On the sustainability of small-scale fisheries in the Philippines

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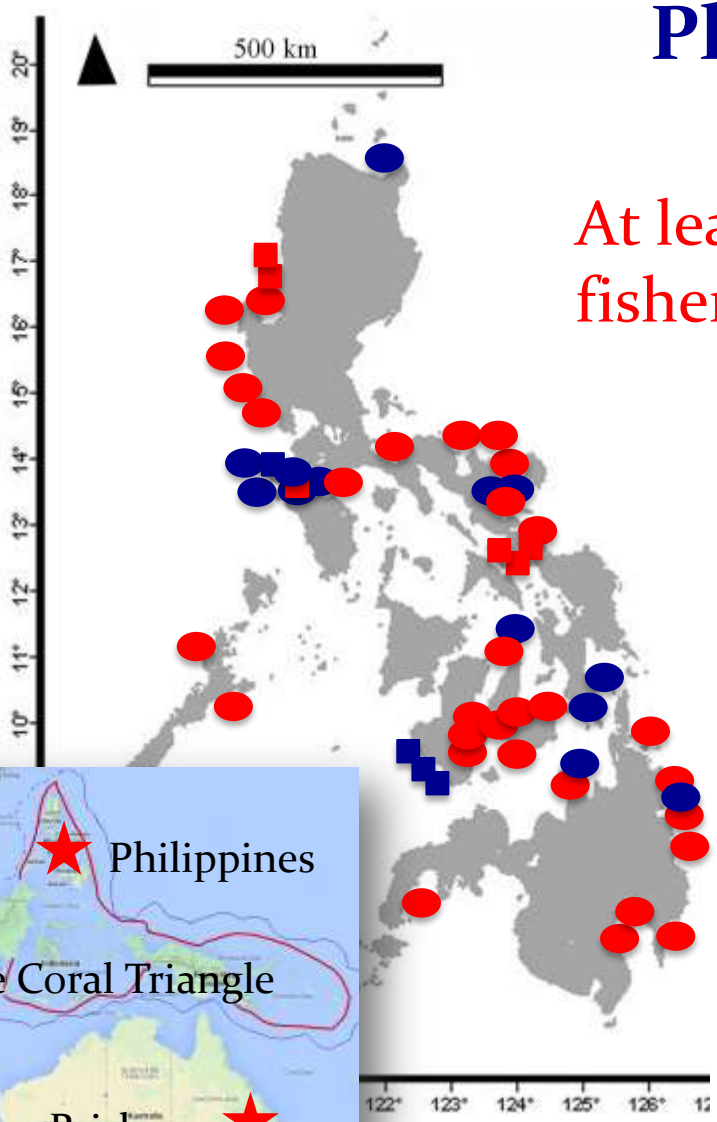
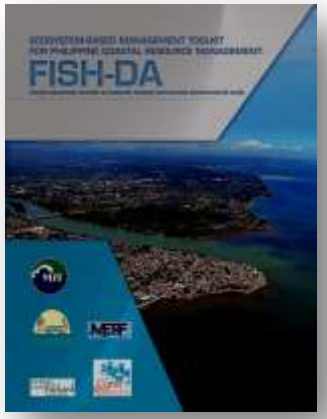
Outline:

- **Status of small-scale fisheries**
- **Achieving sustainable fisheries**
  - **Fishing effort regulation** (fishers' behavior)
    - attachment to the fishery and fishing effort
    - Factors affecting behavior
  - **Marine protected areas (MPAs)** (coral reef fishes)
    - Fish assemblages between fished and protected areas.
    - Dependence of fishers on coral reef fisheries
    - Perception of fishers toward MPAs.
- **Synthesis and recommendations**

Status of small-scale fisheries* in the Philippines



At least 68% of coastal fisheries are unsustainable!!



- Sustainable
- Unsustainable

Muallil et al., 2014

- Sustainable
- Unsustainable

Additional personal data

* Also called municipal fisheries in the Philippines. Size of boat of <3 gross tons. Exploit coastal fishing grounds.

Large-scale/commercial fishers are prohibited inside municipal waters, i.e. up to 15 km from the shore.

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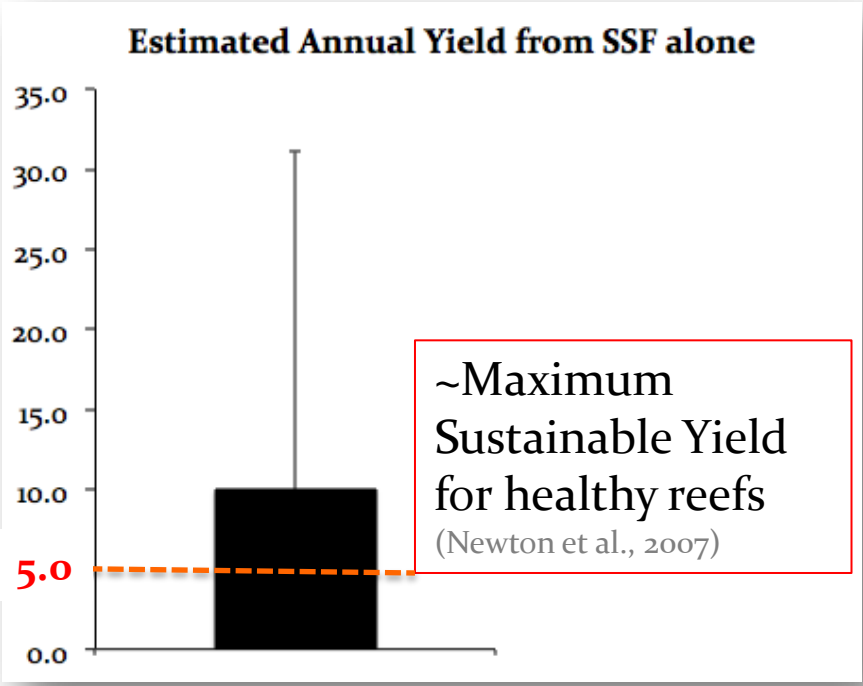
Very high fishing pressure

