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Response to Information request 1 (selected questions)

To what extent do Australia's seafood imports contribute to global IUU fishing and how are we affected by this activity? Are you aware of any evidence that Australian imports of certain species or seafood product from specific countries, regions or fisheries pose a higher risk of being derived from IUU fishing practices?

Importing from Countries with Poor Fisheries Management

When a country imports seafood, any negative social and environmental impacts associated with catching that seafood are displaced to the fished location. This is particularly problematic when a country (e.g., Australia) imports seafood from countries with poorer, less-effective, fisheries management than itself (henceforth 'unequal imports'). Using a published index for national fisheries management effectiveness, we (Klein et al. 2022, <https://doi.org/10.1088/1748-9326/ac97ab>) calculated unequal imports of wild-capture seafood and found that 30-53% (0.95-7.2 million tonnes) of seafood was unequally imported annually between 1976-2015 globally (Figure 1).

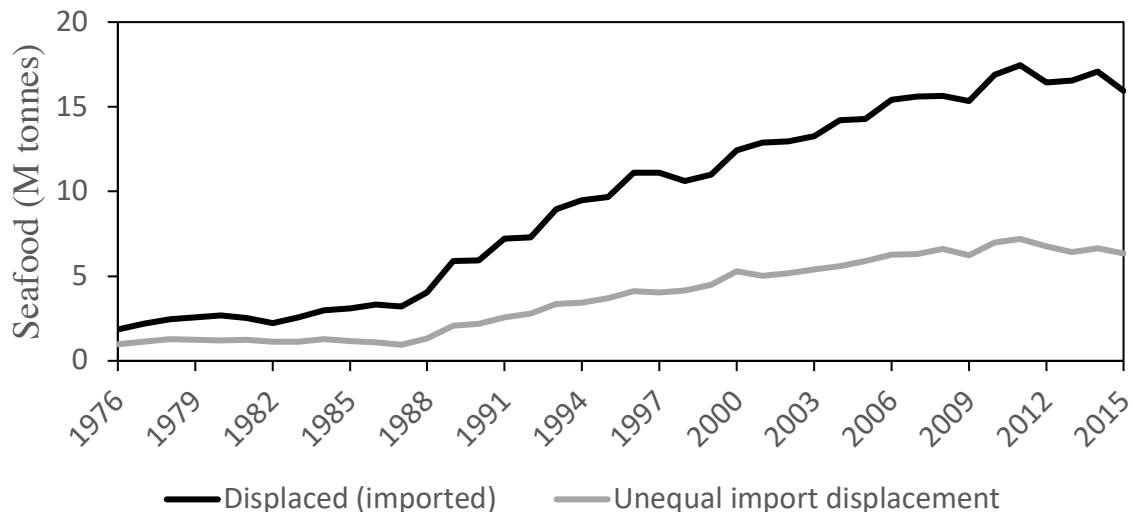


Figure 1. Annual amount of seafood imported in total and unequally (from places with less effective fisheries management according to Mora et al. 2009) between 1976-2015 for 172 countries. From supplementary material Klein et al. 2022 <https://doi.org/10.1088/1748-9326/ac97ab>.

Although this was a global study, we analysed the data specific to Australia for this submission. We assume that the lower the fisheries management score (i.e., poor fisheries management), the higher risk of IUU fishing practices. We found that more than half of Australia's seafood imports are from countries with less effective fisheries management (Figure 2 & 3), most of which is from countries with the lowest (bottom 40%, quintiles 1 and

3). Between 2011-2015, Australia imported the most wild-capture seafood from Indonesia, which has a low fisheries management effectiveness score (Figure 3).

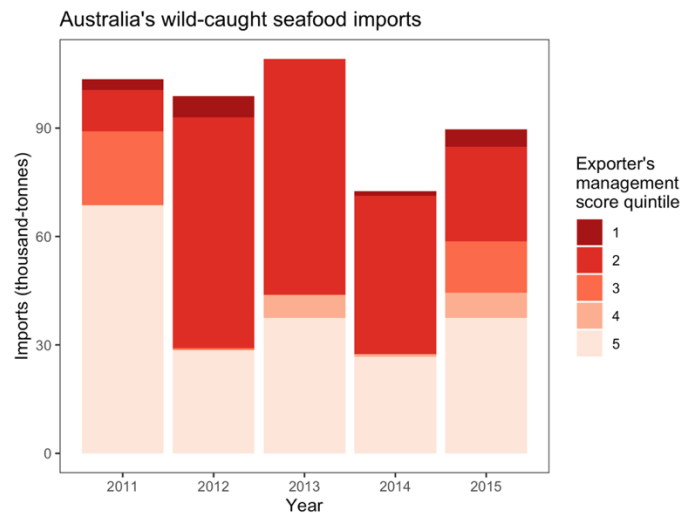


Figure 2: Australia's annual imports by volume of wild-caught seafood distinguished by the fisheries management effectiveness score of the exporting country (2011-2015). The lower the quintile (darker red), the lower the fisheries management effectiveness score (Australia's score is in quintile 5-light orange-representing relatively high fisheries management effectiveness).

