

Trialing shark bycatch release devices on board purse seiners in the Pacific Ocean to enhance shark survival

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- Tropical tuna fisheries catch 5.2 million tonnes annually (2023).
- Sharks are vulnerable due to slow growth, late maturity, low fecundity.
- Shark bycatch in tuna purse seine fisheries can risk shark populations sustainability.
- Shark best handling and release protocols were developed over 10 years ago (Poisson et al., 2012) and have not been updated until recently (Hutchinson et al., 2024; Murua et al., 2024).

To investigate the post-release survivorship (PRS) of sharks in tuna purse seiners operating in the Pacific Ocean when released using most updated best handling and release practices for sharks (i.e., hopper with a shark release ramp).

Specifically:

- Evaluate best handling and release practices with a shark release ramp.
- Quantify post-release survival using tagging, vitality index, lactate levels.
- Conduct skipper training workshops to promote best practices.
- Update safe-handling and release Best Practices for vulnerable fauna bycaught in tropical tuna purse seine fisheries

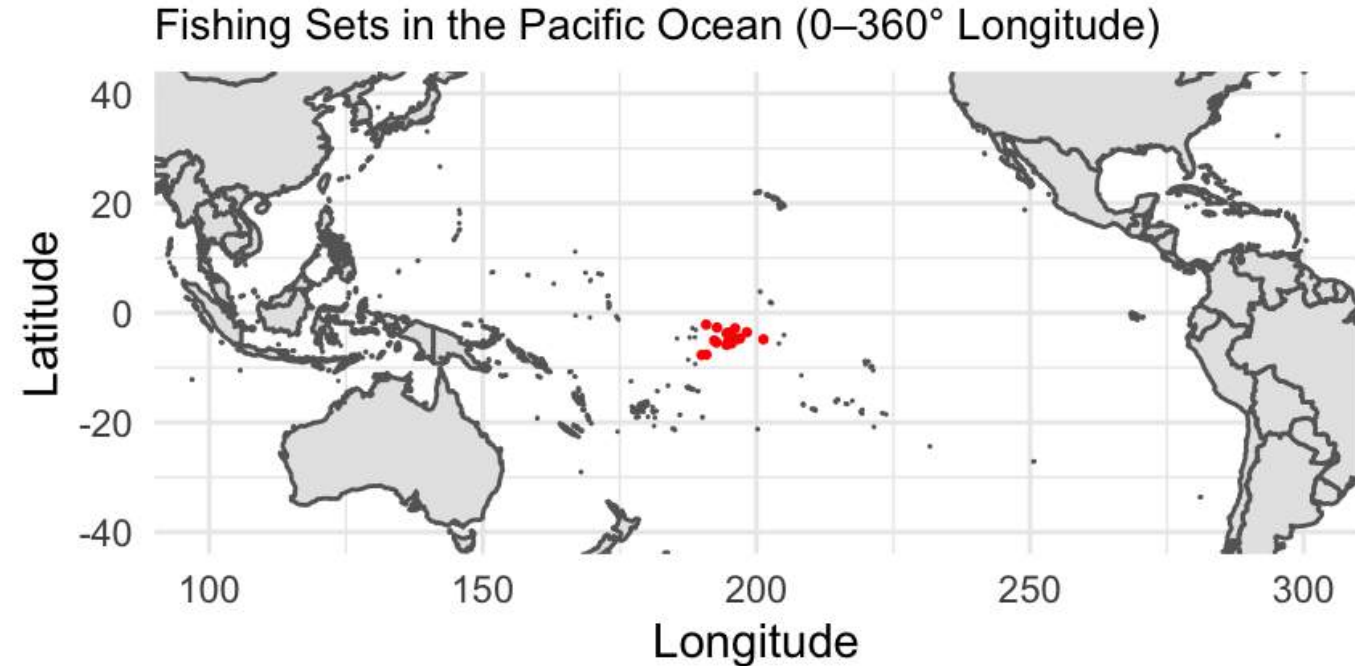
Shark Release Ramp

- Ramp made of marine-grade aluminum,
- 8.6 m. in length, 0.55 m. in width, and a maximum height of 1 m. near the hopper
- Not permanently affixed to the hopper, connects the hopper to sea, facilitating rapid, low-stress releases of sharks
- Detachable, water hose keeps the surface wet, easy installation/removal
- Affordable between \$2000 - \$6500



