

Three simple rules for high catches, high profits and healthy ecosystems

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Rule 1: Do not take out more than is regrown

Taking out more than is regrown is called overfishing and will shrink the fished stock below levels that can produce the maximum longterm catch (MSY). Despite the legal obligation to end overfishing in 2020, the total allowed catches (TACs) for about 40% of the stocks with suitable data in the North Sea and adjacent waters constituted overfishing (1). Overfishing is stupid: with overfishing, more effort = money is spent to get lower catches than possible at lower value and with unnecessarily high impacts on the ecosystem. The lower value is caused by overfishing shrinking the mean size of the fish and smaller fish bring lower price per kg. Impact is unnecessary high because better catches can be obtained from non-overfished stocks with less gear deployment, therefore less by-catch and less physical impact. To end overfishing, catches have to be reduced for 1-4 years, depending on current stock size. The loss caused by such reduced catches is easily regained within a few years after rebuilt stock size allows for permanent high catches at e.g. 90% of the MSY level. The 90% MSY is needed for stability; with fishing at MSY, there is a 50% chance of shrinking the stock below the MSY level and thus reducing future catches.

Rule 2: Catch fish at their optimum size

Most commercial fish about double their body weight every year. Maximum growth of body weight is reached at about 30% of the maximum weight or about 2/3 of maximum length (2). At this size and age, all fish have reproduced and thus passed on their genes to the next generation, an important contribution to genetic diversity as key ingredient of resilience against climate change. Instead, current regulations allow the onset of fishing at about 15% of maximum weight or 1/3 of maximum length. In other words, with the current minimum conservation reference lengths (MCRLs), about twice as many fish are killed than are needed to supply the allowed catch. With the current MCRLs, unnecessary damage is done to the stock, the ecosystem, and the stability of the fishery, to obtain a catch that is of less value because of the smaller size of the fish.

Rule 3: Let commercial fish fulfill their natural ecosystem roles as prey or predator

Healthy, stable fisheries depend on healthy, stable ecosystems with as much as possible resilience against climate change. Predators such as cod and prey species such as herring or sandeel are keystone species that stabilize their ecosystems. Ecosystem reference points for minimum functional population size have yet to be established, but common sense predicts that the current stock sizes of about only 30% of the natural population size are insufficient to supply the variety of natural predators with food or to stabilize and prevent outbreaks of a variety of low trophic level species, including jellyfish. Common sense instead predicts that stock sizes above 60% of natural population size should be able to fulfill these roles. The good news for fisheries managers is that such stock sizes are the expected result of implementing rules (1) and (2), and that stock sizes between 60 and 70% of natural size produce the

highest profits (the maximum economic yield, MEY), simply because more and larger fish in the water mean less effort = cost is required to obtain a certain catch with higher value of the catch. For these reasons, Australian fishing law prescribes MEY as target stock size that as default has to be 20% larger than the minimum stock size required to produce MSY.

Conclusion

Rules (1) – (3) are already contained in the reformed Common Fisheries Policy (CFP) in force since 2014. However, these provisions have been ignored or misapplied in the various regional Multiannual Plans (MAPs) that were supposed to implement the CFP. Evidence of this failure of the MAPs to properly implement the CFP is the ongoing overfishing and the continued presence of depleted stocks in EU waters.

Note: Above text referred to fish for simplicity, but the same rules apply also to invertebrates (e.g. brown shrimp, Norway lobster, mussels).

References

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