Recommendations from the testing of modified fishing gear to reduce seabird bycatch within the LIFE Artina project

Association for Nature, Environment and Sustainable Development Sunce and Association BIOM

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Projekt LIFE Artina sufinanciran je sredstvima Europske unije iz LIFE programa, Ureda za udruge Vlade Republike Hrvatske te sredstvima Fonda za zaštitu okoliša i energetsku učinkovitost.

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Recommendations of measures intended to collect data and determine the extent of seabird bycatch in Croatia (indirect measures)

- Raise the awareness of fishermen and conduct trainings to help them understand all the components of the ecosystem and the importance of reporting bycatch through logbooks and methods of handling sensitive, endangered, and protected individuals of by-caught seabird species.
- Strengthen the capacities of scientific observers for collection of data on seabird bycatch, through joint cooperation (Directorate of Fisheries of the Ministry of Agriculture, Institute of Oceanography and Fisheries, NGOs, etc.), work on improving the communication skills of observers required for work with fishermen.
- Increased data collection on vessels through scientific observers
- Determine additional sea locations/areas used by endangered seabird species as habitats and collect data and expand areas for other seabird species as well.
- Close cooperation between ministries competent for fisheries and nature protection (Directorate of Fisheries of the Ministry of Agriculture and Directorate for Nature Protection/ Institute for Environment and Nature, Ministry of Economy and Sustainable Development) and scientific institutions (Institute of Oceanography and Fisheries, Institute for Ornithology) for the purpose of more efficient collection and exchange of data on protected species bycatch (improvement of logbooks, scientific monitoring, Reporting and monitoring system of the by-caught, killed, injured and sick strictly protected animals).
- Oblige all owners of the privileges on set longlines and nets to use a monitoring system for the movement of vessels and fishing activities and enable the availability of this data for professional and scientific analysis.
- Improve the cooperation of competent authorities (Directorate of Fisheries of the Ministry of Agriculture), the scientific community (scientific observers of the Institute of Oceanography and Fisheries) and NGOs for ensuring information exchange and greater availability of data on bycatch of species.
- Encourage small scale fisheries fishermen to use the electronic logbook (e-logbook /m-logbook).
- More intensive inspection of risky fishing gear (longlines and nets) that affect seabird bycatch and more intensive monitoring of areas important for feeding and resting of seabirds.
- Include seabirds in the existing Notification and Action Protocol in case of finding dead, sick, or injured strictly protected marine animals (in which public institutions for the management of marine protected areas and, if necessary, authorized veterinarians, would play a role).
- Establishment of a system of care for strictly protected sick or injured seabirds.

Recommendations for measures aimed at reducing seabird bycatch (direct measures)

- Adaptation of fishing practices in order to preserve seabird populations ("soft" measures):
  - Carrying out the activities of setting longlines at night while minimising the lighting of the longlines to reduce the visibility of hooks and baits and carrying out fishing activities at a time when seabirds are relatively inactive,
  - Avoiding throwing bait remains or cleaning caught fish when setting longlines or nets, to avoid attracting a large number of birds during this phase of fishing,

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  - In areas where the interaction of seabirds with fishing activities is found (through logbooks/scientific observers/research), propose spatio-temporal fishing regulations (seasonal or permanent).
- Adaptation of fishing gear in order to preserve seabird populations ("hard" measures):
  - Conduct tests of one measure or a combination of measures to reduce seabird bycatch (installation of additional weight for set (demersal) and floating[1] (pelagic) longlines[2], installation of bird-scaring lines, setting longlines at night) on a statistically significant sample of fishermen at the national level, in a period when birds are more present (March-April)
  - Depending on the results of the testing, introduce the obligation to use successful and proven measures to reduce seabird bycatch (e.g., placing additional weight on longlines)
  - Conduct testing of hookpods of appropriate size[3] on floating longlines on a statistically significant sample of fishermen
  - If the existence of interaction between seabirds and fishing activities is proven, introduce the obligation of using measures to reduce seabird bycatch in areas where they are proven to feed and stay.
- Implementation of testing/research of gear and measures:
  - Conducting research/testing of fishing gear at the time when seabirds are most active, i.e. in March and April
  - Implementation of research and testing of fishing gear at the national level, i.e. with fishermen of all coastal counties
  - Provide financing for the testing of various tools to reduce bycatch through the Operational Programme for Maritime Affairs and Fisheries 2021-2027 (operating costs and procurement of test gear/seabird bycatch mitigation gear)
  - During the testing of various measures to reduce seabird bycatch, cooperation with relevant stakeholders (non-governmental organizations, scientific community...) in accordance with the examples and results of testing various measures from other countries, especially those where similar species/groups of birds are present and similar fishing gear are used
  - Comparatively test modified fishing gear and equipment and standard (conventional) gear so that the test results are comparable
  - When testing the effectiveness of individual gear and equipment to reduce seabird bycatch, also consider the bycatch of other species (the measure is more cost-effective if it has an impact on several species and groups of organisms)
  - Test a combination of measures to adapt fishing practices and gear ("soft and hard measures") with fishermen
  - Test other available measures to reduce seabird bycatch, e.g., installing devices to scare or repel birds with sound, light or visual effects (tori lines/streamer lines, scary bird).
  - Monitor international testing and research on measures to reduce seabird bycatch, and examine the possibility of their application in Croatia

[1] According to the *Agreement on the Conservation of Albatrosses and Petrels, 2019*, this measure is applicable in fishing with set and floating longlines.

