

IUCN-SSC Stork, Ibis and Spoonbill Specialist Group Special Publication 2

Proceedings of the IX Workshop of the AEW Eurasian Spoonbill International Expert Group

Djerba Island, Tunisia, 14th - 18th November 2018



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Suggested citation of this publication:

Champagnon J., Kralj J., Cano Alonso, L. S. & Sundar, K. S. G. (ed.) 2019.
Proceedings of the IX Workshop of the AEWA Eurasian Spoonbill International
Expert Group. IUCN-SSC Stork, Ibis and Spoonbill Specialist Group Special
Publication 2. Arles, France. ISBN 978-2-491451-00-4.

Recommended Citation of a chapter:

Marion L. 2019. Recent trends of the breeding population of Spoonbill in France 2012-
2018. Pp 19- 23. In: Champagnon J., Kralj J., Cano Alonso, L. S. & Sundar, K. S. G.
(ed.) Proceedings of the IX Workshop of the AEWA Eurasian Spoonbill
International Expert Group. IUCN-SSC Stork, Ibis and Spoonbill Specialist Group
Special Publication 2. Arles, France.

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Milla/Limes Platalea-SGHN (Conclusions).
We warmly thank Jonathan Holt for the design of the ESIEG logo and Andrew
Bloomfield for English editing.

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Editors' Letter

It is our pleasure to complete and make available the second Special Publication of the IUCN-SSC Stork, Ibis and Spoonbill Specialist Group (SIS-SG). As we wrote in our first Special Publication, the aim of this series of publications is to allow rapid and easy access of information via the SIS-SG, especially information that is frequently difficult to access and find readily. The Special Publications includes, but are not restricted to, abstracts, proceedings, and discussions during seminars on SIS species.

In this Special Publication, we provide the proceedings of the IX Workshop of the AEWA Eurasian Spoonbill International Expert Group (ESIEG) that took place from 14 to 18 of November, 2018 in Djerba Island, Tunisia. The Eurasian Spoonbill *Platalea leucorodia* is an iconic species that is famous for its long and complex migrations that span continents. It is not surprising, therefore, that this species has attracted the attention of a large number of conservationists and scientists, and has led to the creation of a specific Expert Group (ESIEG) under the umbrella of the African-Eurasian Migratory Waterbird Agreement (AEWA).

In the XI workshop dedicated to the European Spoonbill, scientists and conservationists discussed the population status, showcased new ecological findings, reflected on emerging challenges and opportunities for collaboration, and worked to determine the best ways in which the populations and habitats of the species should be studied and conserved for the long term. The full conference programme and all of the submitted abstracts have been collated for this Special Publication.

We express our deep gratitude to the people who made this workshop, and therefore this Special Publication, possible. The heavy lifting of organising the workshop, and the subsequent collating of all of the abstracts and other material presented here was done by the Scientific Committee of the workshop. We especially thank Jocelyn Champagnon and Jelena Kralj for accepting the invitation to be Co-editors for this Special Publication and enabling the material to be put together for wider accessibility via the website of the SIS-SG. We also thank them for providing the Foreword for this publication.

We are certain that the findings included in this Special Issue will be of interest to people already working on the Eurasian Spoonbill, as well as to people interested in waterbirds and wetlands everywhere.

Luis Santiago Cano Alonso and K. S. Gopi Sundar

Co-Chairs, IUCN SSC Stork, Ibis and Spoonbill Specialist Group



Foreword

These proceedings are a compilation of original articles and summaries of the oral presentations and posters given during the IX Workshop of the AEWA Eurasian Spoonbill International Expert Group (ESIEG) that took place from 14 to 18 of November 2018, in Djerba Island, Tunisia.

The Eurasian Spoonbill is a species distributed over a wide range on three continents. Nevertheless, this species so emblematic of wetlands has very specific demands in terms of breeding habitat and lack of disturbance. Thus, various populations are quite small with less than 10,000 breeding pairs. Due to its migratory habits, the conservation of the Eurasian Spoonbill highly deserves international collaboration. Workshops of ESIEG, which take place every three years, allow for the exchanges of experiences in terms of management, research and ecology of the species. An assessment of trends and the progress of the action plan are conducted on these special events.

Tunisia is home to a large proportion of the wintering Spoonbills of the Central European flyway. The organization of a workshop in Tunisia has long been the dream of pioneering researchers on this species such as Mike Smart, Martin Schneider-Jakob, Patrick Triplet, Juan Navedo and Otto Overdijk. The dream came finally true with a new generation of Spoonbillers, at the ninth edition of the Spoonbill workshop, thanks to a merciful political situation and the strong commitment of l'Association des Amis des Oiseaux/Birdlife Tunisia.

Ten years after the initiation of the implementation of the International Single Species Action Plan, an extension for ten more years has been decided by AEWA at MOP7 in December 2018. So, it was time for a thorough assessment of the progress made for the last ten years. 24 participants from 10 countries answered the call and attended this workshop in a very friendly atmosphere, a characteristic of the nine workshops conducted since the first one in 1992. It was fantastic to join in Djerba Island, one of the most beautiful and important sites for waterbirds in Tunisia. In addition to fruitful exchanges during the workshop, extensive media coverage has made it possible to highlight this amazing species to a wider audience in order to raise awareness.

Conservation without borders!

Jocelyn Champagnon and Hichem Azafzaf

Co-organizers of the IX Workshop of the AEWA ESIEG



Credits & Acknowledgements

AEWA EURASIAN SPOONBILL INTERNATIONAL EXPERT GROUP (ESIEG)



Formed in 1991 to conserve Eurasian Spoonbill *Platalea leucorodia*, it is one of the first research network 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. In 2014 the group became an AEWA

International Species Expert Group.

The AEWA (Agreement on the Conservation of African-Eurasian Migratory Waterbirds) is an intergovernmental treaty dedicated to the conservation of migratory waterbirds and their habitats across Africa, Europe, the Middle East, Central Asia, Greenland and the Canadian Archipelago. Developed under the framework of the Convention on Migratory Species (CMS) and administered by the United Nations Environment Programme (UNEP), AEWA brings together countries and the wider international conservation community in an effort to establish coordinated conservation and management of migratory waterbirds throughout their entire migratory range.

Chair Jocelyn Champagnon

Coordinator Jelena Kralj

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

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

ASSOCIATION "LES AMIS DES OISEAUX" (AAO/BirdLife Tunisie)



Association "Les Amis des Oiseaux" is a Tunisian NGO working for the study, monitoring and protection of bird populations in Tunisia. AAO carries out conservation programs for sedentary and migratory birds and their habitats through relevant projects and activities

(information, awareness raising, advocacy, monitoring, capacity building, etc.).

Founded in 1975, AAO has actively integrated national, regional and international networks and programs aiming at the conservation of birds and their key sites. Thus, it is the official partner of Birdlife International in Tunisia, a member of IUCN and a founding member of the MedWaterbirds, MedWet North Africa, Randet and TunWet networks.

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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 today programmes of research into the functioning of wetlands, and 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 and 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 70 persons and conducts numerous activities with a multidisciplinary approach.

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

Scientific Committee of the workshop

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Funding partnerships

EURONATUR

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COTUSAL Compagnie Générale des Salines de Tunisie



CMB/Birdlife Coastal Migratory Birds Birdlife International



Direction Générale des Forêts Tunisie



Programme

Programme Agenda	Topic
Day 1: 15 November 2018	
08:30:00 Welcome	
08:45:00 Coordinator ESIEG	
08:55:00 Direction Générale des Forêts Tunisie	
09:10:00 Association "Les Amis des oiseaux" (AAO/BirdLife Tunisie)	
SESSION : Migratory connectivity – Chairman : Csaba Pigniczki	
15/11/18 09:30 Nedjah Riad – Cancelled	Migratory connectivity
15/11/18 10:00 El Hamoumi Rhimou	Migratory connectivity
10:30:00 Coffee	
15/11/18 11:00 Mikuska Tibor	Migratory connectivity
15/11/18 11:30 Marion Loïc	Migratory connectivity
15/11/18 12:00 Bloomfield Andrew	Migratory connectivity
12:30:00 Lunch	
SESSION : Tracking spoonbills – Chairman : Hichem Azafzaf	
15/11/18 14:00 Kralj Jelena	Tracking Spoonbills
15/11/18 14:30 Pigniczki Csaba	Tracking Spoonbills
15:00:00 Coffee	
15:25:00 1' poster presentation	
15/11/18 15:30 De Goeij Petra	Tracking Spoonbills
15/11/18 16:00 Lok Tamar	Tracking Spoonbills
16:30:00 Break	
15/11/18 18:30 Poster session	
19:30:00 Dinner	
Day 2: 16 November 2018	
SESSION : Ecology and behaviour – Chairman : Petra De Goeij	
16/11/18 08:30 Champagnon, Jocelyn	Ecology and behaviour of Spoonbills
16/11/18 09:00 Hortas Francisco	Ecology and behaviour of Spoonbills
16/11/18 09:30 Hamza Foued – Cancelled	Ecology and behaviour of Spoonbills
10:00:00 Coffee	
SESSION : Conserving wetlands and spoonbills – Chairman : J. Champagnon	
16/11/18 10:30 Azafzaf Hichem	Conserving wetlands and Spoonbills, AEWA International Action Plan
16/11/18 11:00 Champagnon Jocelyn	Conserving wetlands and Spoonbills, AEWA International Action Plan
12:00:00 Lunch	
16/11/18 14:00 Navedo Juan (Videoconference)	Conserving wetlands and Spoonbills, AEWA International Action Plan
16/11/18 14:15 AEWA Action plan	Conserving wetlands and Spoonbills, AEWA International Action Plan
15:00:00 Coffee	
16/11/18 15:30 ESIEG	Conserving wetlands and Spoonbills, AEWA International Action Plan
16:30:00 Break	
16/11/18 17:30 van de Hoef Mark	
PLENARY – Pr. Piersma	
16/11/18 18:00 Plenary, Pr. Piersma	
19:00:00 Dinner	
Day 3: 17 November 2018	
7:30-12:00 Ornithological sightings around Djerba Island	
12:30-14:00 Lunch at Hotel	
14:30-18:00 Cultural programme around Djerba Island	
19:00-23:00 Closing Gala	