915 (56% of total) coastal municipalities in the Philippines

	Mean±SD
Size of municipal waters*	442 ±459 km²
No. of small-scale fishers per municipality	1,797 ±1,558
Catch rate per fisher	5.3 ±3.7 kg/day
No. of fishing days/year	226 ±37 days

*Municipal waters – coastal waters from the shore up to 15 km seaward.



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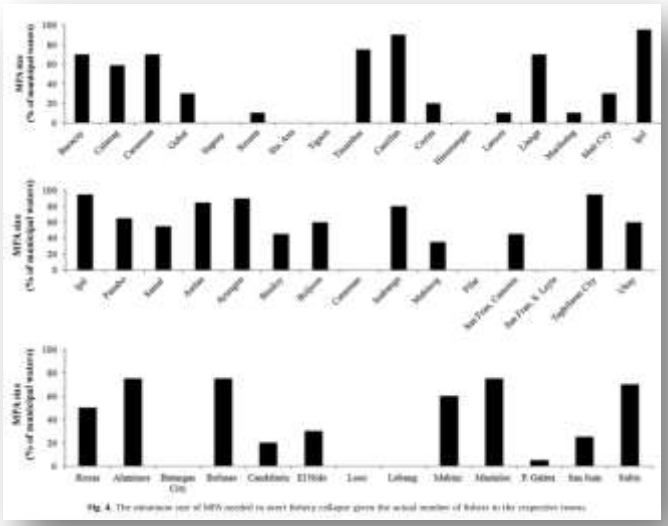
To achieve sustainable fisheries:

Size of MPAs needed
(percent of municipal waters)

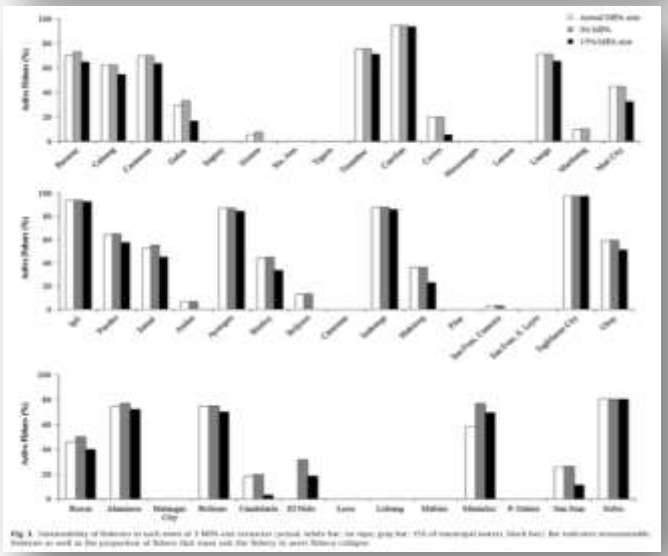


Establish very large MPAs

i.e. at least 58% of the municipal waters must be protected!!

(current MPAs in the Philippines cover only about 3% of municipal waters)

Active fishers that must stop fishing (%)



Reduce considerable fishing effort

i.e. at least 53% of active fishers must stop fishing

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Willingness to exit the fishery:

