



**Atlantic Ocean Tropical Tuna Tagging Programme**  
*Estimating shedding and reporting rates  
for conventional tags*

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***ICCAT Secretariat***

IATTC Tagging Workshop

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**ICCAT CICTA CICA**



# Tag shedding – experimental design

- Objective: 20% double tagged by species & team

	<b>Senegal</b>	<b>GoG</b>	<b>Canaries</b>	<b>Azores</b>	<b>Brazil</b>	<b>S Africa</b>	<b>St Hel</b>
<i>released</i>	13942	38045	9586	7960	30838	196	1518
<i>double tag</i>	2737	6377	1419	1257	5509	13	340
<i>% double tag</i>	<b>0.2</b>	<b>0.17</b>	<b>0.15</b>	<b>0.16</b>	<b>0.18</b>	<b>0.07</b>	<b>0.22</b>

<b>BET</b>	<b>SKJ</b>	<b>YFT</b>	<b>LTA</b>
0.19	0.18	0.14	0.21





# Tag shedding – experimental design

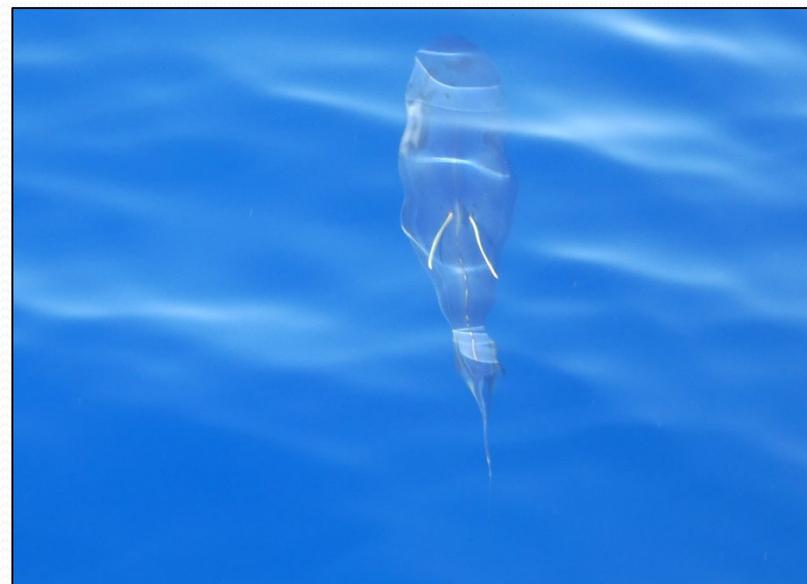
- Single = left side
- Double = both side
- Sequential or logical sequence of tags