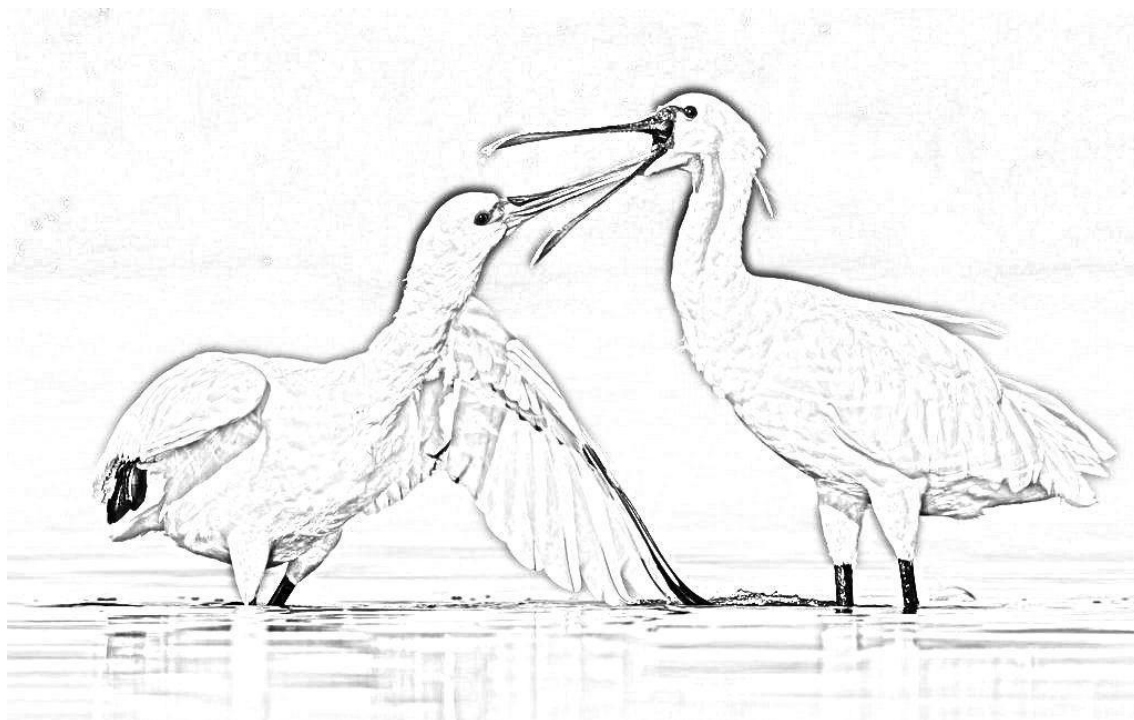


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Proceedings





An Overview of Eurasian Spoonbill Trends

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Keywords: Demography, Monitoring, Trajectory

The Eurasian Spoonbill *Platalea leucorodia* is distributed over a wide range in the Palearctic, from West Europe and Northwest Africa to China (Cramp and Simmons 1977) but the breeding range was formerly more extensive and it decreases due to disturbance and wetlands loss (Triplet *et al.* 2008). Over the last decades, thanks to improved protection and wetland restoration, some former breeding areas have been recolonized, notably in Western Europe (This volume).

A survey conducted among national coordinators allowed the estimation of populations in 2007 (Triplet *et al.* 2008), 2012 (Overdijk *et al.* 2013), 2015 and 2018. Last published results from 2012 showed a healthy East Atlantic population, decreasing Central and South eastern populations, as well as a decreasing *P.l.balsaci* population.

Table 1. Compilation of the numbers of colonies and Eurasian Spoonbill breeding pairs (min-max) for each population 2018. ¹Romanian data only includes Danube delta. Considering a total Romanian population size of 1,100 bp in 2018 which is the mean over the last ten years (instead of the presented 170 bp from Danube delta), then the population size for C Europe would be estimated to 2061-2186 breeding pairs in 2018. ²Estimation from Western Asia was compiled in 2015 during VIII Spoonbill Workshop

Subspecies	Population	N° of colonies	N° breeding pairs	10 year trend
<i>P.l.leucorodia</i>	W Europe	143	8174-8221	Increase
<i>P.l.leucorodia</i>	C Europe	47	1567-1657	Decrease
<i>P.l.leucorodia</i>	SE Europe	34	1131-1256 ¹	Decrease
<i>P.l.leucorodia</i>	W Asia	?	5350 ²	
<i>P.l.archeri</i>	Red Sea	?	?	
<i>P.l.balsaci</i>	Mauritanian	2	>455	Decrease

Results from 2018 are presented in Table 1 and Figure 1. Considering only the three European flyways, the situation of the Eurasian Spoonbill is globally better than ten years ago with an estimation of 8,886-10,211 breeding pairs in 2007 vs. 10,872-11,134 breeding pairs in 2018. Nevertheless, the situation is contrasted among European



populations and the increase is largely driven by Western European population. While Western European population doubled since 2007 (Figure 2), the populations of the Central and South eastern Europe decreased. For the Central European population, the slight decrease over the last ten years is estimated from 4% to 14% and it is largely documented by the situation in Hungary that held two third of the total of the flyway in 2007 and that experienced decrease over the last 10 years (Figure 3). The Southeast European population decreased by 35% to 48% (note that this estimation considered the 2007-2015 mean number of breeding pairs in Romania, the decrease is more important 64%-70% if we consider only the Danube delta for Romania in 2018). This population depends largely on the Ukrainian and Romanian population sizes. 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 but the total number of breeding pairs in 2018 was unknown (Figure 4).

The situation is incomplete for Western Asian population which was estimated to 5350 in 2015 of which 3800 would breed in Russia. It is close to the rough estimation of 5000 breeding pairs estimated in 2007 (Triplet *et al.* 2008). The lack of precise information concerned also the small resident subpopulations *P.l.balsaci* and *P.l.archeri*. At least for Mauritanian population, it is estimated that the number has largely decreased over the last ten years (Overdijk *et al.* 2013) even if the figure in 2018 was incomplete (only two colonies were estimated).

The general picture in 2018 is similar with the situation in 2012 (Overdijk *et al.* 2013). To face this worrying situation, new schemes are put in place by ESIEG in order to obtain a better monitoring for the next years. Nevertheless, in a context of low funding of conservation action by parties, Eurasian Spoonbill is no longer a priority in many country agenda, including some countries of the East Atlantic flyway. It may cause concern for the long-term monitoring of the species in this region, but also and more generally, for the conservation of the decreasing and vulnerable populations.

Figure 1. Map showing trends of Eurasian Spoonbill populations for each country between 2007 and 2018. Dark green corresponds to increasing populations, light green to stable or fluctuating populations and red to decreasing populations. Known breeding sites in 2007 are presented with black patches.

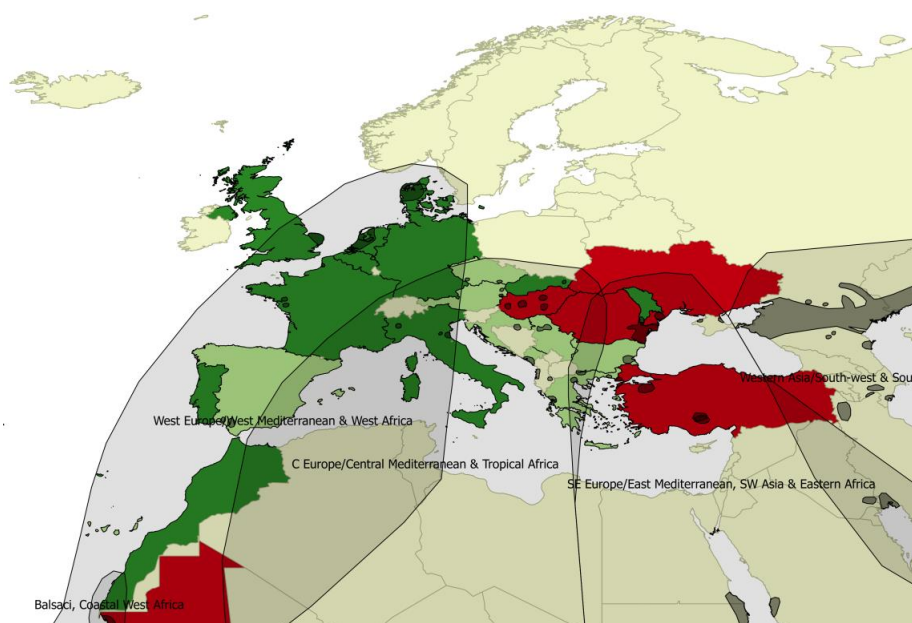




Figure 2. Trends of Western European population. Minimum of breeding pairs for each survey is presented

