3rd Mediterranean Symposium on Ecology and Conservation of Marine and Coastal Bird Species

UN environment programme | Mediterranean Action Plan Barcelona Convention | SPA/RAC

The Specially Protected Areas Regional Activity Centre of UNEP/MAP

BOOK OF ABSTRACTS

Association "Les Amis des Oiseaux" | BirdLife International Partner | IUCN | ISPRA Istituto Superiore per la Protezione e la Ricerca Ambientale | Sistema Nazionale per la Protezione dell'Ambiente | Tour du Valat

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The third edition of the symposium is co-organized by SPA/RAC and AAO/BirdLife in Tunisia, in partnership with Tour du Valat, ISPRA, IUCN-Med, and with financial support from the French Voluntary Contribution, within the framework of the Memorandum of Understanding signed between UNEP/MAP and the French Ministry of Europe and Foreign Affairs.

For more information: **https://act4med-marinebirds.org**

Cover photo: Ben Metzger

BOOK OF ABSTRACTS

FOREWORD

The Mediterranean Symposium on the Ecology and Conservation of Marine and Coastal Bird Species is a key event for the exchange of knowledge and collaboration in bird conservation in the Mediterranean. Both in its first and second editions, held respectively in 2005 and 2015, the symposium served as a catalyst for initiatives aimed at strengthening the protection of marine and coastal birds at different scales, regional and national.

With its third edition, the symposium aims to continue playing this role and is expected to produce the following three outcomes:

1. Aid in the implementation of measures adopted by Mediterranean countries for the conservation of marine and coastal birds:

- Inform about the conservation status of the Audouin's Gull, a threatened marine bird species in the Mediterranean, present and discuss a new action plan for its conservation as well as the implementation of this plan with and by relevant stakeholders.
- Inform about methodologies and different existing frameworks for monitoring and assessing the conservation status of marine and coastal birds, including the Integrated Monitoring and Assessment Programme (IMAP) and the Mediterranean Quality Status Report (MED QSR) of the Barcelona Convention, the European Union's Marine Strategy Framework Directive (MSFD), and Wetlands International's International Waterbird Census (IWC), and discuss their complementarity and integration to facilitate their implementation.
- Inform about regional initiatives for bird conservation, including the Action Plan for the Conservation of Birds listed in Annex II of the SPA/BD Protocol, of the Barcelona Convention, and exchange on partnership and collaboration opportunities to encourage and strengthen their implementation.

2. Contribute to the development of environmental policies based on the latest scientific knowledge:

- Identify priority actions for the conservation of coastal birds, the protection of seabirds, including through Marine and Coastal Protected Areas (MCPAs) and Other Effective area-based Conservation Measures (OECMs). Discussions will also focus on factors and threats that directly impact bird demographics, especially breeding success and survival rates, including accidental bycatch during fishing operations, climate change, and avian influenza.
- Provide recommendations to be proposed to the Contracting Parties of the Barcelona Convention to improve specific provisions for bird conservation in the Mediterranean region, and identify priority actions that could benefit from technical or financial support from the UNEP/MAP system.

3. Identify research topics of importance for bird conservation:

- Identify research gaps and future study tracks to improve our understanding of the ecology and conservation of marine and coastal birds and the impact of global changes on them.

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It is scheduled to take place in Djerba, Tunisia, from 13 to 15 February 2024.

TABLE OF CONTENTS

SCIENTIFIC COMMITTEE

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GENERAL PROGRAMME

MONDAY 12/2/2024 **Participants arrival** **20:00- 22:00** **Registration opening**		
TUESDAY 13/2/2024	**WEDNESDAY 14/2/2024**	**THURSDAY 15/2/2024**
Day 1	**Day 2**	**Day 3**
07:00- 13:30 **Registration (continued)**	**09:45-11:45** **Session 2** Conservation of Mediterranean Seabirds Offshore: research, policy concerning marine protected areas	**09:45-11:45** **Session 4** The Audouin's Gull and its International Single Species Action Plan
07:30 **Excursion (option 1)** Birdwatching along the coast of Guellala & ethnographic museum **08:00** **Excursion (option 2)** Birdwatching on the western coast of Ras R'mal & street art in Djerbahood	**Keynote by José Manuel ARCOS** Conservation of Mediterranean Seabirds Offshore: where are we?	**Keynote by Nuno OLIVEIRA** Review of the Implementation of the Species Action Plan for Audouin's Gull
	10:30 Coffee break	**10:30** Coffee break
	10:45 **Session 2 (continued)**	**10:45** **Session 4 (continued)**
	11:45 **Poster session**	**11:45** **Poster session**
12:30 **Lunch**	**12:30** **Lunch**	**12:30** **Lunch**
14:00 **Opening**	**13:30- 17:00** **Session 3** Demography of Mediterranean Marine/Coastal Birds and the drivers acting on reproductive success and survival rates	**13:30- 17:00** **Session 5** Conservation of Coastal Birds in the Mediterranean
15:00 **GROUP PHOTO!**	**14:45** **Coffee & posters**	**14:45** **Coffee & posters**
15:30 -17:30 **Session 1** **Monitoring and Assessment of Marine and Coastal Birds across the Mediterranean**	**15:15** **Session 3 (continued)**	**15:15** **Session 5 (continued)**
Keynote by Benjamin METZGER Assessing seabird populations across the Mediterranean – SPA/RAC's MED-QSR-23 chapter on Marine Birds		
Coffee Break	**Break**	**Break**
18:00- 18:30 **SPA/RAC side event**	**17:00- 18:00** **Medmaravis meeting**	**17:00- 18:00** **Conference recommendations, Awards ceremony and closure**
		20:00 **Gala Dinner**

SCIENTIFIC PROGRAMME

Oral presentations

13-02-2024	Session 1	Monitoring and Assessment of Marine and Coastal Birds across the Mediterranean					Schedule
	Chair	**Abdulmaula HAMZA**					
	Benjamin METZGER	Malta	13B	1	Assessing seabird populations across the Mediterranean – SPA/RAC's MED-QSR-23 chapter on Marine Birds	Key speaker	**15:30**
	Luc Ortaç ONMUS	Türkiye	13B	2	Current Status of Audouin's Gull (*Ichthyaetus audouinii*) and Mediterranean Storm Petrel (*Hydrobates pelagicus melitensis*) in Turkiye	Oral Presentation	**16:15**
	Fouad ITANI	Lebanon	13B	3	National Assessment for Maritime and Coastal Bird Species of Lebanon	Oral Presentation	**16:30**
	Mohamed HABIB	Egypt	13B	4	Status of breeding seabirds on the Mediterranean coast of Egypt from 2012 till 2022	Oral Presentation	**16:45**
	Samar KILANI	Tunisia	13B	5	Advancing Mediterranean Seabird Conservation: A Collaborative Approach and Integrated Monitoring Initiatives	Oral Presentation	**17:00**
	Riadh MOULAÏ	Algeria	13B	6	Recent data on the status and	Oral Presentation	**17:15**

					distribution of breeding seabirds and coastal birds in Algeria		

14-02-2024	Session 2	Conservation of Mediterranean Seabirds Offshore: research, policy concerning marine protected areas					
	Chair	**Jelena KRALJ**					
	José Manuel ARCOS	Spain	14A	1	Conservation of Mediterranean Seabirds Offshore: where are we?	Key speaker	**9:00**
	Marie Claire GATT	Malta	14A	2	The pre-laying movements of shearwaters in the Mediterranean - Considerations for offshore protection throughout the breeding season	Oral Presentation	**9:45**
	Marie Claire GATT	Malta	14A	3	Drivers of sex-specific foraging behaviour during reproduction in marine top predators of the *genus Calonectris* across their global distribution	Oral Presentation	**10:00**
	Loriane MENDEZ	Monaco	14A	4	Tracking migration of adults and juveniles of a pelagic seabird endemic to the Mediterranean: the Yelkouan Shearwater (*Puffinus yelkouan*)	Oral Presentation	**10:15**
	Adrien LAMBRECHTS	France	14A	5	The French National Action Plan for the Balearic Shearwater	Oral Presentation	**10:30**
	Cristiano LIUZZI	Italy	14A	6	Preliminary data of offshore seabird monitoring in the Northern Ionian Sea (Central Mediterranean Sea)	Oral Presentation	
	Nicola BACCETTI	Italy	14A	7	Steps towards marine SPAs implementation in the Italian seas	Oral Presentation	**11:00**

	José Manuel ARCOS	Spain	14A	8	Self-reporting logbooks to collect seabird bycatch data: case study in the western Mediterranean Sea	Oral Presentation	**11:15**
	Matteo BAINI	Italy	14A	9	Filling the gap: improving knowledge of the impact of marine debris on Mediterranean seabirds by combining ingestion of marine debris with exposure to plasticisers	Oral Presentation	**11:30**
14-02-2024	**Session 3**	**Demography of Mediterranean Marine/Coastal Birds and the drivers acting on reproductive success and survival rates**					
	Chair	**Nicola BACCETTI**					
	Joan MAYOL	Spain	14B	1	Marine birds in the Balearic islands 38 years after the Alghero conference	Oral Presentation	**13:30**
	José Manuel ARCOS	Spain	14B	2	The Conservation status of the Balearic shearwater: an update	Oral Presentation	**13:45**
	Davide SCRIDEL	Italy	14B	3	Conservation status of the Mediterranean shag (*Gulosus aristotelis desmarestii*) in the Adriatic Sea during the non-breeding period: baseline population, trends, threats and knowledge gaps	Oral Presentation	**14:00**
	Jelena KRALJ	Croatia	14B	4	Foraging ranges and breeding success of Common Terns in the Adriatic Sea	Oral Presentation	**14:15**
	Ahmed INAL	Algeria	14B	5	Assessment of fishing gears interactions on bird species in the	Oral Presentation	**14:30**

					Alboran Sea (West coast of Algeria)		
	Samira ENAJJAR	Tunisia	14B	6	Bycatch monitoring in the Gulf of Gabes (GSA 14): impact of fisheries on sea birds	Oral Presentation	**15:15**
	Ilaria CALIANI	Italy	14B	7	Evaluation of toxicological effects of an oil spill on off the Cap Corse (France): chemical analysis and biomarkers on *Puffinus yelkouan* population	Oral Presentation	**15:30**
	Abdulmaula HAMZA	Libya	14B	8	Prevalence and abundance of Nest Incorporated Debris of European Shags (*Phalacrocorax aristotelis desmarestii*) at Gara Island, Libya	Oral Presentation	**15:45**
	Aida ABDENNADHER	Tunisia	14B	9	First assessment of marine litter in marine and coastal birds collected in Tunisia shoreline	Oral Presentation	**16:00**
	Luc Ortaç ONMUS	Türkiye	14B	10	Gulls, Terns, and Skuas of the Mediterranean coast of Türkiye: Species, their distributions and long-term population dynamics	Oral Presentation	**16:15**
	Denizcan DURGUN	Türkiye	14B	11	As a sharing of experience: MedBycatch in Turkey	Oral Presentation	**16:30**

15-02-2024	Session 4	The Audouin's Gull and its International Single Species Action Plan					
	Chair	**Marie Claire GATT**					
	Nuno OLIVEIRA	Portugal	15A	1	Review of the Implementation of the Species Action Plan for Audouin's Gull	Key speaker	**9:00**
	Tânia NASCIMENTO	Portugal	15A	2	Evaluation of Audouin's Gull Species Action Plan – Threats and conservation actions	Oral Presentation	**9:45**
	Martí Franch RODRIGUEZ	Spain	15A	3	The Audouin's Gull in Catalonia: shifts from pristine dunes to rooftops and harbours	Oral Presentation	**10:00**
	Aida ABDENNADHER	Tunisia	15A	4	New records of Audouin's Gull breeding colonies in Tunisia	Oral Presentation	**10:15**
	Intissar THABET	Tunisia	15A	5	Comparative analysis of the Audouin's gull (*Larus audouinii*) and the Yellow-legged Gull's (*Larus michahellis*) trophic ecology breeding in the Zembra Archipelago	Oral Presentation	**10:45**
	Khadija BOURASS	Morocco	15A	6	Evolution and Distribution of wintering Audouin's Gull in Morocco (1983-2023)	Oral Presentation	**11:00**
	Mathieu THEVENET	France	15A	7	Future collaboration for the monitoring of new breeding colonies of *L. audouinii* in Tunisia using IMAP Protocol	Open presentation	**11:15**

15-02-2024	Session 5	Conservation of Coastal Birds in the Mediterranean					
	Chair	**Laura DAMI**					
	Hela BOUGHDIRI	Hungary	15B	1	The Breeding Ecology of Kentish Plover in Tunisia	Oral Presentation	**13:30**
	Hichem AZAFZAF	Tunisia	15B	2	Which wetlands should be protected in Tunisia to effectively secure wintering and stop over sites for the Kentish Plover *Charadrius alexandrinus* Mid-winter counts 2002-2021	Oral Presentation	**13:45**
	Bulut OKUMUSOGLU	Türkiye	15B	3	Waders of the Mediterranean coast of Türkiye: Species, their distributions and long-term population dynamics	Oral Presentation	**14:00**
	Yves KAYSER	France	15B	4	Impact of breeding site management on the conservation of larids in southern France	Oral Presentation	**14:15**
	Laura DAMI	France	15B	5	Overview on the population trend of the Greater Flamingo in North Africa and the breeding population in the Mediterranean Region	Oral Presentation	**14:30**
	Abdelfettah KASSAH	Tunisia	15B	6	The birds of the island of Djerba: attempt at description and geographical interpretation	Oral Presentation	**15:15**
	Houssine NIBANI	Morocco	15B	7	"Conservation Osprey : A Comprehensive Plan	Oral Presentation	**15:30**

					for Safeguarding Ospreys and Marine Avifauna in Al-Hoceima National Park"		
	Abdelkrim SI BACHIR	Algeria	15B	8	Breeding status of Eleonora's Falcon (*Falco eleonorae*) and irruptions of Razorbill (*Alca torda*) on the Mediterranean coast of Algeria.	Oral Presentation	**15:45**
	Sahar MEHANNA	Egypt	15B	9	Impact of fishing activities on seabirds in the coastal Mediterranean lagoons, Egypt	Oral Presentation	**16:00**
	Abdulmaula HAMZA	Libya	15B	10	An update on the status of the Lesser Crested Tern colonies in Libya: field ringing campaign at Gara island	Oral Presentation	**16:15**

Side events

13-02-2024	Lobna BEN NAKHLA	Tunisia	The Mediterranean Action Plan for the conservation of bird species listed in the Annex II of the SPA/BD Protocol: what has been done so far? what still needs to be done?	SE1	18:00
14-02-2024	**Nicola BACCETTI**	Italy	Medmaravis' revival: is a dedicated association possible/needed in the current scenario of seabirds conservation in the Mediterranean?	SE2	**17:00**