100	101
102	103
104	105

or

100	201
101	202
102	203

- Record tagger

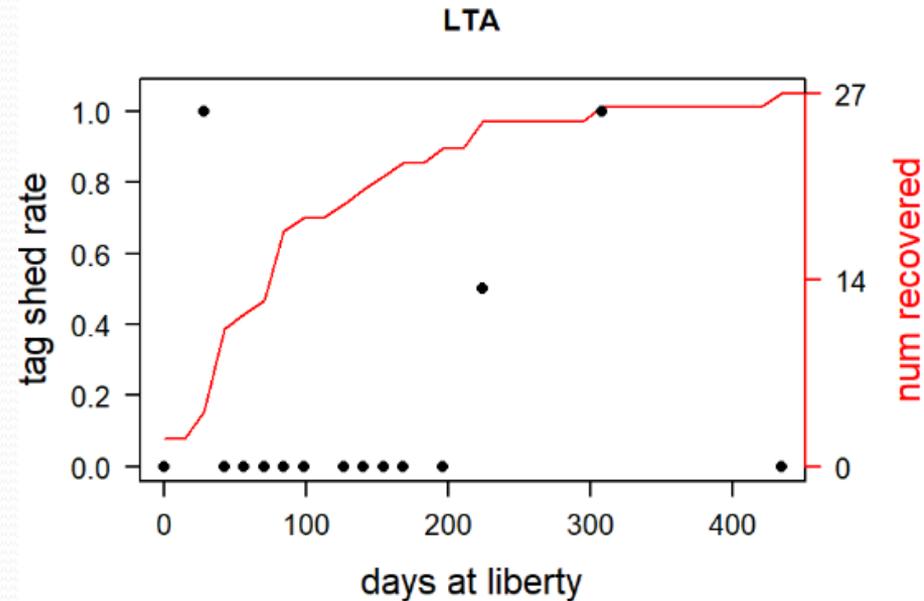
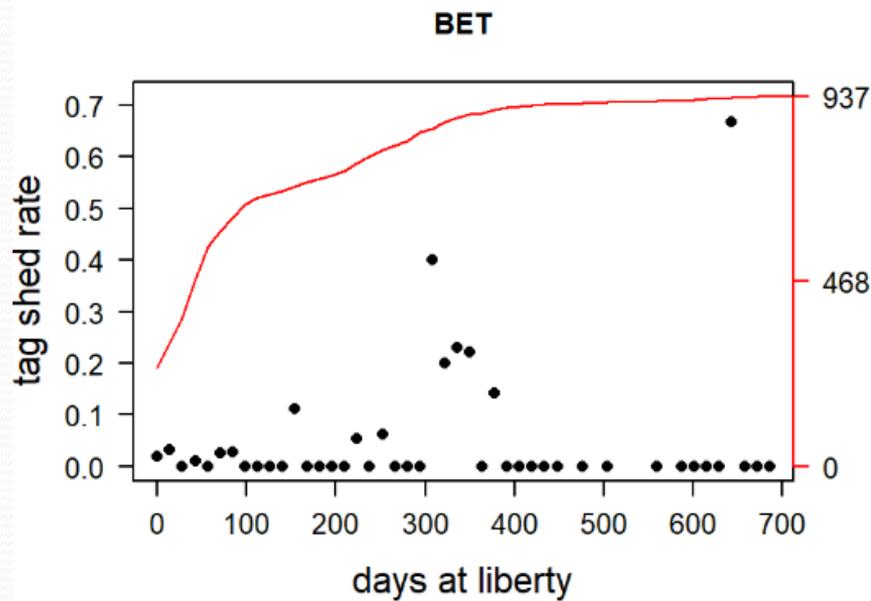
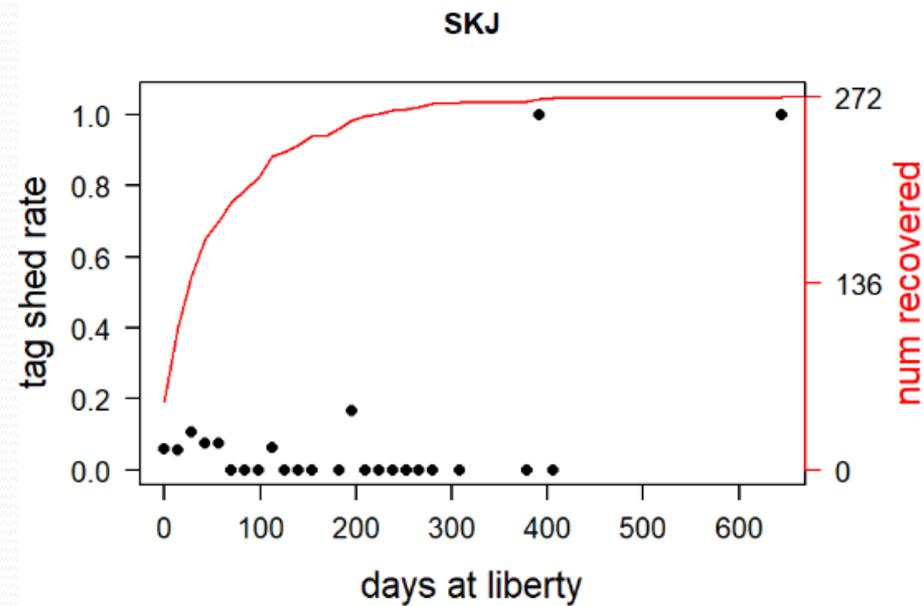
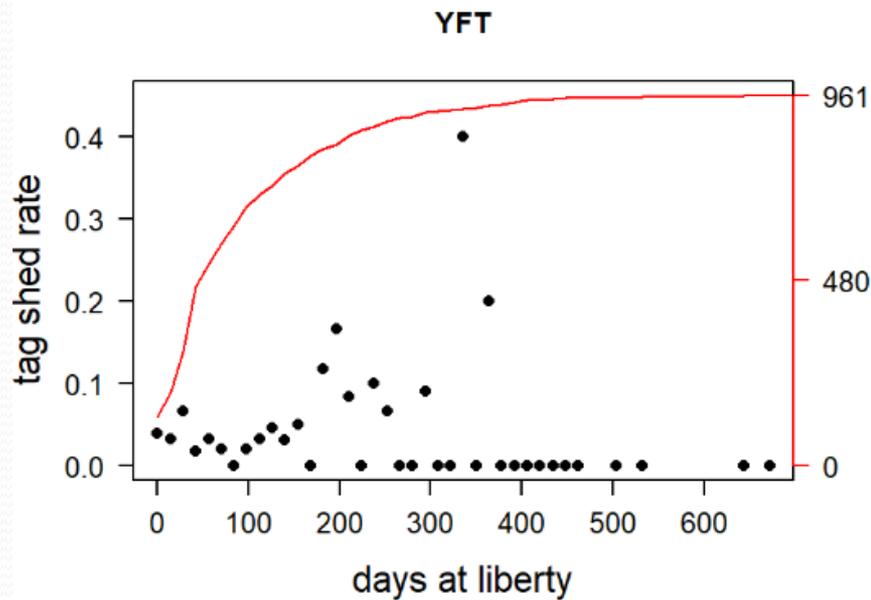




