

# RELEVANT INFO

- Scotland – Proposal to designate Loch Carron as an MPA**  
 Under the Marine (Scotland) Act 2010 Scottish Government has the power to designate an MPA urgently without consultation if it is necessary to protect marine habitats or species. This process was used in May 2017 when sensitive habitats in the Loch Carron area were found to have been damaged.  
<https://consult.gov.scot/marine-scotland/loch-carron-mpa/>
- England –** The MMO is currently engaging with stakeholders over the marine plans in the North East, North West, South East and South West. They are holding stakeholder meetings at a variety of locations and also have an online response form. All the details can be found here;  
<https://www.gov.uk/government/publications/marine-planning-second-outputs-for-north-east-north-west-south-east-and-south-west-marine-plan-areas-marine-planning-engagement-events>
- Shell Eye Project** Shell Eye is a research project which is looking at active management with regard to water quality and particularly toxins. They have released a brief survey and are interested in your views on water quality.  
<https://registrationpml.wufoo.eu/forms/shelleye-stakeholder-survey/>
- Seeking resilience in marine ecosystems**  
 Resilience is a popular narrative for conservation and provides an opportunity to communicate optimism that ecosystems can recover and rebound from disturbances. A resilience lens also reinforces the need for continued conservation investments, even in degraded ecosystems. It is probably for these reasons that resilience has become a conceptual cornerstone in the management of tropical coral reefs, which are one of the ecosystems most vulnerable to climate change.  
[http://science.sciencemag.org/content/359/6379/986?utm\\_campaign=toc\\_sci-mag\\_2018-03-01&et rid=17045989&et cid=1881759](http://science.sciencemag.org/content/359/6379/986?utm_campaign=toc_sci-mag_2018-03-01&et rid=17045989&et cid=1881759)

# EVENTS

- Institute of Fisheries Management (IFM) training courses: <http://www.cmscoms.com/?p=12844> and specialist conference May 23<sup>rd</sup> 24<sup>th</sup> 2018 <http://www.cmscoms.com/?p=12780>
- Upcoming NEF Consulting courses: [find out more here](#)
- Poole Maritime Day 2018 <https://www.poolemaritimefestival.co.uk/>

# PUBLICATIONS

- Addressing Criticisms of Large-Scale Marine Protected Areas**  
 Designated large-scale marine protected areas (LSMPAs, 100,000 or more square kilometers) constitute over two-thirds of the approximately 6.6% of the ocean and approximately 14.5% of the exclusive economic zones within marine protected areas. Although LSMPAs have received

support among scientists and conservation bodies for wilderness protection, regional ecological connectivity, and improving resilience to climate change, there are also concerns. We identified 10 common criticisms of LSMPAs along three themes: (1) placement, governance, and management; (2) political expediency; and (3) social–ecological value and cost. Through critical evaluation of scientific evidence, we discuss the value, achievements, challenges, and potential of LSMPAs in these arenas. We conclude that although some criticisms are valid and need addressing, none pertain exclusively to LSMPAs, and many involve challenges ubiquitous in management. We argue that LSMPAs are an important component of a diversified management portfolio that tempers potential losses, hedges against uncertainty, and enhances the probability of achieving sustainably managed oceans.

<https://academic.oup.com/bioscience/advance-article/doi/10.1093/biosci/biy021/4953612>

- **Recovered and released - A novel approach to oviparous shark conservation**

The small spotted catshark *Scyliorhinus canicula* and the greater spotted catshark *Scyliorhinus stellaris* are benthic elasmobranchs frequently caught as bycatch in commercial fishing gears and landed at local fish markets for consumption. In recent years landings have begun to decline raising concerns for their population numbers and conservation status. In this study we present a novel, direct approach to shark conservation: removal of eggcases from dead *Scyliorhinus* specimens. Any viable embryos were observed during development and hatching. Post-hatching, pups were reared for 6 months and then released back into the wild. Eggcases were collected throughout the year, indicating the absence of a discreet breeding season in these species. Since January 2012, 689 eggcases were collected from females landed at the wholesale fish market in Malta, 548 *S. canicula* and 141 *S. stellaris*. From these a total of 186 shark pups were released back into the Maltese waters between January 2014 and March 2016. *S. canicula* carrying eggcases were found within a range of 36–52 cm total body length (TL), with most eggcases found in females of 41–47 cm TL. In *S. stellaris* eggcases were present in females ranging from 64 to 94 cm TL, with the majority of eggcases recovered from females of 77–88 cm TL. The recovery and release program is on-going with eggcase collection continuing for both species. This is to the best of our knowledge, the first report of the successful hatching and release of viable eggcases recovered from dead elasmobranchs. The program provides a practical methodology which can be optimised for other oviparous elasmobranch species landed by commercial fisheries globally; especially for unprotected species facing extensive local fishing pressure.