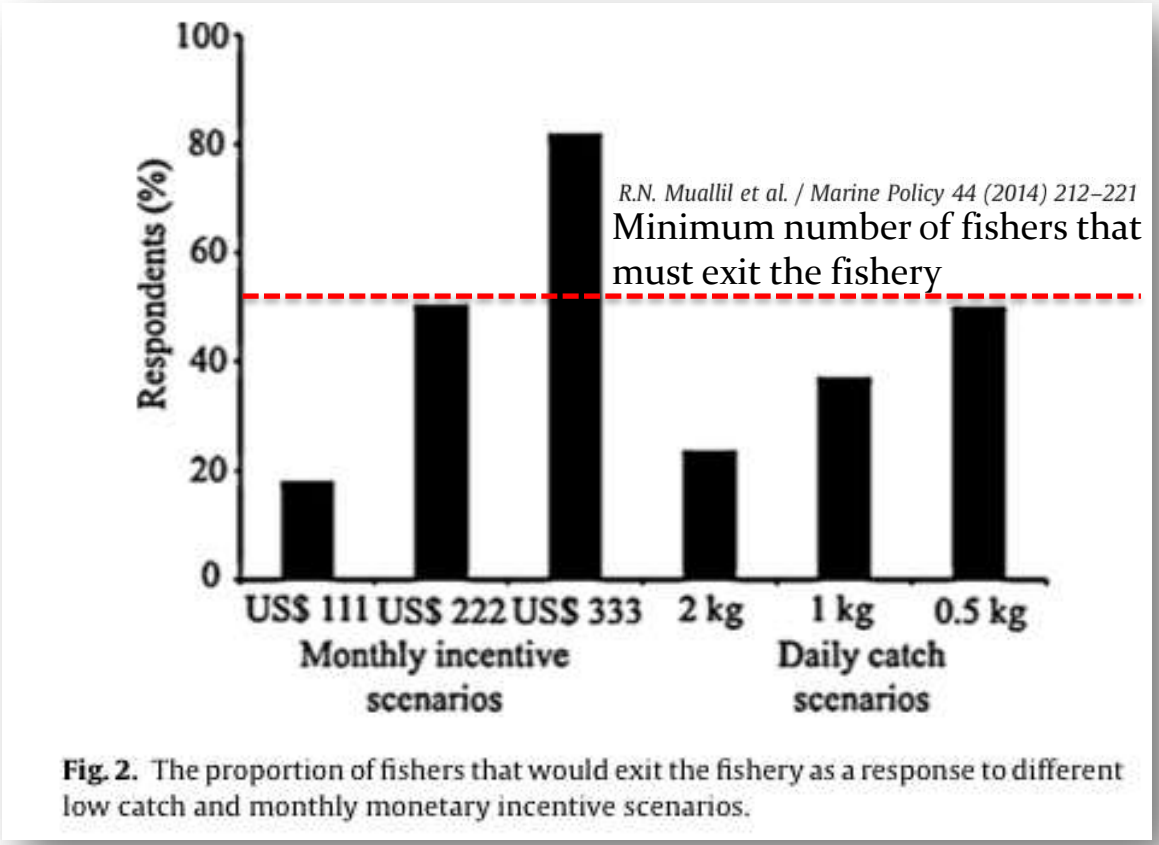

Fig. 2. The proportion of fishers that would exit the fishery as a response to different low catch and monthly monetary incentive scenarios.

Binary logistic regression in R

Fishers who are more likely to exit the fishery:

1. **New in the fishery**
   i.e. ≤10 years
2. **Seldom fish**
   ≤14 days/month
3. **Young fishers**
   ≤35 yrs old

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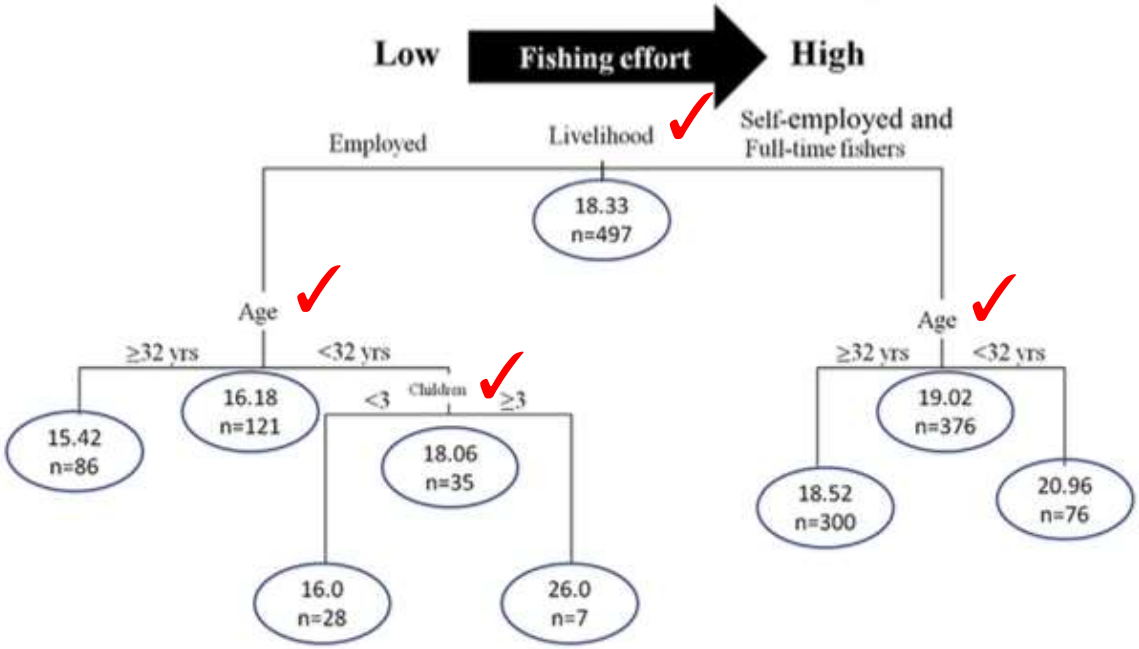
Factors associated with fishing effort:

Fishing effort: measured as the number of fishing days per month.

Regression tree in R



Fishers with high fishing effort:

1. **Those w/o alternative livelihood**
2. **Young fishers**
3. **Those with more children**

Fig. 2. Regression tree showing the most important factors determining fishing effort. Higher branches offer greater explanatory power. Average fishing effort and number of respondents are listed at each node. The length of the vertical line of each split is proportional to the variation explained by each variable.