# Tag shedding – preliminary results

	<b>BET</b>	<b>SKJ</b>	<b>YFT</b>	<b>LTA</b>
<i>released</i>	4108	7438	4402	1226
<i>recovered</i>	940	274	961	28
<i>retained</i>	0.97	0.93	0.96	0.82
<i>shed</i>	<b>0.03</b>	<b>0.07</b>	<b>0.04</b>	<b>0.18</b>



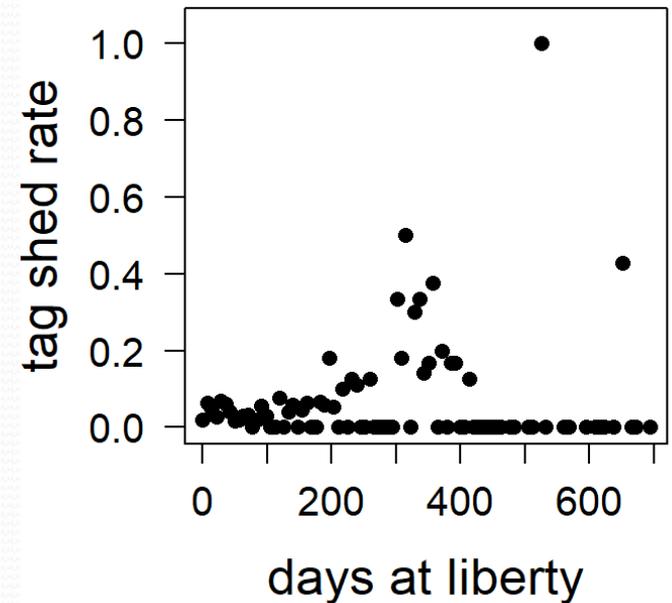


*Data binned by 2 week period*



# Tag shedding – analyses

- Exploratory analyses during capacity building workshops
  - $\text{glm}(\text{tagloss} \sim \text{vessel} + \text{sizebin} + \text{daysliberty}, \text{data}, \text{family} = \text{"binomial"})$
- More in-depth analyses in 2019





