Reducing Pacific Halibut Bycatch in the Groundfish Bottom Trawl Fishery

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Brief Background

- In 2011, the west coast limited entry groundfish trawl fishery began management under the groundfish trawl catch share program (FMP Amendments 20 and 21)
  - this new program establishes Annual Catch Limits and Individual Fishing Quotas along with Individual Bycatch Quotas

- Bycatch of Pacific halibut (prohibited take species) is a major concern for many bottom trawl fishermen
  - they will reach their Halibut bycatch quota before reaching their catch share quota.
  - for some fishermen this scenario occurred in 2011

- Bycatch of Pacific halibut is allocated by weight

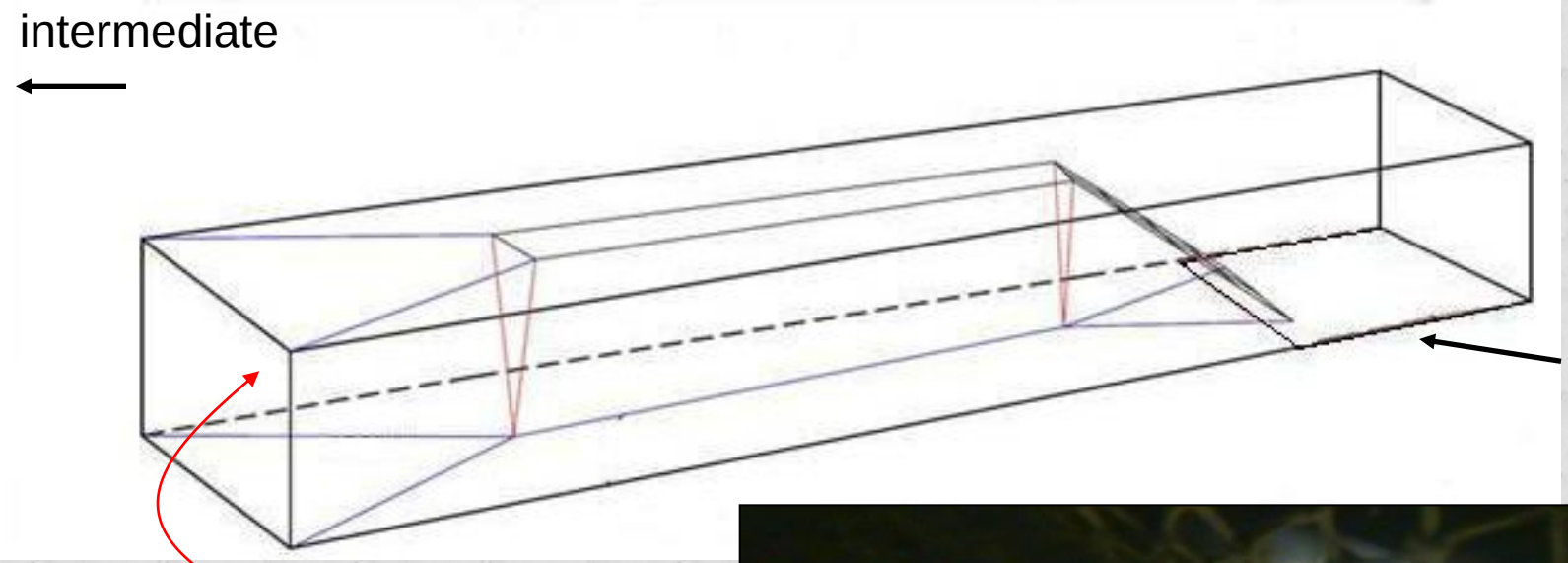
In response to fishermen's Concerns

- **NOAA Fisheries NWFSC, PSMFC, and the fishing industry developed and field tested a flexible sorting grate designed to reduce Pacific halibut bycatch**

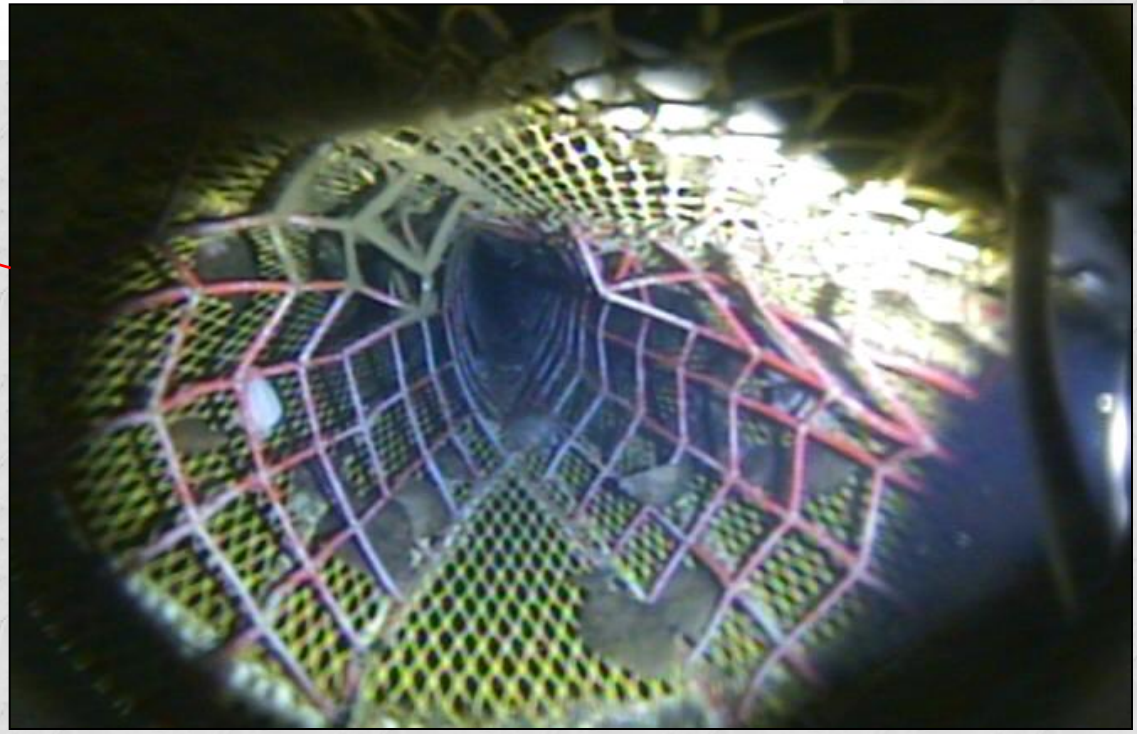
Sea Trials

- **30 tows were conducted shoreward of the RCA off N. WA aboard the *F/V Miss Leona***
  - trawl used was a selective flatfish trawl
- **Escapement was quantified via a recapture net**
- **For each tow all fish caught between the two nets were identified to species and weighed**
- **To examine size selectivity, length data was collected on species of commercial importance**
  - **25 fish / species / net / tow**
  - **all halibut caught were measured**

