

NWWAC/NSAC Joint FG Skates & Ray

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Cuckoo Ray survival

- **Background**
 - Landing obligation
 - Survival exemptions
- **The trial**
 - Methods and Results
- **Discussion**

Cuckoo ray survival

- **Landing obligation**
 - Requirement to land all species subject to TAC
- **Survival exemptions**
 - *Nephrops*, Flatfish and skates and rays
 - Cuckoo ray given exemption to facilitate further research
 - Previous vitality assessments

Trial set up

- **Location**
 - Fishing
 - Holding facility
- **Assessments**
- **Analysis**

Trial location





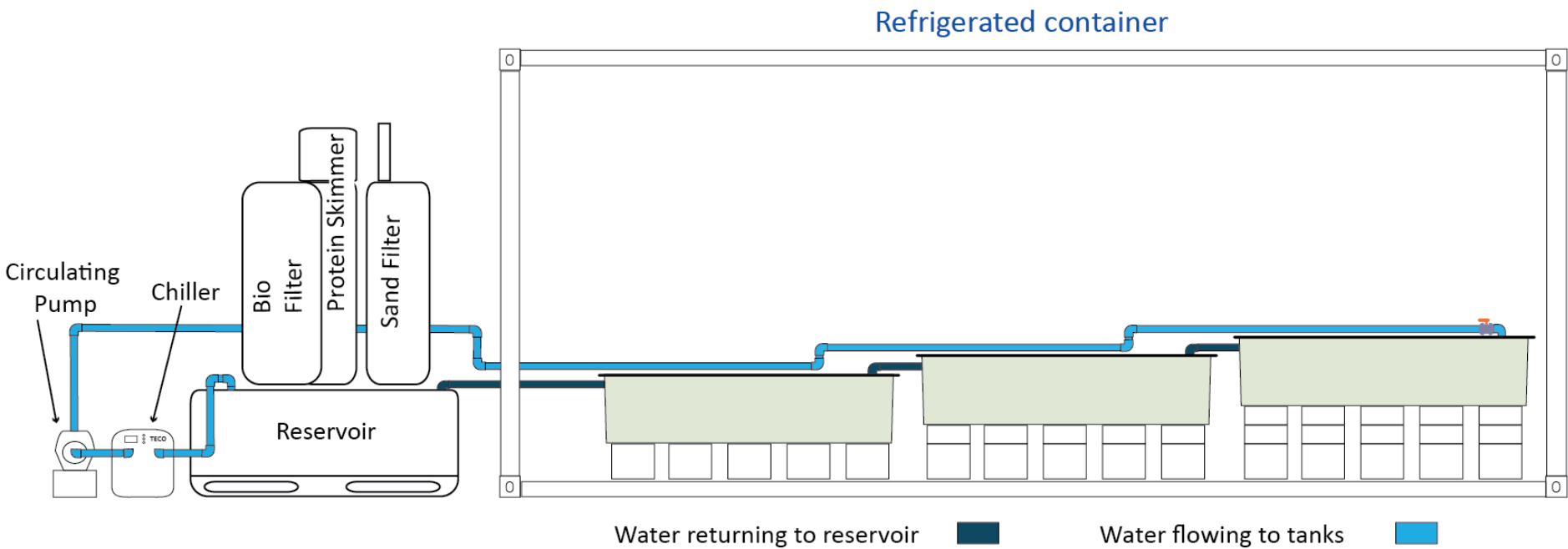
Methods

- **Initial assessments**

- Vitality —A (excellent), B (good), C (poor), D (moribund/dead)
- Reflex (RAMP)—movement and flex
- Injury —bleeding and bruising

- **Ongoing assessments**

- Maintained in closed recirculating system
- Observations up to 23 days





Analysis

- **Survival**

- Kaplan-Meier survival plots for test and control ray for 15 days observation
- Modelled to 25 days

- **Reflex and injury assessments**

- Summed and total standardised between 0 and 1
- Four reflexes each given score of 0.25 (to give max of 1)
- Injuries given weighting of 0.33, 0.66, & 1 depending on severity

