

THE EFFECTS OF A RARE COOPERATIVE FORAGING ON A DOLPHIN POPULATION



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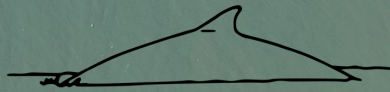
Line of fishers

Mullet





Head slap



Back presentation



Partial emersion



Tail slap



Dolphin





SOCIAL AND ECONOMICAL BENEFITS FOR THE LOCAL COMMUNITY



HUMAN PRESSURES THAT THREATEN THE LOCAL DOLPHINS



1986

1998



Simões-Lopes described the dolphin-fisher interaction for the first time

INTERACTION OF COASTAL POPULATIONS OF *TURSIOPS TRUNCATUS* (CETACEA, DELPHINIDAE) WITH THE MULLET ARTISANAL FISHERIES IN SOUTHERN BRAZIL

PAULO CÉSAR SIMÕES-LOPES

DOLPHIN INTERACTIONS WITH THE MULLET ARTISANAL FISHING ON SOUTHERN BRAZIL: A QUALITATIVE AND QUANTITATIVE APPROACH

Paulo C. Simões-Lopes ¹
Marta E. Fabián ²
João O. Menegheti ²

1986

1998

2007

PHASE 1: Start of a systematic effort

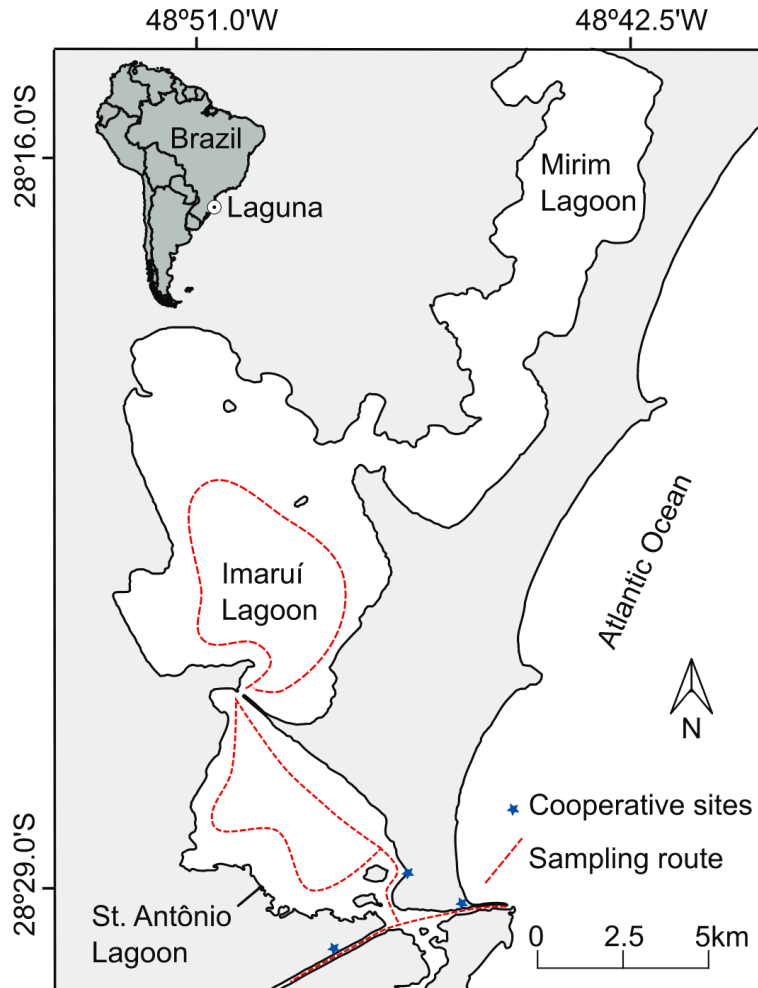


Photo-identification
Population parameters
Social and spatial patterns



Bioacoustics
Acoustic behaviour
Boat disturbance



Biopsy sampling
Genetics
Biochemical and
molecular biomarkers

POPULATION PARAMETERS

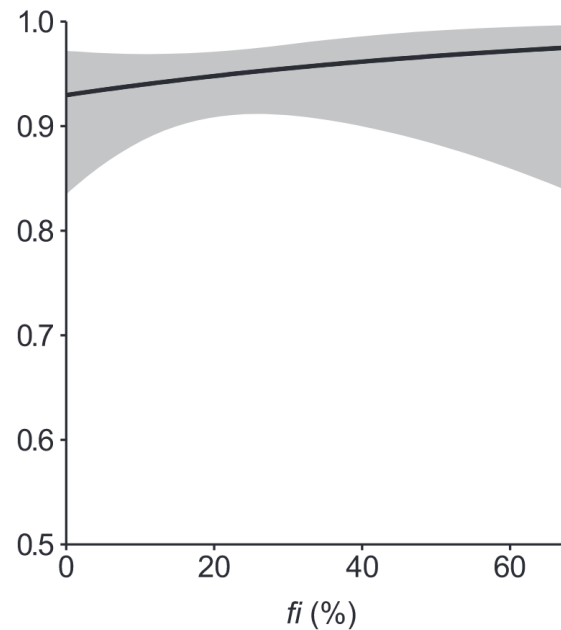
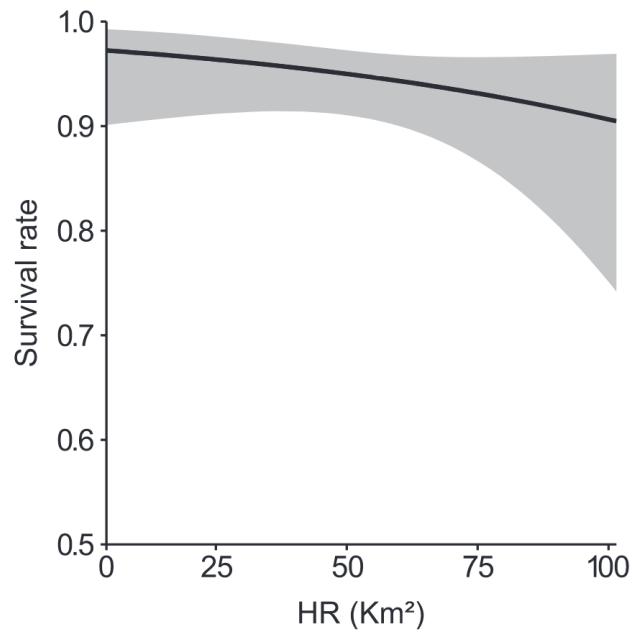


Abundance: range from 54 to 60 individuals

Survival probabilities is high: 0.940 (0.914-0.970)

*Dolphins with higher frequencies of interaction with fishers showed **slightly** higher survival probabilities...*

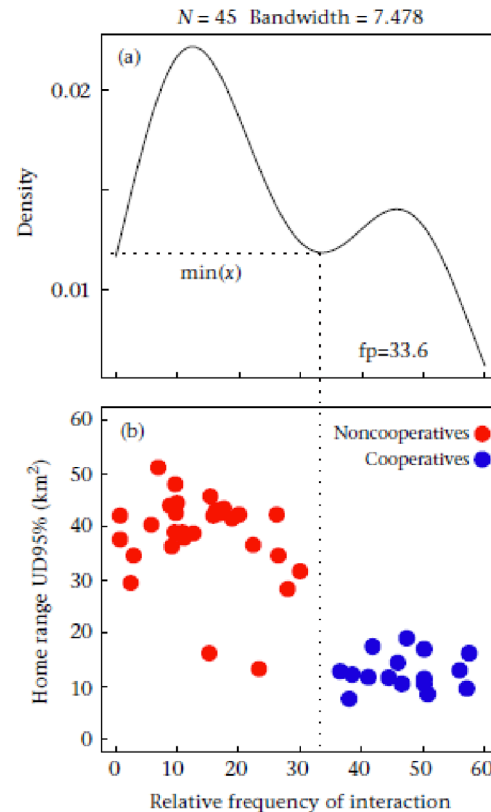
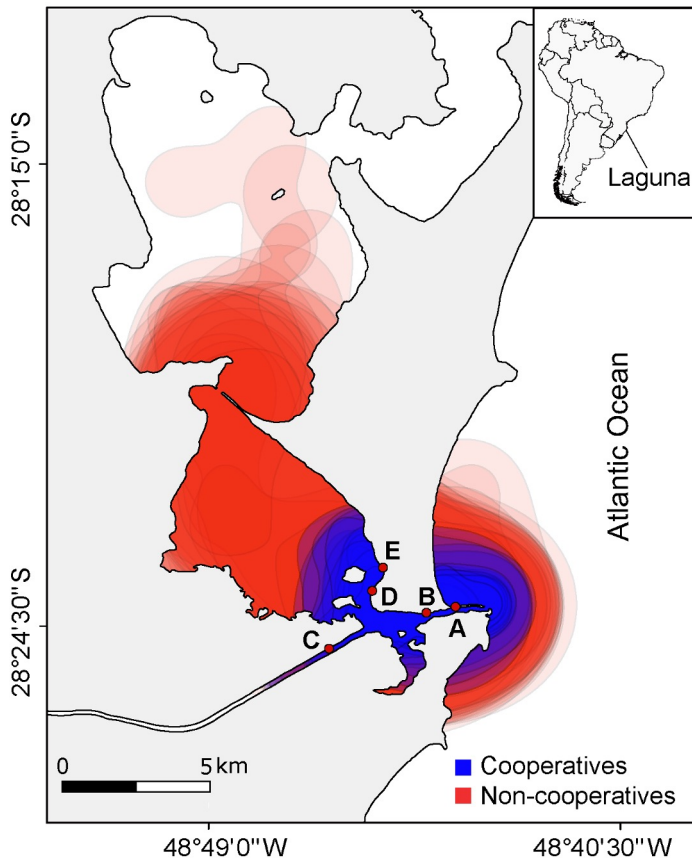
The influence of cooperative foraging with fishermen on the dynamics of a bottlenose dolphin population