Posters

14&15-02-2024	Mohamed Said ABDELWARITH	Egypt	National Action Plan for Conservation and Management of the Seabirds on the Egyptian Mediterranean Coasts and Waters	PO1	From 11 :45 to 12 :30
	Sidi Imad CHERKAOUI	Morocco	A summary and suggestions for monitoring seabirds and marine plastic waste in Morocco	PO2	
	Kastriot KORRO	Albania	Rescue from plastic pollution and protection of seabirds in the marine protected area of Sazan Karaburun Vlore	PO3	
	Silvia BONIZZONI	Italy	Factors affecting the offshore distribution of yelkouan shearwaters in the northwestern Adriatic Sea: insight from machine learning	PO4	
	Ali BERBASH	Libya	Monitoring Marine Bird Populations for Achieving Good Environmental Status in Libyan Coastal Areas	PO5	
	Mustapha MARRAHA	Morocco	When Morocco's Mediterranean MPAs become the main conservation tool for seabirds	PO6	
	Mohamed ABDELWARITH	Egypt	Sea Birds Monitoring in the Egyptian Mediterranean Coast in the frame of the IMAP – MPA project in Egypt	PO7	
	Luay ZONKLE	Egypt	Surveillance of avian influenza virus in some wild birds in Egypt	PO8	
	Ridha OUNI	Tunisia	Investigation sur la présence exceptionnelle du Pingouin Torda le long des côtes tunisiennes	PO9	
	Samia BERKANE	Algeria	Inventaire des oiseaux marins du Parc National du Gouraya	PO10	
	Jaber YAHYA	Libya	New breeding sites of Little Tern (*Sternula albifrons*) and Kentish Plover (*Charadrius alexandrinus*) in Cirenaica, Libya	PO11	
	Malek CHAARANA	Tunisia	Temporal Dynamics of the Population and Nesting of the Little Egret (*Egretta garzetta*) on the Kuriat Islands (2018-2023)	PO12	
	Flávia CARVALHO	Portugal	Seabird Bycatch in Portuguese mainland waters: fisheries, season and species of concern in the case studies in Algarve and Aveiro-Nazaré regions	PO13	
	Sahbi DORAI	Tunisia	Sea and Coastal Birds of the Galite Archipelago - Tunisia	PO14	
	Hany ALONSO	Portugal	Massive wreck of Atlantic puffins and other seabirds in Portugal mainland during the winter of 2022-2023	PO15	

	Hsan BEN JEMAA	Tunisia	The use of stable isotopes in the study of the avifauna of the Galite archipelago in Tunisia	PO16	
	Faouz KILANI	Tunisia	Composition and distribution of pelagic and coastal bird populations in Tunisia	PO17	
	Aymane Khaili	Morocco	Monitoring and observation of seabirds: A study of *Larus michaellis* in the Al Hoceima region in Moroccan Mediterranean Sea.	PO18	
	Neila Ahlem BENLOUCIF	Algeria	Breeding Seabirds on the Small Islands of the Edough Peninsula (Algeria)	PO19	
	Lider SINAV	Türkiye	Research on Birds and Biodiversity in Ayvalık Islands Project	PO20	
	Rafik ZARRAD	Tunisia	The Sabkhet Ennjila as a wetland for marine and coastal birds between vulnerability and monitoring gaps	PO21	
	Wassim AMDROUS	Tunisia	Assessing the Impact of Plastic Pollution on Seabirds in the Mediterranean: A Comprehensive Approach Integrating Adopt-a-Beach Initiatives and a Regional Database	PO22	

ORAL PRESENTATIONS

13B1

Assessing seabird populations across the Mediterranean – SPA/RAC's 2023-MED-QSR chapter on Marine Birds

Benjamin J. METZGER[1], Dilek SAHIN[2], Yassine Ramzi SGHAIER[3], Lobna BEN NAKHLA[3], Samar KILANIi[3]

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Recently, the Ecosystem Approach Group under the Barcelona Convention finalised its 2023 Mediterranean Quality Status Report (2023-MED-QSR). The report presents the assessment of the state of the natural marine environment in the region and whether it reaches Good Environmental Status (GES).

Seabirds *sensu lato* form a crucial component of the region's marine biodiversity and ecosystem, assessed within the report under the Ecological Objective Biodiversity. Many of the relevant seabird taxa are endemic or near endemic to the Mediterranean, are situated on top of marine food webs, and ecologically connect marine and coastal environments across the region. Facing multiple pressures at land and at sea, seabirds from different functional ecological groups in the area serve as sentinels of the health of the Mediterranean ecosystem.

From the comprehensive list of 25 sea and coastal bird species listed in Annex II of the SPA/BD Protocol of the Barcelona Convention, focus was directed to a list of 11 indicator species. These taxa, falling under the broad category of 6 functional ecological groups, were employed for the 2023-MED-QSR assessment. The integrated GES assessment for each of these seabird taxa is based on three Common Indicators: Distributional Range CI3, Abundance CI4, and Demography CI5.

The results indicate that for many seabird populations of the assessed species GES might be reached when taking a modern baseline approach. This is the only reliable approach to set baselines owing to the lack of both information on a pristine state in the Mediterranean and accurate historic data across the region.

The assessments rely on national monitoring datasets, provided by the contracting parties to the Barcelona Convention, augmented with data from BirdLife International's Seabird Tracking Database, Wetlands International's International Waterbird Census (IWC), as well as published scientific articles and reports. The heterogeneity of the data currently prevents a truly quantitative integrated GES assessment across the entire region. Furthermore, some endemic taxa of conservation concern appear to fail to reach GES targets at least in some of the Common Indicators. Closing data gaps, harmonising data collection and monitoring programs, and further implementing suitable conservation actions within the Marine Protected Areas (MPA) network, are important steps towards successfully assessing GES and reaching set targets across the region in the near future.

13B2

Current Status of Audouin's Gull (*Ichthyaetus audouinii*) and Mediterranean Storm Petrel (*Hydrobates pelagicus melitensis*) in Turkiye

Ortaç ONMUŞ

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This study summarizes the current information about the Audouin's Gull (*Ichthyaetus audouinii*) and the Mediterranean Storm Petrel (*Hydrobates pelagicus melitensis*) in Turkiye. This study provides data from both our own previous published studies and new information obtained thorough field work.

Currently, the breeding population of the Audouin's Gull in Turkiye is estimated between 90 and 170 pairs, with breeding activities documented at eight different breeding sites. The Mediterranean subspecies of the European Storm-petrel (*Hydrobates pelagicus melitensis*) is suspected to be resident in the Aegean Sea off Turkish waters, but breeding is yet to be confirmed. Additionally, the area is used by the Storm-petrels during the non-breeding season by individuals from elsewhere in the Mediterranean, and population sizes of over a thousand individuals have been recorded, especially in the central-south Aegean Sea.

Both species are threatened by various factors such as depletion of fish stocks due to overfishing by trawlers, marine pollution due to intensive fish farming activities, pollution due to wastewater discharges from cities, organic and inorganic polluted waters originating from riverbeds and microplastics.

13B3

National Assessment for Maritime and Coastal Bird Species of Lebanon

Fouad ITANI

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The Association of Bird Conservation in Lebanon (ABCL), supported by the Global Greengrants Fund, has launched an essential "National Assessment for Maritime and Coastal Bird Species of Lebanon". The increasing challenges in Lebanon, including pollution, illegal hunting, economic crisis, global warming, and habitat destruction, threaten the survival of various bird species and the wellbeing of coastal communities.

Our surveys using methodologies of point counts in the breeding season and transects in the post-breeding dispersal season or in passage/ wintering seasons, enabled us to count 18 out of the 25 species of the list of Annex II of the SPA/BD Protocol. One more new species for Lebanon (European Shag) was lately included in our list since it was recorded in late 2023 in Tripoli/Lebanon. The other six species were not recorded during the period of our study because they are limited in their distribution to NW Mediterranean (Balearic Shearwater), never occurred in Lebanon (Slender-billed Curlew), vagrant (European Storm Petrel) or very scarce (Dalmatian Pelican, Greater Sand Plover, and Osprey). Number of individuals for each species were also collected. Species fact sheets of all the recorded species were developed, and risks as well as threats facing these species were identified. The study recommended the production of a booklet on how to identify the species of Annex II as that would be a part of the training for the stakeholders that will monitor the targeted avian species.

Lebanon's coastal and marine bird habitats are under threat from pollution, illegal hunting, climate change, and habitat destruction. The study concluded that to combat these challenges, strict pollution control regulations and cleanup initiatives are necessary, as are stronger hunting laws and the establishment of no-hunting zones. Strategies to help birds adapt to climate change must be developed, including the protection of migratory stopovers. Habitat conservation efforts should include the designation of protected coastal areas and the implementation of bird-conscious coastal management practices. Engaging the community through educational programs and involving them in bird monitoring will enhance public knowledge and support for conservation efforts. Additionally, distributing educational materials on bird identification and conservation can further raise awareness and foster a culture of stewardship among both stakeholders and the public.

13B4

Status of breeding seabirds on the Mediterranean coast of Egypt from 2012 till 2022

Mohamed Ibrahim HABIB

Biodiversity consultant

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I undertook direct counts to survey the seabird at the Mediterranean coast of Egypt between 2012 and 2022 to assess the status of breeding seabirds. Two breeding populations of Slender–billed gull Larus genei contained 45 375 individuals. The first population is on the Mediterranean coast, and the second is on Lake Qaron, which is more than 350 kilometers away, representing 32% of the estimated regional breeding population of Mediterranean population. Conversely, only 15 empty nests were found at Egypt's only known breeding colony of Yellow-legged Gull Larus michahellis. I counted 92 occupied nests of Gull-billed Tern Gelochelidon nilotica, over 950 nests of Sandwich Tern Sterna sandvicensis and 670 breeding pairs of Common Tern Sterna hirundo both are first time breeding in Egypt. The Mediterranean coast of Port Said till El Arish is an important nesting area for Levant Little Terns Sternula albifrons levantinus a new subspecies in the Middle East with over 3955 breeding pairs, representing more than 6% of the current Black Sea and Mediterranean breeding population. Disturbance from landfilling and modification of the seashore by the gas industry, tourism resorts and the building of new ports together with the collection of eggs and chicks are the main threats affecting breeding seabirds on the Mediterranean coast of Egypt. Signs should be posted forbidding all human intrusion in the breeding areas throughout the entire breeding period.

13B5

Advancing Mediterranean Seabird Conservation: A Collaborative Approach and Integrated Monitoring Initiatives

Samar KILANI, Yassine Ramzi SGHAIER, Lobna BEN NAKHLA

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In 2008, the Barcelona Convention adopted the Ecosystem Approach (EcAp) as a strategic framework for preserving the Mediterranean's marine and coastal ecosystems, aiming to achieve Good Environmental Status (GES). This approach defines 11 Ecological Objectives (EO), providing a roadmap for operational objectives and GES targets. The regional implementation of the Ecosystem Approach is facilitated by the Integrated Monitoring and Assessment Programme (IMAP), which incorporates regionally agreed common indicators for all Ecological Objectives. This program aims to facilitate a comprehensive quantitative analysis of the Mediterranean's marine and coastal environment.

This study delves into IMAP Common Indicators concerning seabirds, encompassing monitoring scales, assessment criteria, baseline, and threshold values, focusing on CI3 (species distributional range), CI4 (species abundance), and CI5 (species demographic characteristics).

In line with the EcAp roadmap, the SPA/RAC has assisted Mediterranean countries in the IMAP implementation initial phase by developing and harmonizing national monitoring programs. The subsequent phase, supported by EU funded projects such as IMAP-MPA and EcAp MED III, alongside a bilateral agreement with Italy (MiTE), supported countries in implementing their national monitoring programs.

Harmonized monitoring of three common indicators related to seabirds was carried out in 2023 in South Mediterranean countries: Egypt, Morocco, Lebanon, Libya, and Tunisia emphasizing the 11 IMAP indicator species selected out of the 25 sea and coastal bird species listed in Annex II of the SPA/BD Protocol of the Barcelona Convention. Simultaneously, a pioneering effort focused on Seabird monitoring in Bosnia and Herzegovina has supported the preparation and implementation of a related national integrated Monitoring programme.

This collaborative initiative contributes to a holistic understanding of the intricate relationship between environmental pressures and their primary impacts on the diverse seabird populations in the Mediterranean, furthering the cause of effective conservation and management. Both historical and newly collected data reinforce regional-scale data collection and management practices.

13B6

Recent data on the status and distribution of breeding seabirds and coastal birds in Algeria

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In Algeria, eight species of marine and coastal birds and two costal birds of prey appear to nest regularly, depending on the species. These are the Yellow-legged Gull, *Larus michahellis*; Audouin's Gull, *Larus audouinii*; Common Tern, *Sterna hirundo*; Little Tern, *Sternula albifrons*; Kentish Plover, *Charadrius alexandrinus;* Little ringed Plover *Charadrius dubius*; Scopoli's Shearwater *Calonectris diomedea*; European Shag *Gulosus aristotelis*; Eleonora's Falcon *Falco eleonorae* and Osprey *Pandion haliaetus*. Despite a coastline of almost 2000 km, the number of islands, islets and favourable coastal cliffs (potential nesting sites) is limited. For example, there are almost 70 sites considered to be island environments. More than half of these islands remain unexplored from a scientific point of view. Data on the status and distribution of Algerian seabirds is sparse and has not been updated for all the coastlines and island environments studied. The data appear to be more complete for the coast and islands of Oranie and for the regions of Béjaia, Jijel and Annaba. The status, distribution and numbers of certain species remain poorly known, such as the European Shag, Scopoli's Shearwater, Audouin's Gull and Osprey. The most recent results show that the Yellow-legged Gull is the most abundant and widespread species nationwide. On the other hand, Audouin's Gull seems to be the rarest seabird in Algeria. This seabird currently only appears to nest on the Habibas islands, where numbers are small.
The aim of our presentation is to shed some light on the status, numbers and, above all, distribution of seabirds in Algeria, based on the most up-to-date data available. The main threats and conservation issues concerning species with high heritage values will be listed and discussed.

14A1

Conservation of Mediterranean Seabirds offshore: where are we?

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Seabirds are among the most threatened of all bird groups, facing severe threats both on land and at sea. In the Mediterranean, a sea basin characterised by a certain degree of isolation and relatively low productivity, the seabird community is diverse and exclusive, and at the same time populations are rather small, thus posing a challenge for conservation. Traditionally, most conservation action has been conducted on land (breeding colonies) or in coastal areas, while attention to the offshore environment has been lagging behind. However, there is increasing evidence of the relevance of threats occurring at sea for the conservation of the most sensitive Mediterranean seabird species, including fisheries bycatch, overfishing, pollution and offshore renewables. On the other hand, there are also new conservation initiatives that could contribute to halt these threats, including marine spatial planning (with particular assessment to windfarm development and the creation of offshore Marine Protected Areas), and improving fisheries sustainability through an ecosystem-based approach (including bycatch action plans). Here I present an overview of both these threats and these conservation approaches, taking examples of ongoing initiatives, and suggest ways forward.