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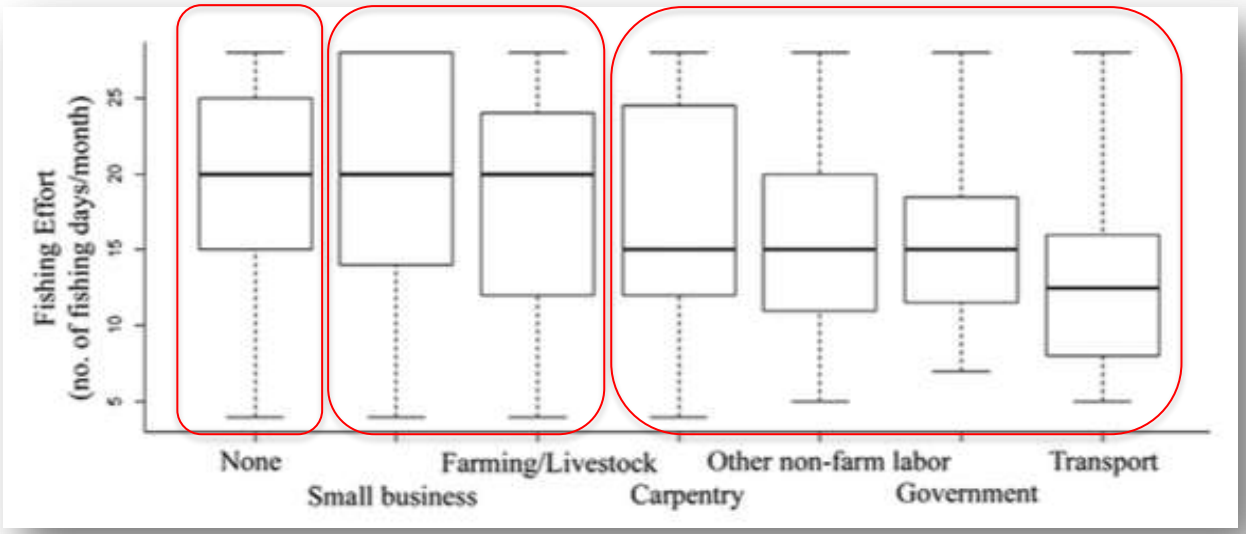
Relationship between fishing effort and different types of livelihood

No alternative livelihood

"self-employed"

"employed"



Nested ANOVA in R
(municipality as random effects)

I II III → I II III

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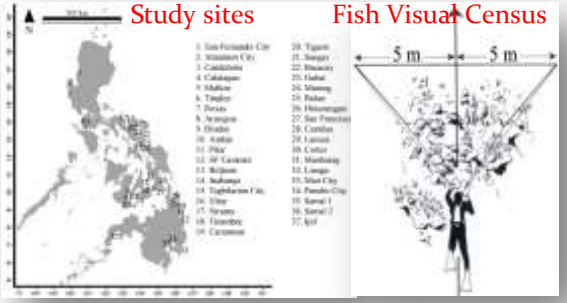
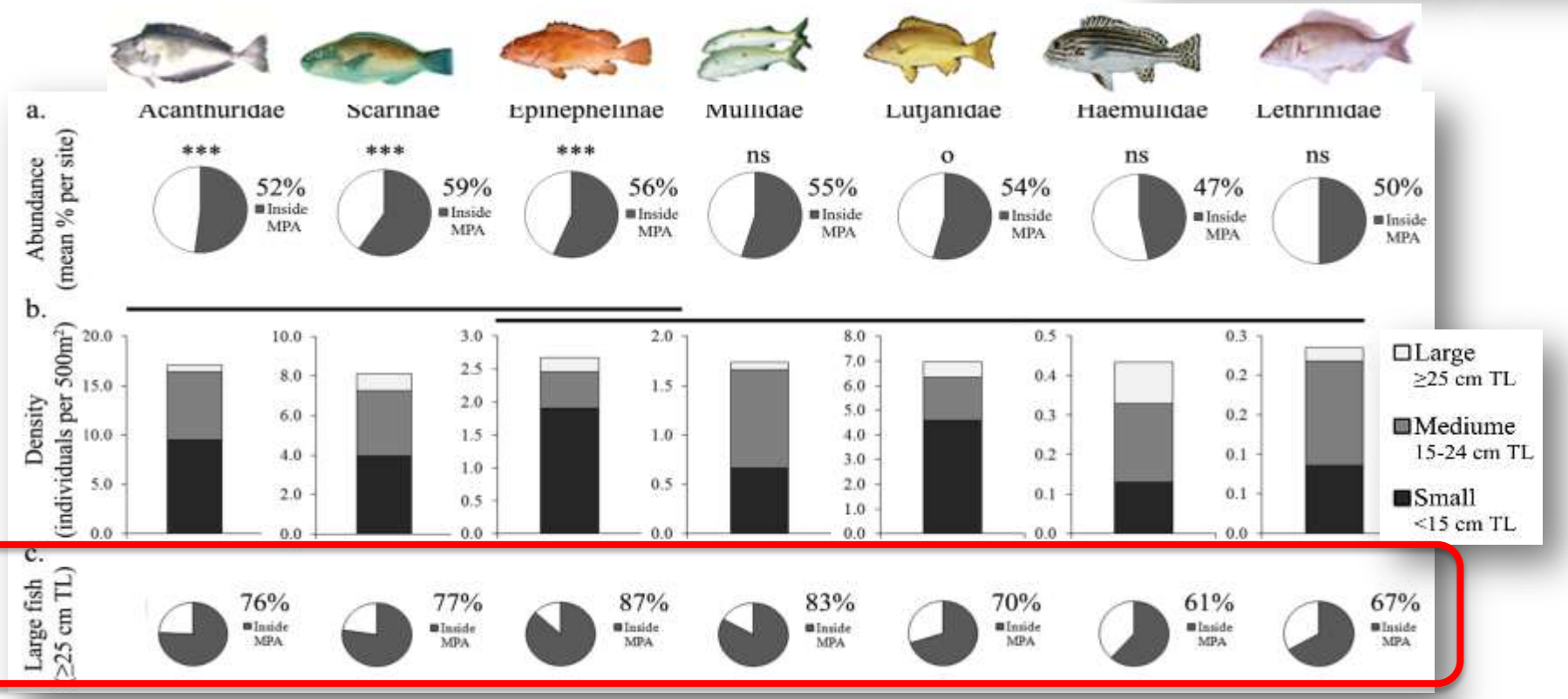
MPAs and coral reef fish conservation:

