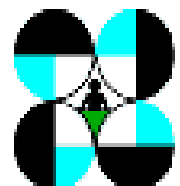




# Size Selectivity of a Small-scale Purse Seine Net in the Philippines

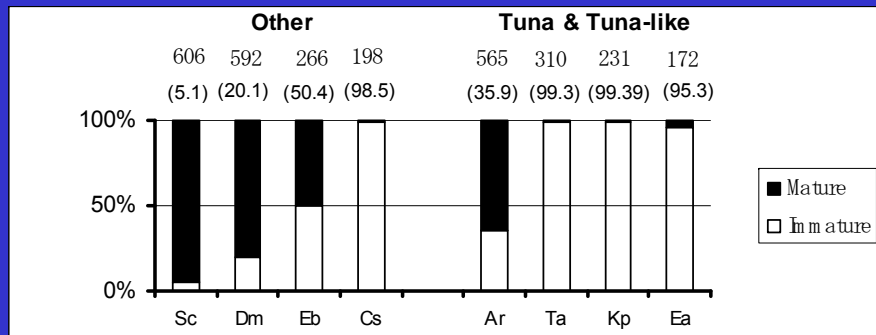
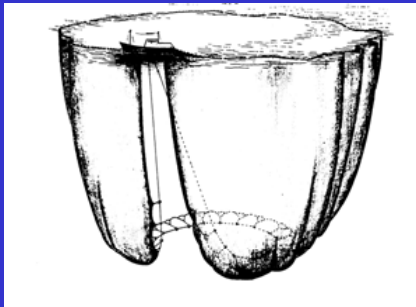
R. Babaran, R. Cruz, M. V. Nagallo, R. Ratilla

*College of Fisheries and Ocean Sciences,  
University of the Philippines in the Visayas*



# Introduction

- Purse seines and ringnets operate near FADs (payaos) and capture small pelagic fish and tuna species
- Large tuna species (e.g. SKJ, YFT) in the catch are juveniles while over 75% of small pelagics (e.g. scads) are mature



# Background: Fish occurrences in Purse seine & Ringnet

Species	English Name	PURSE SEINE				RINGNET			
		Occ	%	Biomass (MT)	%	Occ	%	Biomass (MT)	%
Acipenser stellatus	Starry sturgeon	5	6.8	4.3	0.2	2	8.7	3.4	0.6
Auxis rochei	Bullet tuna	49	67.1	523.2	20.0	20	87.0	122.4	20.9
Auxis thazard	Frigate tuna	60	82.2	130.6	5.0	23	100.0	58.1	9.9
Caranx sexfasciatus	Golden trevally	2	2.7	0.1	0.0	1	4.3	0	0.0
Coryphaena hippurus	Dolphinfish	21	28.8	7.7	0.3	6	26.1	1.2	0.2
Decapterus macarellus	Mackerel scad	65	89.0	141.9	5.4	23	100.0	53.5	9.1
Elagatis bipinnulata	Rainbow runner	43	58.9	30	1.1	12	52.2	5.4	0.9
Euthynnus affinis	Eastern Little tuna	42	57.5	22.3	0.9	17	73.9	10.6	1.8
Katsuwonus pelamis	Skipjack Tuna	73	100.0	1388.9	53.1	23	100.0	237	40.5
Selar crumenophthalmus	Bigeyed Scad	15	20.5	1.7	0.1	5	21.7	0.8	0.1
Thunnus albacares	Yellowfin Tuna	72	98.6	327.4	12.5	23	100.0	86.3	14.7
Thunnus obesus	Bigeye Tuna	51	69.9	39.9	1.5	16	69.6	6.2	1.1
Grand Total		73	100	2618	100	23	100	585	100

(Purse seine (N=73) and ringnets (N=23) Source: NSAP 2005 data)

- Large tunas (skj & yft) occur frequently in the catch: related to the net depth problem