# Tag shedding – recommendations

- Beware of recoveries (2 tags 1 fish = 1 reward)
- Sequential or logical sequence of tags
  - Keep track of tag side
  - Single tags always on same side
- Keep track of individual tagger





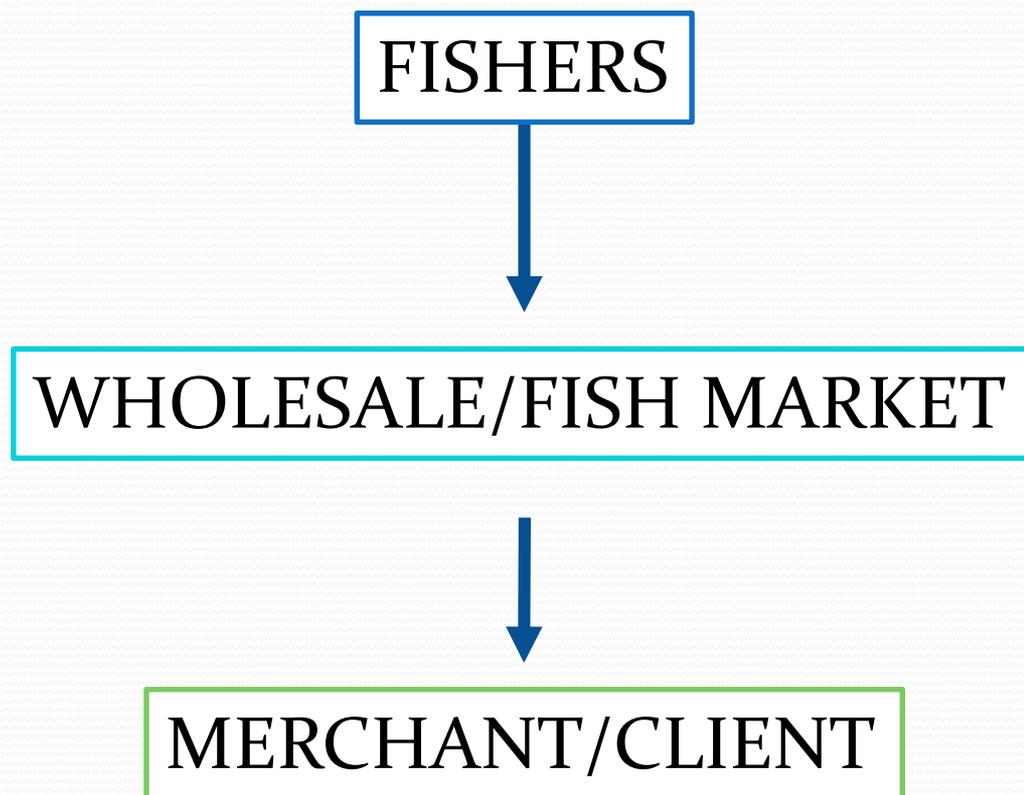
# Tag seeding – experimental design

- Priority: tag reporting rate for **purse seine**
- Tried on LL (1 tag!)
- Tried in artisanal fishery...