1

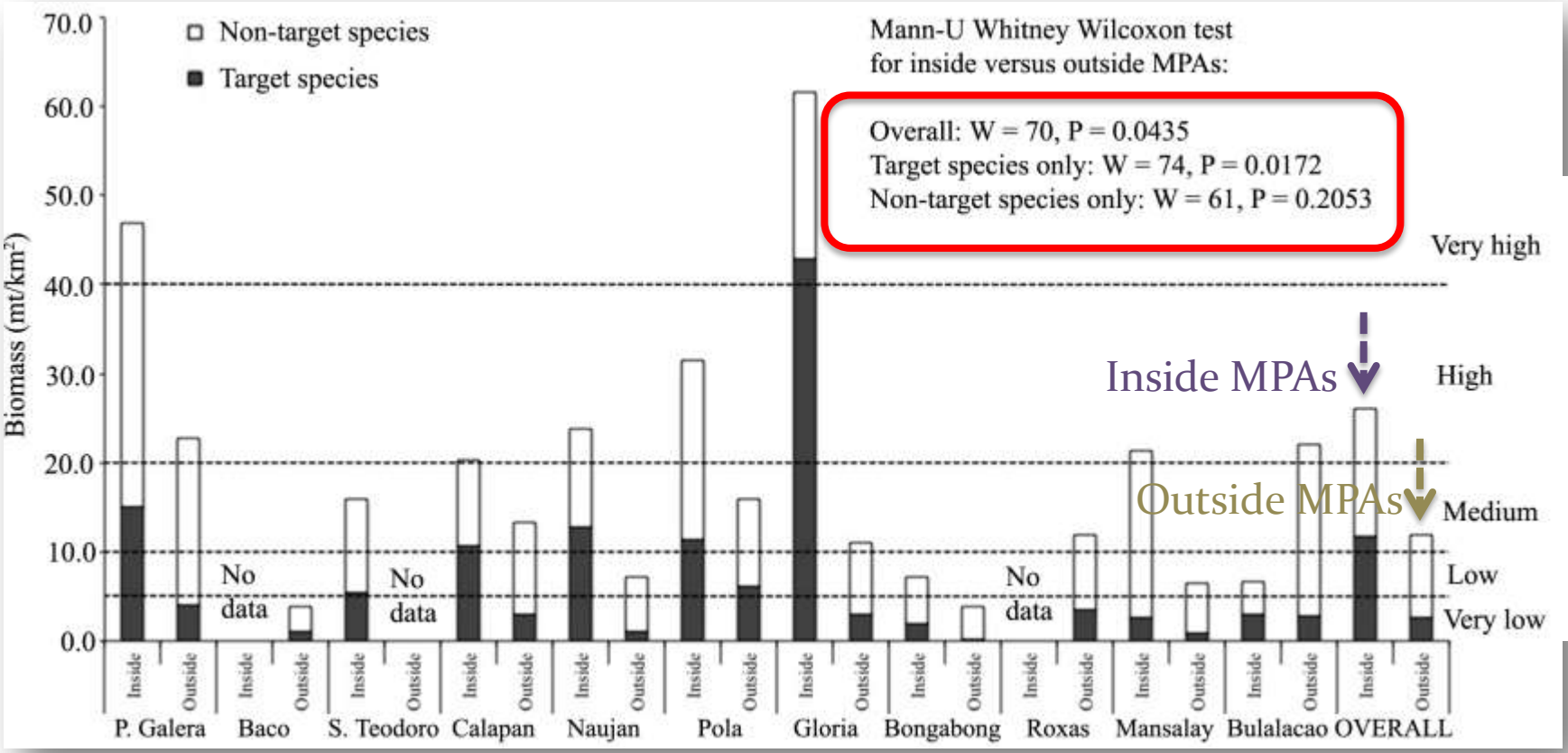
More and larger fish inside MPAs, especially for commercially important species