Flexible Sorting Grate



7.5 x 7.5 in. square grate



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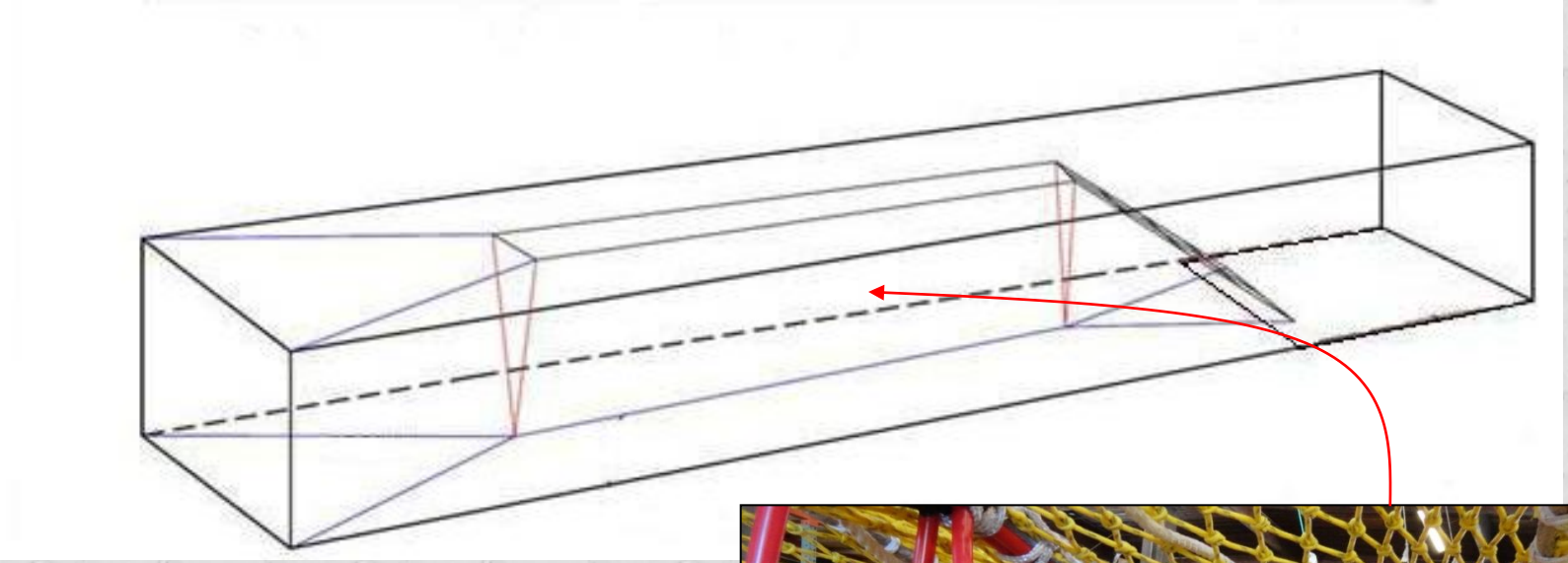

