

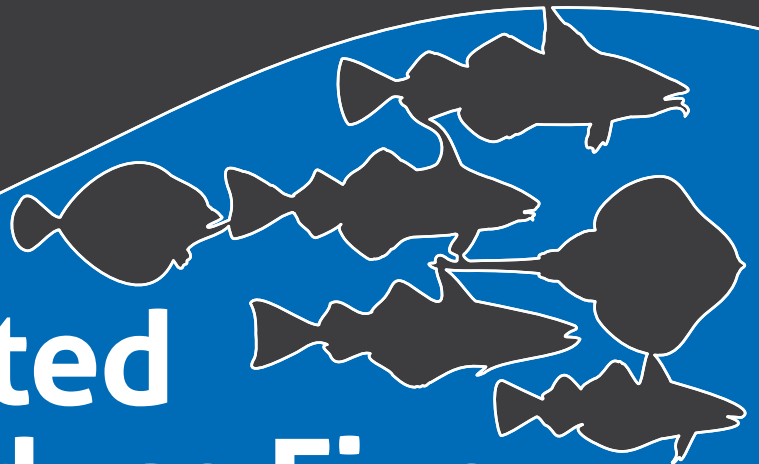
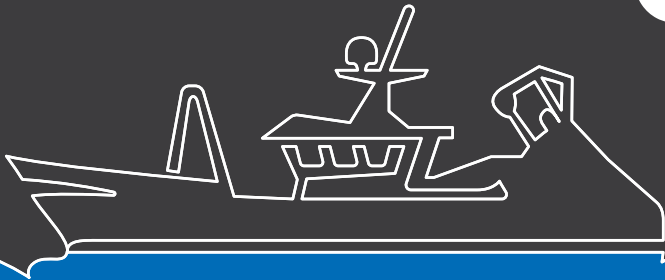


FISHY

FALSEHOODS

A series of papers debunking myths about our industry

04



“Do Protected Areas Produce Five Times More Fish than Unprotected Areas?”

The Claim

*"The evidence, not least from the no-take zone in Lamlash Bay, is clear. Protected areas benefit both fishers and fish, and **one hectare of protected ocean in which fishing is not permitted produces at least five times the quantity of fish that is produced by an equivalent unprotected hectare.** Those fish can then swim into unprotected areas to be caught."* Kenneth Gibson MSP, Scottish Parliament, 21st March 2023.¹

FACT

There is no evidence that protected areas produce five times more fish than unprotected areas: The claim is at best unproven and misleading.

FACT

No research anywhere in the world has found that protected areas actually produce five times more fish than unprotected areas.

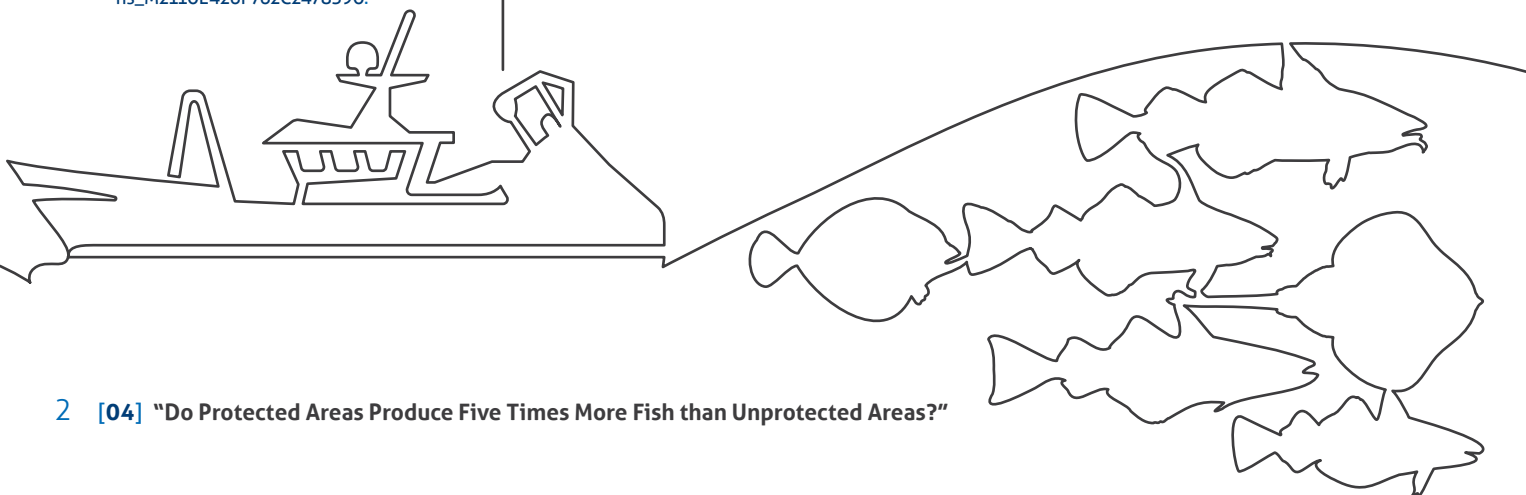
FACT

There is no clear evidence that protected areas enhance stocks or benefit fisheries beyond their boundaries (and evidence that they do not).