SPATIAL PATTERNS

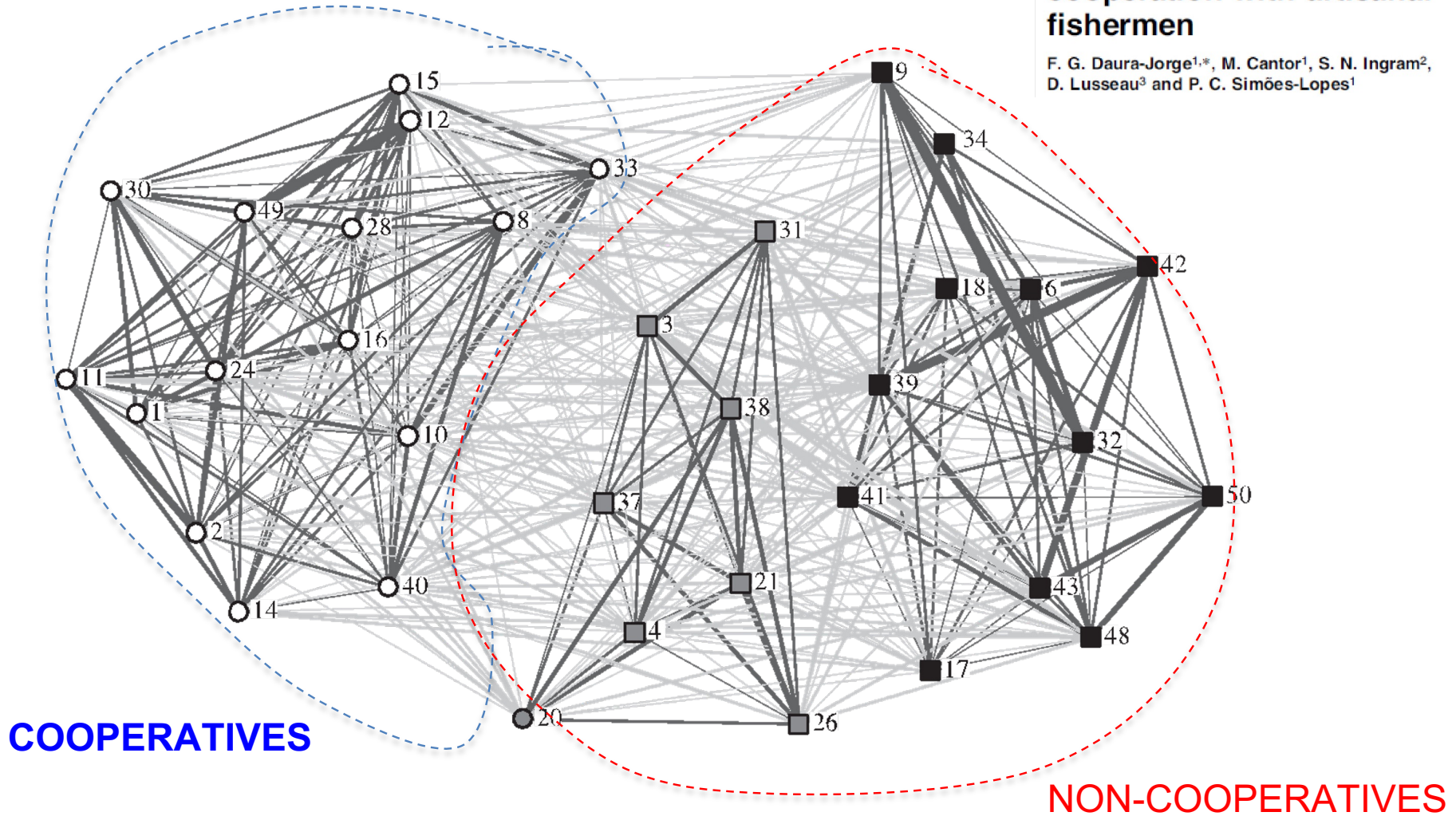
Interaction with fishers defines the home range of dolphins

The cooperative dolphins concentrate around the interaction sites and have smaller home ranges;



SOCIAL PATTERNS

Interplay between the foraging tactic and the social structure



The structure of a bottlenose dolphin society is coupled to a unique foraging cooperation with artisanal fishermen

