Quantifying post-release mortality & identifying best handling practices in a tuna longline fishery WP-EB-07

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Objectives & Background

- Predict survival by creating better indices of condition at the vessel and at release
- Quantitatively assess survival rates with SPATs
- Identify and recommend 'best handling practices' to maximize survival potential
- 3 factors that affect survivability: physiology, time on the line, handling & discard techniques

Study Design

Shark Focus Study -

Data codes developed for observers in the longline fishery to qualitatively assess condition and handling.

Shark Tagging Study – Quantifying post-release survival with satellite tags to elucidate 'best handling' practices

Shark Focus Study

- Create new data codes to record qualitative indicators of condition and handling.

- Estimate how handling affects the condition of sharks from capture to release.

Condition Codes

Current Data Collections

Alive

Dead

Kept

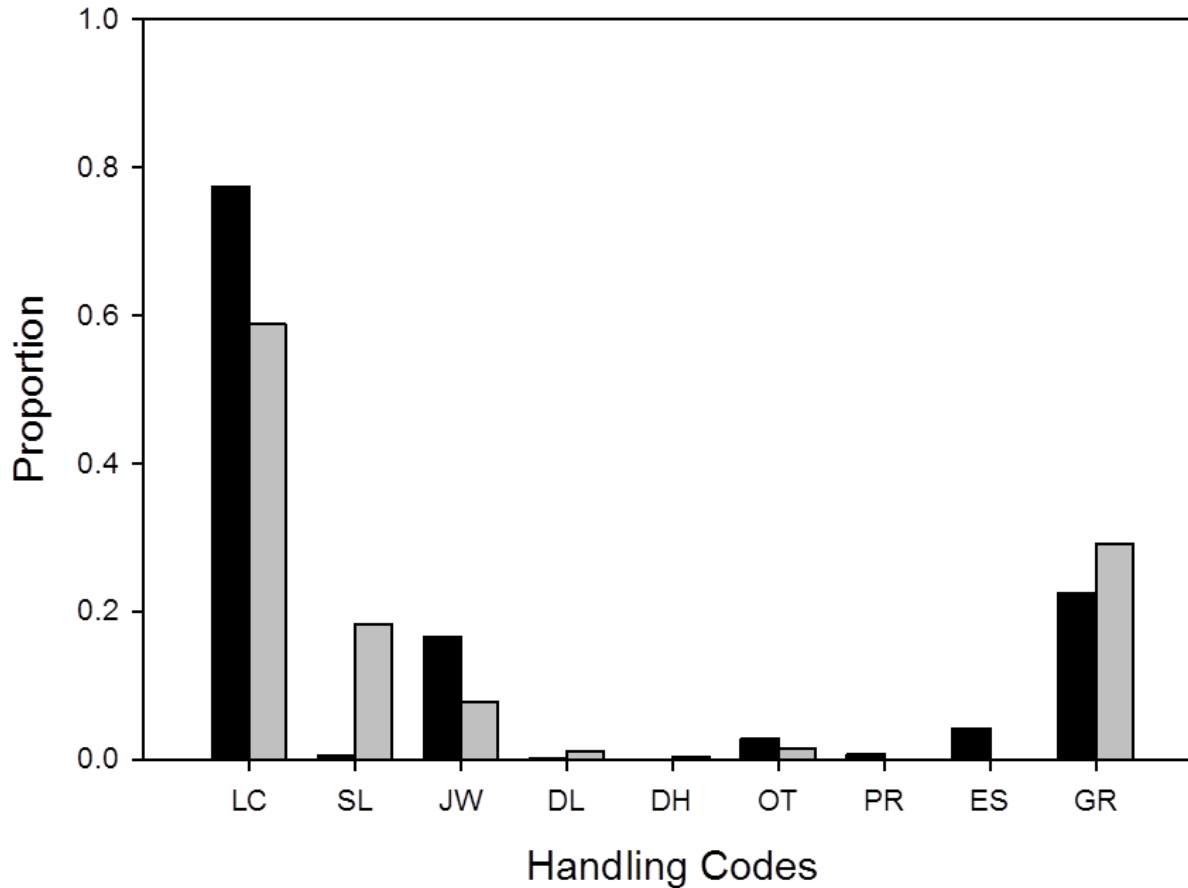**Shark Focus Study Data**

AG = Alive and in Good Condition

AI = Alive Injured

A = Alive

D = Dead

K = Kept

RU = Returned Unobserved

Shark Handling & Damage Codes

LC = Line Cut

SL = Shark Line

JW = Jaw Damage
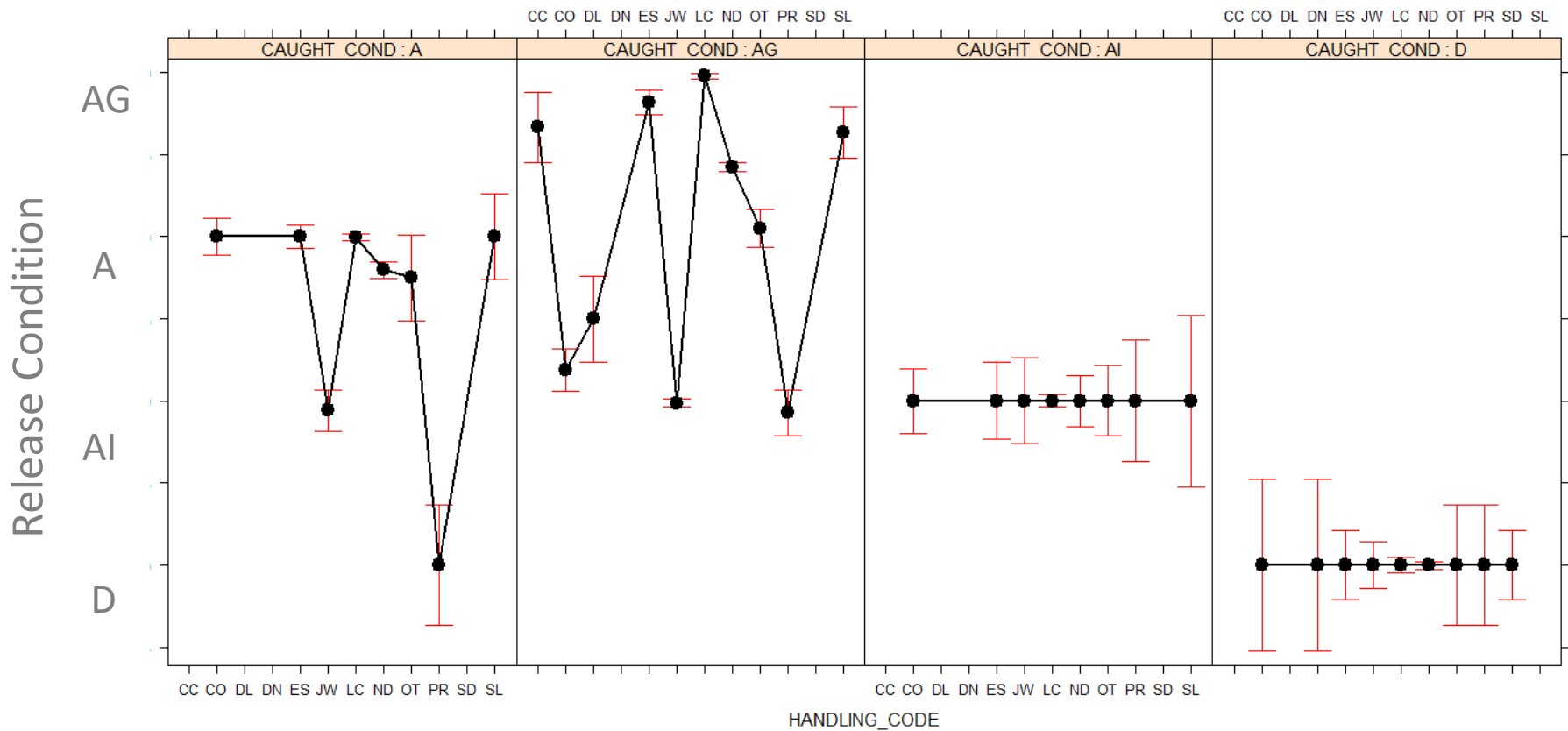
DL = Drag Line

DH = Dehooker

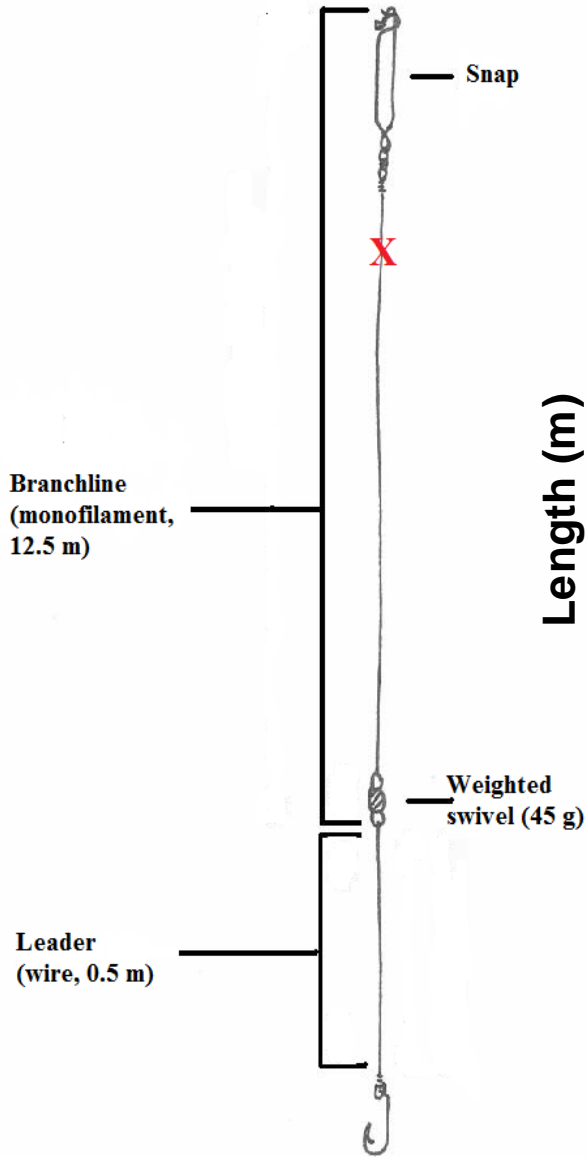OT = Other

PR = Part Removal

ES = Escaped

GR = Gear Removed

Handling Effects on Condition

Paired tests between CC& RC were significantly different (V = 248049, p-value < 0.001).