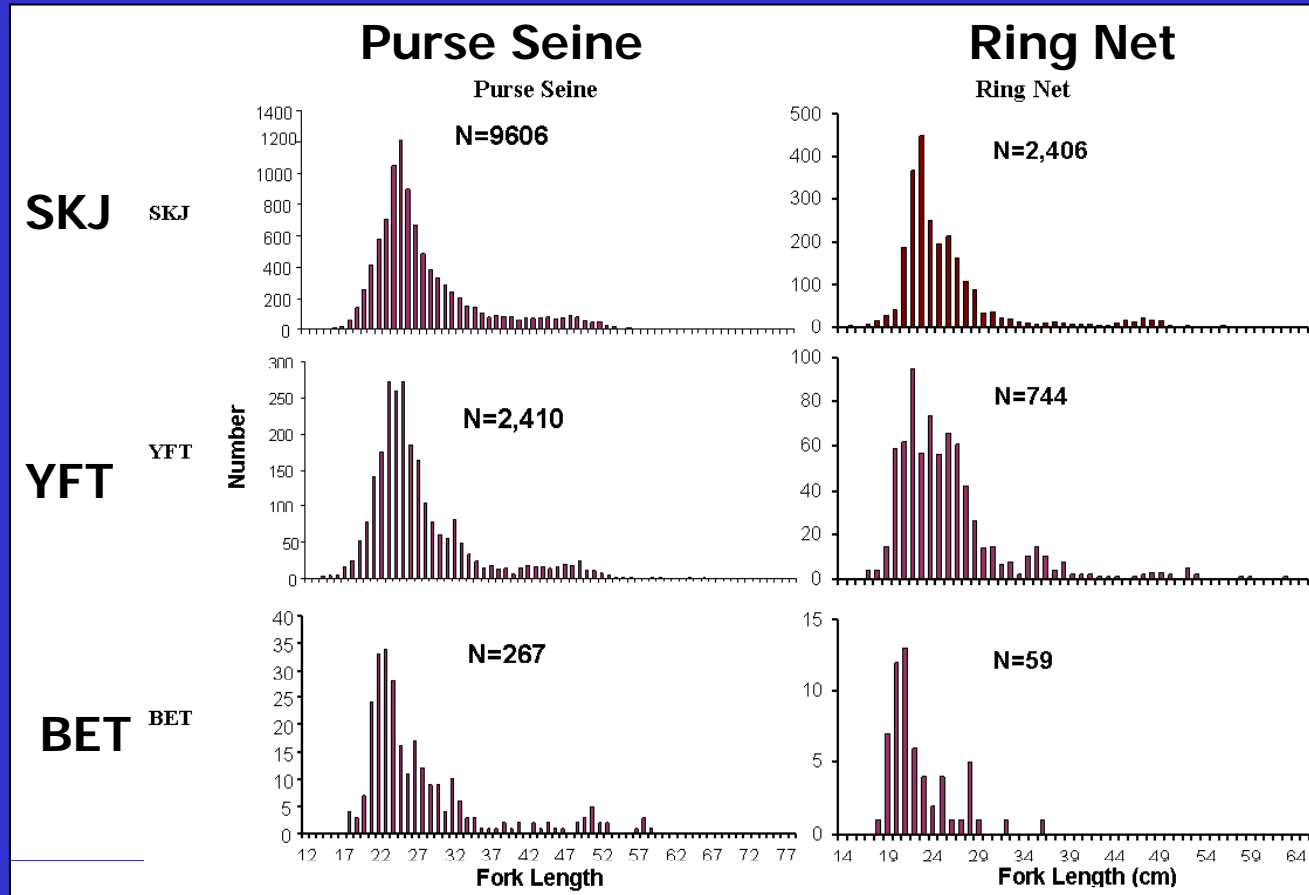
# Background: Biomass in Purse seine and Ringnet

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(Purse seine (N=73) and ringnets (N=23) Source: NSAP 2005 data)

- Purse seine is also capturing bullet tuna (a type of small tuna): a problem related to mesh size

# Size distributions: Tunas



Data source: NSAP

Lengths, cm

	Purse seine	Ringnet
SKJ	14-66	15-57
YFT	14-66	17-64
BET	18-59	18-36

# Objectives of the current study

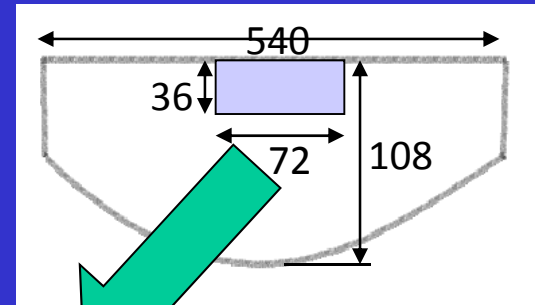
- To assess the mesh sizes of Philippine purse seines and sample catches of selected gears
- To conduct mesh selectivity fishing trials using an modified purse seine net