14A2

The pre-laying movements of shearwaters in the Mediterranean - Considerations for offshore protection throughout the breeding season

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In pelagic seabirds, marine protected area designation is often based on observations during the breeding period, particularly on GPS tracking of breeding adults during incubation or chick-rearing. The pre-laying period has received comparatively less attention, despite being a crucial stage. In particular, the female pre-laying exodus (PLE) determines the success of egg production within a season and, as a result, the population's reproductive output for the year. Here we present the pre-laying movements of the vulnerable Yelkouan Shearwater *Puffinus yelkouan* and the Scopoli's Shearwater *Calonectris diomedea* in the Central Mediterranean. We demonstrate how PLE is characteristically different from foraging trips carried out concurrently by males and females not developing an egg, but also from foraging trips during the rest of the breeding season in terms of duration, distance, and area use. Within the Mediterranean, distant foraging trips have a high probability of being undertaken in waters outside the jurisdiction of the country where the breeding colony is located, with PLE birds visiting areas other than those exploited during better known stages of the breeding season. Therefore, this further underlines that appropriate offshore protection of pelagic seabirds throughout the breeding season requires regional communication and collaboration.

14A3

Drivers of sex-specific foraging behaviour during reproduction in marine top predators of the genus *Calonectris* across their global distribution

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During reproduction, animals must balance reproductive duties with energy intake. While biparental care is common in long-lived species, sex-specific differences in foraging behaviour often persist due to competitive exclusion and/or sexual dimorphism, but their expression may be context-dependent. *Calonectris* shearwaters are monogamous marine top predators breeding in the Mediterranean, northeast Atlantic, and northwest Pacific that display sex differences in wing loading, the extent of which (7 – 16 % lower in females) differs between species and populations, and which may have energetic consequences in the exploitation of resources. Here, we assess how environmental conditions, habitat quality, and colony size drive sexual differences in foraging trip characteristics across the breeding season using GPS data from all four species of *Calonectris* shearwaters in a dataset of over 2,000 individuals from across the species' range collected over 14 years. Overall, sex differences in foraging trip distance and duration were slight across all species, appeared under conditions that reduced foraging efficiency, and were more pronounced in species with the greatest difference in wing-loading between sexes, such as in the Scopoli's Shearwater *C. diomedea*. Moreover, sex-specific differences in trip metrics were evident during chick-rearing, when energetic demands were highest, but not during incubation. Our results suggest that, in bird species with relative dietary flexibility, only slight sexual dimorphism, and little trophic segregation, sex differences in foraging behaviour are driven largely by a competitive exclusion under greater energetic and environmental constraints.

14A4

Tracking migration of adults and juveniles of a pelagic seabird endemic to the Mediterranean: the Yelkouan Shearwater (*Puffinus yelkouan*)

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Seabirds are particularly vulnerable to anthropogenic pressures and require conservation measures adapted to their habitat - which is often poorly known. Here we provide precious information on the behaviour and spatial ecology of the Yelkouan Shearwater (*Puffinus yelkouan*), a Vulnerable seabird known to breed only in the Mediterranean. GPS-GSM transmitters were deployed between 2021 and 2022 on 22 adults and 26 juveniles, including 'full families' (parents and their juvenile), to track their post-breeding journeys from different nesting sites in Croatia, Malta and Tunisia. The monitoring of full families for the first time revealed a total independence of the juveniles from their parents during their migration journey. The Black Sea was confirmed as one of the main destinations of adults, regardless of the colony site. Juveniles embarked on active migratory movements soon after fledging, covering great distances and being able to reach the Black Sea too. While a few adults visited the Gulf of Gabes, an area rich in nutrients, only inexperienced juveniles explored the poorer waters of Libya and Egypt, where one was found dead on a beach near Alexandria. This study provides key information for the conservation of the species and highlights the importance of international cooperation when habitat range crosses several country borders and seas.

14A5

The French National Action Plan for the Balearic Shearwater

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The Balearic Shearwater (*Puffinus mauretanicus*), a species endemic to the Balearic Islands, is considered the most endangered seabird in Europe. The global number of this species is low and declining. Its conservation status has been ranked «critically endangered» in Europe since 2004 and the species is protected in France. France has a major responsibility for the conservation of this species during the non-breeding period (presence in French Atlantic territorial waters), and to a lesser extent during the breeding period (presence in the Mediterranean Sea).

To face the population decline, SEO / BirdLife coordinated the first international action plan for the Balearic Shearwater in 2011, in which France was urged to take this endangered species into account. In 2020, after 2 years of work and public engagement, the French government approved its own National Action Plan (NAP) in support of this species, following its validation by a national steering committee.

This NAP primarily aims to reduce the pressures exerted on the species, such as interactions with fisheries, nautical sports and leisure activities, and also potential interactions with future offshore wind farms, in order to improve its conservation status.

The objective of this National Action Plan for the Balearic Shearwater is to define a medium- and long-term strategy which aims to:

- organise coherent monitoring of populations of the species;
- implement coordinated actions favourable to the restoration of the species and its habitat;
- facilitate the integration of the protection of this species in human activities and public policies;
- inform and raise awareness among the stakeholders concerned and the general public.

This Plan is the first strategic national document whose objective is to act with all partners having potential levers for improving the unfavourable status of this species.

The two first years of this NAP implementation led to a number of significant achievements:

- Setting of a coordinated monitoring plan including surveys from the shore, at sea standardized surveys, GPS bio-logging programme on birds caught at sea, trophic ecology and contamination
- Starting of an ambitious programme to characterize interactions with fisheries and to assess by-catch risk, including surveys with fishermen but also on-board observation on longline, gillnet and purse seine fleets
- Initiating of a global public and stakeholder awareness programme to reduce disturbance of the species at sea by leisure activities, including the distribution of leaflets, the publication of papers, or the awareness raising through at-sea interventions

The main actions of this national action plan are presented, with a focus on the actions related to fisheries and by-catch issues, including those implemented in the Mediterranean waters (golfe du Lion): surveys of fishermen, on-board observations, by-catch risk assessment.

14A6

Preliminary data of offshore seabird monitoring in the Northern Ionian Sea (Central Mediterranean Sea)

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The standardized monitoring of birds is essential to identify the areas of important conservation interest and obtain medium and long-term trends that provide precious indications for appropriate habitat management. Some groups of birds are monitored simultaneously at an international level with multi-year databases (e.g. International Waterbird Census), therefore enabling the assessment of the status of their populations and informing conservation strategies. In contrast, species inhabiting offshore marine environments with an unknown or unfavourable conservation status, are often not properly monitored by census programmes, especially in the Mediterranean Sea. This work aims to present the preliminary data collected during standardized monitoring off the coast of Puglia and Basilicata in the Northern Ionian Sea (Central Mediterranean Sea) carried out from January 2022 to December 2023. Following the European Seabirds at Sea (ESAS) database guidelines, linear transects were made counting all the birds within an angle of 90°, within 300 m from the boat, and noting all other observations as “extra-transects”. Bird counting was carried out in time intervals (“poskey”) lasting 5 minutes, with a constant speed of 7 knots, while tracing was made using the OruxMaps application.

A total of 1030 poskeys over 1105.2 km travelled in about 85.8 h of navigation resulted in 19 species of seabirds sighted, for a total of 10853 individuals.

The three target species have been identified to characterize the study area: the Scopoli’s Shearwater (*Calonectris diomedea*), the Yelkouan Shearwater (*Puffinus yelkouan*) and the Mediterranean Gull (*Larus melanocephalus*). For these species, the phenology and seasonal variations were analysed. Particularly, winter was the season with the highest percentages of positive poskeys for *P. yelkouan* and *L. melanocephalus*, the latter also showing the highest number of individuals. The highest percentage of positive poskeys and abundances for *C. diomedea,* and the highest abundances for *P. yelkouan* were recorded in spring.
Further studies are needed to address the spatial component support of the identification of areas eligible for the establishment of a Marine Important Bird Area or a Special Protection Area for marine birds in the study area.

14A7

Steps towards marine SPAs implementation in the Italian seas

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Protected areas play an important role in the conservation of biodiversity and ecosystem processes. They should include representative portions of the biodiversity of each region in order to decrease the impact of the pressures that threaten its persistence. The new Biodiversity Strategy for 2030 aims at establishing marine protected areas on at least 30% of sea surface in Europe. We present the results of almost 10 years of institutional collaboration between ISPRA (Italian institute for environment protection and research), the Ministry of the Environment and several Italian regional authorities. Steps went through the initial identification of potential marine SPAs and their borders, negotiation (not always fruitful) and finally formal implementation. The areas were proposed according to multi-species criteria, based on the movements of tagged birds and on population size. We took into account also the need of avoiding an over-representation of regions that host the largest populations, to adhere to the actual distribution ranges and to share the responsibility of conservation among different administrations. As a result, from 2019 till now 13 new marine SPAs were designated for the protection of total 1.195.296 ha of sea. The major outcomes and limitations of this work in progress for the conservation of Italian seabirds will be discussed in detail.

14A8

Self-reporting logbooks to collect seabird bycatch data: case study in the western Mediterranean Sea

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Bycatch in fishing gear is the greatest threat to some of the most threatened seabirds in the Mediterranean, particularly shearwaters. But the numerous and highly diversified Mediterranean fishing fleet, mostly small-scale, makes it difficult to carry out a precise assessment of the problem using traditional methodologies of questionnaire surveys at port and via on-board observations. Here a complementary methodology to assess bycatch is presented using self-reporting logbooks filled in by the fishers themselves on a daily basis and regularly monitored by a network of observers in the fishing ports. This approach was implemented by SEO/BirdLife between 2017 and 2021 in the western Mediterranean in Spain in which fishers from 42 vessels using demersal longlines collaborated by filling in logbooks monitored by eight observers at port. Data were collected from 3,522 fishing days in which 1,142 birds were caught, with shearwaters being the most affected (93%), with special relevance for Balearic *Puffinus mauretanicus* and Yelkouan shearwaters *P. yelkouan*. Bycatch rates varied between years and areas and according to the configuration and operational characteristics of the gear, being more frequent in the small-scale fleet in late spring. The greatest risk of bycatch occurred when setting during the day, using small pelagic fish as bait, and adding little or no weight to the line. Self-reporting logbooks turned out to be a good method to assess seabird bycatch in small-scale fisheries with lower effort compared to observer programs and to raise awareness and involve fishermen in finding solutions to mitigate bycatch, showing promise for extension to other areas and gears, mainly in the small-scale fleet.

14A9

Filling the gap: improving knowledge of the impact of marine debris on Mediterranean seabirds by combining ingestion of marine debris with exposure to plasticisers

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The impact of marine debris on seabirds has been studied worldwide since 1987, and recent studies show an increase in the number of species affected. Although the Mediterranean has been identified as one of the hotspots for marine litter pollution, the impact on Mediterranean seabirds is underestimated. The analysis of the gastrointestinal tract (GIT) content of birds has been adopted to measure trends and regional variations in marine debris in the OSPAR monitoring and has been adopted by other monitoring programmes such as the Marine Strategy Framework Directive.

Within the Plastic Busters project, we developed an approach to provide a comprehensive understanding of the impact of marine debris on these species. It includes the assessment of pollutants associated with plastics, such as phthalates, a known endocrine disruptor. The aim of this study is to properly assess the impact of marine litter on seabirds. Carcasses of *Calonectris diomedea* (1), *Puffinus yelkouan* (34), *Puffinus mauretanicus* (1) and *Gulosus aristotelis* (2) from the Tyrrhenian and Ligurian Seas (Italy) were analysed. The different sections of the GIT were examined separately according to the OSPAR protocol and the contents were additionally filtered (100 µm). All filtered material was examined under a stereomicroscope and all anthropogenic material was characterised. A total of 925 pieces of debris were isolated from 35 of the 38 (92%) birds analysed, with man-made polymers being the predominant category of debris, found mainly in the gizzard rather than in the proventricolus and the intestine. Polyethylene and polypropylene microplastics in the form of fragments or films were identified as the most common type of debris found in all species. Accumulation patterns and phthalate burdens varied between different species and tissues. Bis(2-ethylhexyl) phthalate (DEHP), diisobutyl phthalate (DIBP), dibutyl phthalate (DBP) and di-n-octyl phthalate (DNOP) were the most abundant compounds.

The results confirm the importance of seabirds as valuable indicators of marine debris in monitoring programmes and highlight the urgent need for an in-depth assessment of this impact in the Mediterranean basin. However, extensive and continuous monitoring of these and other Mediterranean seabirds is essential to obtain reliable information on the variation in ingested debris and its effects on these species at the individual and population level, and to develop appropriate conservation measures.

14B1

MARINE BIRDS IN THE BALEARIC ISLANDS 38 YEARS AFTER THE ALGHERO CONFERENCE

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The Balearic Islands, in the centre of the Western Mediterranean, are an important hot spot for marine birds. Changes in status, knowledge, and protection almost four decades after the Alghero Conference of 1986 are notable, especially in the socioeconomic context: the human population has increased to 500.000, and tourist visitors to 10.000.000 (up to 14.000.000), whereas professional fishing boats decreased from 811 to 290.

In 1986 not a single protected area existed. Now there are one National Park, six natural parks, one nature reserve and 30 SPAs (Natura 2000 areas) protecting marine birds. Balearic and insular governments, NGOs and scientific institutions presently work on marine birds. We summarize here the most important changes in seabird species since the first Medmaravis conference.

We are currently aware of 17 colonies of Mediterranean Storm Petrel, with a minimum population over 1500 pairs The most important colony, in Espartar, is monitored. Rat eradications in some islets have given positive results for this species.

The Balearic Shearwater has a very restricted known breeding range. It only breeds in the Balearic Islands, where it nests in coastal cliffs and caves, and on small islands. The number of birds breeding in some of the localities is not well known. Census is laborious and time consuming in most of the breeding areas. The most recent estimate from counts at the colonies is over 3.000 breeding pairs, while at sea it is 25.000 individuals. The main conservation issues are bycatch, over 50% of mortality, and the presence of introduced predators in some of the colonies (black rat).

The Balearic Islands host the largest and most important breeding population of the Scopoli's Shearwater of the Spanish Mediterranean, with an estimated 7.000 breeding pairs, of which circa 6.000 pairs nest on Menorca. The number of birds breeding on Eivissa and Formentera are less well known. On Mallorca, the main colonies are found in the archipelago of Cabrera, 800 pairs, and on several islands off the west coast. The main conservation issues are bycatch, 50% of the mortality, and the presence of black rat and small carnivores in several colonies.

The Balearic population of the Mediterranean Shag is the most important of the Spanish Mediterranean coast and has increased from 1.450 (1986) to 2.000 pairs in the last years. It is mainly sedentary in the archipelago, but the expansion to the Iberian coast has its origin in the Balearic population. Almost all colonies are by now protected.

The Audouin's Gull population was estimated at 500 pairs in 1986 and reached a maximum in 2001 with 1956 pairs. Now it is between 600 and 800 pairs, because of a decline in trawling (forbidden in protected areas). Some colonies are disturbed by uncontrolled visitors.

