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LIFE SEABIL PROJECT
LIFE20GIE/FR/000114



APRIL 2024

LIFE SEABIL TECHNICAL WORKSHOP PORTUGAL REPORT

MONITORING THE IMPACT OF MARINNE LITTER ON SEABIRD
COLONIES

Organized By :
SPEA

In the context of:
LIFE SeaBiL Project



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GENERAL INFOS

TITLE OF THE WORKSHOP

Monitoring the impact of marine litter in seabird colonies

DATE

April 18-19, 2024

LOCATION

CETEMARES Building, Polytechnic University of Leiria, Peniche, Portugal

ORGANIZATION

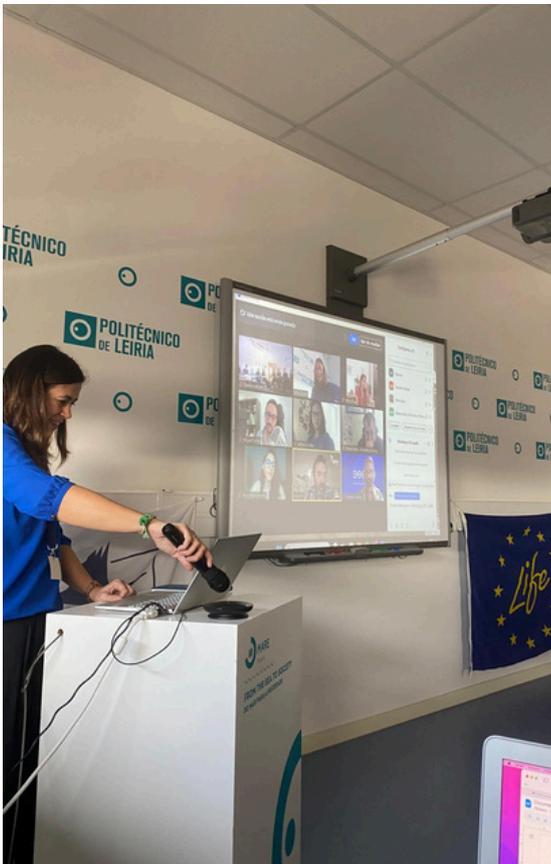
The workshop was organized by the Portuguese Society for the Study of Birds (SPEA) in collaboration with all other partners of the LIFE SeaBiL project.

ATTENDEES

The event was attended by 35 participants (21 in person, 14 online via Zoom), including representatives from NGOs, universities, research centers, governmental authorities, and other stakeholders from Portugal, Spain, and France.

GENERAL INFOS

ORGANIZATIONS



- Institute for Nature Conservation and Forests (ICNF)
- Portuguese Institute for the Sea and Atmosphere (IPMA)
- Marine and Environmental Sciences Centre, University of Coimbra (MARE-UC)
- Centre for Ecology, Evolution, and Environmental Changes, University of Lisbon (CE3C-UL)
- Centre for Environmental and Marine Studies, University of Lisbon (CESAM-UL)
- Stranding Network of Lisbon and Tagus Valley, ISPA - University Institute (RALVT-ISPA)
- OKEANOS Research Centre, University of the Azores (OKEANOS-UAç)
- Regional Directorate for the Environment and Climate Change, Madeira (DRAAC Madeira)
- Regional Directorate of Maritime Policy (DRPM)
- Institute for Forests and Nature Conservation (IFCN)
- Regional Secretariat for the Environment - Madeira (Secretaria Regional do Ambiente - Madeira)
- University of Cadiz (UCA)
- Marine and Food Research Institute (AZTI)
- French Biodiversity Office (OFB)
- University of Siena (UNISI)

GENERAL INFOS

OBJECTIVES OF THE WORKSHOP



Dissemination and Discussion of Results

Share and discuss the findings and progress made regarding marine litter's impact on seabird colonies.



Establishing a Bioindicator

Establish standardized methods for monitoring the impact of marine litter on seabirds - specifically for criteria D10C3 (plastic ingestion) and D10C4 (entanglement) of Descriptor 10.



Collaboration and Networking

Strengthen transnational collaboration among researchers, conservation managers, and policymakers.