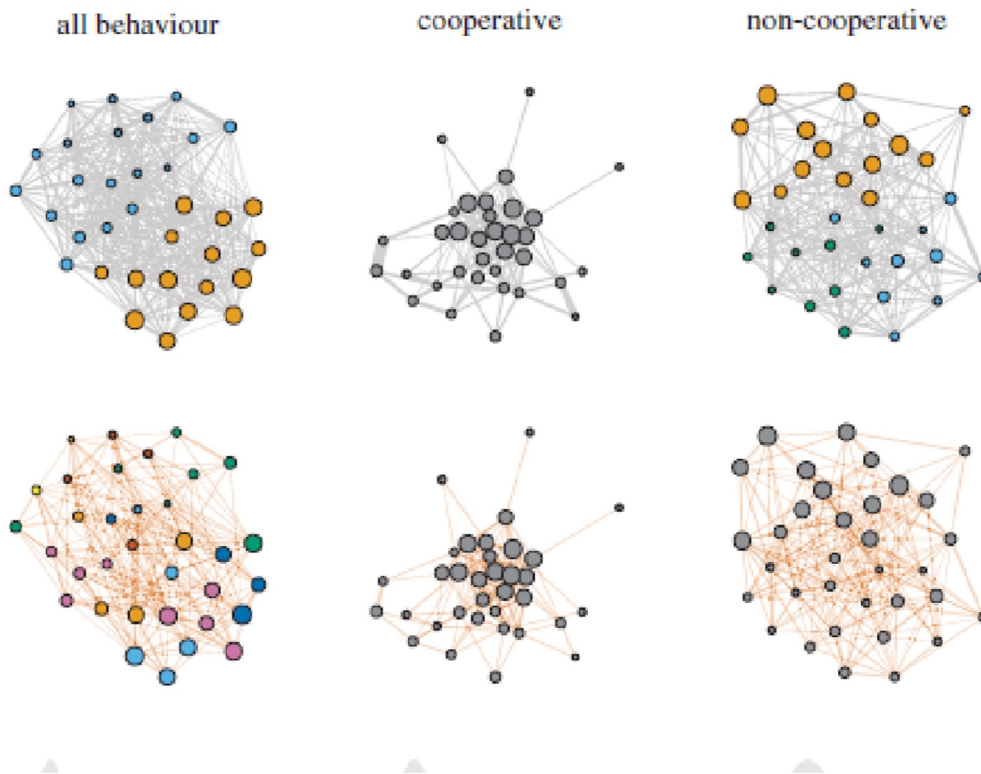


F. G. Daura-Jorge^{1,*}, M. Cantor¹, S. N. Ingram²,
D. Lusseau³ and P. C. Simões-Lopes¹

Homophily around specialized foraging underlies dolphin social preferences

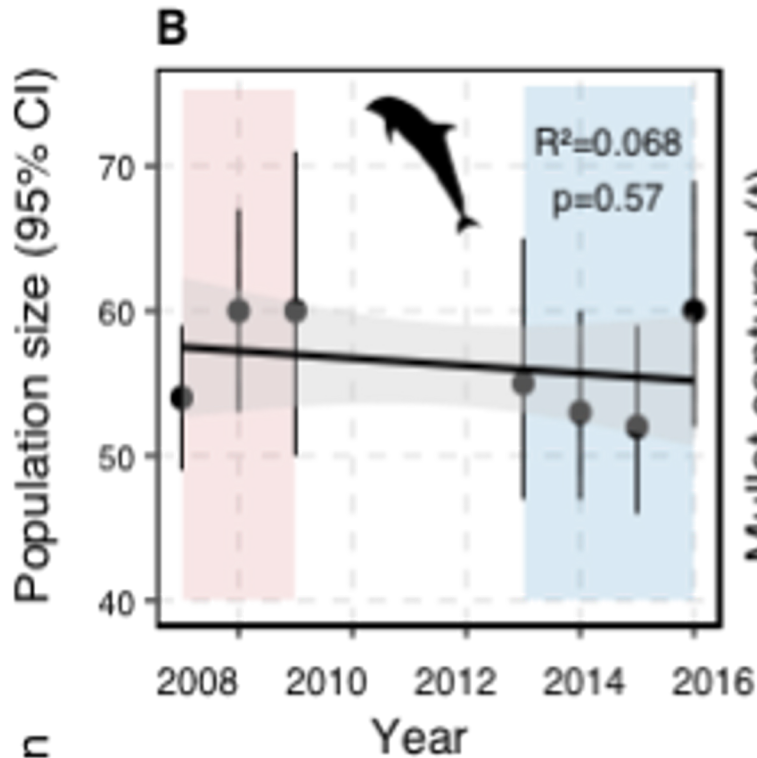
A. M. S. Machado¹, M. Cantor^{1,3,4}, A. P. B. Costa⁵, B. P. H. Righetti²,
C. Bezamat¹, J. V. S. Valle-Pereira¹, P. C. Simões-Lopes¹, P. V. Castilho⁶
and F. G. Daura-Jorge¹

We tested for multiple structural factors in association patterns, but only the frequency they cooperate was significant

