EB WP–1

Estimates of the mortality of non-target species with an initial focus on seabirds, turtles and sharks

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1st Meeting of the Scientific Committee of the Western and Central Pacific Fisheries Commission
WCPFC–SC1
Noumea, New Caledonia
9–19 August 2005

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Introduction

- Industrialized fisheries of the WCPFC region target tunas
- Tunas dominate catches
- Fisheries also interact and catch a wide range of other species
- Some species retained (commercial bycatch)
- Non-target species

Non-target species

- Turtles
- Seabirds
- Marine mammals
- Wide range of sharks and other fishes

- Industrialized fisheries prefer to avoid capture of non-target species
- Invariably, some non-target species are captured
- Some suffer mortality

WCPFC Request

"*Estimates of the mortality of non-target species with an initial focus on seabirds, turtles and sharks.*"

- Large number of species of sharks
- Targeted shark fisheries
- Fining
- Not all sharks are 'non-target' species
- UNCLOS Annex 1

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Data sources

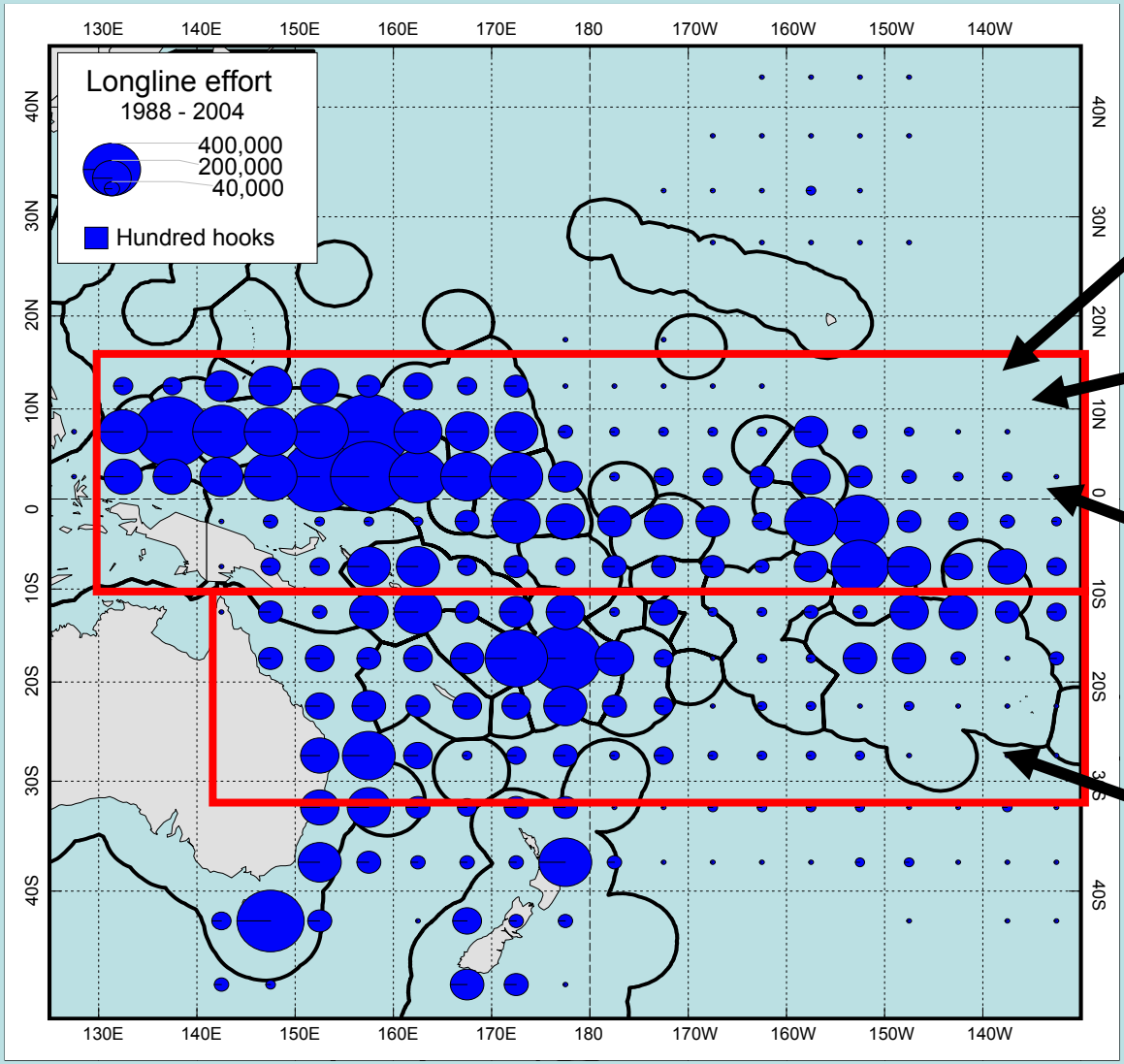
Logsheet data

- Limited records of birds, turtles, mammals
- Generic ‘shark’ category
- Underreporting

Observer records

- Fewer records
- More detail
- Limited spatial coverage
- Species identifications

Four fisheries defined



Purse-seine

Tropical shallow Longline <10 HBF

Tropical deep Longline ≥ 10HBF

Temperate albacore longline

Note: AU, NZ, US(HA), Other sources

Methods

- Annual estimates of CPUE (& SD)

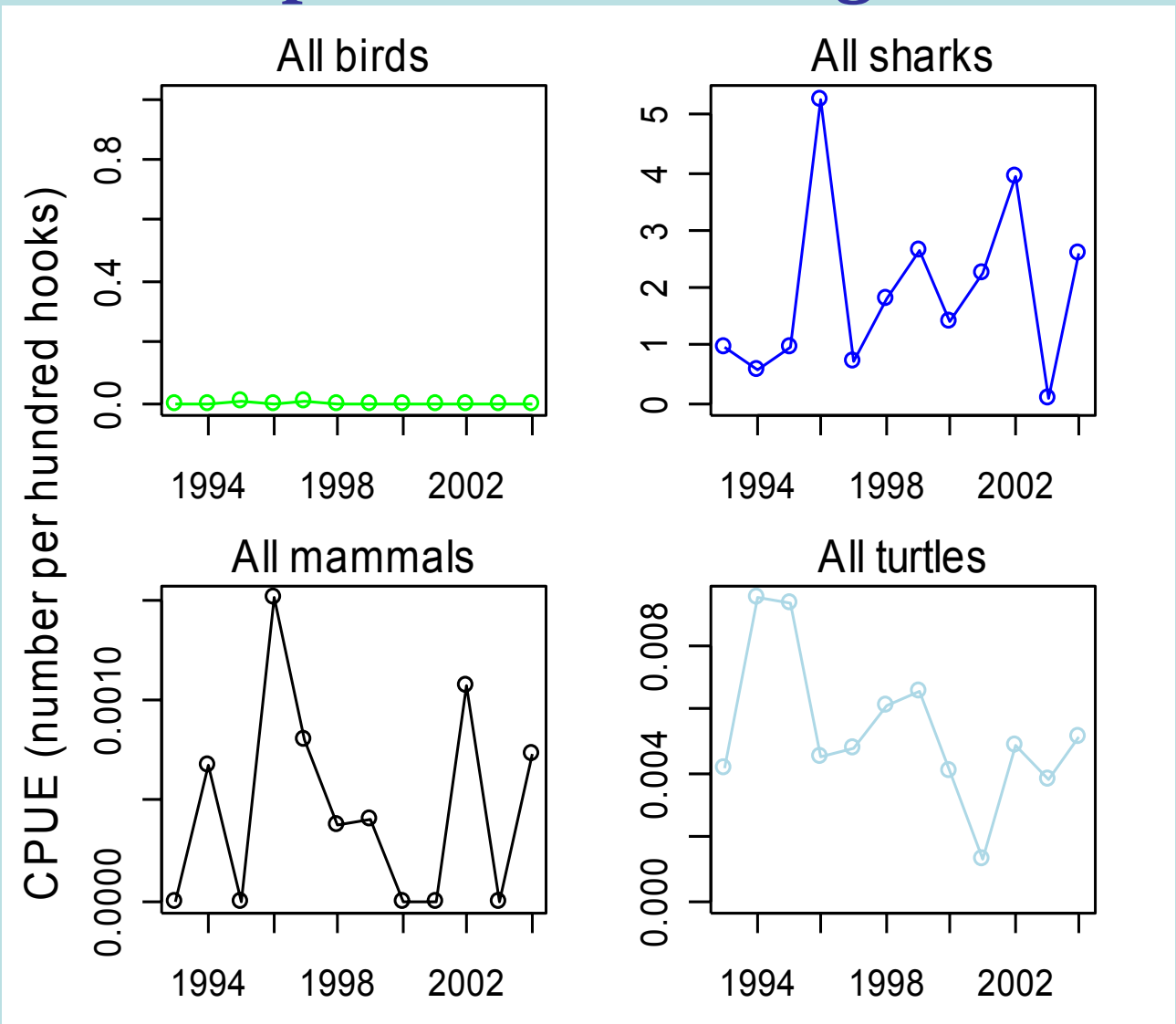
[Catches v Interactions v Encounters]

- Annual estimates of Mortality PUE (&SD)
- Longline: per hundred hooks
- Purse-seine: per set by set type

[aFADs, Animals, dFADs, Logs, Unassociated]

- Similar estimates for common shark species
- Estimates raised by total annual effort
- 2003/04 incomplete

Longline CPUEs: Tropical shallow longline



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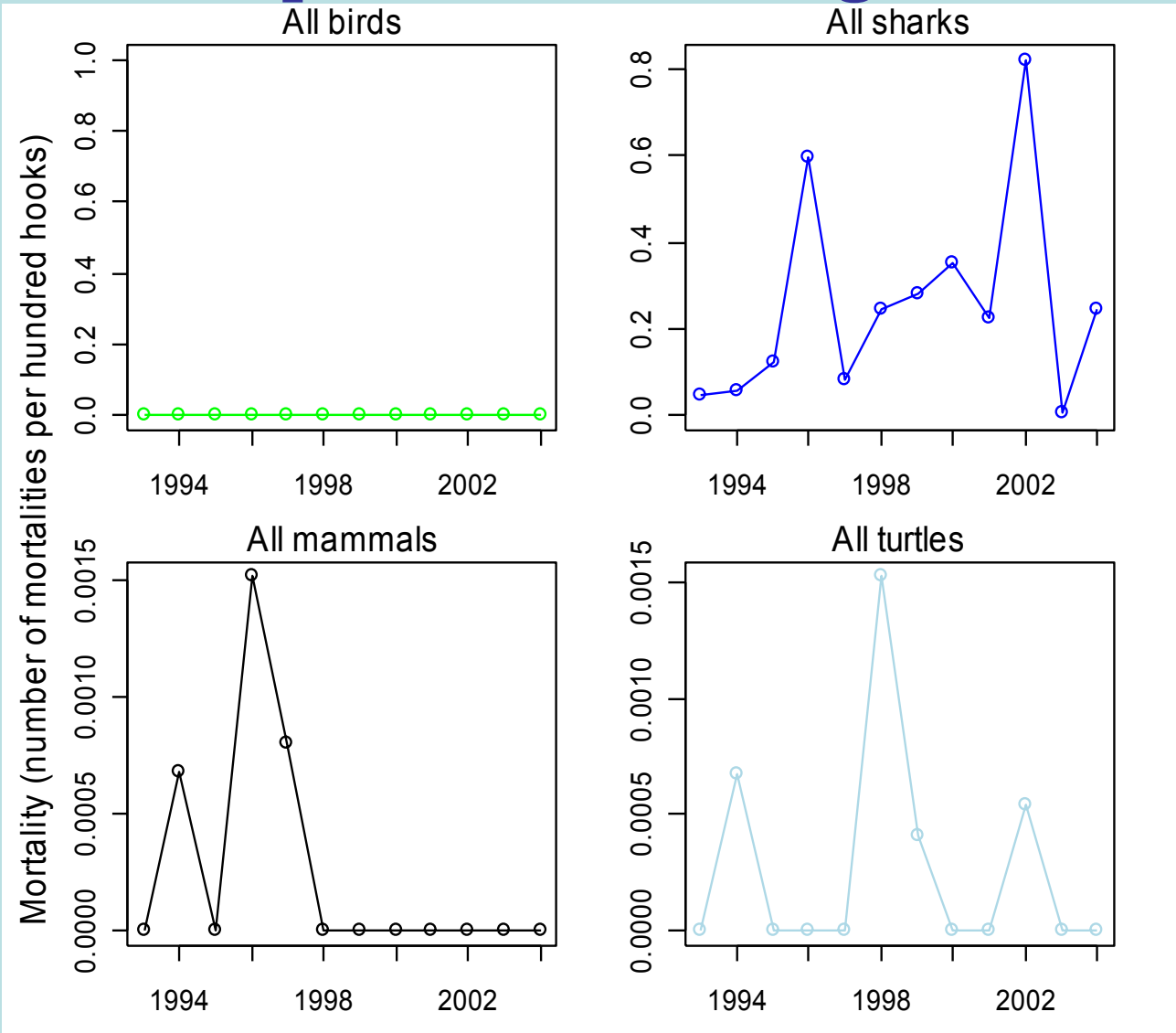