# Materials & Methods

1. Assessment of Philippine purse seines and catch sampling

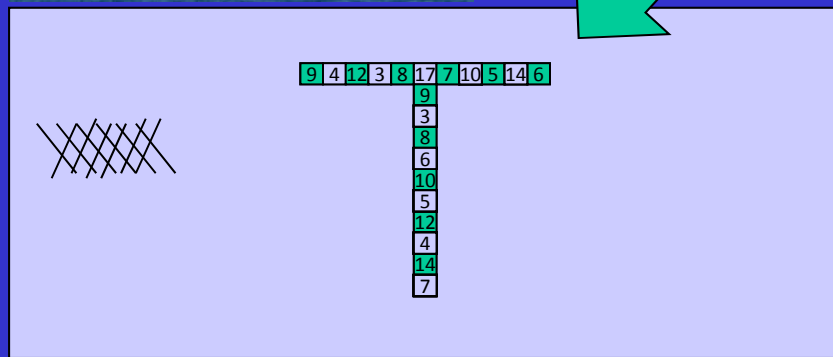
2. Selectivity trials

a. Fishing boat , a small purse seine net (ring net)

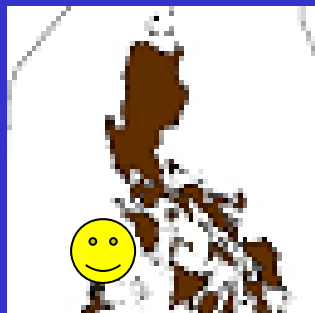


b. Modified net:

Bunt section with multi-net panel nettings (1.9 cm – 15.2 cm) with pockets



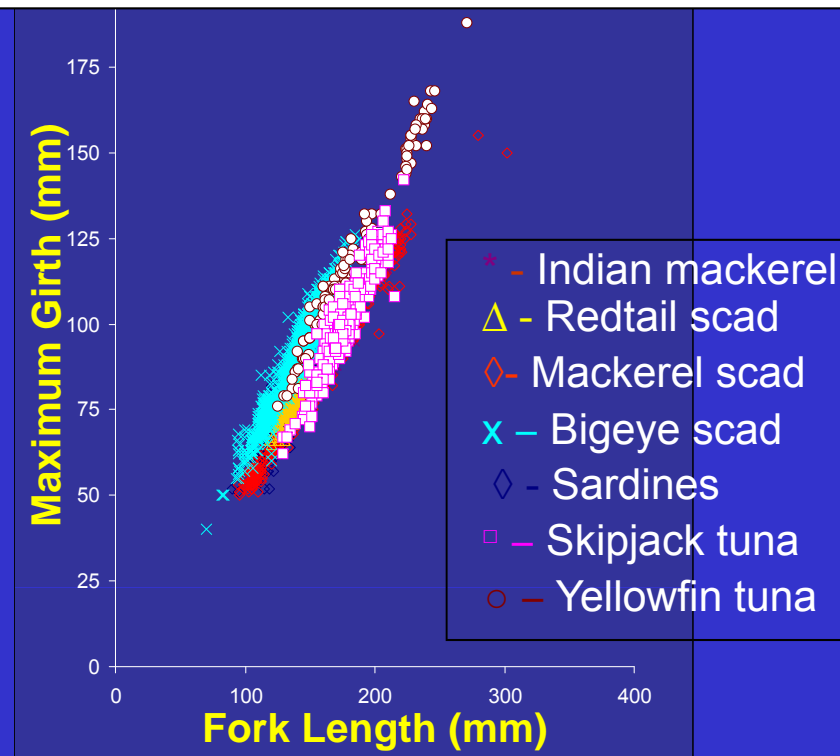
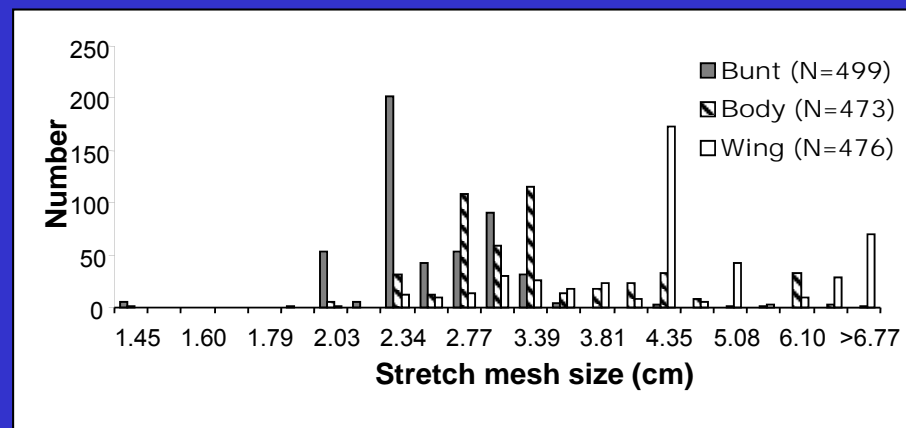
c. Conducted 6 fishing operations in March 2011 off Mindoro



