

# HOW TO OVERFISH

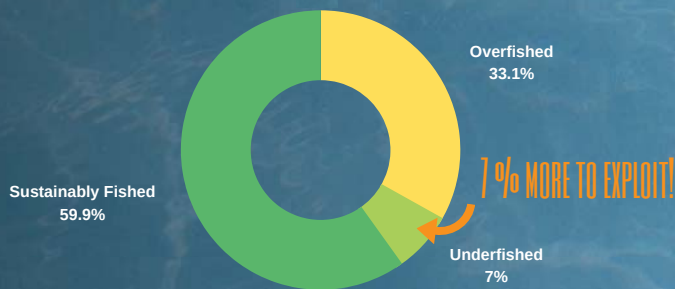
## A guide to unsustainable management of marine resources

SDG214 Poster:

Zaw Myo Win  
Hedda Ørbæk  
Sigurd Korsnes  
Frida Klubb

### SEEKING INSPIRATION?

State of global fish stocks



#### Story of Success

### Bluefin Tuna

70 years ago, the Bluefin Tuna was considered an undesired, cheap fish and had low commercial catches. Following a surge in the sushi market, this unattractive fish became the victim of a massive fishing venture.

Today, the stock assessment estimates that the spawning stock biomass lies at about 3-4% of the theoretical unfished value.

TUNA FISHERIES  
GROWTH FROM  
1970-1990

2000%

IN 2015  
AMERICANS ATE  
227 TONNES FISH  
AND SHELLFISH  
CONTRIBUTING TO THE  
SEAFOOD MARKED  
96 BILLION  
DOLLARS

OF THE WORLD  
POPULATION

10%

ARE DEPENDING  
ON FISHERIES

WHAT AN INSPIRATION!

### 10 THINGS TO AVOID

when you want to overfish

MSY  
&  
VPA

14  
LIFE  
BELOW WATER

Fisheries  
SCIENCE

MPA

WATERS  
STEWARDSHIP  
COUNCIL

Laws  
against  
IUU

IO

WWF

SEA SHEPHERD

SUSTAINABLE  
DEVELOPMENT  
GOALS

### Marine Protected Areas

MPAs are part of making the fishing industry difficult: In 2017, they covered about 6% of the ocean. The goal for 2020 is an increase to 10%, and by 2030 30% of the ocean will be MPAs! This puts limits and restrictions of the present economic wealth of the few and future exploitation of overfished stocks.

UNIVERSITAS  
BERGENSIS



References: See paper for full reference list

(FAO, 2018) (Agnew, 2009) (Marine Stewardship Council, 2019)  
(Sustainable Development, 2019) (Mussman, 2018) (Narula, 2014)  
(NOAA fisheries, 2014) (International Scientific Committee for Tuna  
and Tuna-like Species in the North Pacific Ocean, 2018) (Hoegh-Guldberg, 2015)  
(www.un.org/sustainabledevelopment, 2018) (Sea Shepherd. (2019).

## **How to Overfish - A guide to unsustainable management of marine resources**

By Hedda Ørbæk, Frida Klubb, Sigurd Korsnes and Zaw Myo Win

Fishery industries play an important role in the world economy and has been securing jobs, food, traditions and the livelihood of people for millenniums. Without a healthy ocean, the 10% of the world's population dependent on fisheries will face devastating consequences (FAO, 2018). The state of global fish stocks estimates that 33.1% is overfished and only 7% are left underfished (see ring diagram in poster) (FAO, 2018). With a rapidly growing population and a changing environment, the pressure on our oceans is increasing, and often in relation to depleted and overfished stocks (Hoegh-Guldberg, 2015). Take the Bluefin tuna, for example, who became the victim of massive fishing venture after a surge in the sushi market. The species have declined over the past decades and is now considered endangered and sadly targeted for pirate fishing (WWF, 2019). In 2015, all the state members of United Nations, 193 countries, came together and agreed on 17 sustainable development goals (SDG's) (Sustainable Development, 2019). One of the goals is SDG #14, which contains ten sub targets to conserve and sustainably use the oceans, sea and marine resources for sustainable development (Sustainable Development, 2019). This calls for a change in our relationship with the marine environment as our shared ocean asset. Scientists, governments, communities and organisations must work together to save vulnerable species, habitats and whole ecosystems from threats and further depletion.