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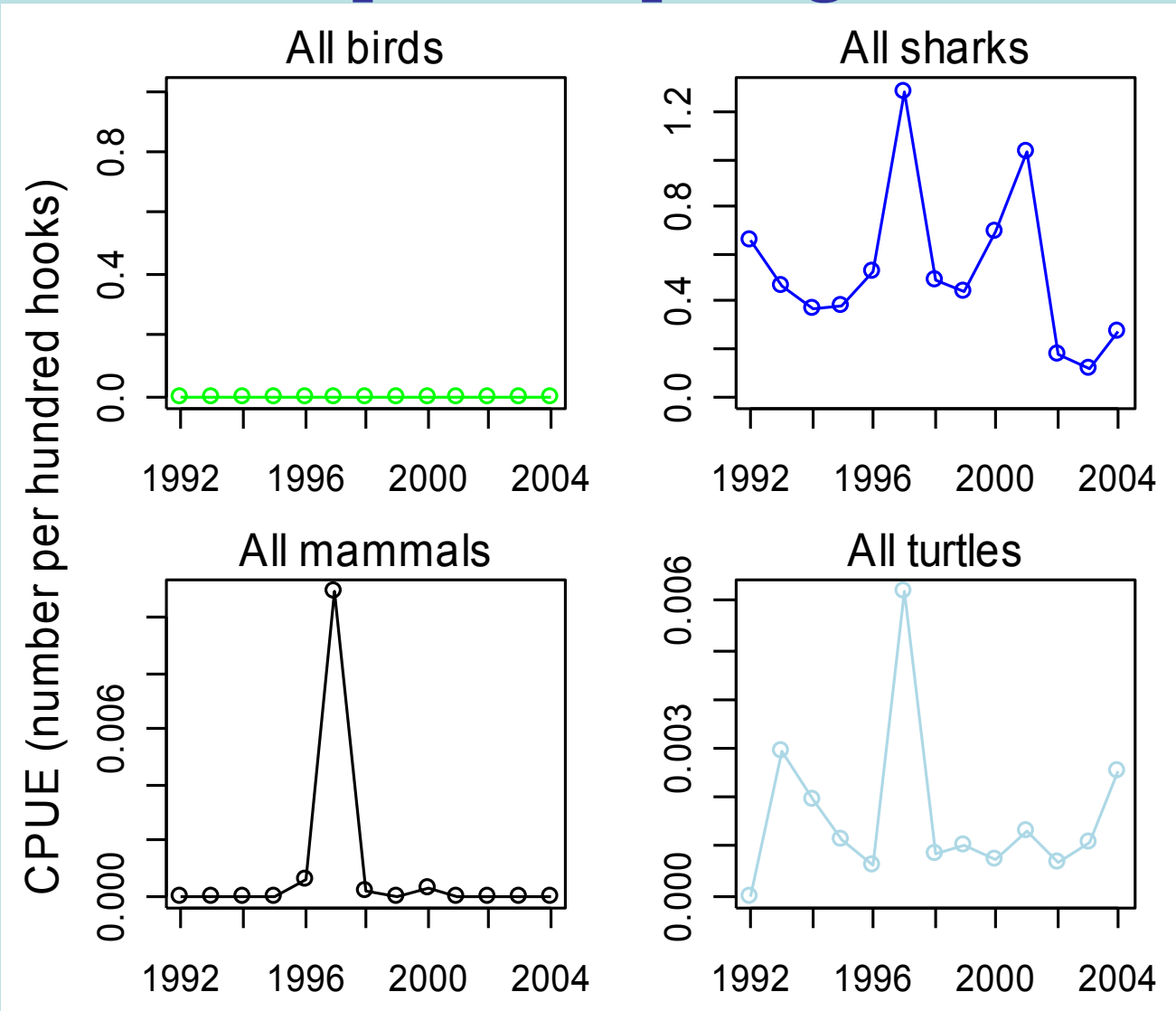
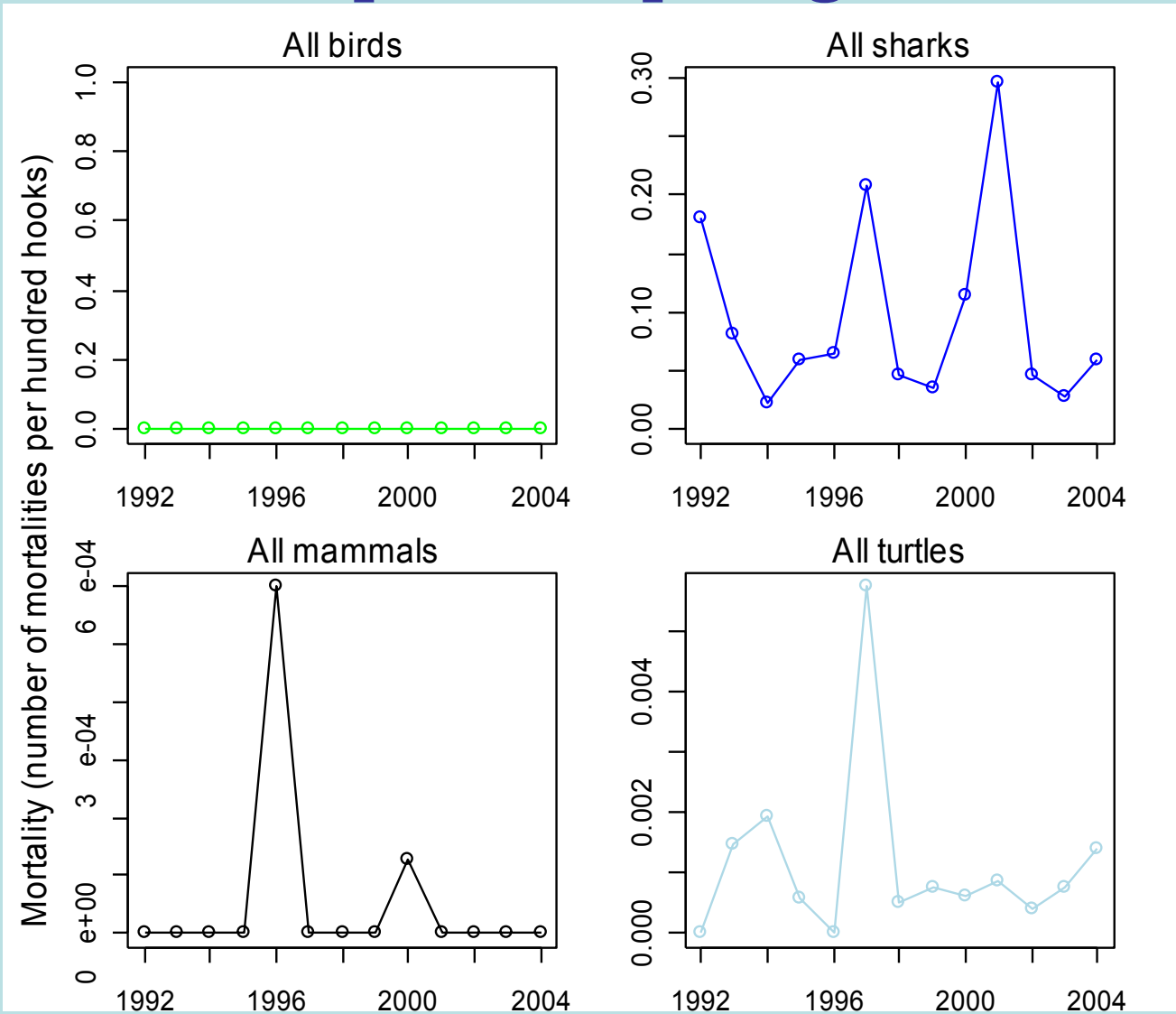
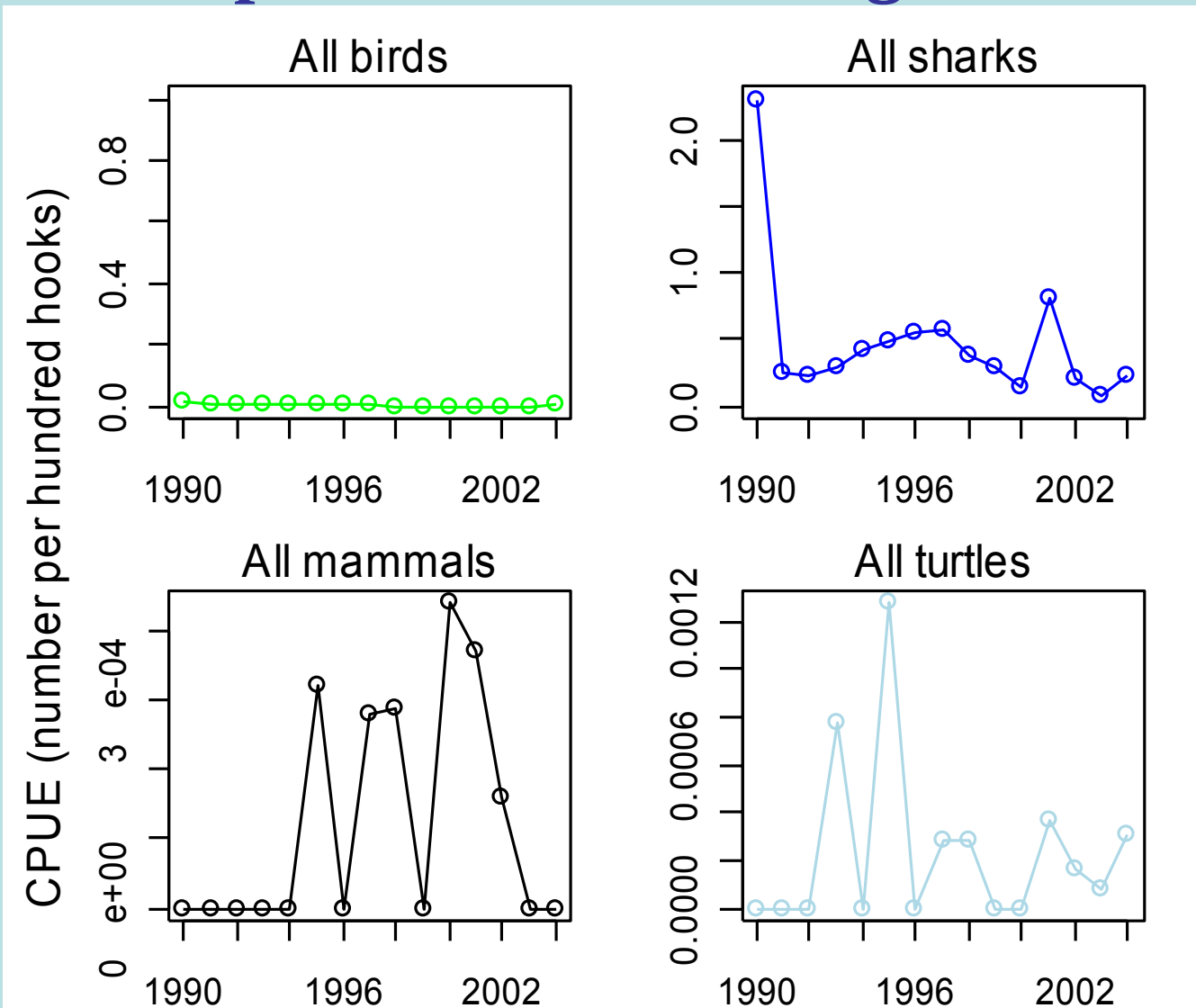


Longline CPUEs: Tropical deep longline



Longline CPUEs:
Temperate albacore longline



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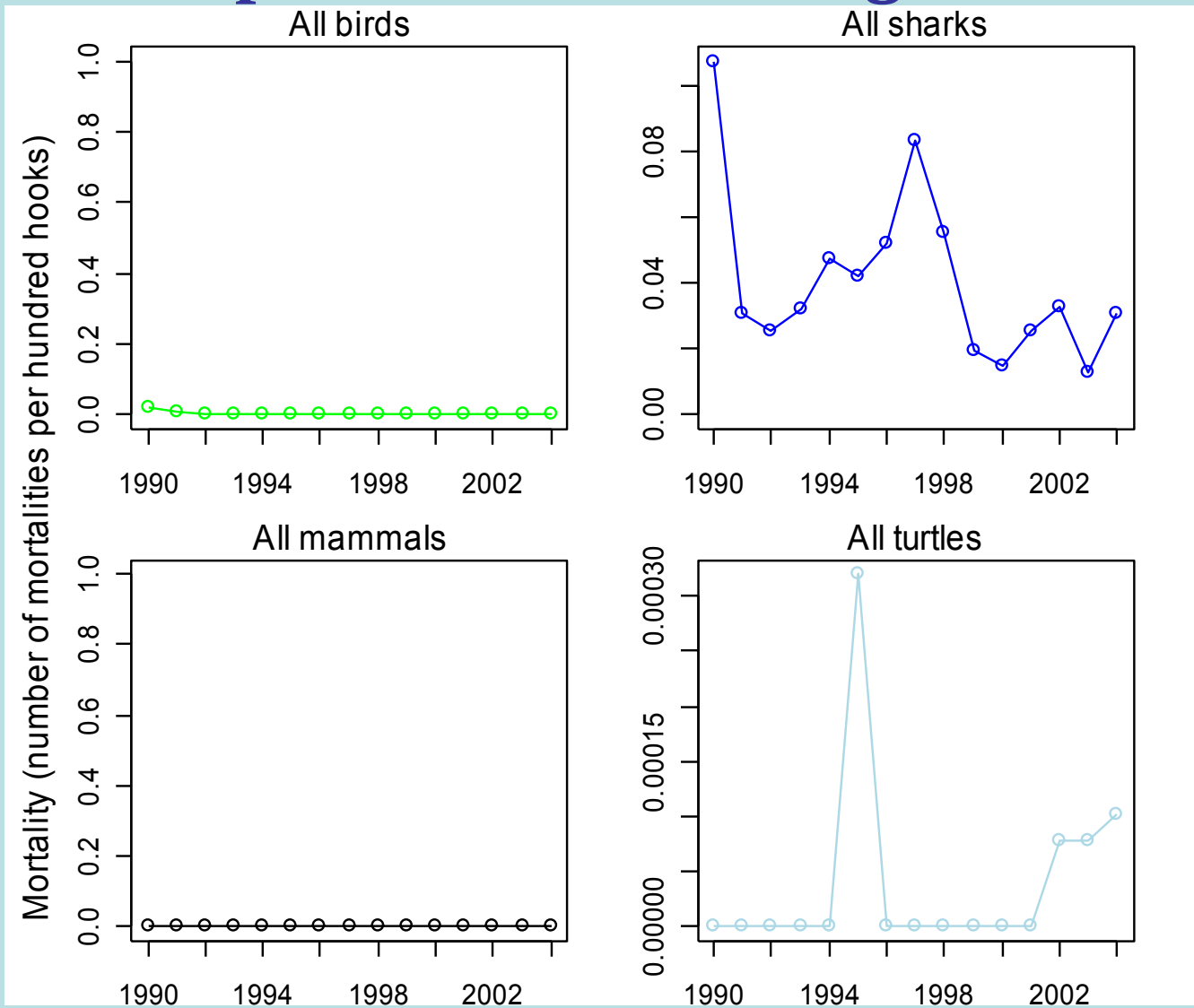
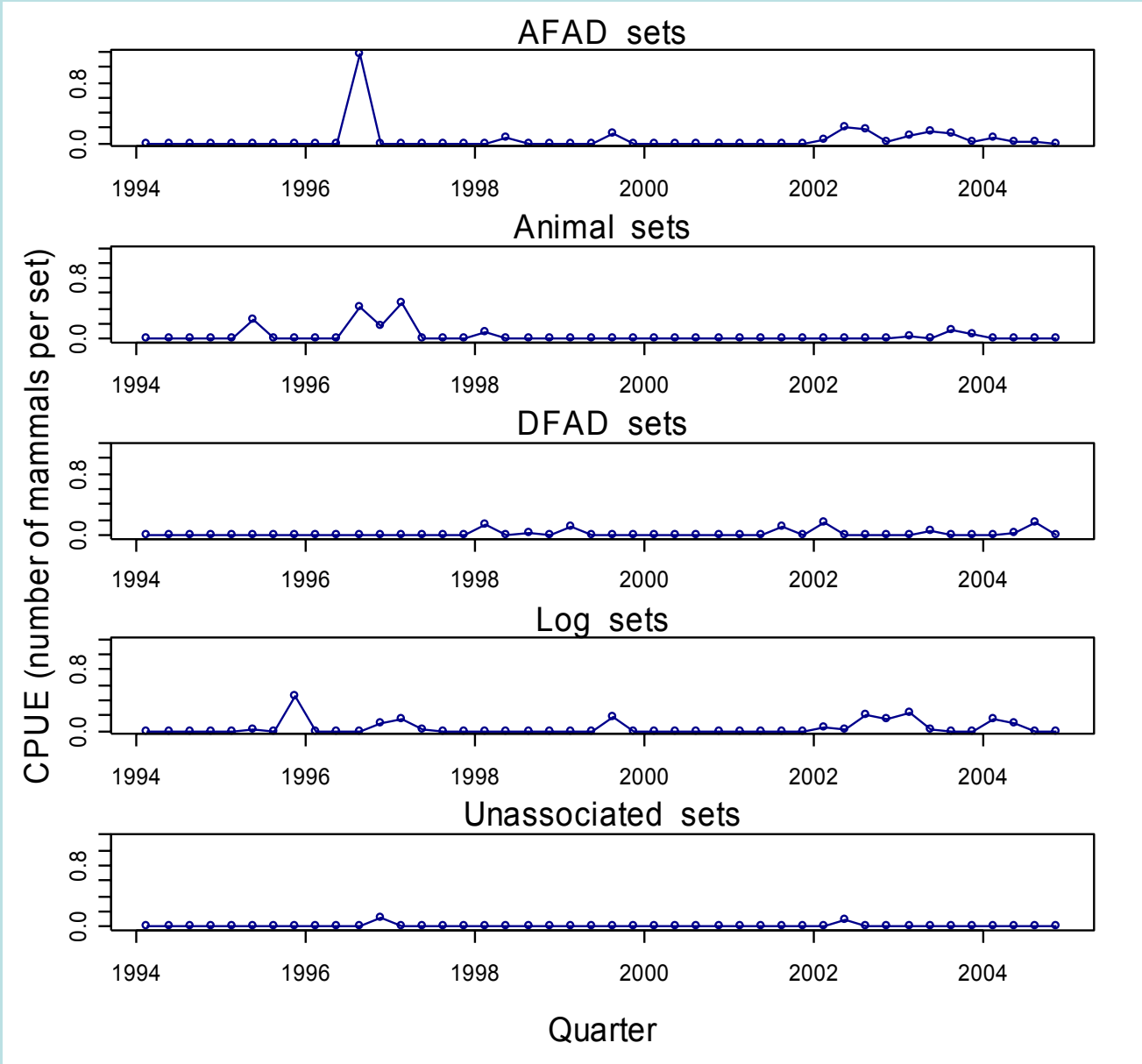