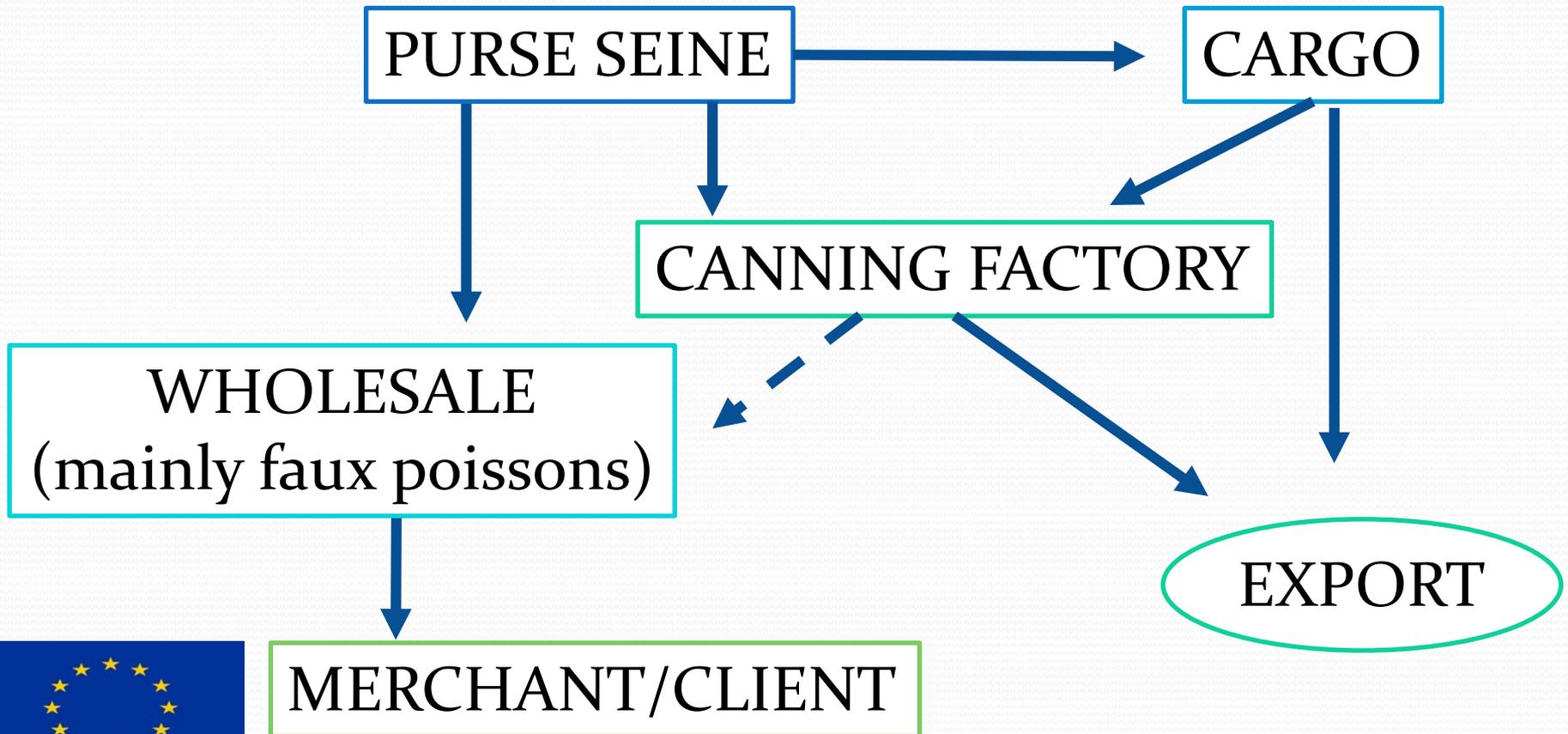
# Tag seeding – artisanal





# Tag seeding – industrial

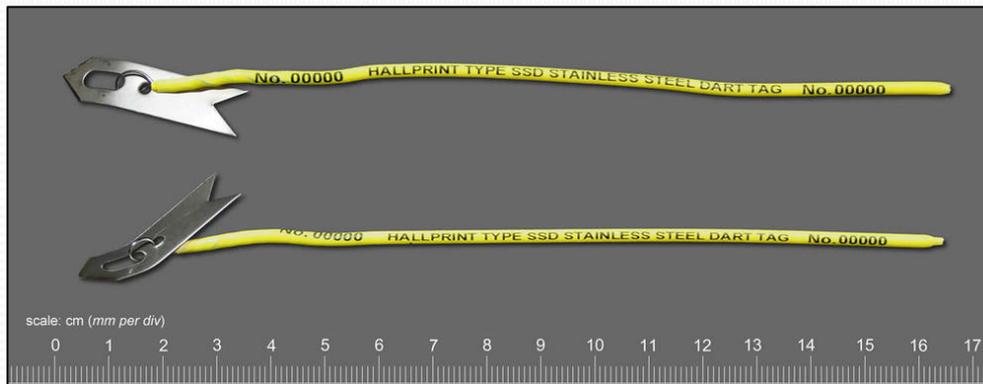
(captain, crew, observers)