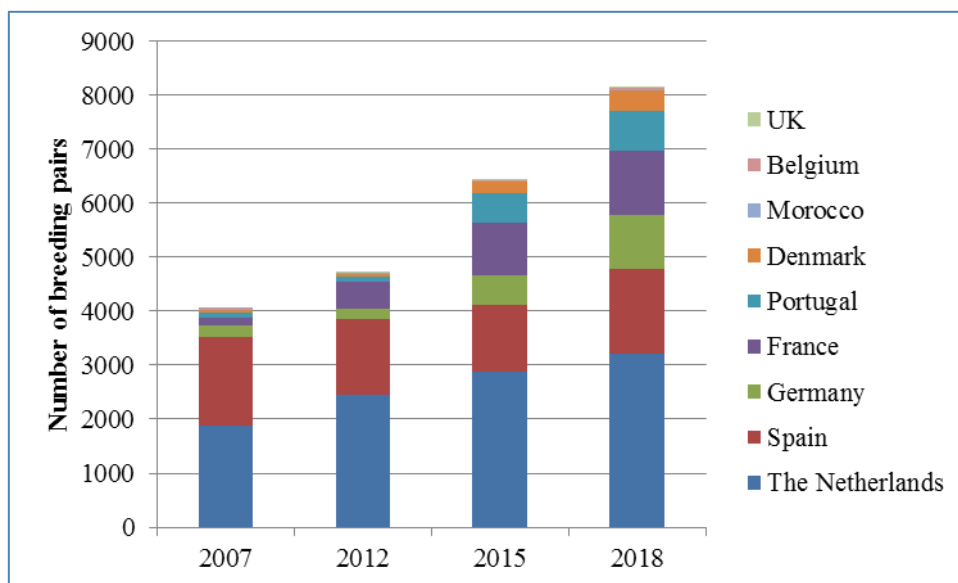


Figure 3. Trends of Central European population. Minimum of breeding pairs for each survey had been considered

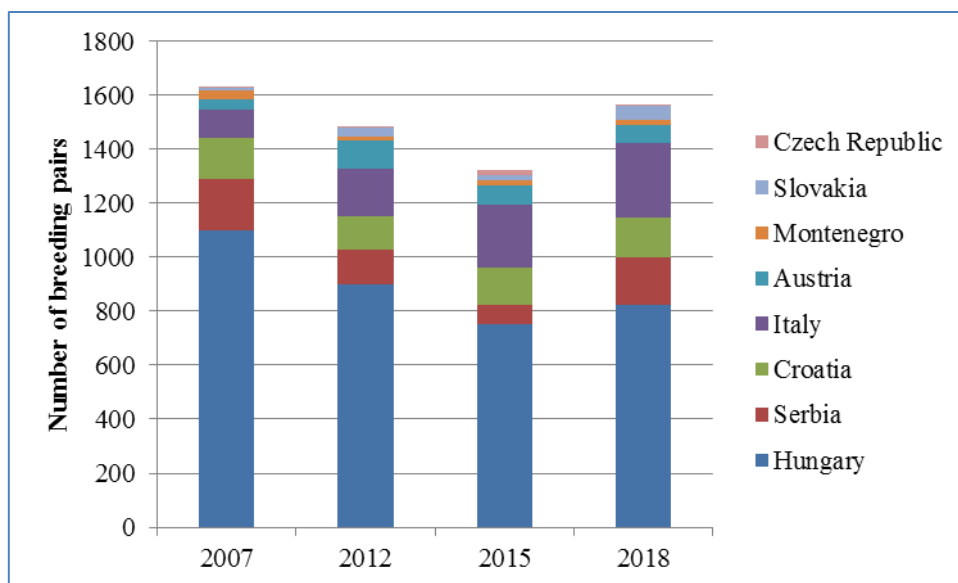
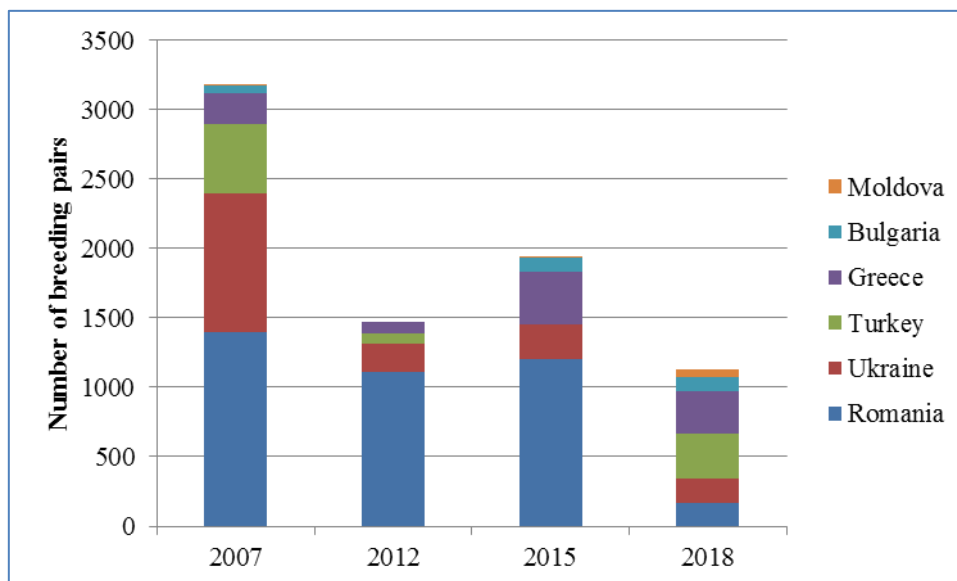




Figure 4. Trends of South eastern European population. Minimum number of breeding pairs for each year had been considered. Note that data from Moldova in 2012 and Turkey in 2015 were lacking, and data from Romania in 2018 were incomplete (only Danube delta data were available)



Acknowledgements

We deeply thank all the participants of the IX Spoonbill Workshop as well as the contributors that sent information for this compilation: V. Ajder (Moldova), A. Ashoori (Iran), A.I. Bloomfield (UK), K.A. Boyla (Turkey), T. Bregnballe (Denmark), M.S. Camara (Mauritania), S. Cheshmedjiev (Bulgaria), P. de Goeij (The Netherlands), C. de le Court (Spain), D.E. Dizdaroğlu (Turkey), R. El Hamoumi (Morocco), V. Encarnação (Portugal), K. Günther (Germany), M. Habib (Egypt), M. Hoekstein (The Netherlands), P. Iankov (Bulgaria), S. Kazantzidis (Greece), S. Kharitonov (Kazakhstan, Russia, Uzbekistan), T. Krüger (Germany), T. Kuzmenko (Ukraine), R. Kvetko (Slovakia), M. Marinov (Romania), L. Marion (France), T. Mikuska (Croatia), V. Mladenov (Bulgaria), L. Sinav (Turkey), J. Skriver (Denmark), G. Spanoghe (Belgium), K. Štastný (Czech Republic), E. Sultanov (Azerbaijan), M. Tucakov (Serbia), S. Volponi (Italy), B. Zeković (Montenegro).

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Ten-year Evaluation of the Implementation of the AEWA Eurasian Spoonbill International Action Plan

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Keywords: Action plan evaluation, Conservation, Legislation, Management, Research

The IXth meeting of Eurasian Spoonbill International Expert Group (ESIEG) took place in November 2018 at Djerba, Tunisia, ten years after the development of the International Action Plan for the Eurasian Spoonbill (Triplet *et al.* 2008). As a ten year implementation period for the action plans was foreseen, we have an opportunity to assess the implementation of the Action Plan and give a proposal for next steps.

During the special session at the meeting, the assessment of implementation was done using the same approach as during the previous two meetings, held in the years 2012 and 2015. The degree of implementation of every action was evaluated, at the level of population. Each action was scored (using scores given in the Table 1) by all participants in the workshop divided in two groups (East Atlantic and Central European populations). Due to the lack of experts from regions of the other four populations concerned by the action plan (South eastern European and Western Asian populations of the nominate subspecies, *Platalea leucorodia balsaci* and *P.l archeri*), the level of implementation for these four populations could not be evaluated.

Actions were grouped in Legislation, Management or Research in order to calculate the average scores and estimate which type of actions had been better implemented for any population.

In the Action Plan, each action was also scored according to the priority (Table 2), however there were no actions foreseen for the East Atlantic and Central European populations being assessed as “Critical”. The implementation score was calculated for each priority group.