Money driven motivation can often be the underlying reason for overfishing and depletion of species. 70 years ago, the Bluefin tuna was considered an undesired, cheap fish and had low commercial catches. Pacific bluefin tuna is the largest of the tuna species and have become highly sought-after delicacy, mainly by Japan for sushi. Some of these tunas have been sold for over 1 million dollars (Narula, 2014). With such high prices, the race to catch tuna has significantly increased over the years. As a result, even between 1970s and 1990s, the tuna industry grew 2000% (Narula, 2014). Today, the stock assessment estimates that the spawning stock biomass lies at about 3-4% of the theoretical unfinished value (International Scientific Committee for Tuna and Tuna-like Species in the North Pacific Ocean, 2018). Lack of knowledge about the biology and migratory behaviour, enforcement and control has hindered successful fishery management plans (WWF, 2019b).

Motivation for overfishing can be understandable and is important to address to be able to prevent further overexploitation. In 2015, Americans alone ate 227 tonnes of fish and shellfish, contributing 96 billion dollars to the sea food market (Mussman, 2018). This demonstrated the vast economic value the fishing industry has. People are also motivated to press the boundaries of overfishing even if it prevents them from losing their jobs that may have been inherited for generations. For them it is not only a job, but their lifestyle that is at stake when new regulations and laws are implemented. And last, but not least, motivation that is caused by hunger. When, in 2016, it was estimated that 10,7 percent of the world's population are suffering from chronic undernourishment (FAO, 2017), it was a challenge to understand how we can prevent overfishing and feed the malnourished at the same time. All these motivations behind overfishing are addressed by the SDGs and solutions are presented so that the laws and regulations for implementation can work in favor for the ones who rely on the ocean for job and food.

With all the challenges that are putting pressure on the marine ecosystems, it may seem impossible to prevent a future where our resources are depleted and our ocean may no longer provide enough food for the population. But in the last few years, the focus has shifted dramatically and measurements are being made to change our direction of overexploitation to a sustainable management of the oceans. During the last decades, there has been a growing focus on sustainable management of the ocean resources, leading to SDG #14. In 1982, under United Nations' supervision, United Nations Law of the Sea (UNCLOS) was created. The policies for proper fishing was put into force in 1994 and was accepted as the international law of the sea (United Nations Convention on the law of the Sea, 1982). In addition, with a vision of sustainable development, nations came together in Rio for a conference to create 'The future we want'. In a part of this convention, nations brought ideas to stress the need for environmental sustainability (The Future We Want, 2012).

In the SDG #14 the sub target 14.4, is to stop overfishing and illegal, unreported and unregulated fishing. Pirate fishing, or Illegal, Unreported and Unregulated Fishing (IUU), is recognized as one of the biggest threats to the sustainability of the world's fisheries (FAO, 2019). Species affected from IUU fishing ranges from Bluefin tuna to a range of other species. 1 in 5 landed fish is IUU and is estimated to represent up to 24 billion dollars annually (Agnew et al., 2009). A World Wide Fund (WWF) report states that more than 85% of global fish stocks in our oceans are at significant risk of IUU (WWF, 2019b), as one of the big drivers to the overfishing of vulnerable species. Promoting ocean sustainability through greater transparency by sharing data about global fishing activity, ocean surveillance or labelling could help with combating IUU.