Results

- **Catches**

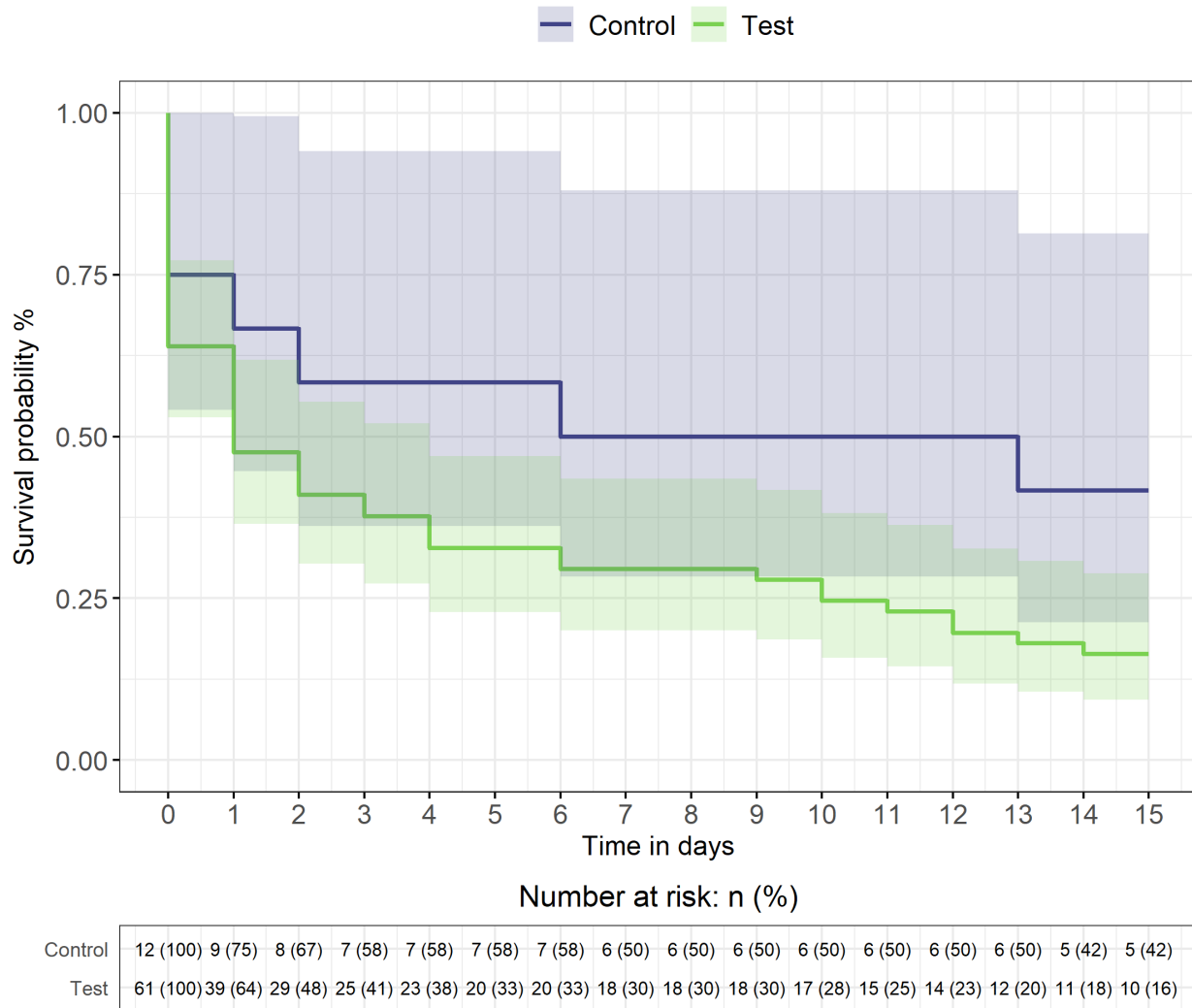
- 12 test and two control hauls—224 and 55 min mean duration
- Bulk catch means of 293kg
- 61 (46 F & 15 M) test and 12 control cuckoo ray

- **Observations**

- 39 test cuckoo ray retained (22 morts at sea)
- 9 control cuckoo ray retained (3 morts at sea)