FACT

Countries like the UK that have effective fisheries management do not need marine protected areas to protect fish stocks.

¹ https://www.parliament.scot/chamber-and-committees/official-report/search-what-was-said-in-parliament/meeting-of-parliament-21-03-2023?meeting=15214&riob=129739#orscontributions_M2110E426P762C2478590.



Analysis of the Claim

No source has been given for the claim that protected areas produce five times more fish than unprotected areas, but it is not supported by any evidence from Lamlash Bay.

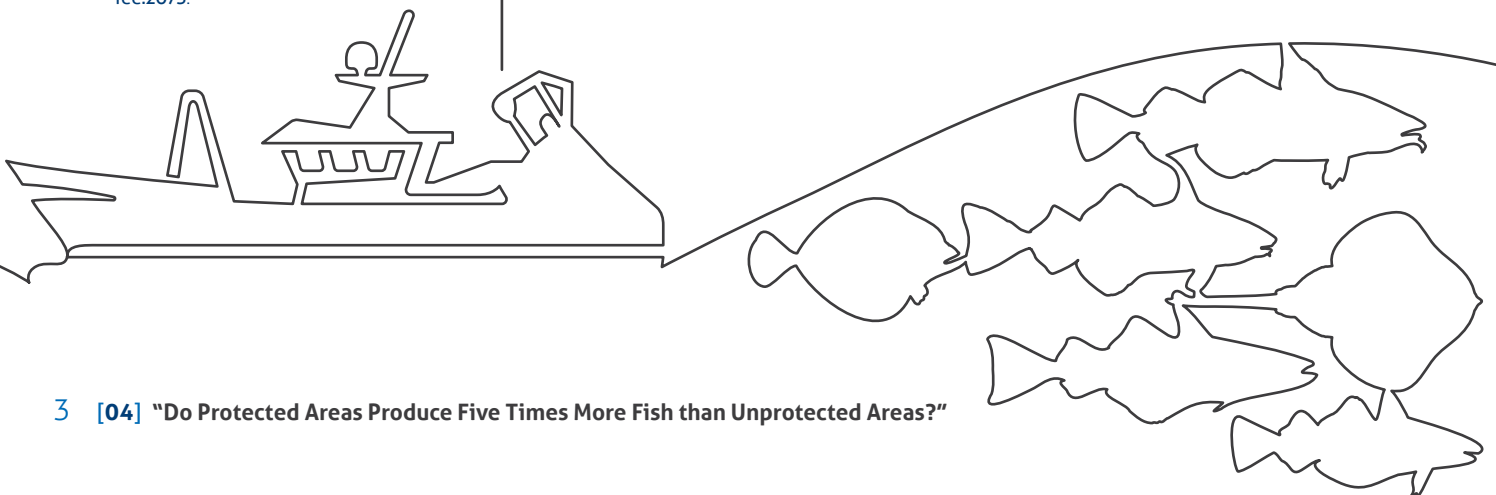
The claim may be based on a misunderstanding of a scientific paper that was published in 2019 which compared the quantities of eggs that might, in theory, be produced by fish inside protected areas compared to those outside such areas.²

It is important to note that this study was entirely theoretical and based on modelling and conjecture. The 'production' referred to is the theoretical production of **eggs** (or offspring) by fish of different sizes. The paper does not suggest that there will be five times more mature (catchable) fish inside protected areas.

The premise of the paper is that fish in protected areas are more likely to survive and grow to larger sizes than those not in protected areas and that these larger fish will produce disproportionately more eggs than smaller fish. Specifically, the paper suggests that previous studies (also theoretical) have underestimated how many more eggs larger fish may produce.

A key assumption of the paper is that fish will remain inside a protected area and, because they are protected from fishing, will be able to grow to larger sizes. That may be true for reef-dwelling fish which tend to be more sedentary (almost all of the individual species of fish mentioned in the paper are reef-dwellers.) However, it is very unlikely to be the case in Scotland's seas where most fish tend to be much more mobile. So, the paper's conclusions (or predictions) are unlikely to be relevant in Scottish waters where fish are unlikely to respect the boundaries of protected areas.

² Marshall et al. 2019. Underestimating the benefits of marine protected areas for the replenishment of fished populations. *Frontiers in Ecology and the Environment*, 17: 407-413. <https://doi.org/10.1002/fee.2075>.