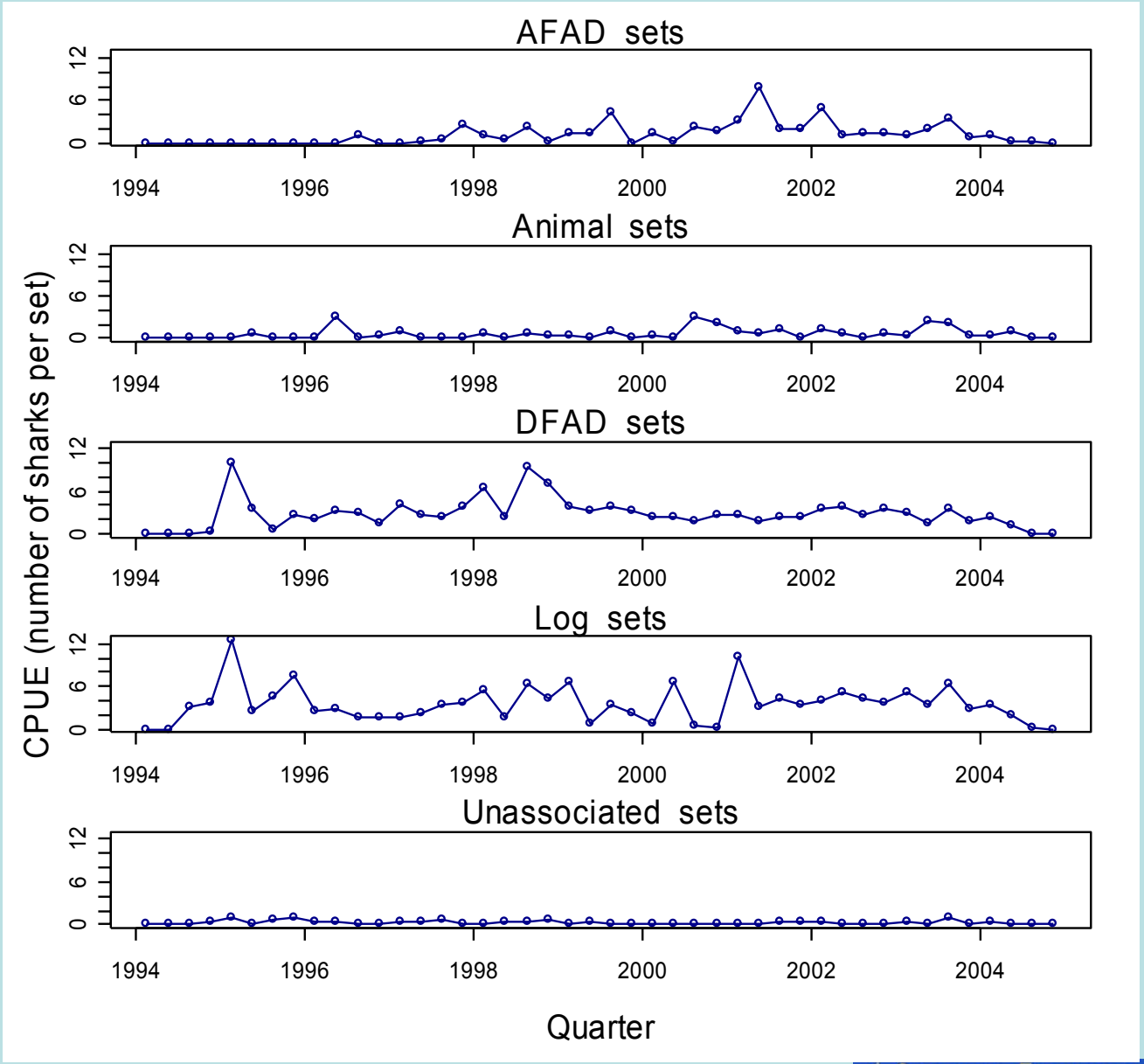
Purse-seine: CPUEs

- Birds: one record only

Purse-seine: CPUEs



Purse-seine: CPUEs



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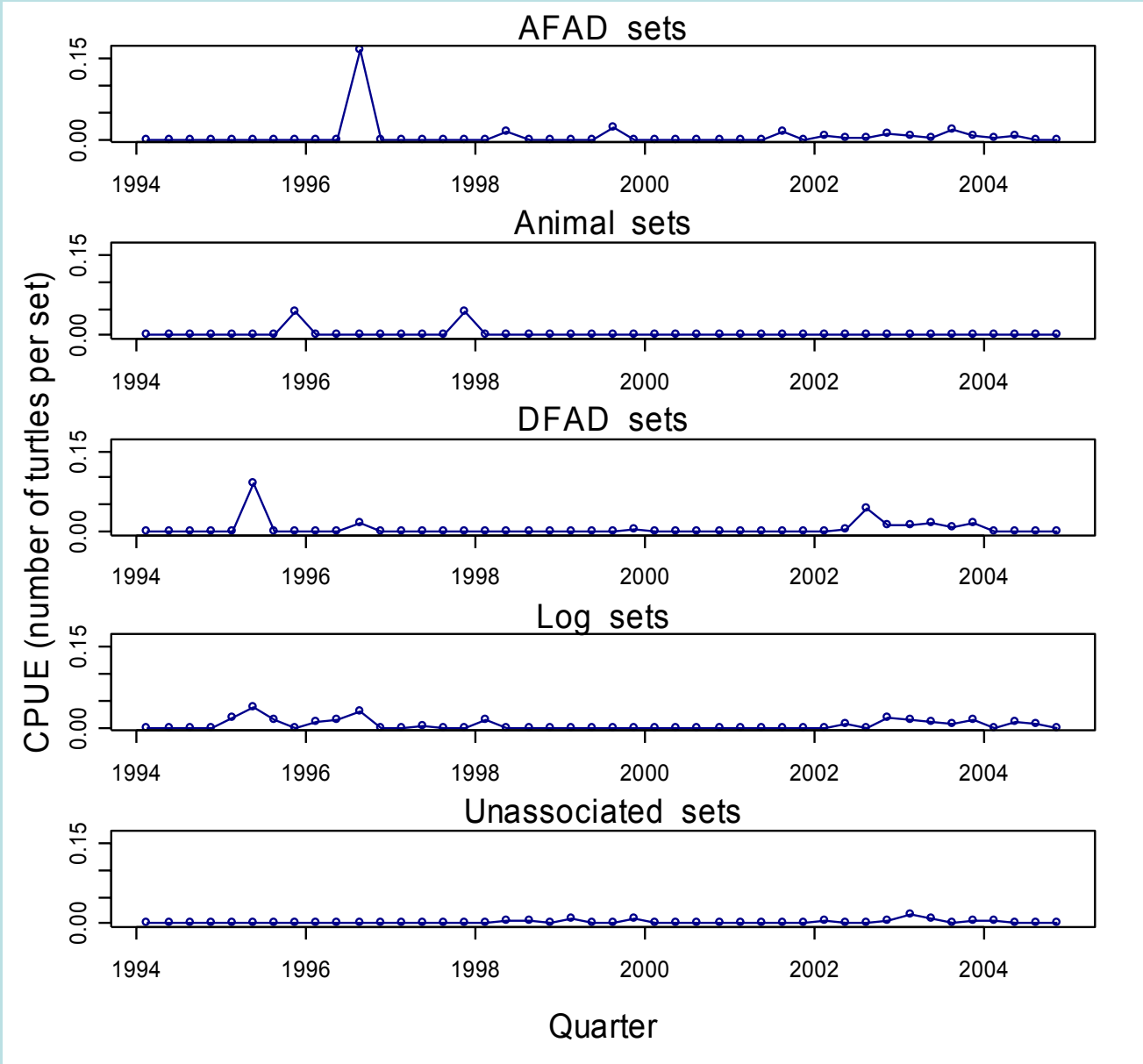
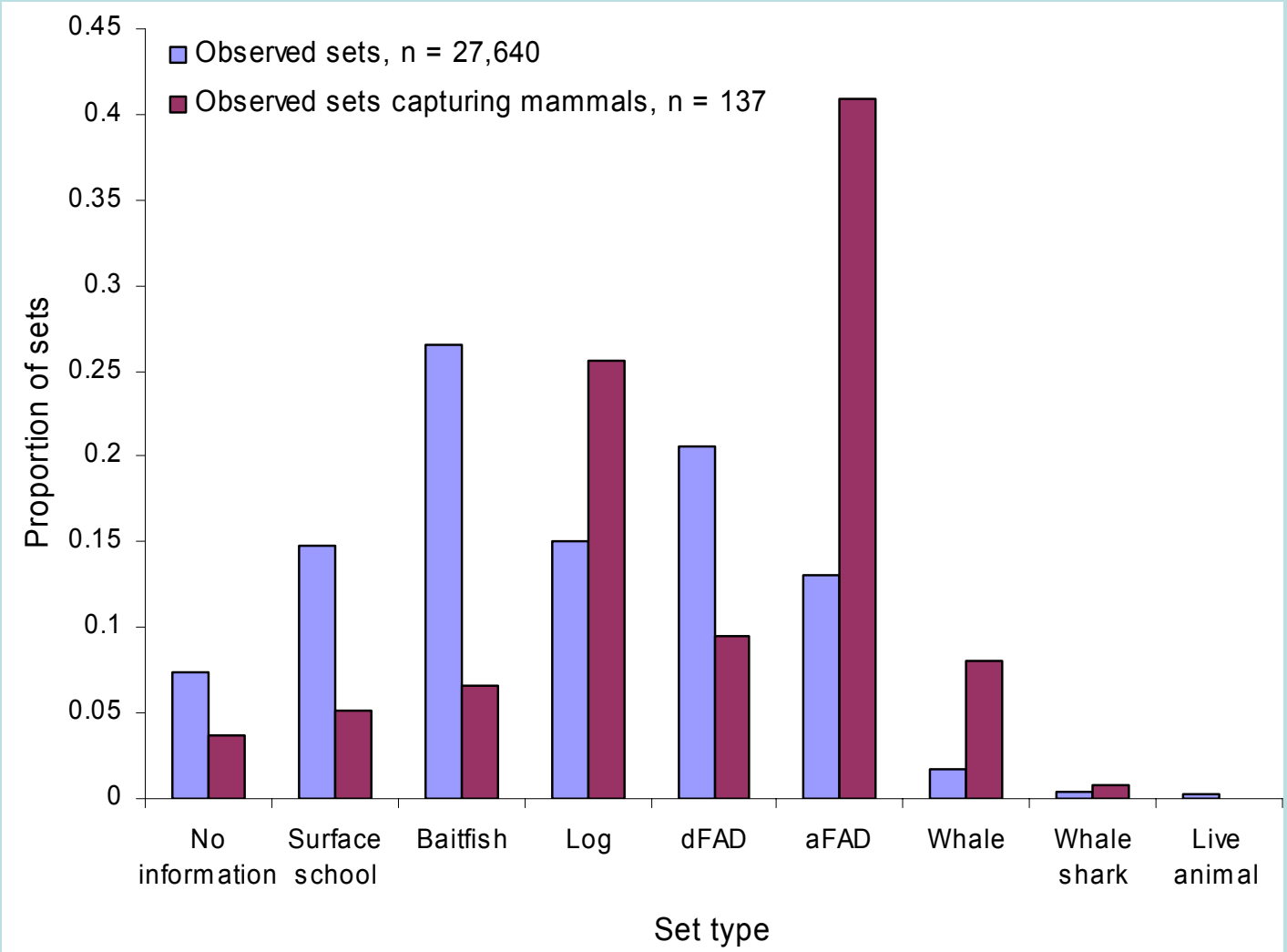


Purse-seine: set type



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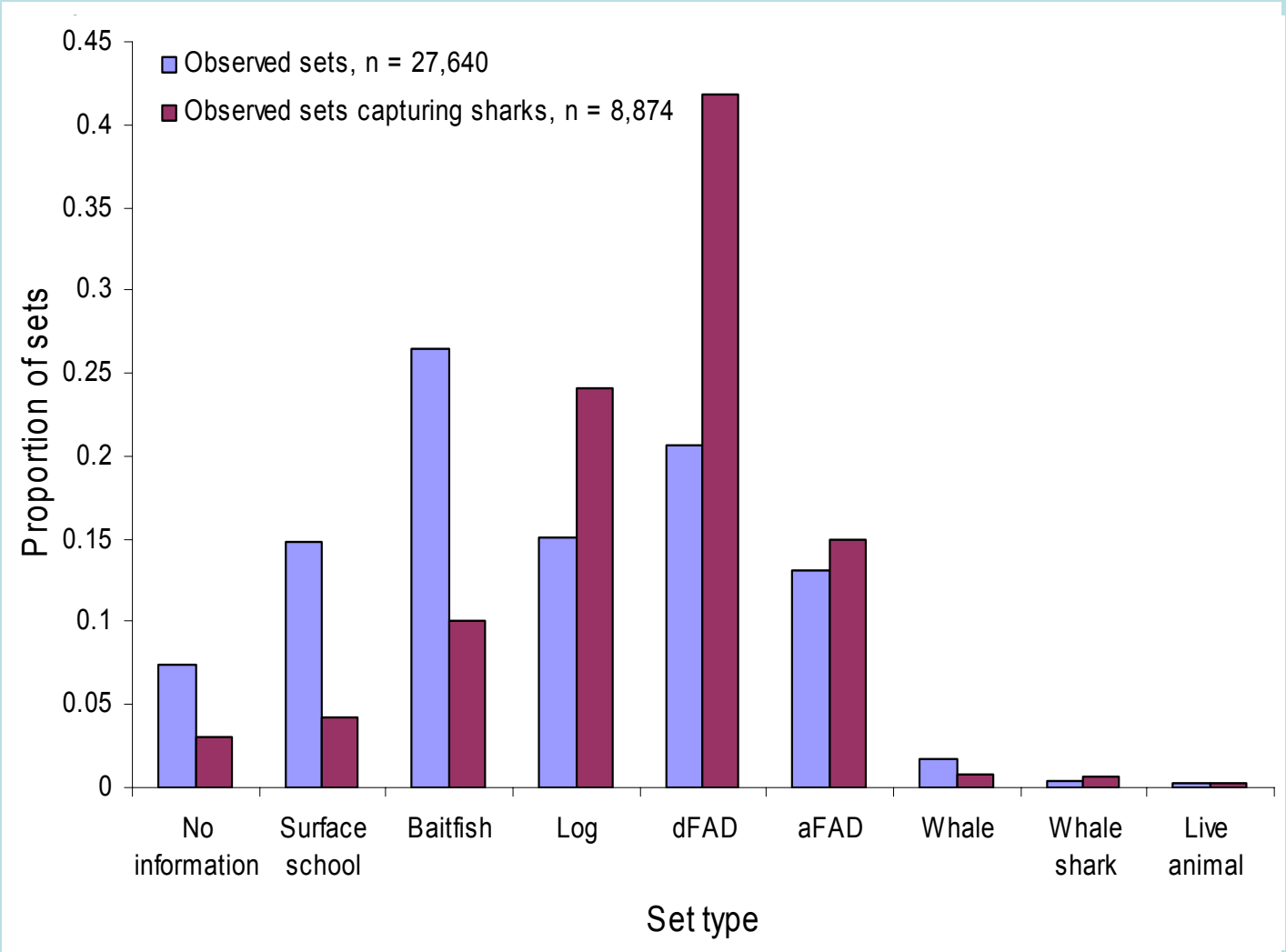

