

IUCN-SSC Stork, Ibis and Spoonbill Specialist Group Special Publication 3

Proceedings of the X Workshop of the Eurasian
Spoonbill International Expert Group

„Strengthen spoonbill network towards Eastern
Mediterranean countries “

Petrčani, Zadar, Croatia 3rd - 7th October 2022



**Editors: Jocelyn Champagnon, Jelena Kralj, Alma Mikuska,
Luis Santiago Cano Alonso and K. S. Gopi Sundar**



Editors-in-Chief, Special Publications, IUCN-SSC Stork, Ibis and Spoonbill Specialist Group

K.S. Gopi Sundar, Co-chair IUCN Stork, Ibis and Spoonbill Specialist Group
Luis Santiago Cano Alonso, Co-chair IUCN Stork, Ibis and Spoonbill Specialist Group

Invited Editors for this issue

Jocelyn Champagnon, Tour du Valat, Research Institute for the Conservation of
Mediterranean Wetlands, Arles, France
Jelena Kralj, Institute of Ornithology, Zagreb, Croatia
Alma Mikuska, Josip Juraj Strossmayer University of Osijek, Croatia

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Mediterranean Wetlands, Arles, France
Jelena Kralj, Institute of Ornithology, Zagreb, Croatia
Alma Mikuska, Josip Juraj Strossmayer University of Osijek, Croatia
Csaba Pigniczki, Kiskunság National Park Directorate, Hungary

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We warmly thank Andrew Bloomfield for English editing.

TABLE OF CONTENT

Editors' Letter.....	5
Foreword.....	6
Credits & Acknowledgements.....	7
Scientific Committee of the workshop	9
Technical Secretariat of the workshop	9
Funding partnerships	9
Programme	10
Participants	12
Proceedings.....	14
Champagnon, J., Kralj, J.: Eurasian Spoonbill population sizes and trends 2007-2022	15
Kralj, J., Lok, T., Pigniczki, C., Cheshmedzhiev, S., Habib, M., El-Hacen, Champagnon, J.: Re-evaluation of priorities from AEWA Eurasian Spoonbill International Action Plan	19
Bloomfield, A.: Eurasian Spoonbills in the United Kingdom. A 2022 update on their status and distribution	29
Cheshmedzhiev, S., Mladenov, V., Iankov, P.: Breeding Status of the Eurasian Spoonbill <i>Platalea leucorodia</i> in Bulgaria	37
Kazantzidis, S., Naziridis, T., Katrana, E.: Breeding population trends and nesting success of Eurasian Spoonbill <i>Platalea leucorodia</i> in Greece	43
Kralj, J., Ćiković, D., Barišić, S., Tutiš, V.: The origins and temporal and spatial distribution of foreign-ringed Eurasian Spoonbills in Croatia.....	50
Mikuska, T., Mikuska, A., Bjedov, D., Ledinščak, J., Tomik, A., Šetina, N., Podravec, D.: NATURA 2000 status does not guarantee the protection of Croatian spoonbill breeding population	55
Habib, M.I., Temraz, T.: Update of the breeding and wintering Eurasian Spoonbill <i>Platalea leucorodia</i> in Egypt	64
Abstracts	68
Spanoghe, G.: Spoonbills in Belgium.....	69
Dreef, C., van der Winden, J.: Habitat use of spoonbills in man-made habitats in a freshwater area in The Netherlands	72
Nedjah, R., Samraoui, K. R., Bouchecker, A., Touati, L., Samraoui, F., Samraoui, B.: A study of wintering trends of Eurasian Spoonbill <i>Platalea leucorodia</i> in northeastern Algeria	73

Zeković, B., Šoškić, M., Novović, N., Sackl, P.: Population trends of Eurasian Spoonbill in Montenegro	75
Gaget, E.: Mediterranean overview of waterbird trends, climate change, and conservation efforts.....	76
El-Hacen, H.M., Camera, M.: The status of the endemic small spoonbill population of the Parc National du Banc d'Arguin, Mauritania: <i>Platalea leucorodia balsaci</i>	77
Vansteelandt, W., Lok, T., de Goeij, P., Boute, W., Piersma, T.: Limits of non-stop flight in Eurasian Spoonbills.....	78
Pigniczki, C.: Results of the GPS-tracking in the Pannonian population of the Eurasian Spoonbill <i>Platalea leucorodia</i>	79
Rodriguez, M.S., Araújo, P. M. Rocha, A. D., Rodriguez, P. C., Ramos, J. A., Abad-Gómez, J., Silva, J. P., Alves, J. A.: Movement and habitat use of juvenile spoonbills in Portugal: to disperse or not to disperse	80
Lagarde, F., Debats, R.: A place to land in the Landes: Feedback from 6 years of monitoring on a major stopping site for Eurasian Spoonbills <i>Platalea leucorodia leucorodia</i> and perspective of an international project.....	81
Ferreira, H., Hodić, S., Hadden, C., Pradalier, C., Champagnon, J.: Citizen Science and Machine Learning: presenting two methods for processing time-consuming camera traps data	82
Lok, T., Champagnon, J.: The role of genes and early-life environment in shaping migration routes of Eurasian Spoonbills.....	83
Bellati, A., Champagnon, J. et al.: Population genetics of the Western Palearctic Eurasian Spoonbill.....	84
Ferreira, H., Champagnon, J., Alves, J. A., Lok, T.: Exploring the relationship between winter location and survival in a migratory waterbird using different migration routes	85
Lovas-Kiss, A., Tóth, P., Lukácsné Urgyán, R., Vad, C., Gregács, B., Green, A. J., Pigniczki, C.: Eurasian Spoonbills <i>Platalea leucorodia</i> as dispersal vectors for different plant and invertebrate species	86
Azafzaf, H., Rebah, S., Feltrup Azafzaf, C., Hamouda, N., Mallat, H., Ghlis, A., Kilani, S.: Which wetlands should be effectively protected in Tunisia to secure wintering and stop over sites for the Eurasian Spoonbill <i>Platalea leucorodia</i> ? Mid-winter counts from 2002 and 2021	87
Hortas, F., Ruiz, J.: Are the East Atlantic breeding populations of spoonbills increasing or decreasing? Preliminary analysis in a migratory corridor in the south of the Iberian Peninsula.....	88
de Boer, A. P., de Goeij, P., Piersma, T.: Primary moult of Eurasian Spoonbills <i>Platalea leucorodia leucorodia</i> in the Wadden Sea in 2021	89
Piersma, T., Lagarde, F.: Vocalizations of Eurasian Spoonbills	90

Diallo, A. Y., Piersma, T., van Eerden, A., Ndiaye, S., Ndiaye, P. I.: Senegal's Atlantic coastal areas play a key role for Eurasian Spoonbill <i>Platalea leucorodia</i> <i>leucorodia</i>	91
Conclusions	92
X Spoonbill Workshop Conclusions	93



Editors' Letter

We are pleased to present the new Special Publication number 3 of the IUCN Stork, Ibis and Spoonbill specialist group (SIS-SG). This is the second Special Publication devoted to the Eurasian Spoonbill *Platalea leucorodia*. This new Special Publication showcases the enormous work of the Eurasian Spoonbill International Expert Group (ESIEG), a group that has been very active in promoting research and conservation of the Eurasian Spoonbill since 1991. For this, we convey our heartiest congratulations to the ESIEG.

This Special Publication compiles the proceedings, including original articles, extended abstracts and summaries of presentations and posters, given during the X workshop of the Eurasian Spoonbill International Expert Group (ESIEG) that took place from 3rd to 7th October 2022 in Zadar, Croatia. One of the most successful aspects of this event was the attendance of representatives working on all three European migratory populations, as well as on two African subspecies, *P. l. balsaci* and *P. l. archeri*. This gave a unique opportunity to evaluate the implementation of the International Action Plan as well as to re-assess the priorities of the actions for the next period. The workshop was an opportunity for the experts to update data and knowledge on population trends and breeding, tracking spoonbills, ecology and behaviour of spoonbills, and threats to spoonbills and their habitats. Moreover, attendees presented new approaches in research (e.g. machine learning, citizen science etc.) to study the species. This Special Publication is therefore of great importance since it not only provides the most updated information of the species but also showcases the most recent view of what researchers are doing to understand and conserve this species.

The new Special Publication sets high levels of quality emphasising particularly the importance of collaboration, robust research, and novel methodology from various parts of the world to understand a single species. Other species covered by the SIS-SG will benefit from a similar approach and we are keen to highlight these aspects of experienced groups such as the ESIEG that may well inspire other groups to similarly undertake species-level work.

We especially thank Jelena Kralj, Jocelyn Champagnon, Tibor Mikuska, Csaba Pigniczki and Alma Mikuska for their work in putting together the X Workshop ESIEG, and for compiling the presentations and abstracts for this Special Publication.

Luis Santiago Cano Alonso and K. S. Gopi Sundar
Co-Chairs, IUCN SSC Stork, Ibis and Spoonbill Specialist Group



Foreword

With great pleasure we present in this special issue the proceedings that compile original articles, extended abstract and summaries of presentations and posters given during the X workshop of the Eurasian Spoonbill International Expert Group (ESIEG) that took place from 3rd to 7th October 2022 in Zadar, Croatia. The X workshop was originally planned for 2021, three years after the previous meeting in Djerba, Tunisia. Unfortunately, we had to postpone it because of the pandemic. Instead, on 1st October 2021 a virtual meeting was organised with 35 participants from 16 different countries that presented the status of Eurasian Spoonbill populations in their respective countries, ongoing research and identified threats. Despite the success of this online meeting, there is no substitute for face-to-face meetings, so it was good to get together again to discuss current research and trends in Eurasian Spoonbill populations.

The X workshop was conducted under the title: “Strengthen spoonbill network towards Eastern Mediterranean countries”. Among the 29 participants from 13 European and African countries, we were delighted to welcome several representatives from the South-Eastern European flyway and learn about the status and threats to Spoonbills in their respective countries.

It was a great success that the workshop gathered representatives from all three European migratory populations, as well as representatives from two African subspecies, *balsaci* and *archeri*, which gave us opportunity to evaluate the implementation of the International Action Plan as well as to re-assess the priorities of the actions for the next period. Contributions were presented in four workshop sessions: Population trends and breeding, Tracking spoonbills, Ecology and behaviour of spoonbills and Threats to spoonbills and their habitats. Presentations were packed with new data and new approaches in research (machine learning, citizen science, etc.). Fruitful discussions opened new ideas for further cooperation among spoonbillers. New findings on the behaviour of spoonbills were presented by two PhD students, confirming that ESIEG workshops are an excellent way of involving young scientists and discussing ideas and solutions for ongoing research. Conservation means and how to act as an expert group drives central discussions during this workshop and it is reflected in the workshop conclusions (page 94). Also, following the previous workshops protocol, the implementation of AEWA International Action Plan was re-evaluated, but this year, new priorities were discussed and they are presented in this volume (page 19).

It was an honour to host all the Spoonbillers on the sunny Adriatic coast in Zadar. With positive energy, hard work and lots of fun we showed once again what it means to be a *Spoonbiller*

Until the next workshop in 2025,

Sincerely,

Jelena Kralj, Jocelyn Champagnon, Tibor Mikuska, Csaba Pigniczki & Alma Mikuska
Organizing /Scientific Committee of the X Workshop ESIEG



Credits & Acknowledgements

EURASIAN SPOONBILL INTERNATIONAL EXPERT GROUP (ESIEG)



Formed in 1991 to conserve Eurasian Spoonbill *Platalea leucorodia*, it is one of the first research networks created on a waterbird species. An international action plan for the Eurasian Spoonbill was adopted in 2008 and ESIEG is in charge of its implementation. From 2014 to 2020, the group was an AEWa International Species Expert Group.

Chair Jocelyn Champagnon

Coordinator Jelena Kralj

FB <https://www.facebook.com/eurasianspoonbillinternationalexpertgroup/>

AEWA website <https://www.unep-aewa.org/>

CROATIAN SOCIETY FOR BIRD AND NATURE PROTECTION



Croatian Society for Birds and Nature Protection is a NGO working for the study, monitoring and protection of wild bird populations in Croatia and Balkan region. CSBNP carries out conservation programs for the protection of birds and their habitats through relevant projects and activities (monitoring, awareness raising, advocacy, information dissemination, publications etc.). The main activities are related to protection of wetlands and large rivers, alluvial forests and prevention of illegal bird killing.

Founded in 1995, CSBNP is one of the oldest NGOs in Croatia dealing with nature protection. It has a long-standing and fruitful partnership with Wetlands International, EuroNature, BirdLife International and other European organisations.

Phone: +385 95 909 87 53

Email: hdzpp@hdzpp.hr

FB: <https://www.facebook.com/Hdzpp>



DEPARTMENT OF BIOLOGY, JOSIP JURAJ STROSSMAYER UNIVERSITY OF OSIJEK



Josip Juraj Strossmayer
University of Osijek

**DEPARTMENT
OF BIOLOGY**

The Department of Biology has been part of Josip Juraj Strossmayer University of Osijek, Croatia since April 1, 2005. The basic function of the Department is scientific and educational activity in the field of natural sciences, the field of biology. The Department of Biology organizes

higher education at undergraduate, graduate, and postgraduate level in various branches of biology. It continuously carries out and develops scientific research and professional activities related to biology and applies acquired knowledge in practice. The Department is dedicated to reaching excellence in research, to delivering quality teaching and to implementing public-private partnership projects.

Website: <https://www.biologija.unios.hr/about-us/>

FB: <https://www.facebook.com/OdjelZaBiologiju>

INSTITUTE OF ORNITHOLOGY, CROATIAN ACADEMY OF SCIENCES AND ARTS



The Institute of Ornithology (founded in 1901 as the Croatian Ornithology Centre) is a scientific institution which systematically conducts ecological, faunistic and taxonomic ornithological research. It is a part of Croatian Academy of Sciences and Arts. Since 1910 the Institute has been coordinating scientific bird ringing in Croatia. The Institute conducts ornithological research of bird communities and individual species throughout Croatia. Results have been published in numerous scientific journals. The Institute of Ornithology publishes ornithological journal “*Larus*”. Important activities of the Institute are protection of birds (through protected areas and individual species), nature protection in general, scientific ornithological education and popularization of birds.

Website: <https://www.info.hazu.hr/en/jedinice/zavod-za-ornitologiju-u-zagrebu/>

TOUR DU VALAT



The Tour du Valat is a research institute for the conservation of Mediterranean wetlands. It was founded in 1954 by Luc Hoffmann. It is located in the heart of the Camargue in southern France. It develops programmes of research on the functioning of wetlands, tests out management methods and puts them into practice on the estate.

Results are communicated by means of training, partnerships and the implementation of innovative projects. The Tour du Valat is involved at the scale of the Mediterranean Basin, in collaboration with local stakeholders, universities, NGOs, public research bodies, and governmental and international organisations. Its mission is to halt and reverse the destruction and degradation of Mediterranean wetlands, and their natural resources, and promote their wise use. The research institute employed 80 persons and conducts numerous activities with a multidisciplinary approach.

Website: <https://tourduvalat.org/en/>



Scientific Committee of the workshop

Tibor Mikuska, Croatian Society for Birds and Nature Protection, Croatia

Jelena Kralj, Institute of Ornithology, Croatian Academy of Sciences and Arts, Croatia

Jocelyn Champagnon, Tour du Valat, France

Csaba Pigniczki, Kiskunság National Park Directorate, Hungary

Alma Mikuska, Josip Juraj Strossmayer University of Osijek, Croatia

Technical Secretariat of the workshop

Tibor Mikuska, Croatian Society for Birds and Nature Protection, Croatia

Funding partnerships

Tour du Valat, research institute for the conservation of Mediterranean wetlands



Foundation of the Croatian Academy of Sciences and Arts



Department of Biology, Josip Juraj Strossmayer University of Osijek, Croatia





Programme

Tuesday, 04.10. 2022.		
09:00 – 09:15	Opening: Welcome & Introductions	
09:15 - 10:00	Plenary: Elie Gaget	Mediterranean overview of waterbird trends, climate change, and conservation efforts
Session 1. Population trends & breeding (moderator: Jocelyn Champagnon)		
10:00 - 10:20	Andrew Bloomfield	Spoonbills in the UK and at Holkham, Norfolk, England – an ongoing study of breeding behaviour
10:20 - 10:40	Geert Spanoghe	Eurasian Spoonbill in Belgium
10:40 - 11:00	Svilen Cheshmedzhiev, Vladimir Mladenov	Breeding Status of the Eurasian Spoonbill <i>Platalea leucorodia</i> in Bulgaria
11:00 - 11:30	Coffee break	
11:30 - 11:50	Savas Kazantzidis, Theodoros Naziridis, Evangelia Katrana	Breeding population trends and nesting success of Eurasian Spoonbill <i>Platalea leucorodia</i> in Greece
11:50 - 12:10	Bojan Zeković, Marija Šoškić, Nikola Novović, Peter Sackl	Population trends of Eurasian Spoonbill <i>Platalea leucorodia</i> in Montenegro
12:10 - 12:30	Kenz Raouf Samraoui, Riad Nedjah, Abdennour Bouchecker, Laïd Touati, Farrah Samraoui, Boudjéma Samraoui	Eurasian Spoonbill <i>Platalea leucorodia</i> in Numidia, northeast Algeria: An update
12:30 – 12:50	Mohamed Habib	Update the status of breeding and Wintering Eurasian Spoonbill <i>Platalea leucorodia</i> in Egypt 2015-2021
12:50 – 13.10	Hacen El-Hacen, Mohamed Camera	The status of the endemic small spoonbill population of the Parc National du Banc d'Arguin, Mauritania: <i>Platalea leucorodia balsaci</i>
13:10 - 15:00	Lunch	
Session 2. Tracking spoonbills (moderator: Tibor Mikuska)		
15:00 - 15:20	Wouter Vansteelant, Tamar Lok, Petra de Goeij, Willem Bouten, Theunis Piersma	Limits of non-stop flight in Eurasian Spoonbills
15:20 – 15:40	Camilla Dreef	GPS-tracking spoonbills in a freshwater area in The Netherlands: usage of man-made habitats
15.40 - 16:00	Jelena Kralj	The origins and temporal and spatial distribution of foreign-ringed Eurasian Spoonbills in Croatia
16:00 - 16:30	Coffee break	
16:30 - 16:50	Csaba Pigniczki	Results of the GPS-tracking in the Pannonian population of the Eurasian Spoonbill <i>Platalea leucorodia</i>
16:50 -17:10	Manuela S. Rodrigues, Pedro M. Araújo, Afonso D. Rocha, Pedro C. Rodrigues, Jaime A. Ramos, José Abad-Gómez, João P. Silva, José A. Alves	Movements and habitat use of juvenile spoonbills in Portugal: to disperse or not to disperse
17:10 -17:30	Florent Lagarde, Raphaëlle Debats	A place to land in the Landes: Feedback from 6 years of monitoring on a major stopping site for Eurasian Spoonbills <i>Platalea leucorodia leucorodia</i> and perspective of an international project
17:30 – 17:50	Hugo Ferreira, Sandra Hodić, Carolina Hadden, Cédric Pradalier, Jocelyn Champagnon	Citizen Science and Machine Learning: presenting two methods for processing time-consuming camera traps data
17:50 - 18:10	CSBNP - Introduction to the field trip	
20:00	Dinner	



Wednesday, 5.10. 2022.		
09:00 - 18:00	Whole day field trip to Pag Island (incl. packed lunch)	
19:00	Spoonbiller World Caffè - sharing spoonbill-ers “gifts”	
20:00	Dinner	
Thursday, 6.10. 2022.		
Session 3. Ecology and behaviour of spoonbills (moderator: Csaba Pigniczki)		
09:00 - 09:40	Tamar Lok, Jocelyn Champagnon	The role of genes and early-life environment in shaping migration routes of Eurasian Spoonbills
09:40 - 10:00	Mauro Fasola, Adriana Bellati, Jocelyn Champagnon, ESIEG	Population genetics of the Western Palearctic Eurasian Spoonbill
10:00 -10:20	Hugo Ferreira, Jocelyn Champagnon, José A. Alves, Tamar Lok	Exploring the relationship between winter location and survival in a migratory waterbird using different migration routes
10:20 - 10:40	Thomas Bregnballe, Jacob Sterup, Jan Skriver, Christian D.F. Castenschiold	Spoonbills in Denmark: The breeding population and post-breeding dispersal
10:40 - 11:00	Adam Lovas-Kiss, Pál Tóth, Renáta Lukácsné Urgyán, Csaba Vad, Bence Gregácz, Andy J. Green, Csaba Pigniczki	Eurasian Spoonbills <i>Platalea leucorodia</i> as dispersal vectors for different plant and invertebrate species
11:00 - 11:30	Coffee break	
Session 4. Threats to spoonbills and their habitats, AEWA International Action Plan (moderator: Jelena Kralj)		
11:30 - 13.30	AEWA Spoonbill Action plan	
13:30 - 15:00	Lunch	
Session 5. Threats to spoonbills and their habitats - continued (moderator: Alma Mikuska)		
15:00 - 15:20	Hichem Azafzaf, Sami Rabah, Claudia Feltrup Azafzaf, Naoufel Hamouda, Hamed Mallat, Abdelnacer Ghlis, Samar Kilani	Which wetlands should be effectively protected in Tunisia to secure wintering and stop over sites for the Eurasian Spoonbill <i>Platalea leucorodia</i>
15:20 - 15:40	Francisco Hortas, Ruiz Javier	Are European Spoonbills increasing or decreasing? Preliminary analysis in a migratory corridor in the south of the Iberian Peninsula
15:40 - 16:00	Alma Mikuska, Dora Bjedov, Josip Ledinščak, Adrian Tomik, Nenad Šetina, Darko Podravec, Tibor Mikuska	NATURA 2000 status does not guarantee the protection of Croatian spoonbill breeding population
16:00 - 16:20	Arjen P. de Boer, Petra de Goeij, Theunis Piersma	Primary moult of Eurasian Spoonbills <i>Platalea leucorodia leucorodia</i> in the Wadden Sea in 2021
16:30 - 17:00	Coffee break	
17:00 - 17:20	Theunis Piersma, Florent Lagarde	Vocalizations of Eurasian Spoonbills <i>Platalea leucorodia</i>
17:20 - 17:40	Movie: Antal Szell (Fauna-film Association)	Spoonbills in Hungary
17:40 - 18:00	Aissatou Yvette Diallo, Theunis Piersma, Arne Van Eerden, Saliou Ndiaye, Papa Ibnou Ndiaye (Poster)	Senegal's Atlantic coastal areas play a key role for Eurasian Spoonbill <i>Platalea leucorodia leucorodia</i>
20:00	Closing dinner	



Participants

Name	Institution	Country
Kenz Raouf Samraoui (online)	The Czech Academy of Science	Algeria
Geert Spanoghe	Research Institute for Nature and Forest	Belgium
Svilen Cheshmedzhiev	Bulgarian Society for the Protection of Birds (BirdLife Bulgaria)	Bulgaria
Vladimir Mladenov	Bulgarian Society for the Protection of Birds (BirdLife Bulgaria)	Bulgaria
Sandra Hodić	Swiss Ornithological Institute - Vogelwarte	Croatia
Jelena Kralj	Institute of Ornithology CASA	Croatia
Alma Mikuska	Department of Biology, Josip Juraj Strossmayer University of Osijek	Croatia
Tibor Mikuska	Croatian Society for Birds and Nature Protection	Croatia
Adrian Tomik	Croatian Society for Birds and Nature Protection	Croatia
Mohamed Habib	Biodiversity consultant	Egypt
Elie Gaget	University of Turku	Finland
Jocelyn Champagnon	Tour du Valat	France
Raphaelle Debats	Syndicat Mixte de Gestion des Milieux Naturels - Réserve Naturelle Nationale du Marais d'Orx	France
Hugo Ferreira	Tour du Valat / University of Aveiro	France / Portugal
Florent Lagarde	Syndicat Mixte de Gestion des Milieux Naturels - Réserve Naturelle Nationale du Marais d'Orx	France
Savas Kazantzidis	Forest Research Institute	Greece
Csaba Pigniczki	Kiskunság National Park Directorate	Hungary
Bojan Zeković	Center for Protection and Research of Birds, BirdLife Montenegro	Montenegro
Hacen M. El-Hacen	Parc National du Banc d'Arguin	Mauritania
Petra de Goeij	University of Groningen	Netherlands
Camilla Dreef	Lowland Ecology Network	Netherlands
Marycha Franken	University of Groningen	Netherlands
Lok Tamar	NIOZ Royal Netherlands Institute for Sea Research	Netherlands
Theunis Piersma	University of Groningen	Netherlands
Wouter Vansteelant	University of Groningen	Netherlands
Jose Alves	University of Aveiro	Portugal
Manuela Rodrigues	University of Aveiro	Portugal
Francisco Hortas	Department of Biology, Universidad de Cádiz	Spain
Andrew Bloomfield	Holkham National Nature Reserve	United Kingdom



Participants of the X ESIEG Workshop on the field trip to the Island of Pag



Proceedings



Photo: Andrew Bloomfield



Eurasian Spoonbill population sizes and trends 2007-2022

Jocelyn CHAMPAGNON¹, Jelena KRALJ²

¹ Tour du Valat, Research institute for the conservation of Mediterranean wetlands, Le Sambuc, 13200 Arles, France

² Institute of Ornithology, CASA, 10000 Zagreb, Croatia

*Corresponding author; e-mail: champagnon@tourduvalat.org

Keywords: monitoring, demography

The Eurasian Spoonbill *Platalea leucorodia* is distributed over the Palearctic, from West Europe and Northwest Africa to China (Cramp and Simmons 1977). The breeding range was formerly more extensive but it decreased especially during the last century due to disturbance and wetlands loss (Triplet *et al.* 2008).