Even if the fish inside protected areas do produce substantially more eggs that will not necessarily result in more adult fish. Most species of fish produce millions of eggs and young each year but almost all of them die before they can reach adulthood. (The chances of an individual cod egg, for example, surviving to reach adulthood are less than the chance of winning the national lottery.) So, more eggs do not necessarily result in more mature fish.

Spillover

It is commonly claimed that the benefits of marine protected areas extend beyond their boundaries via the export of young or mature fish into the surrounding area (known as 'spillover') and that this will benefit local fisheries. However, the extent to which spillover occurs in practice remains unclear and controversial. One recent review of the subject concluded that the main effects of spillover were found close to the boundaries of protected areas (within only 200 metres).³

A scientific survey of the Lamlash Bay No Take Zone (NTZ)⁴ found no evidence of the dispersal of adult scallops into the surrounding area (and no significant increase in the abundance of scallops inside the NTZ).⁵

A study of the network of marine protected areas in the Californian Channel Islands found that although the abundances of targeted fish species inside the MPAs were higher there had been no significant increases in their wider abundances outside the MPAs.⁶

A recent review of one of the largest marine protected areas in the world, the Phoenix Islands Protected Area (PIPA) in the Pacific Ocean, found that it has had no significant effects on the abundance of tuna fish although it has cost the Kiribati Islands millions of dollars in lost fisheries revenues. As a result, the Kiribati government is considering re-opening the PIPA to fishing.⁷

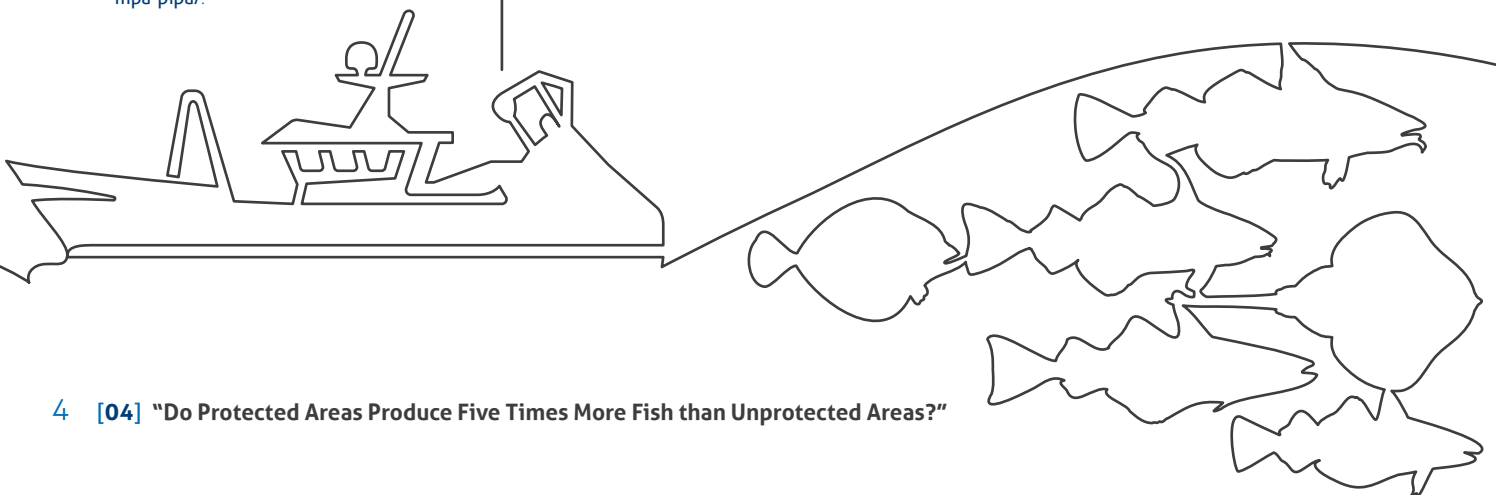
³ Di Lorenzo et al. 2020. Assessing spillover from marine protected areas and its drivers: A meta-analytical approach. *Fish and Fisheries*, 21: 906-915. <https://doi.org/10.1111/faf.12469>.

⁴ Lamlash Bay No Take Zone: <https://www.lamlasharran.co.uk/about-lamlash/no-take-zone-coast/>.

⁵ Boulcot et al. 2018. Estimating fishery effects in a marine protected area: Lamlash Bay. *Aquatic Conservation*, 28: 840-849. <https://doi.org/10.1002/aqc.2903>.

⁶ Ovando et al. 2021. Assessing the population-level conservation effects of marine protected areas. *Conservation Biology*, 35: 1861-1870. <https://doi.org/10.1111/cobi.13782>.

⁷ For a discussion of the results see: <https://sustainablefisheries-uw.org/tuna-mpa-pipa/>.