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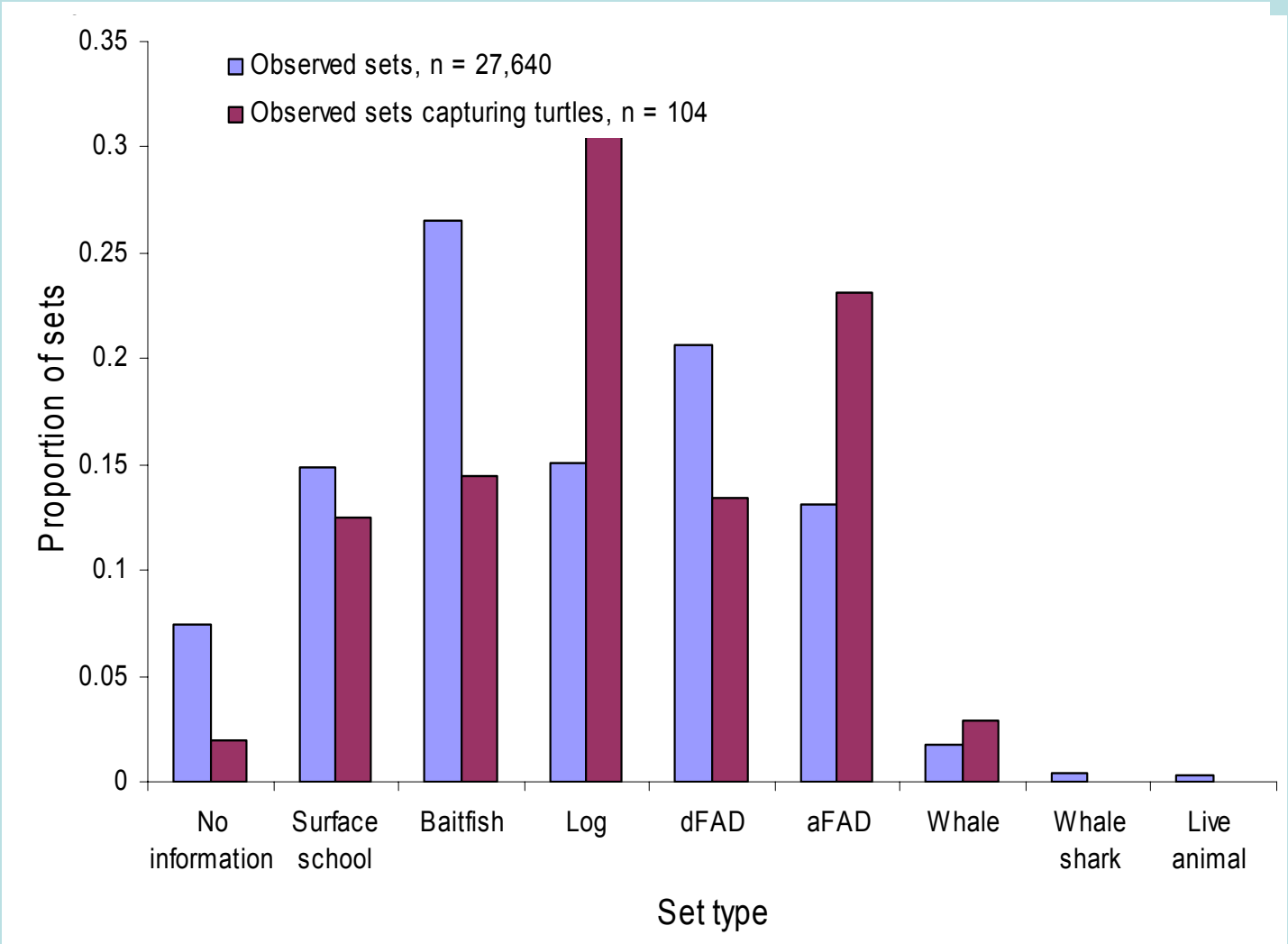
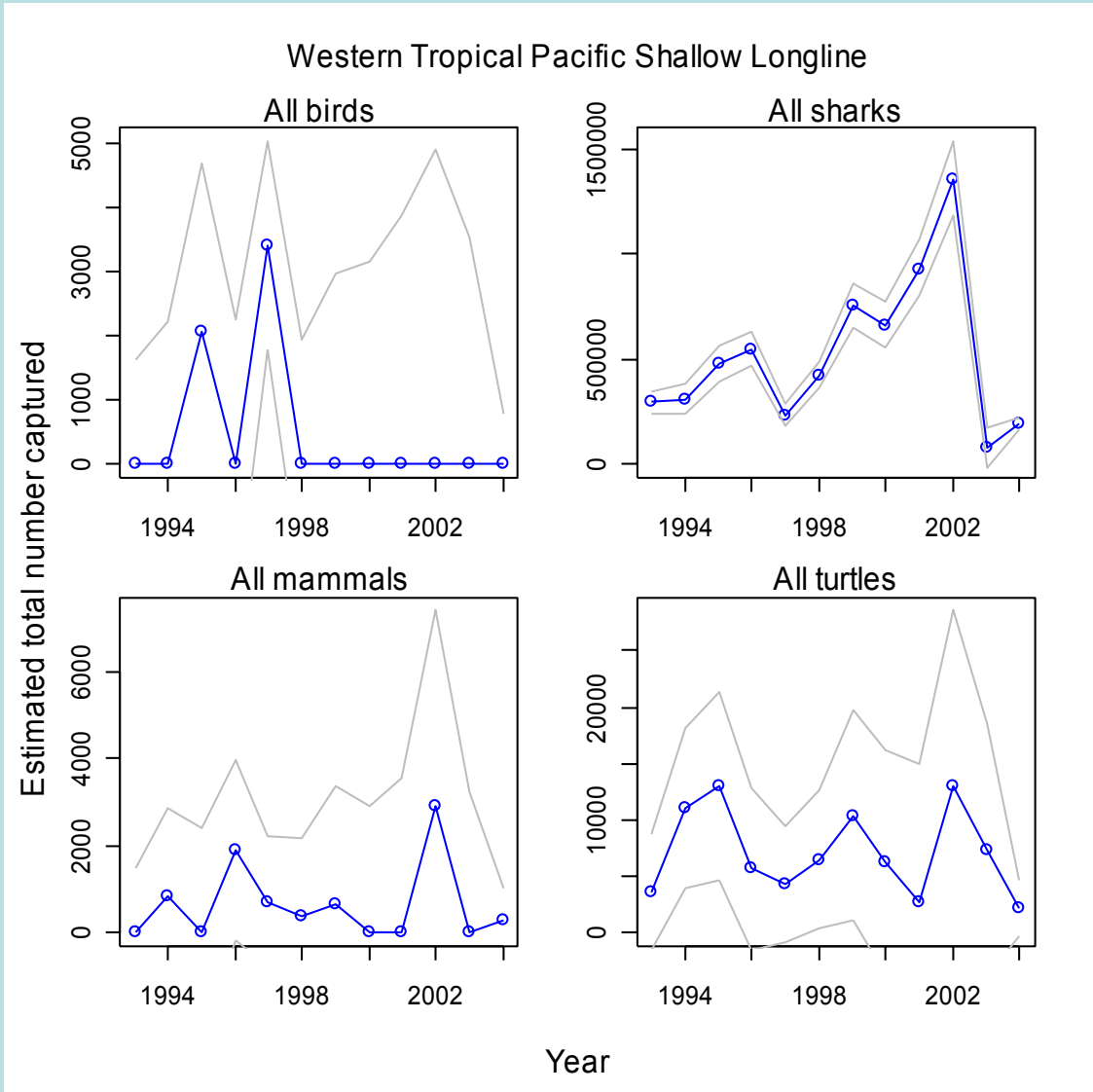


Longline total catches and mortalities: Tropical shallow longline



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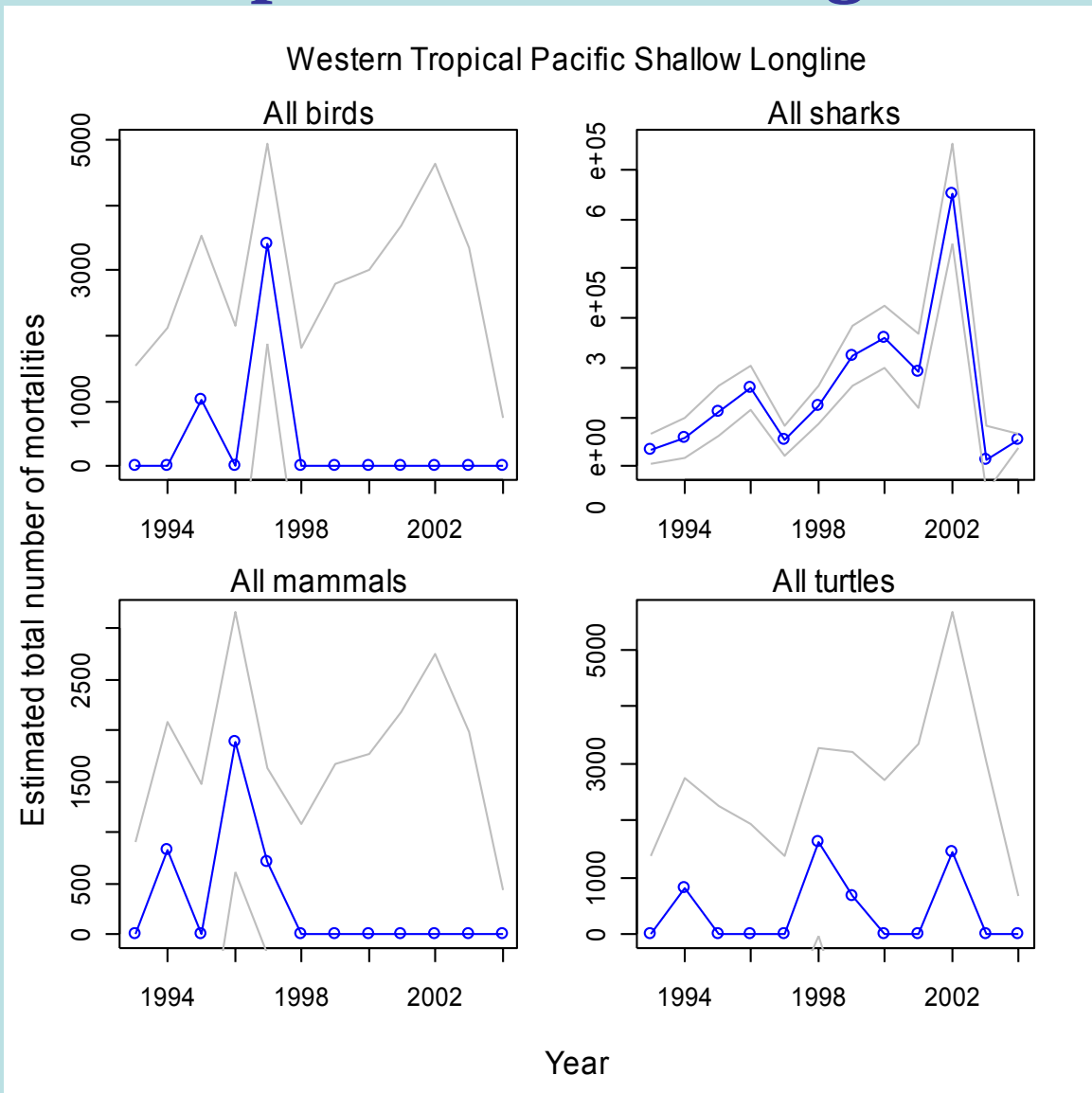

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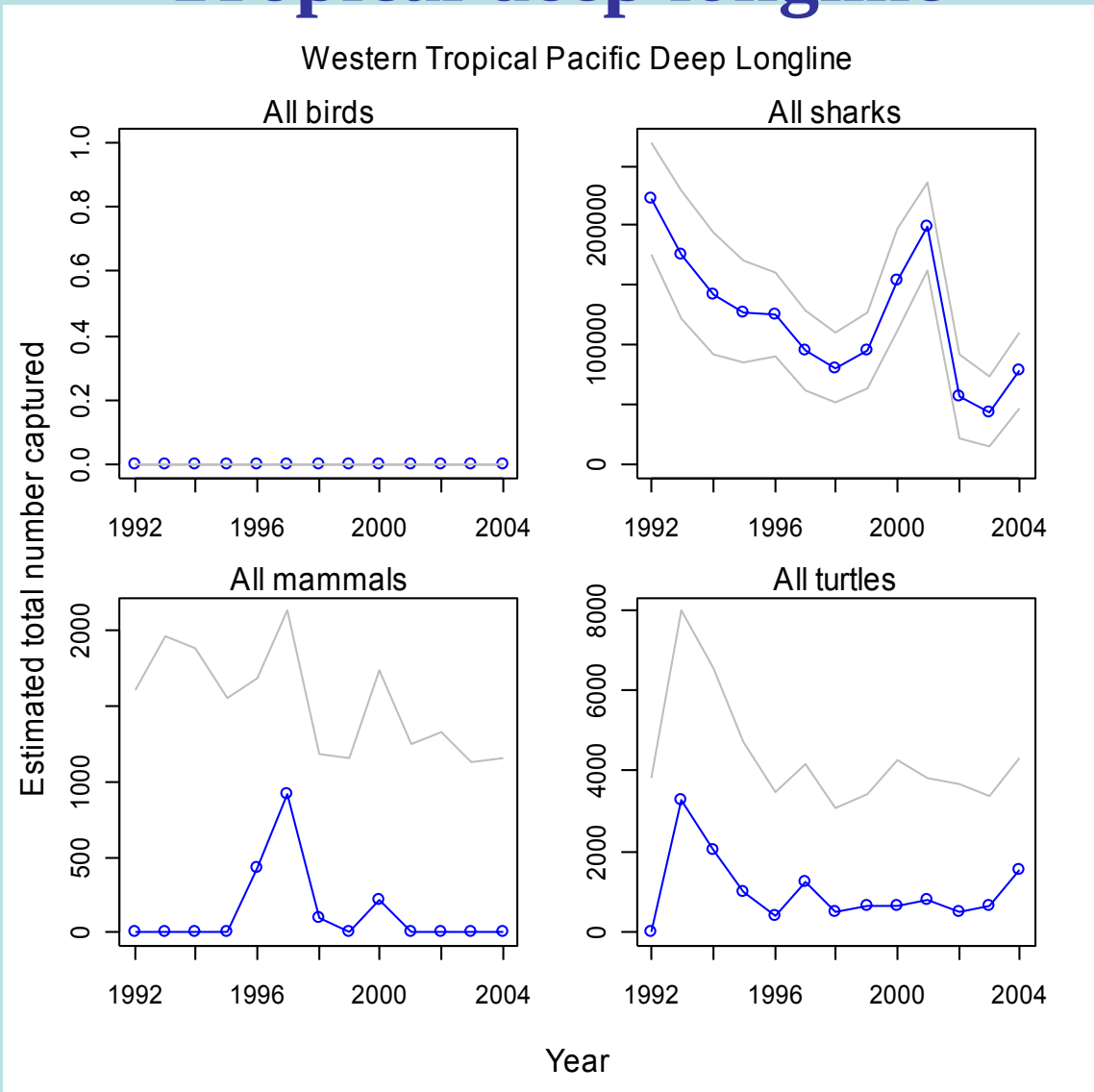