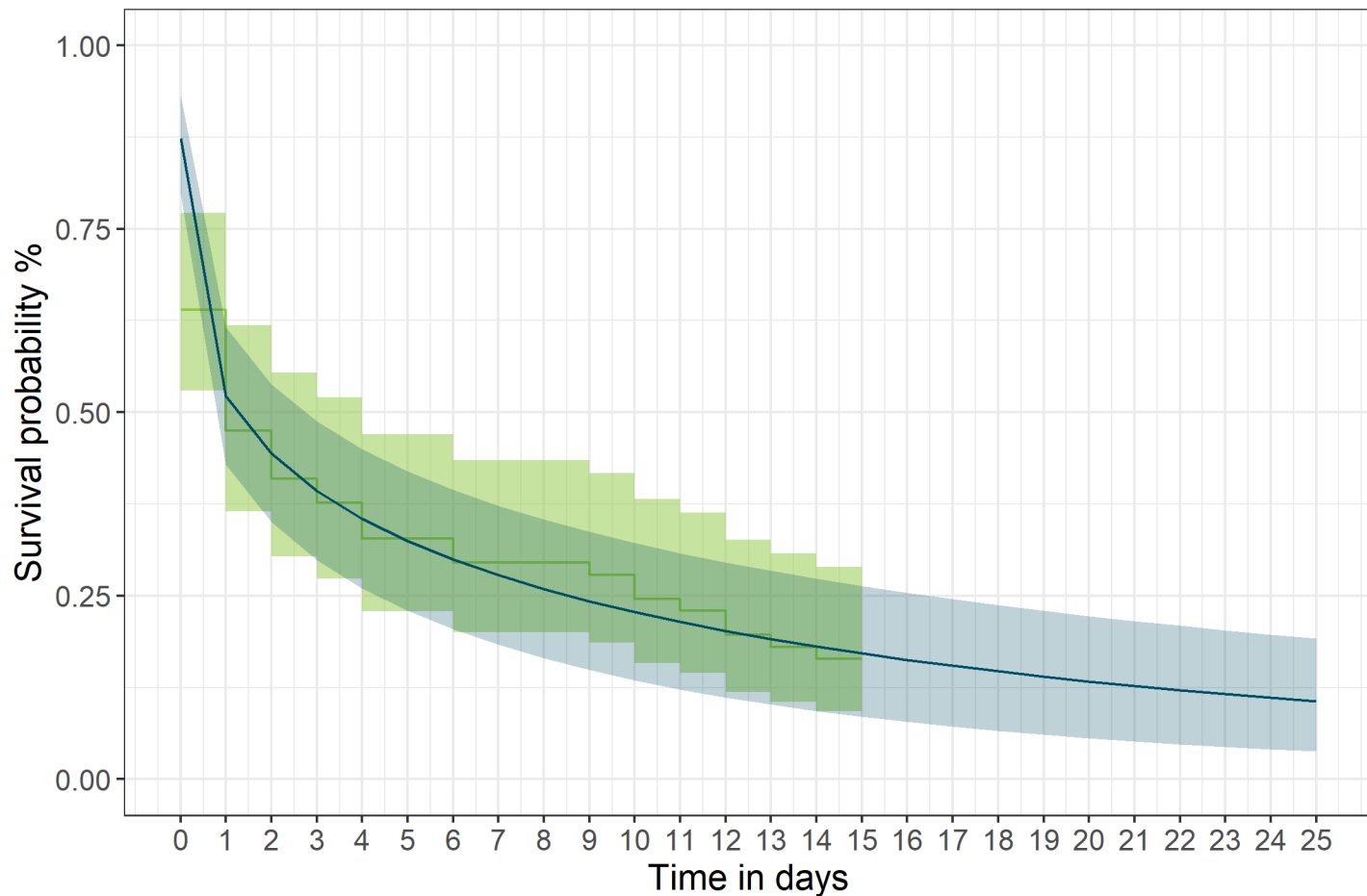
Results

- ▶ Test Ray mortality
 - ▶ 36% on vessel
 - ▶ 48% in holding system
- ▶ Control Ray mortality
 - ▶ 25% on vessel
 - ▶ 33% in holding system



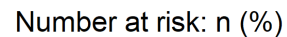
Results

Gamma fit and predicted survivability Observed



- ▶ Predictive model
 - ▶ 11% survival @ 25 days

► Kaplan-Meier by Vitality score

[illegible]

Reflex impairment and Injury

Tail grab (%)	Spiracles (%)	Startle touch (%)	Body flex (%)	Mean ramp score
18.87	11.32	16.98	16.98	0.16

Bleeding head (%)	Bleeding body (%)	Bleeding tail (%)	Open wounds (%)	Fin damage (%)	Mean injury score
35.22	29.56	26.42	1.26	35.22	0.26

Vitality	Reflex	Injury	Reflex & Injury
A	0.00±(0.00)	0.21±(0.10)	0.12±(0.06)
B	0.03±(0.08)	0.30±(0.09)	0.18±(0.06)
C	0.14±(0.20)	0.32±(0.12)	0.24±(0.07)
D	0.81±(0.24)	0.30±(0.09)	0.53±(0.08)

Discussion

- **Survival**
 - 11–16% for test
 - 42% (15 days) for control
 - Unlikely that holding system was at fault
 - Similar results with French otter trawl study at 12–25%

Thank you for listening

Questions?

<https://bim.ie/publications/fisheries/>