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Incidental bycatch in fishing gears is a major threat for populations of small cetaceans in European seas. It is specifically identified as a criterion D1C1 for the Descriptor 1 in the second cycle of MSFD implementation in determining, assessing and achieving good environmental status for cetaceans. Bycatch is believed to be the main mortality factor for some stocks of the Black Sea harbour porpoise leading to their significant decline. The pilot study on bycatch monitoring, including recommendations to further develop D1C1 criterion, is being conducted from January 2019 to December 2020 in the frames of the CeNoBS project (coordinated by the NGO “Mare Nostrum”, Romania) funded by the DG Environment of the European Commission within the call “Marine Strategy Framework Directive - Second Cycle: Implementation of the new GES Decision and Programmes of Measures”. It is focused on demonstrating the feasibility of developing bycatch monitoring programme in the Black Sea in the view of completing gaps on distribution, intensity and effects of bycatch pressure on cetaceans. In addition, the study of use of pingers for bycatch mitigation is undertaken in Bulgaria (NGO “Green Balkans”); it was supported by New England Aquarium, Boston, USA within a research grant from NOAA. These environmental data and related items of information have not been formally disseminated by NOAA and do not represent and should not be construed to represent any agency determination, view, or policy.

The operational pilot studies across the Black Sea riparian countries are aimed to identify the general patterns of cetacean interactions with fisheries and finally provide a common methodology for bycatch assessment at regional level. Data were collected from two sources: questionnaires and on-board observers following GFCM bycatch methodologies under development. The jointly developed questionnaires included data about bycaught species, seasonality, localities, gear types and other relevant information. The special attention was put on sensitive aspects of fisheries operations. Since cetaceans are legally protected in the Black Sea countries, fishermen often tend to hide the facts of incidental bycatch, even if it is non-intended and is a part of legal fisheries operations. Therefore, the questionnaire was designed with indirect indicators discovering bycatch potential of certain fisheries practices, net types and operations. Interviews were conducted with the members of local communities in Bulgaria, Romania, Turkey and Ukraine. Guidelines for dedicated on-board observers were disseminated in cooperation with the GFCM. Postmortem examination of cetacean carcasses stranded ashore was conducted as an independent estimation of bycatch rate. Also, the fishing fleet structure in the Black Sea is being estimated for future assessment: the estimate for Turkey was obtained by Ertug Düzgüneş, and more than 30% of the fleet was operating in the Black Sea using fishing gears which had different levels of interaction with the other marine species. The most unselective ones were the purse seine nets and trammel nets in set nets group.

In total, 51 interviews were conducted, 20 in Bulgaria, 14 in Romania, 7 in Ukraine and 10 in Turkey, covering the main segments of the fleet. Most of interviewed fishermen (86%) were involved in multi-target fisheries, indicating large diversity of catch targets and flexibility in fisheries practices. At least, 16% switched between fisheries practices, gears and target species within the year, due to catch seasonality. The most frequently used fishing gears covered by the survey were gillnets (63% of the responses). The most frequently targeted species were the turbot, horse mackerel, bluefish, red mullet and gobies. The individual responses covered data from 1 to 20 boats each.

In 78% of interviews bycatch was reported, and 41% of respondents reported cases of bycatch of cetaceans: all of them mentioned the harbour porpoise as the bycaught species, and 10% also mentioned the cases of bycatch of the bottlenose dolphins, one also reported common dolphins. Cetacean bycatch was reported for gillnets, other stationary nets, purse seine nets and trawls. In Turkey, it was reported that in trammel nets survival rate was higher than in the other types of nets, and bycaught cetaceans could be released alive. Meanwhile, some respondents mentioned bycatch of species, which are usually bycaught together with cetaceans, thus, indirectly indicating possible cetacean bycatch: the great cormorant, the whiting, the dogfish, sturgeons and rays. Therefore, it can be suggested that majority of respondents did not report the bycatch cases, the hypothesis requiring further validation. Many of the respondents

reported bycatch as historical (at least, one or two years before the interview). Onboard bycatch observers conducted 18 cruises, 17 in Bulgaria and 1 in Romania. Of them, 17 cruises targeted turbot gillnets and one was for the beam trawling. The beam trawler had no bycatch, while 79% of gillnet hauls had bycaught cetaceans, mostly harbour porpoises. The median number of porpoises bycaught per haul was 0.5, and the maximum number was 28; the number of bycaught porpoises per km of the net varied between 0 and 2.50 (the median 0.12). Bycatch rate showed strong seasonal bias: all the cases exceeding median number of bycaught porpoises per km were recorded between June 27 and July 6, 2019, and all the cases exceeding median number of bycaught porpoises per haul were recorded between July 1 and July 6, 2019.

The large-scale use of 200 pingers (Future Oceans 10 kHz, 132 dB – 150 pcs and 70 kHz, 145 dB – 50 pcs) was made during standard turbot fishing operations in Bulgarian waters in 2019 during spring and summer. Five vessels (4.3% of those licensed for turbot fishing) have been involved. Pingers were attached to part of the sets (active) while the rest was considered control. In spring different spacing was tested for the different models: 70-140 m for 10 kHz and 280 m for 70 kHz. Configuration in summer was slightly changed limiting the spacing within recommended limits of 100 m for 10 kHz, 132 dB and 200 m for 70 kHz, 145 dB pingers. Soaking time was 19-23 days in spring and 10-20 days in summer. Bycatch was standardized and calculated as individuals per km².day. There was no statistically significant difference between active and control nets' average bycatch rates but there was significant difference between seasons. Bycatch levels were high in summer suggesting sustainable levels set for the harbour porpoise in the western Black Sea are exceeded. Positive results were recorded only in monofilament nets (0 bycatch in pingered versus 3 porpoises in control nets) but their share was small.

In conclusion, the pilot bycatch monitoring activities showed positive results on applying the proposed methodology for bycatch assessment based on combined methods of direct and indirect assessment and validation. The initial reports obtained from the first approbation of the combined standardized methodology concurred with previous research and data obtained from the aerial survey. The results of the pilot bycatch mitigation study have not shown significant bycatch reduction by use of pingers in multifilament nets. However, some positive results were found for monofilament nets that should be verified by further studies.