Until 1990, a chaotic management of urban waste with more than ten open landfills caused a demographic explosion of the Yellow-legged Gull. Intense culling was necessary to contain the population. Today only one landfill remains in Ibiza. The movements of this species have been investigated through PVC rings and other monitoring projects.

In general, the urbanization of natural spaces, military activities and direct persecution have disappeared as threats. Other problems remain, such as accidental capture. Monitoring of various species has shown that the Iberian and North African continental shelf fall within the home range of Balearic seabirds.

14B2

The Conservation status of the Balearic shearwater: an update

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The Balearic Shearwater *Puffinus mauretanicus* is a seabird endemic to the Balearic Islands, which is globally classified as Critically Endangered. This classification is based on the demographic modelling of a single colony, Sa Cella (SW Mallorca), where a population decline of 14% per year is estimated, mainly due to an abnormally low adult survival rate for a Procellariiform (0.81). However, this view has received criticisms on the grounds that the species is still common on the Iberian and French coasts, and that the modelling of a single colony may not reflect the situation of the population as a whole. Here we present a new demographic analysis of another breeding colony, located in west Ibiza (Sa Conillera-Es Bosc), which is the result of a long-term monitoring programme established in 2011. The results from Ibiza are almost identical to those of Sa Cella (14% decline and adult survival of 0.81). In both cases, these are colonies free of predators, suggesting that the main factors responsible for the low adult survival rates detected occur at sea, with additional evidence pointing to a major role of bycatch. The situation might be even worse for other breeding sites where introduced predators are present.

14B3

Conservation status of the Mediterranean shag (*Gulosus aristotelis desmarestii*) in the Adriatic Sea during the non-breeding period: baseline population, trends, threats and knowledge gaps

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The Mediterranean Shag *Gulosus aristotelis desmarestii* is a conservation priority seabird endemic to the Mediterranean and the Black Sea that is considered a valuable sentinel of marine ecosystem health. However, knowledge of its population size and dynamics in the Adriatic Sea is limited. Here, the majority of the population breeds in Croatia but during the non-breeding period a high proportion of birds migrates northwards to the Gulf of Trieste and Venice Lagoon. To understand the size and distribution of the non-breeding population, a first coordinated census was undertaken in 2020 and 2021 in the Adriatic region (Italy, Slovenia and Croatia), which supports 20-33% of the total non-breeding Mediterranean subspecies' population. In 2020 a total of 4,993 birds were counted while in 2021 the count was 4,871. Italy hosted the largest number of birds ($\bar{x}$ = 3,040), followed by Croatia ($\bar{x}$ = 951) and Slovenia ($\bar{x}$ = 941), with most of the birds (c. 69%) roosting on mussel farms. To better understand the non-breeding population dynamics, we conducted an estimation of the 13-year (2010-2022) population trend in the Gulf of Trieste. During this period, the population strongly declined (-44.7%) for reasons yet to be identified. In 2012-2014, a population fluctuation coincided with an exceptionally wet winter and spring at the Croatian breeding colonies. It is possible that changes in migration strategy, such as new migratory routes, by this partial migrant species may have partially offset the decline of birds in the Gulf of Trieste, as the Venice Lagoon population increased during the same period. Overall, the Adriatic population appears to be declining and yet subject to dynamic changes in its non-breeding distribution. To fully understand the reasons behind this trend, further research of both breeding and non-breeding populations is necessary.

14B4

Foraging ranges and breeding success of Common Terns in the Adriatic Sea

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Along the Croatian Adriatic coast, the Common Tern (*Sterna hirundo)* breeds on small, sparsely vegetated rocky islets or artificial structures, usually in small colonies of 5-40 pairs. We monitored breeding success at four colonies in the Northern and Central Adriatic from 2021 to 2023 through regular visits and camera traps (in one colony for two years). In 2023 we used GPS loggers to track four males and five females from two colonies in the North and Central Adriatic to study their foraging range.
Terns were mainly foraging along the coast or in the channel between the islands and the mainland. The mean daily maximum distance from the colony was 13.9 km, with no significant differences between the sexes. These distances are greater than for Common Terns from freshwater sites in Croatia and the German Wadden Sea. The birds most actively foraged during the late afternoon. As along the east Adriatic coast, diurnal winds increase in the mid-day and calm down towards the evening, this foraging dynamics could be the result of birds avoiding foraging among waves. Tracking studies with a finer temporal scale and detailed spatial and temporal data on wind and tidal dynamics are needed to understand the environmental factors that affect the foraging dynamics of Adriatic terns.

Although freshwater lakes were within foraging range, no tracked terns were recorded foraging at freshwater sites. The average daily colony attendance (ratio of GPS locations within a 200 m buffer of the colony) was 0.47, significantly lower than in the freshwater populations. Daily nest attendance was higher for females (males 0.41, females 0.65).
The clutch size was between 2.1 and 2.8 eggs per colony per year. Replacement clutches were common, with no significant difference in the number of eggs between first and replacement clutches. Breeding success was low in all colonies in all years (<0.5 chicks/nest). Disturbance by fishermen and tourists was identified as the main threat. Slightly larger breeding success was observed on more remote islands.

14B5

Assessment of fishing gears interactions on bird species in the Alboran Sea (West coast of Algeria)

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This study is part of the project "Contribution to the inventory, the assessment of the abundance and the highlighting of the impact of fishing gears on Elasmobranchs species in the Gulf of Ghazaouet (Alboran sea– West Algeria)", carrried out in the framework of MAVA Species Project. Its aim was to update the list of Elasmobranchs species and other vulnerable species, such as seabirds, impacted by fishing gears in this part of the Algerian coast.

For this, five main and complementary approaches have been adopted in two ports located in the area (Port of Beni Saf and Port of Ghazaouet), over a period of twenty-two months (from February 2020 to September 2021). All approaches were based on the effective participation of the fishermen communities.

In the case of bird species, the results show that during the study period, the longlines were the gears that caught the highest number of bird species (37 cases). These gears are mostly used by longliners and small-scale vessels. However, bottom trawls did not record any cases of interaction with bird species and only five cases were recorded for purse seiners. Thus, the cases recorded mostly concern marine bird species that usually live in the open sea and only come to the shore for breeding purposes (gannets, shearwaters and petrels).

Among the nine species of birds already recorded in the region, particularly around Rechgoun Island, five species were observed and impacted by the different fishing gear in the present study. These are the Scopoli's shearwater (Calonectris diomedea), Mediterranean shag (Phalacrocorax aristotelis desmarestii), Yellow-legged gull (Larus michahellis), Audouin's gull (Larus audouinii), and Little egret (Egretta gazetta).

In the case of our study, experience has shown that the use of a Participatory Science approach allowed us to accelerate and facilitate the collection of data on vulnerable marine species.

14B6

Bycatch monitoring in the Gulf of Gabes (GSA 14): impact of fisheries on seabirds

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The bycatch of vulnerable species in fishing gear is a key threat for several taxonomic groups, including sea turtles, elasmobranchs, marine mammals as well as birds.
To evaluate the bycatch of marine vulnerable species in the Mediterranean Sea, we performed the Med-bycatch project (2019 – 2022) together with four countries adopting a standardized data collection protocol.
The present work concerns a study of the impact of fisheries on sea birds in the Gulf of Gabes (GSA 14 - Tunisia). For this, we performed 739 fishing days using direct observation and 1678 questionnaires in the area. Monitoring concern trawls, nets, benthic longline and seiners.
Sea birds represent only 0.6 % of the total number of vulnerable specimens captured during observations. It has not been caught by trawl, despite their presence in fishing areas. However, sea birds were caught by small scale vessels using nets and longline. The *Phalacrocorax carbo* is the single species identified. Generally, specimens were removed dead.

14B7

Evaluation of toxicological effects of an oil spill on off the Cap Corse (France): chemical analysis and biomarkers on *Puffinus yelkouan* population

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On October 7th 2018, approximately 15 miles north of Capo Corso (Corsica), a major oil spill occurred as a result of the collision of a Tunisian ferry with a stationary cargo ship. At that time, part of the yelkouan shearwater population had already returned to breeding areas comprising a large fraction of the global population. We evaluated the potential toxicological effects of contamination in the local colonies, assuming that birds were feeding in the area affected by the oil spill.
Three different nesting areas were selected for sampling in the breeding season: Montecristo and Tavolara, hosting a part of the population that feeds in the impacted area, and Capo Carbonara MPA (Villasimius, southern Sardinia), chosen as a control area, being far from the oil spill area. Polycyclic aromatic hydrocarbons (PAHs) concentration, genotoxic and immune system markers were assessed in blood samples collected from 33 breeding adults. In addition, porphyrin levels were measured in feacal samples. Similar levels of low molecular weight hydrocarbons (naphthalene, acenaphthene, fluorene, and phenanthrene) were found in the three areas; these PAHs were also the main components of the *marine fuel oil* spill. The individuals from Tavolara showed the highest levels genotoxic effects, indicating that the presence of PAHs in the surroundings might have caused genotoxic damage to the bird population. Furthermore, the highest porphyrin levels were found in specimens from Villasimius. This study underlines the importance of ecotoxicological studies on endangered seabirds in order to be able to plan management measures for the conservation of the species.

14B8

Prevalence and Abundance of Nest Incorporated Debris of Mediterranean Shags (*Phalacrocorax aristotelis desmarestii*) at Gara Island, Libya

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Anthropogenic debris is swiftly pervading marine environments, posing significant threats to both biodiversity and human well-being. However, effective mitigation strategies remain hampered by limited knowledge regarding the accumulation patterns of these pollutants, both at sea and within marine wildlife. The relative frequency, abundance, types, and potential sources of anthropogenic debris were studied in the nests of Mediterranean Shags (*Phalacrocorax aristotelis desmarestii*) on Gara Island, Libya, an important breeding site for this vulnerable subspecies listed under Annex II of the SPA Protocol. It is hypothesized that Mediterranean shag nests could serve as sensitive indicators of marine pollution surrounding the colony. Utilizing a non-invasive approach, nests were examined after the end of breeding season during August 2022. Photographs of each nest were taken and accurately analysed on a large screen, to identify and quantify types and colours of debris used in the nests.

Results showed that anthropogenic debris was found in 32 out of 63 nests (51%) of the nests, highlighting the pervasive nature of environmental pollution surrounding Gara Island. Plastic ropes and filaments dominated the collected debris (82%), with most prevalent colours: black and blue (24% each), green and white (14% each) and yellow (11%); other colours accounted for 13%. Notably, fishing lines and rubber materials were found in two nests, metal objects (wires) and textile in three, suggesting that Mediterranean Shags readily incorporate diverse anthropogenic debris into their nests as nest decorations, but potentially impacting breeding success and overall health of nestlings. A preference for hard plastics was clear, mirroring the composition of drifted debris observed around the island's shores.

Continued research to understand the full impact of anthropogenic debris on these seabirds and implement effective mitigation strategies is crucial to safeguard vulnerable species and preserve the health of marine ecosystems.

14B9

First assessment of marine litter in marine and coastal birds collected in the Tunisian shoreline

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As part of the Med Marine Litter project coordinated by SPA/RAC and the COMMON
Project coordinated by the INSTM, both supported by European funding, we analysed litter content in stomachs of marine and coastal birds collected along the Tunisian coastline. The work was carried out with the support of several local NGOs active in the area establishing in this way a monitoring network. Birds' corpses were collected thanks to this network all along the Tunisian coast.
The study revealed that for a sample of 10 corpses, including 5 different species, the prevalence of 60% of plastic debris seems alarming. It is also important to point out that these species use different foraging habitats and occupy different trophic levels: the Yellow legged gull feeds on fishing discards offshore, but also on land, in landfill sites and open dumps. Both species of shearwaters *Calonectris diomedea* and *Puffinus yelkouan* are active pelagic fishers that feed only offshore. The Great crested grebe *Podiceps cristatus* and the Little egret *Egretta garzetta* are species of littoral and coastal areas and are mainly piscivorous. The state of the corpses collected sometimes prevented proper collection of the debris due to the decomposition of the tractus. It is therefore likely that the quantities of plastic debris found were underestimated. The number of particles per bird appears to be greater in species that feed in the littoral/coastal zone, in particular in egrets, grebes and yellow-legged gulls.
However, as the sample sizes were quite small, these conclusions should be treated with caution. A study with a larger number of samples is needed to make a more accurate comparison of the species and their respective habitats.
In the framework of this study, the protocol for analysing microplastics has been adjusted and adapted to the case of seabird stomach contents in consultation with colleagues from Wageningen Marine Research who drew up the first manuals for monitoring plastic giant petrel as part of the OSPAR commission. We have improved the results of digestion and the release of samples from their sediment content in order to better recover the microplastic content. The elaboration of specific protocols for plastic assessments in mediterranean seabirds is very encouraged.

14B10

Gulls, Terns, and Skuas of the Mediterranean coast of Türkiye: species, their distributions and long-term population dynamics

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This study summarises the data on gulls, terns, and skuas of the Mediterranean coast of Türkiye, their distributions, and long-term population dynamics. International Waterbird Census (IWC) spanning from 1989 to 2023 (28-year-long data) and e-bird data spanning from 1946 to 2022 (33-year-long data) were used in this study. Birds either found along the Mediterranean coast or inland up to 50 km from the coast were considered as the birds of the Mediterranean population and were included in this study.

A total of 21 different species were identified during IWCs with a total number of wintering birds reaching up to 69,421 individuals, whereas the e-Bird data indicates 27 different species corresponding to two families (*Laridae* and *Stercorariidae*), and 13 different genera (*Chlidonias*, *Chroicocephalus*, *Gelochelidon*, *Hydrocoloeus*, *Hydroprogne*, *Ichthyaeus*, *Larus*, *Rissa*, *Stercorarius*, *Sterna*, *Sternula*, *Thalasseus*, *Xema*).

The gulls, terns, and skuas play a crucial role not only in terms of biodiversity in the Mediterranean but also affect the healthiness of the coastal ecosystems of the Mediterranean Sea, as they show a variety of different characteristics as a resident, long, and/or short-distance summer or winter migrants and interact with the ornitofauna of the region.

14B11

As a sharing of experience: MedBycatch in Turkey

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Bycatch has a negative impact on the fisheries ecosystem, especially on vulnerable marine species, and has gained importance in Mediterranean fisheries in the last decade. Within this context, civil initiatives on monitoring and mitigating bycatch have gained relative momentum. Seabirds, critical indicators of the marine ecosystem's condition, are among the most endangered bird species worldwide. As part of the MedBycatch project, the first comprehensive and standardized monitoring of the Mediterranean ecosystem's impact due to commercial fishing was conducted for four consecutive years. This was achieved using two main methodologies: on-board observation and Local Ecological Knowledge, focusing on the bycatch of vulnerable marine megafauna.