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

Table 2. Priority categories 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
High result needed to prevent a decline of more than 20% of the population in 20 years or less
Medium result needed to prevent a decline of less than 20% of the population in 20 years or less
Low result needed to prevent local population declines or events likely to have only a small impact on the population across the range
Not a priority local measure which has no significant impact on the population

Table 3 Implementation scores in 2018 of each action of the Eurasian Spoonbill International Action Plan

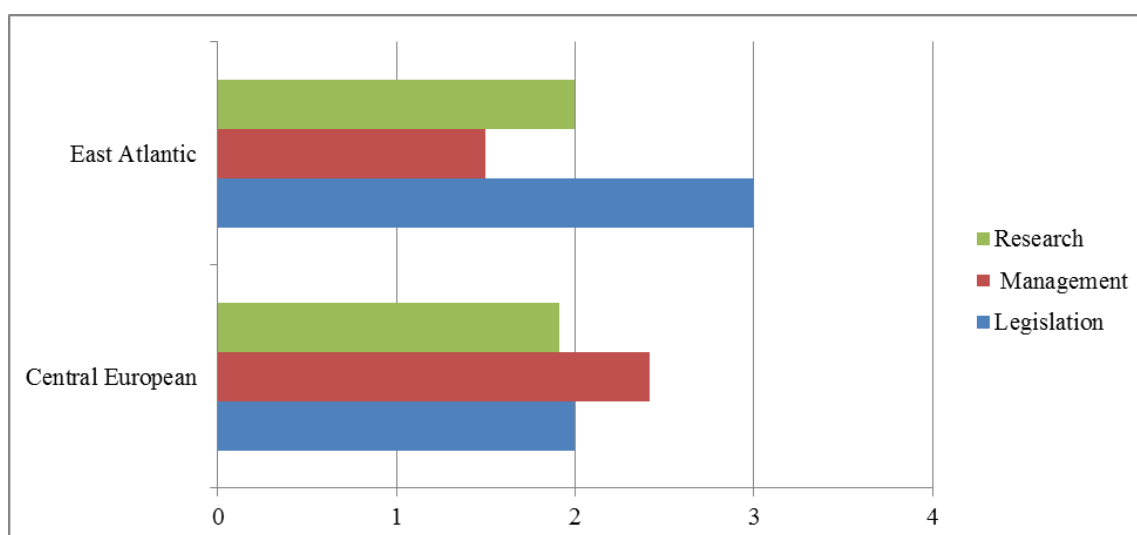
Actions	East Atlantic	Central European
Designate and maintain key breeding, feeding and stop-over sites as Protected Areas (European Union Special Protection Areas in EU countries) and Ramsar Sites	3	2
Restore former feeding areas and prevent drainage of existing feeding areas	2	2
Prevent overgrowth of feeding areas by management of vegetation succession and/or invasive plants	1	2
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
Maintain the area of fishponds managed extensively in Central Europe and adjust their management to the needs of the species		2
Develop management plans for key breeding, feeding and stop-over sites	2	2
Reduce mortality caused by collision with overhead power lines	1	2
Reduce direct mortality caused by poaching	3	1
Reduce direct mortality caused by toxins	3	4
Phase out organochlorines (especially DDT) along the entire migratory flyway	3	
Restore wetlands for breeding, maintain adequate water level at colonies and create water supply systems	2	3
Protect colonies threatened by flooding	1	3
Preserve colonies from burning and cutting reed, by avoiding such activities around colonies		2



Actions	East Atlantic	Central European
Take measures to protect threatened colonies against excessive predation (notably by fox, wild boar or jackal)	2	3
Manage competing species if necessary and appropriate	1	4
Protect nesting colonies from disturbance	2	2
Determine and monitor breeding success and calculate the values necessary to meet the target in relation to survival rate	2	2
Determine and monitor survival rate through colour ringing and satellite telemetry	4	2
Identify limiting factors with a view to promoting further expansion of breeding range and to creating early warning system against potential threats	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)	1	3
Identify any potential age and gender differences in use of stop-over and wintering sites	4	1
Determine migratory status and the migratory flyways (study movements during non-breeding season using colour-ringing and satellite tracking)	4	3
Complete full survey for breeding areas (Turkey as a priority)		1
Study the sensitivity of Spoonbill to disease and toxins	1	1
Identify key mortality factors and hot spots	3	2
Collect and analyse genetic samples (Turkey, Hungary, Mauritania)	4	3
Study the feeding ecology of the species	3	1

Overall, the East Atlantic and Central European populations evaluated 24 and 27 different actions, respectively, and obtained very similar average scores (\pm SD) of 2.3 ± 1.1 and 2.1 ± 0.9 (Table 3). In both populations, legislation actions had the highest implementation scores. The lowest scores were obtained for management activities in the East Atlantic population and research activities in the Central European one (Figure 1).

Figure 1 Average score of research, management and legislation actions of the Eurasian Spoonbill Action Plan implementation in 2018 for each population

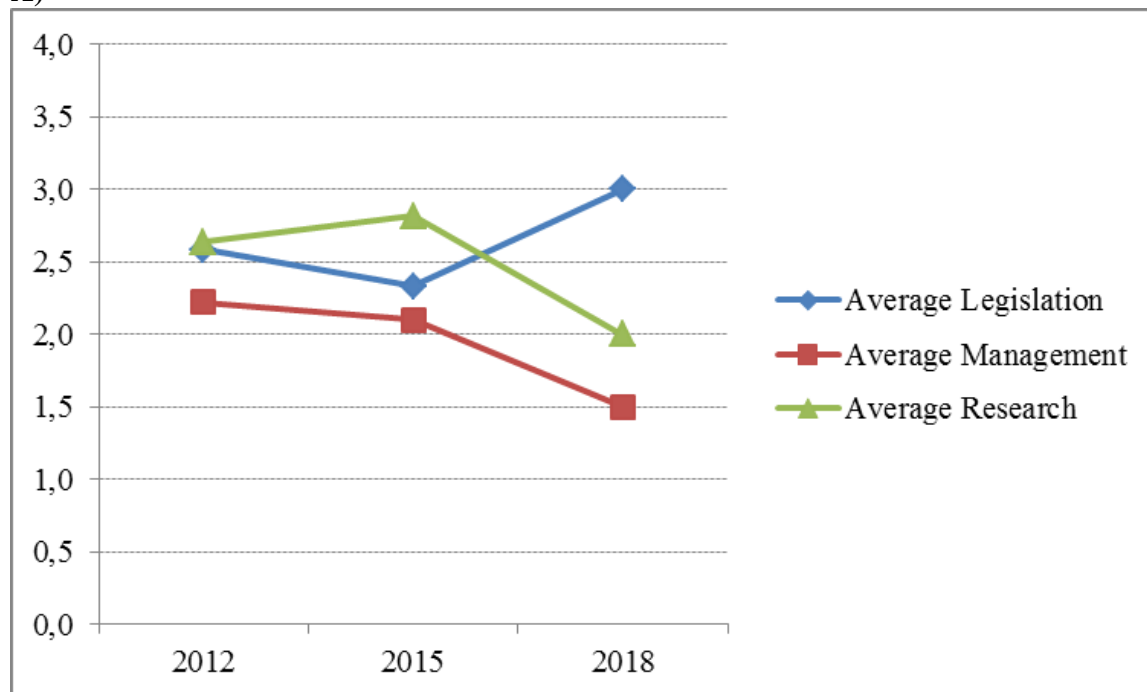




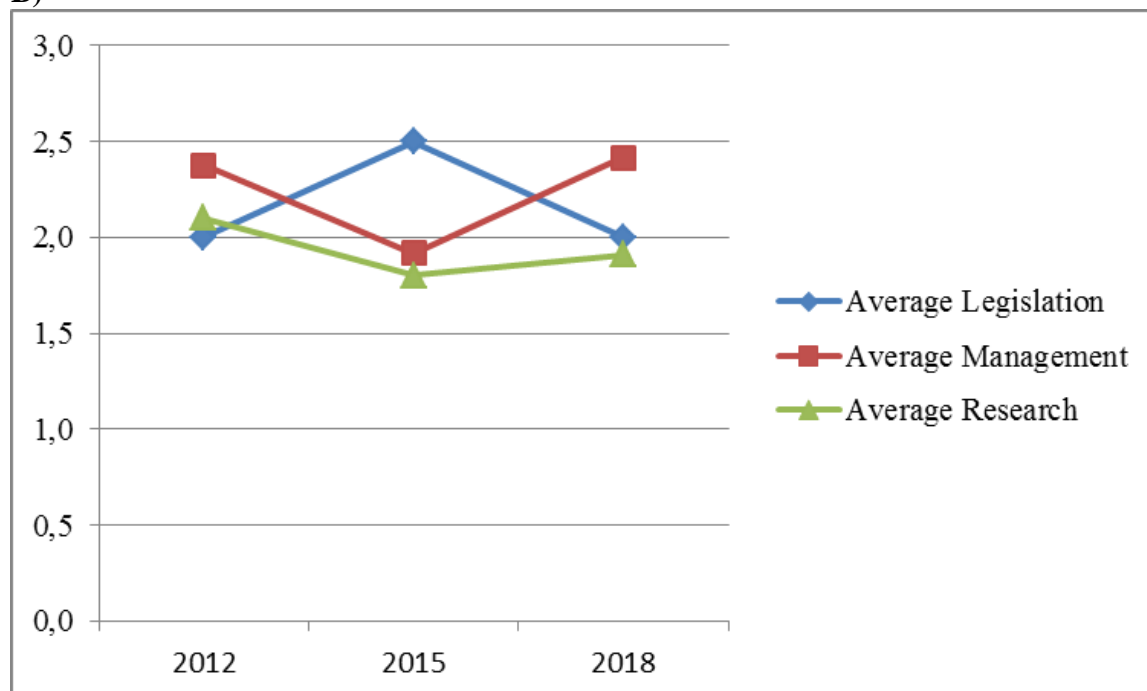
The comparison of scoring during last three ESIEG meetings showed the increase of legislation activities in the East Atlantic population, but surprisingly, also the decrease in management and research actions (Figure 2).