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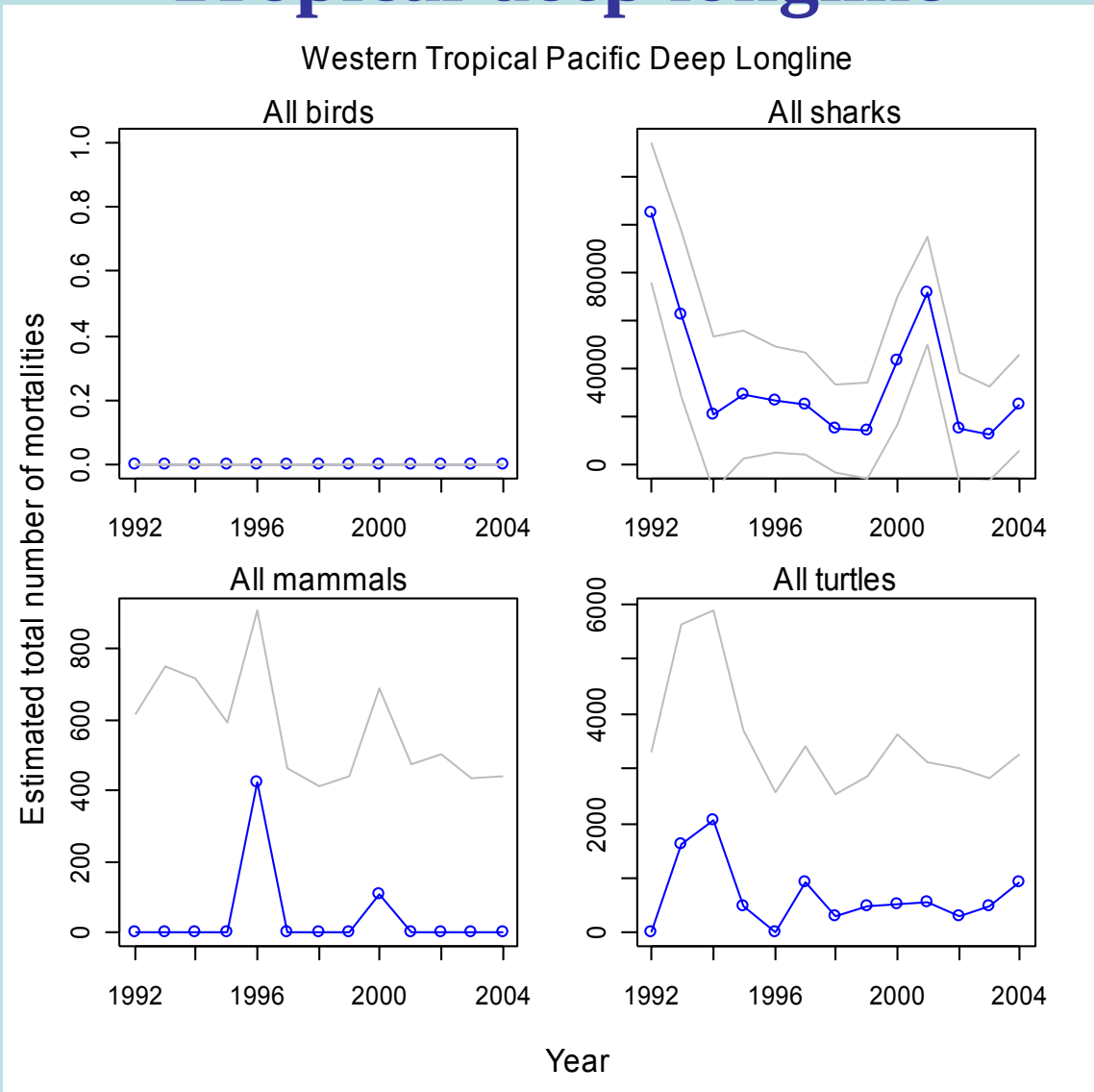
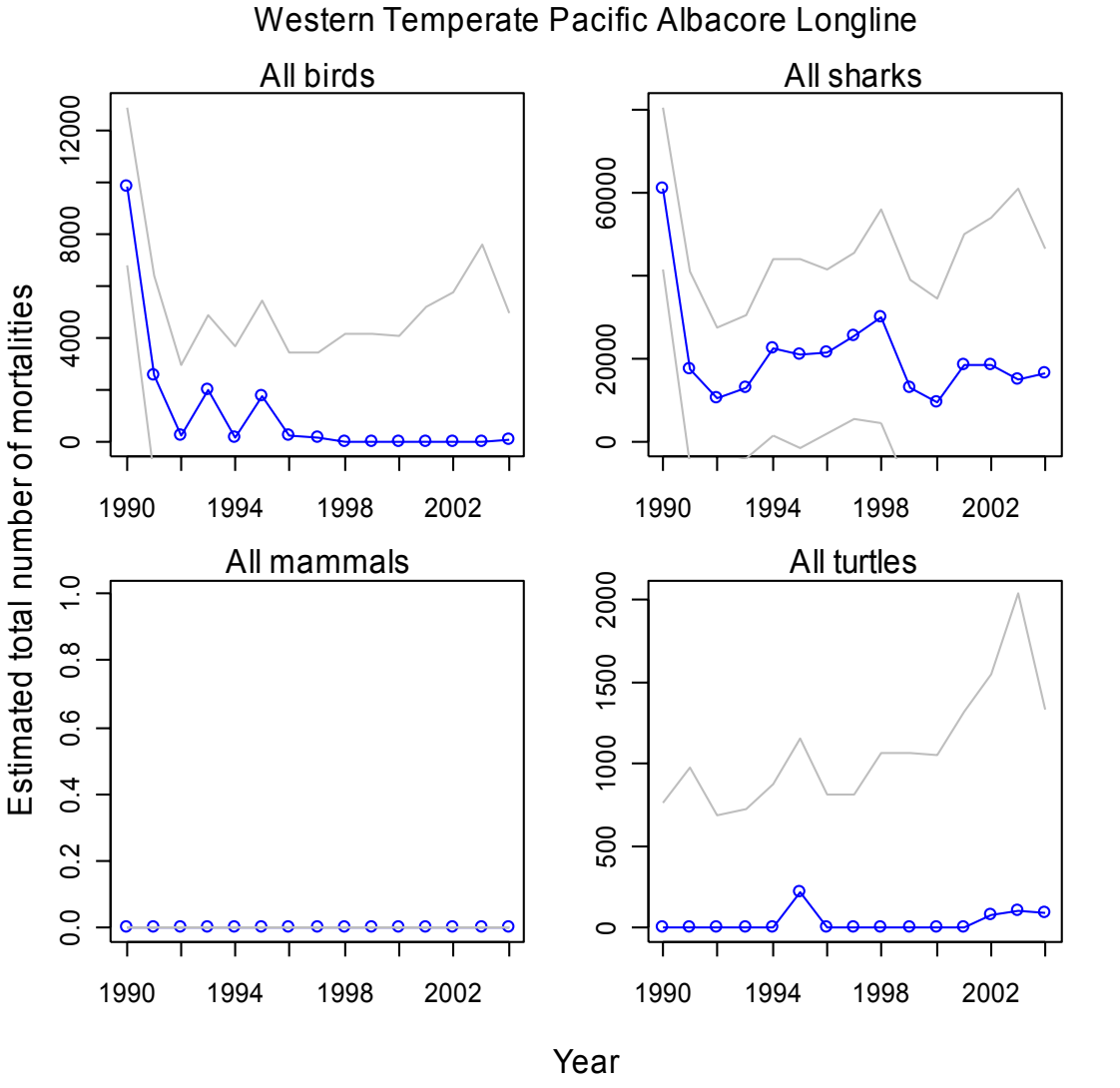
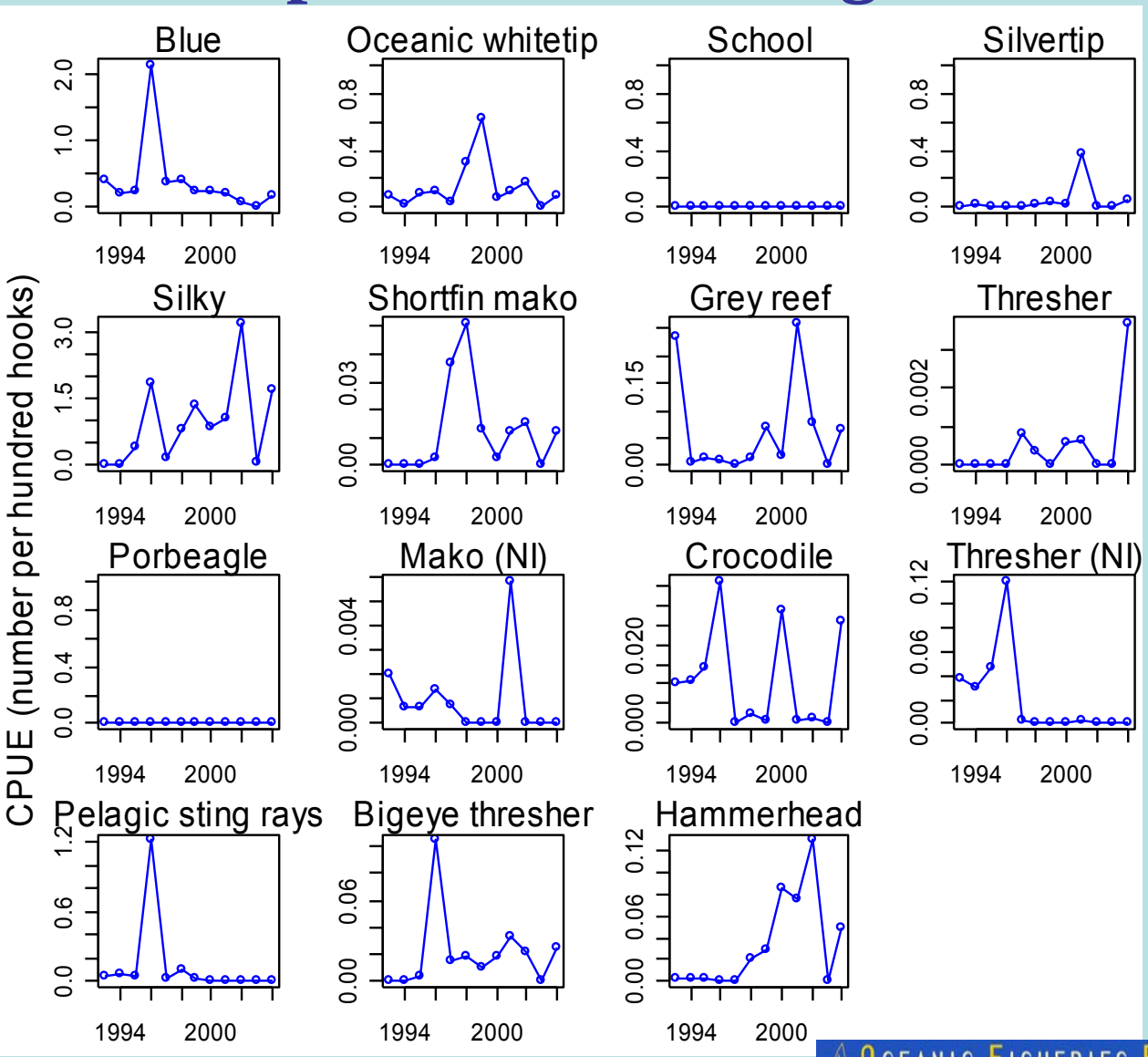


Longline total catches and mortalities: Temperate albacore longline



Longline total shark catches: Tropical shallow longline



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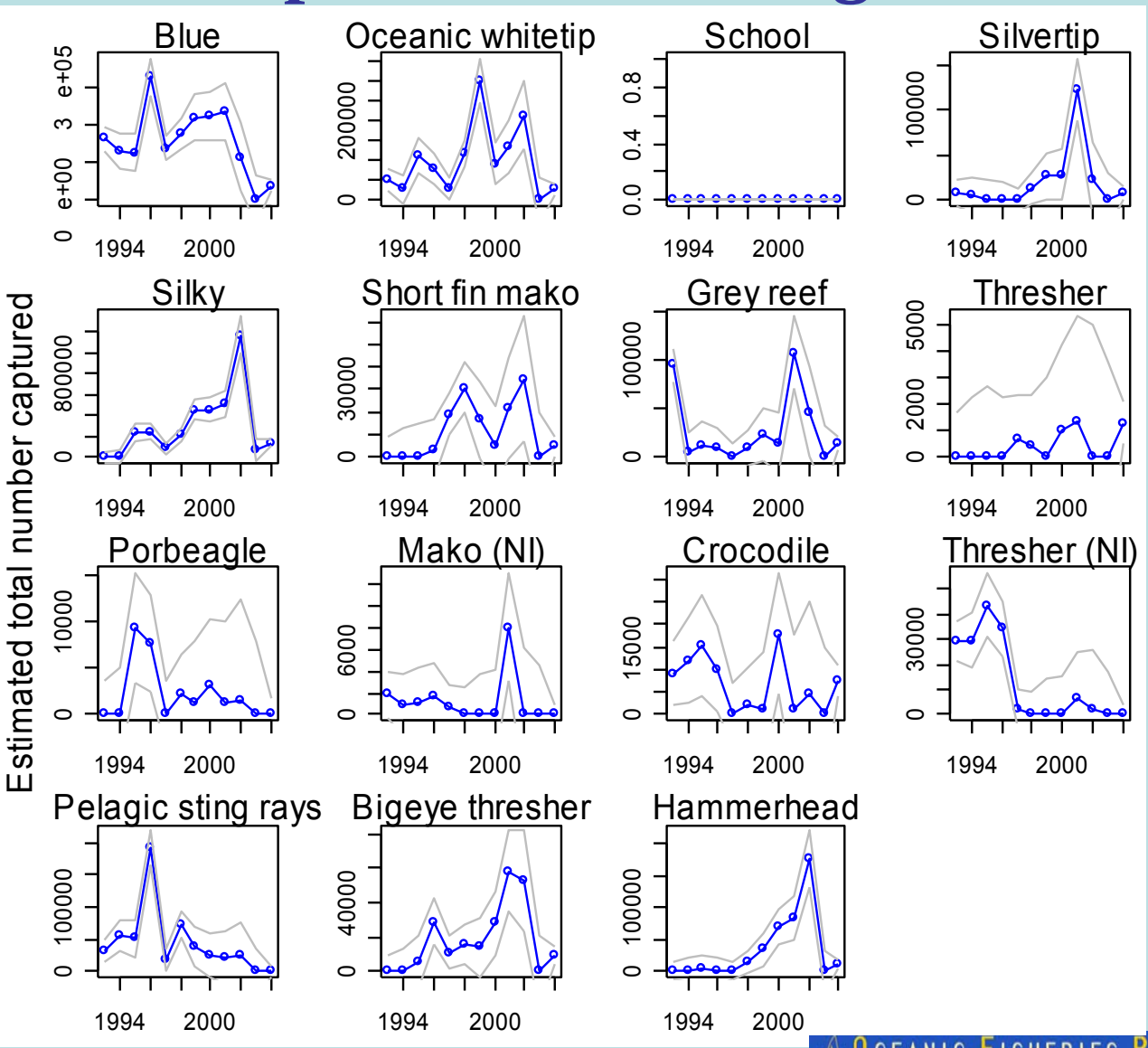