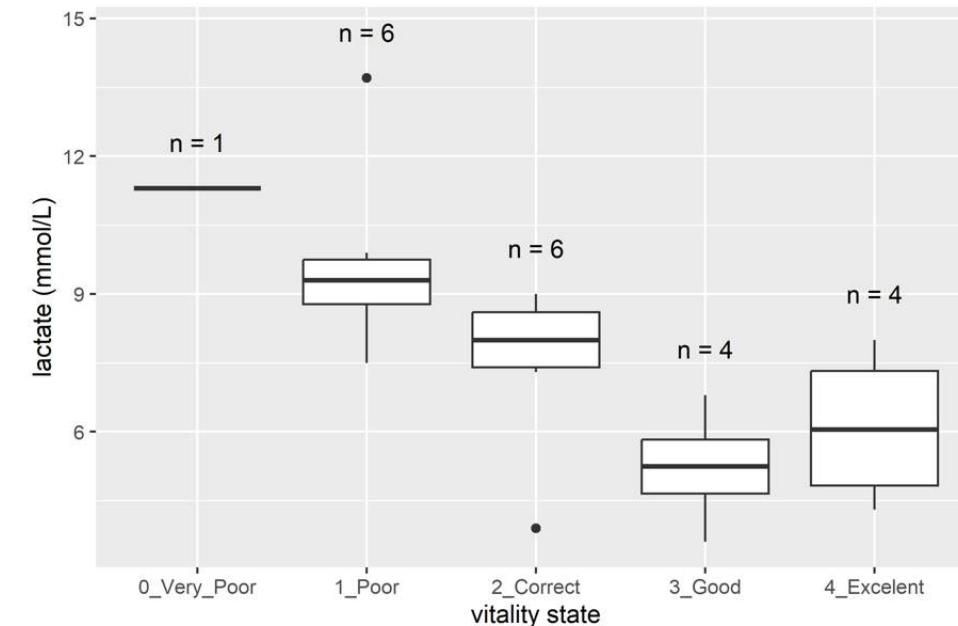
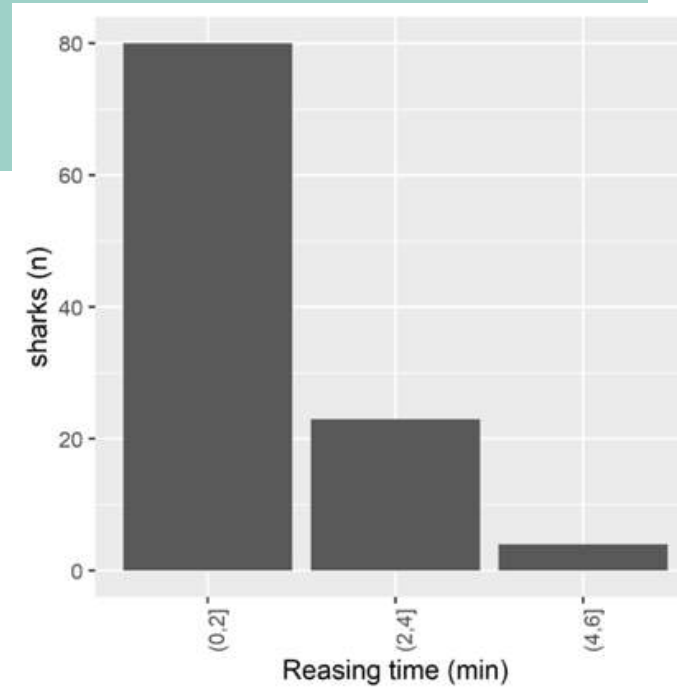


- Trip aboard Cape Ferrat, 28 December 2024 – 30 January 2025
- 17 FAD sets
- 134 sharks caught: 122 silky, 11 oceanic white-tip, 1 hammerhead.
- Data collection
 - Shark, brail #, brail position, release mode, time of release, vitality/condition index, fate after release.
 - Blood simples, lactate
 - 4 satellite tags (normal behaviour > 10 days after release considered survival).