Since 2007 and the publication of the international action plan (Triplet *et al.* 2008), a survey was conducted among national coordinators during each meeting of the international expert group: 2012 (Overdijk *et al.* 2013), 2015 and 2018 (Champagnon *et al.* 2019). During last ESIEG meeting in Croatia that took place in October 2022, the survey was conducted among the national experts following the same protocol (asking for the number of breeding pairs and the number of colonies in 2022, or 2021 if data for 2022 was not available), completed by personal e-mails when the information was not available during the meeting. Even after investigation, some countries (Turkey, Romania, Ukraine, Hungary, Serbia, Austria, Slovakia and Czech Republic) were not able to provide recent estimates, therefore the number of breeding pairs of the previous survey was considered for those countries.

Subspecies	Population	No. of colonies	No. breeding pairs	15-year trend
<i>P.l.leucorodia</i>	E Atlantic	239	8282-8317	Increase
<i>P.l.leucorodia</i>	C Europe	61	1536-1749	Stable
<i>P.l.leucorodia</i>	SE Europe	?	1607-2370	Decrease
<i>P.l.leucorodia</i>	W Asia	?	5350 ²	
<i>P.l.archeri</i>	Red Sea	?	?	
<i>P.l.balsaci</i>	Mauritanian	4	1616-1982	Increase

Table 1. Compilation of the numbers of colonies and Eurasian Spoonbill breeding pairs (min-max) for each population in 2022. ²Estimation from Western Asia was compiled in 2015 during VIII Spoonbill Workshop.

Results from 2022 survey are presented in table 1 and figures 1-3. Considering only the three European flyways, the situation of the Eurasian Spoonbill is globally better than fifteen years ago with an estimation of 8,886-10,211 breeding pairs in 2007 vs. 11,425-12,436 breeding pairs in 2022. Nevertheless, the situation is different between flyways and the increase is largely driven by the eastern Atlantic population. While the later



doubled since 2007 (Figure 1), the populations of the Central European population seems to stabilize (Figure 2) and South-eastern Europe population decreased (Figure 3).

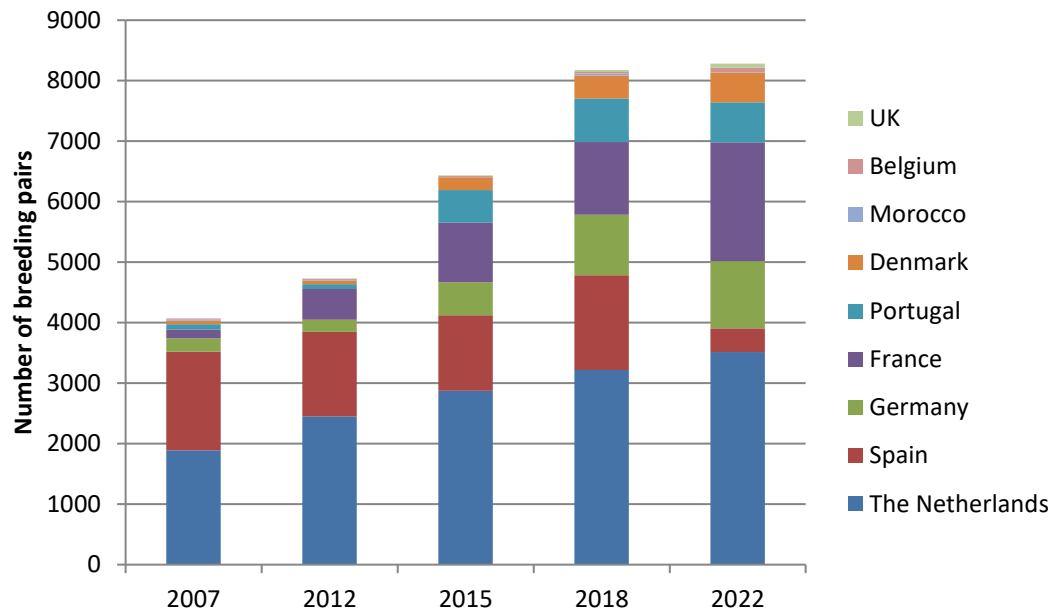


Figure 1. Trends of Eastern Atlantic population. Minimum of breeding pairs for each year is presented.

The Eastern Atlantic population size was slightly higher in 2022 than in 2018, suggesting a stabilization of the population after large increase (Champagnon *et al.* 2019). However, even within this flyway there are strong contrasts. While the population is flourishing in Northern Europe in countries like Belgium (+189% over the last 4 years), United Kingdom (+130%), France (+64%), Southern Europe and Northern Africa experienced a dramatic decrease in the number of breeding pairs. Indeed, in Spain we estimated a 4-fold reduction in population size. This decrease was due to a combination of drought in Southern Europe and groundwater extraction (Navedo *et al.* 2022, Camacho *et al.* 2022). Drought in 2022 also affected Morocco with only one breeding pair in 2022 and probably Portugal (-8% compared to 2018).

An estimate of the resident subpopulations *P. l. balsaci* was available in 2022. While in 2018 it was considered that the number had decreased since 2007 (Overdijk *et al.* 2013, Champagnon *et al.* 2019), when 750 breeding pairs were estimated, the updated figure in 2022 suggested a large increase over the last 15 years (+115%) with 1616-1982 breeding pairs among six colonies.

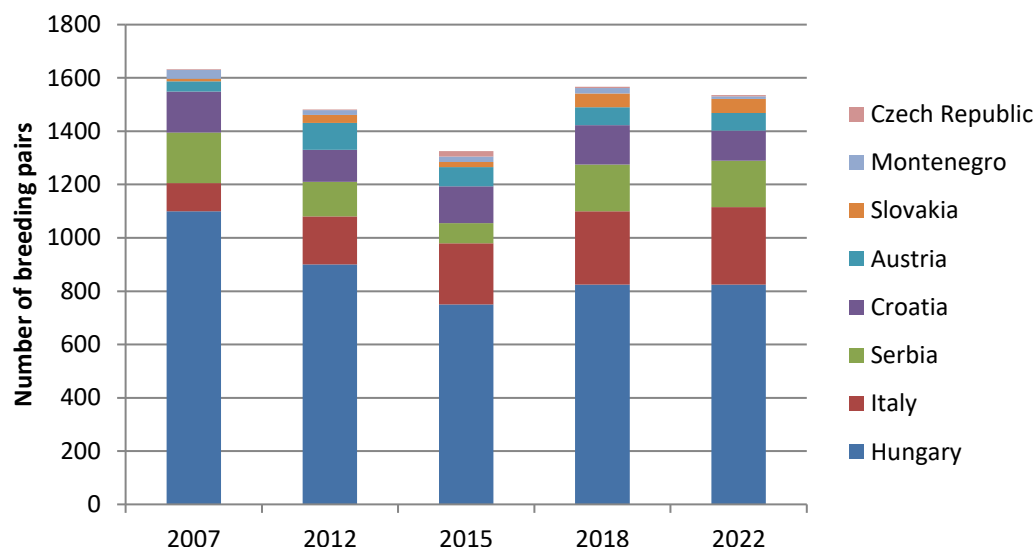


Figure 2. Trends of Central European population. Minimum of breeding pairs for each year had been taken. Note that the estimates from 2018 were used for Hungary, Serbia, Austria, Slovakia and Czech Republic in 2022

For the Central European population, the estimates were not available for many countries with large breeding population, such as Hungary and Serbia. We noted a continued increase in number of breeding pairs in Italy and fluctuations in Croatia. Overall, at the flyway level, it looks that the population is larger than in 2015 but at a lower level than in 2007 (between 6 and 10% lower than 15 years ago; Figure 2).

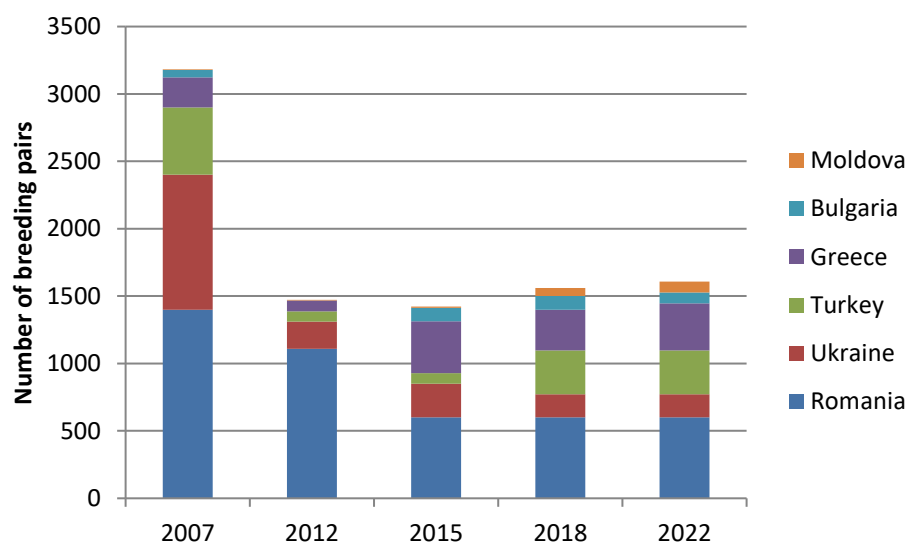


Figure 3. Trends of South-eastern European population. Minimum number of breeding pairs for each year had been considered. Note that the last estimates from 2018 were used for Turkey and Ukraine in 2022, while estimates from Romania were from 2015.

The South-eastern European population decrease observed in 2018 over ten years is confirmed with the estimates from 2022 even if recent estimates are lacking from the three important countries (Romania, Turkey and Ukraine). It is estimated that the population reduced by 43% to 50% over the last 15 years mainly during the period between 2007 and 2012. Notably, Ukrainian population size dropped from a maximum of 1600 breeding pairs in 2007 to less than 200 breeding pairs since 2012, while



Romanian population probably only slightly decreased (Figure 3). Small population of Moldova increased over the last fifteen years while Greek and Bulgarian populations are very fluctuating over the surveys.

No updated situation was available for Western Asian population which was estimated to 5350 in 2015, of which 3800 would breed in Russia. The lack of precise information concerned also the small resident subpopulations *P. l. archeri*.

The general situation in 2022 is similar to previous years (Overdijk *et al.* 2013, Champagnon *et al.* 2019). Significant efforts are needed to obtain a more accurate estimate at flyway level, especially in Eastern Europe and Asia by filling in the missing estimates. While this survey acquired an adequate knowledge of the *balsaci* subspecies population size, we still lack a monitoring of subspecies *archeri*. To address the situation of concern in Southeast and Southwest Europe, some actions were suggested by the expert group and discussed during the update of the international action plan during the workshop (Kralj *et al.*, this volume).

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Re-evaluation of priorities from AEW Eurasian Spoonbill International Action Plan

Jelena KRALJ^{1}, Tamar LOK², Csaba PIGNICZKI³, Svilen CHESHMEDZHIEV⁴,
Mohamed HABIB⁵, Hacen M. EL-HACEN^{6,7}, Jocelyn CHAMPAGNON⁸*

¹Institute of Ornithology, Croatian Academy of Sciences and Arts, Zagreb, Croatia

²NIOZ Royal Netherlands Institute for Sea Research, Texel, The Netherlands

³Kiskunság National Park Directorate, Hungary

⁴Bulgarian Society for the Protection of Birds, Bulgaria

⁵p.o.box 432, Hurghada, Red Sea, Egypt

⁶BirdEyes, Centre for Global Ecological Change at the Faculties of Science & Engineering and Campus Fryslân, University of Groningen, Leeuwarden, The Netherlands

⁷Parc National du Banc d'Arguin, Chami, Wilaya de Dakhlet Nouadhibou, Mauritania

⁸Tour du Valat, Research Institute for the Conservation of Mediterranean Wetlands, Arles, France

*Corresponding author; E-mail: jkralj@hazu.hr

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The 10th meeting of Eurasian Spoonbill International Expert Group (ESIEG) took place in October 2022 in Petrcane near Zadar, Croatia. During the meetings, a special session was dedicated to the assessment of the implementation of the International Action Plan for the Eurasian Spoonbill (Triplet *et al.* 2008) at the population level, using the same approach as during previous meetings (2012, 2015, and 2018). To ease the process and collect the widest possible expertise, the questionnaire with list of actions was sent few weeks before to ESIEG members, requesting the assessment of the implementation level in their respective countries during the last four-year period. The answers from 13 countries were received previously to the workshop. During the meeting, these results were discussed in groups of experts and the scores at the population level were agreed upon. Each action was scored using the scores from Table 1. As in earlier analysis, actions were grouped in Legislation, Management or Research. The average scores for each population were calculated and compared with results from the previous assessments.

Table 1. Scores used for the evaluation of the Eurasian Spoonbill Action Plan implementation in the period from 2012 to 2018

Implementation	Scores
Action fully implemented, no further work required	4
Significant results (51-75%), but still work to be done	3
Some work done (11-50%), further action is required	2
Little or no work (0-10%) carried out	1

The Action plan foreseen the actions for the ten-year period and the implementation in that period has been evaluated in 2018 (Kralj *et al.* 2019). It was shown that a number of higher priority actions had lower implementation level and that some actions were not



relevant anymore. Also, the Action Plan recognised only one “Central and South-eastern European population” that this population has recently been split into the Central European and the South-eastern European populations (AEWA 2022). In 2018, the AEWA MOP7 through its Resolution 7.5 (AEWA 2018) extended the validity of the Eurasian Spoonbill International Single Species Action Plans for another ten years (2019-2028). However, the population split and changes of importance of different actions required the re-evaluation of priorities for proposed actions. Therefore, during the 10th ESIEG meeting, priorities of listed actions were re-evaluated, using the scores from Table 2.

Table 2. Priority scores assigned to each action in the Eurasian Spoonbill Action Plan.

Priority	
Critical- result needed to prevent major decline in the population, which could lead to extinction	4
High result needed to prevent a decline of more than 20% of the population in 20 years or less	3
Medium result needed to prevent a decline of less than 20% of the population in 20 years or less	2
Low result needed to prevent local population declines or events likely to have only a small impact on the population across the range	1
Not a priority local measure which has no significant impact on the population	NA

During the previous meetings, the lack of representatives from several populations limited the possibility to assess the implementation of the activities. The meeting in 2022 gathered representative from all populations, apart from the Western Asian population, and thus enabled to assess the implementation and priority scores for all European and African populations of the Eurasian Spoonbill (Tables 3 and 4).

Table 3. Implementation scores (see Table 1) in 2022 of each action of the Eurasian Spoonbill International Action Plan. NA means “not applicable”

Actions	East Atlantic	Central European	SE European	ssp. <i>balsaci</i>	ssp. <i>archeri</i>
Designate the species as protected in all countries along the flyways in all the range states	4	3	4	4	4
Maintain the integrity of the coastal ecosystem at Banc d'Arguin	3	NA	NA	3	NA
Designate and maintain key breeding, feeding and stop-over sites as Protected Areas (European Union Special Protection Areas in EU countries) and Ramsar Sites	2	3	3	2	3
Restore former feeding areas and prevent drainage of existing feeding areas	1	2	2	1	3



Actions	East Atlantic	Central European	SE European	ssp. <i>balsaci</i>	ssp. <i>archeri</i>
Prevent overgrowth of feeding areas by management of vegetation succession and/or invasive plants	3	2	2	3	3
Take measures to limit activities which may reduce the availability of food (e.g. overfishing, disturbance, scaring at fishponds, constructions which may limit movement of prey species, wind farms, human settlements and infrastructures, development, regulation of rivers)	1	2	2	1	1
Maintain the area of fishponds managed extensively in Central Europe and adjust their management to the needs of the species	NA	1	NA	NA	NA
Develop management plans for key breeding, feeding and stop-over sites	1	2	2	1	1
Reduce mortality caused by collision with overhead power lines	1	2	2	1	1
Reduce direct mortality caused by poaching	1	2	2	1	2
Reduce direct mortality caused by toxins	1	1	1	1	2
Phase out organochlorines (especially DDT) along the entire migratory flyway	1	-	4	1	4
Restore wetlands for breeding, maintain adequate water level at colonies and create water supply systems	1	2	2	1	1
Protect colonies threatened by flooding	1	3	NA	1	1
Preserve colonies from burning and cutting reed, by avoiding such activities around colonies	NA	2	2	NA	1
Take measures to protect threatened colonies against excessive predation (notably by fox, wild boar or jackal)	2	2	1	1	4
Manage competing species if necessary and appropriate	1	1	NA	1	1
Protect nesting colonies from disturbance	1	3	2	1	2
Determine and monitor breeding success and calculate the values necessary to meet the target in relation to survival rate	1	2	1	3	1



Actions	East Atlantic	Central European	SE European	ssp. <i>balsaci</i>	ssp. <i>archeri</i>
Determine and monitor survival rate through colour ringing and satellite telemetry	3	3	1	3	1
Identify limiting factors with a view to promoting further expansion of breeding range and to creating early warning system against potential threats	2	1	1	2	1
Identify additional wintering and stop-over areas along the flyways and their role in limiting the growth of the different populations/subspecies (i.e. the influence of the conditions at wintering sites on breeding success)	2	1	1	2	3
Identify any potential age and gender differences in use of stop-over and wintering sites	2	2	1	2	2
Determine migratory status and the migratory flyways (study movements during non-breeding season using colour-ringing and satellite tracking)	3	3	1	3	2
Complete full survey for breeding areas (Turkey as a priority)		4	3		4
Study the sensitivity of spoonbill to disease and toxins	2	1	1	1	1
Identify key mortality factors and hot spots	2	2	1	2	1
Collect and analyse genetic samples (Turkey, Hungary, Mauritania)	NA	3	1	4	1
Study the feeding ecology of the species	1	3	1	1	2

Table 4. Priority scores (see Table 2) for actions set in 2022 of each action of the Eurasian Spoonbill International Action Plan.

Actions	East Atlantic	Central European	SE European	ssp. <i>balsaci</i>	ssp. <i>archeri</i>
Designate the species as protected in all countries along the flyways in all the range states	Done	2	Done	Done	1
Maintain the integrity of the coastal ecosystem at Banc d'Arguin	1	NA	NA	1	NA
Designate and maintain key breeding, feeding and stop-over sites as Protected Areas (European Union)	3	2	2	2	3



Actions	East Atlantic	Central European	SE European	ssp. <i>balsaci</i>	ssp. <i>archeri</i>
Special Protection Areas in EU countries) and Ramsar Sites					
Restore former feeding areas and prevent drainage of existing feeding areas	4	4	3	1	1
Prevent overgrowth of feeding areas by management of vegetation succession and/or invasive plants	2	2	3	NA	1
Take measures to limit activities which may reduce the availability of food (e.g. overfishing, disturbance, scaring at fishponds, constructions which may limit movement of prey species, wind farms, human settlements and infrastructures, development, regulation of rivers)	3	4	3	2	1
Maintain the area of fishponds managed extensively in Central Europe and adjust their management to the needs of the species	NA	4	NA	NA	NA
Develop management plans for key breeding, feeding and stop-over sites	4	2	3	4	3
Reduce mortality caused by collision with overhead power lines	2	3	1	NA	3
Reduce direct mortality caused by poaching	2	3	2	NA	1
Reduce direct mortality caused by toxins	2	1	1	2	1
Phase out organochlorines (especially DDT) along the entire migratory flyway	2	NA	1	2	NA
Restore wetlands for breeding, maintain adequate water level at colonies and create water supply systems	2	4	3	2	3
Protect colonies threatened by flooding	2	1	NA	4	NA
Preserve colonies from burning and cutting reed, by avoiding such activities around colonies	NA	2	3	NA	1
Take measures to protect threatened colonies against excessive predation (notably by fox, wild boar or jackal)	1	3	1	3	2
Manage competing species if necessary and appropriate	1	1	1	1	1



Actions	East Atlantic	Central European	SE European	ssp. <i>balsaci</i>	ssp. <i>archeri</i>
Protect nesting colonies from disturbance	2	4	3	1	3
Determine and monitor breeding success and calculate the values necessary to meet the target in relation to survival rate	3	2	2	4	1
Determine and monitor survival rate through colour ringing and satellite telemetry	3	2	2	4	1
Identify limiting factors with a view to promoting further expansion of breeding range and to creating early warning system against potential threats	3	1	2	3	1
Identify additional wintering and stop-over areas along the flyways and their role in limiting the growth of the different populations/subspecies (i.e. the influence of the conditions at wintering sites on breeding success)	2	3	2	2	2
Identify any potential age and gender differences in use of stop-over and wintering sites	1	1	1	1	1
Determine migratory status and the migratory flyways (study movements during non-breeding season using colour-ringing and satellite tracking)	1	1	3	1	2
Complete full survey for breeding areas (Turkey as a priority)	NA	1	2	NA	3
Study the sensitivity of spoonbill to disease and toxins	4	3	2	4	1
Identify key mortality factors and hot spots	2	3	2	2	1
Collect and analyse genetic samples from different populations	1	2	2	1	1
Study the feeding ecology of the species	3	3	3	3	2

Additionally, it was suggested that the action “Collect and analyse genetic samples (Turkey, Hungary, Mauritania)” should be extended to cover as many countries as possible, and several new actions were identified with priority scores provided (Table 5).



Table 5. Additional actions with priority scores suggested at 10th meeting of Eurasian Spoonbill International Expert Group.

Actions	East Atlantic	Central European	SE European	ssp. <i>balsaci</i>	ssp. <i>archeri</i>
Reduce direct mortality caused by plastic	1	2	1	2	NA
Improve protection of colonies outside protected areas	1	3	2	NA	2
Improve the protection of feeding areas through water management	3	4	2	1	1
Improve monitoring of breeding success and produce the protocol for estimation of breeding success	3	3	2	3	2
Identify spoonbill prey densities	2	2-3	1	2	2
Determine the effect of wind turbines and powerlines on spoonbill mortality	4	3	1	NA	1
Determine the effect of poaching on spoonbill populations	2	3-4	1	NA	1
Identify important sites by applying 1% threshold criteria, and perform the analysis of their status and existence of management plans	2	2-3	1	1	2
Improve public education (social media and public outreach)	3	3-4	1	2-3	2

The comparison of implementation scores during last four ESIEG meetings was possible for the East Atlantic and Central European populations (Figure 1), as the other three populations were not previously scored, due to the lack of representatives from relevant countries. Until 2018, the Central and South-eastern European population were merged, but representatives from the countries of the South-eastern European population were rarely present at the meetings, so the scoring largely represented the knowledge about the implementation in the Central European population.

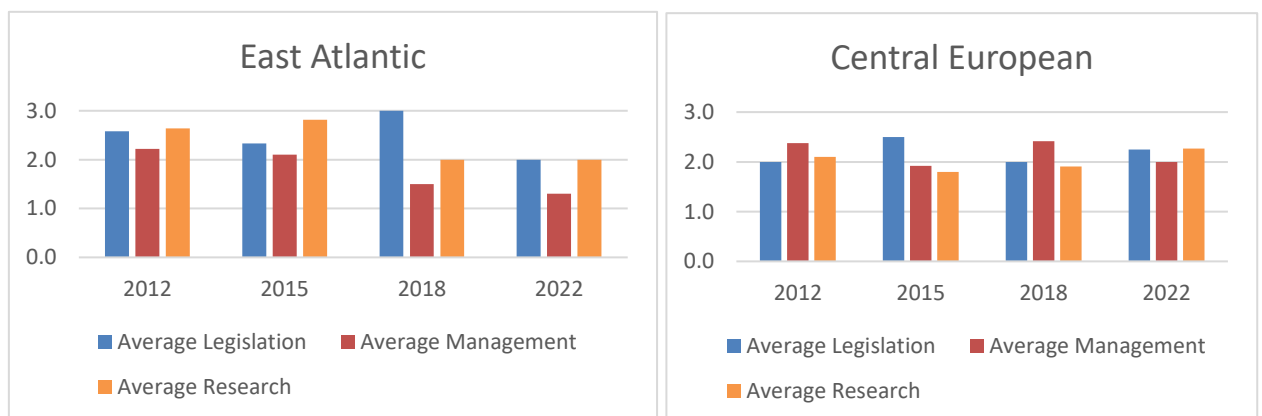


Figure 1. Average implementation scores for activities grouped under legislation, management and research along East Atlantic and Central European flyways between the years 2012 and 2022.

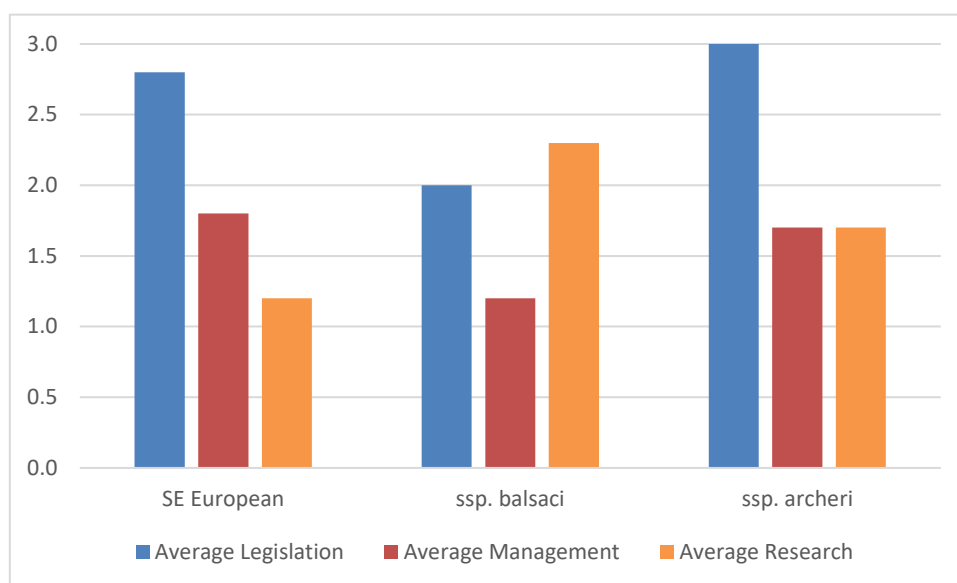


Figure 2. Average implementation scores for activities grouped under legislation, management and research in three populations in 2022.