<https://www.sciencedirect.com/science/article/pii/S0964569117306221>

- **Global analysis of depletion and recovery of seabed biota after bottom trawling disturbance**

Bottom trawling is the most widespread human activity affecting seabed habitats. Here, we collate all available data for experimental and comparative studies of trawling impacts on whole communities of seabed macroinvertebrates on sedimentary habitats and develop widely applicable methods to estimate depletion and recovery rates of biota after trawling. Depletion of biota and trawl penetration into the seabed are highly correlated. Otter trawls caused the least depletion, removing 6% of biota per pass and penetrating the seabed on average down to 2.4 cm, whereas hydraulic dredges caused the most depletion, removing 41% of biota and penetrating the seabed on average 16.1 cm. Median recovery times post-trawling (from 50 to 95% of un-impacted biomass) ranged between 1.9 and 6.4 y. By accounting for the effects of penetration depth, environmental variation, and uncertainty, the models explained much of the variability of depletion and recovery estimates from single studies. Coupled with large-scale, high-resolution maps of trawling frequency and habitat, our estimates of depletion and recovery rates enable the assessment of trawling impacts on unprecedented spatial scales.

<http://www.pnas.org/content/114/31/8301>

- **Tracking the global footprint of fisheries**

Although fishing is one of the most widespread activities by which humans harvest natural resources, its global footprint is poorly understood and has never been directly quantified. We processed 22 billion automatic identification system messages and tracked >70,000 industrial fishing vessels from 2012 to 2016, creating a global dynamic footprint of fishing effort with spatial and temporal resolution two to three orders of magnitude higher than for previous data sets. Our data show that industrial fishing occurs in >55% of ocean area and has a spatial extent more than four times that of agriculture. We find that global patterns of fishing have surprisingly low sensitivity to short-term economic and environmental variation and a strong response to cultural and political events such as holidays and closures.

<http://science.sciencemag.org/content/359/6378/904>

- **Linking spawning ground extent to environmental factors — patterns and dispersal during the egg phase of four North Sea fishes**

Previous studies have shown that four commercially important demersal species, namely Atlantic cod (*Gadus morhua*), haddock (*Melanogrammus aeglefinus*), whiting (*Merlangius merlangus*), and European plaice (*Pleuronectes platessa*), spawn in distinct areas across the North Sea.

Based on two comprehensive ichthyoplankton surveys in 2004 and 2009, the present study uses generalized additive mixed models to delimit these spawning grounds using the distribution of recently spawned eggs, investigates their relationship to specific environmental conditions, and examines egg dispersal during their development. Results indicate that presence–absence of early stage eggs is more related to temporal and topographic variables, while egg densities are closely linked with hydrography. Egg distribution patterns were relatively consistent during development and only changed near hatching. Compared with historic observations, the location of the spawning grounds appeared stable on the broad scale but centres of egg abundance varied between the surveyed years. Potential effects of long-term climate change and anthropogenic short-term disturbances, such as seismic surveys, on fish reproduction are discussed, pointing out the demand for multispecies studies on these issues.

<http://www.nrcresearchpress.com/doi/abs/10.1139/cjfas-2016-0310?journalCode=cjfas#.WpUxrexLHmI>

- **Evaluating the fishery and ecological consequences of the proposed North Sea multi-annual plan**

The possible impacts of the European Commission's proposed North Sea Multi-Annual Plan are evaluated in terms of its likely outcomes to achieve management objectives for fishing pressure, species' biomass, fishery yield, the landed value of key species and ecosystem objectives. The method applies management strategy evaluation procedures that employ an ecosystem model of the North Sea and its fisheries as the operating model. Taking five key dimensions of the proposed plan, it identifies those areas that are key to its successful performance.