Figure 2 Average implementation scores for activities grouped under legislation, management and research along East Atlantic (A) and Central European (B) flyways between the years 2012 and 2018

A)



B)

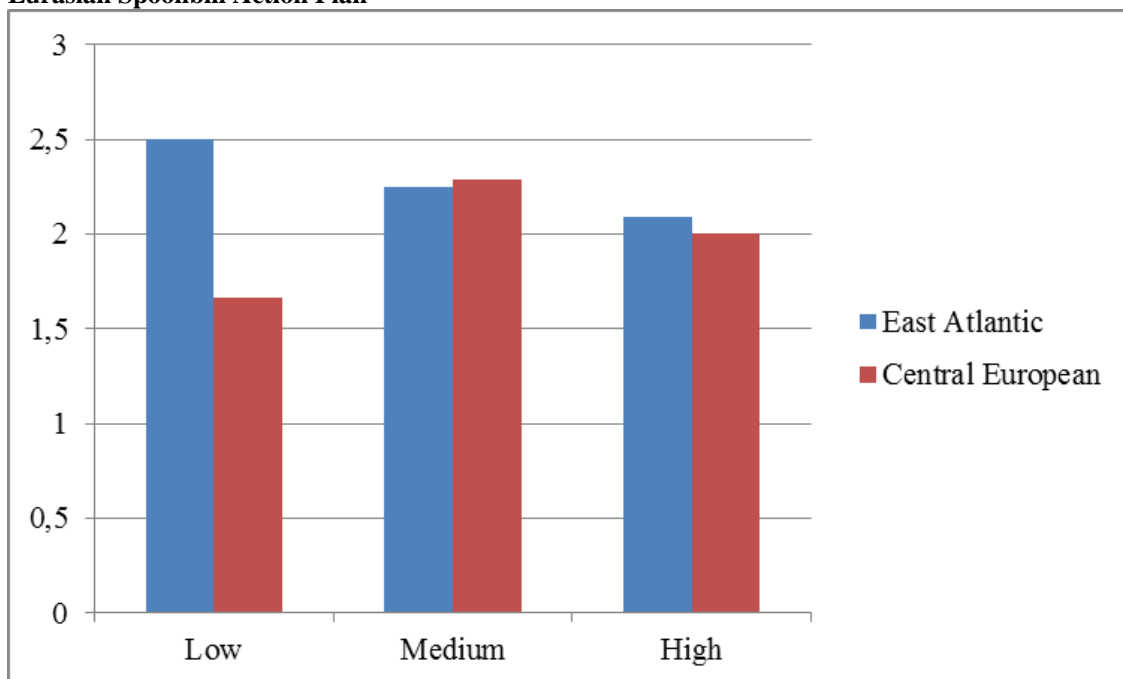




The decrease in the progress of management actions in the East Atlantic population is worrying. Due to the population increase in this flyway, the Spoonbill is no more a priority for action. As a consequence, Eurasian Spoonbill is not included in the local management plans or not eligible for funding. The drought in some breeding areas has led to no breeding at all in several years now, for example in the Coto Doñana in Spain, where agricultural intensification lowers the groundwater level. Another increasing problem is invasive plant species. At both breeding areas and wintering areas rivers and lakes are fully overgrown, by for example the common water hyacinth *Eichhornia crassipes*, so that Spoonbills lose breeding and feeding areas. In the Central European population, legislation activities are decreasing, due to the ineffective measures against poaching and use of toxins. Critical management actions for the Central European population are the restoration of fishpond areas and the limiting of activities that reduce the availability of food or affect foraging (river regulation, disturbance, shooting at fishponds etc.). Main threats are intensification or complete abandonment of carp fishponds, planned constructions of hydro-power plants on karst poljes in Bosnia and Herzegovina and development projects on salinas and coastal wetlands in Montenegro, Albania and Tunisia (Gulf of Gabes).

Comparing the implementation scores with priorities, it is visible that for both populations higher priority actions had lower implementation, indicating the need for better implementation of the highest priority actions (Figure 3). Most high priority actions with low implementation scores belong to management and research groups.

Figure 3. Average implementation scores for activities grouped according to priorities given in the Eurasian Spoonbill Action Plan



During the implementation session, groups of experts identified some actions as being not relevant any more, while a set of new objectives was proposed for the East Atlantic population. These include actions to improve protection of colonies outside protected areas and protection of feeding areas through water management, improvement of monitoring of breeding success, feeding ecology studies and improvement of public



awareness. The need for monitoring of population size, breeding success and survival of *P.l.balsaci* was also stressed.

Information about the implementation of two subspecies: *P.l.balsaci* and *P.l.archeri* as well as information about the Southeastern European and Western Asian populations of *P.l.leucorodia* range was lacking in 2018. Representatives from countries hosting these populations are only irregularly present at ESIEG meetings, and activities are limited. For example, in 2012 only five actions were evaluated for *P.l.balsaci* (Navedo *et al.* 2012). For the next period of the implementation, priority must be put to these three populations. For two assessed populations, more effort should be given to management and research actions with high priority scores.

After ten years of implementation, progress of Action plan is weak and no progress was visible over the last six years for the two better known populations. Funding is crucial for the effective implementation of the action plan, but is sadly lacking, despite considerable efforts by ESIEG members to fundraise for its implementation. The four populations for which the data were missing and the evaluation of the progress of the action plan was not possible were also the ones with more critical conservation status. Urgent actions are needed in order to conserve all populations of Eurasian Spoonbill. The revision of the Action Plan for the next period is therefore needed.

Acknowledgements

We thank all participants of the IX Spoonbill Workshop for their work during this session.

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Recent trends of the Breeding Population of Spoonbill in France 2012-2018

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Keywords: Distribution, Dynamics, Sacred ibis, Red Swamp Crawfish, Wetlands

Introduction

The chronology of colonization of breeding Eurasian Spoonbills *Platalea leucorodia* in France from its first settlement in 1973 at Lac de Grand-Lieu has been presented at the VII Eurosite Spoonbill Workshop in Spain in 2012 (Marion 2013a), when population reached about 529 breeding pairs in 2011 dispersed in fifteen sites, mainly in Loire-Atlantique and in the Camargue. The present paper describes the increase of the French breeding population between 2012 and 2018.

Methods

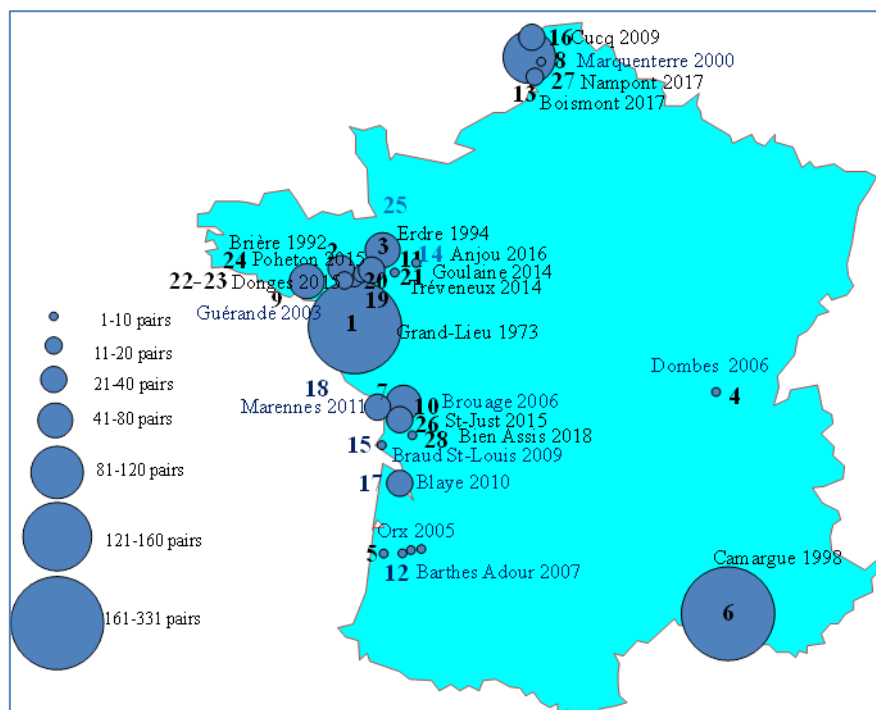
The data of breeding colonies have been obtained from annual censuses of the population through personal research until 1997, and thereafter by coordination of an annual national census (the list of counters is given in Acknowledgments) or from local studies and previous synthesis (Crouzier and Rimbert 1997, Benmergui and Crouzier 2006, Blanchon *et al.* 2010, Marion 1994, 1996, 1999, 2006, 2012, 2013a, Marion and Marion 1982). The methodology was the same as described in Marion (2013a). The counts of occupied nests were made generally in May, during a short visit in the colony or from a point of observation located out of the colony to avoid disturbance. However, in the largest colonies, the breeding season lasts several months and census needed more than one visit. For instance, the census of occupied nests in the Lake of Grand-Lieu are spread over 3 weeks in May and June by walking in floating *Salix* and *Alnus* peatbog where colonies were dispersed within mixed Ardeids colonies. However the appearance in this site since 2012 of late breeders (after May) were not followed until their breeding and we hypothesized they really bred in June-July. In the Camargue, the census of big colonies (more than one hundred breeding pairs) is realized from several aerial pictures taken between March and June. Multiple counts of breeding pairs are avoided by subtracting group of birds that renest after a failed attempt (Champagnon, *pers. com.*). The references are given in the results when the local censuses have been published. The number of breeders was only estimated in some years for some colonies. The chronology of appearance of new colonies is given by number in the Figure 1 from the first colony in 1973 (site n°1 Grand-Lieu) to the last one which appeared in 2018 (site n°28 Bien-Assis).