AGENDA & SESSIONS

DAY 1: APRIL 18, 2024

OPENING AND WELCOME SESSION

- **9:15 AM - Joana Andrade (SPEA)**
 - Opened the workshop by thanking CETEMARES and all participants. Joana discussed logistical details and facilitated a welcome round, emphasizing the importance of collaboration under the LIFE SeaBiL project.

PRESENTATIONS ON MONITORING THE IMPACT OF MARINE LITTER ON SEABIRD COLONIES

- **9:30 AM - Guillaume Le Hetet (LPO)**
 - Presentation of the LIFE SeaBiL Project.
 - Overview of the nature of plastic and its environmental impact.
 - Discussed how marine litter, especially plastic, affects seabirds, noting that seabirds often use plastic as nesting material, which poses significant health risks.
- **10:00 AM - Yasmina Rodríguez (OKEANOS)**
 - Presented two studies related to plastic ingestion and entanglement in seabirds, focusing on Cory's shearwater as a potential bioindicator for Southern Europe.
 - Highlighted the importance of standardized necropsy methods, citing data gaps and the need for reliable information.

AGENDA & SESSIONS

- **10:20 AM – Vitor Paiva (MARE-UC)**
 - Discussed the historic connection between seabirds and plastic contamination, with research from Berlenga and Porto highlighting the significant impact of plastic ingestion.
 - Mentioned ongoing studies tracking the effects of plastic on seabird tissues.
- **10:40 AM – Nuno Oliveira (SPEA)**
 - Presented findings on plastic debris in Cory's shearwater from Berlenga Island, noting that 24 out of 25 birds sampled had ingested plastic.

Coffee Break (11:00 – 11:30 AM)

- **11:30 AM – Javier Franco (AZTI)**
 - Presented a case study on the Assessment of the incidence of plastic ingestion by seabirds through analysis of bird pellets, specifically focusing on the European Shag (*Gulosus aristotelis*) along the Cantabrian coast in Northern Spain.
- **11:50 AM – Matteo Baini (UNISI)**
 - Discussed the impact of marine debris ingestion in Mediterranean seabirds, with a focus on exposure to plasticizers.

AGENDA & SESSIONS

- **12:10 AM - Nuno Oliveira (SPEA)**
 - Discussed the impact of marine debris ingestion in Mediterranean seabirds, with a focus on exposure to plasticizers.
- **12:20 PM - Clara Lopes (IPMA)**
 - Responsible for Descriptor 10 (criteria D10C3 and D10C4) in Portugal
 - Explored impact monitoring using fish as bioindicators for microplastic contamination, proposing horse mackerel as a valuable species for monitoring.
- Portuguese Marine Litter Action Plan presentation by Margarida Nunes from DGRM was scheduled, but unfortunately could not be delivered as Margarida was unwell

Lunch Break (1:00 - 2:00 PM)

AGENDA & SESSIONS

AFTERNOON SESSION: MARINE LITTER INDICATORS

- **2:20 PM – Nuno Oliveira (SPEA)**

Nuno Oliveira delivered a detailed presentation on the monitoring of marine litter's impact on seabird colonies. The presentation focused on the Marine Strategy Framework Directive (MSFD) and the use of seabirds to assess marine litter's impact through criteria D10C3 (plastic ingestion) and D10C4 (entanglement).



The Marine Strategy Framework Directive (MSFD) is a European Union directive aimed at protecting the marine environment across Europe. The MSFD is structured around 11 Descriptors that define what constitutes a good environmental status. Descriptor 10 focuses on marine litter.

Key points included:

- Importance of careful site selection for monitoring, based on potential marine litter accumulation areas and regions of environmental significance.
- Proposal of harmonized protocols for assessing plastic litter use as nesting material and associated mortality due to entanglement in bird breeding colonies.
- Suggested use of species such as Northern Fulmar, Cory's shearwaters, European Shag, Northern Gannet, and Kittiwake due to their behaviors that make them suitable bioindicators.

AGENDA & SESSIONS

- Emphasized the development of specific recommendations for using seabirds as indicators of marine litter impacts on the biota in regions like the Bay of Biscay and Iberian Coast, with potential for extension to broader MSFD regions.