# Results: Gear specifications, fish measurements

- Typical mesh sizes in Philippine purse seines
  - Bunt section: 2.03 - 3.39 cm
  - Body section: 2.34 - 4.35 cm

- Length and maximum girth plots of associated species overlap



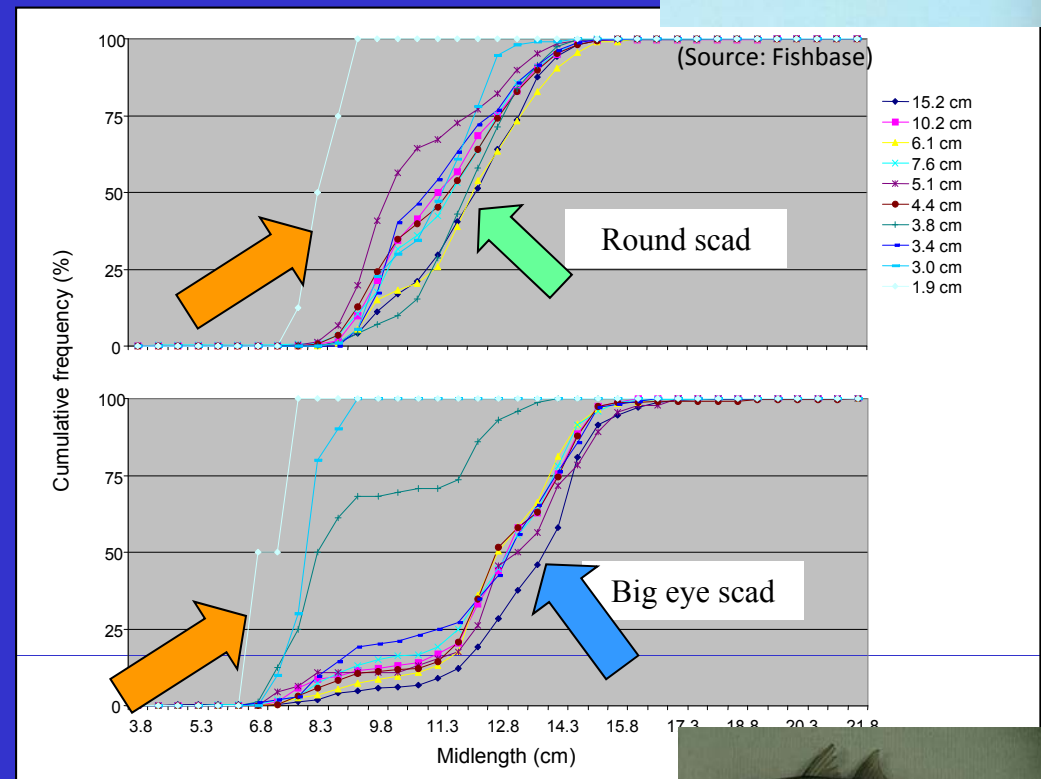


# Catch summary of selectivity experiments

- 50 species were captured during the fishing operations
- Most dominant species were *Decapterus macrosoma* (round scad), *Selar crumenophthalmus* (bigeye scad) & *Sardinella gibossa*.
- Other dominant species were *Auxis* spp. (*rochei* and *thazard*) bullet and frigate tuna) and *Decapterus kurroides*
- Only 2 individuals of yellowfin tuna