The legislation activities have the highest average scores in *ssp. archeri* and the South-eastern European population, while the East Atlantic population the average legislation score is decreasing (Figures 1 & 2). The management activities showed low average scores (mostly below 2) in all populations, and the decrease in the progress of management actions in the East Atlantic population continues, possibly driven by the fact that the population is still increasing in this flyway (see: Kralj et al. 2019). The research activities are slightly increasing in the Central European population, including studies on migration, wintering, and genetic differentiation. Contrary, for the South-eastern European population and *ssp. archeri* average score is below 2, showing the need for more research on these populations.

Comparing the implementation scores with the newly proposed priority scores, in general the higher priority actions had lower implementation, indicating the need for better implementation of the highest priority actions (Figure 3).

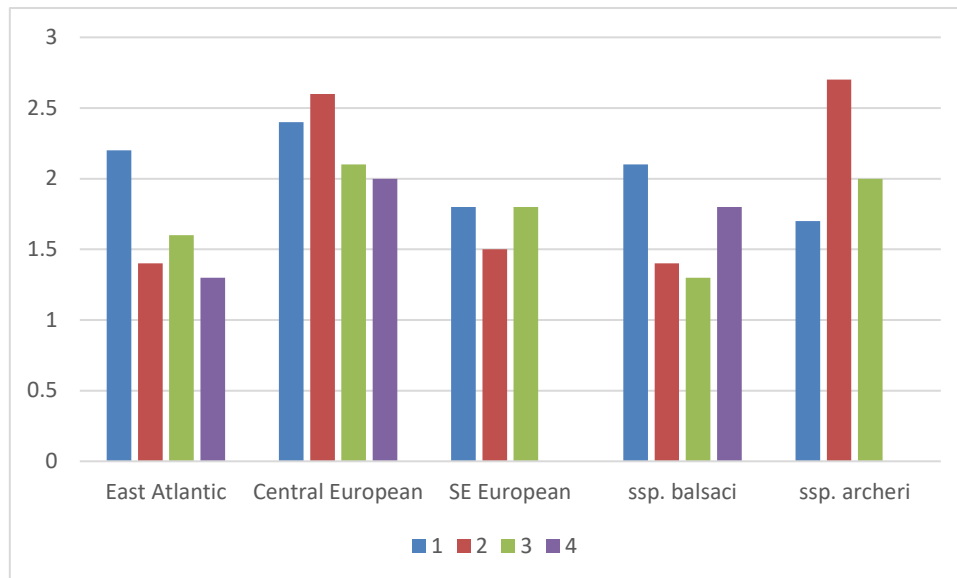


Figure 3. Average implementation scores for activities grouped according to priorities agreed during the 10th ESIEG meeting

Comparing the proposed new scores with ones from the Action Plan, priorities of legislation actions slightly decreased, with the exception of the protection of species in the Central European population, where the hunting in Bosnia and Herzegovina, North Africa and sub-Saharan Africa is recognised as an important threat. The management actions (for example, restoration of former feeding areas and prevention of drainage of existing feeding areas, management plans development, and management of fishponds in Central Europe) received higher priorities than before. In the Research group, some actions have been downgraded and others upgraded. Some gaps in knowledge, especially related to migration and wintering, were already fulfilled and therefore received lower priorities. However, some other research topics, including a study on the effect of toxins and on genetic differentiation, were prioritised. The monitoring of the population size, breeding success and survival and undertaking measures to protect colonies from flooding and predation by jackals were identified among the most important actions for *ssp. balsaci*, while conducting a genetic study to identify the taxonomic status of birds present in Egypt is needed for *ssp. archeri*. Proposed new actions belong to the Management or Research group, and are mostly focused on the improvement of the protection, determination of threats and reduction of mortality.

Very few actions from the Action plan are fully implemented, and many threats that were identified 14 years ago still exists. However, some priority scores changed during that period and several new actions were proposed. For the effective implementation of the action plan, it is crucial to ensure funding, especially for the actions with high priority scores that are not implemented yet. International cooperation is crucial, and the ESIEG plays the vital role in bringing together experts from different countries and with different expertise.



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Eurasian Spoonbills in the United Kingdom. A 2022 update on their status and distribution

Andrew BLOOMFIELD¹*

¹Senior Warden Holkham NNR, UK Spoonbill Working Group Co-ordinator,

*Corresponding author; E-mail: a.bloomfield@holkham.co.uk

Keywords: breeding success, colonisation, historical overview, population size

Introduction

The Eurasian Spoonbill *Platela leucorodia* (hereafter referred to as ‘Spoonbill’) was once a localised breeding species in the UK that was brought to extinction in the late 1600s due to hunting and habitat loss. Its past historical distribution is known from early ornithological writings and record books of birds hunted for medieval feasts. Sites were widely spread across southern England although there was even a colony in Wales. Most birds nested in the wetlands of the Fens and the Broads in East Anglia; the region of eastern England closest to the North Sea (Figure 1).

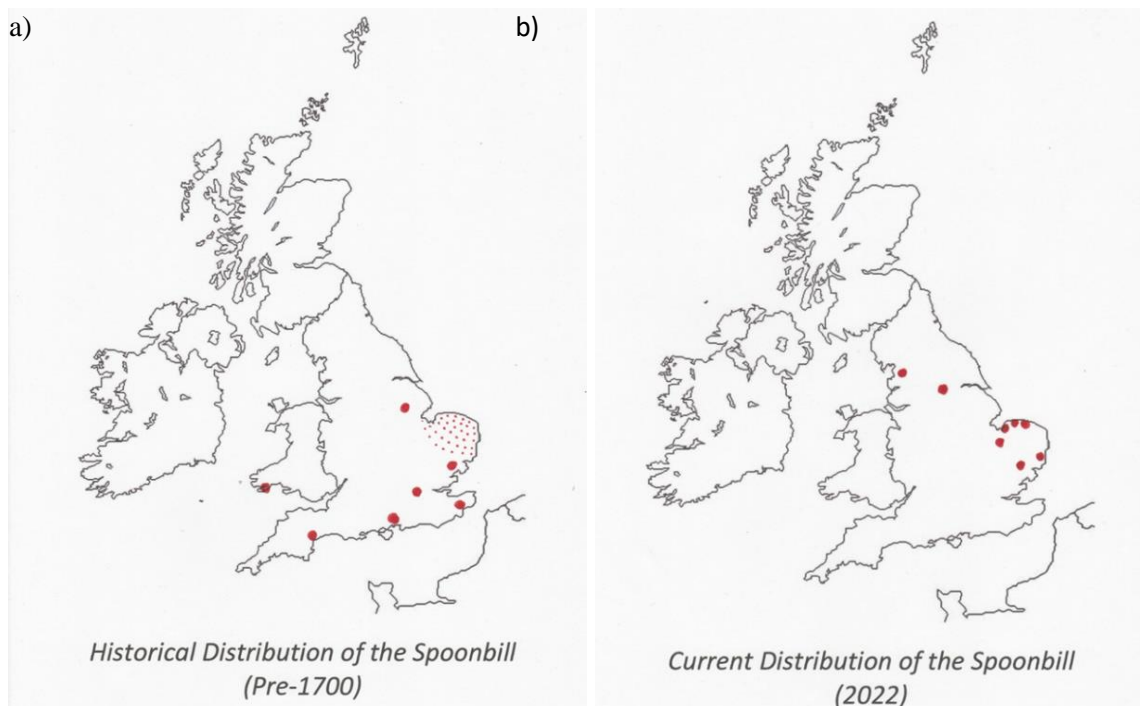


Figure 1. Maps showing the a) historical and b) 2022 breeding distribution of the Spoonbill in the UK. The closely dotted area of the historical map represents the region of East Anglia where multiple sites made up the species former stronghold.

Re-colonisation has been a long and slow journey that began with the first signs of nest building activities in the 1970s followed by sporadic breeding attempts, with success finally occurring in 1999 at the Ribble Estuary in Lancashire. A colony then became established at Holkham in Norfolk in 2010 that has thrived ever since. The success rate



of the colony's productivity has enabled birds to colonise new areas across the UK ensuring that the Spoonbill is currently not only a regular breeder but an increasing one too. This short paper summarises the species current distribution and hopes for the future.

Results and discussion

Current UK status

In 2022 the UK Spoonbill population reached 69 breeding pairs following a record year in 2021 when 71 pairs nested. That year had seen a rapid increase from 39 pairs in 2020 (Figure 2). Even more encouraging is that the population has now spread out to eight different sites compared to only two in 2017 and five in 2019 (Figure 3). With success continuing to be high all things point to numbers ever increasing into the future. The rise in numbers can be described as comparable to the situation in the Netherlands in the 20th Century when that particular population began its rapid ascendancy. Number of fledged young Spoonbills for each year since colonisation in 2010 is presented in Figure 4.

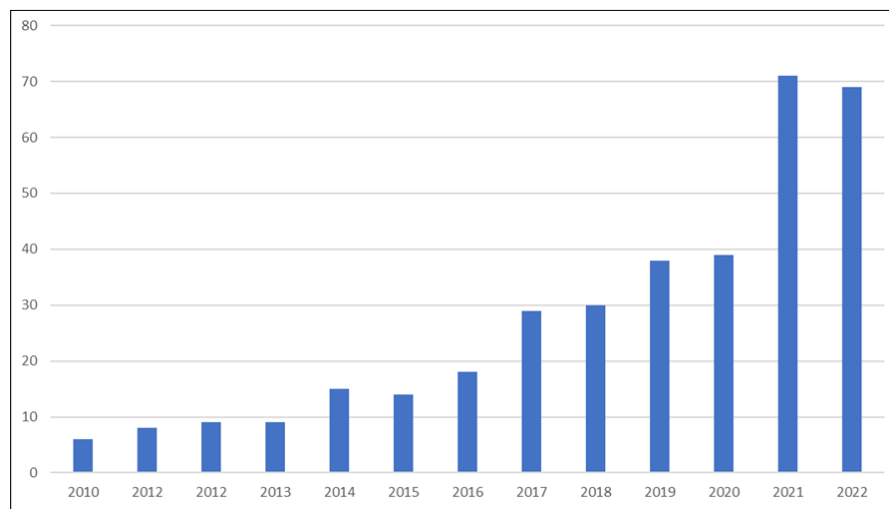


Figure 2. The UK Spoonbill breeding population since the colony formed at Holkham in 2010, then the sole site.

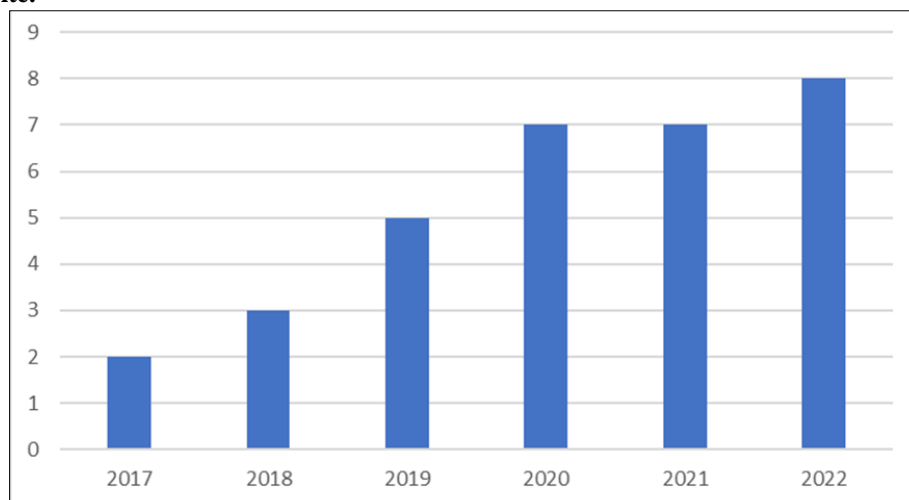


Figure 3. The number of breeding sites in the UK since 2017 when a second site (Fairburn) joined Holkham in hosting nesting birds.

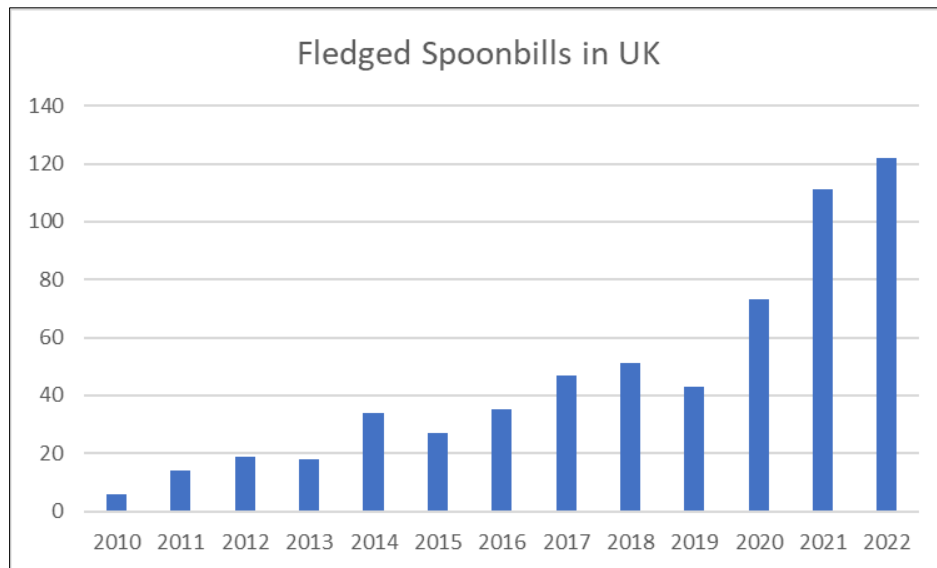


Figure 4. Number of fledged young Spoonbills in UK since colonisation in 2010

Success of the Holkham colony

Holkham National Nature Reserve is privately owned by the Earl of Leicester and covers 4000 hectares of coastal habitats on the Norfolk coast in eastern England (Figure 5). A redundant duck decoy: 4 hectares of wet woodland habitat created in the 1700s to hunt ducks, lies in the centre of 900 hectares of freshwater grazing marshes and is home to an important colony of wetland birds such as Little *Egretta garzetta*, Great White *Ardea alba* and Cattle Egrets *Bubulcus ibis*, Grey Herons *Ardea cinerea* and Cormorants *Phalacrocorax carbo*. Spoonbills began prospecting in 2004 and following several unsuccessful nesting attempts a colony formed in 2010 that produced 10 youngsters. Nesting has been annual ever since and numbers have increased rapidly. All nesting is within trees (willow *Salix* sp, oak *Quercus robur* and hawthorn *Crataegus monogyna*) and productivity has been very good (Figure 6); a total of 496 youngsters fledging between 2010 and 2022.



Figure 5. An aerial image of the Holkham NNR with its Spoonbill colony in the centre

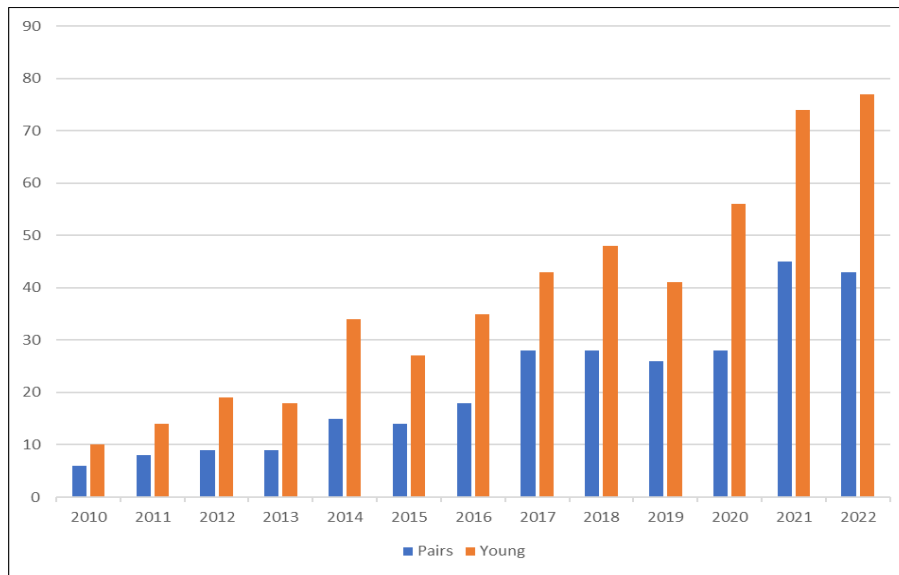


Figure 6. Spoonbill nesting pairs and fledging success at Holkham since 2010

Fairburn in Yorkshire - the second UK colony

In 2017 a second UK Spoonbill colony began to take shape on the RSPB's nature reserve at Fairburn Ings in Yorkshire. The area covers 1000 hectares and incorporates wetland lagoons, grazing marshes and woodland, created partly on a former industrialised coal mining site. From an initial single pair in 2017, numbers have increased to 8 pairs by 2022. The nesting colony bears some resemblance to Holkham in as much that it is amongst Grey Herons, Little Egrets and Cormorants within willow trees on islands surrounded by fresh water. One difference is that it is 90 km inland from the eastern coast of England. Birds routinely make this journey to the Humber Estuary to feed. Breeding success has similarly been good (Fig 7).

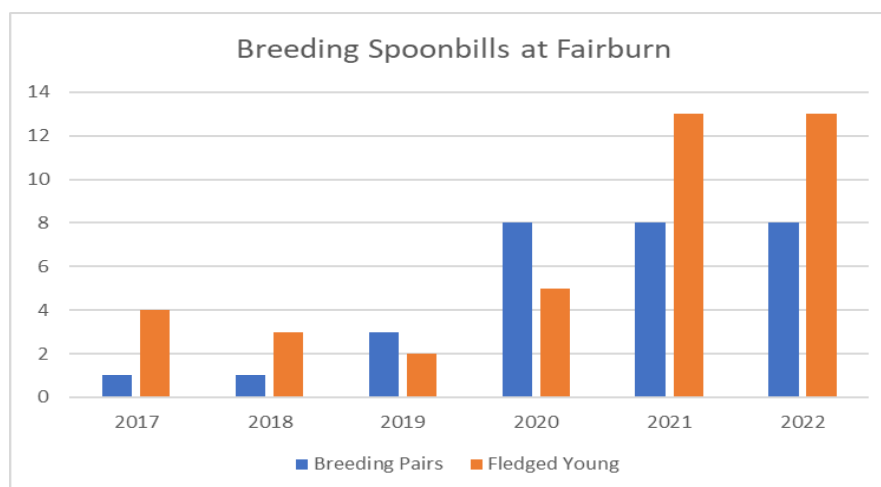


Figure 7. Nesting Spoonbills and fledging success at Fairburn Ings RSPB Reserve in Yorkshire



Havergate in Suffolk – the UK's first ground nesting colony

The third site in the UK to be colonised and show both success and growth is another RSPB Reserve; Havergate Island in Suffolk on the eastern coast of England. At just over one square kilometre, it is the only island on the Suffolk coast and is comprised of saline lagoons, saltmarsh and shingle ridges. The lagoons are home to a notable concentration of nesting Avocets *Recurvirostra avosetta* alongside Herring *Larus argentatus* and Lesser Black-backed *Larus fuscus* gulls.

Havergate first attracted nesting Spoonbills in 2019 (5 pairs) but suffered due to Badger *Meles meles* predation. Currently, Havergate is the only UK site to host ground nesting Spoonbills with the birds nesting amidst the large gulls of the islets within the lagoons. Having such an attraction to Spoonbills, the RSPB acted quickly and erected an anti-predator fence around the lagoon, and thankfully in 2019 nesting was once more attempted but this time with success. Since then, like at Holkham and Fairburn, success and breeding numbers have also risen, and it could be assumed that there are no reasons why this colony should not grow very large in the future (Fig 8). Its likeness to some of the Wadden Sea colonies is most apparent.

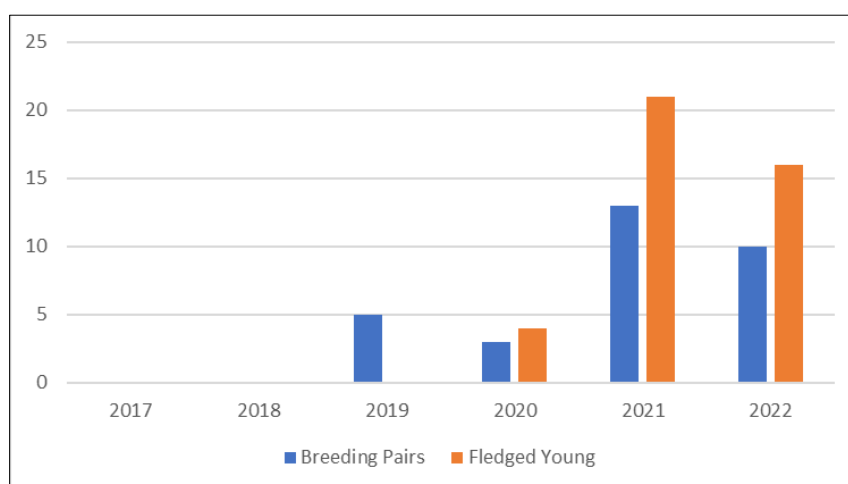


Figure 8. Nesting Spoonbills and fledging success at Havergate Island RSPB Reserve in Suffolk

Other UK sites in 2022

Two sites hosted nesting Spoonbills for the first time in 2021: Hodbarrow RSPB Reserve in Cumbria and Abberton Water in Essex. Both sites attracted single pairs and the same scenario occurred again in 2022. Both nest sites are within active tree nesting colonies of Grey Herons and Little Egrets. As success was reached on both occasions it is optimistic to assume that both sites might well evolve into colonies as time moves on. Hodbarrow is a coastal site in Cumbria on the NW shore of England. Like Fairburn it too had links with England's industrial past, part of it being a former iron mine. Now it is a 100-hectare nature reserve of grassland and scrub backing a large 50-hectare lagoon. Abberton is at the other end of the UK's plethora of Spoonbill colonies (the most southern one on the above map, Figure 1) and is a large 700-hectare freshwater reservoir. Part of it is managed by Essex Wildlife Trust, the other by Essex Water and it lies 8 km from the Essex coastline.



Other exciting developments in 2022 saw three more new localities utilised, one of which was an instant colony. All three sites are in the county of Norfolk (part of East Anglia) and all are quite close to Holkham. The furthest one away is a freshwater wetland in the Fens about 60 km from Holkham that wishes to remain un-named for now, whilst the other two sites are roughly 20 km away from Holkham. This suggests perhaps, that at least two of these might be satellite colonies formed due to the proximity to the successful colony at Holkham and the feeding areas that those birds regularly use. Of these sites the un-named Fenland locality involved a bird feeding seemingly recently fledged youngsters very close to a woodland heronry. No nest had been seen although infrequent sightings in the vicinity were made throughout the summer. All things pointed to this being a breeding occurrence although the ultimate proof was not definite, as we have known Holkham birds to take their youngsters further afield after fledging. For now, these figures have been omitted from the overall totals in the UK (Figures 3, 4).

There was no denying the provenance of the other two sites with nests and young noted. The first new site and that which produced a small colony was within a privately owned small mixed wood beside the Norfolk Wildlife Trust Reserve at Cley some 20 km east of Holkham. This is one of the oldest nature reserves in Norfolk and covers 176 hectares of grazing marshes, coastal reed bed and fresh and salt-water lagoons. Here four nests from sycamore trees produced 9 fledged youngsters. It is thought that prospecting had occurred for at least the previous three seasons so success here was great news and again should continue to occur into the future. Being very close to the adjacent freshwater marshes and also the salt marshes of Blakeney NNR there seems no reason why this colony should not increase to the same level of success as Holkham has. The final site is at Old Hunstanton some 20 km to the west of Holkham, consisting of a single pair that fledged three youngsters from a Yew tree nest. As with Cley it is within another old established Grey Heron colony where Little Egrets also breed. Interestingly it is a site where Spoonbills nested in the distant past pre-1600.

Additionally, there were also at least two other sites in England where birds summered close to tree nesting heronries suggesting that yet more colonies will shortly form.

The future of the Spoonbill in the UK

Currently it seems the Spoonbill is very much in its ascendancy in the UK. In its favour, the one thing the UK has excelled at in relatively recent times is the creation of many new wetland habitats. These have ranged from wetter grazing marshes, large inter tidal lagoons and new reedbeds. In various places former arable fields have been converted to wetlands. This has benefitted many species such as Bitterns *Botaurus stellaris*, Cranes *Grus grus*, Marsh Harriers *Circus aeruginosus*, breeding waders and colonising birds from Europe such as Cattle, Little and Great White egrets. Spoonbills too, very much come into this same category. Around the coasts of the UK there are numerous estuaries and old established salt marshes that offer bountiful feeding opportunities for Spoonbills. There is much habitat that Spoonbills can exploit. What has become apparent is that Spoonbills will readily prospect at established heronries even if there are not readily available feeding opportunities in close proximity. The fact that the Fairburn Spoonbills will regularly fly up to 90 km to coastal feeding grounds proves that this is no handicap. It also proves that UK Spoonbills are very reliant upon these saltwater environments for best feeding. What little has been found out is that species such as gobies *Gobiidae*, sticklebacks *Gasterosteidae* and shrimps/prawns *Dendrobranchiata* are all favoured food sources.