The sub targets 14.5 and 14.a are about Marine Protected Areas (MPAs), improving ocean health and enhancing the contribution of marine biodiversity. Biodiversity in coastal areas declines with intensifying pressure (Sustainable Development, 2019). MPAs are used as an effort towards conserving these areas and the ecosystem services they provide. The International Union for the Conservation of Nature (IUCN) define MPAs as an area of the sea dedicated to the protection and maintenance of biological diversity and of natural and associated cultural resources, managed through legal and other effective means (IUCN, 2019). These covered around 6% of the ocean in 2017 but SDG #14.5 reaches for conservation of at least 10% of coastal and marine areas by 2020. Because the participation and involvement of people are included under the establishment and management of a protected area system, MPAs could change traditional livelihoods and socio-economic structures, interrelating SDG14 to other SDGs, particularly target #1 (poverty), #8 (economic growth and employment) and #10 (inequality). Well managed fisheries should increase economic growth and jobs, but reduction of fisheries is needed in places with documented overfishing. At a local level, protection of such areas may impact the redistribution of access, wealth and jobs, thus the resilience of local communities. A changing access to resources could have impacts on inequality, local employment and economic growth (Blanc, Freire & Vierros, 2017). Conservation of areas associated with both ecosystem services and cultural values needs social assessments and recognition of the distribution of costs and benefits after an implementation of MPAs. More management effectiveness assessments with a greater focus on measuring biodiversity and social outcomes, are also needed (Juffe-Bignoli et al., 2014).

There are several NGOs working with marine conservation, like the Sea Shepherd Conservation Society. Sea Shepherd is an international non-profit organisation with focus on marine wildlife conservation. Since 1977, they have fought against the destruction of habitats and are known for their direct and controversial methods to stop illegal fishing vessels. Sea Shepherd operate in 21 different regions and protect the ocean's biodiversity. Another influential organisation is Marine Stewardship Council (MSC), an independent non-profit organisation that aims to set a standard for sustainably caught fish. Products which contain fish that has passed the certification by MSC is given a label. This label give insurance to the consumer that the fish in the product comes from well-managed fisheries as well as being sustainably caught. As more consumers, retailers and restaurants choose MSC labeled products, more fisheries move towards sustainable management in order to achieve MSC certification.

In the ocean, physical and biological processes can make it problematic when estimating and sustaining the many global fish stocks, since fish do not burden them self with our human made boundaries and often migrate. An agreement between nations is needed for them to cooperate and share their research (Munro, 2004) to avoid what Hardin called "Tragedy of the Commons" (Hardin, 1968). In 1982 the UN Convention stated in their article that "Where the same stock or stocks of associated species occur within the exclusive economic zones of two or more coastal States, these States shall seek, either directly or through appropriate sub regional or regional organisations, to agree upon the measures necessary to coordinate and ensure the conservation and development of such stocks without prejudice to the other provisions of this Part [V]" (UN, 1982, Article 63(1)).

International organisations (IO) that have a collective and cooperating mindset, where a sustainable harvesting is in all the involving countries interest are crucial if we want a sustainable ocean. An organisation like this is The International Council for the Exploration of the Sea (ICES), a global

organisation that develops science and advice for sustainable use of the oceans with its network that consist of over 5000 experts, 700 institutions and organisations and 20 countries (ICES, 2017).

The increasing number of overfished populations and the indirect effects of fisheries in synergism with climate change alter the threats to marine ecosystems and the ecosystem services they provide. Increasing harvest rates in response to socio-political pressure for greater harvests, the uncertainty in predicting the harvest that will cause collapse with a history of neglecting consequences of mismanagement, calls for a different approach in management for ocean sustainability. Working towards more awareness of the ocean are crucial for a robust management of the ocean resources and the solutions are both political and corporate and will affect local to national and transnational to global stakeholders. Identification and description of the structures, components and functioning of relevant marine ecosystems, its diet composition and food webs including species interactions and predator-prey relationships, and the role of habitats and their resilience, is needed to better understand the needs of the ocean. To ignore the positive development, and working against the implemented regulations and cooperations, will be a guide to unsustainable management of our marine resources.