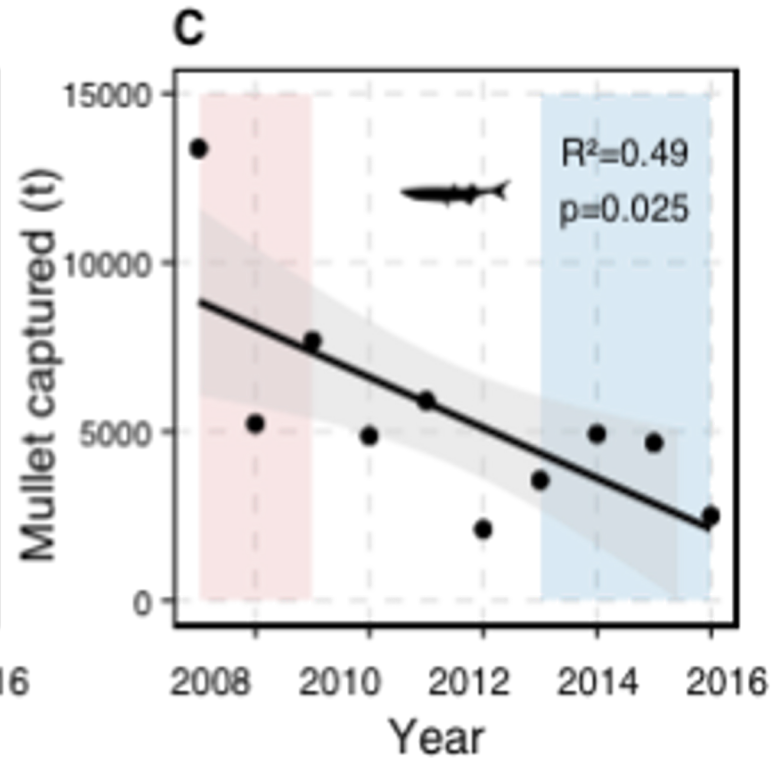


POPULATION PREDICTIONS

However, this system has been changing...



No trends in population size



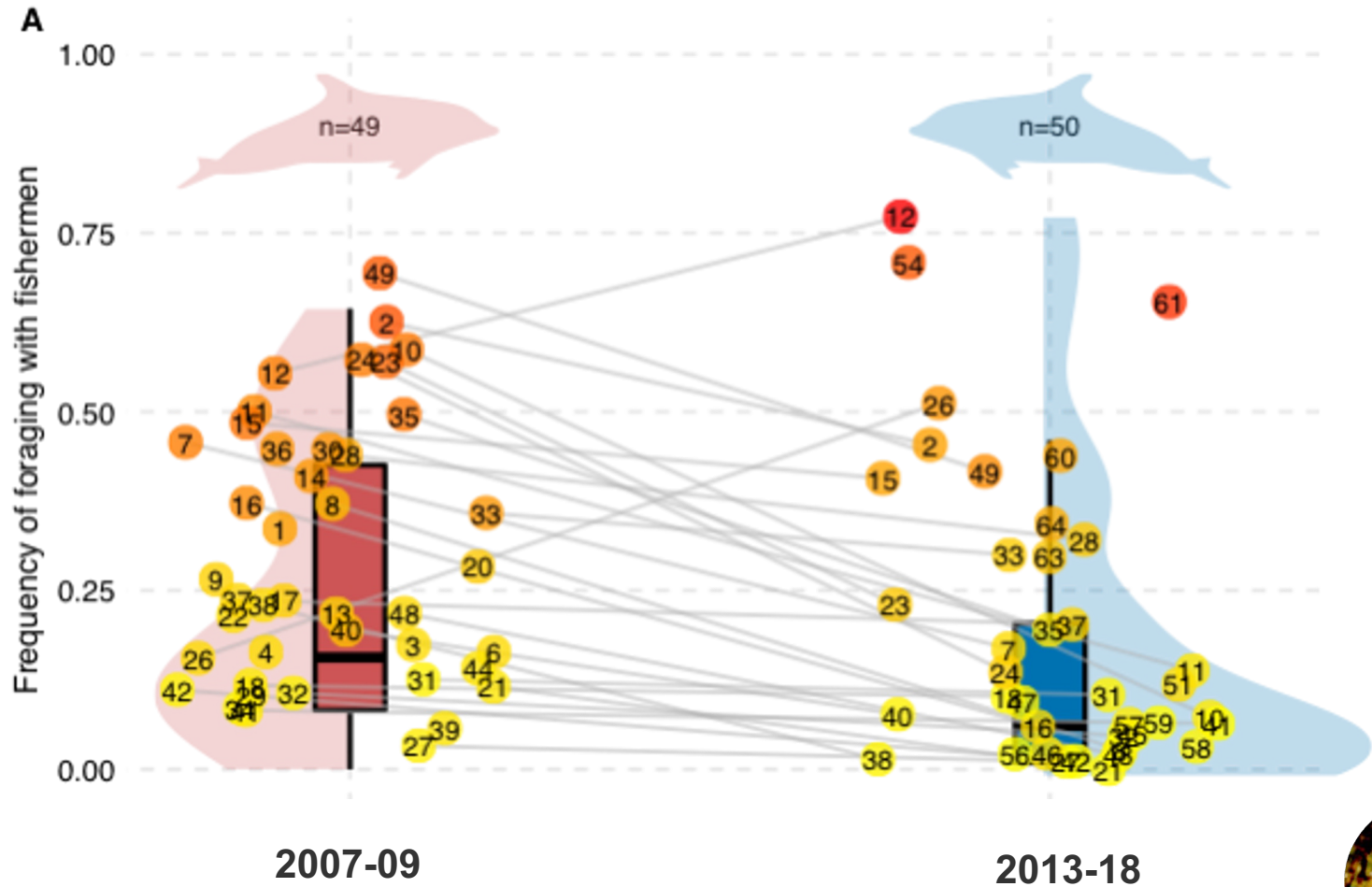
The availability of mullets declined regionally.