Regarding practical encouragement and active Spoonbill conservation work, two exciting projects have occurred in the last two years. Firstly in 2021, Titchwell RSPB Reserve, 12 km west from Holkham (Figure 9), partially re-designed its freshwater marshes and reed beds and in doing so created some small islands where dead trees had regularly attracted roosting Cormorants and Little Egrets. Willows were planted in the hope that in the not-too-distant future nesting egrets and Spoonbills might be attracted. At Holkham itself in 2022 a new area of deep channels, islands and pools was created to be planted in the future with a mix of trees (Figure 10). The idea is to more than double the size of the current nesting area and also to compensate for a loss in nesting trees due to the acidic nature of Cormorant's guano.



Figure 9. Newly created Spoonbill islands at Titchwell, prior to planting



Figure 10. The site of the new future heronry at Holkham after groundwork in 2022

Conclusion



All this is positively good news for Spoonbills yet there remain unanswered questions in the movements and ecology of the UK's birds. Firstly, where do most of our breeding birds go in the autumn and winter? We know that a small wintering population now frequents Poole Harbour, Dorset in the southwest of England and some of those birds (one breeding male in particular) journey to Holkham. Even if some of the wintering population at Poole has connections to Holkham, there are many more that are unaccounted for. Do these head to France or directly to Spain? Which migration route do they take? Strangely whilst there are many records of birds migrating along the east coast back to Holkham in the spring, there are very few records of birds migrating anywhere in England in the autumn. At present there are no birds ringed in the UK or satellite tagged. Both would undoubtedly answer our questions. The other question that needs researching is more detail on diet. Hopefully it is a study that someone in the future might be willing to undertake. In the meantime, all seems well for the Spoonbill in the UK and it will be of great interest to see how quickly the new colonies/sites develop and how large the population will become in another five years.

Acknowledgements

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Breeding Status of the Eurasian Spoonbill *Platalea leucorodia* in Bulgaria

Svilen CHESHMEDZHIEV^{*1}, Vladimir MLADENOV¹ & Petar IANKOV¹

¹ Bulgarian Society for the Protection of Birds, 1111 Sofia, Bulgaria. P.O.box 50. Yavorov complex, bl. 71, en.4, ap.1

*Corresponding author email address: svilen.cheshmedjiev@bspb.org

Abstract

Data about the spatial distribution, numbers and dynamics of the breeding pairs of the Eurasian Spoonbill *Platalea leucorodia* in Bulgaria during the period 2015-2022 are provided. Currently the species breeds in Bulgaria mainly along the Danube River and in the central part of the Bulgarian Black Sea Coast. During the study period (2015-2022), seven colonies existed along the Danube River: at Srebarna Lake (with 25-46 pairs), Malak Bliznak Island (with 8-21 pairs), Kalimok Complex (with 13 pairs in 2018), Ibisha Island (with 0-13 pairs), Kutovo Island (with 0-9 pairs), Martvo Marsh (with 6 pairs in 2021) and Mishka Island (with 0-5 pairs). A single colony exists along the Black Sea Coast at Poda Protected Area near Burgas (6-41 pairs). In inland Bulgaria single pairs bred in certain years at one small wetland - Kamenetz dam (0-12 pairs).

Keywords: breeding, Eurasian Spoonbill, spatial distribution, numbers, dynamics, Bulgaria

Introduction

The Eurasian Spoonbill *Platalea leucorodia* is a species of Least Concern category (BirdLife 2022a, 2022b), as its global population has increased in the last decades (Keller *et al.* 2020; Lok 2020). This trend is very obvious in countries with limited numbers of wetlands such as Bulgaria where the species is included in the National Red Data Book as Critically Endangered (Michev and Boev 2011). Information about the Eurasian Spoonbill in Bulgaria is scattered in various publications for the period before 2015 (Michev 1985; Simeonov *et al.* 1990; Kostadinova and Mihaylov 2002; Nankinov *et al.* 2004; Shurulinkov *et al.* 2005; Kostadinova and Gramatikov 2007; Kovachev *et al.* 2007; Iankov *et al.* 2007; Michev and Boev 2011; Shurilinkov *et al.* 2019) but there is no publication on the current breeding population situation. The aim of the paper is to present the current state of the Eurasian Spoonbill breeding population in Bulgaria.

Study Area

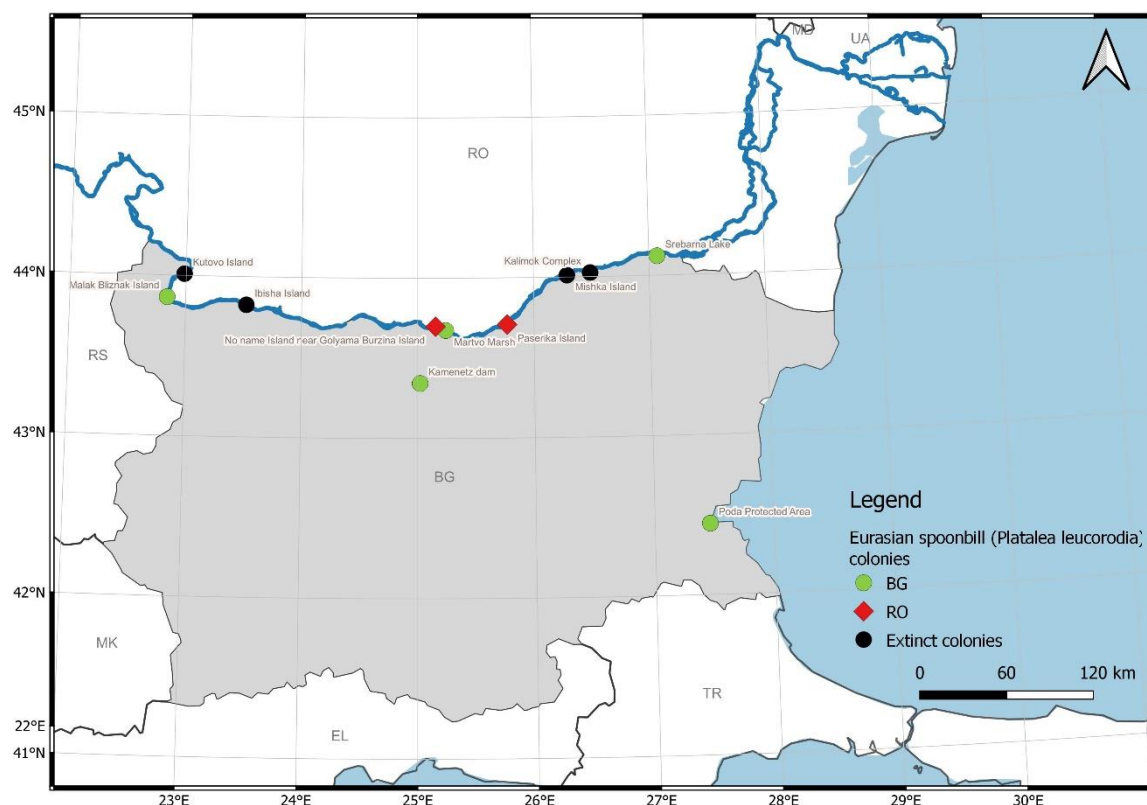
The entire territory of Bulgaria was studied in 2012-2022 by BSPB – BirdLife Bulgaria. Special attention was paid to the sites with known Eurasian Spoonbill breeding in addition to the long-term monitoring of the birds at some sites, especially along the Danube River and the Black Sea coast.



Methods

Multiple visits were done to the sites where breeding was suspected and whenever possible breeding status was clarified, and birds were counted. At some traditional breeding sites, the colonies were subject to monitoring (from twice per month for Poda Reserve during the period 2015-2022 to two-three times per breeding season for sites such as Kalimok Complex, Srebarna Lake and the islands along the Danube River). The largest and more traditional colonies were part of regular monitoring of waterbirds at important wetlands and they were visited two times per month. The breeding pairs were counted on site and total number of breeding pairs of all colonies is evaluated in the end of every year. To obtain more precise data about the breeding colony at Poda Protected Area during the breeding period 2019-2021 we used a small quadcopter drone. The model used was DJI Mavic Pro. Sites where breeding was suspected and whenever possible, breeding status was clarified by visiting at least one time during the breeding period. Numerous single records from different observers all over the country were used to complete the information. In cases where approximate figure was published, (e.g. 30-35 pairs) the bigger one was used for the graph.

Figure 1. Breeding localities of the Eurasian Spoonbill in Bulgaria during 2015-2022



Results

At around 1990 the national breeding population of the species was estimated to have 50-70 breeding pairs (Michev 1985; Simeonov *et al.* 1990), around 1995 – 100-110 pairs (Kostadinova 1997), 105 pairs in 2002 (Kostadinova and Mihaylov 2002), 100-120 pairs in 2004 (Nankinov *et al.* 2004), and 80-150 pairs in 2007 (Kostadinova and Gramatikov



2007; Iankov 2007). Data about the spatial distribution, numbers and dynamics of the breeding pairs of the Eurasian Spoonbill in Bulgaria during the period 2015-2022 are provided. Currently the species breeds in Bulgaria mainly along the Danube River and in the central part of the Bulgarian Black Sea Coast (Figure 1). Seven colonies exist along the Danube River: Kutovo Island, Malak Bliznak Island, Ibisha Island, Martvo Marsh, Mishka Island, Kalimok Complex and Srebarna Lake. A single colony exists along the Black Sea Coast at Poda Protected Area near Burgas. In inland Bulgaria, single pairs bred in certain years at one small wetland - Kamenetz dam. The species also breeds on two more islands along the Danube River (No name Island near to Golyama Burzina Island and Paserika Island), but they are part of the territory of Romania (Table 1). During the last eight years (2015-2022) between 67 (2020) and 115 (2018) pairs of Eurasian Spoonbill bred in Bulgaria (Table 2). The national breeding population of the Eurasian Spoonbill is stable with aperiodic fluctuations and with a slightly pronounced decreasing trend (Figure 2).

Table 1. Numbers of breeding pairs (per colony) of the Eurasian Spoonbill *Platalea leucorodia* along the Romanian section of the Danube River

Colony/Year	Breeding pairs							
	2015	2016	2017	2018	2019	2020	2021	2022
No name Island near Golyama Burzina Island	22	26	29	30	38	40	0	42
Paserika Island	6	10	8	17	15	14	3	17
Total Romanian Danube Islands	28	36	37	47	53	54	3	59

Table 2. Numbers of breeding pairs (per colony) of the Eurasian Spoonbill *Platalea leucorodia* in Bulgaria, 2015-2022.

Colony/Year	Breeding pairs							
	2015	2016	2017	2018	2019	2020	2021	2022
Kutovo Island	7	9	6	7	0	0	0	0
Malak Bliznak Island	11	18	21	23	17	18	8	10
Ibisha Island	13	11	9	9	0	0	0	0
Mishka Island	3	3	5	5	0	0	0	0
Kalimok Complex	0	0	0	13	0	0	0	0
Srebarna Lake	30-46	30-40	30-35	40-50	25-30	30-40	30-40	30-40
Martvo Marsh	0	0	0	0	0	0	6	0
Kamenetz dam	3	0	0	0	7	4	8	12
Poda Protected Area	27	19-23	12-18	6-8	41	15-20	15-20	28
Total BULGARIA	94-110	90-104	83-94	103-115	90-95	67-82	67-82	80-90

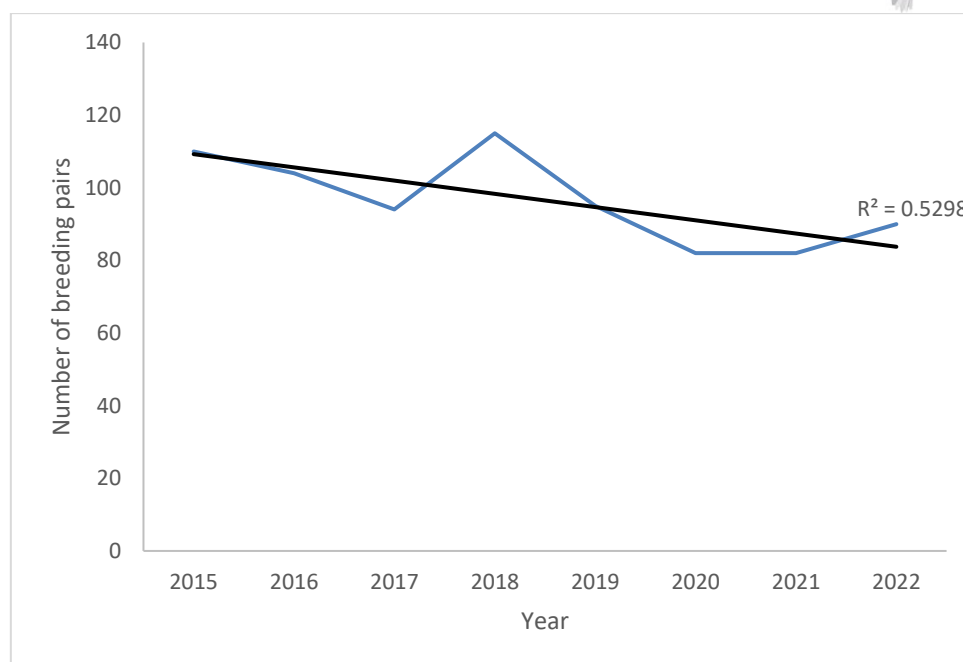


Figure 2. Dynamics of the breeding population numbers of the Eurasian Spoonbill *Platalea leucorodia* in Bulgaria, 2015-2022.

Discussion

Currently the Eurasian Spoonbill breeds in Bulgaria mainly along the Danube River and in the central part of the Bulgarian Black Sea Coast. In inland Bulgaria, single pairs bred in certain years at one small wetland - Kamenetz dam. In the Kalimok Complex, breeding of the species was registered only in 2019 and at Martvo Marsh – only in 2021. Since 2019, the species has not bred at Kutovo Island, Ibisha Island and Mishka Island. The likely reason for this is the significant human impact, particularly through forestry operations undertaken on these islands, resulting in clearance of trees containing nests or causing disturbance. The number of active breeding colonies of the species in the country in 2021 is 5 (Srebarna Lake, Poda Protected Area, Malak Bliznak Island, Kamenetz dam and Martvo Marsh) and in 2022 - only 4 (Srebarna Lake, Poda Protected Area, Kamenetz dam and Malak Bliznak Island). Among the most important threats for the Eurasian Spoonbill in Bulgaria are water drainage of the wetlands along the Danube River, illegal forestry practices and logging of the trees, disturbance by local people, anglers, hunters and tourists, fires in the reeds massifs registered at some wetlands along the Danube (Kalimok Complex, Kaykusha Marsh) and the climate changes.

Acknowledgements

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Breeding population trends and nesting success of Eurasian Spoonbill *Platalea leucorodia* in Greece

Savas KAZANTZIDIS^{1*}, Theodoros NAZIRIDIS², Evagelia KATRANA³

¹Forest Research Institute/Hellenic Agricultural Organization “DIMITRA”, Vassilika, GR-57006, Thessaloniki, Greece

²The Natural Environment and Climate Change Agency/Management Unit of Protected Areas of Central Macedonia/Kerkini Branch, Greece

³The Natural Environment and Climate Change Agency/Management Unit of Protected Areas of Central Macedonia/Chalastra Branch, Greece

* Corresponding author; e-mail: savkaz@elgo.gr

Keywords: heron colonies, wetlands, breeding population

Introduction

Eurasian Spoonbill *Platalea leucorodia* Linnaeus, 1758 (hereafter referred to as ‘Spoonbill’) was already known from ancient times in Greece as it was described by the Greek philosopher Aristotle in his work *Historia animalium* in the 4th century BC (384-322). In that book, Spoonbill is described as a “white heron” (“leukerodios” in Greek) with a broad bill (“plati” in Greek) and from these two words, “plati” and “leukerodios”, has derived the scientific name of the species (Pollard 1977). Spoonbill in Greece was recorded again in the 18th century, as we know from reports of naturalists travelling in Greece. However, the nesting of Spoonbill was for the first time recorded in north-eastern Greece (at the Evros Delta and Ismaris Lake) in 1965 (Handrinos and Akriotis 1997). Later, in the 1970s, three more colonies were recorded in northern Greece and the total breeding population in 1971 was estimated at 200-240 pairs (Handrinos and Akriotis 1997; del Hoyo *et al.* 1997). In the early ‘80s, the breeding population declined to 113-172 pairs (Crivelli *et al.* 1988). Since the late ‘80s more systematic research on heron and cormorant colonies has been carried out in Greece, so that the distribution and abundance of nesting herons and associated colonial species, including Spoonbill, are much better known. However, the Spoonbill is considered a poorly studied species in Greece as no specific research has been carried out on this species other than monitoring the nesting population and distribution.

The species is protected under the EU Bird Directive and is listed as “Vulnerable” in the “Red Data Book of Animals in Greece” (Legakis and Maragou 2009).

The aim of this study is to describe the status of the Spoonbill in Greece, the recent nesting population trends, as well as the nesting success of the species.



Methods

The data used in the present research comes from direct or indirect counts of nests and estimates of the number of nesting pairs during the period 1988-2022. Nest counts were carried out during national surveys of heron colonies in Greece (2003, 2009, 2014 and 2018). Additionally, two of the three main heron colonies with Spoonbills have been systematically monitored (Kerkini Lake: annually since 1988, Axios Delta: annually since 2011 and every 2-3 years since 1988, although there are no data for the period 1991-2002) while the other colonies have been monitored irregularly.

Survey of colonies

All wetlands that could potentially host heron colonies (including Spoonbills, Glossy Ibises and cormorants in addition to herons) were visited during the breeding season (from late April to early June). When a colony was found, the following data were collected: a) the geographic location (coordinates) of the colony, b) the type of vegetation and the tree species that hosted the nests, and c) the number of active nests for each species (Yfantis and Kazantzidis 2004; Kazantzidis *et al.* 2013). The number of nests of each species was recorded during the chick rearing period of most nesting pairs (late May and early June, Kazantzidis *et al.* 2013). We usually counted the active nests from outside the colony, either from the ground, from boats, or from high observation towers, using binoculars and telescopes. In cases where the colony was inaccessible, e.g. in a reed bed, we estimated the number of nests by tallying the birds departing for the feeding grounds. Starting before dawn, we counted the leaving birds for about one hour (Fasola *et al.* 2011; Kazantzidis *et al.* 2013). We assumed that two birds correspond to one nest. In certain mixed colonies with Spoonbills (Kerkini Lake, Axios Delta) we counted all the active nests after entering the colonies in the morning (6 – 9 am). Additionally, a drone was used to count the nests in colonies located in reed bed (Amvrakikos Gulf) or in dense vegetation (Axios Delta).

Breeding success

The methods used to estimate breeding success were: a) Weekly counts of the number of eggs and nestlings surviving to 25-30 days of age in marked nests at Axios Delta during 2021 breeding season. The nests were marked individually by small, numbered, wooden tags placed below the nest and checked with a mirror on a pole and b) Counting (once per breeding season) the number of chicks surviving to 25-30 days of age, from a distance, in successful nests only at Axios Delta (2020, 2021 and 2022) and Kerkini Lake (2019, 2020 and 2022).

To assess the changes in the population size of the Spoonbill over the years 1988-2022 and to investigate the trends, the software package TRIM v. 3 was used which is based on log-linear models and uses the data from the different count sites to calculate the overall population trend (Pannekoek and van Strien 2005). For the comparison of the nesting success among the years and between the colonies we used the ANOVA test (SPSS 20).



Results

Spoonbills were recorded nesting in eight wetlands and overall, in eleven colonies during the study period in Greece (Figure 1). The number of colonies increased from three in the period 1988-2001 to five in 2009, 2014 and 2015 and six in 2018, 2021 and 2022 (Figure 2).



Figure 1. Distribution and size of Spoonbill colonies in Greece. Orange circles: colonies in 2022. Black circles (names in blue): colonies active until 2018. The large circles indicate the largest colonies (>60 nests) and the small circles the smaller colonies (<30 nests).

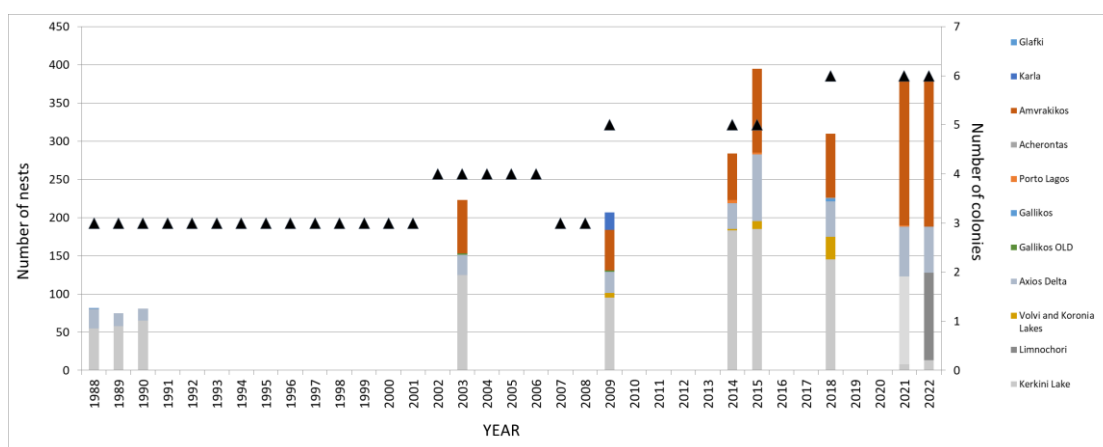


Figure 2. Number of nests and colonies of Spoonbills in Greece during the period 1988-2022. The bars indicate the number of nests, the colours of the bars indicate the number of nests at the different colonies and the triangular dots indicate the number of colonies (right axis).



The number of nests increased from 75 in 1989 (the lowest value in the study period) to 395 in 2015 (the highest value) and to 391 in 2022. The breeding population showed a moderate increase of 3.5% per year during the study period ($p < 0.001$).

Breeding success

The clutch size of Spoonbills at the Axios Delta (2021) was 2.8 eggs per nest (± 0.6 SD, range 1-4, $n=19$). The mean hatching success was 1.7 eggs per nest (± 0.8 SD, range 1-3, $n=13$) or 40.7% of eggs laid. Finally, from all nests, including failed ones, a mean number of 1.5 nestlings per nest survived to 25 days of age (± 0.9 SD, range 1-3, $n=13$), or 35% of eggs laid and 86.0% of eggs hatched.

When we counted the successful nests only at Axios Delta and Kerkini Lake, we found no differences in the mean number of fledglings per nest between the two sites ($F=0.037$, $p=0.848$, Table 1). However, differences were found among the years ($F=3.382$, $p=0.022$, Table 1). The highest values were recorded in 2019 (at Kerkini Lake) and 2020 (at Axios Delta) and the lowest in 2022 (at both sites) (Table 1).

Table 1. The mean number of fledglings (up to 25 days old) per nest and range of successful nests only (n) at Axios Delta and Kerkini Lake colonies during the breeding periods 2019 – 2022.

Year	Axios Delta	Kerkini Lake	Total
	Mean \pm SD, Range, (n)	Mean \pm SD, Range, (n)	Mean \pm SD, Range, (n)
2019	-	2.2 \pm 0.7, 1-3, (19)	2.2 \pm 0.7 1-3, (19)
2020	2.4 \pm 0.8, 1-4, (14)	1.7 \pm 0.5, (1-2), (6)	2.2 \pm 0.8, 1-4, (20)
2021	1.8 \pm 0.8, 1-3, (21)	-	1.8 \pm 0.8, 1-3, (21)
2022	1.7 \pm 0.6, 1-3, (15)	1.7 \pm 0.6, 1-3, (21)	1.7 \pm 0.6, 1-3, (36)
Mean	1.9 \pm 0.8, 1-4, (50)	1.9 \pm 0.6, 1-3, (46)	1.9 \pm 0.7, 1-4, (96)

Characteristics of the breeding areas

Spoonbills breed in colonies near: a) freshwater lakes including reservoirs (five colonies): Kerkini, Limnochori, Koronia, Glafki and Karla, b) river deltas and estuaries (four colonies): Axios, Acherontas and two colonies in Gallikos, c) large marshes with reedbeds (one colony): Amvrakikos and d) lagoons (one colony): Porto Lagos.

All wetlands where the species was recorded nesting are protected areas (national parks and special protection areas).

Characteristics of the colonies

Spoonbills always nested in mixed colonies, together with herons, egrets, Glossy Ibises, Great *Phalacrocorax carbo sinensis* and Pygmy Cormorants *Microcarbo pygmaeus*. The number of other species associated with the Spoonbill ranged from 3 to 9. Spoonbill, at least in 2022, nested always in colonies with Little Egrets *Egretta garzetta* and Grey Herons *Ardea cinerea* and in 83.3% of cases with Black-crowned Night Herons *Nycticorax nycticorax*.

Spoonbills nested on trees, such as willows *Salix* spp. (one case), Poplars *Populus* spp. (one case), Tamarisks *Tamarix* spp. (one case) and Pine trees *Pinus* spp. (two cases) and



in reed beds of *Phragmites australis* (one colony that is the largest in Greece, at Amvrakikos Gulf).