A collaborative approach aimed at understanding the multi-taxa 'bycatch' of vulnerable species in Mediterranean fisheries and testing their mitigation within the synergy of five Mediterranean countries was designed to include 1500 on-board observations and 11000 face-to-face questionnaires. Among the partners of the MedBycatch project, Doğa (BirdLife in Turkey) and DEKAMER, WWF-Turkey were the organizations that implemented the project in the Turkish part of GSA-22 and GSA-24 (GFCM Geographical subareas).

Doğa, who undertook almost half of the on-board observations and surveys during the MedBycatch, created its observer pool and conducted 2642 face-to-face surveys, 99 trawl and 123 on-board polyvalent observations. No seabirds were caught during Doğa’s onboard observations. Another interesting finding from the project is the attitudes of fishers towards seabirds. It would not be wrong to say that fishers do not recognize seabirds as a component of the marine ecosystem. Further studies, mainly focused on pelagic fisheries, may create important outputs for sustainable fishing management. The knowledge generated by the study can provide insight into policymakers, non-governmental organizations and researchers to improve acceptable, less costly and applicable policy interventions for supporting sustainable fisheries.

15A1

Review of the Implementation of the Species Action Plan for Audouin's Gull

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This review evaluates the implementation of the Species Action Plan (SAP) for the Audouin's Gull for the period between 2011 and 2023. Overall, the implementation of the SAP has not been satisfactory, with some exceptions. Eleven of 15 countries delivered information on the SAP implementation. At a later stage, a twelfth country (Senegal) delivered information only on the main current threats for the species. Most progress has been made on ensuring that Audouin's Gull and its habitats receive full protection through national and international legislation, promoting international cooperation and funding from bilateral agencies, designating key sites as protected areas and determining current distribution, especially towards the West of the range, and informing on the population status. There has been little progress on the preparation of national action plans, preventing egg-collecting and studying habitat requirements. Many of these actions were carried out by academic institutions, NGOs and National Agencies.

For the coming future, the actions that are shown to be of highest priority to address are the preparation of national action plans, investigating the feeding ecology and habitat use in winter, studying population dynamics and monitoring fishing activities for possible impact on breeding and wintering populations. Also, more collaborative work is expected in the future.

15A2

Evaluation of Audouin's Gull Species Action Plan – Threats and conservation actions

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Following the evaluation of the implementation of the Species Action Plan (SAP) for the Audouin's Gull for the period between 2011 and 2023, the current and emerging threats for the species were assessed. A total of 12 threats/groups of threats were identified in different levels of importance, with persistent threats such as depletion of food resources, changes in fishing practices, negative interactions from other species, and human disturbance; and emerging new threats such as bycatch, offshore windfarms, and disease outbreaks. A description of the conservation priorities previously outlined on the SAP will be referred to, to encourage the discussion on its effectiveness, and to propose new or revised conservation strategies, taking into account the identified threats and challenges.

15A3

The Audouin's Gull in Catalonia: shifts from pristine dunes to rooftops and harbours

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The Catalan population of the Audouin's Gull (*Ichthyaetus audouinii*) has undergone significant changes in recent decades. The species established itself in the dunes and saltpans of the Ebro Delta in the early 1980s, breeding in a single colony in Punta de la Banya that reached 15,396 pairs in 2006. In 2009, first pairs breeding in Catalonia outside of the Ebro Delta were recorded, and since then, the population has dispersed into several smaller colonies along and beyond the Catalan coast. In 2023, there were only 4,421 pairs breeding in Catalonia, based on direct counts of nests. They were found in six different colonies, with only 2,467 pairs breeding in the traditional colony in Punta de la Banya, Ebro Delta. Moreover, the species has colonized new habitats, enabling this dispersal: there are currently four colonies in Catalonia located in highly anthropogenic environments such as coastal harbours and building rooftops, currently adding up to 1,944 pairs, the maximum since the first case registered in 2010. This shift in habitat presents new challenges for the conservation of the species but also offers new opportunities to be considered in its future recovery plan.

15A4

New record of Audouin's Gull breeding colonies in Tunisia

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As part of a study aimed at improving knowledge of the small islands of northern Tunisia, a quick assessment of the marine and terrestrial compartments was carried out in June 2021 on Fratelli, Pilau, Plane and Cani islands. These sites have different characteristics, and their marine ecological assets have not yet been explored. This study led to the discovery of two breeding colonies of Audouin's Gull *Larus audouinii* on Pilau and Cani Islands. On Pilau, around twenty individuals were counted. Breeding was well advanced, and the fledglings were already a few weeks old. On Cani, 90 adults were counted. Breeding was at various stages: nests with a single egg, two eggs, three eggs, chicks a few days old. A colony of Scopoli's Shearwater *Calonectris diomedea* was also discovered on Fratelli and reproduction was at the incubation stage. We could count 10 nests during the very short visit because of the meteorological conditions.

The updating of knowledge on the four northern islets, located between the Galite and Zembra archipelagos has led to the discovery of two seabird colonies that have not yet been reported. The two species *Calonectris diomedea* and *Larus audouinii* are listed on Appendix II of the Barcelona Convention (SPA/BD Protocol). Future studies are therefore necessary to define their reproductive phenology, to assess the interactions with the other neighbouring colonies (Galite and Zembra) and, at best, to take measures for their protection integrating them in the monitoring system.

15A5

Comparative analysis of the Audouin's gull (*Larus audouinii*) and the Yellow-legged Gull's (*Larus michahellis*) trophic ecology breeding in the Zembra Archipelago

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The Audouin's gull, *Larus audouinii*, a Mediterranean endemic seabird classified as Vulnerable on the IUCN Red List since 2020 and the Yellow-legged gull, *Larus michahellis*, considered as an overabundant and highly opportunistic predator, are two sympatric species feeding on similar resources.

When food resources are very abundant and predictable, competition between these sympatric species decreases and allows coexistence. On the other hand, when they are limited, the absence of trophic partitioning can contribute to increasing the overlap of niches between them and to reinforcing the impact of the Yellow-legged gull on the Audouin's gull.

The aim of this work was to assess the degree of competition between these two gull species breeding in the Zembra Archipelago through stable isotopes analysis. Carbon and nitrogen isotope values were analyzed in the blood and feathers of chicks during the chick-rearing in 2015 and 2016, to assess variations in stable isotope composition, isotopic niches and diet inferred from isotope mixing models.

Yellow-legged gulls showed wider isotopic niches than Audouin's Gulls, with no overlap between their niches. Referring to isotope mixing models, the results showed that the two gull species feed mainly on pelagic fish and the proportion of this prey group was higher in Yellow-legged gulls ((blood: YLG; 97,9%, AG; 88,7% , feathers: YLG ; 97,7%, AG; 75,3% in 2015) and (blood: YLG; 91,2% , AG; 90,4 %, feathers; YLG; 95,6%, AG; 88,6% in 2016)) while non-pelagic fish and cephalopods was higher in Audouin's gulls ((blood: AG; 11,2%, YLG; 2,1%; feathers: AG; 24,7%, YLG ; 2,2% in 2015) and (blood: AG; 9,5%, YLG; 8,7%, feathers: AG; 11,3%, YLG; 4,4% in 2016)). These results suggest that there is a segregation of foraging habitat between the two gull species during their breeding season; Yellow-legged gulls forage more offshore whereas Audouin's gulls forage more in more coastal areas.

15A6

Evolution and Distribution of wintering Audouin's Gull in Morocco (1983-2023)

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Understanding the distribution patterns and habitat preferences of populations during the non-breeding season is crucial for assessing the vulnerability of species to environmental changes, especially those with declining populations. We assessed the winter distribution and abundance patterns of the Audouin's Gull, a vulnerable and endemic seabird of the Mediterranean region, derived from over 40 years of counts (1983-2023) undertaken at roost sites along the Moroccan coast.

From 1983 to 2023, wintering Audouin's Gull were noted in 75 distinct wetlands along the Atlantic and Mediterranean coasts with a maximum of 31 sites in the same year. The population showed large annual fluctuations, from 7 birds in 1983 to 22,150 in 2022, representing approximately 40% of the global population (range 48,000–66,000).

The distribution pattern was fairly constant from year to year. This Laridae exhibits a preference for the coastal wetlands of the Moroccan Sahara, by hosting several thousand birds contributing to over 80% of its national average numbers. On the Mediterranean coast, only a few hundred birds were seen, mainly at Sebkhet Bou Areg (Marchica) and the Moulouya estuary.

Over recent decades, there has been a substantial increase in the number of birds in the south region (between Agadir et Dakhla) mainly at Dakhla bay, Pointe d'Awfist and Cap 7 (Aftissat). The average count, which was 3,648 during the period of 1994-2003, surged in the last decade (2014-2023) to 9,878 individuals. Thus, we argue that this is a globally important area for the species. The distribution observed can be attributed to the presence of the upwelling phenomenon throughout the year in the southern region of Morocco, which explains the abundance of species of the family Clupeidae in this area, which this gull feeds on.

However, it is important to highlight that the population numbers for this species, distributed along the coast, are likely underestimated. This is attributed to the fact that censuses are only carried out at important sites, and the majority of beaches remain unvisited due to the immensity of the Atlantic coastline, exceeding 3,500 km, with over 1,100 km in the southern provinces.

We propose conducting a thorough census along the Mediterranean and Atlantic coasts of Morocco at least once every 9 years, aligning with the estimated generation duration of 8.1 years. This comprehensive approach involves monitoring various indicators to gain insights into spatial distribution and to identify disturbances affecting the species. Given the global importance of the population wintering in Morocco, measures to protect marine feeding areas and roosting sites should be implemented as a priority. Further research is needed to assess the actual size of the Moroccan wintering population of Audouin's Gulls and its conservation status, as well as the threats it faces.

15A7

Future collaboration for the monitoring of new breeding colonies of L. audouinii in Tunisia using IMAP Protocol

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As part of a study aimed at improving knowledge of the small islands of northern Tunisia conducted in June 2021, two breeding colonies of Audouin's Gull (*Larus audouinii)* have been recorded for the first time on Pilau and Cani Islands, as well as a colony of Scopoli's Shearwater (*Calonectris diomedea*) on Fratelli. These recent discoveries improved the knowledge on the Tunisian breeding sites of these two species listed on Appendix II of the Barcelona Convention (SPA/BD Protocol). Future studies are therefore necessary to define their reproductive phenology, to assess the interactions with the other neighbouring colonies (Galite and Zembra archipelagos) and, at best, to take measures for their protection integrating them in the monitoring system. Monitoring of these colonies should therefore be considered within the implementation of the national seabirds IMAP (Integrated monitoring and assessment programme) planned in the future.

It should be noted that the successful implementation of this programme and its related recommendations will depend on a broad national collaboration between administration, MPA managers and scientists as well as on a synergy between regional programmes and initiatives (PIM, IMAP, IWC, etc.). Moreover, this will contribute to the development of a common and harmonised monitoring strategy for all the breeding sites.

15B1

The breeding Ecology of the Kentish plover (*Charadrius alexandrinus*) in Tunisia

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Shorebirds worldwide are facing a concerning decline due to climate change, habitat degradation, and heightened predation. The selection of nesting sites plays a crucial role in influencing predation risks, thermal conditions for developing embryos, and overall breeding success in ground nesting birds. Thus, understanding the breeding biology and nest selection of shorebirds is essential to help protect these bird species from threatening factors. In this study, we present for the first time an assessment of the abundance, distribution, nest characteristics, and habitat preferences of the Kentish plover in North Africa, specifically along the Eastern coast of Tunisia during 2022. Additionally, we conducted a mate removal experiment in order to investigate the nest site preferences of male and female Kentish plover parents using a sample of 25 pairs.

Our study observed the breeding ecology of Kentish plovers at the Mahres fishpond site, demonstrating its potential as a significant location for future ecological and behavioural research on these birds in Tunisia. The nest predation emerged as the primary cause of nest failures, with approximately 58% of nests falling victim to avian and mammalian predators, including red foxes, harriers and gulls.

Moreover, Kentish plovers tend to select locations with low vegetation cover, despite a wide variation ranging from 0% to 100% cover over nests. In addition, it has been determined that seasonality played a significant role in nest cover choice, showing an increasing trend towards lower cover as the breeding season advanced.

Furthermore, our experimental findings indicated no significant difference between male and female Kentish plovers in their selection of nest cover, suggesting a shared strategy in nest site preferences. Intriguingly, our analysis revealed that males that were second released parents tended to opt for higher nest cover compared to first released males.

In terms of conservation and awareness-raising efforts, our experience demonstrated a notable inclination among the local population to actively cooperate, express interest in preserving coastal ecosystems, and effectively contribute to conservation efforts after being informed about the significance of protecting birds and regional biodiversity.

15B2

Which wetlands should be protected in Tunisia to effectively secure wintering and stop over sites for the Kentish Plover *Charadrius alexandrinus* Mid-winter counts 2002-2021

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Kentish Plovers, Charadrius alexandrinus, are familiar and common in Tunisia, where they breed and are also observed throughout the year. They are mainly recorded in the coastal zones of central and southern Tunisia, notably in the Gulf of Gabes, which is unique in the Mediterranean for its tidal range of up to two meters. Up to 11,000 individuals were observed wintering or on passage through this shallow tidal flat area. They are also observed on a regular basis, although in lesser numbers, in freshwater habitats in north Tunisia.

Between 2002 and 2021 the Kentish Plover was wintering or stopping over in 142 Tunisian wetlands, 29 of which at least hosted 1% of the wintering population in Tunisia over the last 10 years and can be considered sites of national importance for the species.

This paper shows the evolution of annual abundance during these years, their spatial distribution and fluctuations. It also gives the trend estimation of the species over the last 20 years and by using 20 covariates (such as latitude, longitude, altitude, distance between sites and the nearest city, distance between sites and the coastline, amount of winter precipitation, area, northwest temperature anomaly in spring, northeast temperature anomaly in spring, etc.) in an imputation model which may influence the presence and numbers of Kentish Plover in Tunisian wetlands.

Therewith, the authors aim to draw attention to the most important wetlands (wintering areas and stopover sites) needing an effective protection to effectively conserve at least 90% of the wintering population of the Kentish Plover in Tunisia.

15B3

Waders of the Mediterranean coast of Türkiye: Inventory, distribution and long-term population dynamics.

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This study summarises the results of wader distribution on the Mediterranean coast of Türkiye and long-term population dynamics. International Waterbird Census (IWC), spanning from 1962 to 2023 (33-year-long data) and e-bird data spanning from 1946 to 2022 (33-year-long data) were used in this study. Birds either found along the Mediterranean coast or inland up to 50 km from the coast were considered as the birds of the Mediterranean population and were included in this study.

A total of 35 species belonging to five families (Burhinidae, Charadriidae, Haematopodidae, Recurvirostridae, Scolopacidae) were identified during IWCs with a total number of wintering birds reaching up to 195,872 individuals. Whereas the e-Bird data indicates six different families (Burhinidae, Charadriidae, Glareolidae, Haematopodidae, Recurvirostridae, Scolopacidae) and 54 different species.