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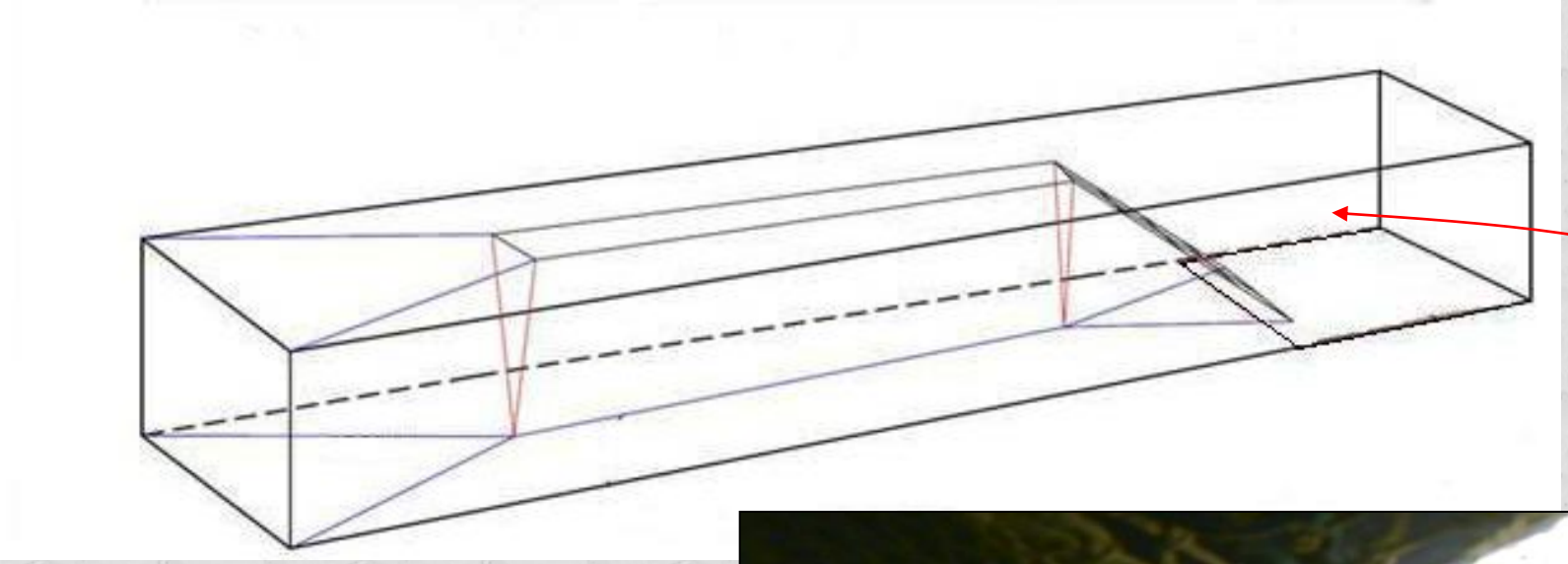
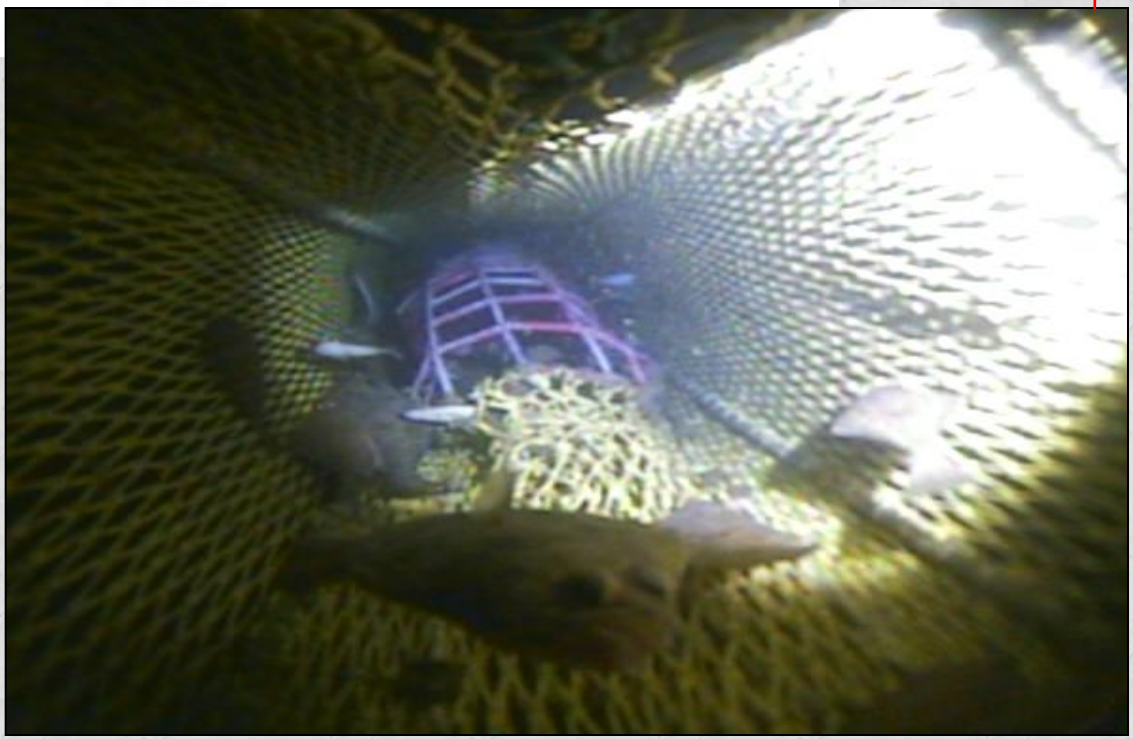


5.5 x 5.5 in. square grate



Circular Ring System

Image courtesy Nils Olof Borghed

Developed in Sweden in collaboration with Dantrawl Inc. (Seattle, WA)