Results: Key Findings

- 98.5% sharks released via ramp, mostly within 2 minutes.
- 47% showed poor/very poor condition at release, which are considered as deaths.
 - 49% for silky shark (59 out of 120)
 - 27% for oceanic white-tip shark (3 out of 11)
- Blood lactate levels correlated with vitality; higher in stressed sharks.

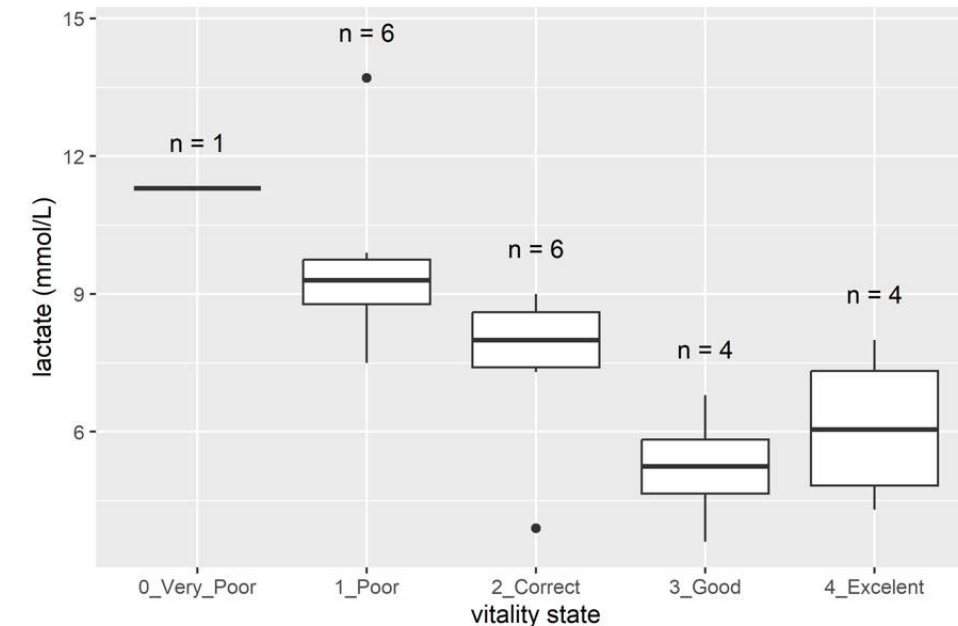
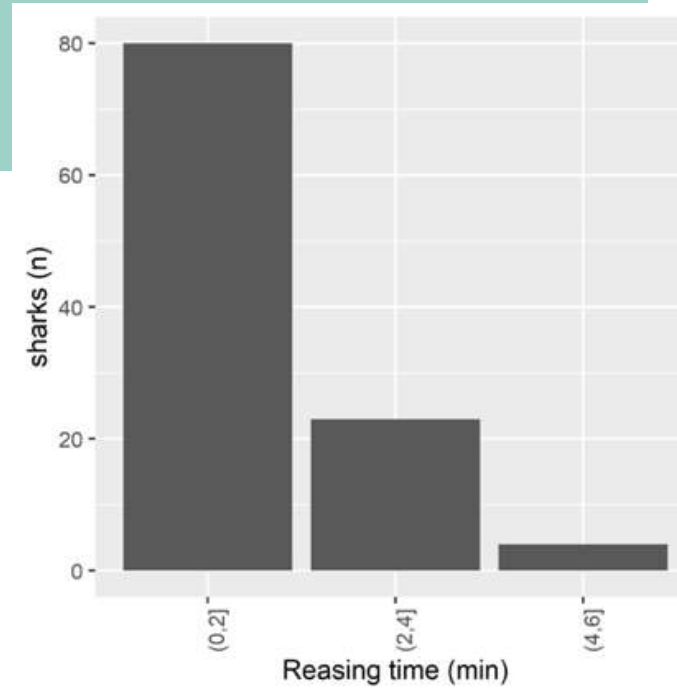