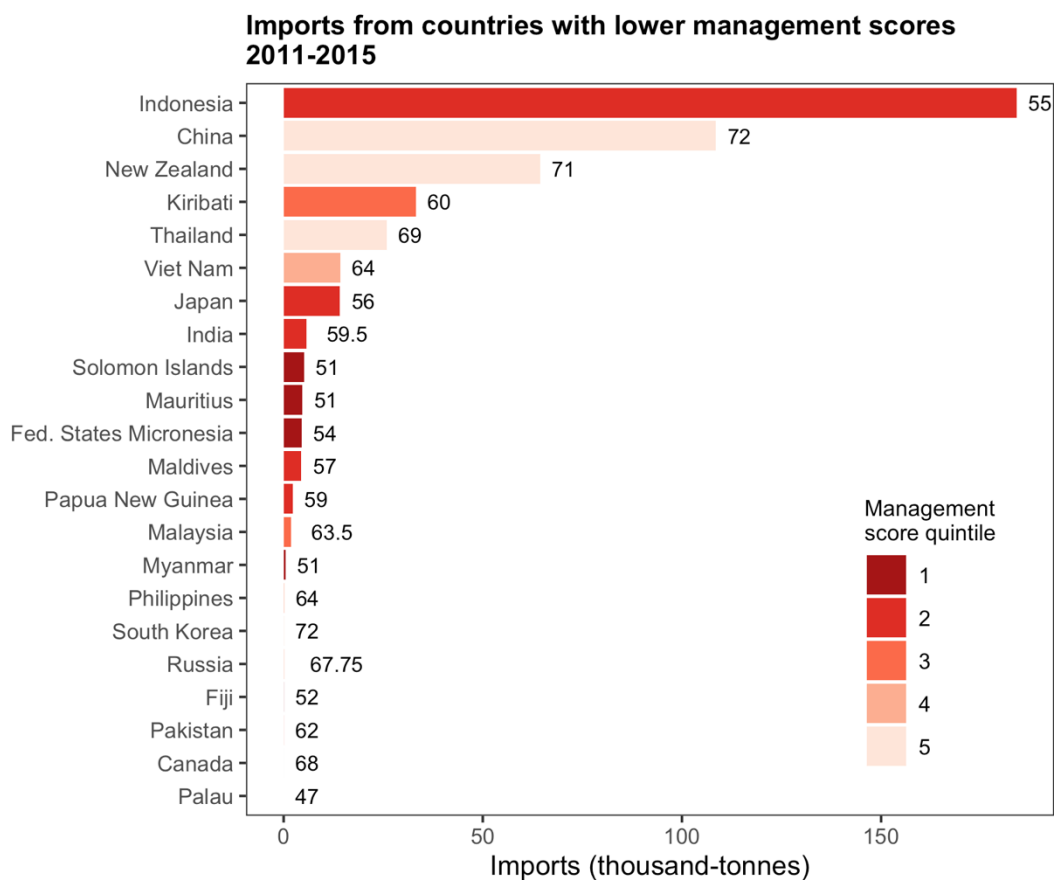


Figure 3. Australia's imports (Tonnes of wild-caught seafood) from countries with lower management effectiveness scores between 2011-2015. The lower the quintile (darker red), the lower the fisheries management effectiveness score (Australia's score is in quintile 5-light orange-representing relatively high fisheries management effectiveness). Bars are labelled with the exporter's management score (0-100) from Mora et al. 2009 (Australia=73).

Another important consideration that has similar implications is when Australia obtains seafood caught in places outside its EEZ through international fishing, rather than through imports (Figure 4). In Klein et al. 2022, we calculated unequal displacement from both imports (reported above) and international fishing. We did not report unequal displacement from international/distant water fishing here as it does not appear to be the focus of the discussion paper. However, we suggest that it should be considered when investigating the extent of Australia's involvement in IUU fishing.