Provides a fixed shape of the BRD area

Rings are rigid nylon and are held together by shock cords

Image courtesy Nils Olof Borghed

Dantrawl Inc. net loft in Seattle, WA

Results

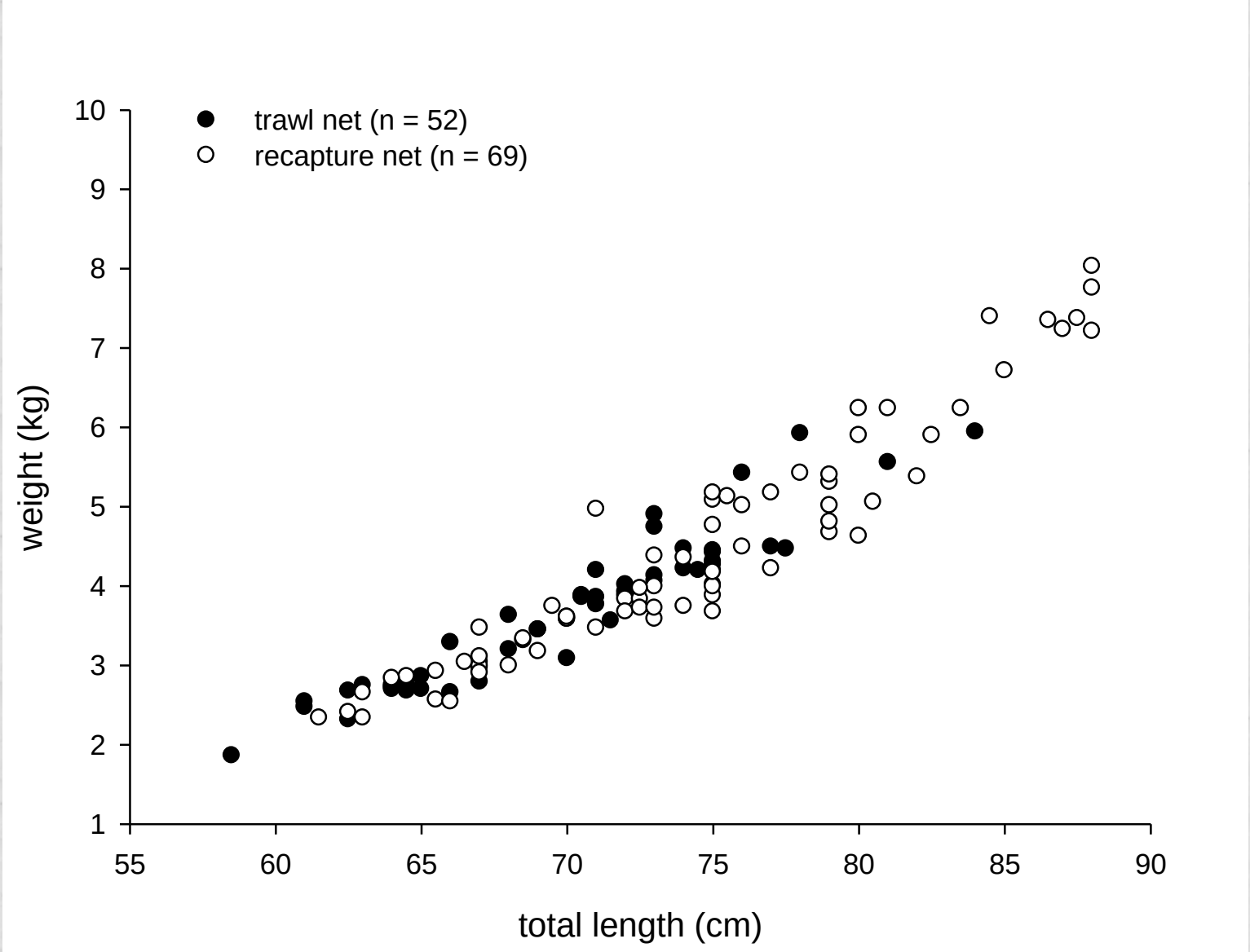
Trawl data

	Speed (knt)	Duration (min:sec)	Depth (m)	Catch (kg)	Temp (°C)
Range	2.7 - 3.2	26:40 - 39:00	113 - 173	82 - 1,535	6.80 - 7.40
Mean (SE)	2.9 (±0.02)	35:17 (±0.00)	126 (±2.58)	596 (±54.42)	7.08 (±0.00)

Pacific Halibut Bycatch Reduction

	Trawl net	Recapture net	Result
Number of fish	52	69	57%
Weight (kg)	193	309	62%
Mean total length (cm)	70.0 (±0.75 SE)	74.4 (±0.84 SE)	$P<0.001$

Pacific Halibut Size Selectivity



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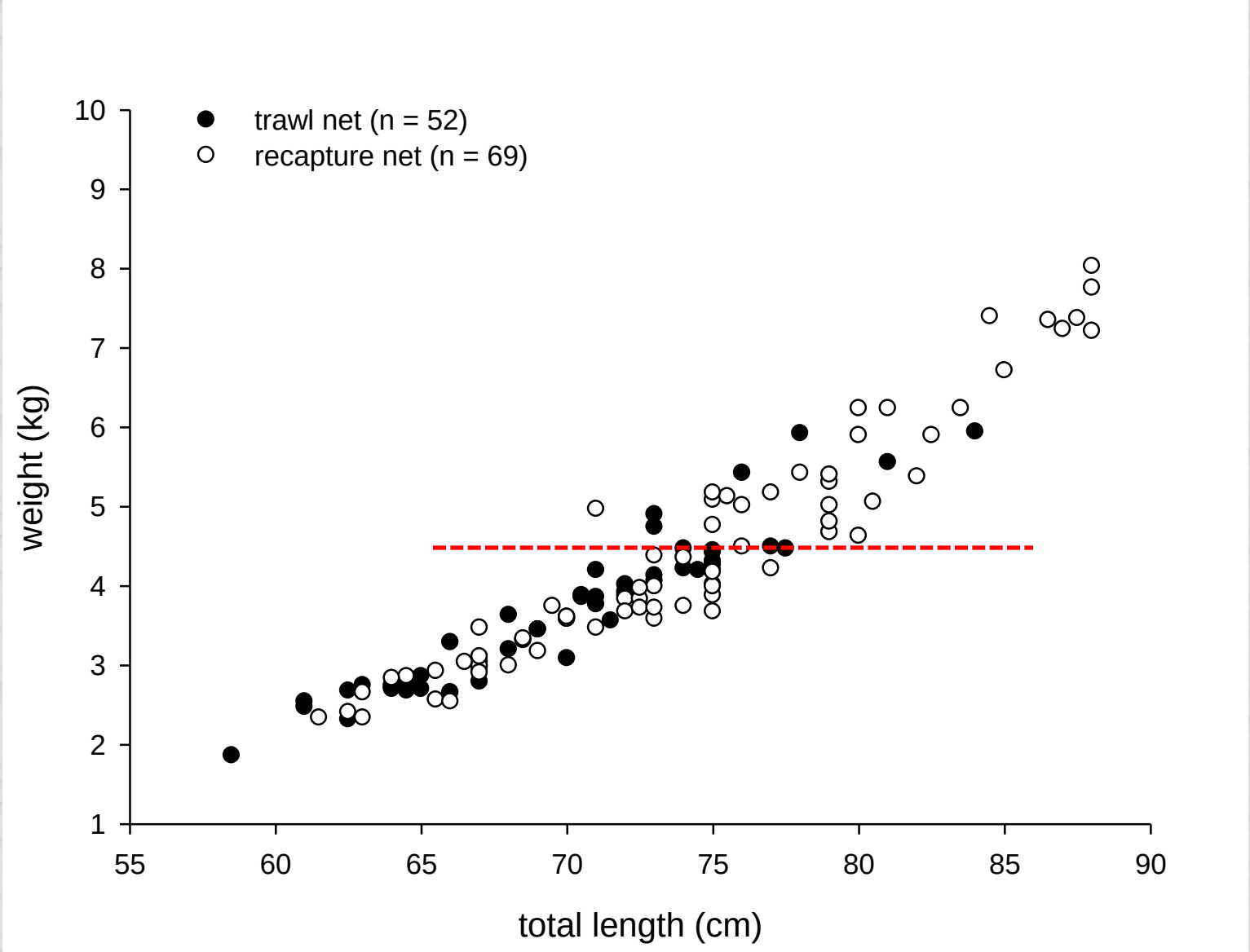