Cantor et al. in revision

The overall population frequency of foraging with fishers decreased

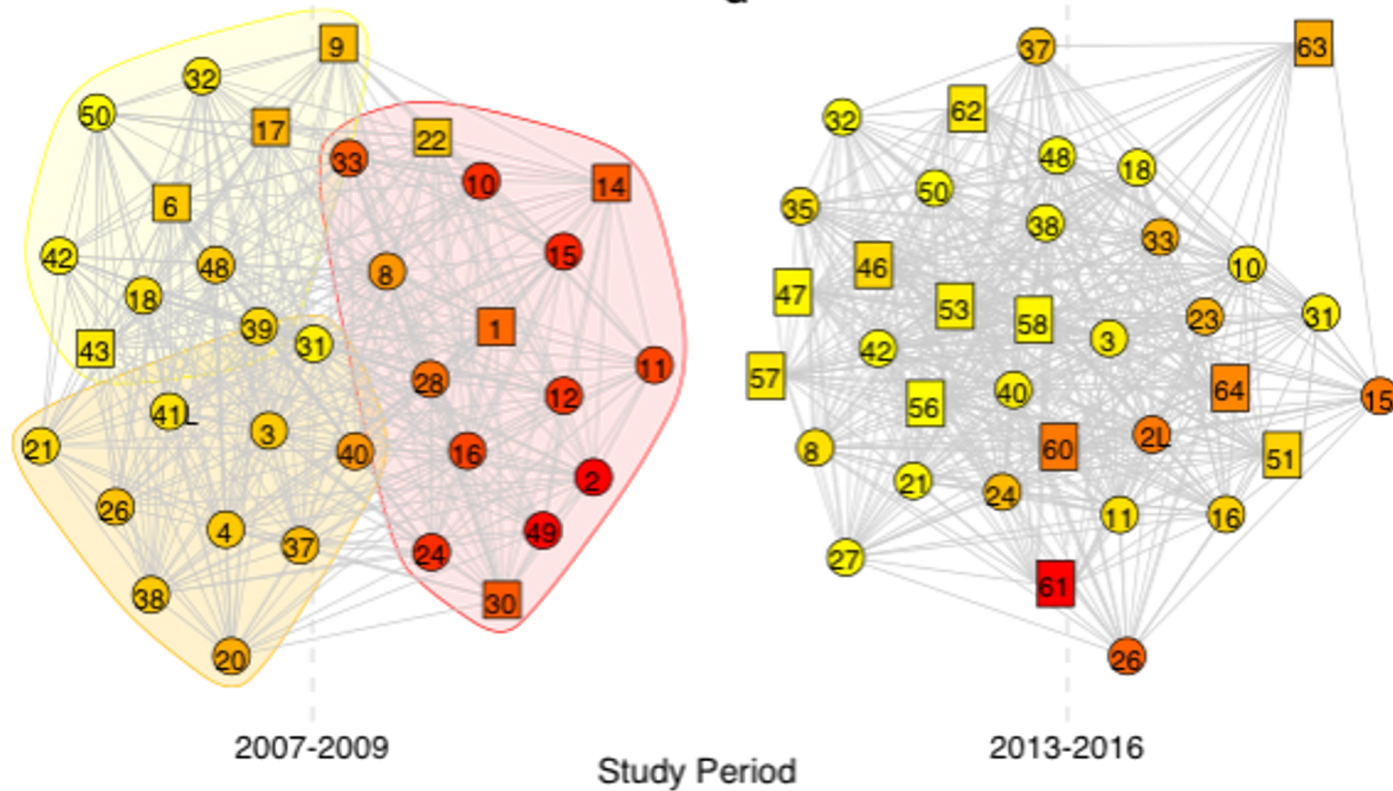
Almost all dolphins **reduced their use of the cooperative foraging**