Design and test sorting grids

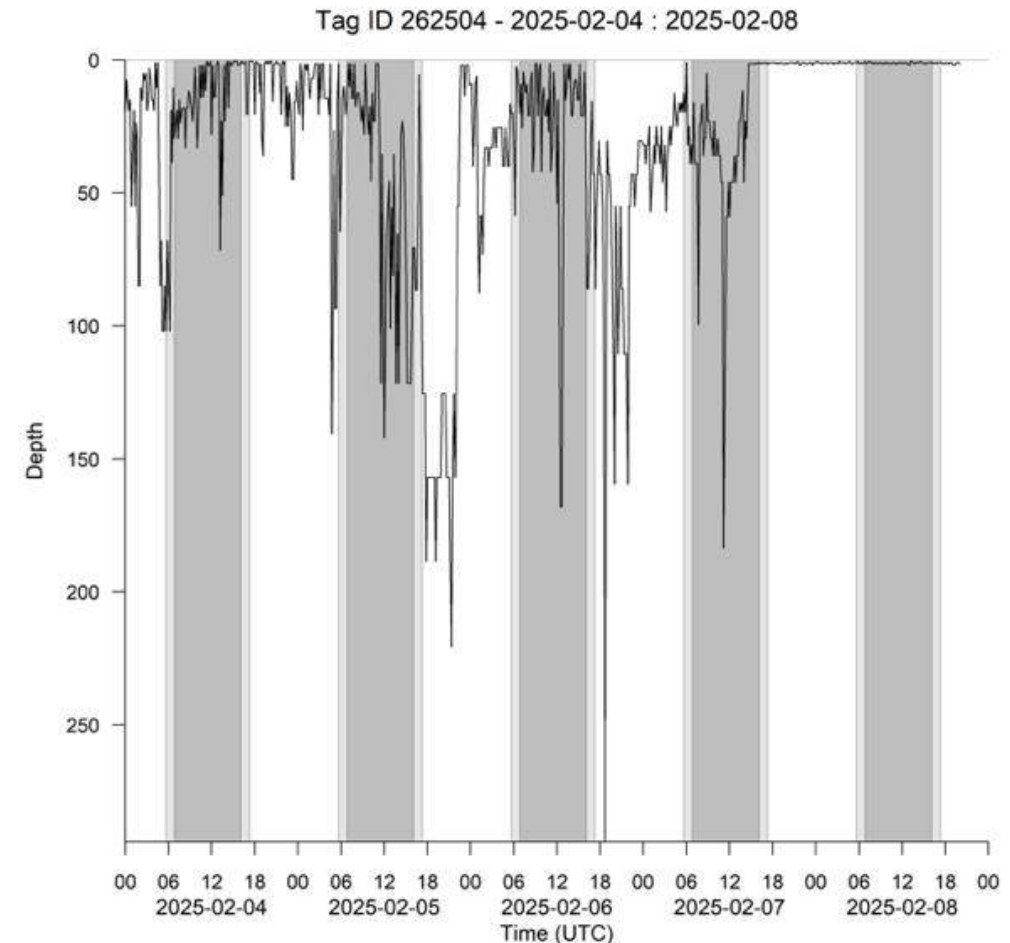


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- 4 sharks tagged: 3 FAL and 1 OCS
- 3 FALs showed survival signs (7–32 days, premature detachments) and OCS tag failed to transmit data.
- Normal vertical movement patterns indicate likely survival: shallow depth distributions, typically remaining above 150 m and spending considerable time at < 50 m
- Small sample size limits generalizability.



Workshops & Training

- Held in Pago Pago, American Samoa, March 2024 (a second one in Madeira – Portugal)
- Focused on BRDs, safe release, and biodegradable FADs: four U.S. PS vessels were visited.
- Strong fishers' interest in adopting the ramp system with a hopper.
- All have a mobulid sorting grid.



- A ramp system with a hopper improved operational efficiency, enhanced crew safety, and increased shark survival.
- The cost of the ramp (USD 2,000 - 7,000) is considered affordable for most PS fleets.
- The ramp enabled rapid and safe releases (98.5% of sharks released < 2 minutes), minimizing air exposure and handling stress, both of which affect survival.
- The onboard observer and fishers reported that the ramp did not interfere with other deck operations (e.g., brailing), and fish loading times remained unaffected.
- Skipper and train-the-trainer workshops represent an effective strategy for scaling best practices across fleets, an essential component for the sustainability of vulnerable shark species.
- In summary, given the operational benefits, improved crew safety, and potential for substantial reductions in shark (and other groups) bycatch mortality, the ramp with a hopper represents a cost-effective mitigation measure.



Q & A