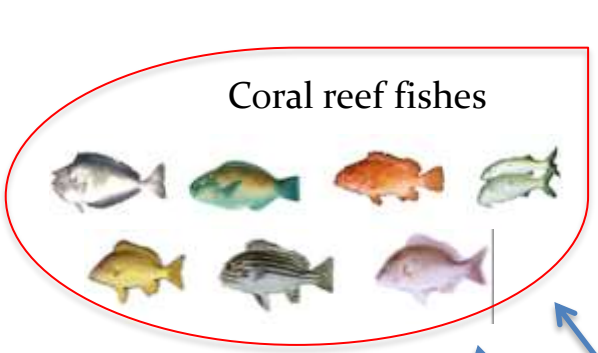
Muallil et al., 2014. Proceedings of the 2nd World Small-Scale Fisheries Congress.
Muallil et al. *in prep* (submitted to Regional Studies in Marine Science journal)

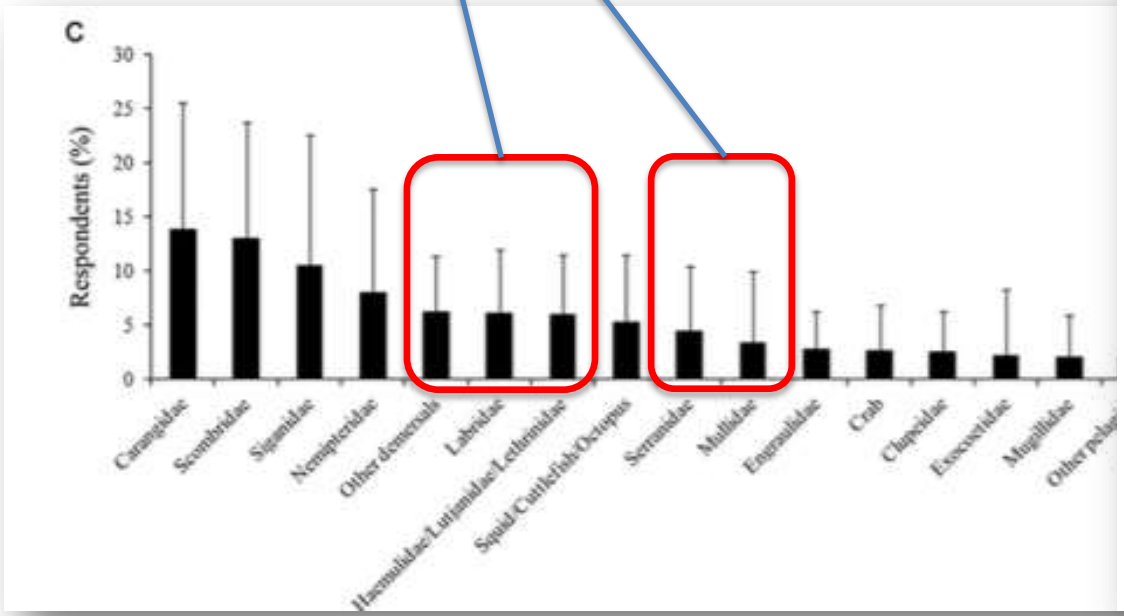
2 More fish inside MPAs
BUT only very few reefs are "healthy".

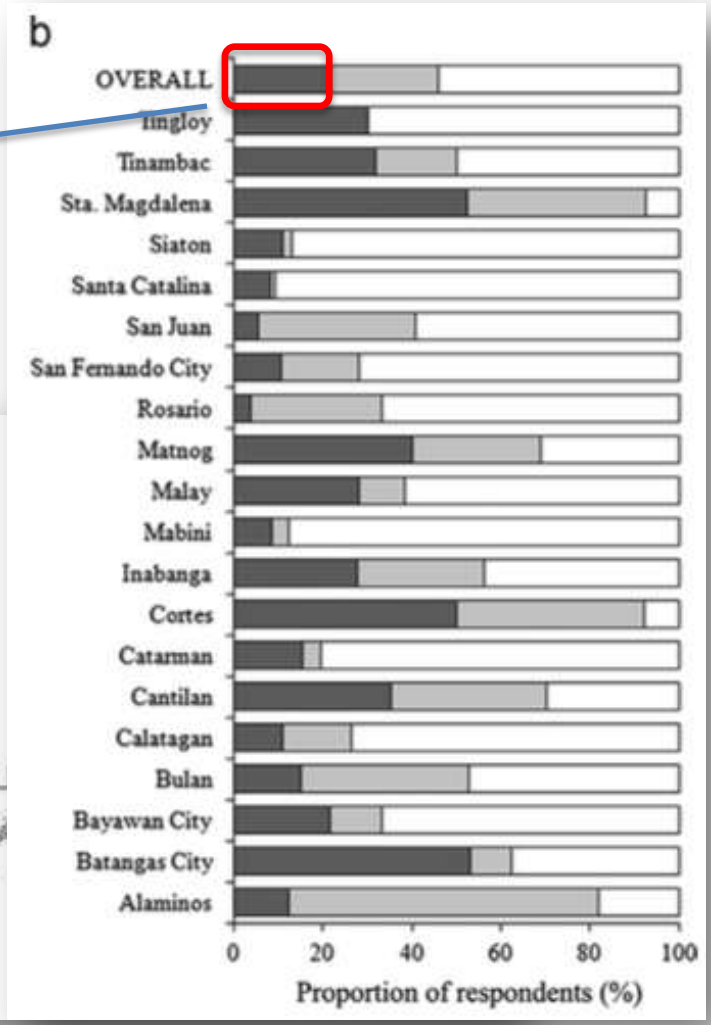


Muallil et al. *in prep* (submitted to Marine Policy journal)