[2] During our research, the installation of additional weights proved to be a good, simple, cheap, and cost-effective measure, which fishermen support (according to Miletić A., Kapelj S., Čeprnja, H. (2022): Report on Testing Modified Fishing Gear to Reduce Seabird Bycatch in Croatia. Project LIFE ARTINA - LIFE17 NAT/HR/000594 "Seabird Conservation Network in the Adriatic". Association for Nature, Environment and Sustainable Development Sunce).

[3] Currently, there are hookpods available on the market that correspond to larger hook sizes than those used in Croatia. During this research, the manufacturer announced the production of hookpods in a size that will match the hooks of Croatian fishermen.

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- Find ways to compensate for fishermen's participation in research and gear testing (covering fuel costs, assistance in applying for tenders, additional points when applying for measures from the Operational Programme, etc.)
- After conducting the testing of measures to reduce seabird bycatch, maintain contacts with fishermen and present data and research results in a transparent manner
- When proposing and including new measures, avoid the use of harmful materials such as plastic, lead, etc.

Notes related to the testing of modified fishing gear to reduce seabird bycatch within the LIFE Artina project[4]

- While testing gear, pay attention to determining the technical specifications for their procurement (e.g. optimal distance, quantity, weight and method of attaching weights/leads to the longline, total optimal weight of weights/leads on the vessel, method of attaching LED lights to nets and hookpods to longlines, size of hooks that correspond to hookpods, permitted sizes of hooks in Croatia, etc.) and the possibility of producing them (existence of companies involved in their making, time required for their production, etc.).
- When determining the optimum number of fishing trips with fishermen, carefully consider all relevant factors and clearly define what one fishing trip entails (a higher number is better for collecting data, but it is not always possible due to the weather forecast, other obligations and free time of fishermen, conditions and the size of the vessel and the possibility of receiving a certain number of people while taking care of the safety of everyone present, choosing the fishing location with regard to the number of people on the vessel, the possibility of gear damage, trust, etc.).
- Enable the presence of bird identification experts on the vessel during gear testing, so that in case of a bycatch, the species of the bird can be determined, as well as monitor their interaction with the fisheries more effectively.
- Test the measure of setting additional weight (weights) in longline fishing (according to the *Agreement on the Conservation of Albatrosses and Petrels*, 2019, and *Recommendation by ICCAT on Reducing Seabird Bycatch in Longline Fisheries*, 11-09, this measure is applicable in set and floating longline fishing) and determine the optimal amount/weight of weights in relation to the size and type of longline.
- Test LED lights on trammel nets[5] (from February to May during cuttlefish fishing season).
- Test hookpods with a smaller diameter, adapted to the hooks used by fishermen in Croatia (The hookpod manufacturer[6] was provided with samples of hooks from Croatia and they plan to produce hookpods with a smaller diameter).

[4] Miletić A., Kapelj S., Čeprnja, H. (2022): Report on Testing Modified Fishing Gear to Reduce Seabird Bycatch in Croatia. Project LIFE ARTINA - LIFE17 NAT/HR/000594 "Seabird Conservation Network in the Adriatic". Association for Nature, Environment and Sustainable Development Sunce.

[5] According to a fisherman from the island of Brač, more birds are caught in trammel nets than in gill nets. This fisherman's opinion is that the setting of trammel nets in areas with high numbers of cormorant individuals should be avoided. (According to Miletić A., Kapelj S., Čeprnja, H. (2022): Report on Testing Modified Fishing Gear to Reduce Seabird Bycatch in Croatia. Project LIFE ARTINA - LIFE17 NAT/HR/000594 "Seabird Conservation Network in the Adriatic". Association for Nature, Environment and Sustainable Development Sunce).

[6] Hookpod Ltd.

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- Simplify and maximally shorten the questionnaires in which fishermen give feedback on the experience of using the gear,[7] i.e., arrange the questionnaire in such a way that the fisherman can fill it out quickly and easily (e.g., rounding the answers) or ensure that the observer fills out the questionnaire while consulting with a fisherman.
- Information in the questionnaire should contain: location (coordinates), time and date of the event, number of individuals and species, information about the individual (size, photo, information on whether the individual was released alive, etc.), information on the method of bycatch (type of fishing gear, fishing phase – gear deployment/retrieval, gear deployment depth, etc.), information on any feature that may have induced bycatch (bait type, season, weather, depth, etc.), information on fishing effort in meaningful units (e.g. the length of the nets in combination with the immersion time in the case of nets, the number of hooks in the case of longlines), opinion on functionality and practicality of use.

[7] Fishermen do not have time to fill out long questionnaires, nor the will to fill them out themselves (most often it is through a conversation with the interviewer during boat ride), and the conditions on the boat should also be taken into account (lack of space, difficulty writing due to windy weather and waves) (according to Miletić A., Kapelj S., Čeprnja, H. (2022): Report on Testing Modified Fishing Gear to Reduce Seabird Bycatch in Croatia. Project LIFE ARTINA - LIFE17 NAT/HR/000594 "Seabird Conservation Network in the Adriatic". Association for Nature, Environment and Sustainable Development Sunce).

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