ROUND TABLE DISCUSSION MODERATED BY SPEA

Following his presentation, Nuno Oliveira moderated the final round table discussion. The focus was on leveraging findings from seabird surveys to enhance monitoring of marine litter impacts.

Topics covered included:

- Selection of common seabird species that could serve as bioindicators across Portugal, Spain, and France.
 - Discussion on site selection for effective monitoring and the relevance of different species and habitats.
 - Considerations for setting thresholds for plastic ingestion and entanglement based on historical data, as well as addressing sub-lethal effects of contaminants associated with plastics.
 - Strategies to secure data quality and control contamination during sample collection and analysis.
 - Long-term sustainability of monitoring programs, including funding and collaboration opportunities.
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- Participants explored the application of Nuno Oliveira's recommendations and the practicalities of integrating these methodologies into existing national and European marine litter action plans. The discussion emphasized collaboration across regions to standardize protocols and share data for more comprehensive monitoring and conservation efforts.

AGENDA & SESSIONS

DAY 2: APRIL 19, 2024

FIELD TRIP TO BERLENGA ISLAND

A field trip was organized around Berlenga Island, where participants observed the seabird colonies and marine litter-impacted sites.



DISCUSSIONS & CONCLUSIONS

The workshop yielded critical insights and conclusions that will shape future efforts in marine litter monitoring, seabird conservation, and transnational collaboration. Below is a detailed synthesis of the key points discussed during the sessions, organized by thematic areas and interventions:

1. MARINE LITTER AND ITS IMPACT ON SEABIRDS

Plastic Ingestion and Entanglement

Yasmina Rodríguez (OKEANOS): Presented two pivotal studies focusing on criteria D10C3 and D10C4 in seabirds. The studies revealed that Cory's shearwaters are particularly suitable as bioindicators for Southern Europe due to their wide distribution and frequent ingestion of plastic debris. Yasmina emphasized the need for standardized necropsy methods to ensure reliable data, noting significant information gaps due to inconsistent data collection over the years. The studies also highlighted that Cory's shearwaters in the Azores ingest more fishing tools compared to those in the Canary Islands, where the plastic ingestion is predominantly green and white, often linked to fishing activities in Northern waters.

Threshold for Plastic Contamination

Hany Alonso (SPEA, online): Questioned the threshold value of less than four pieces of plastic used to define contamination levels. Yasmina clarified that the threshold was based on existing datasets and not directly applicable to other species. The threshold was developed with input from OSPAR and reflects the current environmental values, although it remains challenging to apply uniformly across regions due to varying contamination levels.

DISCUSSIONS & CONCLUSIONS

Necropsy Methodology and Data Collection

Marga Rivas (UCA): Raised concerns about the selective necropsy approach, questioning whether different results might be obtained if the entire digestive tract were analyzed. Yasmina acknowledged that while more comprehensive necropsies could yield additional insights, practical challenges, such as difficulty in accessing the intestines, limit the feasibility of this approach. Marga also inquired about detecting microfibers, to which Yasmina responded that while they collected such data, they had not yet analyzed it but planned to do so in future studies.

2. BIOINDICATOR SPECIES FOR MONITORING MARINE LITTER

Identification and Suitability of Bioindicator Species

Nuno Oliveira (SPEA): Emphasized the importance of selecting appropriate bioindicator species. He proposed Cory's shearwater as a key species for monitoring plastic ingestion (D10C3) but noted its limitations for entanglement monitoring (D10C4). Nuno highlighted that, in Portugal, the Cory's shearwater and European shag are strong candidates due to their coastal habits and proximity to fishing areas, which expose them to higher levels of marine litter.

Expanding the Bioindicator Framework

Guillaume Le Hetet (LPO): Supported the inclusion of species like the Kittiwake, Northern Gannet, and Guillemot for France, although he acknowledged that Guillemots might be too small to serve as effective indicators. He suggested that Razorbills, common across all three countries involved in the project (Portugal, Spain, and France), could be another viable candidate. This suggestion was echoed by Jerome Fort

DISCUSSIONS & CONCLUSIONS

(LRUniv), who noted that Fulmars are already used by the French government to monitor litter impacts on the Atlantic side, while the Loggerhead turtle is used in the Mediterranean.