Cantor et al. in revision

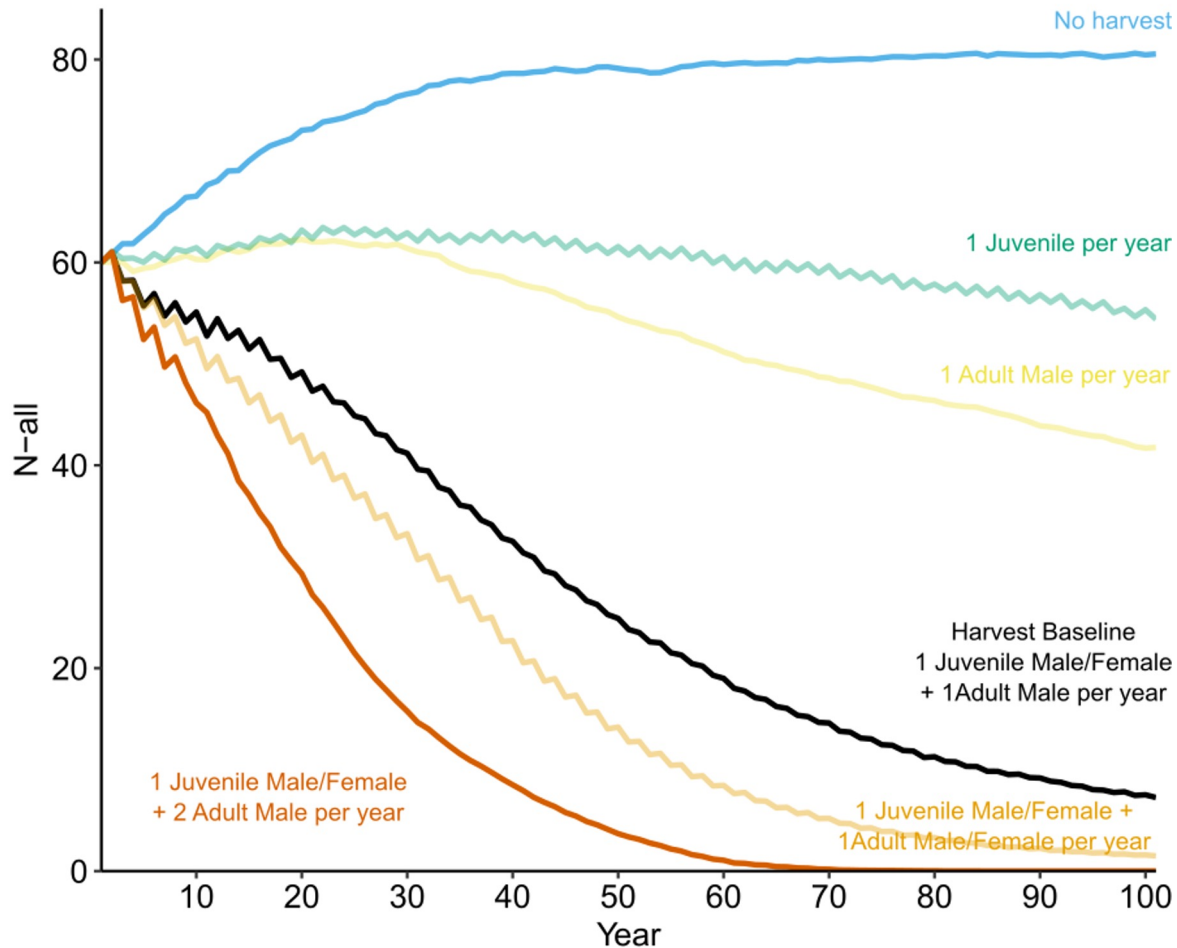
As a result...

The social division **dismantled** following the drop in the use of the cooperative tactic.



POPULATION PREDICTIONS

Population viability analysis considering different scenarios of mortality per bycatch:



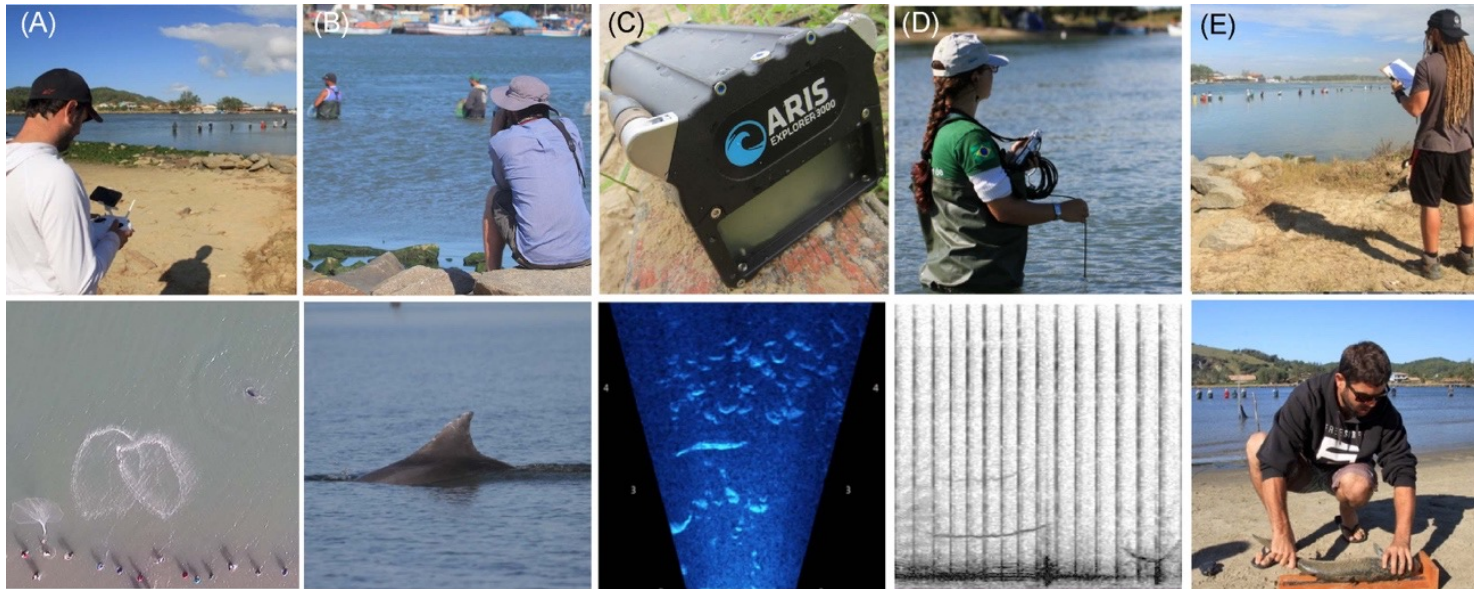
Only a **zero-bycatch** management strategy can guarantee the persistence of this dolphin population