Results

Apart the Camargue (site n°6) and the small inland population of the Dombes (site n°4), all the colonies were still distributed in France in 2018 along the Atlantic migration route used by the Dutch population and the French mother colony of Lac de Grand-Lieu (Figure 1), in accordance with the previous studies (Marion 2006, 2013a). The global distribution did not change since 2011, with only small new daughter colonies in the usual areas such as in Loire-Atlantique (site n° 19 in the Figure1 appeared in 2012, n°20-21 in 2014, n° 22-23-24 in 2015), in Charente-Maritime (site n°26 appeared in 2015 and n°28 in 2018), in Somme (site n°27 appeared in 2017), with also two colonies re-occupied after a previous abandonment (in Anjou, abandoned site in 2010 n°11-14 reoccupied in 2016, Boismont n°13 in Somme abandoned in 2012, reoccupied in 2014, abandoned in 2015, reoccupied in 2017). The only attempt of breeding in a new geographic administrative “département” occurred in 2015 in Ile-et-Vilaine (Antrain, site n°25 in Figure 1). All the new colonies stayed small while the largest French colonies still concerned Grand-Lieu and the Camargue with about 300 breeding pairs each. However the main breeding region still concerned the Loire-Atlantique with about 550 breeding pairs grouped in 10 colonies, a little less than half of the total of 1200 breeding pairs in France distributed in 28 colonies.

Figure 1. History of colonisation of France by breeding Eurasian Spoonbills and size of colonies (dots) in 2018. The names of each site are followed by the date of appearance of the colony (or re-appearance after abandonment). Each circle size is proportional to the size of the colony (number of pairs, see legend). Site number indicates the chronology of the first appearance of each colony. Numbers in blue without names of colony represent colonies that had disappeared in 2018

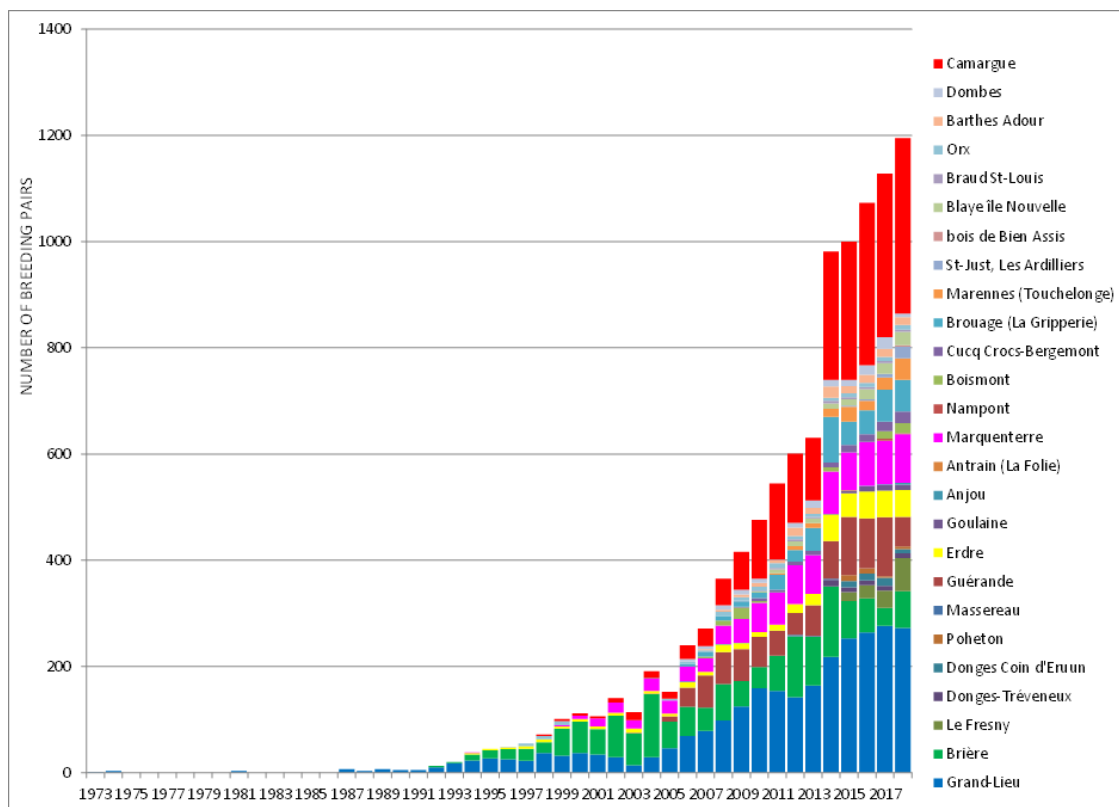


The Figure 2 illustrates the three main stages that marked the occupancy breeding Spoonbills in France: the first one lasts from 1973 to 2005 was defined by irregular (1973-1987) or very low breeding numbers at the mother colony of Lac de Grand-Lieu



up to 1992. Since then, Sacred ibises *Threskiornis aethiopicus* started to breed in mixed colonies with Spoonbills and Ardeids and likely facilitated the breeding of Spoonbills (Marion and Marion 1994, Marion 2006), however the total number of breeders in France decreased in 2003 (114 pairs) and 2005 (152 pairs). The second stage between 2006 and 2013 showed a regular increase of the French population of Spoonbills which reached 631 breeding pairs, thanks to the increase of the number of breeding pairs in Loire Atlantique (Grand-Lieu, Brière, Guérande), in the Camargue and at the Marquenterre in Somme. The third stage between 2014 and 2018 showed a very strong increase of the French population of Spoonbills which reached about 1,200 breeding pairs, mainly thanks to the increase of Grand-Lieu, Guérande, Erdre, Marquenterre, in many colonies in Charente-Maritime, and above all in the Camargue, which suddenly doubled from 118 pairs in 2013 to 241 in 2014 (see Blanchon *et al.*, this volume), while the total number of breeding pairs in France reached 981 this year.

Figure 2. Annual numbers of breeding pairs of Eurasian Spoonbills in each colony in France from 1973 to 2018



Discussion

While overall decreases in the total number of breeding pairs of Spoonbills occurred in 2001, 2003 and 2005, mainly affecting the Grand-Lieu and Brière colonies (Marion 2013a), there was by contrast a very regular overall increase since 2006. However fluctuations still occurred in important site such as Brière since 2011 (from 133 breeding pairs in 2014 to only 33 in 2017, Figure 2) probably due to shooting or other deterrent actions against Sacred ibises in the main mixed colony leading to its abandonment (Marion 2013b). These actions probably contributed to the multiplication of new small colonies in Loire-Atlantique and the strong increase of existing colonies such as Guérande and Le Fresny, and maybe an emigration of some pairs to Charente-



Maritime. Disturbance also occurred in Dombes with abandonment of the main colony (56 pairs) in 2018 due to the drying out of the pond during the breeding season (M. Benmergui in litt. 2018).

Practically all the increase of breeding pairs still occurred in the four main usual breeding areas (Loire-Atlantique, Camargue, Somme and Charente-Maritime), confirming the main factors explaining the presence of this species mentioned by Marion (2006, 2013). Notably, the important carrying capacity of the large feeding wetlands areas favoured increases comparatively to the small areas, food resources increased due to invasive Red Swamp Crayfish *Procambarus clarkii*, and those major sites present undisturbed sites for breeding (except in Brière, Dombes and maybe locally in Charente-Maritime) and their large number of breeders are very attractive for new breeders.

However, the strong and brutal increase of the French breeding population since 2014 and the step observed this year (reaching 981 pairs against 631 in 2013), which concern most of the colonies, suggests another factor, maybe an increase of immigration from the Dutch population where population seemed levelling-off (Oudman *et al.* 2017). Such immigration could concern not only the main migration Atlantic flyway but also the Camargue. Nevertheless, Champagnon *et al.* (this volume) suggest that local recruitment in the Camargue was the main factor explaining the large increase from 2014 onwards. However this local factor cannot explain the huge increase observed since 2014 over all French population. The increase of wintering Spoonbills in Europe may also partly explain a more rapid return in breeding colonies of younger adults or sub-adults birds which increase the number of Spoonbills in the colony of Grand-Lieu in May since 2012, grouped altogether in roosts of 50-140 non-breeders, part of them probably waiting for breeding later (floating population) when the site become less saturated. Although these birds were not followed in June we included them in the total of breeders in the data of this lake between 2012 and 2018, with the risk of overestimated the real breeding population. However in 2019 such late birds really bred in June.

Acknowledgements

I thank all the counters who participated to the annual census of the breeding Spoonbills in France: J.Cl. Beaudoin, M. Benmergui, E. Beslot, T. Blanchon, G. Bourlès, J. Bourlès, F. Caloin, M.F. Cannevet, S. Cardonnel, Ph. Carruette, G. Cassegrain, M. Caupenne, F. Cazaban, J. Champagnon, R. Chazal, G. Cochard, X. Commecy, P. Crouzier, P. Della Valle, J.L. Dourin, H. Dugué, F. Dupuy, A. Fossé, A. Frère, O. Gagne, M. Gauthier-Clerc, A. Gentric, C. Gentric, M. Guénezan, M. Guerville, R. Hargues, L. Jomat, Ph. Jourde, Y. Kayser, G. Kervinant, F. Lagarde, K. Le Rest, P. Lesclaux, I. Mahé, M. Maillard, D. Maréchal, L. Marion, P. Marion, F. Martin, G. Mazo, F. Méranger, Y. Montané, D. Montfort, F. Potiron, J. Recarte, T. Rigaux, N. Sadoul, F. Sueur, A. Troffigué, F. Veillé, and their organizations: Bretagne Vivante, CNERA ONCFS Birieux, Conseil Général (Départemental) Gironde, CNRS-Université Rennes1, CPIE Seignanx et Adour, FDC Landes, Parc du Marquenterre, LPO Charente-Maritime, LPO Anjou, LPO Loire-Atlantique, Picardie Nature, R chasse Massereau, RNN Courant d'Huchet, RNN d'Orx, SESLG, Syndicat mixte gestion milieu naturels des Landes, Tour du Valat.