Challenges in Applying Bioindicators

Pedro Sepulveda (DRAAC Madeira) and Yasmina Rodríguez discussed the challenges of applying bioindicator frameworks across different regions. Pedro pointed out that in Madeira, the authorities opted not to implement such frameworks, highlighting the difficulty in securing consistent financial support and the risks of data gaps once the initial funding ends. Yasmina added that while the Azores government has implemented the framework, sustaining it remains a challenge, particularly as long-term monitoring requires significant resources.

3. TECHNICAL AND METHODOLOGICAL CONSIDERATIONS

Standardization of Necropsy and Sampling Methods

Nuno Oliveira and Vitor Paiva (MARE-UC) discussed the necessity of standardized sampling and necropsy methods. Vitor mentioned ongoing research involving plastic ingestion by seabirds in Cape Verde, where results showed varying levels of anthropogenic particles in different seabird species, with coastal species exhibiting higher contamination. This highlighted the need for region-specific approaches in monitoring.

Analysis of Plastic Composition

During the discussion, Paulo Lago (SEO/Birdlife) questioned why the composition of ingested plastics was not analyzed. Nuno explained that it's challenging to distinguish between industrial and consumer plastics without advanced analytical methods. Vitor and Yasmina further

DISCUSSIONS & CONCLUSIONS

elaborated that in the Canary Islands, more green plastics are ingested, whereas in the Azores, the plastics are mostly white, often linked to fishing activities. This variability underscores the importance of context-specific monitoring and analysis.

Invasive Sampling Techniques

The invasiveness of sampling techniques was questioned by Paulo Lago, particularly the use of tubes for diet sampling. Yasmina acknowledged that the sensitivity of the operator could impact the procedure's invasiveness and emphasized the need for careful timing and technique to minimize harm to the birds.

Use of Biomarkers and Contaminants Analysis

Clara Lopes (IPMA): Discussed using biomarkers and models to assess sub-lethal effects of contaminants on seabirds. This approach could help in understanding the broader impact of plastic ingestion beyond immediate mortality. Marga added that experimental studies using fluorescence markers in plastics have shown clear differences in health outcomes between exposed and non-exposed birds.

4. LONG-TERM MONITORING AND POLICY RECOMMENDATIONS

Data Quality and Contamination Control

Clara Lopes raised concerns about contamination at various stages of data collection, including before, during, and after sampling. Javier Franco (AZTI) pointed out that while contamination is less likely in bird pellets, it remains a significant issue in microplastics research. The discussion highlighted the importance of rigorous contamination control measures to ensure the reliability of collected data.

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Securing Long-Term Monitoring Efforts

Jerome and Guillaume emphasized the challenges of maintaining long-term monitoring programs, particularly in academic settings where funding and research priorities may shift. Guillaume discussed efforts to reduce costs and scale monitoring programs but acknowledged the difficulties involved, especially in expanding these programs to new regions.

National Marine Litter Action Plans

The workshop underscored the need for stronger integration of monitoring efforts within national marine litter action plans. In France, the MSFD indicators are referenced, while in Spain, comprehensive action plans are still lacking. Participants agreed on the importance of aligning scientific monitoring with national and European policy frameworks to ensure that research informs policy and vice versa.

5. THRESHOLDS AND IMPACT ASSESSMENT

Defining Harm and Establishing Thresholds

Yasmina and Nuno discussed the complexities of defining harm and establishing thresholds for plastic contamination. Yasmina mentioned that current thresholds, such as those for Fulmars, are based on pristine sites and might not reflect the realities of more polluted areas. Nuno noted that while setting thresholds near zero is desirable, particularly for bycatch, the lack of comprehensive data complicates such efforts.

DISCUSSIONS & CONCLUSIONS

Javier expressed concerns about the limited data available, which constrains the ability to set scientifically robust thresholds.

Implications for Policy and Future Research

The workshop concluded that establishing scientifically sound, region-specific thresholds is essential for effective marine litter management. However, this requires a balance between scientific rigor and practical implementation, considering the variability in data availability and the different ecological contexts across regions.