# Tag seeding – experimental design

- Started with 1 tag per experiment, now doing 5 tags
- Metal dart for frozen fish





# Tag seeding – preliminary results

	2016	2017	2018
<i>seeded</i>	28	359	349
<i>reported</i>	9	292	268
<i>%</i>	0.32	0.81	0.77





# Seeded

BB	PS	CACL	FISM	LL	TRAN
209	<b>296</b>	5	11	1	<b>198</b>

# Reported

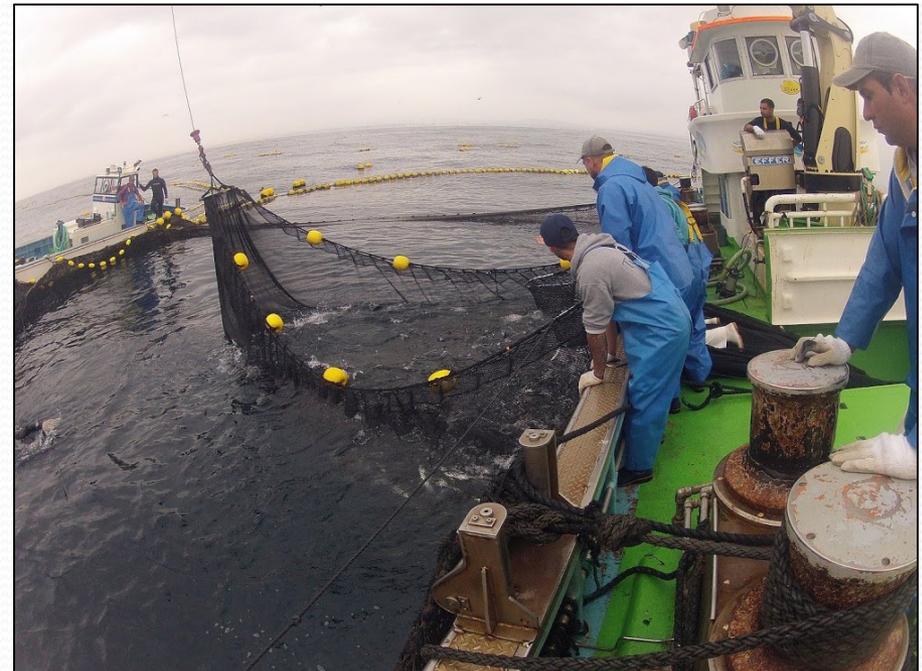
VESS	TRAN	UNLO	CACK	CACL	FISM	UNKN
<b>158</b>	71	<b>156</b>	9	9	70	96





# Tag seeding – further analyses

- Need to estimate reporting rates by species, size (influence their handling at unloading), date and area (influenced by the publicity campaigns), tagger (skipper or observer)
- Additive probability at different levels of the industry





# Tag seeding – recommendations

- Use completely separate tag series
- Use different data entry template (includes location type, name)
- Treat recoveries (rewards, etc.) the exact same as a regular tag
- Start as soon as you start tagging to see evolution through time and success of awareness campaigns
- Not worth effort on artisanal fisheries
- Worth doing it at several levels of the industry chain
- How many tags per event? (account for non independence within seeding experiment)



A photograph of a sunset over the ocean, taken from the deck of a boat. The sun is low on the horizon, casting a warm orange glow across the sky and water. The sky is filled with scattered clouds. In the foreground, the dark silhouette of the boat's deck and equipment is visible, including a person's head and shoulders on the right side, looking out at the sea.

**Thank you!**

**...questions?**

**Photos courtesy of our tagging and recovery teams.**