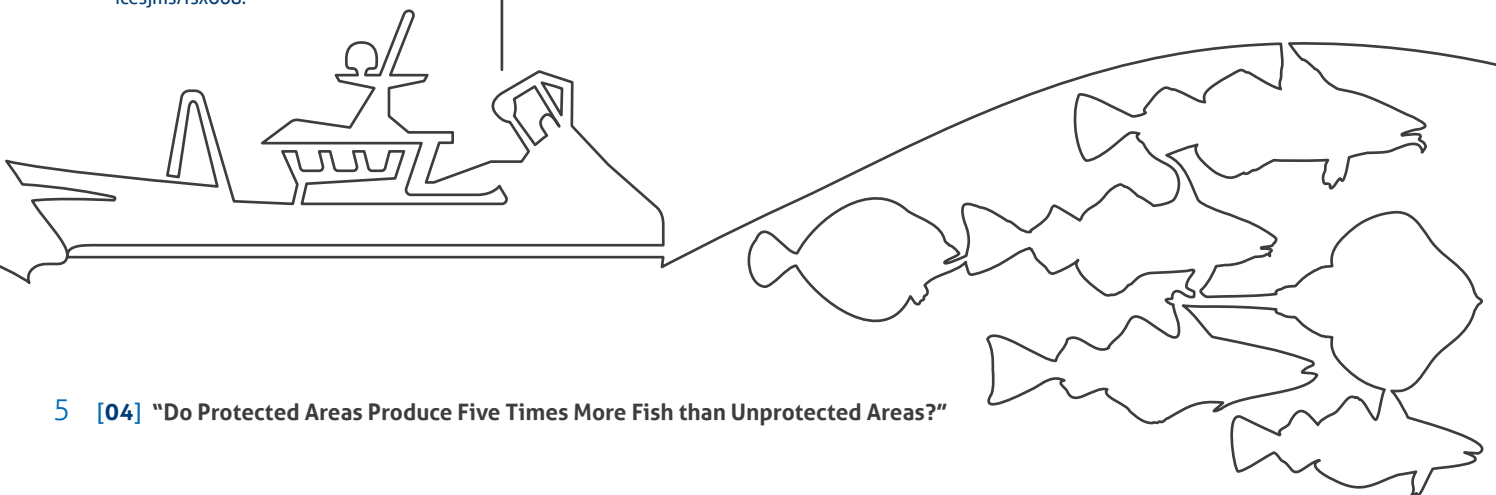
Professor Ray Hilborn has concluded that: *"The biodiversity of a whole region is better protected when 100 percent of the area is governed by good fisheries management than by closing 10 percent, 20 percent, or 30 percent to fishing inside MPAs. It is not clear whether MPA advocates wilfully ignore or do not understand that the abundance of fish in a region will not go up when MPAs are put in place..."*

"Countries with effective fisheries management [including EU Atlantic fisheries] ... do not need MPAs to protect fish stocks."⁸

Conclusion

The suggestion that "one hectare of protected ocean in which fishing is not permitted produces at least five times the quantity of fish that is produced by an equivalent unprotected hectare" is at best unproven and misleading (and almost certainly false), especially in the context of Scotland's seas. Evidence for the benefits of marine protected areas beyond their boundaries, and of wider benefits to fisheries, is at best limited and equivocal. It has been suggested that countries that have effective fisheries management (like the UK) do not need MPAs to protect fish stocks.

⁸ Hilborn & Hilborn. 2019. Ocean Recovery: A Sustainable Future for Global Fisheries? p. 155-161. See also: Hilborn, 2018. Are MPAs effective? ICES Journal of Marine Science, 75: 1160-1162. <https://doi.org/10.1093/icesjms/fsx068>.



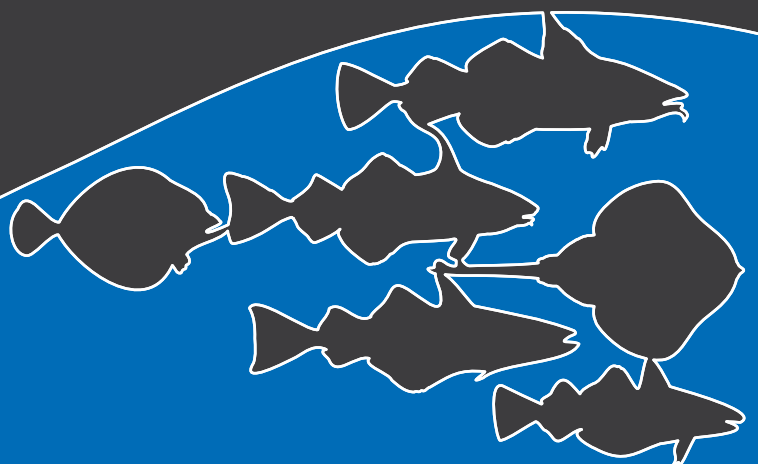


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