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The Return of the Eurasian Spoonbill to the United Kingdom and the First Modern Colony at Holkham National Nature Reserve

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Keywords: Breeding success, Colonisation, Historical overview, Population size

History of the Spoonbill in the UK

The Eurasian Spoonbill *Platalea leucorodia* (referred hereafter as ‘Spoonbill’) was once a prominent species of the wetlands of southern England before nesting for the last time in 1668. Whilst the former population size is not known, it is known through records maintained at medieval feasts, where it was found and that it was hunted significantly. It also had a number of old local names such as ‘White heron’, ‘Popelar’, Shovelard’ and ‘Banjo Bill’, all which would only have been given with familiarity.

From this era, the last UK Spoonbill colony was at Trimley in Suffolk which is situated in East Anglia, an area adjacent to the North Sea coast of eastern England that had plenty of wetlands. River valleys, coastal marshes, the Norfolk Broads (a network of flooded redundant peat diggings) and the Fens (a vast lowland area of coastal flood plain that stretched inland from The Wash) were all Spoonbill haunts. In addition, former nesting colonies were found further south near London, in Kent, Sussex and Dorset, to the west in Wales and further north in Lincolnshire. It is thought all colonies were in trees often alongside Grey Herons. A combination of wetland drainage and hunting finally banished the species to the history books. Spoonbills continued to visit the UK yet as the Victorian era of shooting for museums and private collections began so any birds that appeared were deemed valuable targets. In these times in UK history, the rarer the bird, the more valued to the collectors it became. Legal protection was finally granted in 1880 yet illegal persecution prevailed for quite some time afterwards. One particular hunter who was taken to court in Great Yarmouth, Norfolk for shooting two Spoonbills openly admitted to receiving far more in financial reward than the subsequent fine he received.



Figure 1. Spoonbill breeding localities in the UK prior to 1700. The paler, more extensive area represents the main population of East Anglia where eight sites were known including the last colony in 1668



Thankfully attitudes changed as the 20th century progressed and as the population started to grow in the Netherlands and then France so more and more birds started to appear in England. In the species former haunts, the wetlands of eastern Suffolk and Norfolk and the nearby Broads, Spoonbills started to summer again although none seemed really serious about nesting until the latter part of the century. From 1989 onwards there then started a frustratingly long and drawn out recovery period in the UK that had as many false starts and failures as it did successes. It was perhaps rather fitting that the county of Suffolk (where nesting had ceased in 1668) should be the place for the first attempts. This time however it was coastal saltmarshes that were used. Nest building was noted in 1989 followed by egg laying in 1998 although predation from Fox *Vulpes vulpes* caused failure. As many as ten nests were built in 2002 but yet again foxes were thought to have caused failure, no surprise perhaps as these were ground nests. More unsuccessful attempts occurred at the same site in 2006 and 2007, predation again halting proceedings in the latter year. In nearby Norfolk another pair attempted nest building within a Broadland reed bed in 1995 and again in 2000 when Coots *Fulica atra* stripped the nest bare of twigs as fast as the Spoonbills positioned them! The hoped-for success finally occurred in 1999 on the Ribble Estuary in north-west England with two youngsters fledging. The next successful breeding occurred further north still in south west Scotland with three youngsters fledging from a single pair in 2008. It then took until 2010 before a colony formed at Holkham in Norfolk which has subsequently gone from strength to strength and continued to increase in numbers to 28 breeding pairs by 2018. Since then another pair has nested two years in succession at Fairburn Ings in Yorkshire in 2017 and 2018. In 2018 the most northerly breeding in the UK took place at Orkney where two juveniles fledged from a brood of three.



Figure 2. Modern Breeding Sites of the Spoonbill in the UK; Successful sites in red 1A The Ribble Estuary, 2A Dumfries and Galloway, Scotland, 3A Holkham NNR, 4A Fairburn Ings and 5 Orkney. Unsuccessful attempts in Green 1B The Suffolk Coast, 2B The Norfolk Broads, 3B Frodsham, 4B Cumbria



The Holkham Colony

Holkham National Nature Reserve is situated on the low-lying North Sea coast of the county of Norfolk in eastern England. It covers an area of 4,200 hectares and is comprised of inter tidal salt marshes, fresh water grazing marshes, sand dunes, pine woods and a sandy foreshore. The area is strictly protected and has designations such as Area of Outstanding Natural Beauty, Special Site of Scientific Interest, Special Area of Conservation and is part of the North Norfolk Coast Ramsar Site and Biosphere Reserve. Habitat enhancement work commenced in 1987 to make a valued and varied fresh water wetland habitat on former arable land that had been reclaimed from the sea. Since then its ornithological value to conservation in the UK has rapidly risen. It has become a site valued nationally for its breeding species such as Lapwings *Vanellus vanellus*, Avocets *Recurvirostra avosetta*, Redshank *Tringa totanus*, Marsh Harriers *Circus aeruginosus*, Little Terns *Sternula albifrons* and Little Egrets *Egretta garzetta*. In the winter it is visited by internationally important numbers of Pink-footed Geese *Anser brachyrhynchus* and nationally important numbers of Wigeon *Mareca penelope*, Teal *Anas crecca*, Shoveler *Anas clypeata*, Gadwall *Anas strepera* and Brent Geese *Branta bernicla*. It is also highly visited by about 800,000 people per year who come to enjoy the environment and its wildlife.

In recent years the reserve shot to national prominence due to the formation of a successful Spoonbill breeding colony, the first such example in the UK since 1668. Ever since the 1980s when the wetland creation work began, Spoonbills started to drop in to the newly made scrapes and pools and gradually, they started to spend longer periods of time there. The isolation of the pools enabled a disturbance-free site to feed and roost in



peace. Holkham's real attraction however is a tiny fragment of wet woodland. Covering an area of only four hectares it is centred around a fresh water pool linked by wide dykes and is surrounded by Oaks *Quercus robur* and Poplar *Populus nigra* trees. Low growing willows *salix sp.* make up the understorey and it is these that have been colonized by a number of breeding species. Grey Herons *Ardea cinerea* began nesting there in 1993, followed by Cormorants *Phalacrocorax carbo* in 1999, Little Egrets in 2002 and finally Spoonbills in 2010. Since then Great White Egrets *Ardea alba* have also started to colonize, breeding for the first time in 2016. The actual history of the wood dates back further than recent events and those moments from the past have undoubtedly shaped and helped to produce a uniqueness and attractiveness that has ultimately made the site the paradise for birds that it is today. On the north side of the wood a series of earth banks; the remnants of an ancient iron-age fort, produce shelter from cold onshore winds. It is also these banks that give Holkham a fortunate viewing area as with the aid of a vehicle, wardening staff are able to sit and look directly down into the colony. Another part of the wood's story comes from slightly more recent times; the 1700s. This is when the wood with its central pool and the dykes leading into it were managed to make what was referred to as a 'duck decoy'. The series of water ways would have been netted over and with aid of a hunter and a dog, wild ducks were driven into the pool to be shot for food. It is undoubtedly this combination of shelter from the old fort and the habitat created for the now redundant duck decoy that has shaped what it has become in recent times.

Another integral piece of the Spoonbill's colonisation of the North Norfolk coast is the feeding opportunities found in either direction from the Holkham colony. Up to 2200 hectares of inter tidal salt marshes with channels, lagoons, harbours and pools form the backbone and dominant habitat of the coast and it is here where a plentiful food supply of fish and crustaceans can be obtained by not only the growing Spoonbill population but by the coast's Little Egrets too. Along the coast's 40 km there are also a continuous series of nature reserves which effectively provide additional fresh water habitat used for roosting flocks and feeding. In summary the whole area has strict protection amidst a large and varied wetland environment. It is indeed the perfect place for Spoonbills.

Spoonbills first started to show interest in the wood at Holkham in the late 1990s, occasionally disappearing into the trees with sticks, but it was not until 2004 that birds began spending more time prospecting alongside the then newly establishing Little Egret colony. Initially wardening staff kept their distance and allowed the birds to carry out their routines without any threat of disturbance. From 2004 to 2009 it is known that summering occurred and presumed failed breeding attempts were made. In 2006 at least two nests were built but without a successful outcome. Most of the birds were immatures, whilst one of the nests built in 2006 happened rather too late in the season before strong north-west winds blew the stick platforms out of the trees as it was in an unsheltered part of the wood. Success finally occurred in 2010 in the main sheltered area of the wood when not one but six pairs nested from which a minimum of ten youngsters fledged. Ever since then the birds have returned annually (only one or two birds winter irregularly along the Norfolk coast) and the colony has grown to a peak of 28 pairs in both 2017 and 2018. The number of fledged young produced in eight years has been a minimum of 244 with 2018 being the best season when 48 juveniles were raised.



