

MODULE 2. SYLLABUS

Elaborated by UNIDU – University of Dubrovnik

MODULE 2. DISCARDED SPECIES IN FISHERY AND SUGGESTED METHODS TO REDUCE

AUTHORS

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The syllabus will be added to the website as a "preview" of the module, to inform the prospective student/trainee.

MODULE MOTIVATION

The motivation for this module is to provide knowledge about discarded species in fisheries and methods to reduce them. Discards occur because fishing methods and gear are not perfectly selective or because fishermen are under pressure to catch more of the target species than they can market. The content of this module is aligned with the Common Fisheries Policy and the changes to the landing obligation, which requires fishermen to record, land and account for all catches subject to catch limits by submitting quotas. The implementation of the CFP will bring major operational changes for EU fleets and fisheries managers, and fishermen will have to work together to find solutions. The module highlights two main categories of tools to minimise discards: smarter use of available quotas within a total allowable catch (TAC) and increased selectivity and avoidance measures.

TASK RANGE

The following teaching and learning activities will be adapted and used:

- Presentation
- Questions
- Case studies
- Self-study (Syllabus reading and ppt.)

LEARNING OUTCOMES

The following learning outcomes are defined for the module:

- The learner has knowledge:
 - about problem of discarded fish
 - on the status of Mediterranean fisheries
 - about characteristics of main commercial species
 - about methods to reduce discard

- about creation of the good management plan in fisheries
- The learner has skills of being able to:
 - participating in discussions related to discard problems
- The learner has the competence of:
 - identify problems in fisheries
 - apply methods to reduce discards
 - implement management plans to maintain sustainability

MODULE CONTENTS

Discards, that part of the catch that is not retained on board and may include target species or other commercial and non-commercial species that are discarded dead or alive into the sea, are a worldwide problem. This module provides an overview of discarded species in fisheries and proposed methods to reduce discards in the Mediterranean with an overview of best practices from other areas. The module is divided into four chapters, starting with an introduction to the topic explaining the problem of discards, followed by a chapter on the Mediterranean explaining the status of fisheries in the Mediterranean and the main reasons for discards in the area. The third chapter deals with discard species and regulations, highlighting different types of fisheries: bottom trawling, purse seine fishing and artisanal fishing. The main part of this chapter deals with the characteristics of the main commercial fish species in the Mediterranean, highlighting the differences in Turkish fisheries. The final chapter presents methods to reduce discards, explaining gear restrictions, temporary gear closures, landing bans for undersized fish and discard bans – landing obligation, as well as discard management plans for the Mediterranean Sea and examples of good practice.

MODULE INCLUDES

The module includes an overview of:

- The status of Mediterranean fisheries
- The discard problem using different fishing gear
- The characteristics of main commercial fish species
- The methods to reduce discards
- The management plan for Mediterranean fisheries

RECOMMENDED AND/OR REQUIRED READING

Celić, I., Libralato, S., Scarcella, G., Raicevich, S., Marčeta, B., Solidoro, C. 2018. Ecological and economic effects of the landing obligation evaluated using a quantitative ecosystem approach:

a Mediterranean case study. *ICES Journal of Marine Science*, 75(6): 1992–2003. <https://doi.org/10.1093/icesjms/fsy069>

Dalyan, C. 2020. The Commercial and Discard Catch Rates of the Trawl Fishery in the İskenderun Bay (Northeastern Levantine Sea). *Trakya. Univ. J. Nat. Sci.* 21(2): 123-129. <https://doi.org/10.23902/trkjnat.773435>

Damalas, D. 2015. Mission impossible: Discard management plans for the EU Mediterranean fisheries under the reformed Common Fisheries Policy. *Fisheries Research* 165: 96-99. <https://doi.org/10.1016/j.fishres.2015.01.006>

Demestre, M., de Juan, S., Sartor, P., Ligas, A. 2008. Seasonal closures as a measure of trawling effort control in two Mediterranean trawling grounds: Effects on epibenthic communities. *Marine Pollution Bulletin*, 56: 1765-1773. <https://doi.org/10.1016/j.marpolbul.2008.06.004>

D'Onghia, G., Carlucci, R., Maiorano, P., and Panza, M. 2003. Discards from deep-water bottom trawling in the eastern-central Mediterranean Sea and effects of mesh size changes. *Journal of Northwest Atlantic Fishery Science*, 31: 245–261. <https://doi.org/10.2960/J.v31.a19>

FAO. 2022. The State of Mediterranean and Black Sea Fisheries 2022. General Fisheries Commission for the Mediterranean. Rome. <https://doi.org/10.4060/cc3370en>

Gil, M.M., Catanese, G., Palmer, M., Hinz, H., Pastor, E., Mira, A., Grau, A., Koleva, E., Grau, A.M., Morales-Nin, B. 2018. Commercial catches and discards of a Mediterranean small-scale cuttlefish fishery: implications of the new EU discard policy. *Sci. Mar.* 82S1: 155-164. <https://doi.org/10.3989/scimar.04735.03B>