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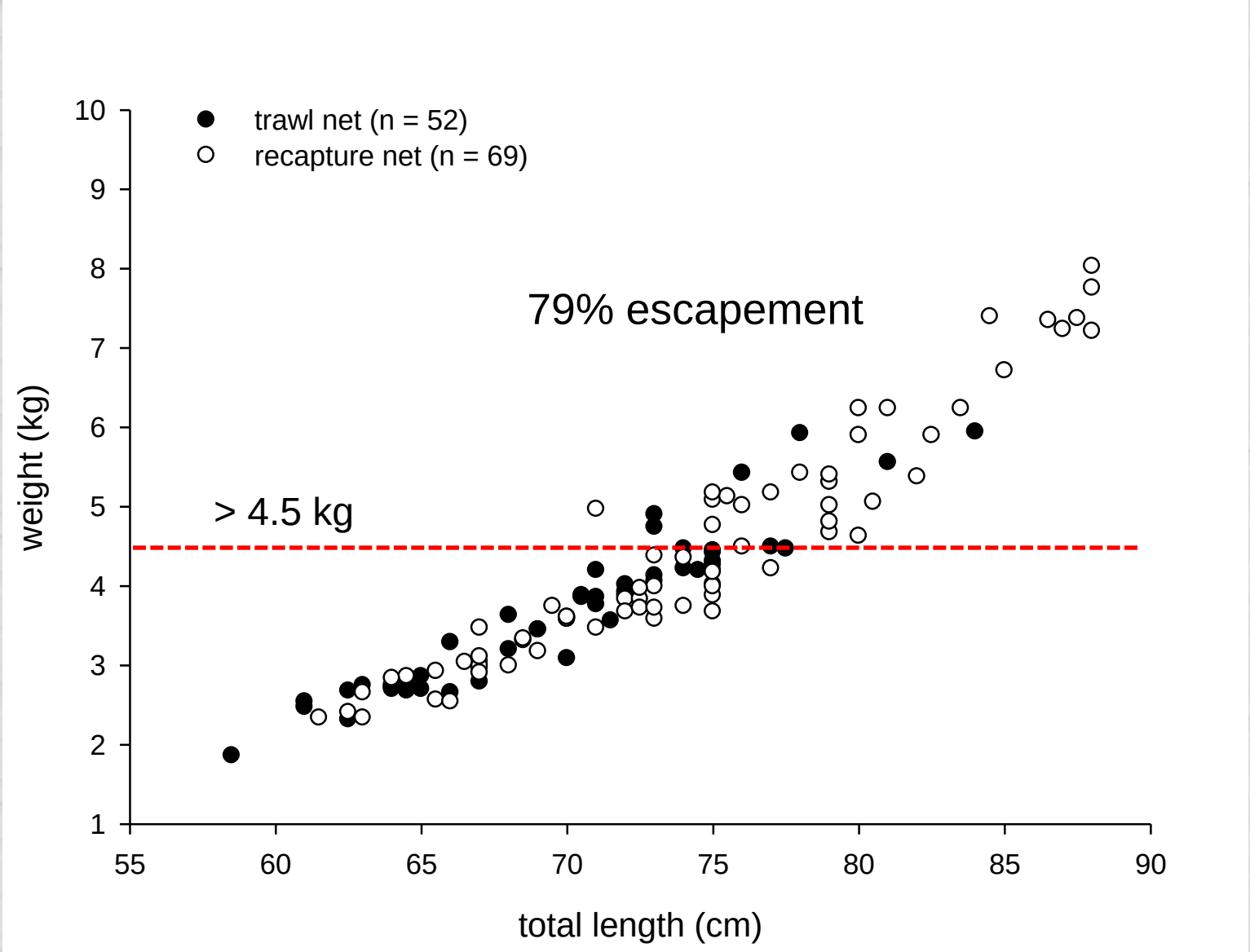