The waders play a crucial role not only in terms of biodiversity in the Mediterranean but also affect the healthiness of the coastal ecosystems of the Mediterranean Sea, as they show a variety of different characteristics as a resident, long and/or short-distance summer or winter migrants and interact with the ornithofauna of the region.

15B4

Impact of breeding site management on the conservation of larids in southern France

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Over the last few decades, several small colonial Laridae species have been declining along the French Mediterranean coast. Five of these species are listed in Annex II of the Barcelona Convention, two of which have an unfavorable conservation status in France (Slender-billed *Gull Chroicocephalus genei*, VU; and Sandwhich Tern *Thalasseus sandvicensis*, NT). Although there are various explanations for this decline, the quality of nesting sites seems to have had a major impact on the trends observed. As a result, a major program to restore and create high-quality nesting sites was launched in the late 2000s as part of various conservation schemes. Almost, 154 nesting sites were created or restored between 2006 and 2015 (473 large islands, 93 small island sand 11 raffs). They have been designed according to the needs of each species to optimize their attractiveness and encourage breeding success while avoiding becoming ecological traps. Monitoring carried out in parallel with the management of the nesting sites has shown that these sites are highly attractive to the target species, with better breeding success than the other sites available. In addition, all species studied showed a strong increase in breeding numbers over the period considered (2010-2022). In conclusion, the creation or restoration of artificial breeding sites has proved to be of great interest for the conservation of Laridae species in southern France.

15B5

Overview on the population trend of the Greater Flamingo in North Africa and the breeding population in the Mediterranean Region

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Tour du Valat has been coordinated the Mediterranean Waterbirds Network (MWN) since 2013, a collaborative network between North African countries, and the OFB (French Office of Biodiversity) aimed at supporting and the improvement of the quantity and quality of North African International waterbird censuses (IWC). It allows to improve the overall global monitoring program, dedicated to wetland conservation and implemented through the AEWA (African-Eurasian Waterbird Agreement) and the Ramsar Convention.

Here, we take advantage of the consolidated database to show how it allows us to derive the population trends of the Greater Flamingo, *Phoenicopterus roseus*, in North Africa over a period of 30 years. We rely upon a new statistical method, called LORI (Low-rank imputation method), that helps to evaluate some of the environmental parameters that may influence the observed trend.

Finally, we put these results in perspective with the monitoring of the breeding numbers at the Mediterranean scale in the last 20 years.

15B6

The birds of the island of Djerba: attempt at description and geographical interpretation

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The observation and conservation of birds around the world is a field practically reserved for ornithology specialists. However, the growing challenges facing avifauna, highlighted in particular in BirdLife reports, require the motivation of many people and the involvement of different scientific disciplines. The communication aims to present the experience of a geographer who came late to bird observation and data interpretation, taking into account all the richness and relevance of the geographical approach. Thus, socio-spatial dynamics, climate changes and economic developments will be taken into account in the current state of the avifauna in Djerba.

15B7

Conservation Osprey: A Comprehensive Plan for Safeguarding Ospreys and Marine Avifauna in Al-Hoceima National Park (Morocco)

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The Osprey (*Pandion haliaetus*), a diurnal raptor species belonging to the order Accipitriformes and the family Pandionidae, is the sole living representative of the family and genus, with four identified subspecies. In Morocco, the nesting population of Ospreys, estimated at 15 pairs (Royaume du Maroc, Plan d'Action National du Balbuzard pêcheur ANEF and AGIR, Expertise France 2022), is located along the Mediterranean coast within the Al-Hoceima National Park (PNAH), spanning 40 km of coastline. Having experienced a one-third decline over 20 years, human activities, especially illegal fishing, pose the primary threat to the Osprey population.

Conservation measures, implemented by park partners, have addressed some factors affecting Osprey conservation, improving knowledge about the species. However, the population remains fragile and locally highly threatened. Establishing an appropriate conservation strategy for the restoration of this emblematic Osprey population in the park is a top priority for park managers, environmental organizations, and local authorities.

To guide and plan conservation actions, the National Water and Forests Agency, in collaboration with the AGIR Association, organized a workshop in Al Hoceima on November 30 and 31, 2022, under the "Ghabati-Hayati" program to develop a national action plan for the conservation of the Osprey. The plan aims to ensure the conservation and development of the current breeding population, preserve habitats, and address direct and indirect causes of disturbance, mortality, or reproductive failure, through the identification of specific measures to be implemented by each stakeholder. The plan spans a 5-year duration (2023 – 2028) with the goal of increasing the number of breeding pairs within the Al-Hoceima National Park.

The implementation of this action plan requires the establishment of a framework for consultation and partnership, defining the intervention modalities of the various national actors to strengthen monitoring and surveillance capacities within the national park. In addition, it should be noted that this program also encompasses activities for the monitoring of other seabird species, such as Audouin's gulls and petrels, within the framework of the Integrated Monitoring and Assessment Program (IMAP) that exists in the Al-Hoceima National Park.

The aim of this presentation will be to present the latest available data on the conservation status of the species and its threats, to present this Osprey Action Plan, the main conservation actions agreed, how it will be implemented, and the results

15B8

Breeding status of Eleonora's Falcon (*Falco eleonorae*) and irruptions of Razorbill (*Alca torda*) on the Mediterranean coast of Algeria

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The avifauna of the Algerian coast has recently experienced changes in the composition of its community, as well as in the dynamics of certain populations. This would be due to variations in these populations across the world, linked to extreme weather conditions in the North Atlantic and destructive anthropogenic action. Unfortunately, data concerning the ecological status of coastal, and seabirds remains sparse. In this communication, we will present new data concerning the recent irruption of the Razorbill (*Alca torda*) across the entire Algerian coast, as well as the update of the populations of Eleonora's Falcon (*Falco eleonore*).

The censuses carried out by different observers, using the necessary optical equipment, allowed to count, in November-December 2022, 36 razorbills, including 26 alive specimens, observed within harbors; and 10 individuals washed up on the beaches. None of the bird carcasses observed showed signs of oil contamination or visible injuries. The razorbills recorded are distributed from east to west of the Algerian coast and represent only a portion of the actual population wintering in the region.

Furthermore, until 2017, the reproduction of Eleonore's Falcon in Algeria was only represented by 7 colonies hosting 234 pairs, including 120 pairs on the East Coast and 114 on the West Coast. The latest censuses of this species, carried out after 2017, report 9 colonies sheltering 239 pairs on the east coast and 206 pairs on the west coast. The breeding population is therefore estimated at 445 pairs representing approximately 3% of the world population and 76% of the southern Mediterranean.

15B9

Impact of fishing activities on seabirds in the coastal Mediterranean lagoons, Egypt

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Human activities including fishing, oil spills and the expanding ocean economy and climate change are threatening seabird populations. Competition with fisheries and incidental capture in fishing gear are the major current threats for seabirds at sea. Fishing is a traditional activity in Egypt and is composed of both industrial and artisanal fleets with about 85% of them being small vessels less than 12 m length. The Egyptian Mediterranean coast exhibits six lakes or lagoons which are situated along the Nile delta coast (Northern delta lakes: Manzalah, Burullus, Edku and Mariut) and to the east of the Suez Canal (Port-Fouad and Bardawil). All of them, apart from Lake Mariut, are directly connected to the sea. The lakes and wetlands in the coastal region of the delta represent an important ecosystem for migratory water-birds, as they represent the winter home for thousands of migratory birds such as gulls, flamingo, terns, and cormorants. Gillnets, trammel nets, traps, hooks and lines are usually used in the coastal lagoons and lakes and their by-catch in respect to seabirds was never assessed before. Searches about the impact of the Egyptian fishing fleet on seabird populations are very rare and we need to fill the gap in knowledge about these impacts. Also, bycatch should be assessed in the coastal waters as well as understanding the feeding habits and grounds of these birds could help in arranging better protection strategies from the hazards they may face at sea. More efforts should be paid to ensure fish stocks are managed to take seabirds into account and to protect important seabird habitats.

15B10

AN UPDATE ON THE STATUS OF LESSER CRESTED TERN COLONIES IN LIBYA: A FIELD RINGING CAMPAIGN AT GARA ISLAND

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The Lesser Crested Tern (*Thalasseus bengalensis emigratus*) is an endangered seabird taxon listed under the SPA species protocol. The most important breeding population is located on three coastal islands in Libya, namely Elba, Jeliana, and Gara, where adult terns arrive in groups between June and July to breed. To update the status of these colonies, a field mission was conducted during August 2023 (later than usual due to administrative constrains). Unusually the colonies of Elba and Jeliana were deserted, and no breeding occurred based on monitoring during June and July, possibly due to a high disturbance level by illegal hunters in Elba and development works at Jeliana. At the Gara colony the most important and largest among all, the breeding status was assessed as normal, with over 2000 breeding pairs teeming the island. A total of 168 nestlings, between 10 and14 days old, were successfully ringed using coded colour rings (PVC) and Metal rings. In previous seasons 1354 fledglings were ringed, and 80 were resighted (5.91%) either in breeding areas, or during migration to west Africa for wintering. In this campaign two local NGO volunteers were trained on the ringing campaign process, to allow them to have a larger role in the monitoring and conservation of the site in the future. The successful ringing campaign at Gara Island highlights the importance of collaborative conservation efforts. The situation of the colonies on Elba and Jeliana needs further investigation in the coming seasons, to determine the reasons for desertion, and a call to the local authorities to take action to protect these sites. The collected data will contribute to ongoing research and inform future management strategies for the Lesser Crested Tern population in Libya. This work was financially supported by UNEP-MAP-SPA/RAC through the French Voluntary contribution.

SIDE EVENTS

SE1

The Mediterranean Action Plan for the conservation of bird species listed in the Annex II of the SPA/BD Protocol: what has been done so far? what still needs to be done?

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The Mediterranean Action Plan for the conservation of marine and coastal bird species listed in the Annex II of the SPA/BD Protocol, identifies priorities and activities that need to be undertaken to attain its specific objectives. It also urges and encourages co-ordination, cooperation, and collaboration amongst Mediterranean states to work towards the achievement of conservation of a species or a group of species within this region. The Action Plan was adopted by the Contracting Parties to the Barcelona Convention in 2003 as a response to growing international concern about the status of marine and coastal birds in the Mediterranean and the need to maintain/restore populations of such species at a favourable conservation status and to ensure their long-term conservation , It has been updated three times and adopted by the respective Contracting Parties meetings: COP 18, 2013 (Decision IG 21/5,); COP 20, 2017 (Decision IG.23/08,) and COP 23, 2023 (Decision IG.26/6, 2023)

The steps taken for the updating the Action Plan included checking to which extent each action/activity is achieved and identifying potential mitigation measures for its further implementation if necessary. This was done through a questionnaire filled in by the Contracting Parties where each action was examined in comparison. The questionnaire was tailored to address each action listed in the current action plan, identifying the level of progress achieved by each country, as well as by international and regional organizations, and assessing the impact of protection on the target species of the Annex II.

SE2

Medmaravis' revival: is a dedicated association possible/needed in the current scenario of seabirds conservation in the Mediterranean?

Lead by Hichem AZAFZAF and Nicola BACCETTI,

with the un-foreseen participation of Fabrizio BORGHESI

This symposium offers us a key opportunity to discuss limitations and benefits of the existence of a Mediterranean seabird association in years when many contrasts have arisen. Medmaravis, born in the mid-eighties of the last century, was far-sighted in creating its own niche, on a subject which soon became crucial for many different overlapping initiatives by governments, EU, conventions, other (stronger) NGOs, universities and not last citizen science. A brief history of the association, its links with SPA-RAC and current administrative difficulties will be discussed, in presence of some of the Medmaravis founders and pillars. Those who are no longer with us will be remembered. An open jam session, probably chaotic but fully Mediterranean-style, is the expected output of this side event.

POSTERS

PO1

National Action Plan for Conservation and Management of the Water birds on the Egyptian Mediterranean Coasts and Water

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The Mediterranean Coastal area of Egypt is one of the areas where several natural and man-made wetlands, lakes and small islets are present. These habitats provide ecosystem services to several hundred species of birds, including resident and migratory waterbirds. The area is also one of Egypt's highly populated areas, and anthropogenic pressures including coastal development are threatening the natural ecosystems in an increasing trend, apart from other threats such as pollution and sea level rise, and above all unsustainable and illegal hunting of birds.

Based on the above, the EEAA has established a national programme focusing on coastal birds and their habitats within the Monitoring programme for marine biodiversity that based on the Integrated Monitoring and Assessment Programme (IMAP), to rescue the remaining ecosystems for these species; it was necessary to prepare an integrated management plan for resident and migratory waterbirds along the Egyptian Mediterranean coast, especially those listed in the annexes of the SPA/BD protocol, and to determine the current status of these species, the threats they face, and the objectives and priorities of protection, in addition to involving local partners and stakeholders.

This action plan is prepared to provide the governmental, scientific, and non-governmental bodies the road for several actions related to increasing the awareness of locals on the ecosystem services provided by birds, the need for a national census of wintering and breeding waterbirds, and contribute to the establishment of new MPAs in the future, to reach the post-2020 SAP BIO goals, the post-2020 Global Biodiversity Framework (GBF) and 2030 sustainable development goals.

PO2

A summary and suggestions for monitoring seabirds and marine plastic waste in Morocco – Case of the Moroccan Atlantic Sahara

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Plastic pollution of the maritime environment is a well-acknowledged problem with significant negative effects on the environment, economy, and aesthetics. Through entanglement, nest integration, and ingestion, a variety of marine species come into contact with plastic garbage, which can have detrimental effects. To date, there hasn't been much work done in Morocco, a region that is home to multiple seabird species and/or intersects with their flyways. To evaluate plastic wildlife research to gain a better understanding of the spatiotemporal variance in the effects of marine plastic on various seabird species, we undertook a synthesis of the literature and social media to gather data on all known documented incidences of plastic ingestion and nest inclusion by this group to better understand seabirds and marine plastic in southern Morocco. Out of the 27 seabird species that are frequently found in Southern Morocco, 5 (18%) showed signs of having consumed plastic. Regarding nest incorporation in Morocco, no published information could be located. From some studies that reported on ingestion in nearby regions, sample sizes were either too small or not reported for many species, suggesting that our knowledge of the present prevalence of plastic ingestion and nest inclusion for the majority of species is very limited. This synthesis identifies significant gaps in our existing understanding, and we suggest coordinated cooperation to acquire a more thorough and up-to-date understanding of how Mediterranean and Atlantic seabirds are being impacted by marine plastic.