Discussion

Despite the expansion of colonies and the increasing number of nests after 2002, more than 88% of the nesting population was recorded in only three wetlands (Amvrakikos Gulf, Kerkini Lake and Axios Delta) in 2021 and 2022. The increase of the nesting Spoonbill population in Greece coincided with the restoration of certain wetlands and the establishment of management authorities at the main protected areas, which include all areas with large heron colonies with Spoonbills. The legal protection framework and the proper management leading to a reduction of disturbance and many illegal activities, have created the appropriate conditions for an increase in the Spoonbill population. A similar increase has been observed in some (but not all) other sympatric species e.g. Glossy Ibis, Great and Pygmy Cormorant, Squacco Heron etc. There are two examples of the impact of restoration of Greek wetlands on birds: a) Karla Lake (Thessaly) was drained in the 1960s, and recently partially restored (Zalidis *et al.* 2004). After the restoration of the lake, many waterbirds including Herons, Cormorants, Pelicans and Spoonbills have started nesting (2009), b) Koronia Lake (central Macedonia) had been heavily polluted and drained in the 1990s due to water mismanagement. In 2015, after the start of the restoration works, two heron colonies have been established where Spoonbills also nested. Another possible reason of the breeding population increase is the increasing number of the wintering Spoonbills in Greek wetlands (about 600-700 birds in the 2020s). Although many Spoonbills ringed as nestlings in Greece winter in North Africa (Tunisia, Egypt) and Eastern Mediterranean (Israel, Turkey) (Akriotis and Handrinos 2004) there are also many of them that winter close to their breeding grounds.

The positive trend of the breeding population in Greece is in line with the trend in north-western Europe, but different from the stable or negative trend in central Europe and in the South-eastern Europe (Champagnon *et al.* 2019, Champagnon *et al.* this issue, Marion 2019).

Despite the increase of the breeding population, there are still several threats. Although wetland drainage and water pollution played a role in the past, today, plastic waste spread along the coastal areas that are used by Spoonbills as foraging sites, could be a serious threat that should be investigated. Another possible threat, especially at Kerkini Lake, is considered to be the antagonism with Great Cormorants for nesting sites in an ever-shrinking forest. The increase of the Great Cormorants breeding population in recent years (Kazantidis *et al.* 2021) may have contributed to the displacement of the Spoonbill (and also some other heron species) from the old colony and the establishment of a new colony about 8 km away (in Limnochori).

Clutch and brood size in Greek colonies is lower or similar compared to other colonies in Europe. The nesting success in Greece is similar to that recorded in Belgium (Spanoghe *et al.* 2013) and lower than in The Netherlands (Oudman *et al.* 2017, Triplet *et al.* 2008, Lok *et al.* 2009) and Romania (Vespremeanu 1968).

It is important to continue monitoring not only the nesting population and breeding success but also the wintering population as well as the migratory movements preferably



by applying colour ringing which will provide a more complete picture of the distribution of this species in the Mediterranean.

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The origins and temporal and spatial distribution of foreign-ringed Eurasian Spoonbills in Croatia

Jelena KRALJ¹*, Davor ČIKOVIĆ¹, Sanja BARIŠIĆ¹, Vesna TUTIŠ¹

¹Institute of Ornithology CASA, Croatia

*Corresponding author; e-mail: jkralj@hazu.hr

Abstract

Until May 2022, a total of 273 observations of 172 foreign-ringed Eurasian Spoonbills from eight countries were recorded in Croatia. All observed birds were ringed as chicks in the nest. Birds mostly originated from Carpathian Basin populations. The majority of recoveries (75%) were recorded during the post-breeding period, with 96% of them in NE Croatia. The most important locality during that period in Croatia is the Nature Park Kopački Rit. During the spring migration (March to May), Spoonbills were mostly observed in southern Dalmatia, mostly in Neretva Delta, while during autumn migration, observations in that area were scarce. Spoonbills migrating through Croatia were mostly resighted in Italy and North Africa. Winter resightings were not numerous. Birds originating from Hungary, Serbia and Italy overwintered in inland Croatia and Southern Dalmatia. Eight birds were recorded during the breeding season at the colony Krapje Đol (NW Croatia), five of them originating from Hungary and one from Serbia, Italy and France. The median distance from breeding colonies was 395.6 km (range 252.5-1003.4 km). Recoveries of foreign-ringed spoonbills confirm the importance of Croatian wetland habitats for migration of the Central European population using the Adriatic flyway.

Keywords: colour-ringing, stopovers, Adriatic flyway

Introduction

Eurasian Spoonbill *Platalea leucorodia* is a breeding, passage and wintering species in Croatia with the breeding population being Endangered at national level (Mikuska 2013). Colour-ringing in Croatia started in 2003 and gained data that allowed the study of dispersion and migration of the Croatian population (Kralj *et al.* 2012; Pigniczki *et al.* 2016). However, data about foreign-ringing birds found in Croatia has not been analysed yet. Analysis of the origin of birds recorded in Croatia is needed for the assessment of the importance of stopovers on wintering sites, as well as for understanding the position of Croatia in the Eurasian Spoonbill flyways.

Material and methods

Records of foreign-ringed birds from the database of the Croatian Ringing Centre, Zagreb were used. For the analysis of the spatial distribution, Croatia was divided in five regions: Central Croatia, Eastern Croatia, Mountain Region, Northern coast, Southern Coast (or Dalmatia). There were no records from Mountain region, due to the lack of appropriate habitats. Data were collected by 35 observers. The observation effort was not uniform but



was concentrated around the most important sites for the spoonbills. In inland Croatia, observations were collected during monitoring in Kopački rit and on carp fishponds, while along the coast, monitoring of waterbirds is ongoing at Neretva delta, Vransko lake and smaller wetlands on the island of Pag. Breeding season is underrepresented, as the main colonies are situated in large reedbeds and inaccessible without disturbance of breeding spoonbills.

For the determination of the age, four calendar year categories were used: juveniles (in the year of hatching), immatures (in their 2nd and 3rd year), subadults (in the 4th year) and adults (older than 4th calendar year). Stages of the Eurasian Spoonbill's annual cycle were assessed as follows: dispersal and post-breeding migration from July to October, wintering from December to February and spring migration from March to May. Observation of subadults and adults at the colonies between March and June were assigned as breeding/prospecting records.

Results

Until May 2022, a total of 273 observations of 172 foreign-ringed Eurasian Spoonbills were recorded in Croatia. Majority of records (262) were of colour-ringed birds, collected during last two decades (2001-2022). From those, 260 were live resightings and two birds were found dead. Additionally, 11 records of dead birds ringed in Hungary and Serbia were collected between 1908 and 1938.

All observed birds were ringed as chicks in the nest. Birds mostly originated from Central European population (Table 1), especially from the Carpathian Basin (Hungary, Serbia and Czechia), with 92% of all observations. Observations of birds from the North Atlantic population (the Netherlands) and SE population (Romania, and Greece) were scarce.

The majority of recoveries (75%) were recorded during the post-breeding period, with 96% of them in NE Croatia (Figure 1). The most important locality during that period in Croatia is the Nature Park Kopački rit. During the spring migration spoonbills were predominantly observed in southern Dalmatia (36 observations), mostly in Neretva Delta, while during autumn observations in that area were scarce. Winter recoveries (December to February) are not numerous. Birds originating from Hungary, Serbia and Italy overwintered in inland Croatia and Southern Dalmatia. Eight birds were recorded during the breeding season at the colony Krapje Đol (NW Croatia), five of them originating from Hungary and one from Serbia, Italy and France. The median distance from breeding colonies was 395.6 km (range 252.5 – 1003.4 km).

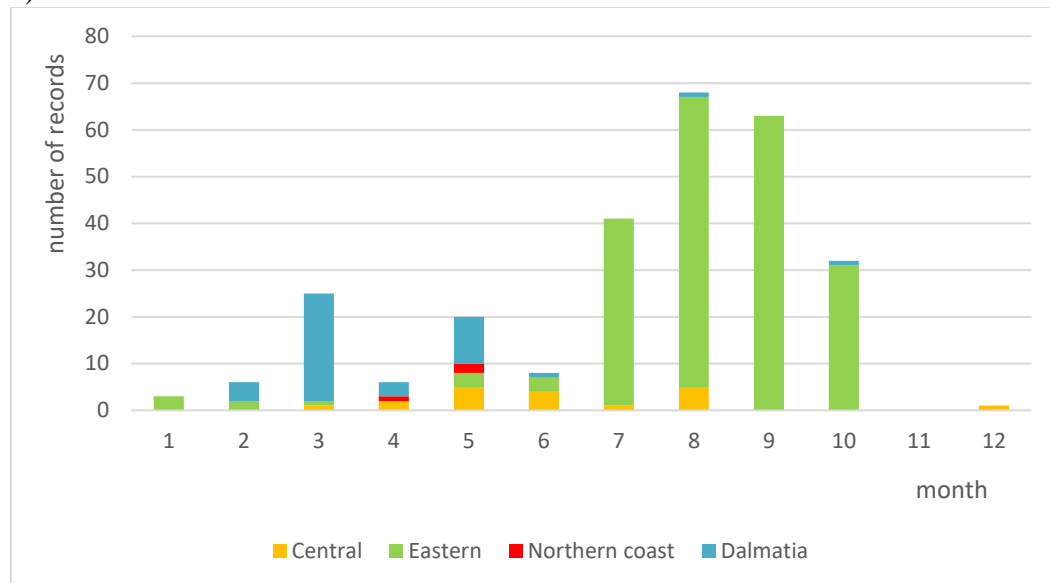
The majority of observed birds were in their first year (60.4%), followed by adults (Figure 2). First-year birds belonged to Central European and SE European populations. Immature spoonbills from Italy were recorded in April and May along the Adriatic, while adults were recorded during spring migration at Neretva Delta. The oldest recorded bird was in its 16th year.

Table 1. The origin of colour-ringed Eurasian Spoonbills observed in Croatia

Country of origin	Number of birds	Number of records
Hungary	104	138
Serbia	51	111
Czechia	1	1
Italy	12	18
France	1	1
The Netherlands	1	1
Romania	1	2
Greece	1	1



a)



b)

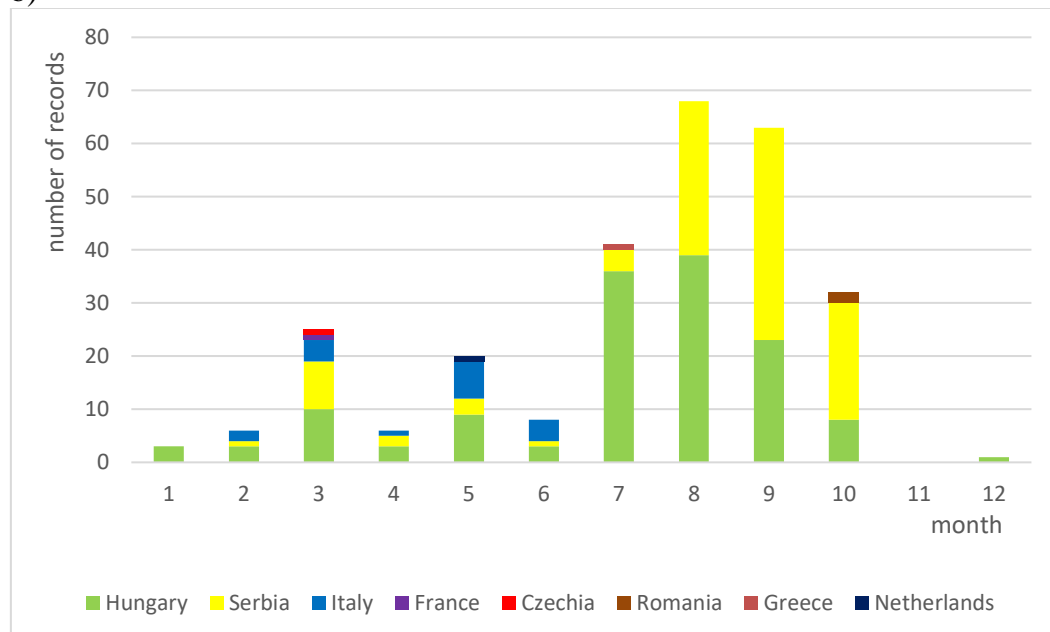


Figure 1. Monthly number of records of foreign-ringed Eurasian Spoonbills a) per regions in Croatia b) per country of origin.

Discussion

Croatia is situated at the SW edge of the Carpathian Basin, between the main breeding areas of Central European population and the Adriatic flyway. Therefore, a high number of records from Hungary and Serbia was expected. During the post-breeding period, Kopački Rit in Eastern Croatia hosted concentrations of spoonbills before their department towards wintering area. Spoonbills from the Carpathian Basin that were migrating through Croatia were mostly recovered in Italy and North Africa, following North- or South-Adriatic Flyway (Pigniczki *et al.* 2016).

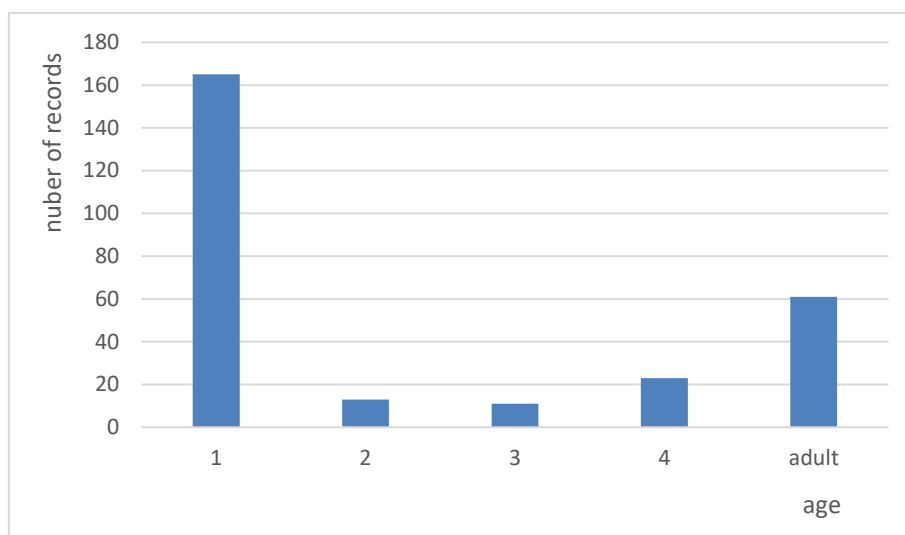


Figure 2. Age structure of foreign-ringed Eurasian Spoonbills found in Croatia.

Birds from Italian breeding populations (Valli di Comacchio colony) were observed in Croatia between February and June. Immatures and subadults were observed along the coast from March to May, while in May and June, subadults were observed in inland Croatia, closer to the breeding colonies or at the colony. As there are no spoonbill colonies along the Croatian coast, non-breeding individuals might spend the early breeding period there at good foraging areas before prospecting colonies at the end of the breeding season, when the best quality information about reproductive success can be achieved (Boulinier *et al.* 1996).

Five Hungarian and one Serbian adult spoonbills were reported as breeding in Krapje Đol colony in Croatia. Similarly, several birds hatched in Croatia and Serbia were later observed breeding in Hungary (Pigniczki 2017), showing the dispersal of birds inside the Carpathian Basin. During the breeding season, adult spoonbill from Camargue and a subadult from Ferrara, Italy were recorded at colony Krapje Đol. An Italian subadult was observed at the colony on 10th May and 8th June and reported as breeding bird on both occasions. The individual from Camargue was recorded at the colony on 30th March, but was observed successfully breeding in Camargue from May to August in the same year. Therefore, its visit to Krapje Đol colony most probably represents pre-breeding prospecting. Nevertheless, the presence of these birds indicates some gene flow between Camargue and Croatian populations. Similarly, during the breeding season adults from the Wadden Sea area (the Netherlands and Denmark) and Romania were observed in Hungary (Pigniczki 2017, Kiss 2019). Further genetic studies are needed to assess the level of connectivity inside the Carpathian Basin and among different populations.

Two birds from the SE European breeding population were observed during post-breeding period in Kopački Rit, Eastern Croatia: second-year bird from Romania and 5-years old bird from Greece. Spoonbills belonging to SE European population predominantly use SE flyway, but some birds also use the Adriatic Flyway (Kiss *et al.* 2019).

Spoonbills from the North Atlantic population winter from France and Iberia to Mauritania and Senegal (Lok *et al.* 2011), however a small overlap of the wintering area with the Central European population has been found (Smart *et al.* 2007) and individual birds have been already observed in the Carpathian Basin (Pigniczki 2017).

Foreign-ringed spoonbills in Hungary (Pigniczki 2017) show similar distribution of birds originating from different populations: the majority of observations (84.3%) were of birds



from the Carpathian Basin, with 6.7% observations from Italy and very few from SE European and North Atlantic population. The main difference is the presence of Austrian spoonbills and more birds of Czech origin observed in Hungary, compared to Croatia. Among age classes, immatures were least present. It is known that 2nd year spoonbills mostly stay in the wintering grounds or somewhere between wintering and breeding area (Pigniczki & Végvári 2015). Birds from that age class observed in Croatia originated from Hungary, Romania and Italy and were observed between May and July. Italian-ringed birds were observed along the coast of the Northern Adriatic, 126-220 km N-ENE from their breeding sites, showing that during spring they migrated more towards east from their natal colonies.

Recoveries of foreign-ringed spoonbills confirm the importance of Croatian wetland habitats for migration of the Central European population using the Adriatic flyway. The most important locality during the autumn migration is Kopački Rit in NE Croatia, whereas during spring migration it is Neretva Delta in southern Dalmatia. Both sites are designated as SPAs.

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NATURA 2000 status does not guarantee the protection of Croatian spoonbill breeding population

Tibor MIKUSKA^{1*}, Alma MIKUSKA², Dora BJEDOV³, Josip LEDINŠČAK¹, Adrian TOMIK¹, Nenad ŠETINA¹, Darko PODRAVEC¹

¹Croatian Society for Birds and Nature Protection, Osijek, Croatia

²Department of Biology University of Josip Juraj Strossmayer, Osijek, Croatia

³Croatian Institute for Biodiversity, Biota Ltd., Zagreb, Croatia

*Corresponding author; e-mail: tibor.kopacki.rit@gmail.com

Abstract

Eurasian Spoonbill *Platalea leucorodia* is a regular breeding bird species in Croatia whose population has been fairly well monitored since 1962. They bred in a single colony (Krapje Đol) until 1989 when the population dispersed due to drought and colonised new breeding sites, primarily man-made carp fishponds. Krapje Đol colony, situated in former Sava River oxbow, is the only natural breeding site for spoonbills in Croatia. Despite being protected as NATURA 2000 sites, lack of proper management plans and nature protection enforcements results in so called “paper protection” that cannot ensure the wellbeing of Croatian breeding population. The main threats are continuous breeding habitat destruction during fishpond reconstruction for the purpose of intensification of fish production, abandonment of the fish production that result in dry fishponds as well as disturbance caused by hunting during the fall migration and wintering.

Keywords: *Platalea leucorodia*, conservation, fishpond, management

Introduction

Eurasian Spoonbill *Platalea leucorodia* is a regular breeding bird species in Croatia whose population has been fairly well monitored since 1962. Prior 1960s their breeding was recorded in two natural floodplain wetlands: Kopački rit and Krapje Đol. Spoonbills bred in 1954 in Kopački rit wetlands along the Danube River, but their colonies were quickly destroyed by the local fisherman (Majić & Mikuska 1972). Since then, despite existence of mixed heron colonies in the area, only three unsuccessful attempts were recorded with three (1990), four (2007) and again three pairs (2022), respectively. These attempts were bizarre in a sense that spoonbills were mimicking courtship display, pair formation and nest building in the areas outside of existing heron colonies, while egg-laying have never occurred. However, Kopački rit wetlands remained one of the most important stop-over sites during post-breeding dispersal and fall migration with flock of up to 1500 individuals gathering at best foraging sites (Mikuska et al., 2006).

Second nesting site, in Krapje Đol oxbow, along the Sava River floodplain was discovered in 1961 by Ern (1985, 1990). Some authors hypothesised that breeding on this location started as early as 1949, but detailed information was not obtained (Rucner, 1970). Spoonbills remained faithful to this nesting site until 1989 and during this period Krapje Đol was the only known nesting site in the whole Croatia (Schneider-Jacoby et al. 2002). They have bred on this site until 1989 when population has dispersed due to drought and colonised new breeding sites, primarily man-made carp fishponds along



eastern Croatia (Schneider-Jacoby et al. 2002). Since 1990, besides of Krapje Đol, breeding of spoonbills has been recorded on six fishponds: Jasinje, Našice, Donji Miholjac, Grudnjak, Vrbovljani and Blatnica.

Spoonbill breeding from 1990-2013

In 1990, spoonbills from Krapje Đol colony moved 100 km downstream Sava and established new colony at Jasinje fishponds. The following year, after a successful restoration of water levels, part of the breeding population moved back to Krapje Đol colony (Schneider-Jacoby et al. 2002). These two colonies along Sava River remained as main breeding sites for the national breeding population until now (Table 1). Colonisation of other fishponds were recorded in 1993 (Našice), 1995 (Donji Miholjac) and 2003 (Grudnjak) (Table 1). Those three fishponds are situated 55-75 km north-east from Jasinje fishponds and belong to the Drava watershed.

Despite the fact that spoonbills are strictly protected species by Law on Nature Protection (Official gazette No. 80/05; 139/08; 80/13; 15/18; 14/19; 127/19) breeding on commercial fishponds was not properly secured by conservation measures and activities. The colony at Donji Miholjac fishpond was abandoned by 2004 due to reedbed degradation caused by high water levels maintained for sport angling purposes. Appropriate water levels that would enable breeding of spoonbills in reedbeds were not maintained in 2012, either, preventing breeding of all colonially nesting waterbirds. Colony at Grudnjak fishpond has been abandoned in 2004 because fishponds, including colony site, were kept dry enabling predator intrusion. Spoonbills returned to breed on this site in small numbers from 2007-2012, but then abandoned it again and have not breed there since. By 2012 spoonbills were nesting on three fishponds (Jasinje, Grudnjak and Našice) while Krapje Đol colony was again abandoned due to drought and lack of water (Table 1).

Croatian accession to EU and Natura 2000 network

Croatia entered European Union in 2013 when EU directives came to force. Prior to that, during the accession period, a proposal for NATURA 2000 network was prepared including 39 proposed SPAs and covering 40% of land and 42% of marine area (Radović et al., 2005). At the end of the process, 38 SPAs covering 1.844.773,47 ha have been designated (Official gazette, 134/2013; <https://www.bioportal.hr/gis/>) and all spoonbill colonies were included in the Natura 2000 network (Figure 1).

By Law on Nature Protection management and protection of Natura sites is under responsibility of several governmental offices. While national and nature parks have separate nature protection offices, all other Natura sites are supposed to be managed by nature protection offices on the county level (Official gazette, 80/2019). Nature protection management offices are responsible for protection, conservation, and promotion of the Natura 2000 sites. By law, Natura 2000 sites should have proper management plans, but in practice only few sites (mainly national and nature parks) have those in place. Only in 2021 development of management plans for selected Natura sites have started, and they are still in progress. Furthermore, appropriate nature and impact assessment studies should be made for all activities that could have detrimental consequences on the site values. That includes commercial activities such as aquaculture on fishponds. While implementation of EU directives and legal nature protection system would imply that protection of spoonbills and their colonies would be secured, this is not happening in practice.



Table 1. Development of Eurasian Spoonbill *Platalea leucorodia* breeding population in Croatia from 1948-2022 (Detailed information from 1948-2001 published in Schneider-Jacoby et al., 2002)

Legend: Number = number of breeding pairs; 0 = breeding not present; ? = colony not visited; B = colony visited, breeding confirmed, but number of pairs unknown; Dry = no water under colony, breeding absent

Year	Kopački rit	Krapje Đol	Jasinje fishponds	Našice fishponds	Donji Miholjac fishponds	Grudnjak fishponds	Vrbovljan i fishponds	Blatnica fishponds	Total
1948	?	?							0
1949	?	B							0
1950	?	?							0
1951	?	?							0
1952	?	?							0
1953	11	?							11
1954	0	?							0
1955	0	?							0
1956	0	?							0
1957	0	?							0
1958	0	?							0
1959	0	?							0
1960	0	?	0						0
1961	0	?	0						0
1962	0	10	0						10
1963	0	13	0						13
1964	0	25	0						25
1965	0	32	0		0				32
1966	0	48	0		0				48
1967	0	42	0		0				42
1968	0	3	0		0				3
1969	0	46	0		0				46
1970	0	69	0		0				69
1971	0	81	0		0				81
1972	0	90	0		0				90
1973	0	105	0		0				105
1974	0	98	0		0				98
1975	0	108	0		0				108
1976	0	96	0		0				96
1977	0	105	0		0				105
1978	0	102	0		0				102
1979	0	112	0		0				112
1980	0	104	0		0				104
1981	0	90	0		0				90
1982	0	84	0		0				84
1983	0	77	0		0				77
1984	0	72	0		0				72
1985	0	120	0		0				120
1986	0	150	0		0				150



Year	Kopački rit	Krapje Đol	Jasinje fishponds	Našice fishponds	Donji Miholjac fishponds	Grudnjak fishponds	Vrbovljan i fishponds	Blatnica fishponds	Total
1987	0	170	0		0				170
1988	0	180	0		0				180
1989	0	Dry	0		0				0
1990	3	Dry	99	?	0	?			102
1991	0	30	102	?	0	?			132
1992	?	30	100	?	0	?			130
1993	?	50	112	10	0	?			172
1994	?	36	125	31	0	?			192
1995	?	50	107	22	3	?			182
1996	?	50	112	25	6	?			193
1997	?	70	123	20	5	?			218
1998	?	50	110	32	11	?			203
1999	0	50	58	30	9	?			147
2000	0	50	1	30	9	?			90
2001	0	50	0	30	8	?			88
2002	0	50	80	?	?	?			130
2003	0	30	70	30	0	30			160
2004	0	80	40	B	2	Dry			122
2005	0	82	45	35	0	Dry			162
2006	0	155	30	60	0	0			245
2007	4	95	50	(15?)	0	9			173
2008	0	103	30	0	0	3			136
2009	0	140	52	?	0	9			201
2010	0	60	65	10	0	4			139
2011	0	61	65	?	0	0			126
2012	0	Dry	86	14	Dry	9	?		109
2013	0	27	89	45	0	0	19		180
2014	0	27	87	B	0	Dry	6		120
2015	0	41	50	47	0	0	0		138
2016	0	53	70	129	0	0	0	?	252
2017	0	43	41	11	0	Dry	0	?	95
2018	0	68	61	19	Dry	0	0	?	148
2019	0	53	22+	29	Dry	0	0	3	107
2020	0	63	B	19	0	0	?	?	82
2021	0	100	B	Dry	0	0	?	77	177
2022	3	6	40+	3	0	0	60	?	112



Spoonbill breeding from 2013-2022

From 2013 onward, spoonbills continued to breed in Krapje Đol oxbow and four fishponds (Table 1). Two additional fishponds were colonised in this period. Breeding on Vrbovljani fishpond, situated 25 km eastward of Krapje Đol, was recorded in 2013 and it is very likely that breeding started a year earlier when spoonbills abandoned Krapje đol due to drought. Few pairs remained breeding there in 2014, but after that period no nesting was recorded from 2015-2019. Breeding on Blatnica fishponds, situated 63 km north-west from Krapje Đol colony was recorded in 2019 after establishment of a mixed species heron colony. No breeding has been recorded on Donji Miholjac and Grudnjak fishponds in this period (Table 1).

