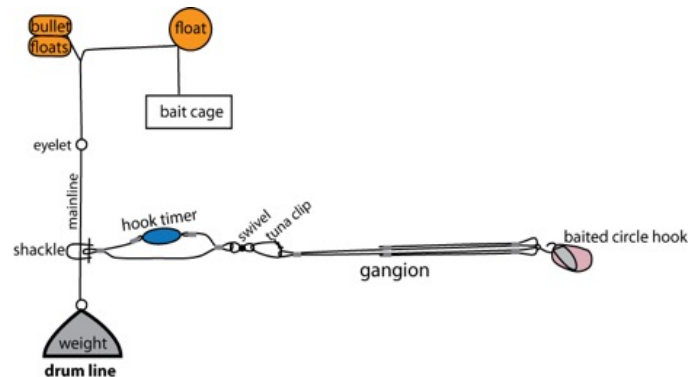


- Yrs 2020 – 23: 16 sites sampled
- 2 species detected: *P. pristis* and *A. cuspidata*
- Results complement other methods!
 - Last sawfish caught by our team in 2018,
 - but 9/16 sites positive for eDNA,
 - 8 of those sites also sampled with handlines / drum lines / gill nets



Methods – field work

- 3 types of gear:
 - Bottom set gill nets: 6" mesh, drop 33 meshes, length 25-50m
 - Drumlines: single circle hook
 - Handlines: small J hooks (barra hooks) or 14' circle hooks
- Method of choice depended on external circumstances (launch site, depth, presence of curious crocodiles, presence of other vessels, etc.)



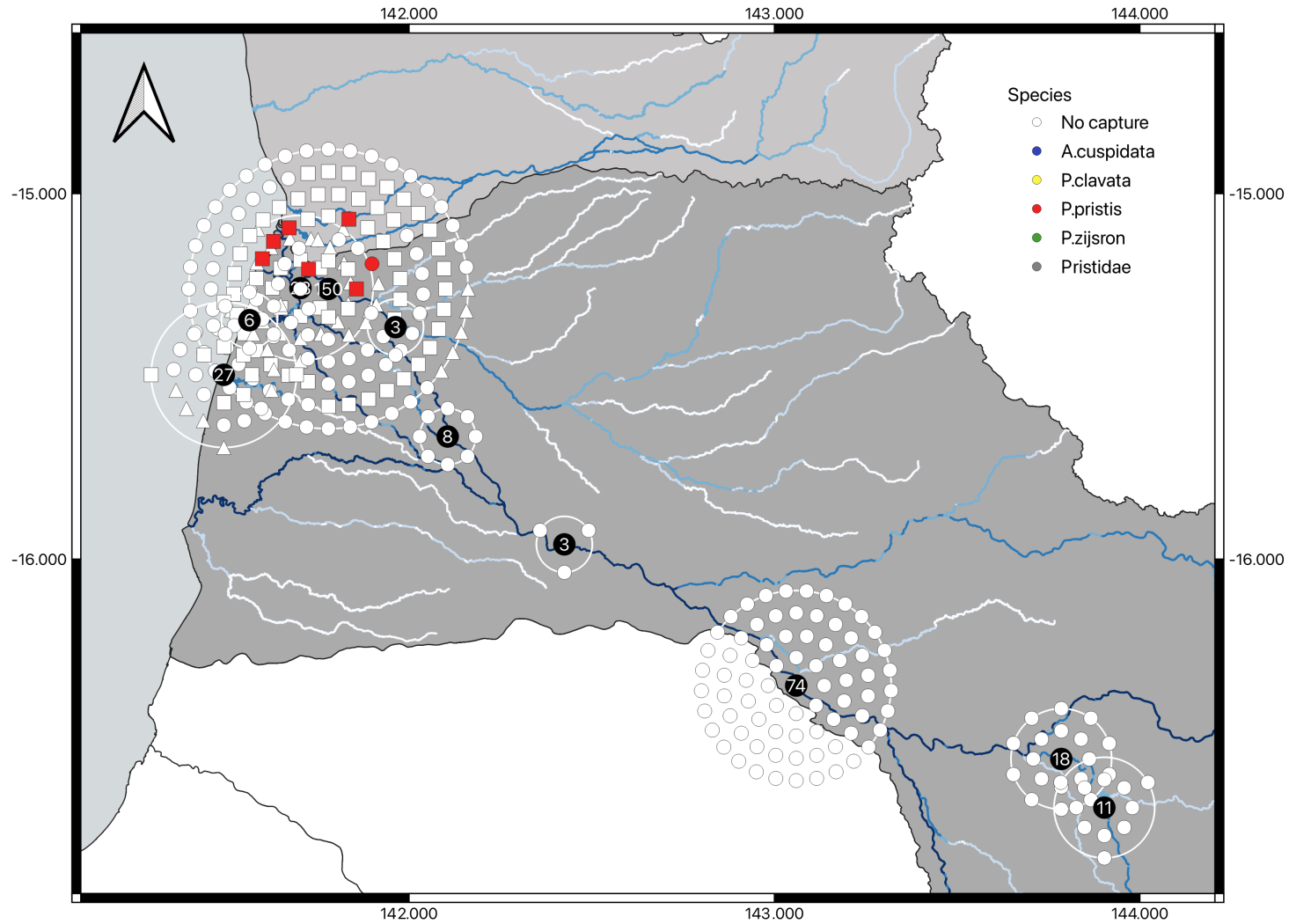
Results – field work

- 2016 – 2023, one field trip per year, 2 weeks each.
- 39 drumlines (2.8 ± 1.6 h), 74 gillnets (3.7 ± 1.5 h), 215 handlines (2.7 ± 1.7 h)
- N = 76 elasmobranchs of 5 species caught:
 - *Urogymnus dalyensis* 48.7%,
 - *Carcharhinus leucas* 42.1%,
 - *P. pristis* 6.5%,
 - *Aetobatus ocellatus* 1.3%,
 - *Carcharhinus limbatus/tilstoni* 1.3%
- 3 recaptures, 2 *P. pristis* recaptured within 2 days of initial capture
- N = 5 *P. pristis*, TL 167 ± 106 cm, age 2.5 ± 3.2 yrs.



sara187: *P. pristis* female, TL
344cm incl saw – sexually mature





The bigger picture

- When working with rare/ threatened / cryptic species, using a combination of methods is important!
- Gill nets most efficient way to capture sawfish.
- Three (four?) species of sawfish confirmed in waters of the Mitchell River and coastal/estuarine habitat
- Juvenile freshwater sawfish confirmed in 4 tributaries of the Mitchell River, up to 300 km upstream.
- Last sawfish captures in downstream regions a year before confiscation of saws (2019, coincides with drop in crocodile abundance), but positive eDNA afterwards.
- But low number of data points really shows that better protections are required.

Acknowledgements

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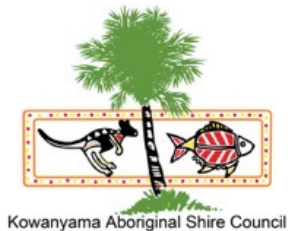
All our interns & volunteers ☺

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This study is dedicated to Louie Native and Viv Sinnamon.



Daniela Matheus Holland | SHARKS AND RAYS AUSTRALIA



**Shark
Conservation
Fund**



**Queensland
Government**



Mitchell River ISRA