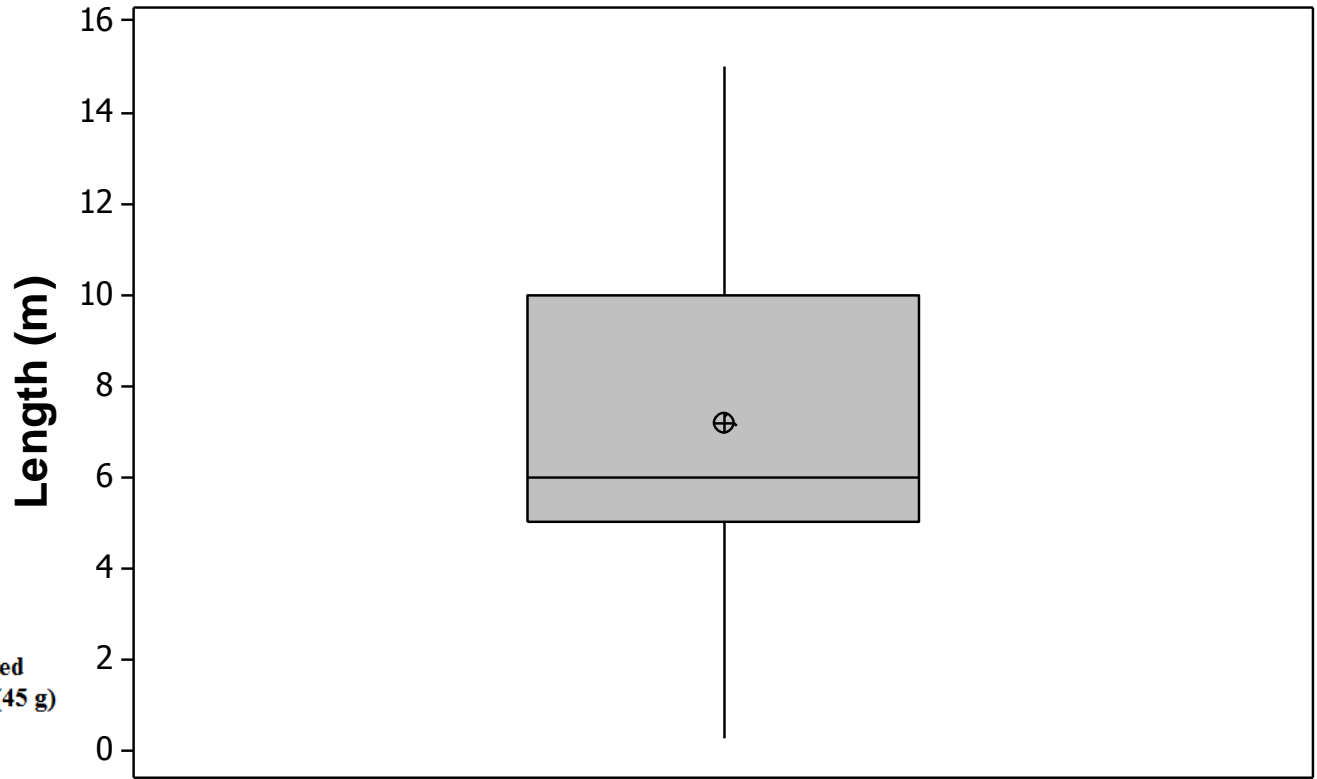Release Condition ~ Handling Code + Caught Condition+ (HC * CC)

Branchline Diagram.

Snap

X

Branchline
(monofilament,
12.5 m)

Weighted
swivel (45 g)

Leader
(wire, 0.5 m)

Gear Remaining

Length (m)

Range = 0.3 – 15 m
Mean Length = 7.2 m
Median = 6 m

Shark Tagging Study

- Sharks are tagged by observers while they are still in the water, fishers then discard the animal however they normally would.

- Post-release fate is measured using survivorship pop-up archival tags (sPAT).

Study Species

Tagging Structure

Handling Method	Shark Species	Condition Criteria	# Survival Tags	Fishery
1. Cut line	Blue	AG	14	Hawaii
2. Gear Removal	Blue	AG	14	Deep Set
1. Cut line	Bigeye Thresher	AG	14	Hawaii
2. Gear Removal	Bigeye Thresher	AG	14	Deep Set
1. Cut line	Oceanic Whitetip	AG	14	Hawaii
2. Gear Removal	Oceanic Whitetip	AG	14	Deep Set
1. Cut line	Silky	AG	14	American
2. Gear Removal	Silky	AG	14	Samoa

Progress: Observer Training

- Developed training materials
- Conducted 3 trainings (Hawaii & American Samoa)
- 16 observers trained
- 25 vessels voluntarily participating

Progress: Tags Deployed

Tag deployments on sharks in 'AG' condition and results to date.

Shark Species	Line Cut		Gear Removed		*in situ*	Total
	S	M	S	M		
Blue	8	1	3	0	4	16[1]
Bigeye thresher	7	3	2	0	0	12
Silky	1	1	0	0	0	2
Oceanic whitetip	0	1	1	0	0	2
Tags at sea						18
Totals	16	6	6	0	4	51

Summary

- Project is in progress

- Several of the SC12 WP and IPs have identified post release survival as a data gap (e.g. EB-WP-06, EB-WP-08, SA-IP-17)

Future Directions

- Awarded additional funding (NOAA BREP) to assess survival in blue sharks in compromised conditions.

- Simulate how survivorship affects populations.

- Find funding to assess survival in additional species and in sharks that are in less than excellent condition at the vessel.

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Thank You
Terima Kasih!