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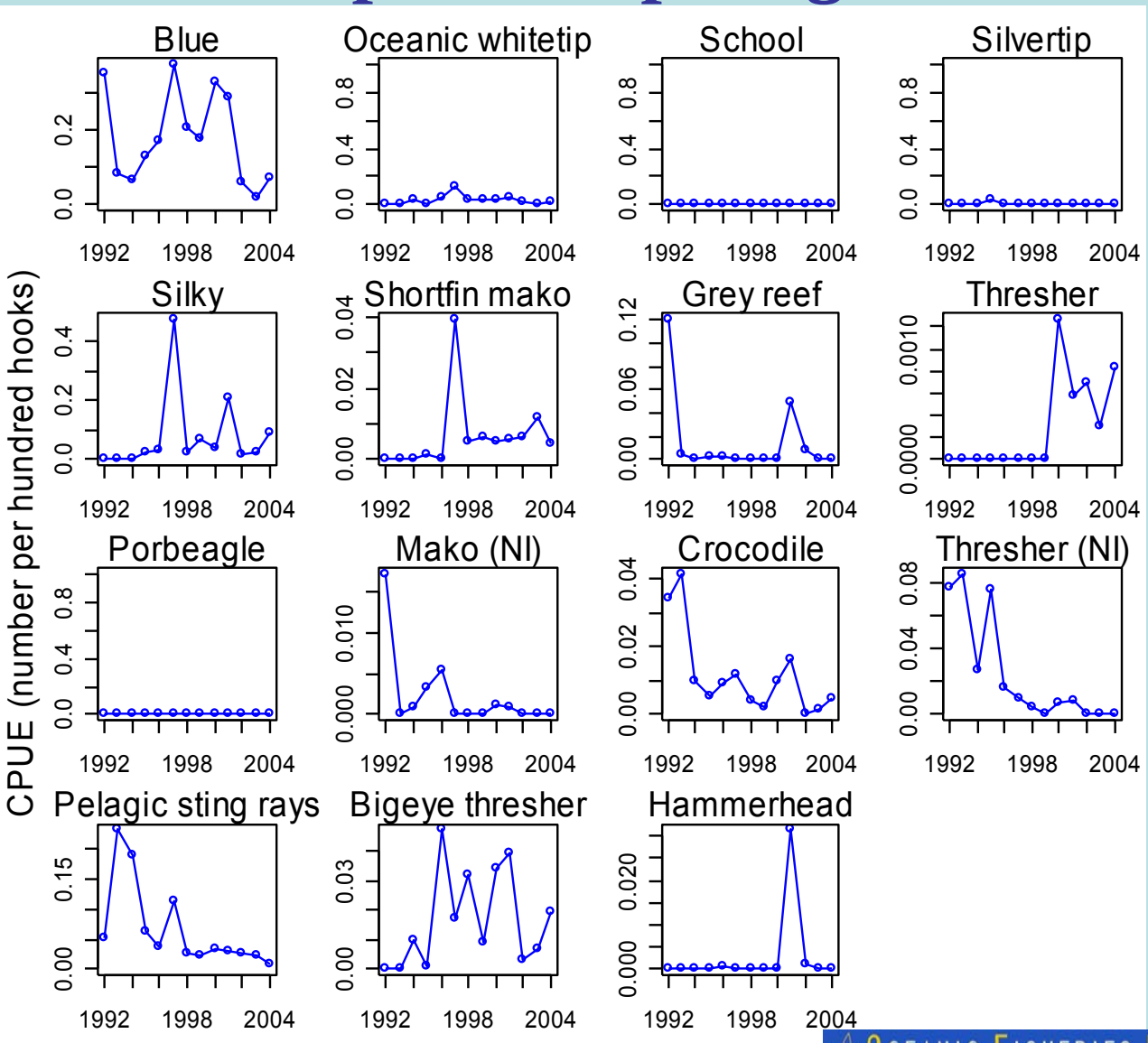
Longline total shark catches: Tropical deep longline



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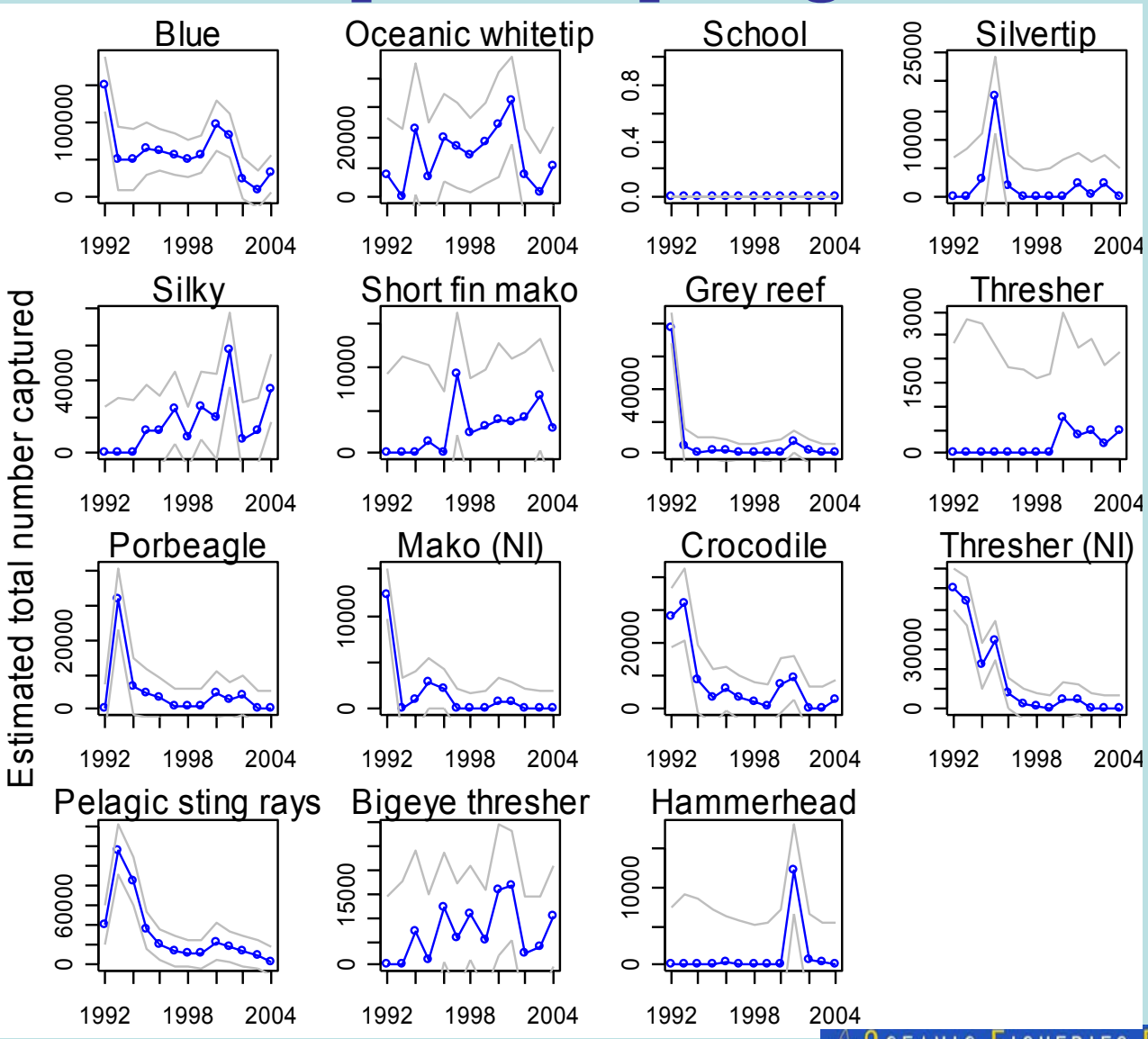

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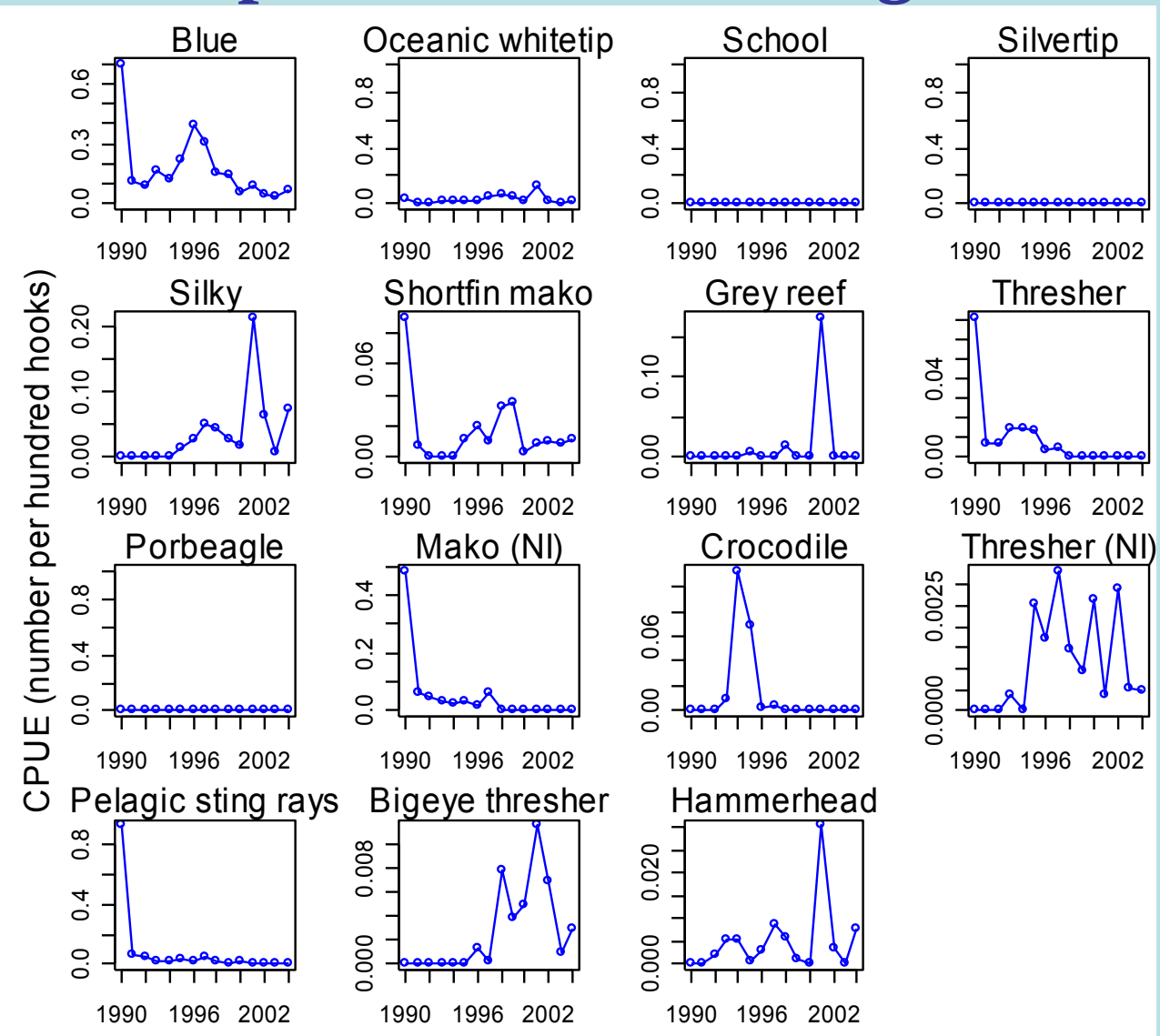

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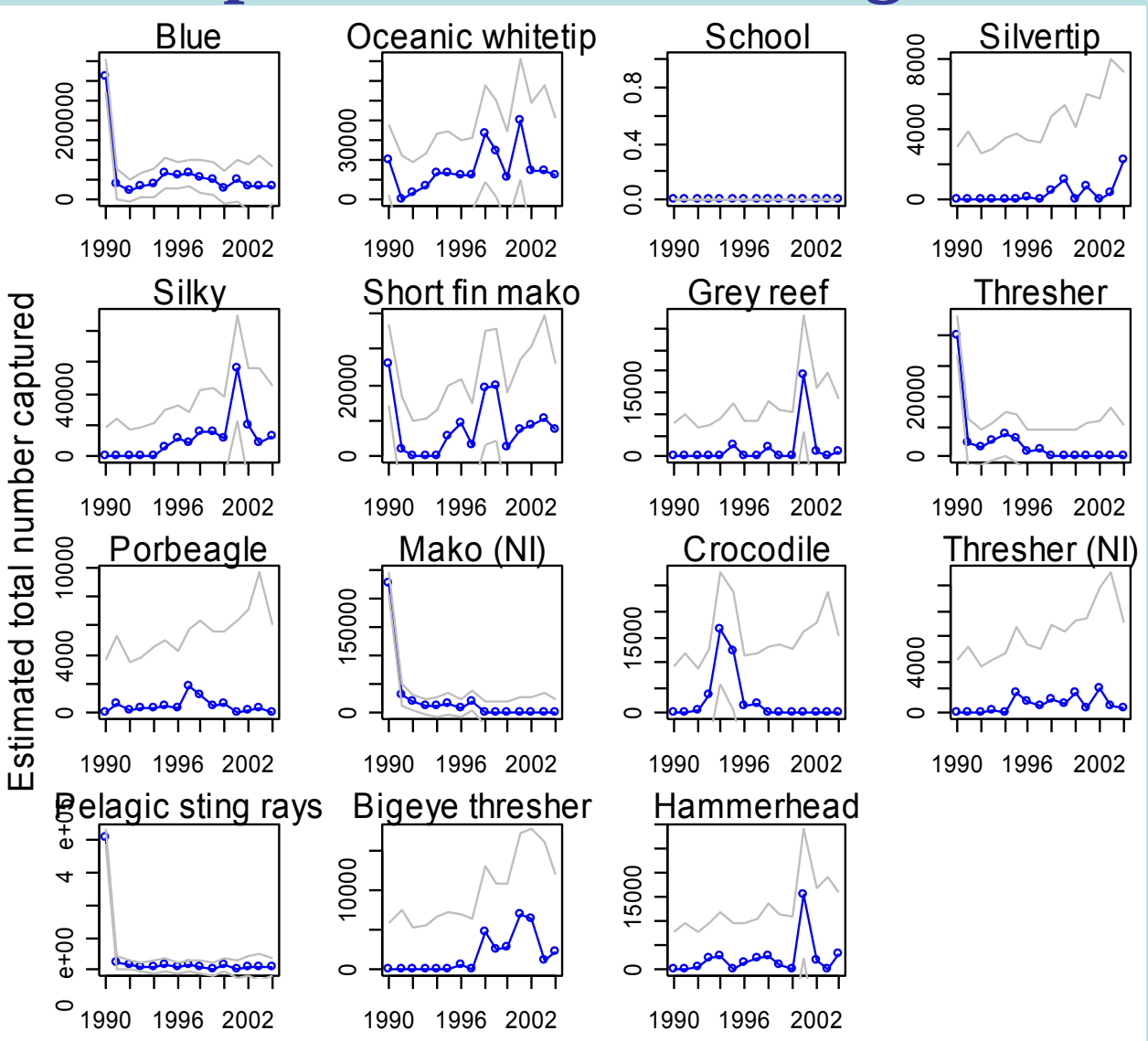
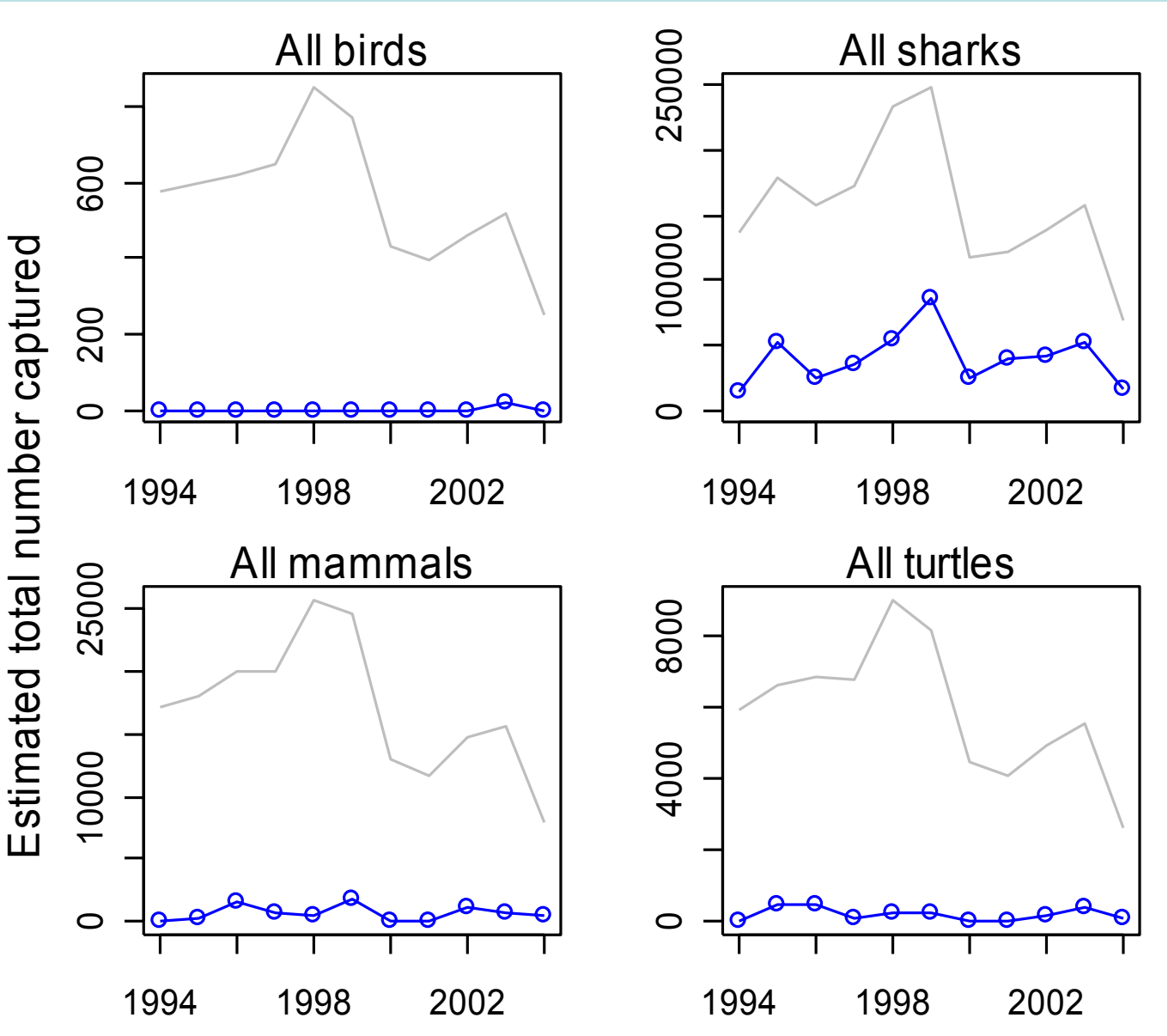