PHASE 2:

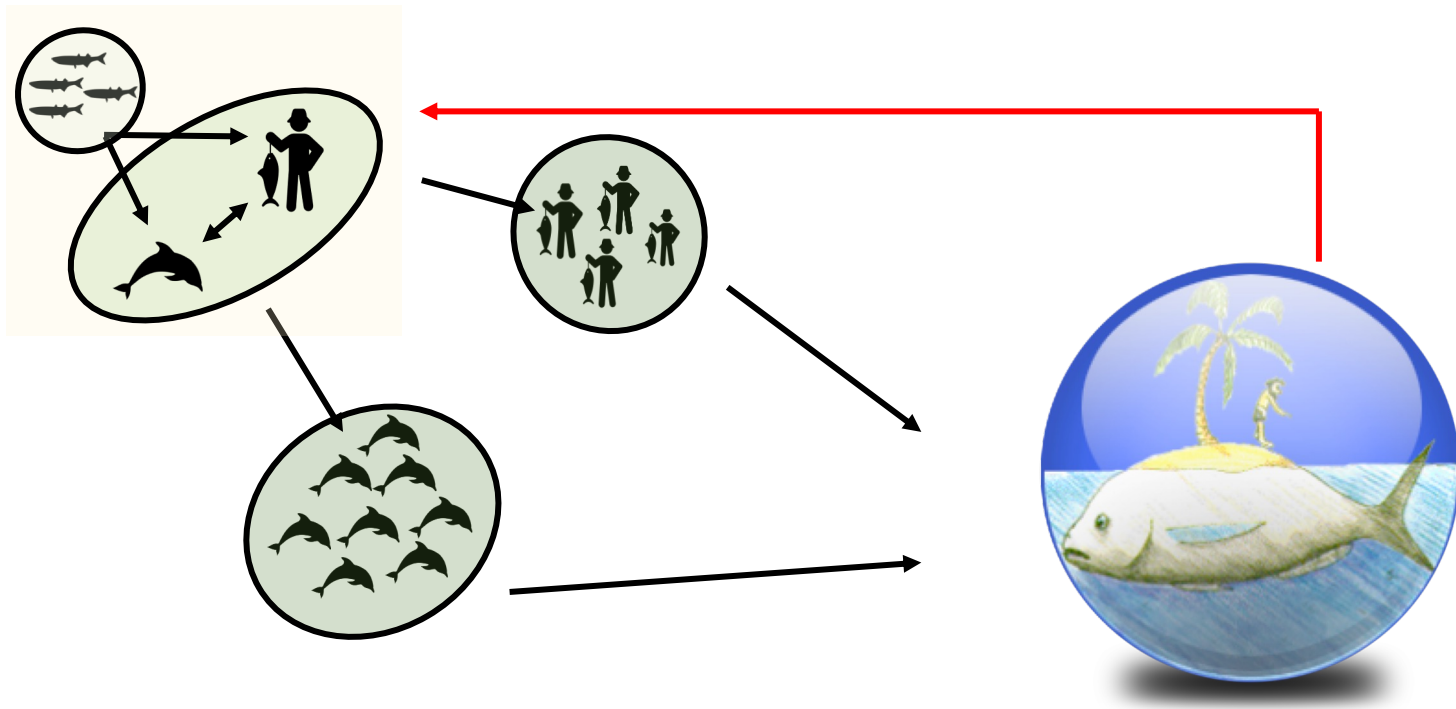
What are the direct benefits for the dolphins engaging in the cooperative foraging?

What are the underlying mechanisms of the dolphin-fisher interaction?



PHASE 3

Understand the effects of the cooperative foraging for the ecosystem and vice-versa;



Recommendations/conservation strategies

Saving dolphins from bycatch:

- *Restriction and management of local fisheries;*
- *Enforcement actions on illegal fishing activities*



Saving dolphins from increasing boat traffic:

- *Engaging local stakeholders in a discussion on how to reduce boat traffic.*

Assessing dolphins' health:

- *Monitoring the prevalence of skin diseases in the dolphin population*

Our team



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Supporters