PO3

Rescue from plastic pollution and protection of seabirds in the marine protected area of Sazan Karaburun Vlore

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The Karaburun Sazan Marine Protected Area is the first marine protected area created along the Albanian coast. This area is known for its high and unique marine biodiversity values and great importance in terms of sustainable development potential for the region of Vlora. Hundreds of wild birds live and travel in this protected area, a good part of them are listed in the red list of IUCN and Albania. During the years 2014-2023, the staff of RAPA Vlora recorded over 79 cases of birds suffering from plastic suffocation, as a result of micro plastic or macro plastic suffocation. The main species found were: *Anser anser, Gallinago gallinago, Anas clypeata, Anas querquedula, Anas crecca, Anas penelope.* In cooperation with the Faculty of Veterinary Medicine, Wildlife Health Cabinet, about 33 cases have been saved. This has been realized through the intervention of the Wildlife Health Cabinet team and the involvement of a few students who attend the 5th pre-graduation course for veterinary physician, who have saved around 33 birds choked with plastics. This is also thanks to the voluntary work of the students and the contribution of the Royal Albania Foundation (RAF), a foundation that supports the nature and fauna. This is a new initiative that is continuing through the contribution of the students of the Faculty of Veterinary Medicine, the staff of RAPA-Vlore and the contribution of the RAF volunteers, contributing to the return to nature of birds found drowning in plastics.

PO4

Factors affecting the offshore distribution of Yelkouan Shearwaters in the northwestern Adriatic Sea: insight from machine learning

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The Yelkouan Shearwater *Puffinus yelkouan* is endemic to the Mediterranean and Black Seas and is classified as Vulnerable in the IUCN Red List. Most information on its distribution and habitat use comes from telemetry tracking of single individuals and land-based studies at nesting sites, whereas few studies have been based on direct visual observations conducted offshore. Information on the species' distribution and habitat use in the eastern Mediterranean is scant. Land-based studies suggest that the northern Adriatic Sea represents an important area for moulting, feeding and passage during the interbreeding period; however, the species' distribution at sea is unknown. Based on visual surveys conducted from small boats between April and October 2018–2022 (total effort: 169 days and 23,836 km), we provide information on 1) the occurrence of Yelkouan Shearwaters within a study area of 3000 km^2 off the region of Veneto, Italy, in the northwestern Adriatic Sea; and 2) the geographic, bathymetric and oceanographic variables likely to drive the species' offshore distribution in this area. Yelkouan Shearwaters were observed in all months during the study period (except in April, when effort was lower). They were encountered on 66 days, for a total of 238 sightings including 916 individuals, in waters 9–33 m deep, between 2 and 24 km from the coast. Individual counts ranged between 1 and 100 (mean 3.85, SD 8.33, mode 1), with 95% of the encounters having less than 10 individuals. When the birds were spotted, behaviour was recorded as "flying" (75%) or "sitting on water" (25%). An Explainable Boosting Machine model—a machine learning technique based on generalized additive models, specifically designed to produce interpretable models for high dimensional datasets—selected chlorophyll *a* as the most important variable to explain the species' occurrence, followed by distance from the coast, and bottom depth. The model indicated a higher occurrence in waters with chlorophyll *a* less than ~2.3 mg/m^3, farther than ~15 km from the coast, and deeper than ~22 m. The effects of sea surface temperature, salinity, and day of the year were less clear. This study provides insight into the offshore distribution of Yelkouan Shearwaters, within one of the Mediterranean areas most exposed to cumulative human threats.

PO5

Monitoring Marine Bird Populations in Libyan Coastal: Insights for Assessing Good Environmental Status in MPAs and high-pressure areas

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Implemented within the framework of the national Integrated Monitoring and Assessment Programme (IMAP), marine bird monitoring aligns with the overarching goal of achieving Good Environmental Status (GES) for the Mediterranean Sea and its coastal regions. The focus lies on IMAP Common Indicators related to Seabirds, specifically CI3 (Species distributional range), CI4 (Population abundance of selected species), and CI5 (Population demographic characteristics).

This study presents data collected during monitoring activities at four selected sites along the Libyan coast. Two of these locations, Tripoli coast and Gulf of Sirte (Gara island), face human pressure, while the other two, Farwah Lagoon in the west and Ain Al-Ghazaleh marine protected area in the east of Libya, are designated as marine protected areas (MPAs).

Using both techniques point observations by spot scope and/or binoculars and drone footage, the team conducted the work on two phases. The first phase aimed at counting the total number of individuals following the International Waterbird Census (IWC) standardized monitoring and in cooperation with the Libyan team of wintering water bird census. During the second phase, focus was made on medium colony census to survey the targeted sites during the nesting season, The study continued from the beginning of January 2022 to the end of May 2022.

Although the bird survey took note of all the seabird species, the study focussed on the 10 IMAP indicator species of which only *Phalacrocorax aristotelis desmarestii*. *Larus audouinii, Larus genei, Thalasseus bengalensis, T. sandvicensis, Puffinus yelkouan*, species were recorded in Libya. During the wintering season, for a total four of observation points, 38 species of seabirds have been sighted for a total of 18,018 individuals. Breeding season monitoring in the Gulf of Sirte Gara Island spotted 24 nests and 600 individuals of Lesser Crested Tern *T. bengalensis.* Colonies of nesting shags *Phalacrocorax aristotelis desmarestii* were spotted in both Gulf of Sirte (Gara island) with 68 nests and 216 shags, and in Ain Alghazala MPA 66 nests and 170 shags. Illegal hunting is still considered the main threat to birds in Libya, and the absence of some protection measures in important sites for bird migration and nesting sites has had an impact on the decrease in bird numbers.

PO6

When Morocco's Mediterranean MPAs become the main conservation tool for seabirds

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The objective of the study is to evaluate the management effectiveness of the different categories of MPAs implemented in the Moroccan Mediterranean Sea and its impact on the conservation of marine biodiversity with a focus on marine and coastal birds. The methodology used is based on the evaluation of a certain number of criteria and key elements. The criteria for evaluating these MPAs vary depending on the categories of each MPA, its specific objectives and conservation priorities. The approach adopted to inform these evaluation criteria boils down to a detailed analysis of documents related to these indicators, but also to discussions with national stakeholders concerned by the ecology of marine birds, by the integrated management of coastline and its artificialization and by MPA managers. All of the general criteria often used to assess the effectiveness and impact of marine protected areas listed below are relevant:1) Establishment and expansion of the MPA Network; 2) Zoning and Spatial Planning of each of the MPAs with varying levels of protection; 3) The degree of integration and governance of MPAs; 4) The degree of collaboration of populations and partners; 5) Degree of artificialization of the coastline surrounding the MPA; 6) Capacity Building; 7) Application of the Regulations; 8) Monitoring and control; 9) Scientific Research and Monitoring; 10) Technological Innovation; 11) Sustainable Tourism to minimize negative impacts; 12) Education and Awareness; 13) Degree of integration of adaptation strategies to Climate Change.

This attempt at evaluation, although it remains largely perfectible, made it possible to classify MPAs according to their degree of effectiveness and hence their significant contribution to the conservation of marine biodiversity and the preservation of crucial habitats for marine and coastal birds.

PO7

Seabirds Monitoring in the Egyptian Mediterranean Coast in the frame of the IMAP – MPA project in Egypt

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Because of Egypt's unique, strategic geographical position along migration routes of Palearctic birds wintering in Africa, many Palearctic species migrate through Egypt in internationally significant numbers. Many of these species are included in the SPA/ BD sea bird's annex.

Of the Mediterranean coastal wetlands, the most important are the six major coastal lagoons on the Mediterranean: Bardawil, Malaha, Manzala, Burullus, Idku, and Maryut. The remainder of the Egyptian Mediterranean coast is of rather limited importance for birds. Two of these important wetlands for sea birds have been declared Ramsar Sites along the Egyptian Mediterranean coast.

The programme of monitoring of sea birds in the Egypt Mediterranean coasts has been implemented in the framework of the EU-funded project "Towards achieving the Good Environmental Status of the Mediterranean Sea and Coast through an ecologically representative and efficiently managed and monitored network of Marine Protected Areas" (referred to as IMAP-MPA project). The IMAP monitoring requirements focus on, based on agreed common indicators, parameters that are indicative of the state of the environment, the prevailing anthropogenic pressures and their impacts, and the progress towards a good environmental status (ecological objectives and targets).

The bird monitoring programme was implemented during the winter periods of the IMAP- MPA project along the Egyptian Mediterranean coast. Fourteen species listed in the SPA/ BD sea birds annex have been recorded.

PO8

Surveillance of avian influenza virus in some wild birds in Egypt

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This study aimed to assess the presence and virulence of H5N9 and H5N1 avian influenza viruses in wild bird populations in Egypt. Passerines and egrets showed no positive samples, indicating a low prevalence of these viruses in these bird groups. However, highly virulent isolates of H5N9 and H5N1 were predominantly detected during the winter season, particularly in the years 2017 and 2018, which recorded the highest percentages of positive samples compared to subsequent years (2019, 2020, and 2021). Wetland sites exhibited higher infection rates than other sites, suggesting a potential association between avian influenza transmission and wetland habitats. Although, our study did not find strong evidence to support the significant contribution of asymptomatic infected wild birds in the spread of H5N1 virus in Egypt, supporting previous data on the negligible role of wild birds in disseminating highly pathogenic avian influenza. However, further investigations are recommended to better understand the potential role of migratory/wild birds as asymptomatic vectors for the highly virulent H5N1 avian influenza virus in Egypt. Continuous monitoring of migratory/wild birds for avian influenza viruses is crucial to detect the introduction of new populations into the country, as genetic shifts could lead to the emergence of new pandemic strains with significant implications for public health. This makes seabirds wintering or breeding in Egypt in risk of infection, that can lead to mass mortality and impact Egyptian populations of these seabirds, including those protected under SPA protocol. Our study provides insights into the epidemiology of avian influenza in Egypt and highlights the need for additional research to address the important environmental, health, and social implications associated with this issue.

PO9

Investigation into the exceptional presence of the Rozorbill along the Tunisian coast

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The Tunisian coastline is known for its pelagic avifauna diversity, which occupy various marine ecosystems throughout the year. In addition to the eight pelagic bird species regularly encountered during breeding and wintering seasons, we exceptionally recorded an occasional species, the Razorbill Alca torda. This accidental occurrence was due to stormy weather conditions in the Atlantic which have pushed back a significant number of Razorbill specimens into the Mediterranean basin, including our Tunisian coasts. In order to understand this phenomenon and explain this recent remarkable irruption, monitoring across the entire Tunisian coastline and offshore and specifically on fishing ports and beaches, was carried out during November and December 2023. Throughout our campaign (45 days with 60 participants and specialists) we documented a total of 89 individuals observed, including 32 individuals washed up on the beaches.

PO10

Inventory of seabirds in the Park National of Gouraya and Lake Mezaia, Bejaia, Algeria.

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An inventory study was carried out between September 2021 and August 2022 in order to collect more information on the seabirds of the Park National of Gouraya and Lake Mezaia.
This study made it possible not only to appreciate the avian importance of these sites but also to gather more data on the appearance of their activities and behaviors. By combining the results of this inventory with previous studies, a total of 12 species recorded in the coastal zone of the Park National of Gouraya and Lake Mezaia, this birds belonging to 06 different families: Sulidae, Phalacrocoracidae, Procellariidae, Phaethontidae, Laridae and Sternidae.
The inventory carried out on two sites showed the existence of protected species such as the Northern gannet, Eastern gull, Great crested cormorant, and Great cormorant.
These study sites are favorable places for birds which play a role in the ecological balance and are also true indicators of the good health of these ecosystems.

PO11

New breeding sites of Little Tern *Sternula albifrons* and Kentish Plover *Charadrius alexandrinus* in Cirenaica, Libya

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A total of 23 coastal wetlands and islets of Cirenaica, Libya, were irregularly visited during the last 4 years in the breeding season. Kentish Plovers were present in 14 of them, Little Terns in 10, while 10 sites hosted both species and 9 none of them. Maximum number of pairs per site was 20 for Kentish Plover at Gsibaia and 16 for Little Tern at Ain Al Wahsh in Bumbah Gulf. Breeding of either species was previously unknown in 19 sites overall, according to the main reference text of Isenmann et al.

PO12

Temporal Dynamics of the Population and Nesting of the Little Egret (*Egretta garzetta*) on the Kuriat Islands (2018-2023)

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The Kuriat Archipelago is a high-valued ecosystem area, nationally and internationally. This archipelago is characterized by its rich biodiversity, culture and heritage. It is home to endangered and / or protected species such as the loggerhead turtle, the Posidonia Seagrass and marine birds. In 2020, a total of 99 species of marine and terrestrial birds were recorded on the Kuriat Islands. Through continuous monitoring, the number of species increased to 110, encompassing migratory and endemic species. Among the endemic and nesting species of the Kuriat Islands, the Little Egret (*Egretta garzetta*) stands out. The winter bird census involves regular visits with techniques such as fixed listening points, ensuring reliable results by recording the present species and their behaviors. It was observed that between 2020 and 2023 on these islands, there were variations in the number of Little Egret individuals, with a winter average of 98 individuals.

The nesting monitoring of the Little Egret primarily focuses on small wooded areas, especially among thorny bushes, providing protection against predators. Two historically favorable nesting zones, specifically located on Petite Kuriat, are targeted during this surveillance. In 2018, the first nesting signal of the species was recorded with the discovery of 16 nests on little Kuriat, highlighting the gradual establishment of the Little Egret in the site. In 2020, the population reached 448 individuals, accompanied by 125 recorded nests, marking a significant expansion. Subsequent monitoring in 2021 reveals the presence of 186 nests. In 2022, the number of nests continued to increase, reaching 230, and new colonies were observed in the northwest zone. In 2023, although the population remains present with 108 nests, the complete absence of a colony could be attributed to weather conditions, climate change, and/or early mass tourism activity this year.

Furthermore, the possibility of diseases affecting the Little Egret population on the island cannot be ignored. These results underscore the importance of closely monitoring ecological dynamics for effective conservation of this species on the small Kuriat Island.

PO13

Seabird Bycatch in Portuguese mainland waters: fisheries, season and species of concern in the case studies in Algarve and Aveiro-Nazaré regions

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Bycatch resulting from fishing activity is one of the most serious threats to marine megafauna (i.e., seabirds, cetaceans and sea turtles). Particularly with regard to seabirds, around the world, annually hundreds of thousands of individuals of various species are bycaught in different fishing gears. This phenomenon has different intensity and depends on the type of fishing, area and time of year. Even knowing this problem, for Portuguese continental waters there are no estimates of the bycatch rate and average removal values for specific species.

In Portugal, for the Eastern Algarve and for the Special Protection Area (SPA) Aveiro-Nazaré, within the scope of the LIFE Ilhas Barreira (2019-2023) and LIFE PanPuffinus (2020-2025) projects respectively, efforts have been made to obtain more data regarding this serious threat. In both areas, using in person questionnaires to fishermen, it was possible to fill in information gaps for these areas.