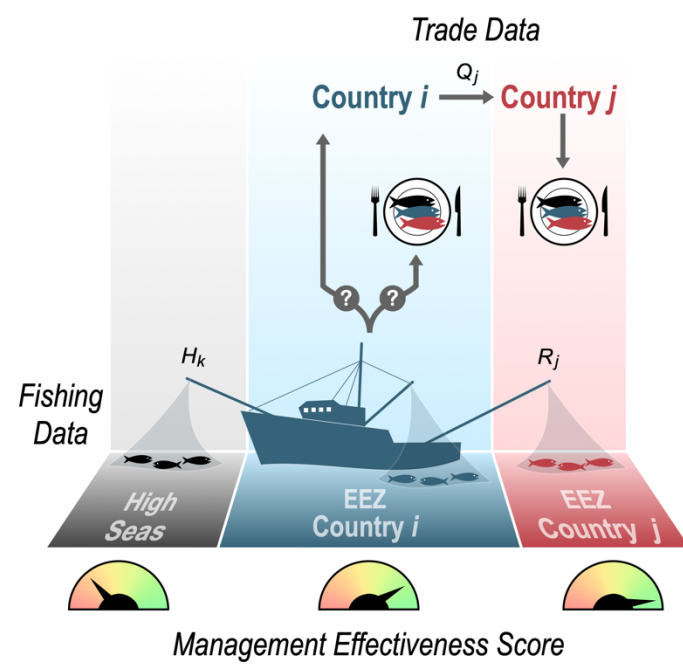


Figure 4. Wild caught seafood can be obtained by a country through fishing in its own exclusive economic zone (EEZ), in another country's EEZ (R_j), fishing in the high seas (H_k) and through trade (Q_j). The question marks between the fishing and trade sections represent uncertainty about where traded seafood was originally captured.

Importing Endangered Species

In Roberson et al. (2022, <https://www.nature.com/articles/s41467-020-18505-6>), we analyze global fisheries catch and import data and find reported catch records of 91 globally threatened species. Thirteen of the species are traded internationally. For this submission, we analysed the trade data and found that Australia imports at least eleven threatened species (listed on the IUCN Red List of Threatened Species), including one species listed as Endangered (Figure 5). Our results are a conservative estimate of threatened species catch and trade because we only consider species-level data, excluding group records such as 'sharks and rays. Given the development of new fisheries monitoring technologies and the current push for stronger international mechanisms for biodiversity management, industrial

fishing of threatened fish and invertebrates should no longer be neglected in conservation and sustainability commitments.

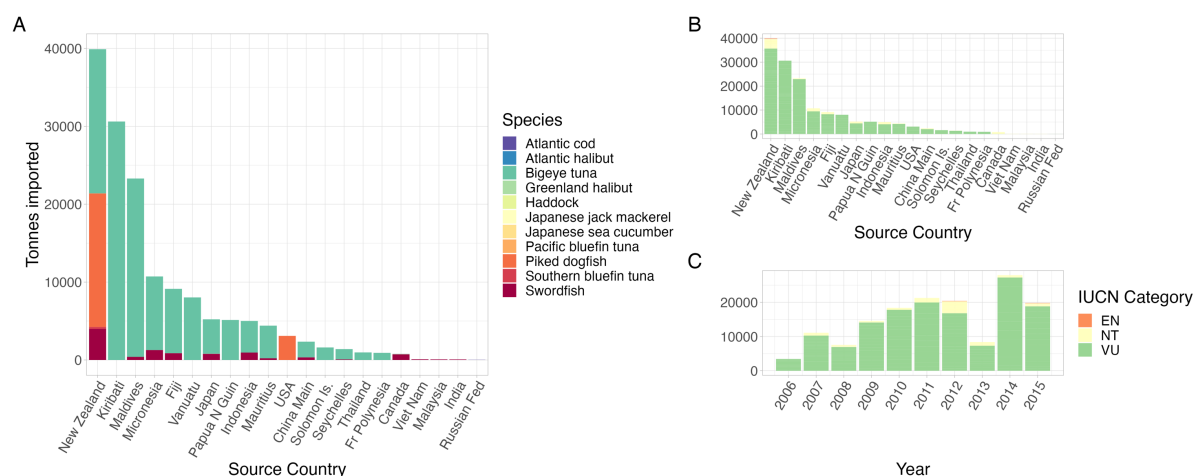


Figure 5. IUCN Red List of Threatened Species Imported into Australia between 2006-2015 (A), by country (A and B) and over time (C). Subset of Roberson et al. 2020 (<https://www.nature.com/articles/s41467-020-18505-6>). EN, NT, and VU stand for Endangered, Near Threatened, and Vulnerable, respectively.

Data Sources

We used a global seafood trade database that estimates the annual volume of seafood imported by each country and its origin (i.e., exporting country) from: WatsonRA, GreenBS, TraceySR, FarmeryA and PitcherTJ. 2016 Provenance of global seafood. FishFish: 17585–95. <https://doi.org/10.1111/faf.12129>.

We used fisheries management effectiveness scores from Mora et al (2009): Mora C, Myers R A, Coll M, Libralato S, Pitcher T J, Sumaila R U, Zeller D, Watson R, Gaston K J and Worm B 2009 Management effectiveness of the world's marine fisheries PLoS Biol. 7 e1000131. <https://doi.org/10.1371/journal.pbio.1000131>

What data and methodological approaches should we consider when assessing the key sources, and the value and volume of any IUU fishing product entering Australia?