3 Only small proportion of fishers are primarily targeting coral reef fishes







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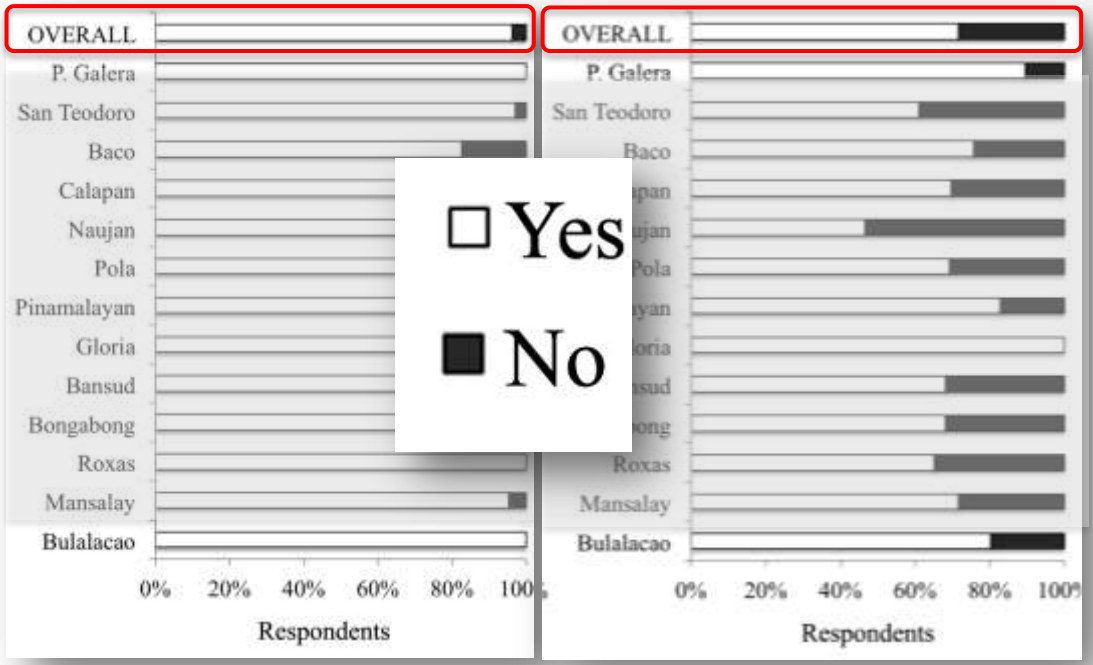
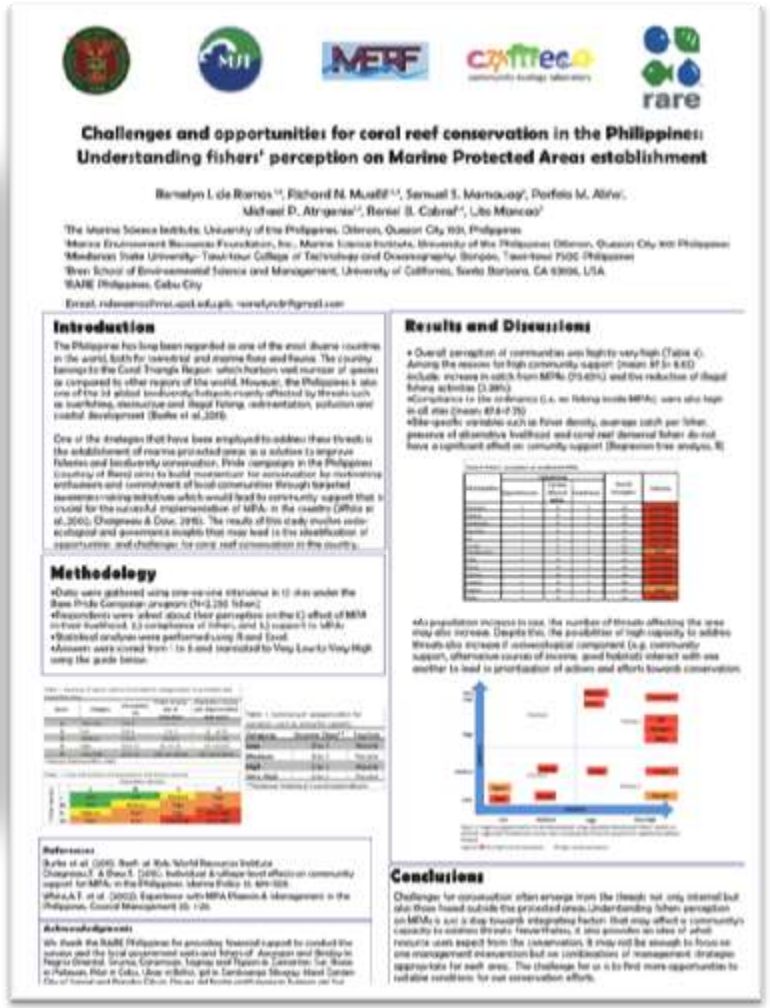
4 High local support for MPA establishment!

a. Do fishers support MPA establishment?

b. Do fishers think MPAs can improve the fisheries?