Purse-seine: total catches and mortalities



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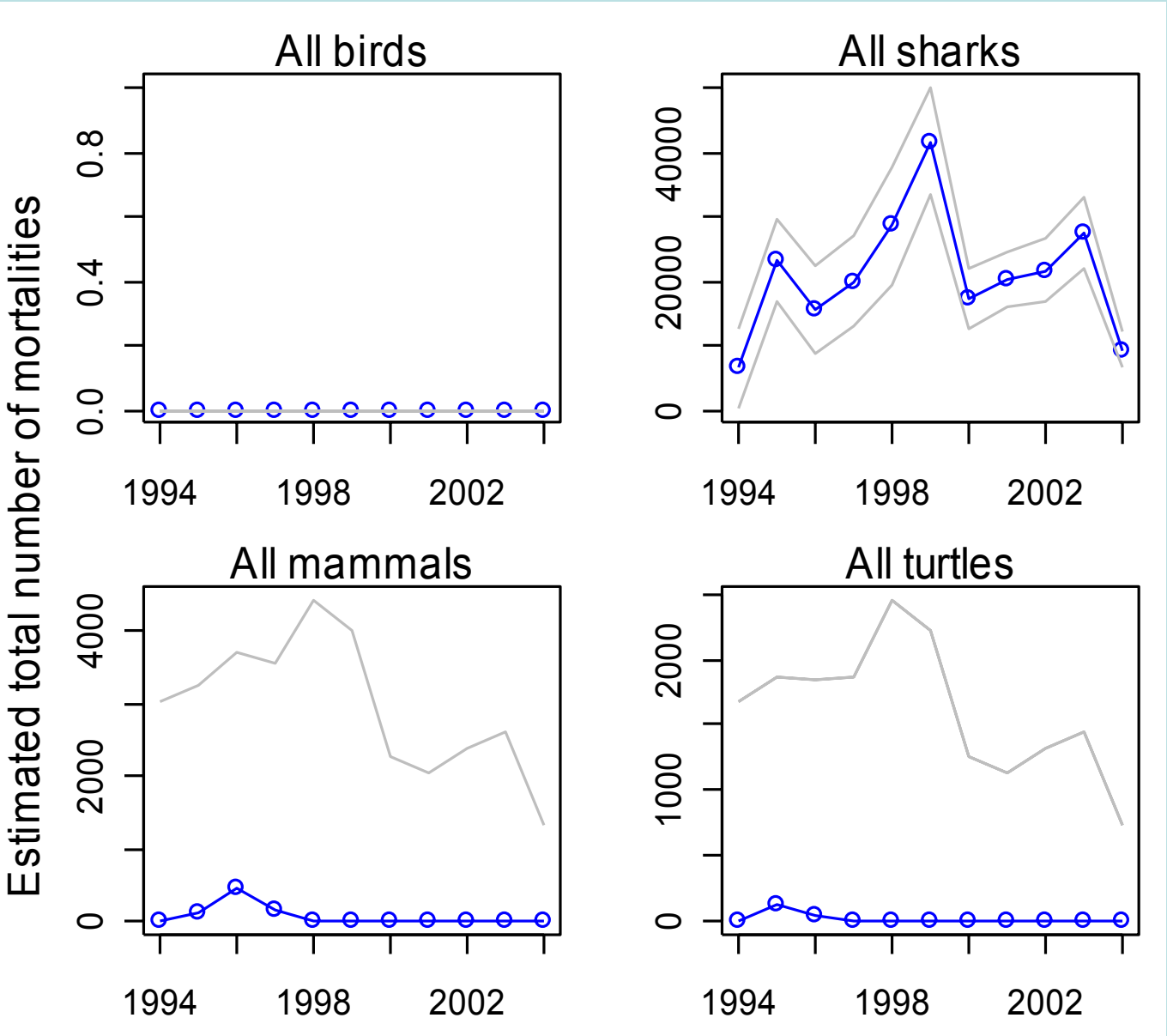
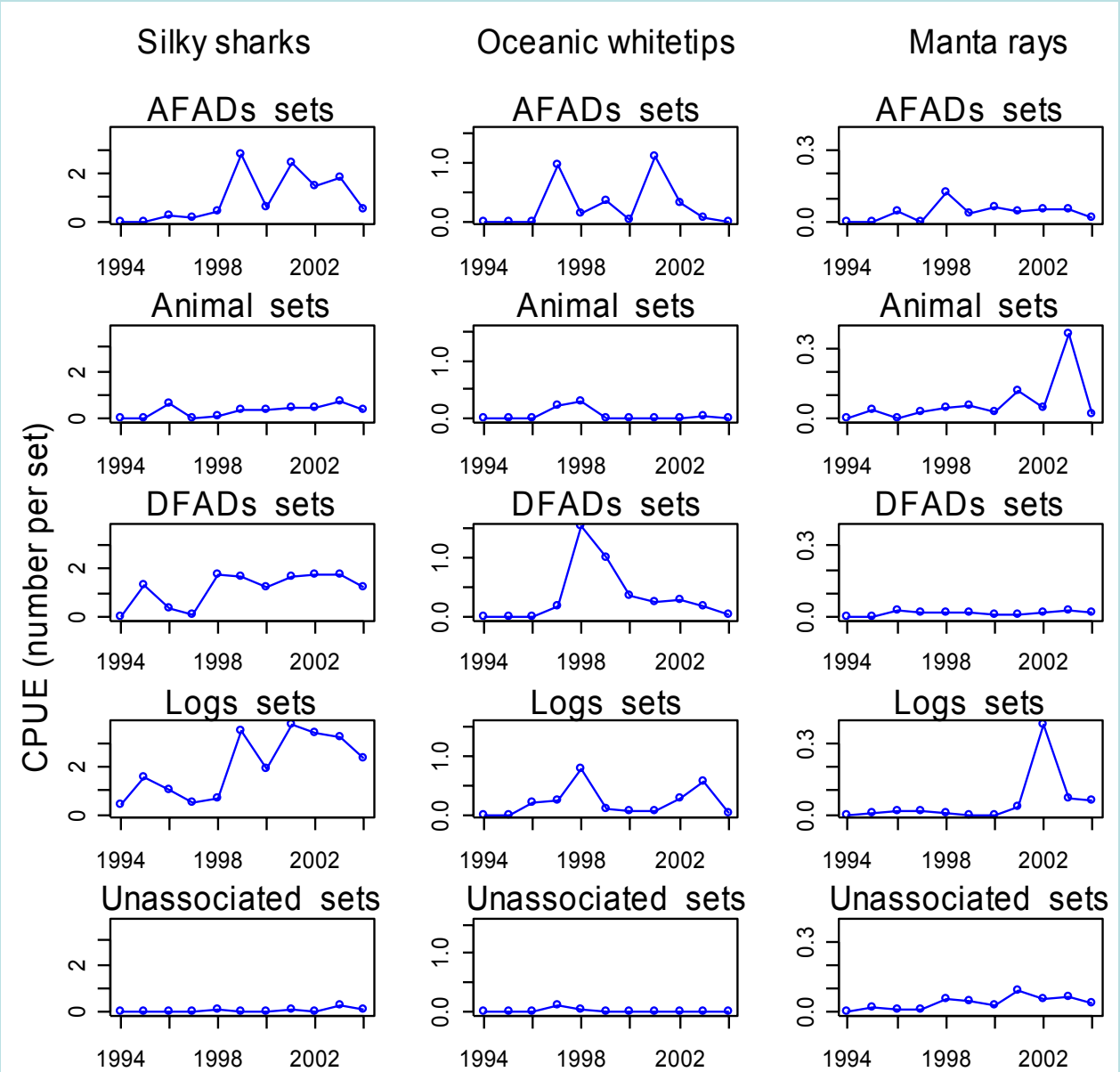


Purse-seine: shark CPUEs



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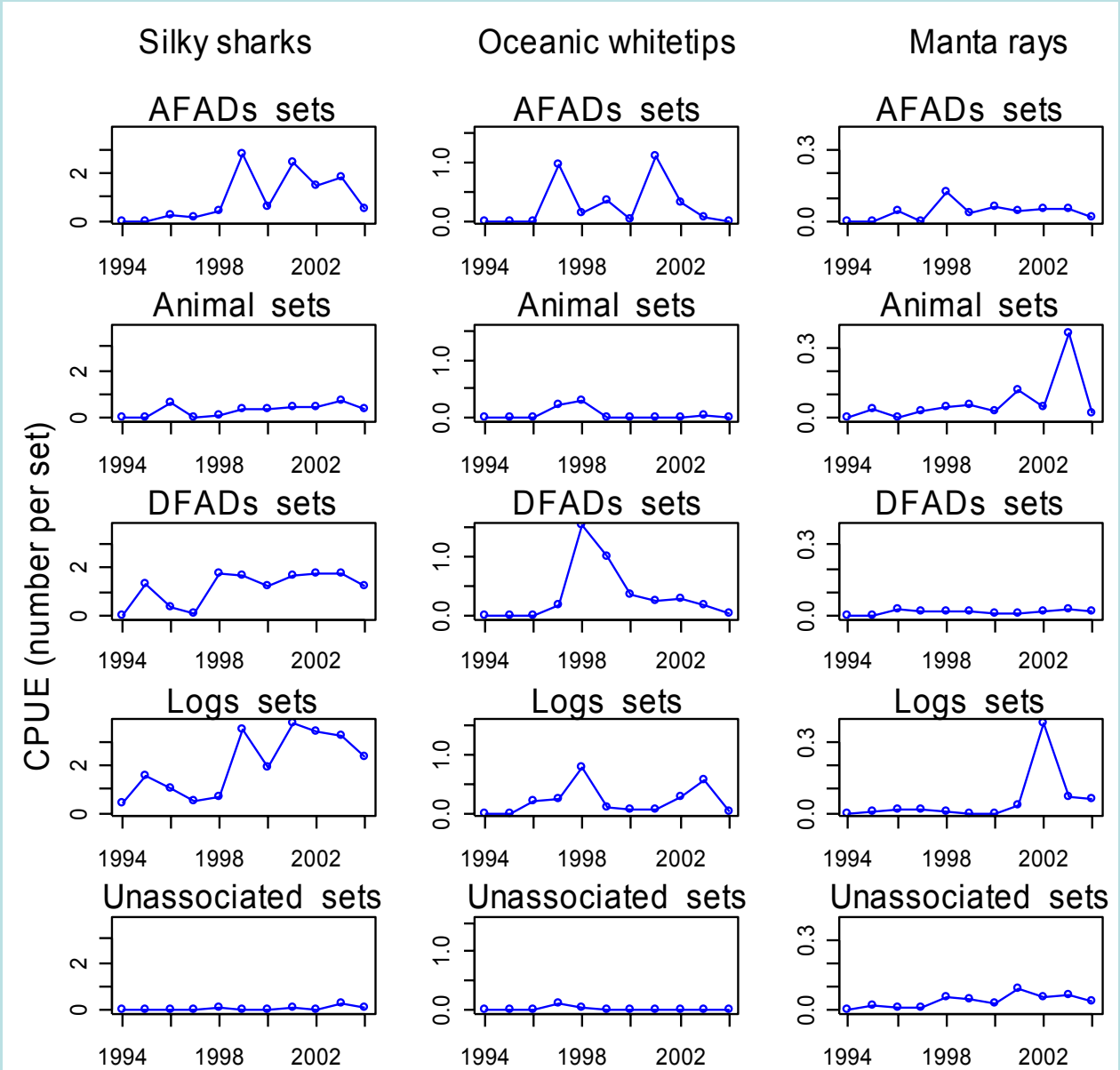

