



Published on *Marine Ecosystems and Management (MEAM)* (<https://meam.openchannels.org>)

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## Letter to the Editor: Marine conservation and sustainable food production are on a collision course

Dear MEAM:

The last issue of MEAM included an interesting case of trade-offs between food production (in the form of food safety) and in-stream/watershed engineering for biodiversity conservation barriers in the Salinas Valley, California ("[Integrated land-and-sea management: Examining three cases where marine practitioners are looking upstream](#)", MEAM 6:6).

From the article, I infer the practitioners in that case have found some compromises that allow both needs (food production and biodiversity conservation) to come away with something positive. That is welcome news because it goes beyond the superficial platitudes that get wide circulation in the marine realm - i.e., how if we all just practice good conservation (typically with lots of big no-take zones) then all the fish stocks will recover and there will be fish for all.

Now, no one can dispute that overfishing or irresponsible fishing practices are harmful to medium-term food security, even if they allow (excessive) catches to be maintained in the short term. But achieving medium-term global food security is going to require more than a few local scale win-win choices for biodiversity and food production.

Fortunately at the global scale some of the planners and policy-makers know this. Take note of the FAO and World Bank 2008 study of the "sunken billions" that could be returned to global economies if fisheries were curtailed everywhere that stocks are depleted, then allowed to rebuild to their long-term most-productive states ([www.worldbank.org/sunkenbillions](http://www.worldbank.org/sunkenbillions)). That's only a win-win when the foregone yield over the entire rebuilding period is considered optional food for the affected communities. In addition, think of the economic displacement caused by the harvest reductions needed for rebuilding, particularly in parts of the world where viable alternatives to fishing are not available. A soon-to-be-published follow-up study estimates that all those recovered billions in economic value might cover only two-thirds of the social assistance needed to take care of all the displaced employment.

Combine this with estimates that Serge Garcia and I did for a 2011 paper in the ICES Journal of Marine Science special issue on fisheries and climate change (<http://icesjms.oxfordjournals.org/content/68/6.toc>). Taking into account the UN world population projections to 2050, and the proportion of dietary protein currently provided by fish in the parts of the world that will experience the most population growth, our estimates suggest that protein from capture fisheries and aquaculture will have to increase by another 50% over 2010 levels just to break even with current food security levels. Then we accounted for forecasts by FAO and OECD of expected declines in wheat and rice production as climate change makes summers hotter and drier in many wheat-producing areas and makes storms more severe in rice-producing areas (with concomitant flooding). A **lot** more aquatic protein is going to be needed, as livestock is not an option in parts of the world where grain production will already be declining.

It is becoming clear that there is an inseparable tripod of issues facing marine resource management: poverty alleviation and food security in a changing climate - sustainable fisheries and aquaculture - and aquatic biodiversity conservation. There are no easy solutions out there where all perspectives will walk away thinking that they are the winners. People must start having some serious discussions about some very painful choices that will need to be made in the next decade or so. MEAM might have a role in trying to prompt such dialogue.

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Source URL: <https://meam.openchannels.org/news/meam/letter-editor-marine-conservation-and-sustainable-food-production-are-collision-course>