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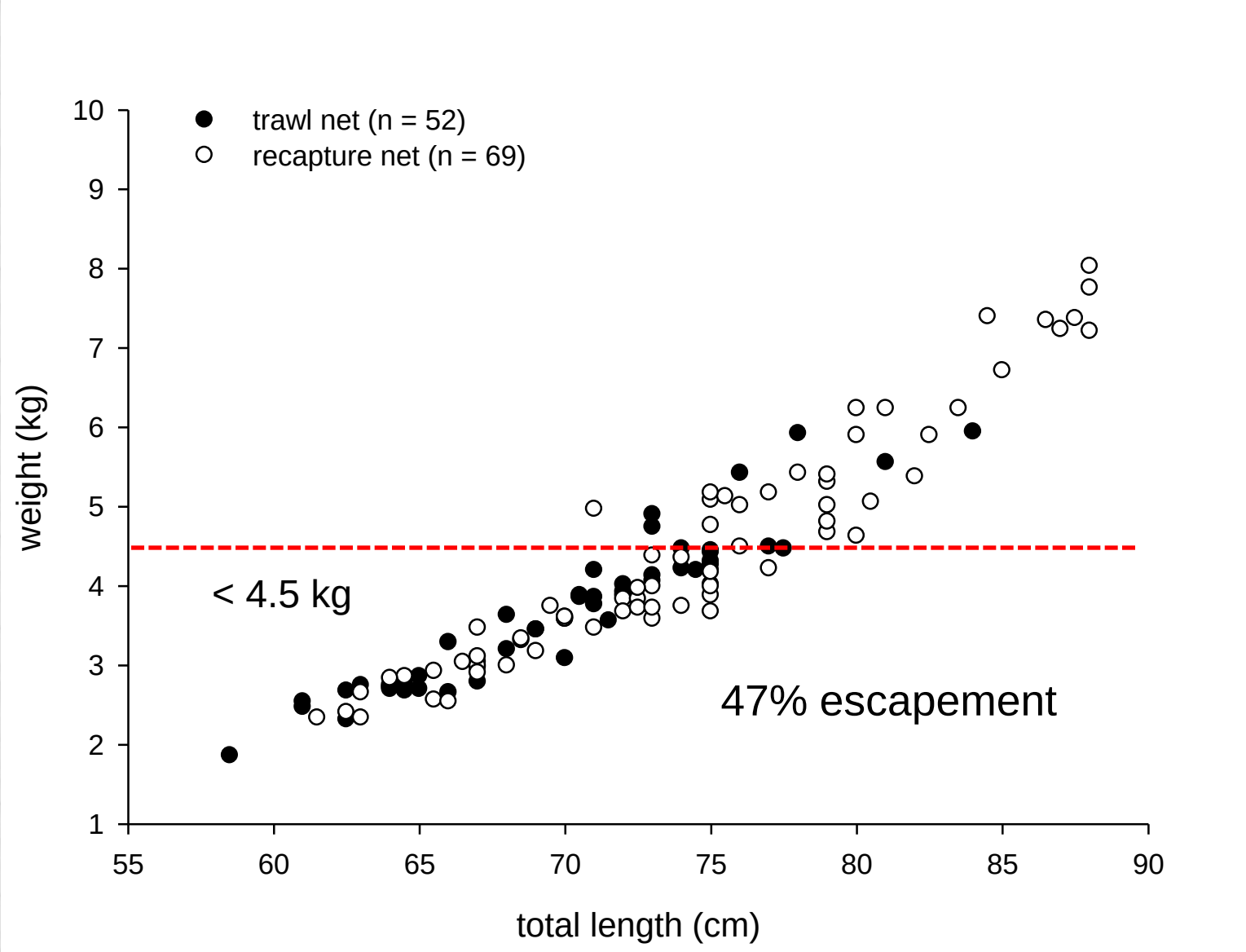
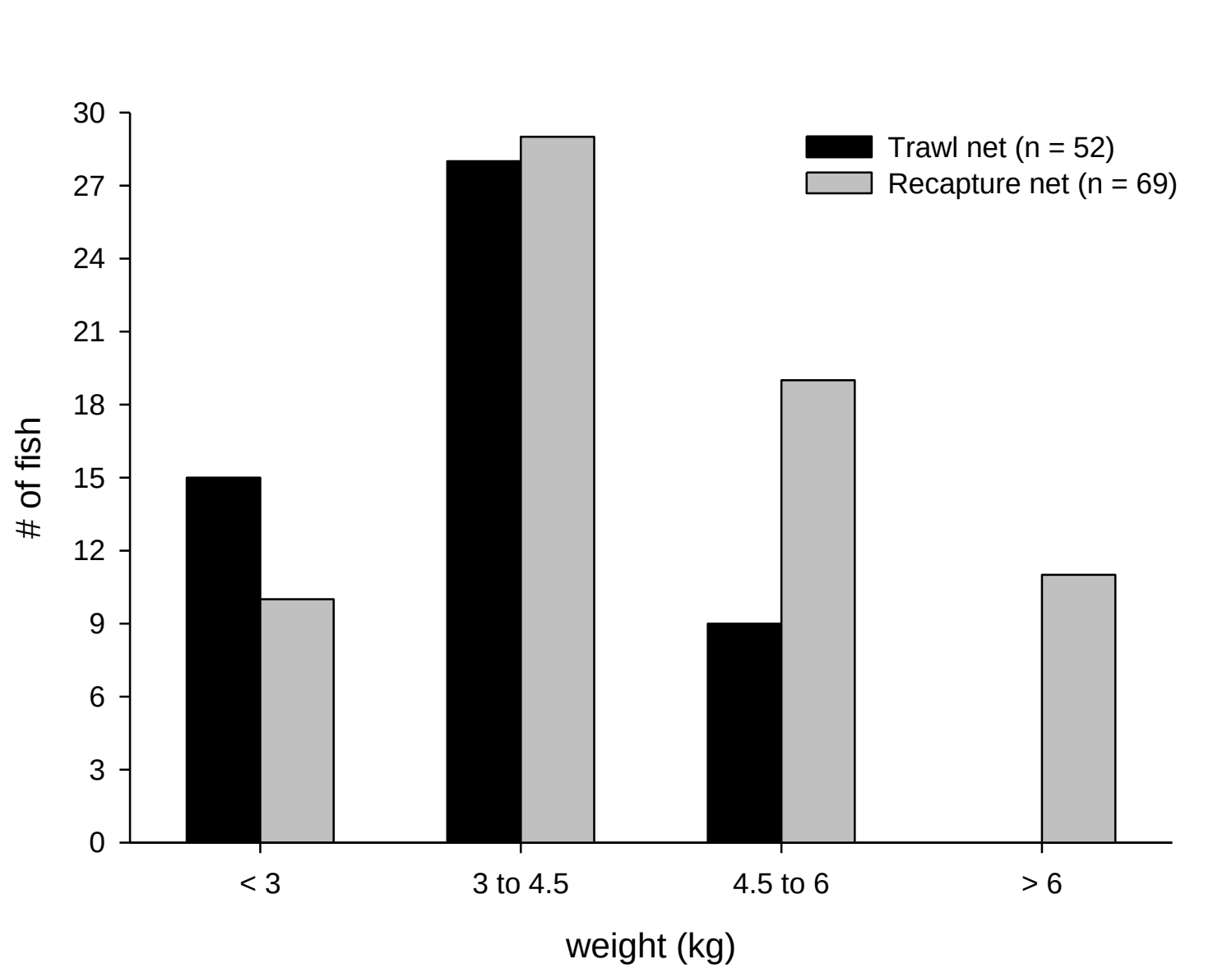
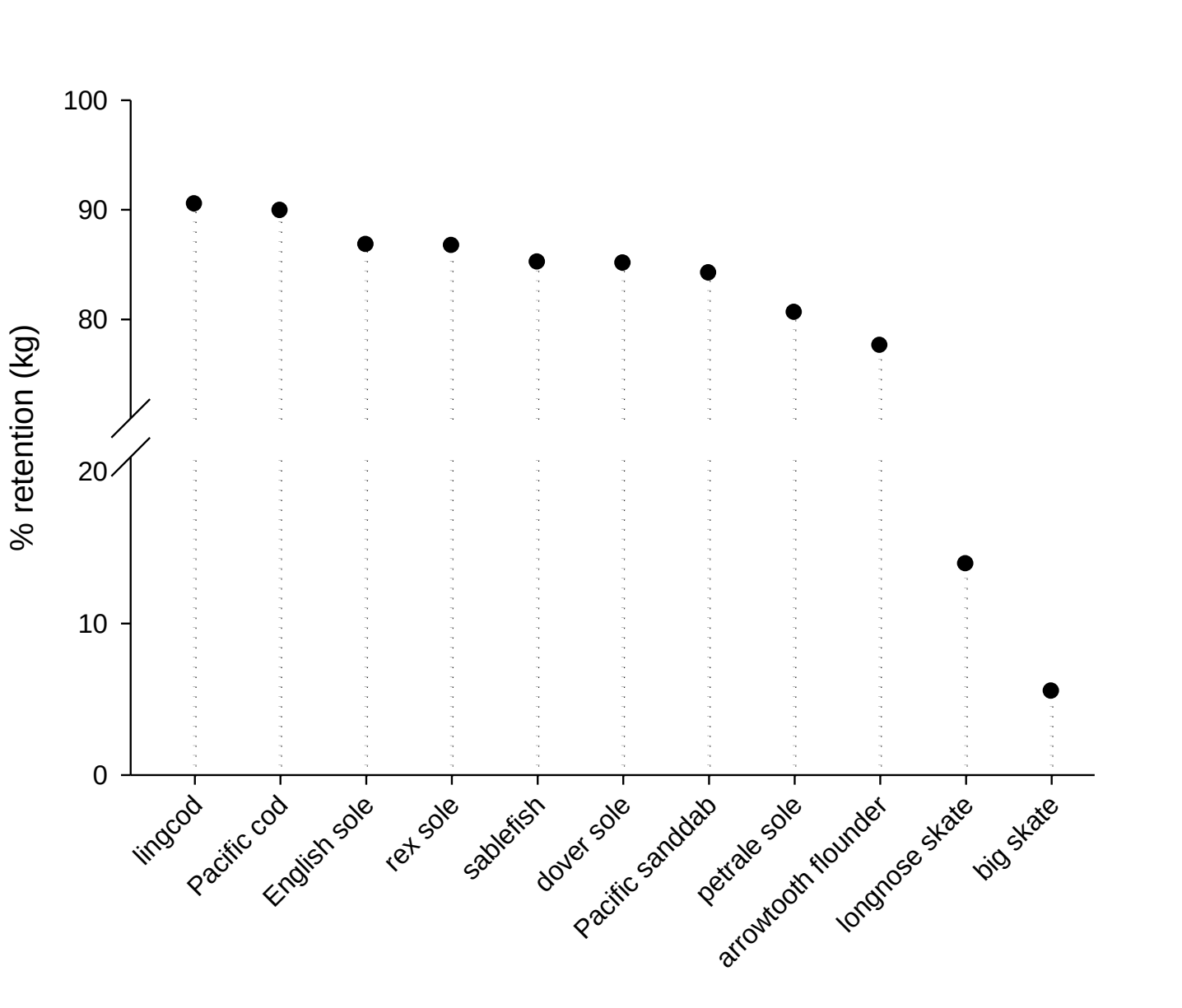