Please also visit poster exhibit:



Muallil et al. *in prep* (submitted to Marine Policy journal)

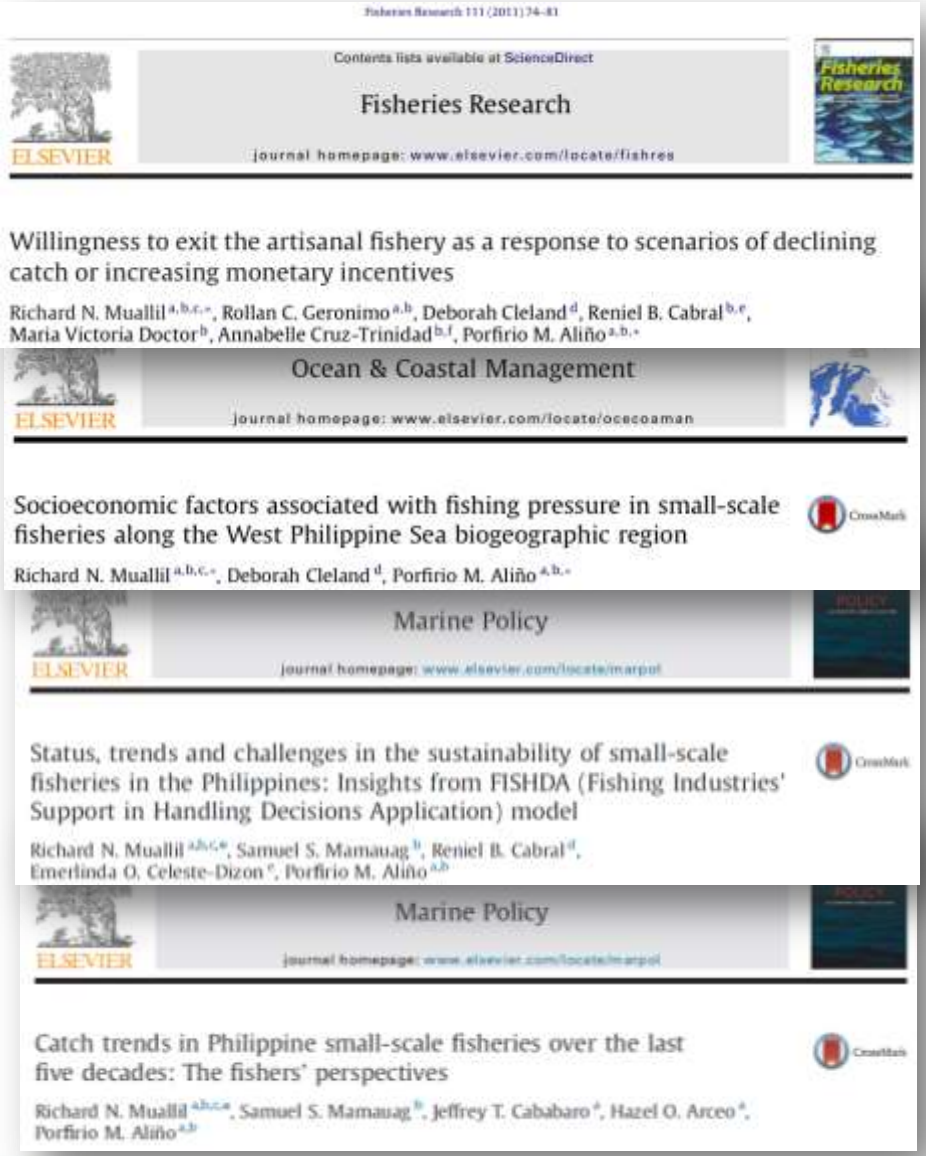
❖ Synthesis:

- ❖ SSF is highly unsustainable and has been drastically declining.
- ❖ The required MPA size and fishing effort reduction for sustainable SSF are very high.
- ❖ Fishers have variable behaviors in terms of their attachment to the fishery and fishing effort they exert.
- ❖ Better condition of reef fishes inside MPAs.

❖ Recommendations: Policy makers must also carefully address the ff:

- ❖ Illegal and destructive fishing practices and other anthropogenic threats
- ❖ IEC and awareness raising activities to encourage local participation in coastal resource management activities.
- ❖ Poverty and lack of alternative options (livelihood programs, capacity building, conditional cash transfers).
- ❖ Right sizing of fishing effort (i.e. divert catch from vulnerable coral reef fishes to the more abundant pelagic species).
- ❖ Poor governance

References



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COMECO laboratory

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