We generally have a poor understanding of aquatic food trade globally, including its geographic origin and production method (farmed or wild capture). In the above work, we used the best estimate for trade flows from Watson et al. 2016

<https://doi.org/10.1111/faf.12129>. This database uses data from the FAO and supplementary sources to estimate seafood trade flows between countries, including countries that import, re-process, and re-export.

However, an improved dataset has been developed (and that should be used) that will soon be available. Gephardt et al. (see reference below) developed a global database of species trade for wild capture and farmed aquatic foods. This dataset addresses many shortcomings of existing trade data and should be used to assess source, value, and volume of fishing products entering Australia.

Other - Uncertainties around sourcing fish for feed

Considerable fisheries resources are used in Australia for feed purposes annually. Data from the FAO suggest that the use of fish/fish products for feed has increased in Australia since the 1960s, with a declining trend from 2015, since when ~170,000 tonnes of pelagic fish and ~10,000 tonnes of fish oil have been used for feed per annum on average (Figure 6). Much of this is expected to be flowing into aquaculture for fishmeal and oil (FMFO), with minority flows likely to the pet food industry and livestock production. These fisheries resources may be traded as formulated pellets, individual meals, or as whole products. While an increasing proportion of FMFO used in feed is derived from seafood waste streams (i.e., trimmings from processing food fish, ~30% worldwide), the majority is supplied through dedicated render fisheries. These fisheries are typically well regulated with many feed producers requiring that major suppliers be Marine Stewardship Council certified, and smaller suppliers be engaged in fisheries improvement programs. Thus, we assume the risk of IUU fishing practices embedded in production of these ingredients is low. However, FMFO can be produced via poorly regulated fisheries, such as the examples of bottom trawling for groundfish in parts of East Asia that has high potential for benthic destruction and bycatch. Given FMFO are typically traded in aggregated product codes which encompass all species from many trading nations, this presents opportunities for comingling to hide the provenance of unsustainable products. Further analyses need to examine the risk of illegal practices embedded in fisheries resources used to support Australia's animal feed industries.

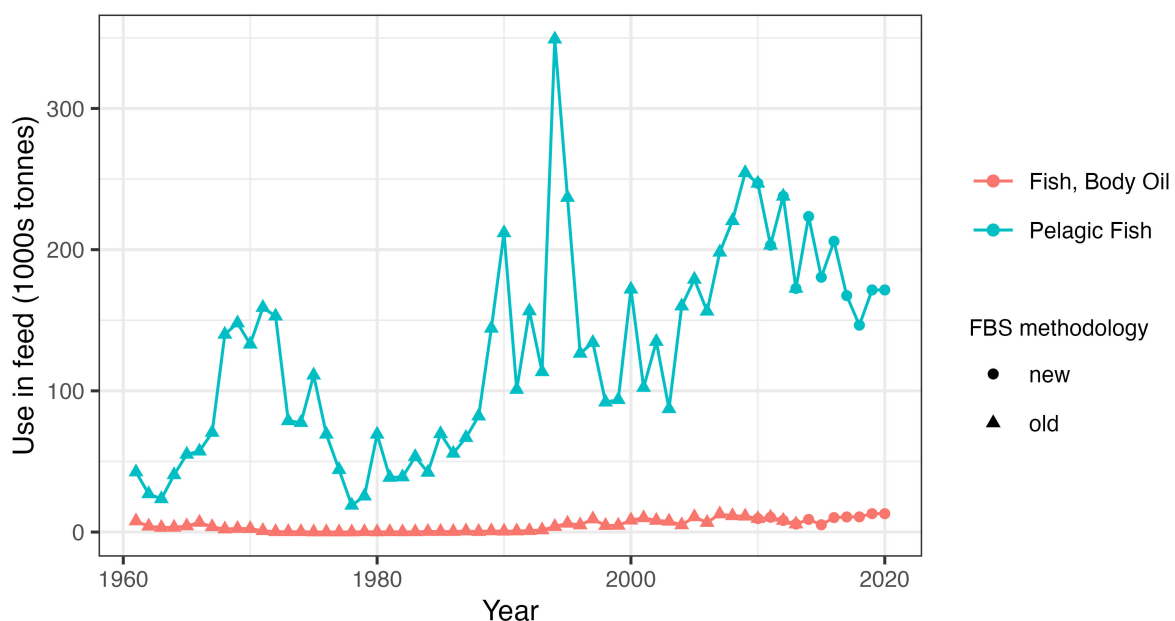


Figure 6 – Fish use for animal feed in Australia, 1961-2020. Data taken from FAO food balance sheets (FBS), including new and old methodologies for error distribution. Methodologies included as a variable to illustrate no effect on temporal trends.