In 2.5 years, for the Algarve, 888 questionnaires were carried out in seven fishing ports (Quarteira, Olhão, Culatra, Fuseta, Tavira, Cabanas de Tavira and Monte Gordo) to vessels operating trammel/gillnets and purse seine. 109 captured seabirds were reported, among the most affected was the northern gannet *Morus bassanus*, the great cormorant *Phalacrocorax carbo* and gulls *Larus* spp. Most catches were recorded in winter and autumn (bycatch rate = 0.006 and 0.005 birds/fishing days, respectively) and in purse seine (bycatch rate = 0.007 birds/fishing days). In the SPA, in 2 years, 311 questionnaires were carried out in three fishing ports (Nazaré, Figueira da Foz and Aveiro) on vessels operating different fishing gears. 1112 seabird captures were reported, among the most affected were the northern gannet, the common murre/razorbill *Uria aalge/Alca torda*, gulls and the Balearic shearwater *Puffinus mauretanicus*. Most catches were also recorded in winter and autumn (bycatch rate = 0.21 and 0.09 birds/fishing days, respectively) and in trammel nets (bycatch rate = 0.17 birds/fishing days).

Between these two areas, the northern region seems to be more concerning, where higher rates of seabird bycatch were found. All this work includes building a relationship of trust and sharing with the fishermen over time, this is one of the most important points for good monitoring and mitigation of bycatch, ensuring the conservation of these sensitive species.

PO14

Sea and Coastal Birds of the Galite Archipelago, Tunisia

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Situated at a pivotal crossroads of avian migration routes and ecosystems, the Galite Archipelago holds unique significance. Our study focuses on a comprehensive analysis of available literature on the Galite archipelago since 1876, as well as the missions conducted by the co-management team (MAN/APAL) between 2021 and 2023. The objective is to establish an inventory of avifaunal species, with a particular emphasis on nesting seabird species of conservation interest in the archipelago. In total, 107 bird species were identified over the past three decades, including six species of seabirds belonging to four distinct families. Five of these species are listed in Annex II of the Barcelona Convention Protocol concerning Specially Protected Areas and Biological Diversity in the Mediterranean. These species are considered threatened or vulnerable, namely Scopoli's Shearwater, Yelkouan Shearwater, European Storm Petrel, European Shag, and Audouin's Gull. The results highlight the importance of these observations in guiding future scientific monitoring of vulnerable species in the archipelago, thereby contributing to a more effective conservation of these populations.

PO15

Massive wreck of Atlantic puffins and other seabirds in Portugal mainland during the winter of 2022-2023

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In the winter of 2022-23, a large number of dead and live seabirds, particularly Atlantic puffins *Fratercula arctica*, washed up along the mainland coast of Portugal. These massive mortality events can be associated to different causes (e.g., extreme weather conditions, food shortages, pollution or bycatch) and, when occurring frequently or at a large spatial scale, can have a significant impact on seabird populations. The documentation of these events is challenging, considering their unpredictability and magnitude. Nevertheless, it is crucial work for a better understanding of marine threats and their impact on seabird conservation. In mid-January 2023, through a collaborative effort from ICNF, SPEA, DGAV, CRAM and many local NGOs and volunteers, there was a campaign in the Peniche region over several weeks to count and collect dead and live stranded seabirds, and to take them to a wildlife recovery centre. We also collected information of stranded seabirds through an ongoing SPEA citizen science project and encouraged the public and local NGOs to report dead or live stranded seabirds found elsewhere along the Portuguese coastline. In this study based on the information collected, we characterise this seabird wreck, including the species and numbers affected, its extent, and provide information on possible causes. From early December to early March, we recorded 2151 stranded seabirds of 20 species, 80% of which were Atlantic puffins (n=1723) and 8% (n=165) were Razorbills *Alca torda*. The peak of this seabird wreck was the 2nd fortnight of January 2023, when nearly 90% of all stranded birds were reported, and it was spatially concentrated in the area around Peniche, where 81% of birds were washed ashore. Most puffins were adult birds (78% of 311 birds, aged > 3 years), 14% were immature (2-3 years) and only 8% were first winter birds. Six ringed puffins were adult birds from UK breeding colonies, including two birds > 23 years old. The majority of the puffins (98% of 229 birds) were not moulting their flight feathers and were in condition to fly. A total of 227 puffins were rescued alive and transported to a wildlife recovery centre (CRAM) but the survival rate was low (21% did not survive transportation and 71% died at CRAM). Necropsies of the birds were inconclusive regarding the cause of death, but most birds were emaciated, showing gastrointestinal vacuity and atrophy of internal organs. Eight puffins were tested for H5N1, with negative results.

PO16

THE USE OF STABLE ISOTOPES IN THE STUDY OF THE AVIFAUNA OF THE GALITE ARCHIPELAGO IN TUNISIA

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The Mediterranean basin is considered a biodiversity hotspot, characterized by a diverse range of landscapes, marine areas, and organisms. Among its islands is the Tunisian archipelago of "La Galite." Still difficult to access, this archipelago showcases incredible richness and biodiversity, serving as a major migratory route and nesting site for numerous seabirds. Many of these bird species are endemic to the Mediterranean, such as the Eleonora's falcon (*Falco eleonorae*), an obligate migratory species. The breeding habitat of Eleonora's falcons encompasses the islands of the Mediterranean, extending as far as the Canary Islands in the Atlantic.

Studying the diets and migratory circuits of species is essential for developing effective conservation and sustainable development plans within island ecosystems. Our research will commence with a thorough investigation into the feeding habits of Eleanor's falcons during the breeding season within the Galite archipelago. Subsequently, we will delineate the wintering habitats of these falcons and the geographical origins of their prey.

The diet analysis of Falco eleonorae was conducted by examining the stable isotopic signatures of carbon ($\delta^{13}C$) and nitrogen ($\delta^{15}N$) in the feathers of 19 falcons and their prey (7 specimens) (the remiges p8 and p9), along with insect fragments retrieved from regurgitated pellets. A Bayesian stable isotope mixing model from the "Simmr" package in the R programming language was employed to elucidate the dietary patterns of the falcons. Additionally, to determine the geographical origins of both adult falcons and their prey, the isotopic signatures of deuterium ($\delta^{2}H$) were utilized. Geospatial assignments were performed using the "Isorix" package in R. Feather sampling from Eleonora's Falcons and their prey was exclusively carried out on Fauchelle Island during the final three weeks of September. Seven prey species were identified through the morphological characters of the feathers described in the literature and knowledge of migratory bird species flying above the breeding grounds of *F. eleonorae*: common nightingale *Luscinia megarhynchos (Lu.m),* European greenfinch *Chloris chloris (Ch.ch),* spotted flycatcher *Muscicapa striata (Mu.s),* common quail *Coturnix coturnix (Co.c),* hoopoe *Upupa epops (Up.u),* common whitethroat *Sylvia communis (Sy.c) and* European storm petrel *Hydrobates pelagicus (Hy.p).*

The contribution of passerines to the diet of falcons was significantly higher than that of insects. This contribution was very high compared to those found in other breeding colonies. The diet of all the falcons was dominated by the whitethroat, the nightingale and the hoopoe.

Eleonora's falcons prey on species originating from various regions, ranging from the Mediterranean to the southern Scandinavian countries. The results of attributing the geographical origins of the falcons' prey validate the effectiveness of the utilized method, which involves hydrogen isotope analysis. Concerning the attribution of the original sites of adult Falco eleonorae using our prediction maps, the results indicate relatively low P values for the theoretical wintering sites in Madagascar and the Southeast region of the African continent. This suggests that the remiges p8 and p9 of adult Falco eleonorae have molted on Galite Island.

PO17

Composition and distribution of pelagic and coastal bird populations in Tunisia

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As part of the Torda initiative conducted in 2022 and 2023, an exhaustive survey of avian fauna in the sea and along the coast covering the entire territory from the Northwest to the extreme Southeast revealed various data on the population of marine and coastal birds and their spatial distribution. Consequently, significant sites for the conservation of these birds have been identified with the aim of supporting their protection and conservation status

PO18

Monitoring and observation of seabirds: A study of *Larus michahellis* in the Al Hoceima region of the Moroccan Mediterranean Sea.

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Seabirds play a fundamental role in marine ecosystems as predators, nutrient recyclers, and key indicators of ocean health. To better understand the ecological dynamics to which they are exposed and the pressures they face, it is imperative to monitor and study them closely. In this context, our study aims to observe seabirds during a trawler trip on December 18, 2020, in the Al Hoceima region of the Moroccan Mediterranean. We recorded the sighting of a particular species of *Larus michahellis*, marked by colored rings on the tarsus, using accelerated photography, their movement and behavior were also tracked, as were the geographical coordinates of the observation. In addition, we conducted surveys of trawler fishermen concerning seabird bycatch from February 1 to 19, 2021. Finally, we raised awareness among fishermen of the ecological importance of these seabirds. Consequently, our research has documented marked seabird individuals and compared our sighting data with previous records, particularly from Spain and Portugal. The results show a total distance migrated of 957 km recorded in 4 sightings after 5 months, as well as a significant correlation between sightings of this species and fishing activity. According to the questionnaire, no seabird by-catch was recorded. These observations contribute significantly to the understanding of seabird movements and migrations in the region, while assessing the impact of human activities in order to contribute to the conservation of seabirds.

PO19

Breeding Seabirds on the Small Islands of the Edough Peninsula (Algeria)

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This study focuses on breeding seabirds on the small islands of the newly established Marine Protected Area (MPA) recently created in the Edough Peninsula, comprising 15 identified sites housing active colonies of seabirds. This community includes over 10,000 breeding pairs belonging to many species (*Larus michahellis, Phalacrocorax carbo, Columba livia, Chroicocephalus ridibundus*) etc. The Yellow-legged Gulls *(Larus michahellis)* dominate the community in terms of both number and distribution. A particular observation made is the apparent preference of the island of Sainte-Piastre, the furthest island from the mainland, by breeding Yellow-legged Gulls. The number of Yellow-legged Gulls keeps increasing year after year. More recent trends emerge, with a significant and rapidly multiplying population of Rock Pigeon *(Columba livia)* and the decline of the European Shag *(Gulosus aristotelis)* to a critical level. Recommendations are provided for the conservation and management of this seabird community.

PO20

Research on Birds and Biodiversity in Ayvalık Islands Project

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Ayvalık Islands Nature Park is an archipelago consisting of 25 islands in Northern Aegean Turkey, where "Research on Birds and Biodiversity in Ayvalık Islands Project" is currently being conducted[1]*. The area is a Key Biodiversity Area. The main goal of the project is to conduct field research on five target bird species to fill the knowledge gaps regarding their current population and breeding status. The research hypotheses arise from the surrounding environment of the protected area which is covered by marine zones to a large extent of the total 179.5 km^2; therefore, the marine ecosystems of the nature park ecologically represent some of the most important ones of the protected area.

The Audouin's Gull is a breeding bird on the Turkish Aegean coast. The Yelkouan Shearwater, the Scopoli's Shearwater, and the Storm Petrel are also well-known but less studied species in terms of their breeding areas in the Turkish Aegean coast. Despite the fact that the population and breeding status of these species are known in the surrounding area of the nature park, there are major knowledge gaps for the nature park.

Based on the currently available data so far, the target species can be seen in the nature park, except for the Storm Petrel. The Audouin's Gull has been recorded more than 10 times since 2005. The Scopoli`s Shearwater has been recorded 5 times since 2007. The Yelkouan Shearwater has been recorded more than 15 times since 1989. Thus, the project is going to enable field research for these species to enhance our understanding of their habitat use and seasonality in the nature park. The project team is going to record the abundances, breeding status, and the threats that can be seen on the islands. During the autumn field research, we recorded 73 bird species on five islands and collected 520 bird records in five days. Furthermore, research on all the other bird species and other key biodiversity elements of the nature park will be conducted. The scientific findings will be published to make them available for advocacy and nature conservation purposes.

PO21

The Sabkhet Ennjila as a wetland for marine and coastal bird between vulnerability and monitoring gaps

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The paleolagoon “Ennjila” is located in the Central East of Tunisia, close to the village El Alya (Mahdia). In the past, it was connected to the Mediterranean Sea by a “Roman Canal”. Nowadays it is separated from the sea by around 600 meters wide rocky beach-ridge. This sebkhet is relatively small with a surface of 60 hectares. However, it is periodically surrounded by a large flooded area locally named “Garaa” that can reach up to 1800 hectares. This wetland attracts periodically a variety of marine and coastal bird species with large abundances (eg. Greater Flamingo, shearwaters, gulls,...). However, this wetland is scarcely monitored regarding ecosystem and ornithology.

The present work raises the ecological importance of SebkhetEnnjila. The analysis of the precipitations showed a great fluctuation influencing the annual and seasonal water surface patterns. These results were proved by remote sensing, too. The temporal analysis of atmospheric temperature showed a clear warming trend in the last twenty years with an average of 0.13°C per year. We report that this sebkhet is under the pressure of human activities (pollution) and climate change (drought and global warming). These factors can increase the vulnerability I of wintering, feeding and breeding bird populations. A scientific program should be developed to study the ecosystem, flora and fauna with a focus on marine and coastal birds.

PO22

Assessing the Impact of Plastic Pollution on Seabirds in Tunisia: A Comprehensive Approach Integrating Adopt-a-Beach Initiatives and a Regional Database

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Plastic pollution is a growing threat to marine ecosystems worldwide, with seabirds being particularly vulnerable to its lethal effects. This study is to evaluate the impact of plastic pollution on seabird populations in the Mediterranean, employing an integrated approach that combines Adopt-a-Beach initiatives with the establishment of a comprehensive database on plastic pollution. The Adopt-a-Beach program is an initiative that engages local communities, citizen scientists, and environmental organizations in beach cleaning activities along the Mediterranean coastline. Through systematic data collection, including the type and quantity of recovered plastics, spatial distribution, and temporal variations, we aim to quantify the extent of plastic pollution on selected beaches. Concurrently, the program is developed in Tunisia to raise public awareness on plastic pollution and marine organisms (inc. seabirds) and promoting community involvement in mitigating this environmental challenge. In tandem with Adopt-a-Beach efforts, a database will be established to consolidate information on plastic pollution along the Tunisian coastline. This database will provide a comprehensive overview of plastic pollution trends over time. Geographic Information System (GIS) tools will be used to map and identify hotspots with high plastic concentrations, offering insights for conservation actions.

In 2023, an extensive assessment of over 80 beaches in Tunisia resulted in the identification and classification of the top 10 main pollutants. The findings underscored a significant presence of microplastics, including abandoned fishing nets and other fishing gear. Given that these areas are commonly utilized by seabirds, studying a possible correlation between plastic pollution levels and the status of seabird populations is imperative. This correlation will be analysed through necropsy examinations, dietary analysis, and behavioural observations. The integration of field data with the regional perspective provided by the database aims to determine the interaction between plastic pollution and the health of seabirds, contributing to a more comprehensive understanding of the ecological challenges at hand.

The outcomes of this 2 years long (since 2022 and continuing) research will not only enhance our understanding of the specific impacts of plastic pollution on seabirds in Tunisia but will also contribute to the development of potential conservation strategies. The integrated approach, merging citizen science through Adopt-a-Beach initiatives with a comprehensive regional database, holds promise for promoting sustained engagement in mitigating plastic pollution and safeguarding the ecological health of the Mediterranean Sea.

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