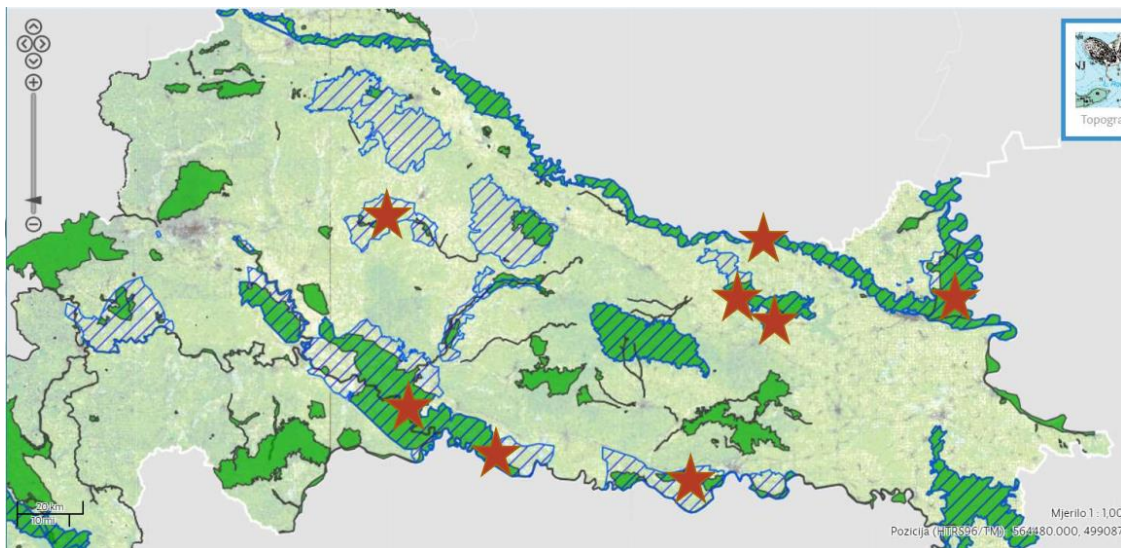


Figure 1. Natura 2000 areas and Eurasian Spoonbill colonies in Croatia. All existing colonies are part of Natura 2000 sites

Despite being strictly protected species breeding in Natura 2000 sites, several key issues emerged that are threatening the nesting of spoonbills in Croatia:

- Habitat and breeding colonies destruction by fishpond managers

With accession to EU, large amount of funds become available for Croatia, particularly from European Regional Development Fund (ERDF), European Maritime, Fisheries and Aquaculture Fund (EMFAF) etc. Fishpond managers quickly started to apply for these funds and fishponds entered reconstruction and modernisation phase (Figure 2). During this process, fishponds were drained and all wetland vegetation has been destroyed, including colonies of spoonbill and other wetland birds (Figure 3). Grudnjak fishponds were the first one to enter “modernisation” era. Colonial birds tried to escape unfortunate faith by moving from destroyed colony site to another suitable location for breeding, but with works in progress they were finally left without suitable habitats for breeding and colonies were destroyed. In the given 10-year period, mixed heron colonies on Grudnjak and Donji Miholjac fishponds were destroyed twice. Mixed heron and spoonbill colony on Našice fishpond was destroyed in 2021 and new heron colony has been formed in 2022 but spoonbills have not returned to breed at this site so far. The work on Našice fishponds was done without any permits, and was legalised with permit after the damage has been done.

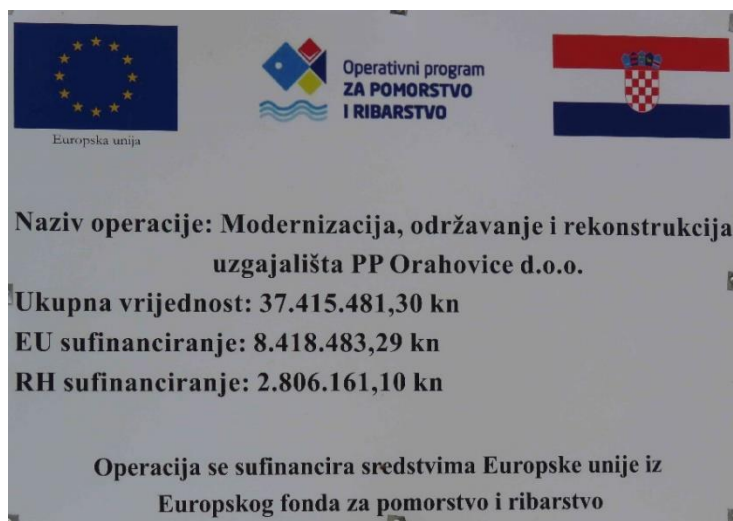


Figure 2. Fishpond reconstruction and habitat destruction is financed by EU subsidies (Photo: Mikuska/CSBNP)



Figure 3. Fishpond modernisation would lead to complete destruction of wetland habitats and waterbird colonies (Photo: J. Ledinščak/CSBNP)

- Abandonment of fish production

During the past decade we have witnessed that fish production would be abandoned on the whole or part of the fishpond. During those times, fishponds would be left without water and became completely dry during the breeding season, preventing nesting of reed-nesting colonial waterbirds. For example, locations of colonies were left dry on Grudnjak fishponds during 2014 and 2017, while Donji Miholjac colonies were left dry during 2018-2019. Vrbovljani fishponds are out of production since 1990s due to unsettled ownership issues. Našice fishpond drained the colony site in 2021 prior to reconstruction works starting. In all above cases, appropriate water levels below colonies, that would allow colony formation and breeding, were not secured either by fishpond managers or nature protection offices and government.



- Nature protection management offices do not participate in NIA and EIA processes

Above reconstructions of fishponds, with resulting habitat destructions, were supposed to pass through proper nature (and Natura 2000) impact assessment (NIA) process. Such process is obligatory by law and EU directives for any project that can cause significant damage to Natura 2000 site, habitats and species. However, works were granted permissions by the responsible ministry covering nature protection during the screening phase, thus no appropriate NIA has been done for any of these works. On the other hand, nature protection management offices, that are responsible for the protection of particular Natura 2000 site have never participated in any of these NIA and EIA processes and they have never objected to any of these reconstruction plans and follow up works.

- Weak and useless nature protection management offices

Established nature protection management offices, particularly on the county level, are notorious for their inefficiency and lack of political will to provide proper protection to protected sites. Usually understaffed and lacking financial funds, they just serve as label that nature protection system is present in the country. Coupled with the fact that most of the Natura 2000 sites (including spoonbill colonies on the fishponds) lack proper management plans it is easy to conclude that Natura 2000 network in Croatia has only “paper protection” status. In reality, proper monitoring of Natura 2000 sites and their values (habitats and species) by nature protection offices is completely lacking. Regular monitoring of spoonbill colonies, for example, is usually provided by environmental NGOs or interested individuals on their own expense (with Krapje Dol colony as the only exception). Similarly, control, enforcement and implementation of protection measures by nature protection offices is not present on the field.

- Disturbance caused by hunting during the fall migration and wintering

Apart from lack of protection of nesting colonies, spoonbills suffer from disturbance on fishponds during fall migration and wintering. By Hunting law (Official gazette no. 99/18, 32/19, 32/20) fishponds in Croatia are considered hunting game farms for farming Mallards *Anas platyrhynchos* and Coots *Fulica atra*. However, in practice they serve as hunting grounds primarily for Italian hunters that are parasitising on migratory populations of ducks. Hunting season starts in September and last until end of January (Official gazette no. 94/19) and it is well documented that such hunting is one of the main driving forces for illegal killing of birds in Croatia (Mikuska et al. 2017). During the same period, due to fish harvest season, fishponds serve as prime sites for foraging spoonbills and other aquatic prey eating waterbirds where they would gather in flocks of several hundred birds to exploit such superb foraging sites. While killing of spoonbills has not been observed (contrary to herons who are often victims of illegal killing), hunting is causing disturbance of all other birds in the area. This disturbance is even more serious during winter time for overwintering spoonbills when food sources are already limited and energy requirements are high due to cold weather. Instead of providing extra protection for wintering spoonbills (and other waterbirds) neither fishpond managers nor nature protection management offices are doing anything to secure their wellbeing.



Lack of efficient protection measures and activities are very well reflected on the overall spoonbill breeding population in Croatia that is erratically fluctuating between 80-250 pairs (Figure 4). As data from Krapje đol colony (and many other breeding sites in Europe) shows, spoonbills are faithful to their nesting sites if proper conditions (availability of nesting substrate and sufficient water levels that prevent entrance of predators) are met. However, due to lack of protection of existing colonies, spoonbills in Croatia are facing uncertainties after arrival from wintering grounds and they then have to make extra effort to find the appropriate place for breeding if the known site has been destroyed or lacks proper water levels. Disturbance from hunting during fall and winter does not help the survival of individuals, either.

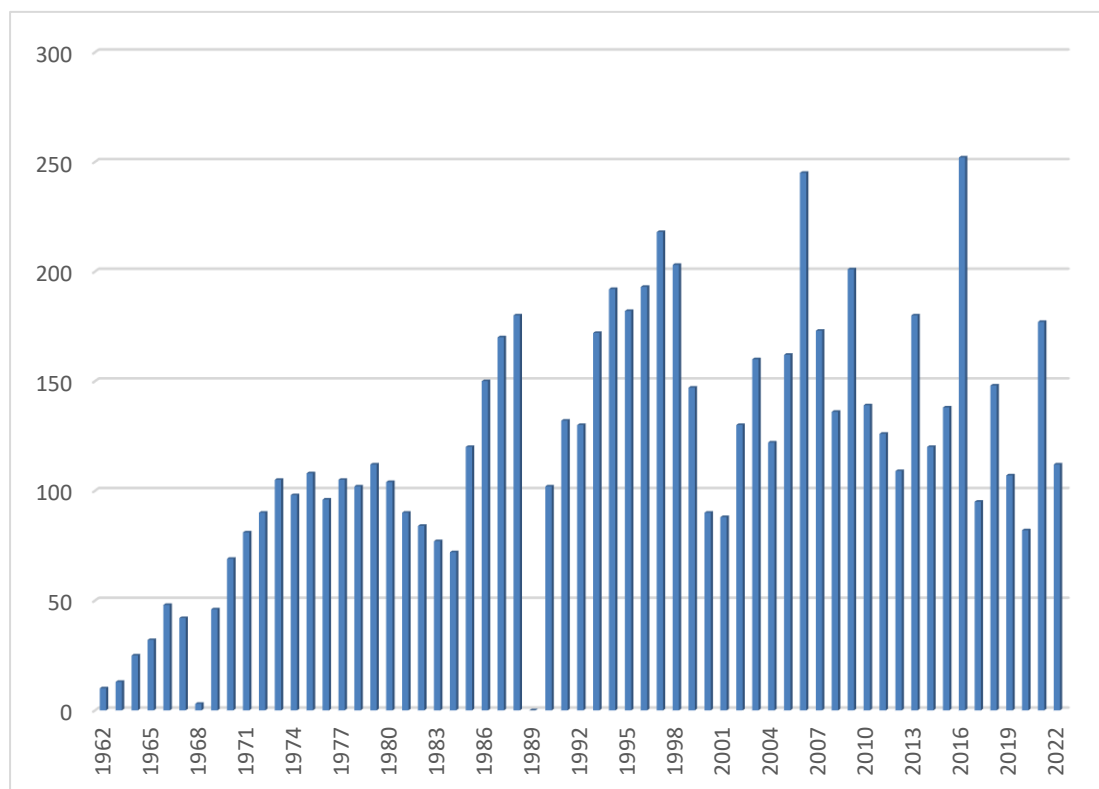


Figure 4. Development of Eurasian Spoonbill *Platalea leucorodia* breeding population in Croatia from 1962-2022. No breeding was recorded in 1989 due to drought, but spoonbills colonised new areas in the following year (Schneider-Jacoby et al., 2002)

Thus, in order to secure long-term conservation of spoonbills (and other colonial waterbirds) in Croatia and fulfil obligations set by EU Bird and Habitat directives following should be immediately imposed by the government:

- All spoonbill (and other colonial waterbirds) colonies should immediately receive mandatory protection status as Special reserves (the status that Krapje Đol colony already has).
- Breeding site habitat destruction must be prevented and proper conservation zones should be established around the colonies, including maintenance of appropriate water levels under colonies.
- No-hunting zones should be immediately established on all fishponds in order to protect spoonbill during fall migration and wintering and prevent illegal killing of wild birds.



- Proper management plans for the protection of Natura 2000 sites on fishponds should be immediately prepared, adopted and fund for its implementations secured.
- Fishponds reconstruction and modernisation plans should pass obligatory NIA and EIA procedures without any exceptions.
- Nature protection management offices on the county level should be immediately reinforced by appropriate staff that would be able to implement appropriate monitoring and protection activities and measures in the Natura 2000 sites. Alternatively, they should be abolished, and their tasks delegated to other entities (including NGOs)

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Update of the breeding and wintering Eurasian Spoonbill *Platalea leucorodia* in Egypt

Mohamed I. HABIB^{1*}, Tarek TEMRAZ²

¹Biodiversity consultant, Egypt

²Assistant professor, Marine Biology department, Suez Canal University, Egypt

*Corresponding author; e-mail: mrhydro35@hotmail.com

Keywords: Spoonbill, Red Sea, Egypt

Introduction

The nominate subspecies Eurasian Spoonbill *Platalea leucorodia leucorodia* is scarce passage and winter visitor from late August or early September to late May at Egyptian wetlands, the Nile valley and Delta. In parallel, the subspecies *Platalea leucorodia archeri* is a rare and local breeding resident in coastal mangrove swamps and on Egyptian Red Sea islands. The total Egyptian breeding population of *P. l. archeri* was estimated from 11 to 20 pairs in 1984, 30 – 50 pairs 1989, 10 pairs in 1999. The aim of this research is to survey resident breeding population of *P. l. archeri* at Egyptian Red Sea islands and wintering population of the Eurasian Spoonbill *P. l. leucorodia*, and to identify wintering sites at the following Egypt governorates: Port Said, Red Sea, Luxor and Aswan.

Material and Methods

The Red Sea coast in Egypt extends 1050 km from El Zafrana in the north to Halib in the south. Surveys for the resident breeding population were conducted in 2014 and 2017 at Red Sea Egyptian governorate. Seventy islands of the Red Sea archipelago were explored for possible spoonbill breeding sites between late May and late August. Binocular and spotting scope were used to identify and count spoonbills. Behavioural observations and counting were made using a telescope from vantage points and at safe distance to prevent any disturbance of the birds. Occupied nests and nests that appear to have been used during current season were counted by direct counting method. Because the temperature varied from 37°C to over 40°C, in order to limit disturbance, visits to each colony were limited to 20 minutes. All nests were geolocated by GPS and photographed with Canon and Sony Cyber camera. Surveys of spoonbill's wintering sites at Port Said, Red Sea, Luxor and Aswan were conducted irregularly in January, from 2015 to 2021. All areas were explored with car and spoonbills were observed with binoculars and spotting scope.

Results and discussion

Breeding spoonbill population

Spoonbill's colonies were present at four locations in the 2014 breeding season and on five locations in the 2017 breeding season (Figure 1). In 2014 spoonbills were breeding at Ashrafi Island North, Big Magawish Island, Shwareet Islands and Wadi El Gemal Island with eight, three, one and three nests respectively. In the 2017 breeding season spoonbills were breeding at Ashrafi Island North, Big Magawish Island, Sayal Island



Shwareet Islands and Wadi El Gemal Island with seven, three, two, one and three nests respectively (Figure 2)

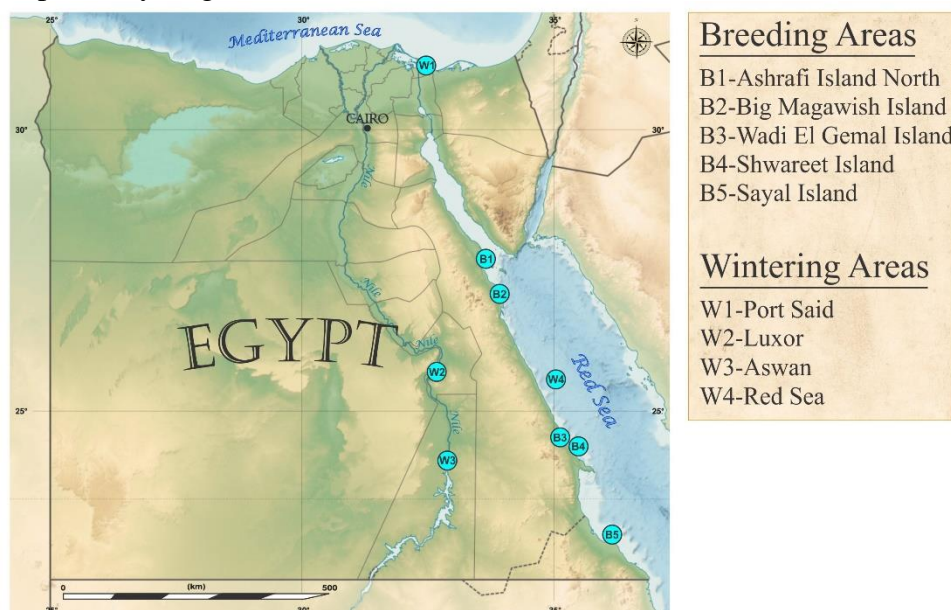


Figure 1. Breeding and wintering area in Egypt (B = breeding & W=wintering)

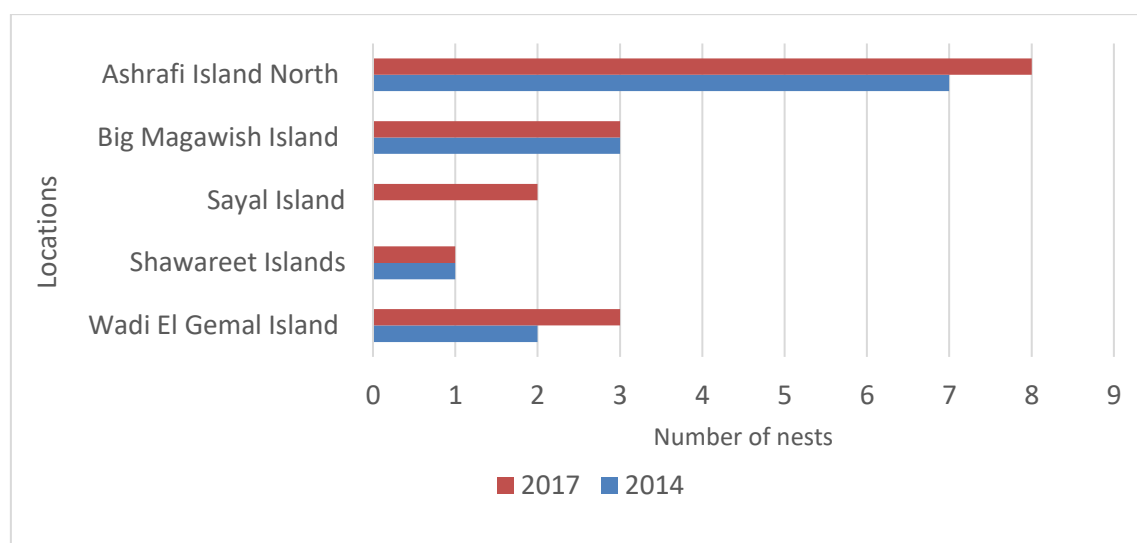


Figure 2. Number of spoonbill's nest on five breeding sites in Red Sea Egyptian governorate during breeding seasons 2014 and 2017.

Spoonbills pairs at Egyptian Red Sea colonies start with courtship and nest building from first the week of April. Nests are made from twigs of dry rushes. They build nests on top of *Tamarix nilotica* and *Nitraria retusa* bushes and shrubs or on top of sandy hills. At Wadi El Gemal Island spoonbills where seen nest building on an approximately one and half meter-tall osprey *Pandion haliaetus* nest. Egg laying starts from the last week of April to second week of May following with hatching from the third week of May to the middle of June and fledging from July to August. At the islands Ashrafi, Big Magawish and Wadi El Gemal, spoonbills tend to nest in compact breeding colony, close or within a Western Reef Heron *Egretta gularis* colony.



Non-breeding spoonbill population in Egypt

Between 105 and 255 spoonbills were recorded at the Port Said, Red Sea, Luxor, and Aswan governorates during counts in January in 2015, 2016, 2017, and 2021 (Figure 3).

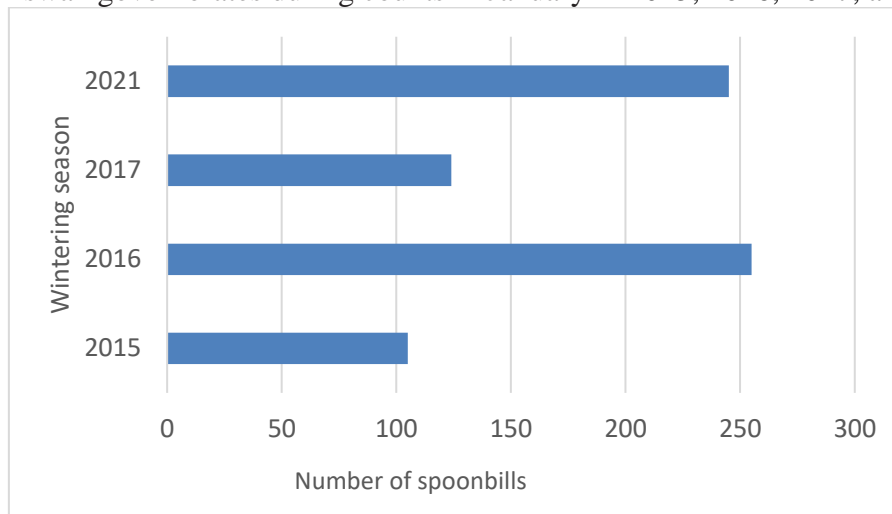


Figure 3. Wintering spoonbill population in Egypt in Port Said, Red Sea, Luxor, and Aswan governorates (counts in January)

In Aswan governorates at lake Nasser during 2017, 2019, 2021 and 2022 season, 14 to 28 immature spoonbills were observed respectively (Table 1). For first time in September 2021 at 58°C, 28 immature spoonbills were observed at lake Nasser indicating the possible presence of immatures spoonbills all year round.

Table 1. Monthly distribution and number of spoonbills in Egypt at Lake Nasser, in Aswan governorates

	May	June	July	August	Sept.
2017	14				
2019	19				
2021					28
2022				18	

During study period it is observed that spoonbills in Egypt are facing different threats. Hunting of spoonbills is common in the Mediterranean coast and Lake Nasser. Oil pollution from different sources was observed at Ashrafi Island. This can have devastating effects on spoonbills and other sea birds breeding at Red Sea islands. Those birds prefer to feed in areas of shallow water, where they are exposed to oil pollution. Ingesting the oil as the birds try to remove it during preening can conduct to death. Also, human disturbance during spoonbills breeding season occurs in the study area. Disturbance can cause lower breeding success or lowering the number of breeding pairs. Spoonbills observed during the breeding season at Red Sea area showed a yellowish subterminal patch on the upper mandible and a deep yellow-buff area on the lower neck/chest at Northern Egyptian islands, while yellow-buff area on the lower neck/chest absent at southern islands of Egyptian the Red Sea. This could indicate that *P. l. archeri* breeds south of Egyptian Red Sea while *P. l. leucorodia* is breeding North of Egyptian Red Sea islands but further studies is needed to confirm this hypothesis.



Conclusion

After a decline of the spoonbill breeding population in Egypt from 1980 to 1990 this study indicates that the population is stable and low, from 13 pairs in 2014 to 17 pairs in 2017. From 2015 to 2021, the wintering population was between 105 and 255 spoonbills. Immature birds were observed for the first time at lake Nasser in August and indicate that spoonbills can be present whole year around at lake Nasser. DNA studies are necessary to confirm possibility of breeding *Platalea leucorodia leucorodia* on north Egyptian Red Sea islands and *Platalea leucorodia archeri* on south Egyptian Red Sea islands.

