

Abstract:

We are only ~6 years away from 2030 – how close are we to the 30% international protection goal? Given how slow it can be to designate protected areas, is this goal attainable? How does this MPA efficacy study inform next steps to meet the 30% goal in under 6 years?

Introduction:

Line 30 – fished populations

Line 31 – overharvesting

Line 42 – “calls” seems off to me, a different word here?

Line 49 – Movement of fish? Or fished species?

Line 47/48 – Using ecosystems as the terminology is fine, but there are several terms and definitions that could have been used (e.g., habitat types). If you decide to stick with ecosystems for this terminology, provide a citation the first time.

Methods:

Line 115 – the order of these two paragraphs should be swapped.

Line 119 – depth less than 30m? Otherwise there is overlap between shallow and deep reefs.

Line 122 – Name what the measures are that you are using from these monitoring programs (e.g., fish species; abundance; fish length; etc.)

Methods described in SI – Only the Shallow Reef section names survey dates. There are no sample sizes listed in any of the sections.

For Shallow Reef sampling, North and South Coasts were sampled beginning in 2017, and through 2020 like the Central Coast?

Surf Zone and Shallow Reef fishes length was measured the same? The Shallow Reef has a more detailed description of the length measurement. How was length measured in Deep Reef?

Each ecosystem has one lead monitoring organization? Can they be named? Any consistency across monitoring is not articulated.

Line 153 – What is the study period? This has not been stated yet in the Methods. Also, here you should state that 59 is the MPA sample size. It's inferred here, and not clearly stated until Line 213.

Line 162 – How was biomass, diversity, and richness calculated? Same for all ecosystems? What is the estimate's time frame, per year?

Line 175 – Again, these performance metrics have not been properly introduced or defined yet.

Line 179 – What fisheries data (source, year(s), citation?), and what expert opinion process? This sentence in the Methods references a results table in the Supplemental Materials. The methods need to be explained, or point the reader to a citation that explains the methods in more detail. What experts provided opinions for fish species being targeted or not? And when? How was this information collection and summarized? What about conflicting opinions and uncertainty? How was the “California data” integrated with expert opinions to make a final determination?

Line 180-1 – I’m not following why body size would have been used to classify a fish species as targeted or not. Size is not presented alongside the targeted/not targeted classification in Table S1. This phrase can be deleted? I find it confusing.

Line 238 – Missing reference to Supplemental where larval settlement methods are described.

Figure 1 – I recommend using open and closes diamonds / squares as the symbols, instead of coloring. It’s hard for many to discern purple and green, or any two colors.

Discussion:

Line 350 – I’m not sure this study evaluates an MPA network across biological ecosystems, if that is what the statement is implying. CA MPAs are all within the CA Current. Unless the authors are considering the dynamics inside the Current, like the Southern CA Bight, for example. But this seems to be an overstatement to me, and rather I see this study as being an evaluation **within** a well-known biological large marine ecosystem.

Line 356 – what does “representative habitats” mean? I know it’s discussed in the paper, but if someone is just reading the Discussion (not uncommon), can you be more descriptive here to explain representative of what? And reference sites (Line 357) are outside MPA study locations, correct? I think you should state that so the Discussion could stand alone if necessary.

Line 356 – “more” meaning on average? A threshold? A percentage? Can you add a qualifier here so the reader knows what “more” means?

Lines 366-379 – Nicely articulated.

Line 828 – Can you add an i.e. after “placement effect (i.e., high pre-existing biomass)”, like you did for regulatory protection? I think e.g.s would also help. (i.e., an emergent effect from e.g., no-take MPA

designation). I also suggest a comma after “placement effect”. I see a more detailed explanation follows, but these additions could also be helpful.

Line 385 – Could edit for clarity to “relative to the outside reference study location”

Lines 412-414 – Is this true over long time scales, or just during/near the heat waves / perturbations?

Line 415 – This hasn’t been the only perturbation through the study time period, correct? What about El Nino and La Ninas? Maybe climate patterns and heat waves are not foreign to the CA Current, yet it’s the frequency and magnitudes that are increasing with climate change, and those are the factors to examine, not the events themselves.

Line 432 – Delete “a” before “Rockfish Conservation Areas”.

Lines 439-454 – Nicely written. Suggestion for another reference re: functional diversity on line 451: Dee et al. 2016. Functional diversity of catch mitigates negative effects of temperature variability on fisheries yields. *Proceedings of the Royal Society B* 283(1836):1-9.

Also for this paragraph, I wonder if speaking about MPA mgmt. diversity goals is appropriate.

Line 459 – Can delete “the” in phrase “Although ~~the~~ conservation performance...”