Overwhelmingly, choices in the options for the implementation of regulatory measures on discarding practices outweigh the effects of options related to fishing within ranges associated with 'pretty good yield', the way that biomass conservation safeguard mechanisms are applied and the timeframe for achieving fishing mortality targets. The impact of safeguard options and ranges in fishing mortality become important only when stock biomass is close to its reference points. The fifth dimension—taking into account wider conservation and ecosystem objectives—reveals that discard policy has a big impact on conservation species, but also that the type of harvest control rule can play an important role in limiting risks to stocks by 'applying the brakes' early. The consequences to fisheries however is heightened risk to their viability, thus exposing the sustainability trade-offs faced with balancing societal pressures for blue growth and enhanced conservation. It also reveals the wider ecosystem impacts that emphasise the connectivity between the demersal and pelagic realms, and thus, the importance of not treating the demersal NSMAP in isolation from other management plans. When stocks are below their biomass

reference points, low F strategies lead to better long term economic performance, but for stocks consistently above biomass reference points, high F strategies lead to higher long term value. *Nephrops* and whiting often show contradictory responses to the strategies because changes in their predators abundance affects their abundance and success of their fisheries.

<http://journals.plos.org/plosone/article?id=10.1371/journal.pone.0190015>

- **Evidence that the Great Pacific Garbage Patch is rapidly accumulating plastic**  
Ocean plastic can persist in sea surface waters, eventually accumulating in remote areas of the world's oceans. Here we characterise and quantify a major ocean plastic accumulation zone formed in subtropical waters between California and Hawaii: The Great Pacific Garbage Patch (GPGP). Our model, calibrated with data from multi-vessel and aircraft surveys, predicted at least 79 (45–129) thousand tonnes of ocean plastic are floating inside an area of 1.6 million km<sup>2</sup>; a figure four to sixteen times higher than previously reported. We explain this difference through the use of more robust methods to quantify larger debris. Over three-quarters of the GPGP mass was carried by debris larger than 5 cm and at least 46% was comprised of fishing nets. Microplastics accounted for 8% of the total mass but 94% of the estimated 1.8 (1.1–3.6) trillion pieces floating in the area. Plastic collected during our study has specific characteristics such as small surface-to-volume ratio, indicating that only certain types of debris have the capacity to persist and accumulate at the surface of the GPGP. Finally, our results suggest that ocean plastic pollution within the GPGP is increasing exponentially and at a faster rate than in surrounding waters.  
<https://www.nature.com/articles/s41598-018-22939-w#Sec15>

## UPDATE ON MSEP

- **BLUE NEW DEAL Action Plan** – ‘Turning back to the sea’ <http://neweconomics.org/turning-back-to-the-sea/>
- **MSEP legacy: A marine economics handbook for NGOs**  
[http://b.3cdn.net/nefoundation/fd13ca36cea4cb53b7\\_xhm6b9tzq.pdf](http://b.3cdn.net/nefoundation/fd13ca36cea4cb53b7_xhm6b9tzq.pdf)
- **The Infographic Impact Assessment for MCZs** <http://www.mseproject.net/infographic-ia>
- **Poole Rocks MCZ-** [www.poolerocksmcz.uk](http://www.poolerocksmcz.uk) <https://www.youtube.com/watch?v=68dly3ofgMU>
- **NEF Economics in policy making briefings** <http://neweconomics.org/2013/05/economics-policy-making/>
- **NEF ‘A fair fishing deal’** [http://neweconomics.org/2017/09/fish/?\\_sft\\_latest=research](http://neweconomics.org/2017/09/fish/?_sft_latest=research)
- Find out more about **NEFs work with the fishing community in Eastbourne.** [Film here](#)

## OVER TO YOU

- **Follow the MSEP on twitter @MarineEconomics**
- If you have any research, articles or information that relates to socio-economic studies in the marine environment please share them with the network

Thanks, Chris @ NEF