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Abstracts



Photo: Andrew Bloomfield



Spoonbills in Belgium

Geert SPANOGHE^{1*}

¹Research Institute for Nature and Forest, Belgium

*Corresponding author; e-mail: Geert.spanoghe@inbo.be

Keywords: breeding success, GPS-GSM transmitters, wetland restoration and management

The Belgian population of Eurasian Spoonbill stands at 80 pairs in 2022. Colonies are spread over 7 to 8 locations, almost all in the very low lands. The numbers at the first locality at Verrebroek (first breeding pair in 2003) still count for 45 % of the national total. Only one other area, the wetlands around river Ijzer, reaches consistently 10 or more pairs. Although suitable habitat seems to be present at quite a few other places, the lack of safe breeding places seems to limit the growth of the population. The presence of Red Fox *Vulpes vulpes* seems to have a big influence on colonising suitable breeding habitat. More than 80 % of the current breeding pairs are either tree nesting or nest in fenced off areas (Figure 1). Ongoing wetland restoration and management, taking into account safe breeding places for colonial waterbirds, could push the breeding numbers in the near future well over 100 breeding pairs.



Figure 1: Belgium's biggest colony at Verrebroek, fenced off since 2020, as it was abandoned by the spoonbills during the breeding season of 2018.

At the oldest colony, numbers reach 30 breeding pairs easily but not after a drawback by predation of Red Fox between 2017 and 2020. In 2019 the colony moved to an adjacent location, ignoring the newly fenced off breeding locality. They probably abandoned this location due to a manipulated nest site in combination with temporarily noisy activities



at 350 m. Only eight pairs bred on an unprotected nest site where all nests were predated. From 2020 onwards the ‘safe’ breeding locality was recolonised. At this colony the breeding success was measured since its origin. Within this measure the fate of all nests is included, starting from the early March-breeders to the late breeders, sometimes only starting at the end of June. Between 2003 and 2022 the breeding success was 1.4 fledged juvenile per pair on a total of 323 nests (Figure 2). This includes the years with no or very low breeding success due to predation. Mortality of pulli and even nests with eggs is also higher in springs with long, cold and/or rainy periods. This explains the low breeding success of 0.6 in 2013 and 0.9 in 2021, respectively the coldest and one of the wettest springs of this period.

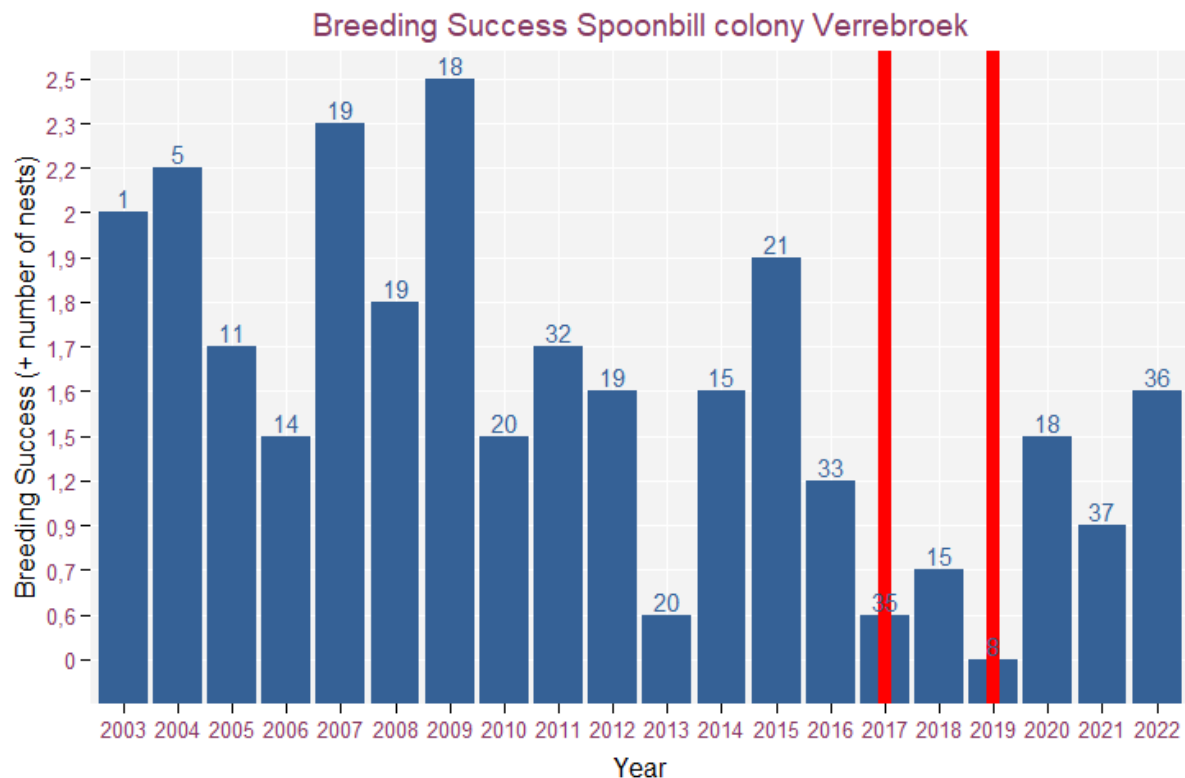


Figure 2: Breeding Success (= number of fledged youngs per pair) of the entire colony at Verrebroek with the number of nests indicated on top. The red lines indicate the period of heavy predation by Red Fox.

Throughout the years some fragmentary data was collected on mortality of flying birds near the colony of Verrebroek. A ‘natural’ cause of death in different years were toxic blooms of bacteria, either botulism or cyanobacteriae. The latter seem to be more important in certain foraging areas where the former is known to occur in all used areas but with a high variety of occurrences throughout the years. In the summer of 2023 Avian Influenza was not found on dead or ill waterbirds (Pied Avocet *Recurvirostra avosetta* and Northern Lapwing *Vanellus vanellus*) in the area indicating that the ill or dead spoonbills found here probably also suffered from bacterial infections. Just like some other waterbirds, some ill found spoonbills also recovered in only a few days.

Non-natural causes of death in the Antwerp harbour area are collisions with wind turbines or power lines. The application for a building permit must be accompanied by an impact analysis on flying birds and bats. At a selection of wind turbines, the spoonbill is considered a critical species implying that any case of collision leads to the revision of the operation procedure. We do, however, suffer a lack of knowledge about flight heights



and nocturnal/diurnal movements throughout the breeding cycle of the spoonbills. A misjudgement of these can influence the impact factors in the analysis in a detrimental way for the species.

A study was launched in 2022 to fill this knowledge gap using GPS-GSM transmitters. Although the original plan was to use one or two transmitters on adult birds, we did not succeed in capturing them. In the end, five transmitters were deployed on nearly fledged juveniles. As a start the study seems promising, producing multiple data on flight behaviour in and around the harbour area but limited compared to what we could expect from adult birds.

All five juveniles survived into their first winter, well after settling in their wintering grounds (Figure 3): one in the Netherlands (43 km north of the breeding area, arriving at the end of November), three in Atlantic France (arriving around 10th October) and one in southern Spain near Sevilla (arriving on 20th September). In the second half of January 2023 one of the wintering birds in France died (of an unknown cause). We expect some of the four other birds to return to the colony when they reach maturity. In addition, in 2023 we want to gather more data by deploying five more transmitters in the study area.



Figure 3: Movements of the five juvenile Spoonbills from Verrebroek equipped with a GPS-GSM transmitter between July and December 2022. The southern edge of each colour indicates the wintering site for the first four birds. For Wout (orange) this was at the northern edge of the line.



Habitat use of spoonbills in man-made habitats in a freshwater area in The Netherlands

Camilla DREEF^{1}, Jan VAN DER WINDEN²*

¹Lowland Ecology Network, The Netherlands

²Ecology research & consultancy, The Netherlands

*Corresponding author; e-mail: 72amilla.dreef@gmail.com

In 2018 the newest national park in The Netherlands, called 'Nieuw Land' (New Land), was founded. It is the largest man-made nature reserve in the world covering 29.000 ha. It consists of multiple wetlands, such as the Oostvaardersplassen and new archipelago Marker Wadden. In 2021 we started a tracking study on spoonbills to get a better understanding of the connectivity and the function of the different wetlands. The availability of shallows significantly increased areas as part of nature development. How do spoonbills profit from such man-made habitats? What sites do they use as foraging areas? How does this change during the season and also is there a difference between diurnal and nocturnal foraging sites? This knowledge can potentially contribute to future nature development.

In 2021 and 2022 we equipped three juveniles and four adult spoonbills from a colony on a dam near a harbour within the freshwater lake Markermeer. In these years we also monitored the breeding success of the colony and studied breeding success of the tagged individuals, and prey intake rates. Partner organisations collected information on prey availability at sites where spoonbills foraged frequently. Additionally, we counted spoonbills in the different areas to see how the numbers and habitat use fluctuate during the season.

The spoonbills moved at distances up to 45 km from the nesting site, however most foraging sites were in a distance of 10 to 25 km. Individually preferences for feeding spots were striking, however preferred feeding sites shifted throughout the season and between years. From the different sites surround the nesting site, the Oostvaardersplassen was the most important foraging site. However, this shifted to other areas in 2022 because of a “swamp reset” and therefore temporary lowering the water level. Subsequently, it was less suitable as a foraging area. In 2021 the spoonbills were visiting constructed man-made areas (made in 2018) Marker Wadden and Trintelzand frequently, however this increased significantly due to the temporary loss of Oostvaardersplassen as a foraging site. This indicates the readiness of spoonbills to take advantage of these new habitats. These man-made areas add substantially to the dyked shores of Lake Markermeer where spoonbills cannot feed.



A study of wintering trends of Eurasian Spoonbill *Platalea leucorodia* in northeastern Algeria

Riad NEDJAH¹, Kenz Raouf SAMRAOUI^{2,3}, Abdennour BOUCHEKER^{1,4}, Laïd TOUATI^{1,5}, Farrah SAMRAOUI¹, Boudjéma SAMRAOUI^{1,4}

¹Laboratoire de Conservation des Zones Humides, University of Guelma, Algeria

²The Czech Academy of Sciences, Institute of Botany, Department of Functional Ecology, Třeboň, Czech Republic

³Faculty of Science, Jihočeská univerzita, České Budějovice, Czech Republic

⁴Biology Department, University of Annaba, Algeria

⁵Biology and Ecology Department, University of Constantine, Algeria

*Corresponding author; e-mail: kenzsamraoui@gmail.com

Keywords: Eurasian Spoonbill, Rings, North-Eastern Algeria, Wintering, Climate change.

The Eurasian Spoonbill *Platalea leucorodia* is one of two species of the family Threskiornithidae found in Algeria. Although Algeria is not a known breeding area for this species, the North eastern region is an important wintering area. The three wetlands in north eastern Algeria known to be wintering sites for spoonbills are Lac des Oiseaux, Mekhada Marsh, and Lake Tonga, all Ramsar sites (Figure 1). This study represents a follow-up survey of the Eurasian Spoonbill's wintering in North eastern Algeria. We conducted individual counts and mapped their locations between 2014 and 2018, including ringed birds from Hungary, Italy, and France. Our results show that the number of spoonbill sightings in Algeria increased from October 2014 to April 2018 (Figure 2). This increase can be attributed to spoonbill conservation efforts in Europe and the increased focus on quantifying the number of spoonbills wintering in the area. However, in order to maintain this positive trend in the threatened Ramsar sites, a more comprehensive assessment of the species' current distribution and abundance throughout its range, including North eastern Algeria, is needed to properly assess its population and habitat status. As an apex predator, the Eurasian Spoonbill plays a crucial role in maintaining the ecological balance in its habitats. By studying and understanding the population, distribution, and ecology of the species in its wintering grounds in North eastern Algeria, we can work towards the conservation and protection of this important species.



Figure 1. Map of the study area

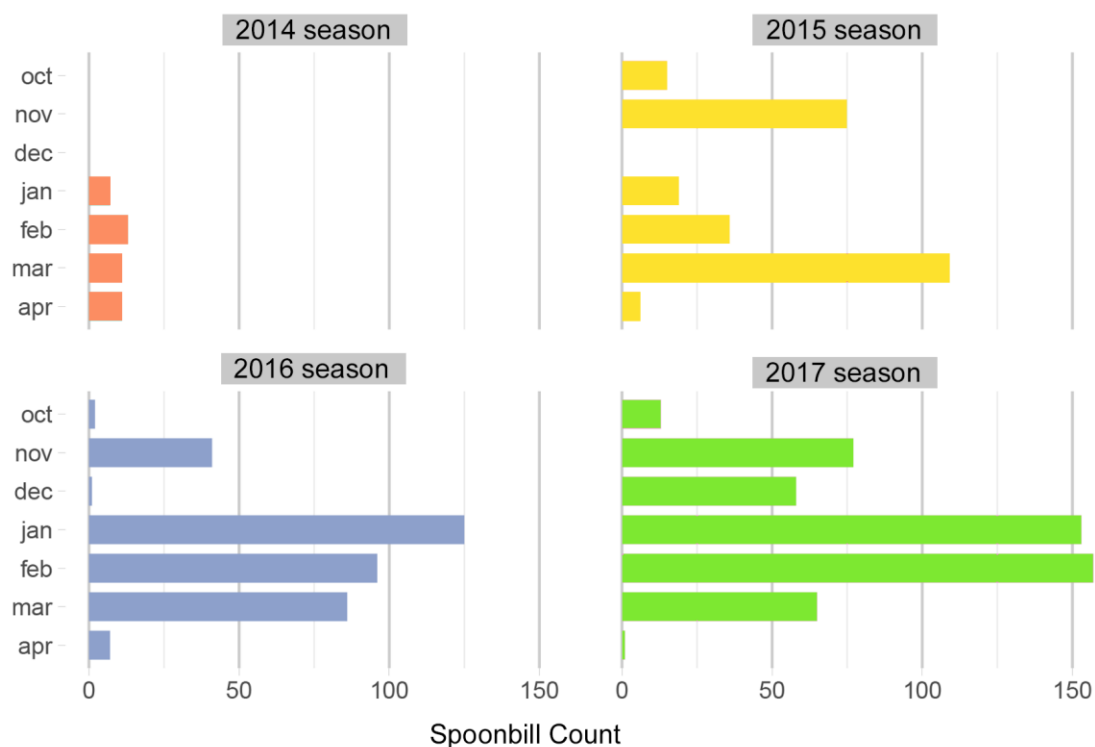


Figure 2. Monthly numbers of Eurasian Spoonbills counted in NE Algeria



Population trends of Eurasian Spoonbill in Montenegro

Bojan ZEKOVIĆ¹, Marija ŠOŠKIĆ¹, Nikola NOVOVIĆ¹, Peter SACKL²*

¹Centar za zaštitu i proučavanje ptica / BirdLife Montenegro, Montenegro

²Universalmuseum Joanneum, Graz, Austria

*Corresponding author; e-mail: bojan.zekovic@czip.me

Although Montenegro is a mainly mountainous country, it also harbours a number of extensive wetlands. Wetlands of international importance are Skadar Lake and the Bojana- Buna Delta with the Ulcinj salina. The Bojana-Buna Delta is the only breeding area of Eurasian Spoonbill in the country, while, within the delta, the Ulcinj salina is the main feeding site of the birds. Besides occasional observations in the Tivat salina, on Skadar Lake and inland karst poljes, the Ulcinj salina is also the most important resting site in Montenegro. Based on conventional waterbird counts and breeding surveys throughout the delta the numbers and population trends of resting and breeding spoonbills in Montenegro have been documented since 2003. In 2003 spoonbills bred in two mixed-species breeding colonies on Ada and Paratuk Island. After the breakdown of both colonies over the last decades, the population decreased from formerly 37 to currently 10-20 breeding pairs. In addition, migration numbers have slightly decreased (Figure 1). But at the same time, since 2015, spoonbills winter more regularly and in larger numbers in the Ulcinj salina.

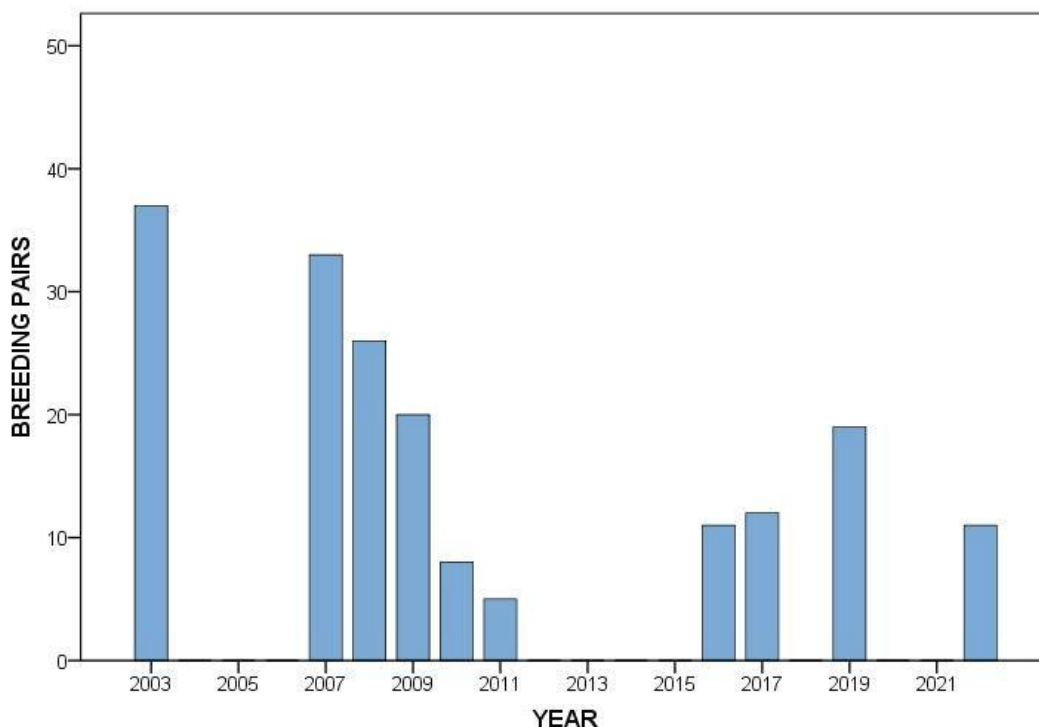


Figure 1. Number of the Eurasian Spoonbill breeding pairs in Montenegro



Mediterranean overview of waterbird trends, climate change, and conservation efforts

*Elie GAGET¹**

¹University of Turku, Finland

*Corresponding author; e-mail: elie.gaget@gmail.com

The Mediterranean region is a biodiversity hotspot where wetland ecosystems play a central role in supporting biodiversity. Every year, millions of waterbirds breed and over-winter in this region, contributing to natural processes and providing services to human societies. While the Mediterranean region was a refuge for biodiversity during the past glacial events, it is now one of the most threatened places on earth because of climate change. Anthropogenic pressures, such as increasing human demography, habitat loss and degradation, pollution, water extraction, over-exploitation of wildlife populations, temperature increases, droughts, are responsible for a loss of one third of vertebrate abundance since 1990. Waterbirds are critical indicators of human pressures, some species being on the verge of extinction, while others benefiting from conservation efforts. Protected areas are extremely important to conserve biodiversity, from both current and future threats. Yet, many wetlands of great biodiversity value still deserve to be protected in the Mediterranean region. Species conservation status, anthropogenic pressures and conservation gaps highlights regional contrasts across the Mediterranean. Scientific knowledge, population monitoring, and conservation efforts are critical components to bend the curve of biodiversity loss.

This abstract was given as a plenary talk



The status of the endemic small spoonbill population of the Parc National du Banc d'Arguin, Mauritania: *Platalea leucorodia balsaci*

Hacen M. EL-HACEN^{1,2*}, Mohamed CAMERA²

¹BirdEyes, Centre for Global Ecological Change at the Faculties of Science & Engineering and Campus Fryslân, University of Groningen, Leeuwarden, The Netherlands

²Parc National du Banc d'Arguin, Chami, Wilaya de Dakhlet Nouadhibou, Mauritania

*Corresponding author; e-mail: hacen.rim@gmail.com

Mauritanian Spoonbill *Platalea leucorodia balsaci* is an endemic species to Banc d'Arguin, Mauritania, West Africa. Its populations have experienced strong declines in late 2000s due to unknown reasons. For instance, numbers of breeding pairs declined from 1943 in 2000 to 750 in 2007, which coincides with low recruitments rates. The status of the population, however, has not been evaluated since. Here, we aim to shed more light on the dynamic of the Mauritanian Spoonbill population based on a recent monitoring scheme that started in 2017. A monthly count of the most important high-tide roosts in the area as well as the number of breeding pairs were used in this evaluation. Further, we used nine available total counts of the whole area to evaluate the dynamic of the two populations of spoonbills (*balsaci* and Eurasian) at Banc d'Arguin over the last 40 years.

Talk given during the session “Population trends & breeding”



Limits of non-stop flight in Eurasian Spoonbills

Wouter VANSTEELANT^{1,2*}, Tamar LOK^{3,4}, Petra DE GOEIJ^{1,4}, Willem BOUTE²,
Theunis PIERSMA^{1,3}

¹BirdEyes, University of Groningen, The Netherlands

²IBED, University of Amsterdam, The Netherlands

³NIOZ Royal Netherlands Institute for Sea Research, Texel, The Netherlands

⁴Duch Spoonbill Working Group, The Netherlands

*Corresponding author; e-mail: vansteelant.wouter@gmail.com

For all their qualities, spoonbills do not stand out as particularly strong flyers. Nevertheless, due to their dependence on shallow waters in coastal or freshwater habitats, high-quality stop-overs are few and far between. This suggests that spoonbills may regularly engage in protracted non-stop flights during migration. Consistent with this idea, spoonbills have been recorded to migrate at night as well as by day, and are known to engage in substantial sea-crossings spanning several 100 km during migration. The limits of spoonbill flights, however, are poorly known. Using GPS-tracking data for adult and juvenile migrations in the East-Atlantic flyway we quantified the distance and time limits for non-stop flight by Eurasian Spoonbill. We found that spoonbills flew for more than 12 hours or covered more than 500km on 10% of all recorded flights. We detected at least one 12h-flight in 144 of 189 recorded migrations by adults as well as juveniles. Such flights were especially common when flying relatively far from the coast, either offshore, or over the interior of France and the Iberian Peninsula. Spoonbills travelled a substantial part of their migration at night, and 12h-flights were typically achieved by extending diurnal flights into the night. However, spoonbills almost never flew more than 24h before resting or refuelling. As such their flight performance falls well below that of migratory waders that use similar stop-over sites in the East-Atlantic flyway. This limited 'motion capacity' could make spoonbills more vulnerable to the loss of key wetland sites. Moreover, our data suggest spoonbills have significantly lower flight ranges in spring, likely due to winds opposing migration more strongly in that season. We further investigate the importance of wind support for the spoonbills' realized flight ranges, and the extent to which they adjust departure times and flight altitudes to prevailing winds to facilitate migration.

Talk given during the session "Tracking spoonbills"



Results of the GPS-tracking in the Pannonian population of the Eurasian Spoonbill *Platalea leucorodia*

Csaba PIGNICZKI^{1*}

¹Kiskunság National Park Directorate, Hungary

*Corresponding author; e-mail: csaba.spoonbill@gmail.com

The Eurasian Spoonbill (hereafter Spoonbill) population that breeds in Hungary belongs to the Pannonian breeding population which is a subpopulation of the Central European population. Between 2017 and 2022, 15 Spoonbills (7 adults and 8 juveniles) were equipped with GPS devices. The autumn migration of six adults (15 complete tracklogs) and six juveniles (four complete and two partial tracklogs) were followed, while only four adults came back to the Carpathian Basin (ten complete and one partial tracklogs) and an immature stayed during summer in its wintering area in Croatia. Spoonbills with complete tracklogs migrated to wintering areas in Italy, Tunisia, Algeria and the Carpathian Basin part of Croatia. A juvenile started to cross the Sahara; however, it is not known whether it reached its wintering area or died during its migration. The complete and the partial tracklogs indicate that all Spoonbills used the South Adriatic Flyway. The dispersal areas, the migratory paths, and the wintering areas of the GPS tracked and the colour-ringed individuals largely overlap, however, the movements of colour-ringed specimens indicate that Spoonbills can use different migratory routes as well. Several stop-over areas were identified: the most important was in Manfredonia (Italy): 11 of 13 individuals stopped there for a while. The length of the migration can be different: it could last for a few days or can be even longer than a month.

Talk given during the session “Tracking spoonbills”



Movement and habitat use of juvenile spoonbills in Portugal: to disperse or not to disperse

Manuela S. RODRIGUES^{1*}, Pedro M. ARAÚJO^{2,3}, Afonso D. ROCHA⁴, Pedro C. RODRIGUES⁵, Jaime A. RAMOS², José ABAD-GÓMEZ⁴, João P. SILVA³, José A. ALVES^{1,6}

¹CESAM - Universidade de Aveiro, Portugal

²University of Coimbra, MARE – Marine and Environmental Sciences Centre, ARNET – Aquatic Research Network, Portugal

³CIBIO/InBIO, Universidade do Porto, Portugal

⁴Universidad de Extremadura, Spain

⁵Escola Superior de Educação inED, Instituto Politécnico do Porto, Portugal

⁶University of Iceland, South Iceland Research Centre, Iceland

*Corresponding author; e-mail: manuelarodrigues@ua.pt

The first months of life are critical for all birds and this is the life stage when survival is typically the lowest. For migratory species that gain independence and must feed for themselves often in new environments, this life stage may be particularly important. Eurasian Spoonbills are migratory waterbirds and after leaving their natal colonies, most juveniles undertake dispersive movements to explore new wetlands and habitats. Dispersing from the natal wetland, which in the most extreme case corresponds to the first migration, may encounter benefits (e.g., decreased competition, occupation of higher quality sites, accessing new resources) but also entails energetic costs and challenges associated with using unknown areas. In Portugal, however, not all spoonbills perform such dispersal movements, and some remain near the colony during their first autumn and winter. In this work, we explore the variation in the behavioural and spatial ecology of spoonbills tagged with GPS and tri-axial accelerometers, between individuals that disperse and those that remain in the natal wetland.