Nedreaas, K., Kuhnle, G.A., Iversen, S.A., Kjellevold, M. 2022. The Norwegian small scale fishery and data provided for the IHH FAO-Duke-WorldFish project. *Rapport fra havforskningen 2022-18* ISSN: 1893-4536

Oro, D., Ruiz, X. 1997. Exploitation of trawler discards by breeding seabirds in the north-western Mediterranean: differences between the Ebro Delta and the Balearic Islands areas. *ICES Journal of Marine Science*, 54: 695–707. <https://doi.org/10.1006/jmsc.1997.0246>

Sacchi J. 2008. The use of trawling nets in the Mediterranean. Problems and selectivity options. In: Basurco B. (ed.). *The Mediterranean fisheries sector. A reference publication for the VII meeting of Ministers of agriculture and fisheries of CIHEAM member countries* (Zaragoza, Spain, 4 February 2008). Zaragoza: CIHEAM / FAO / GFCM, 2008. p. 87-96. *Options Méditerranéennes: Série B. Etudes et Recherches*; n. 62

Sardà, F., Coll, M., Heymans, J. J., and Stergiou, K. I. 2015. Overlooked impacts and challenges of the new European discard ban. *Fish and Fisheries*, 16: 175–180. <https://doi.org/10.1111/faf.12060>

Spedicato, M.T., Lizaso, J.L.S., Tsagarakis, K. et al., 2022. Synthesis of the Landing Obligation Measures and Discard Rates for the Mediterranean and the Black Sea. Final Report. European Climate, Infrastructure and Environment Executive Agency. 73 pp. <https://doi.org/10.2926/237700>

Tsagarakis, K., Nikolioudakis, N., Papandroulakis, N., Vassilopoulou, V., Machias, A. 2018. Preliminary assessment of discards survival in a multi-species Mediterranean bottom trawl fishery. Journal of Applied Ichthyology, 34: 791-1096. <https://doi.org/10.1111/jai.13691>

Tsagarakis, K., Palialexis A., Vassilopoulou V. 2014. Mediterranean fishery discards: review of the existing knowledge. Journal of Marine Science, 71(5): 1219–1234. <https://doi.org/10.1093/icesjms/fst074>

Uhlmann, S.S., Ulrich, C., Kennelly, S.J. 2019. The European Landing Obligation: Reducing Discards in Complex, Multi-Species and Multi-Jurisdictional Fisheries. Springer Open pp. 43. <https://doi.org/10.1007/978-3-030-03308-8>

ASSESSMENT FORMAT

IQ quiz assessment to be taken on Moodle

GLOSSARY

BYCATCH: Fish other than the primary target species that are caught incidentally to the harvest of those species. Bycatch may be retained or discarded.

CATCH: The total number (or weight) of fish caught by fishing operations. Catch includes all fish killed by the act of fishing, not just those landed.

DISCARD: The part of the catch that is not retained on board, which may include target species or any other commercial and noncommercial species that are returned to the sea dead or alive

LANDINGS: The number or weight of fish offloaded at a dock by fishermen. Landings are reported at the locations where fish are brought to shore.

MONITORING: The collection of fishery information for the purposes of science, including setting catch limits, assessing stocks and ensuring accountability, including catch accounting and enforcing fishery regulations.

MORTALITY: A measurement of the rate of the death of fish, resulting from several factors but mainly predation and fishing.

MULTI-SPECIES FISHERY: A fishery in which more than one species is caught at the same time. Because of the imperfect selectivity of most fishing gear, most fisheries are “multi-species.” The term is often used to refer to fisheries where more than one species is intentionally sought and retained.

NON-TARGET SPECIES: Species not specifically targeted as a component of the catch but which may be incidentally captured.

QUOTA: The maximum number of fishes that can be legally landed in a time period. Quota can apply to the total fishery or an individual fisherman's share under a catch share program.

SELECTIVITY: Ability to target and capture fish by size and species during harvesting operations, allowing by catch of juvenile fish and non-target species to escape unharmed.

STOCK: A part of a fish population usually with a particular migration pattern, specific spawning grounds and subject to a distinct fishery. A fish stock may be treated as a total or a spawning stock. Total stock refers to both juveniles and adults, either in numbers or by weight, while spawning stock refers to the numbers or weight of individuals that are old enough to reproduce.

TARGET SPECIES: Those species primarily sought by fishermen in a particular fishery. There may be primary as well as secondary target species.

TOTAL ALLOWABLE CATCH (TAC): The annual recommended or specified regulated catch for a species or species group.

LINKS TO USEFUL WEBSITES

- <https://www.europarl.europa.eu/studies/>
- <https://www.fao.org/publications/card/fr/c/CA4914EN/>



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