Pacific Halibut Size Selectivity (cont.)



Retention of Target Species by Weight (kg)



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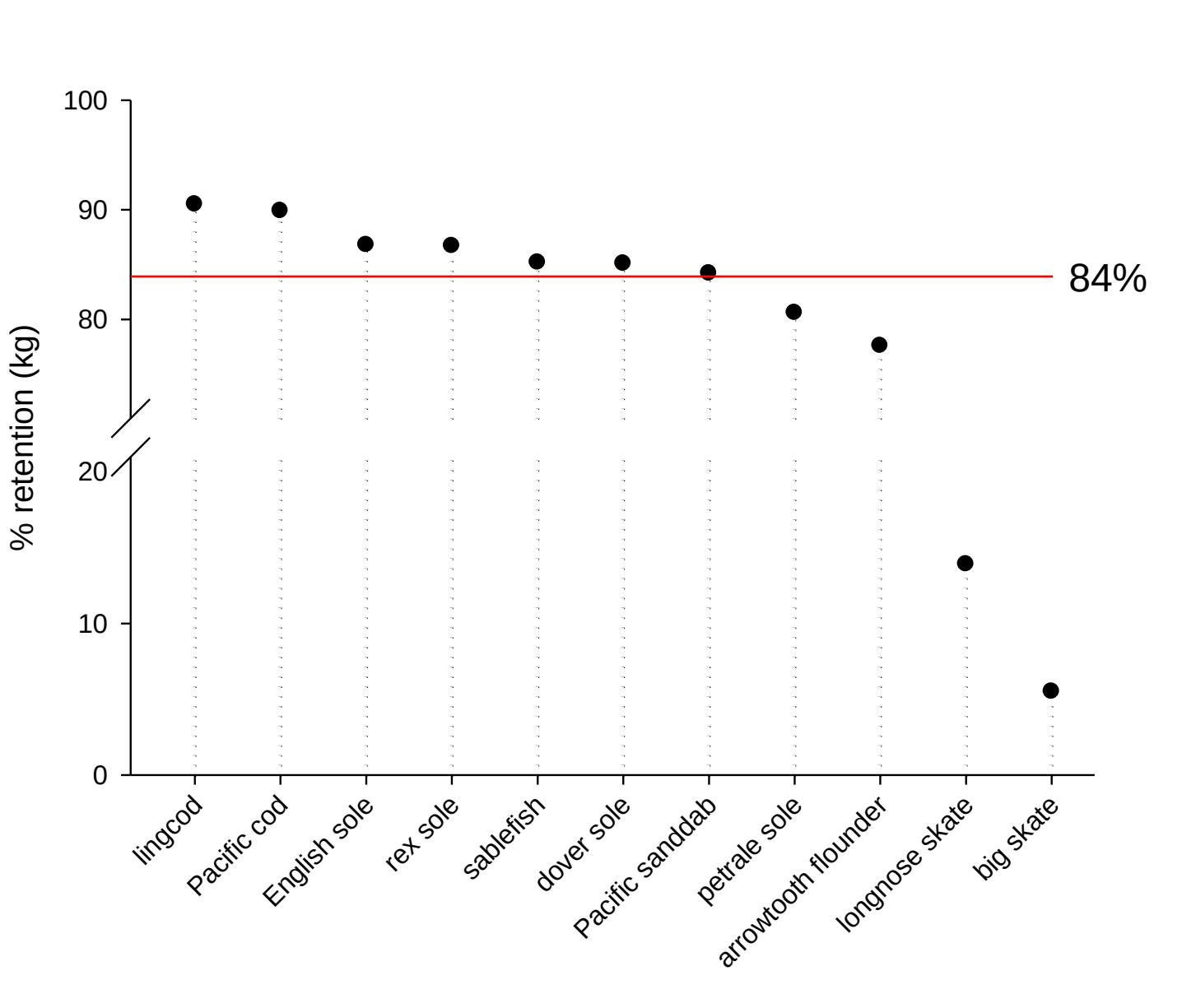