We use data from 23 juveniles born in two Portuguese colonies (the Tagus Estuary and Ria Formosa protected areas) between 2016 and 2021. We first identify dispersal movements by calculating daily displacement and then compare dispersers and no-dispersers according to: 1) habitats used (type and number); 2) daily time-budgets (based on an ethogram classified with accelerometer data; 3) daily movements and daily total distance and 4) home ranges size and overlap between consecutive days. We also compared these aspects on the week before and following the dispersal movement, for those individuals that dispersed from the natal wetland.

This information will help to better understand the advantages and disadvantages of such movements during a particularly sensitive life stage and also in identifying important areas and habitats for both groups of juveniles, particularly for those that disperse from the protected areas where they were born.

Talk given during the session “Tracking spoonbills”



A place to land in the Landes: Feedback from 6 years of monitoring on a major stopping site for Eurasian Spoonbills *Platalea leucorodia leucorodia* and perspective of an international project

Florent LAGARDE¹, Raphaëlle DEBATS¹*

¹Syndicat Mixte de Gestion des Milieux Naturels, National Nature Reserve of the Marais d'Orx, France

*Corresponding author; e-mail: florentlagarde.milnat@orange.fr

Despite a lack of interest in the past, stopping sites of migratory birds are now getting more attention. Their role is central and crucial so that migratory birds can carry out their life cycle. In the actual context of climate imbalance, the durability of some stopping sites is unsure and threatened, especially for birds dependent on wetlands. This reality of a constant changing world requires investing constant efforts in the understanding of the role and the function of stopping sites for migratory birds. Located on the Atlantic flyway of Eurasian Spoonbill *Platalea leucorodia leucorodia* from western Europe, the National Nature Reserve of the Marais d'Orx is one of the last French wetlands of the Gulf of Gascogne before the big crossing of the mountains and the Spanish plateau. Since 2016, the Nature Reserve invests annual efforts in the monitoring of spoonbills during autumn migration in the aim to understand the degree of importance for the species. Here we present the results of the first 6-years (2016-2021) of a long-term study based on daily counts associated with colour ring reading from mid-August to mid-October. A total of 1433 individuals were identified during the study period. Most of the identified birds come from the Netherlands (60.7%), followed by French (20.2%) and German (9.7%) birds. The average length of stay is 1.4 ± 1.9 days. We observed a difference between years with a variation from 1.1 ± 0.4 days to 1.9 ± 2.7 days. The length of stay of the individuals observed during the first part of the season (mid-August to mid-September) is higher compared to birds in the second part from mid-September to mid-October (1.7 ± 2.7 vs. 1.2 ± 0.7). These results could be partly correlated to a change in the abundance of certain prey, in particular small fish, resulting from water levels management. Assuming a source population of about 20,000 spoonbills, we further estimate that at least a quarter of the spoonbills from northwest Europe make a stop at the National Nature Reserve of the Marais d'Orx. These results give the site an important responsibility for the conservation of the species, which could be even higher in the future. Due to the impact of some agricultural practices associated with current climate imbalance more and more wetlands are threatened. After the Gulf of Gascogne, the Spanish plateau is a stage with very few stopping options for spoonbills. Their next stopover is south of the plateau, in Extremadura, where current water issues could affect their migration and their survival along the Atlantic flyway. This is why, with the precious help of our partners, we are developing an international joint project with the aim of better understanding what is really happening on the way of what may possibly become a newly threatened species.

Talk given during the session "Tracking spoonbills"



Citizen Science and Machine Learning: presenting two methods for processing time-consuming camera traps data

Hugo FERREIRA^{1}, Sandra HODIĆ¹, Carolina HADDEN¹, Cédric PRADALIER³,
Jocelyn CHAMPAGNON¹*

¹ Tour du Valat, Research institute for the conservation of Mediterranean wetlands, Arles, France

² Zone Atelier du Bassin de la Moselle (LTSEFrance), Centre National de la Recherche Scientifique, Université de Lorraine, France

³ Georgia Tech Lorraine, Metz, France

*Corresponding author; e-mail: hr.ferreira@ua.pt

Eurasian Spoonbills are individually marked with an engraved colour-ring PVC that allows for individual visual identification from a distance (re-sightings). Re-sightings of those marks are usually done by experienced observers using telescopes, frequently from a hiding place. Since 2016, in Camargue, we progressively tested the use of automatic camera traps, as a complement or replacement of direct observation methods. We intended this way to increase the total number of individual breeders identified and minimize colony disturbance. However, this resulted in around 30,000 to 50,000 photos collected each year, which need to be manually processed at the office. Furthermore, detecting and reading these marks is a tedious and time-consuming task. To face this new challenge, two different methodologies were developed and tested: One using the citizen science Zooniverse platform, which involved the participation of the public in the photo processing. And the second by employing machine learning techniques and an autonomous processing using trained classifiers, such as deep convolutional neural network, which have been developed and tested by dedicated students over the last two years. In this presentation we will discuss the progress being made by both these methods, including some general advantages and limitations of each.

Talk given during the session “Tracking spoonbills”



The role of genes and early-life environment in shaping migration routes of Eurasian Spoonbills

Tamar LOK^{1}, Jocelyn CHAMPAGNON^{2*}*

¹ NIOZ Royal Netherlands Institute for Sea Research, Texel, The Netherlands

² Tour du Valat, Research institute for the conservation of Mediterranean wetlands, Arles, France

*Corresponding author; e-mail: tamar.lok@nioz.nl

Seasonal migration is a fascinating phenomenon that enables animals to exploit seasonal peaks of resource abundance. To do so, they have to make the right decisions when to migrate and where to. Changes in any of the sites that migratory animals use during their annual cycle may affect the optimality of these decisions. To understand the limits to the capacity of migratory animals to respond to environmental change, we need to understand the mechanisms that lead to their migratory decisions. Here, we address the importance of genetic and environmental factors in shaping the first southward migration of Eurasian Spoonbills *Platalea leucorodia*. To this aim, we performed a large-scale common-garden experiment in which we exchanged eggs of spoonbills between two populations exhibiting contrasting migration routes (The Netherlands versus southern France) and equipped the juveniles raised from these eggs with state-of-the-art tracking devices to monitor their migration routes. In this talk, I will present the results from this experiment.

Talk given during the session “Ecology and behaviour of spoonbills”



Population genetics of the Western Palearctic Eurasian Spoonbill

Adriana BELLATI¹, Jocelyn CHAMPAGNON^{2*}, Arnaud BÉCHET³, Alexandru DOROSENCE³, Petra DE GOEIJ³, Savas KAZANTZIDIS³, Jesper J. MADSEN³ Loïc MARION³, Mihai MARINOV, Alma MIKUSKA³, Tibor MIKUSKA³, Csaba PIGNICZKI³, Cristina RAMO³, Marko TUCAKOV³, Stefano VOLPONI³ and Mauro FASOLA¹

¹Department of Earth and Environmental Sciences, University of Pavia, Italy

²Tour du Valat, Research institute for the conservation of Mediterranean wetlands, Arles, France

³Eurasian Spoonbill International Expert Group

*Corresponding author; e-mail: champagnon@tourduvalat.org

Eurasian Spoonbills *Platalea leucorodia* breed across Europe with a disjunct distribution of their breeding colonies. The first Italian spoonbill colony appeared in 1989 in the Comacchio Lagoon, and the subsequent population increase was driven both by local recruitment and by immigration, as shown by demographic analysis. But the origin of the founders remains unclear. By adopting a multilocus approach, we genetically characterized the spoonbills of the main breeding areas across Europe, in order to: 1) infer their population structure; 2) disclose cryptic genetic variation across Europe in relation to distinct migratory routes; 3) infer the origin of Italian breeders. Preliminary results suggest greater genetic variation in southern populations compared to northern European ones, with the most differentiated haplotypes found in Greece. Locally distributed haplotypes were recovered in Italy, highlighting genetic similarities with French/Carpathian Basin/Balkan colonies. Finally, microsatellite analysis suggests the occurrence of cryptic genetic gene pools at the same colony, in line with the presence of alternative migratory behaviours.

Talk given during the session "Ecology and behaviour of spoonbills"



Exploring the relationship between winter location and survival in a migratory waterbird using different migration routes

Hugo FERREIRA^{1,2*}, Jocelyn CHAMPAGNON², José A. ALVES^{1,3}, Tamar LOK⁴

¹Dep. De Biologia e CESAM-Centro de Estudos do Ambiente e do Mar, Universidade de Aveiro, Portugal

² Tour du Valat, Research institute for the conservation of Mediterranean wetlands, Arles, France

³South Iceland Research Centre, University of Iceland, Iceland

⁴NIOZ Royal Netherlands Institute for Sea Research, Texel, The Netherlands

*Corresponding author; e-mail: hr.ferreira@ua.pt

Migration occurs as a response to seasonal changes and allows birds to exploit localized peaks in resources. However, when using different wintering sites, individuals can be subject to different costs and benefits, with consequences that may last over time, particularly if they are faithful to their wintering sites. Using a dataset from a longitudinal study on the Eurasian Spoonbill in the Camargue, southern France, we explored the relationships between survival rates and different wintering locations. In the last 13 years, more than 3000 birds have been ringed in Camargue which can winter in five main regions, that vary on both the migratory route (East Atlantic Flyway; Central European Flyway) and the distance travelled (long- distance; short-distance; and residents). Our results do not support a link between migratory route (encompassing several wintering sites) and survival rates. However, a trend in survival with regards to migration distance was detected, with birds travelling the longest distance having the lowest survival rates at their pre-breeding migration independently of flyway. This trend was not detected when accounting for a full year migration (from one breeding season to the next), suggesting that the distance effect could be due to a diminished inter- individual variation in migratory performance with experience. This is also supported by the apparent higher survival rates of both immatures and adults as they age. Additionally, like previous studies, our results indicate that despite the suggestion of a link between distance and survival rates, other factors could be involved, as the crossing of natural barriers (e.g., Mediterranean Sea and Sahara Desert) and the degradation of wintering sites.

Talk given during the session “Ecology and behaviour of spoonbills”



Eurasian Spoonbills *Platalea leucorodia* as dispersal vectors for different plant and invertebrate species

Adam LOVAS-KISS¹, Pál TÓTH^{1,2,3}, Renáta LUKÁCSNÉ URGYÁN¹, Csaba VAD¹,
Bence GREGÁ CZ¹, Andy J. GREEN⁴, Csaba PIGNICZKI^{5*}

¹Centre for Ecological Research, IAE, Wetland Ecology Research Group, Hungary

²Hortobágy National Park Directorate, Hungary

³University of Debrecen Pál Juhász-Nagy Doctoral School, Hungary

⁴Department of Wetland Ecology, Estación Biológica de Doñana, EBD-CSIC, Spain

⁵Kiskunság National Park Directorate, Hungary

*Corresponding author; e-mail: csaba.spoonbill@gmail.com

Dispersal is a very important process, which allows different organisms to move away from local competition, predation or keep the gene flow between separated populations or colonise new habitats. In the case of plant and aquatic invertebrate species, there is limited information on their dispersal mechanisms and potential for climate change-induced range shifts. To keep pace with climate change, long-distance dispersal is vital and can be provided by the migratory and disperser Eurasian Spoonbills *Platalea leucorodia* (hereafter Spoonbill). Spoonbills are dispersive birds in Hungary: they visit foraging areas up to 43 km far from their breeding colonies and they cover larger distances (often over 100 km) during their post-fledging/post-breeding dispersal. There is no available information about the possible dispersed species by Spoonbills. In our study, we investigated the endozoochorous dispersal potential of the Spoonbills in different Hungarian wetlands. Throughout three years (2016, 2017, 2018) we collected overall 168 faecal and pellet samples from nine different locations, including breeding colonies, foraging areas and roosting sites across the Great Hungarian Plain. We tested the viability of the plant and invertebrate propagules with intact seed and egg coats under standard and controlled conditions using germination and hatching as a method for one month. Overall 24 species and 14 families of plants and 9 groups of invertebrates were identified. *Ranunculus aquatilis* had the largest number of seeds (752). In the case of invertebrates, the *Simocephalus* sp. (234) was the most represented in the samples. Five plant species germinated (*Alisma plantago-aquatica*, *Phleum pratense*, *Rumex crispus*, *Chenopodium album*, *Bolboschoenus maritimus*). *Daphnia magna* had the most viable eggs with 8 intact embryos. Ellenberg moisture indicator values show that not just aquatic but terrestrial species could be dispersed by the Spoonbills. The diverse dispersed organisms and their migratory and long-distant dispersal movements make the Spoonbills an excellent vector of plants and invertebrates.

Talk given during the session “Ecology and behaviour of spoonbills”



Which wetlands should be effectively protected in Tunisia to secure wintering and stop over sites for the Eurasian Spoonbill *Platalea leucorodia*? Mid-winter counts from 2002 and 2021

Hichem AZAFZAF¹, Sami REBAH^{1}, Claudia FELTRUP AZAFZAF¹, Naoufel HAMOUDA¹, Hamed MALLAT¹, Abdelnacer GHLIS¹, Samar KILANI¹*

¹Association Les Amis des Oiseaux (AAO/BirdLife Tunisia), Tunisia

*Corresponding author; e-mail: samyrabah@yahoo.fr

Spoonbills are a familiar and quite common non-breeding species in Tunisia, where they may be observed all year round. They are mainly recorded in the coastal zone 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 metres, where at least three thousand individuals, winter from July/August to February/March on the shallow tidal flats. They are also observed on a regular basis, although in lesser numbers, in northern freshwater habitats, sometimes apparently wintering and sometimes on passage to more southerly wintering areas. Between 2002 and 2021 the Eurasian Spoonbill was observed wintering in 85 Tunisian wetlands. This paper shows the evolution of annual abundance during these years, the spatial distribution and fluctuations. It also gives the trend of the species over the last 20 years and an analysis of 20 covariates (as Latitude, longitude, altitude, distance between sites and the nearest city, distance between sites and the coastline, amount of winter precipitation, area, spring NW anomalies, spring NE anomalies, etc.) that may influence the presence and numbers of spoonbills in Tunisian wetlands. Therewith, the authors aim to draw attention to the most important wetlands (wintering areas and stopover sites) in need of effective protection to conserve 90% of the wintering population of the Eurasian Spoonbill in Tunisia.

This talk was not given due to the absence of the author.



Are the East Atlantic breeding populations of spoonbills increasing or decreasing? Preliminary analysis in a migratory corridor in the south of the Iberian Peninsula

Francisco HORTAS^{1,2}, Javier RUIZ²*

¹Department of Biology, Faculty of Marine and Environmental Sciences (Cádiz University), Spain

²Cádiz Natural History Society, Limes Platealea Project, Spain

*Corresponding author; e-mail: francisco.hortas@uca.es

The discovery of a migratory corridor in the south of the Iberian Peninsula in 2012 called "Playa de la Barrosa-Cabo Roche" has made it possible to have an annual monitoring programme during the postnuptial passage and to quantify how many spoonbills of the East Atlantic flyway population make the crossing to the African continent towards the wintering quarters. After a decade of monitoring, the number of spoonbills that cross the ocean to Africa (2012-2021) a preliminary trend analysis has been carried out. These trends are compared with the breeding population in The Netherlands and in Andalusia (Spain). The results obtained in the migratory corridor of southern Spain indicate that during this period there has been a moderate increase of total numbers of spoonbill during postnuptial migration of 2% per year ($p < 0.01$). However, the breeding Dutch population shows a strong increase of 5.3% per year ($p < 0.05$) for the period considered, while the Spanish population is decreasing and has qualified as vulnerable in the recent red list of birds in Spain. All the results obtained are discussed in a European context taking into account wintering birds and highlight the importance of monitoring in southern Spain based on counts rather than estimates.

Talk given during the session "Threats to spoonbills and their habitats"



Primary moult of Eurasian Spoonbills *Platalea leucorodia leucorodia* in the Wadden Sea in 2021

Arjen P. DE BOER¹, Petra DE GOEIJ¹, Theunis PIERSMA^{*1,2}

¹Groningen Institute for Evolutionary Life Sciences, University of Groningen, The Netherlands

²Royal Netherlands Institute for Sea Research-NIOZ, The Netherlands

*Corresponding author; e-mail: theunis.piersma@nioz.nl

The annual moult of Eurasian Spoonbills *Platalea leucorodia leucorodia* has remained remarkably poorly described. Using digital photography, we studied primary moult in the eastern Dutch Wadden Sea from July to October 2021, with observations from Schiermonnikoog where spoonbills breed, and from Lutfjewad, on the mainland coast of Groningen, where the Schiermonnikoog breeders are joined by others after the breeding season. We were able to obtain 1471 clear images of flying individuals. Black wing tip patterns and bill size and colour allowed us to separate age groups, whereas abdominal profiling gave an index of body mass changes indicating fuelling for southward migration. We found that immature, and probably nonbreeding, spoonbills started their primary moult before the adult birds with white wingtips. Only a few individuals completed primary moult before southward migration; typically, moult was interrupted before southward departures in the course of September and October. Such a pattern of interrupted primary moult does not usually occur in coastal shorebirds, but is typical of the shorebird species of freshwater habitats, e.g. Ruffs *Calidris pugnax* and Black-tailed Godwits *Limosa limosa*.

Talk given during the session "Threats to spoonbills and their habitats"



Vocalizations of Eurasian Spoonbills

*Theunis PIERSMA^{1,2} Florent LAGARDE^{*3}*

¹Royal Netherlands Institute for Sea Research-NIOZ, The Netherlands

²Groningen Institute for Evolutionary Life Sciences, University of Groningen, The Netherlands

³Syndicat Mixte de Gestion des Milieux Naturels, National Nature Reserve of the Marais d'Orx, France

*Corresponding author; e-mail: florentlagarde.milnat@orange.fr

Known as 'silent' birds, adult Eurasian Spoonbills *Platalea leucorodia* actually have a surprisingly long and curved trachea enabling the syrinx to produce a range of sounds. The discovery trail here began with the detection of soft muffled sounds in spoonbills at a stopover site during southward migration in southwestern France and at a post-breeding feeding site in The Netherlands. When making such 'ook'-sounds, adults, as well as juveniles, contributed to what looked like dialogues, the sound of the juvenile having a higher pitch than that of the adult. On the basis of their occurrence in pre-departure contexts, we propose that these particular vocalizations function during collective decision-making, perhaps contributing to reach consensus before and during non-routine group movements from one place to another. The morphological differences in the length of the trachea between juveniles and adults were correlated with the pitch of their 'ook'-sounds. This may represent a badge of accumulated experience that comes into play during migration, but also during competitive interactions in the breeding colonies.

Talk given during the session "Threats to spoonbills and their habitats"



Senegal's Atlantic coastal areas play a key role for Eurasian Spoonbill *Platalea leucorodia leucorodia*

Aissatou Yvette DIALLO^{1*}, Theunis PIERSMA^{2,3}, Arne VAN EERDEN², Saliou NDIAYE⁴, Papa Ibnou NDIAYE¹

¹Laboratoire de Biologie évolutive – Ecologie et gestion des écosystèmes, Département de Biologie animale, Faculté des Sciences et Techniques, Université Cheikh Anta Diop de Dakar, Senegal

²Royal Netherlands Institute for Sea Research-NIOZ, The Netherlands

³Groningen Institute for Evolutionary Life Sciences, University of Groningen, The Netherlands

⁴Département de biologie animale, Université Cheikh Anta Diop, Senegal

*Corresponding author; e-mail: diallo.aissatou.yvette@gmail.com

Senegal hosts hundreds of wintering Eurasian Spoonbills *Platalea leucorodia* every year. To contribute to the paucity of knowledge on their distribution and ecology, this study aimed to compare the occurrence and behaviour of spoonbills at the three most important sites in Senegal: Djoudj National Park, Technopôle of Dakar and Palmarin Reserve. Based on monthly counts in 2017 and 2018, Djoudj reached peak numbers of more than 2500 birds in April. The number in Palmarin peaked at 500 birds in October. In both cases this well exceeds the 1% threshold for the East Atlantic Flyway population, but Djoudj can hold up to a sixth of the population. Technopôle is an intermediate site that rarely hosts more than 50 individuals. Based on the scanning of behaviours throughout the day, we show that foraging activity was high early in the morning and decreased towards noon. At Palmarin, spoonbills spent more time resting (68%) than in the Djoudj (50%), allocating less time to foraging (29%) compared with Djoudj (16%). If this indicates favourable wintering habitat at Palmarin, the growing population of Eurasian Spoonbills from Europe may increasingly rely on the Palmarin site during the coming decade. Appropriate conservation measures are important to ensure that these sites continue to support Eurasian Spoonbills.

Poster in the session “Threats to spoonbills and their habitats”



3

Conclusions





X Spoonbill Workshop Conclusions

WORKSHOP

1. 29 participants from 13 different countries attended the workshop in a multicultural, friendly and benevolent atmosphere. Organising the ESIEG workshop in Croatia was an opportunity to strengthen the network towards Eastern Mediterranean countries. It was a success with representatives present from Croatia, Montenegro, Greece, Hungary, Bulgaria and Egypt. We acknowledge the great organisation by the Croatian Society for Birds and Nature Protection in Croatia, the Department of Biology of the University of Osijek in Croatia, the Institute of Ornithology CASA in Croatia and Tour du Valat, Research Institute for the Conservation of Mediterranean Wetlands that allowed the success of the workshop.
2. ESIEG thanks sponsors (Tour du Valat) for their financial support that allowed the venue of a plenary speaker from Finland and representatives from Hungary, Algeria, and Egypt. Nevertheless, we regret the lack of means and the short time that prevented the obtention of visas for more representatives from Africa.
3. ESIEG was glad to have the venue of several PhD students working on spoonbills. We would like to include more young scientists in the future workshop to enable them to join the international networks and discuss their study topics. The involvement and mentoring of the new generation of spoonbill experts will not only allow the group continuity to the future but also bring a new perspective to its present.
4. ESIEG expresses high concerns for the preservation of key sites for spoonbills in Europe. There is an urgent need for the appropriate management of Doñana Ramsar site and Croatian fishponds that are part of the Natura 2000 sites.
5. ESIEG acknowledged the development of joint genetic study and study on survival that included several flyways and expressed the intention to widen the geographic scope of these studies.
6. The Eurasian spoonbill international action plan was updated considering a new evaluation of priorities. An evaluation of achievements was also performed. There will be published in the proceedings in 2023.

TRENDS AND MAIN RESULTS

7. East Atlantic flyway
 - a. ESIEG expressed his major concern about the situation of Doñana degradation of wetlands. Doñana is a major wetland for wintering and stopover of migrating spoonbills. Both drought and diversion of water for agriculture constitute a major threat for the East Atlantic population.
8. Central Europe / Central Mediterranean flyway
 - a. ESIEG expressed his major concern about the situation of the mismanagement of Croatian fishponds that lead to spoonbill breeding and feeding habitat destruction despite being NATURA 2000 sites. Majority



of Croatian spoonbill breeding population depends on these man-made habitats, but recent fishpond “reconstruction works” for the purpose of intensification of production, funded by EU money, are causing serious habitat degradation and loss of colonies.

- b. In the Carpathian Basin, the dryness in the 2019 - 2022 period caused serious problems for the breeding spoonbills because the natural wetlands dried out. This led to many foraging areas disappearing and the number of the breeding pairs and breeding success were very low. ESIEG encourages wetland management that helps to preserve water in natural wetlands.

9. East Europe / East Mediterranean flyway

- a. Population increase in some countries in the South East European breeding population is highlighted, but threats and knowledge gaps still exists.
- b. Activities from the Eurasian Spoonbill international action plan were prioritised for the first time for this flyway.

10. *P. l. archeri*

- a. Further research, including genetic study, is needed to understand the status of breeding population at Egyptian Red Sea islands.

11. *P. l. balsaci*

- a. Over the last years, monitoring is reinforcing through regular evaluation of the numbers of breeding pairs in the main breeding sites and ringing of chicks in order to have a better understanding of the trend of this unique population.
- b. The population breeds on low lying islands that are subjected to regular jackal attacks as well as flooding, which is expected to exacerbate with sea level rise. Also, jackals seem to have increased with increasing freshwater availability in the nearby villages, which may increase attacks on breeding colonies.

COMMUNICATION

- 12. A logo of the group was created and adopted in 2020.
- 13. For the first time, due to COVID situation and the postponing of next workshop, a virtual meeting took place in October 2021 with 35 participants from 16 different countries.

ESIEG ORGANISATION



14. ESIEG acknowledges AEWA Secretariat in regards to our proposal to split Central Europe and South East European flyways in 2019. Recent genetic study presented at this workshop strengthens the new delineations now adopted by AEWA.
15. ESIEG took note of the temporary pause in the implementation of the Memorandum of Understanding between the AEWA Secretariat and the coordination of ESIEG in May 2021. Accordingly, use of the AEWA logo by ESIEG stopped since then. We regard positively the likely reintegration of ESIEG into AEWA scheme in 2023.

NEXT STEP

16. Next ESIEG workshop will be organised in 2025 in Bulgaria or The Netherlands.

Zadar, Croatia, 6th October 2022
Eurasian Spoonbill International Expert Group



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