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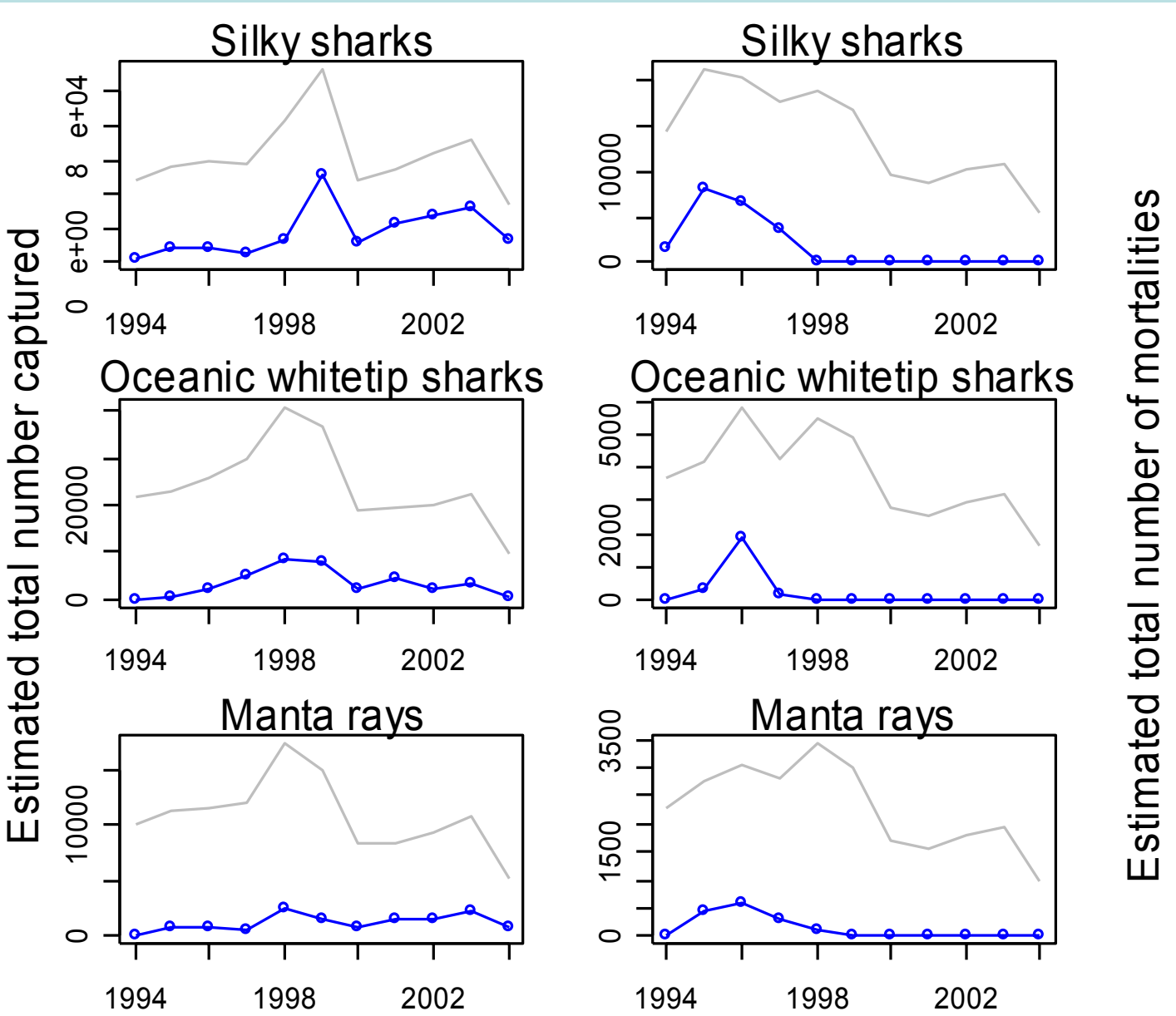


Birds

- Very low CPUEs
- Most in temperate albacore longline
- Most recorded as mortalities
- **Mean annual catch for all fisheries, 1990–2004: 1,593 (0 –10,307)**
- Less than 100 mortalities estimated per year since 1998

Longline and purse-seine fisheries pose a low risk to seabird populations in WCPO

Mammals

- Very low CPUEs
- Most in tropical shallow longline and purse-seine fisheries (‘Animal’ sets)
- Low and declining mortality rates
- **Mean annual catch for all fisheries, 1990–2004: 1,362 (0–88,714)**
- **Mean annual mortalities, 1990–2004: 300 (0–4,286)**

- **Longline and purse-seine fisheries pose a low risk to mammal populations in WCPO**

Sharks

- High CPUEs
- Targeted fisheries, plus opportunistic retention and fining
- Most catches from tropical shallow longline (dedicated shark fisheries in region)
- **Mean annual catch for all fisheries, 1990–2004: 696,401 (0 –1,604,249)**
- Higher in recent years: > 1 million p.a.
- Blue, silky, oceanic whitetip sharks and pelagic sting rays
- At least 40 other species

Turtles

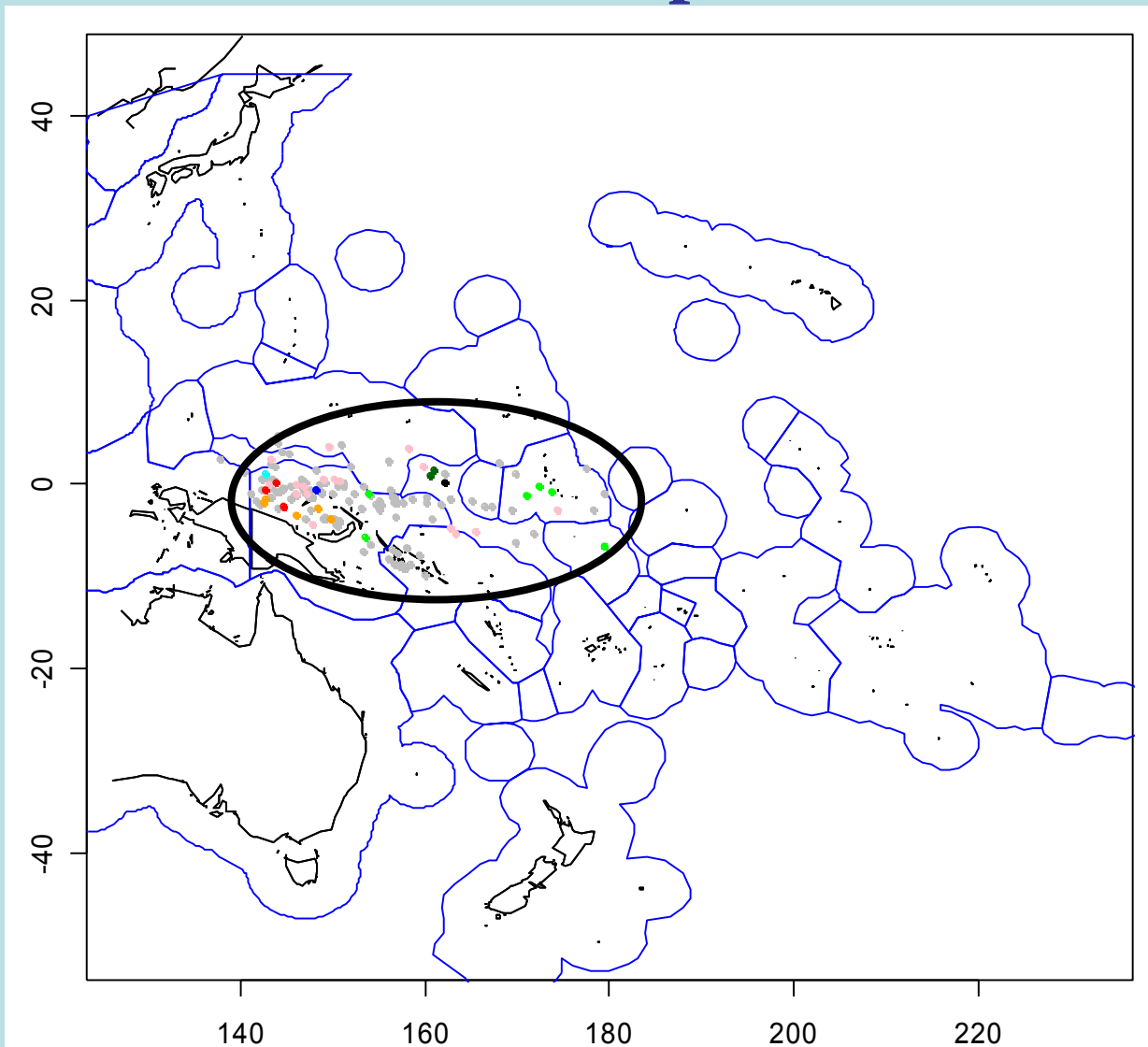
- Very low CPUEs
- Most in tropical shallow longline
- **Mean annual catch for all fisheries, 1990–2004: 6,962 (0–29,529)**
- **Mean annual mortalities, 1990–2004 : 931 (0–8,323)**
- Highest mortality rates in tropical deep longline
- Many records were for olive ridley but most turtles were unidentified

Other issues

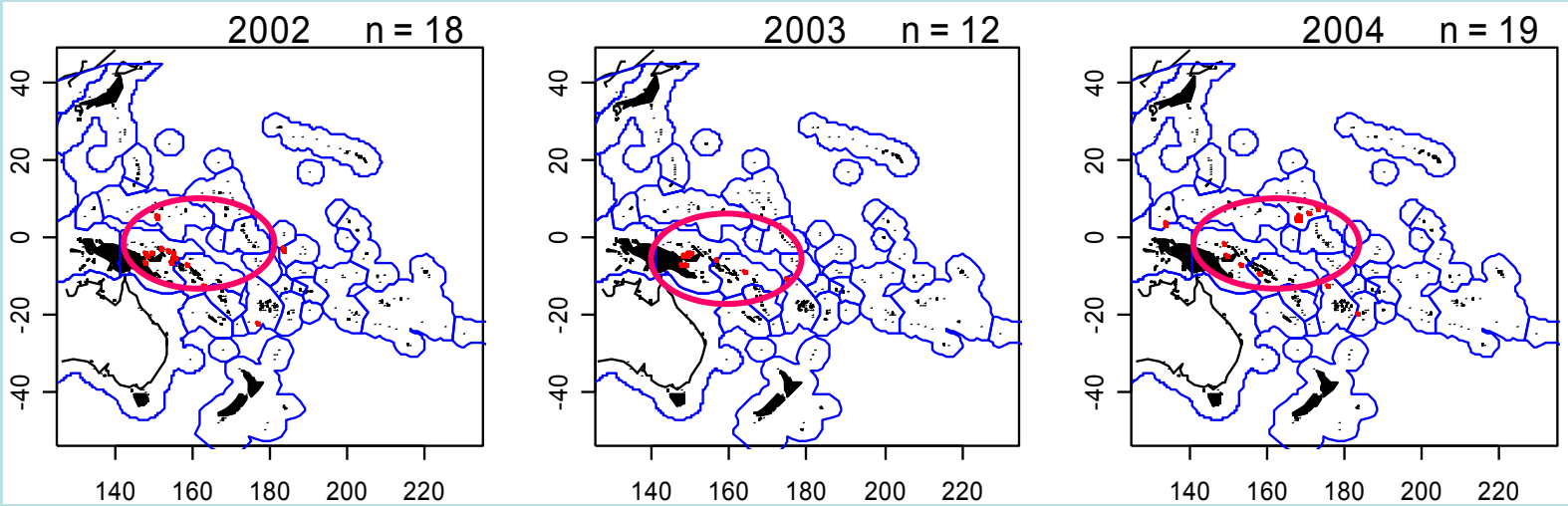
Highest purse-seine CPUEs for all taxa from associated sets

- Most turtle and mammal captures recorded in western equatorial area
- Most not identified to species

Other issues:
Mammals and purse-seine



Other issues: Turtles



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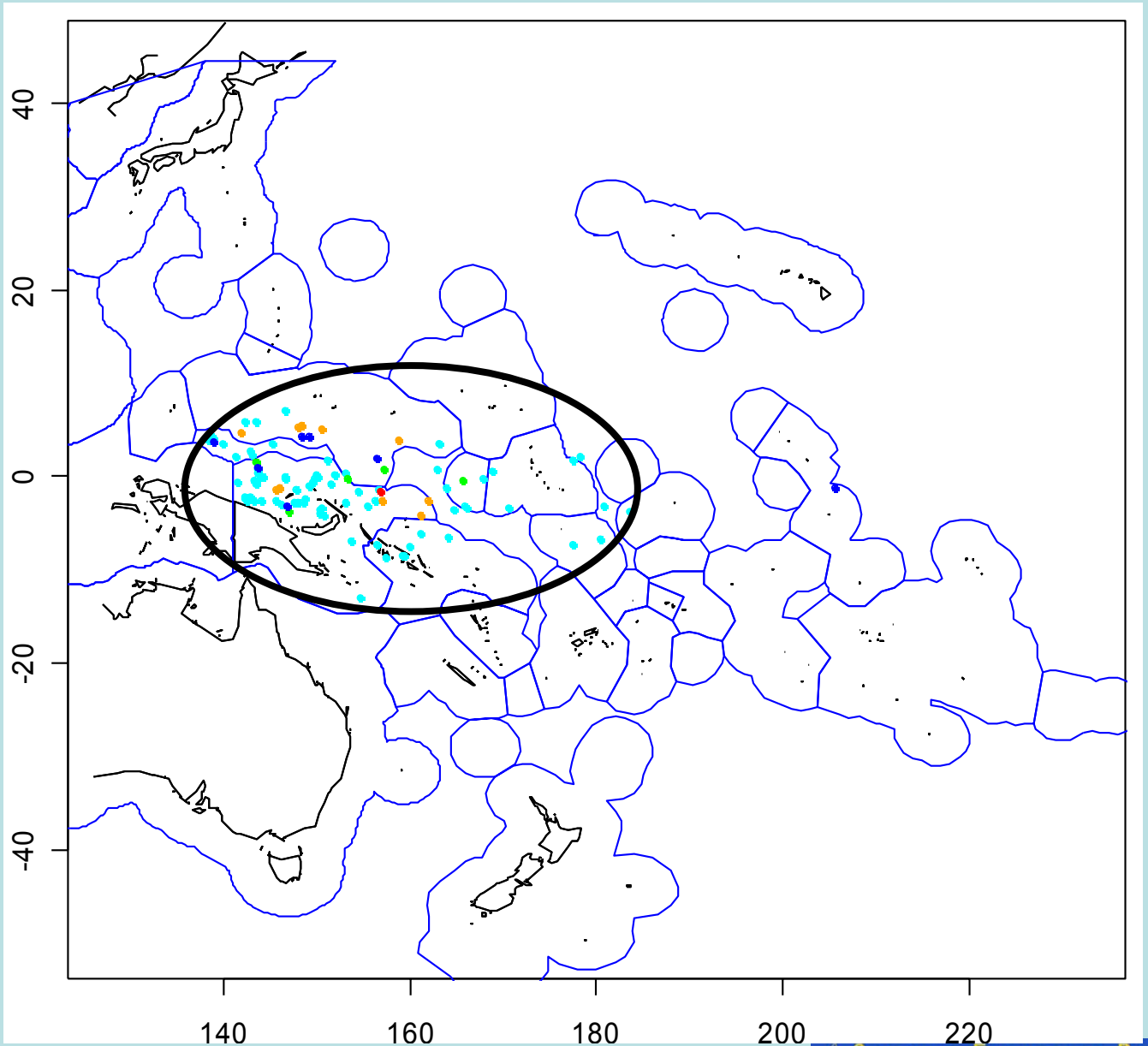

Conclusions

- Birds: low CPUEs and mortalities
- Mammals: low mortalities and declining
- Mammals: (minor) set-type for purse-seine
- Sharks: relatively large catches
- Sharks: fisheries; fining
- Sharks: blue, silky, oceanic whitetip and pelagic ray
- Turtles: mortalities occur but declining
- High levels of uncertainty (low coverage)
- Influence of one observation is relatively large

Future

- Expand areas with new data from outside the four defined fisheries
- Consider changing spatial boundaries
- Reduce the number of taxa to allow more thorough examination of catches and mortalities
- Compare with other sources of mortality

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Recommendations

1. Increasing observer coverage rates
2. Increasing identification rate
3. Increasing rates of recording fate and condition
4. Consider designing specific observer programmes to address specific objectives

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Recommendations

5. Review of shark species in Annex 1
6. Centralise observer data
7. Prioritise species to focus future research
8. Interactions between newly developing fisheries and these four taxa.

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- Adam L. and John H.

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