Abstract

L40-41. This is not the case in all MPAs.

L44. Change density by densities.

L44-46. Seems odd why the restricted harvest (RH) sites will have fewer sea urchins than the unrestricted (UH) sites because of natural and human predation cumulative effects. The normal expectations are that UH will have more sea urchins unless differences in the environmental conditions of the sites (e.g. L195-196).

L58. Complex mechanisms? Like?

Introduction

L70. Delete object.

L75-76. The increase of surveillance controls anthropogenic impacts which may increase the abundance and diversity of predators. The enforcement level will reestablish the predatory interactions in the system as a side effect, not as a direct effect.

L98. Nozawa *et al*., 2020 different format.

L132. Wrong citation format.

L136. What is the actual level of *P. lividus* exploitation?

L142. Include areas of the whole island and with the inclusion of the MPAs

L155. Local extinction is a drastic statement due to the current status.

L164, 201. Unify “no-take areas” are “no harvest (NH) areas”

L163-165 and L170-172. This statement could be used in the hypothesis rather than L44-46.

L173. Change “smallest” by “lowest”

Materials & Methods

L190, 194. Is there any reason why the authors selected the UH sites (two points) at the reserve boundaries on Figure S5?

L211-213 Information and regulation on *P. lividus* harvest landings will be useful for the management plans.

L225. Delete “without spines”.

L231. The type of bottom is an important factor influencing sea urchin’s density and abundance. So, it should be considered in the discussion.

L269-271. Are these results are the same for total and commercial?

L278. Change “#” by “number” (or use “ind/yr per site”) and keep numbers in the whole manuscript.

Discussion

L284. Since you don't have data on natural predation, I would not stress that in the discussion and I will use it at the end as a potential factor influencing the sea urchins densities due to the larger number of predatory fish in MPAs compared with unprotected areas (Guidetti *et al*., 2019; Pessarrodona *et al*., 2019).

L285-288. Here you said: "The spatial evaluation has in fact highlighted differences between harvesting conditions suggesting a natural predation effect **in selecting large-sized individuals** where no harvest is allowed (Pessarrodona *et al*., 2019)" but in L110-113 you said: "Predation mostly affects **sea urchins up to 40 mm in size** (Pessarrodona *et al*., 2019)". Is completely the opposite, please clarify. See also L329-330 "constrained by natural predation pressure (targeting the small-sized individuals, Guidetti and Sala, 2007).

L290. Specify what kind of "not predatory fish", Sea urchins predatory fish or in general predatory fish.

L288-291. Discuss the potential factors influencing higher sea urchins densities in UH compared with RH sites.

L292-293. "the commercial sea urchin density was significantly higher in NH than in UH conditions". Why do fishermen prefer harvesting in RH compared with UH sites?

L309-313. I will include statistical differences among densities Years*Treatment (NH, UH and RH) which will provide a robust discussion and conclusions.

L314. Add "law" after "enforcement"

L313-316. There are two different sentences that should be better connected. 1) The positive effect on the global densities in NH sites. 2) That lower densities at RH sites in 2019 should be "claimed" (I would change it by "related") to environmental threats, such as global warming or acidification.

L321-324. The important statement is directly related to your data.

L325. Change deep by high.

L328. Specify the adult size of *P. lividus* in the introduction.

L353-355. Outcomes of this debate? When was it? Where we can read about it? How recent this topic has started?

L356-358. Use sea urchin in the whole manuscript.

Conclusions

L372. The study included non-protected areas as well.

L375. Anthropogenic impacts, fishing pressure or sea urchins harvesting could be more appropriate than "human predation".

L379. "complex mechanisms" definitely occur in sea urchins populations. This is a vague statement here and it would be better to state your results.

L381-382. “the need to ban sea urchin harvest” Banning sea urchins harvest is not always the best option. There are several examples in the literature suggesting other options that could be addressed here.

Acknowledgements

“English mother tongue (Ms Katie Duff) has reviewed the manuscript”. She could be included here.

References

Must be carefully reviewed manually or using references software.

Figure 1

Legend: Change “gr” by “grey and C zone in light grey.”

Figure 3

In the X axe reduce space between NH and RH bars.

Unify Y axe legend format.

Adding a legend on the plot of total density (black) and commercial density (white) will be useful.

In the figure legend “between the values o”, “o” means?

SE are large and similar in the Ln response ratio for total density and commercial densities. Explain in the discussion.

Figure 4

In the legend change “in total density (abundance/m^2)” by “in total abundance (ind/m^2)”

Unify in all figures “ind/m^2” or “#individuals/m^2”. I would keep “ind/m^2”

Figure 5

In the legend change “mean+SE” by “mean ±SE”.

In the legend add the total variation period in years.

In Y axe use only one decimal.

In Y axe legend add (ind/m^2yr).

Table 1

Delete double parenthesis “10 (2018))”

Excel files

Change abundance for density and specify if is in m^2.

General

There are significant differences in the spatial-temporal variability but no significant differences among years. A statistical test will provide robust discussion and conclusions.

Accurate data on sea urchin harvest landings and effective law enforcement, regulations and penalties as well local education workshops are useful tools to achieve better conservation and sustainable targets.

I would be recommended to suggest sea urchin natural predatory experiments among the RH, UH and NH in future studies.

The references and citation should be improved using reference software or with very careful review in the entire manuscript.

Full scientific name on the figures

The upper case for the first letter of the axes labels