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Trawl net

Target species retention = 89%

Recapture net

Halibut escapement = 61%

Mean Length (cm) Comparison for Target Species

Species	Recapture net	Trawl net	Difference ±	P-value
		≠		
English sole	33.4	33.2	- 0.2	0.201
Arrowtooth flounder	48.1	48.4	+ 0.3	0.257
Lingcod	59.2	57.7	- 1.5	0.147
		<		
Petrale sole	35.3	35.7	+ 0.4	0.000
		>		
Rex sole	32.7	30.8	- 1.9	0.000
Dover sole	37.4	33.9	- 3.5	0.000
Pacific sanddab	29.8	28.5	- 1.3	0.000
Pacific cod	61.4	59.0	- 2.4	0.000
Sablefish	51.3	49.8	- 1.5	0.014

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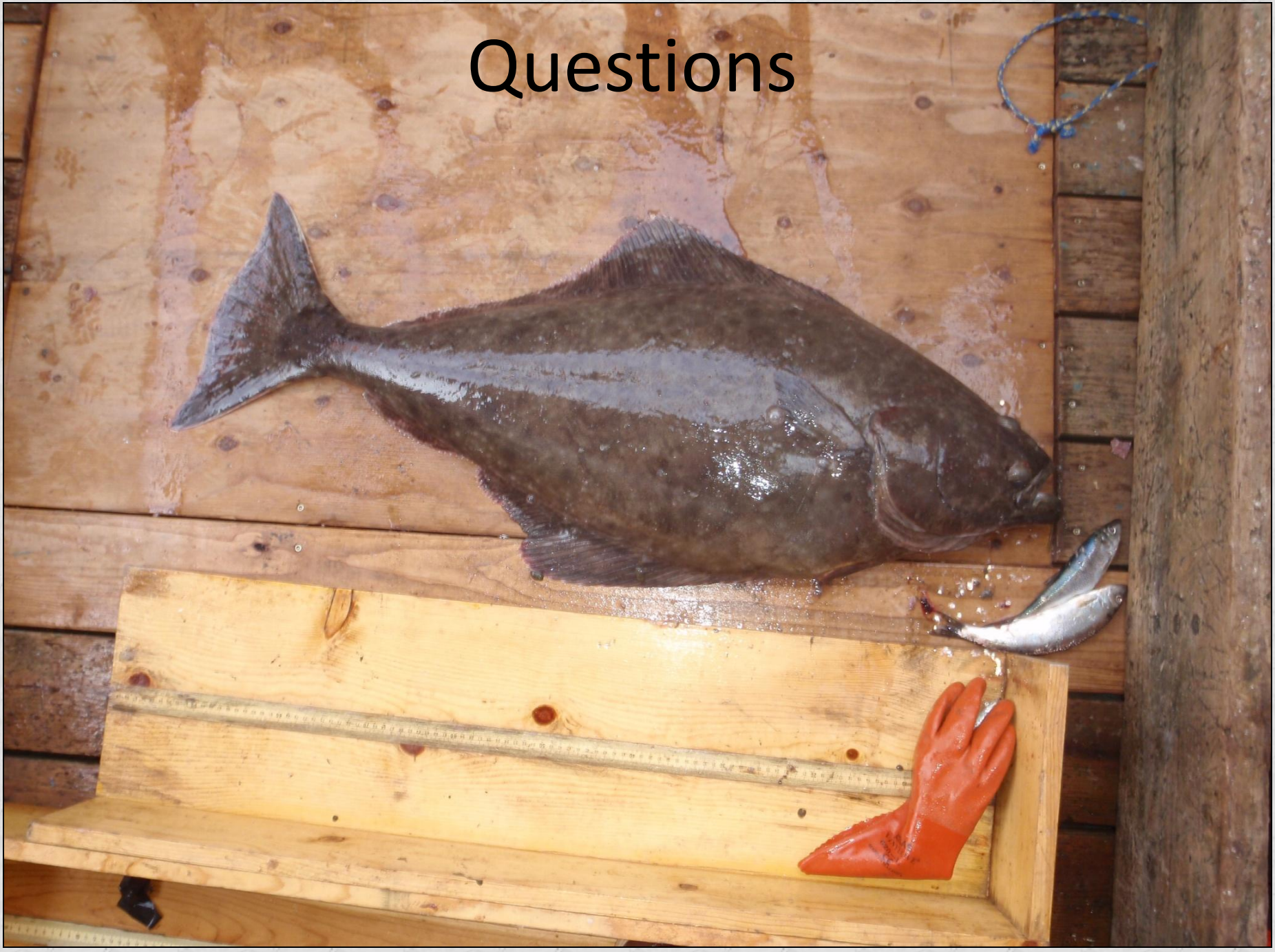
Findings

- Results demonstrated the capability of a flexible sorting grate BRD to reduce halibut bycatch
  - 62% gravimetrically; 57% numerically
  - selectivity highest for halibut > 4.5 kg
  - 84% of the targeted catch was retained

- In light of the catch share program, which establishes Annual Catch Limits and Individual Fishing Quotas along with Individual Bycatch Quotas, this finding is important

Acknowledgements

- NOAA Fisheries Bycatch Reduction Engineering Program
- NWFSC- Michelle McClure, and Patty Burke
- PSMFC – Dave Colpo, Carol Barstow, and Michael Arredondo
- AFSC – Craig Rose
- Gauvin and Associates – John Gauvin
- Dantrawl Inc.
- *F/V Miss Leona*

Questions