6. COLLABORATIVE EFFORTS AND FUTURE DIRECTIONS

Enhanced Collaboration Across Regions

Paulo Lago: Inquired about extending indicators from the Azores to other regions like Cantabria.

Maria Dias (CE3C-UL): Emphasized including colonies like Selvagens in monitoring efforts.

Jerome: Suggested considering other species like Northern Gannet as bioindicators.

The workshop highlighted the need for continued collaboration across Portugal, Spain, and France. Participants agreed on the importance of sharing data, methodologies, and findings to build a more comprehensive understanding of marine litter's impact on seabirds.

Future Research Priorities

Diana Matos (MARE-UC) and Clara Lopes suggested expanding research to include sub-lethal effects of plastic ingestion, using biomarkers, and exploring the potential of non-commercial species as

DISCUSSIONS & CONCLUSIONS

bioindicators. They emphasized the importance of integrating these findings into policy and conservation strategies.

Funding and Resource Allocation

Securing long-term funding was identified as a critical challenge. Pedro Sepulveda stressed that without sustained financial support, monitoring efforts risk becoming fragmented, leading to data gaps that could undermine conservation efforts.

CORE GUIDELINES



Implement and Standardize Monitoring

Adopt Cory's shearwater and European shag as a primary bioindicator for Southern Europe, with standardized necropsy and sampling methods to ensure data consistency.



Strengthen Contamination Control

Implement rigorous protocols to minimize contamination during data collection and analysis, particularly in microplastics research.



Advocate for Policy Integration

Align marine litter monitoring efforts with national and European policy frameworks to ensure that research informs policy decisions.



Secure Long-Term Funding

Advocate for sustained funding to support ongoing monitoring and research programs, ensuring that data collection remains comprehensive and consistent.



Expand Research on Sub-Lethal Effects

Prioritize research on the sub-lethal effects of plastic ingestion, using biomarkers and models to assess the broader impact on seabird health and reproduction.



Promote Transnational Collaboration

Continue fostering collaboration among Portugal, Spain, and France to share data, methodologies, and best practices in marine litter monitoring and seabird conservation.

ANNEX

LIST OF ATENDEES

Name	Organization	Status	Regime
Christopher Pham	UA	external	online
Clara Lopes	IPMA	external	presencial
Diana Matos	MARE-UC	external	presencial
Dília Menezes	IFCN	external	online
Edna Correia	CESAM-UL	external	online
Gonzalo Munoz	UCA	external	online
Guillaume Le Hetet	LPO	partner	presencial
Hany Alonso	SPEA	staff	online
Inês Lacerda	SPEA	organization	presencial
Javier Franco	AZTI	external	presencial
Jerome Fort	LRUniv	partner	presencial
Joana Andrade	SPEA	organization	presencial
Karen Bourgeois	OFB	external	presencial
Louis Doremus	LPO	partner	presencial
Ludovico de Veja	SEO/Birdlife	partner	presencial

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Name	Organization	Status	Regime
Lurdes Morais	ICNF	external	presentail
Marga Rivas	UCA	partner	presencial
Maria Dias	CE3C-UL	external	online
Maria Laranjeiro	MARE-UC	external	presencial
Maria Magalhães	DRPM	external	online
Matteo Baini	UNISI	external	online
Miguel Grilo	RALVT-ISPAA	external	online
Mónica Costa	SPEA	organization	online
Monica Exposito	UCA	partner	presencial
Monica Silva	CE3C-UL	external	online
Nicola Pestana	SRAM	external	online
Nuno Oliveira	SPEA	organization	presencial
Paulo Lago	SEO/Birdlife	partner	presencial
Pedro Sepulveda	DRAAC Madeira	external	online
Sara Veríssimo	MARE-UC	external	presencial

ANNEX

LIST OF ATENDEES

Name	Organization	Status	Regime
Tânia Nascimento	SPEA	staff	online
Thomas Jonca	LRUniv	external	presencial
Vitor Paiva	MARE-UC	external	presencial
YADA Trapletti	UCA	external	presencial
Yasmina Rodriguez	OKEANOS-UC	external	presencial