# Cumulative frequency plots

- ❖ Few fish can escape through a mesh size of 1.9 cm.
- ❖  $L_{50}$  for fish with circular cross-section: (10.3 to 11.85 cm) for most sizes used.
- ❖  $L_{50}$  range for fish with elliptical cross section: Higher (12.3 to 13.3 cm)



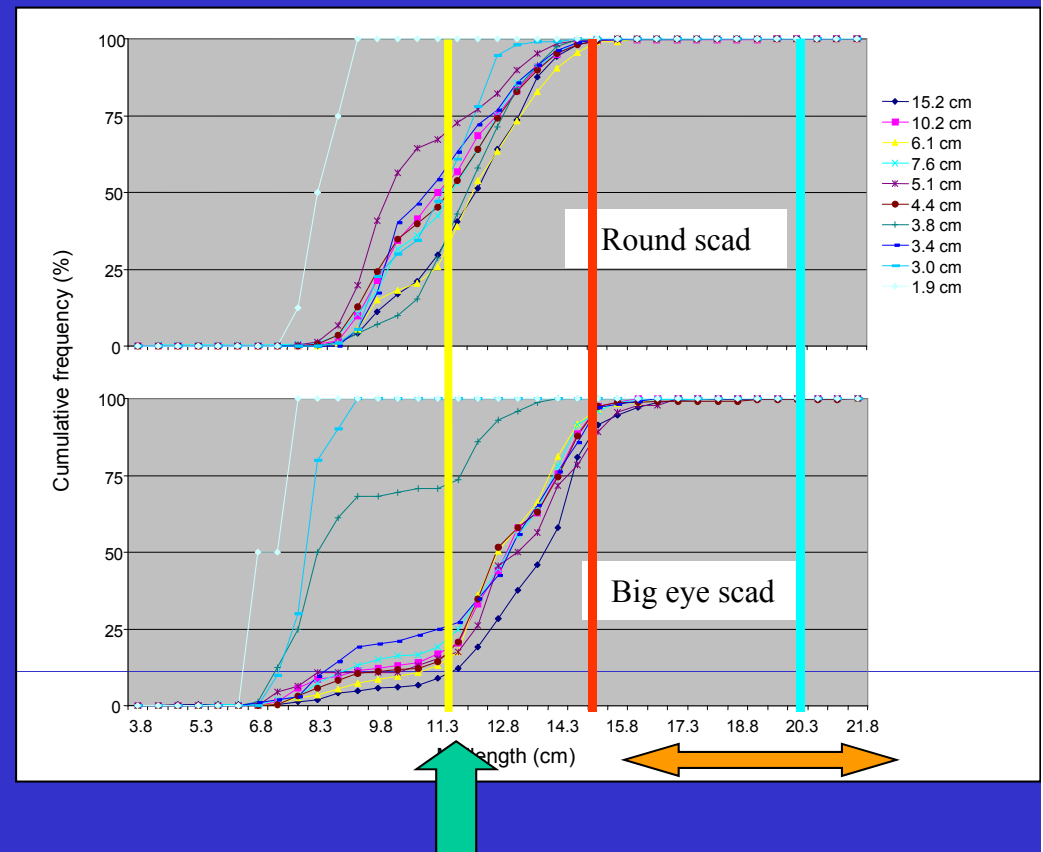
(Source: Fishbase)

# Cumulative frequency plots

❖ “Circular” fish can escape with greater probability; “elliptical” fish, even if small, would not easily escape.

❖ To retain fish > 15 cm FL, retained small pelagic fish would be < 10%.

❖ Aiming for 50% escapement of tuna juveniles?



# Conclusions

- Small-scale purse seines in the Philippines have the potential to capture juveniles of tuna and other small pelagic fishes
- Fish body form affects size selectivity of purse seines
- Increasing small-scale purse seine mesh size is necessary, but this must be done by striking a right balance on issues related to **tuna sustainability** and **food security**

## Future activities

- Additional field selection experiments (this month)
- Economic impact studies of some proposed interventions
- Is FAD (payao) selectivity possible?

*EBFMtuna-2012 Organizers*  
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*University of the Philippines in the Visayas*

**THANK YOU**