### References

- Agnew, D., Pearce, J., Pramod, G., Peatman, T., Watson, R., Beddington, J. and Pitcher, T. (2009). Estimating the Worldwide Extent of Illegal Fishing. *PLoS ONE*, 4(2), pg. 4570.
- Blanc, D. L., Freire, C. & Vierros, M. (2017). Mapping the linkages between oceans and other Sustainable Development Goals: a preliminary exploration. *Department of Economics & Social Affairs*, 149.
- FAO. (2017). *The State of Food Security and Nutrition in the World*. (pg. 7).
- FAO. (2018). *The State of World Fisheries and Aquaculture 2018 - Meeting the sustainable development goals*. Rome. Licence: CC BY-NC-SA 3.0 IGO.
- FAO (2019). *Illegal, Unreported and Unregulated (IUU) fishing* | Food and Agriculture Organization of the United Nations. [online] Available at: <http://www.fao.org/iuu-fishing/en/> [Accessed 20 May 2019].
- Hardin G. (1968). The tragedy of the commons. The population problem has no technical solution; it requires a fundamental extension in morality. *Science*. 1968;162(3859):1243–8. PubMed PMID: 5699198.
- Hoegh-Guldberg, O. & et al. (2015). *Reviving the Ocean Economy: the case for action - 2015*. WWF International, Gland, Switzerland, Geneva.
- ICES. (2018). *Annual report 2017*. Retrieved on May 19, 2019 from <http://www.ices.dk/sites/pub/Publication%20Reports/ICES%20Annual%20Report/Annual%20report%202017.pdf>
- International Scientific Committee for Tuna and Tuna-like Species in the North Pacific Ocean (2018). *Stock assessment of Pacific Bluefin Tuna (Thunnus orientalis) in the Pacific Ocean in 2018*. Publication: ISC/18/ANNEX/14.
- International Union for Conservation of Nature (IUCN). (2019). *About*. Retrieved on May 18, 2019 from <https://www.iucn.org/theme/protected-areas/about>.
- Juffe-Bignoli D, & et al. (2014). *Protected planet report 2014: Tracking progress towards global targets for protected areas*. Cambridge, UK: UNEP-World Conservation Monitoring Centre.
- Munro, G., Van Houtte, A. & Willmann, R. (2004) *The conservation and management of shared fish stocks: legal and economic aspects*. FAO Fisheries Technical Paper. No. 465. Rome, FAO. (pg. 67)
- Narula, S. K. (2014). *Sushinomics: How bluefin tuna became a million-dollar fish*. theatlantic.com. Retrieved May 14, 2019 from: <https://www.theatlantic.com/international/archive/2014/01/sushinomics-how-bluefin-tuna-became-a-million-dollar-fish/282826/>
- Robert O'Boyle, Micah Dean, Christopher M. Legault. (2016). The influence of seasonal migrations on fishery selectivity, *ICES Journal of Marine Science*, Volume 73, Issue 7, July 2016, Pages 1774–1787, <https://doi.org/10.1093/icesjms/fsw048>
- Sea Shepherd. (2019). *Mission statement*. Retrieved May 19, 2019, from <https://seashepherd.org/mission-statement/>
- Sustainable Development. (2019). *Goal 14: Sustainable Development Knowledge Platform*. Retrieved on May 19, 2019 from <https://sustainabledevelopment.un.org/sdg14>.
- The Future We Want –Declaration of the UN Conference on Sustainable Development, Rio (2012). Retrieve May 19, 2019 from [http://www.un.org/disabilities/documents/rio20\\_outcome\\_document\\_complete.pdf](http://www.un.org/disabilities/documents/rio20_outcome_document_complete.pdf)
- United Nations Convention on the Law of the Sea. (1982). Retrieved May 19, 2019 from [http://www.un.org/depts/los/convention\\_agreements/convention\\_overview\\_convention.htm](http://www.un.org/depts/los/convention_agreements/convention_overview_convention.htm)
- World Wide Fund. (2019a). *Bluefin Tuna Facts*. Worldwidelife.org. Retrieved May 19, 2019 from <https://www.worldwildlife.org/species/bluefin-tuna>
- World Wildlife Fund. (2019b). *Illegal Fishing: Which fish species are at highest risk from illegal and unreported fishing?* | Publications | WWF. [online] Available at: <https://www.worldwildlife.org/publications/illegal-fishing-which-fish-species-are-at-highest-risk-from-illegal-and-unreported-fishing> [Accessed 20 May 2019].