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COMMENTARY AND CORRESPONDENCE

Turning the tide on bottom trawling

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Trawling is universally recognized as one of the most destructive fishing methods, causing irreversible damage through scraping large tracts of bottom habitats. These habitats then suffer from declines in ecosystem functions and services, and collapses in populations of trawled species. The plethora of studies on the unsustainable impacts of commercial trawling is widely acknowledged by the scientific community, but few findings have been translated to actual policy. High profile attempts to curb deep-sea trawling have failed in the recent past, e.g. proposed moratoriums on deep-sea bottom trawling at the United Nations General Assembly in 2006 and within the European Union in 2013. In light of the global inertia to sanction trawling, countries in the Asia-Pacific are making significant headway.

Within one week in November 2014, two giants in marine capture fisheries announced expansions in national trawling regulations. From 2016, Malaysia will extend their trawling ban from 8 nautical miles (nm) to 15 nm from the shore, requiring trawl fishers to convert to alternative fishing gear (http://www.nst.com.my/node/48495). Indonesia effected an immediate moratorium on licences for large fishing trawlers (>30 GT), with plans to end fuel subsidies and renew efforts to tackle illegal fishing (http://www.antaranews.com/en/news/96371/indonesian-new-minister-vows-to-crack-down-upon-illegal-fishing). More recently, the moratorium was extended to a national ban on large trawlers starting in September 2015 (http://www.medanbisnisdaily.com/news/read/2015/02/14/146904/kapal-besar-dilarang-pakai-trawl). Although trawling was largely banned throughout Indonesia in 1980 (Bailey, 1997), this ban faced enforcement difficulties and a lack of political will. By the 2000s, trawling was again permitted in certain areas and illegal trawling was rampant (REBYC-II CTI, 2010). Continued trawling at the current rate is untenable, and is presumably the impetus for renewed efforts to regulate this fishery.

These measures in Malaysia and Indonesia, the complete ban on trawling in the territorial waters of Hong Kong (2012) and Palau (2006), and the announcement in December 2014 to permanently ban super trawlers in Australian waters (http://www.theguardian.com/environment/2014/dec/24/supertrawlers-to-be-banned-permanently-from-australian-waters), represent a significant advancement towards fisheries sustainability and marine conservation in the region. Asia-Pacific nations account for half of all global marine capture fishery production, with Indonesia ranking 5th (5.1%) and Malaysia 16th (1.5%) in global

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production (Funge-Smith *et al*., 2005). Trawling restrictions are successful if implemented broadly, enforced well, and applied before fish stocks collapse. In Indonesia, the trawling ban also decreased social tensions and violence between small-scale fishers and the trawling industry (Chong *et al*., 1987).

In light of global food security, livelihoods, and impacted marine ecosystems, a regional ban on trawling is the next logical step. The recent trawling restrictions not only signal a regional commitment towards ocean responsibility, but also a move towards recognizing bottom trawling as an unsustainable fishing practice. It is time for the other countries in Asia-Pacific to re-evaluate their trawling programmes and seek viable alternatives. If well supported and enforced, a regional trawling ban, in addition to the establishment of marine protected areas, will greatly advance the safeguarding of marine resources. We argue that national fisheries departments should prioritize the process of phasing out bottom trawling while accounting for supporting measures. Zoning restrictions may seem more tractable on paper, but total bans are more effective and easier to enforce (Bailey, 1997).

Without effective enforcement and the empowerment and support of the local communities, fishing regulations will not succeed. Illegal, unreported and unregulated (IUU) fishing has to be tackled in tandem, with the understanding that small-scale fisheries contribute greatly to overall fishing effort (Bailey, 1997). Beyond legislation, governments and society at large must offer institutional support for fishers to transition to alternative employment, be it changing fishing practices or moving to a different industry. This transition is an investment in our collective long-term future, given the importance of fisheries as income and protein sources. To this end, provision of funding and technical assistance for educational or training programmes, research into sustainable fishing methods, and affirming traditional resource-use rights are paramount. Simply enforcing bans and leaving fishers with no feasible alternatives effectively means the management strategy is doomed to failure, leading to poaching and defiance of laws. For example, thousands of fishers became unemployed after the Indonesian trawling ban went into effect in 1980 (Chong *et al*., 1987). Former trawler crew members qualified for government loans to purchase smaller boats, but many solo ventures failed as they were not provided with business training (Chong *et al*., 1987). In Hong Kong, the government paid $US 219 million for a trawler buyout scheme that included grants for all affected fishing crew, a success that can be emulated if countries are committed.

The cheap prices of seafood do not reflect their true costs, and are low partly due to fuel subsidies for trawlers from government agencies. Without these subsidies, commercial fishing is a non-profitable venture. Unpaid, underpaid, and highly exploitative labour within the fishing industry further depresses the true cost of seafood and fisheries products, even without accounting for the losses in ecosystem services from damaging bottom habitats and non-target populations. Given these realities, the consumer market should recognize the negative impacts of destructive fishing methods and demand firm legislation, purchasing only sustainably-sourced seafood within a clear and transparent labelling system, thus funding well-regulated fisheries.

The technical ability to change our fisheries practices has been in existence for decades. The inertia lies in the lack of societal impetus and political will. While the Malaysian, Indonesian and Australian governments should be commended for acknowledging the destructive impacts of trawling and taking steps to address this issue, there is more work to be done. We now have the momentum within the region to review fisheries laws and work cooperatively on tackling IUU fishing, while keeping communication channels among conservation science, the general public and policymakers open. If efforts continue on revamping laws, effective enforcement, and community training and support, we may have hope for the eventual rehabilitation of marine bottom habitats, re-establishing functional groups and keystone species, and restoring ecosystem functions to allow for the continued provision of essential goods and services.

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