Figure 3. Number of nesting Spoonbills annually at Holkham NNR

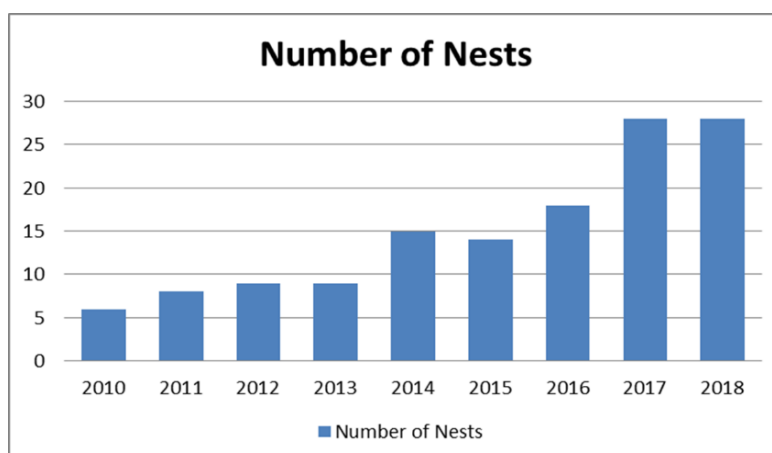
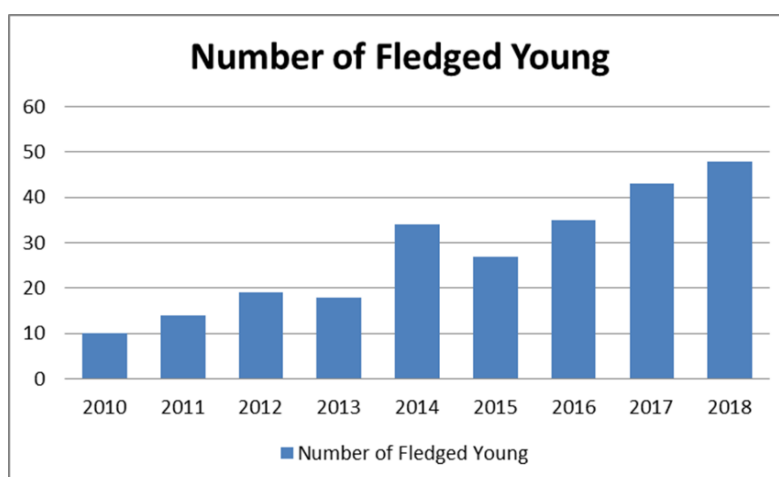


Figure 4. Annual Productivity of Spoonbills at Holkham NNR



Now that the Spoonbill has become truly established at Holkham the periods of observation have increased and the subsequent knowledge gained has been substantial. Each year the colony has been closely monitored (always from a vehicle, never on foot as that would create disturbance) to determine the number of breeding pairs and fledged juveniles, arrival dates and the reading of colour rings. In addition, in 2017 a more dedicated survey of all behavioural matters commenced concentrating on determining courtship periods, egg laying dates, incubation periods, hatching dates and fledging periods. All aspects of behaviour at the nest are recorded such as the males' courtship displays, pair formation and bonding, mating rituals, aggressive interactions and the behaviour of chicks. It has been found that in the eight years of the colony, arrival dates have become earlier. The Spoonbill has gone from appearing in early April (during the prospecting and failure years) to arriving in late February. The laying period begins at the end of March with a peak in late April. Re-lays have been recorded each year following failures and it is usually early to mid-August when the last juveniles fledge and the colony is deserted. Since 2014 there have been significant post fledging build ups on the North Norfolk coasts close to favoured feeding areas and these too have increased in close correlation with the growing Holkham population. Numbers start to dwindle in late September and by early October most will have gone.



The future of the Spoonbill at Holkham and in the UK

At this present time the future of the Holkham colony looks secure but there are issues that could have serious implications. Firstly, in such a small wood with so many other species how much space will there be for more? Will there be other limiting factors and what are they? Will food availability be an issue? Will productivity decrease if the population increases? Will predation be a problem and what will cause it? There is one potential problem that might well limit numbers; a colony of tree nesting Cormorants. These highly gregarious birds began breeding in 1999 and have since risen to a peak of 196 nests in 2017. As has been witnessed at many continental sites, the trees of the wood are starting to die due to the guano the Cormorants produce. Initially the Cormorants preferred the taller Oaks and Poplars but since 2017 have started to move into the canopies of the willows where the Spoonbills nest prompting fears that these too might have a very limited lifespan. This might considerably decrease the Spoonbill's long-term future at Holkham. Plans are in their infancy to plant more willows in a different part of the wood, whilst 17 km along the coast, the RSPB at their Titchwell reserve are planning to create a similar area of willows within their marsh to try and replicate Holkham's colony.

So, with Holkham's colony thriving it is perhaps not surprising that birds have started to nest and colonize new areas. First has been Fairburn Ings RSPB reserve in Yorkshire (some 200 km north) where a pair nested successfully in 2017 and 2018. Interestingly the nesting area is a willow island surrounded by water in a redundant industrial area. Its resemblance to the Holkham site is in some ways uncanny. It is also known that birds which have appeared at Holkham bearing colour rings have also moved to Fairburn confirming inter site movements. Also fledged birds from Holkham still in attendance of their parents have been seen approximately 160 km to the north shortly after vacating Holkham, confirming that other areas are certainly being used for post breeding feeding that are also closer to Fairburn. Another undisclosed site produced a single breeding pair in 2018 too. A pair even nested in northern Scotland in 2018 also. With many conservation initiatives and wetland creation projects occurring widely throughout the UK, the outlook is far better for the Spoonbill than it was in the past. It should therefore be highly feasible that any suitable sites where protection and seclusion can be guaranteed for breeding alongside productive feeding areas could be colonised in the future.

Whilst some of this information has been gleaned thanks to the presence of colour-ringed birds that have appeared at Holkham (so far Dutch, German, Spanish and French birds have been seen) the temptation to attempt ringing has been resisted. With Holkham's birds nesting at varying heights in trees that are submerged in water alongside all the other species in differing stages of their nesting cycles, the risk of chicks or eggs falling out of nests would be huge. There is no denying it is a highly sensitive site. Advice from the AEWA Eurasian Spoonbill International Expert Group also confirmed thoughts that colour ringing should not be attempted.

Interestingly another pattern seems to be emerging which has seen growing number of Spoonbills winter in southern English coastal wetlands, Poole and Rye harbours in particular. Here numbers have increased steadily from two in 2002 to 40 by 2016. This increase has gone almost hand in hand with the growing population at Holkham although of course without the Holkham juveniles being ringed it is difficult to say for definite whether the majority are of English origin or not. A Dutch ringed adult that



nested in 2017 and 2018 at Holkham spent the winter in between at Poole Harbour confirming that at least some of the breeding birds move only this relatively short distance south. Although England has experienced a succession of mild winters in recent years, a particularly cold snap hit in late winter 2018 which resulted in one Spoonbill dying after its legs became frozen in ice. Such changes in weather patterns will undoubtedly be the deciding factor in how regular a wintering area the English south coast becomes.

Conclusions

At the present it could be said that the UK is on the cusp of far greater colonization by the Spoonbill. Influencing factors as discussed include the greater population size in The Netherlands and France, greater protection and a wider selection of wetland habitats in the UK than in the recent past, the growing colony at Holkham in Norfolk where success has been good and a recent trend for growing numbers wintering in the UK. Limiting factors will include food availability and colony selection. There will be room for much research to be carried out as the future unfolds.

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Monitoring Breeding Spoonbill Population in Croatia During 2016-2018 Period

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Keywords: Eurasian Spoonbill, *Platalea leucorodia*, Croatia, breeding population

Introduction

Eurasian Spoonbill *Platalea leucorodia* is a regular breeding bird species in Croatia whose population has been fairly well monitored since 1962. They have bred in a single colony (Krapje Đol) until 1989 when population has dispersed due to drought and colonised new breeding sites (Schneider-Jacoby *et al.* 2002). Regular monitoring of Spoonbill population is taking place since 1990 and until 2016 the size of the Croatian breeding population varied between 88 and 245 pairs (Mikuska *et al.* 2005a).

Methods

All known Spoonbills breeding sites were monitored for nesting during the study period. All colonies are situated in the northern part of Croatia within the Pannonian region.

Krapje Đol colony, situated in former Sava River oxbow, is the only natural breeding site for Spoonbills in Croatia. However, due to implementation of international melioration programme that disconnected the natural connection with the Strug River and prevented regular flooding and each year oxbows needs to be artificially refilled by water from Sava River (Schneider-Jacoby *et al.* 2002). Spoonbill breeding population was increasing since 2012 when the colony was abandoned for the second time due to drought.

Breeding at Jasinje fishponds started in 1990 and, with an exception of the 2000-2001 period continued until the present. The Colony is situated in large reed bed stands, and nests are built on sedges. Within the past period, Spoonbills have changed nesting location twice due to possible habitat degradation and moved from one pond to another within 4.5 km distance.

Breeding at Našice fishponds was discovered in 1993. Unfortunately, monitoring effort was not consistent throughout the whole period. First nesting site was abandoned due to disturbance and nesting was not confirmed in 2008. New nesting site, situated at distance of 1.8 km, was discovered in 2010.

At colonies where breeding of Spoonbills was confirmed, number of breeding pairs was established by use of UAV drones, a method that we have used since 2008. Colonies are photographed twice per breeding season from mid-May to mid-June and numbers of

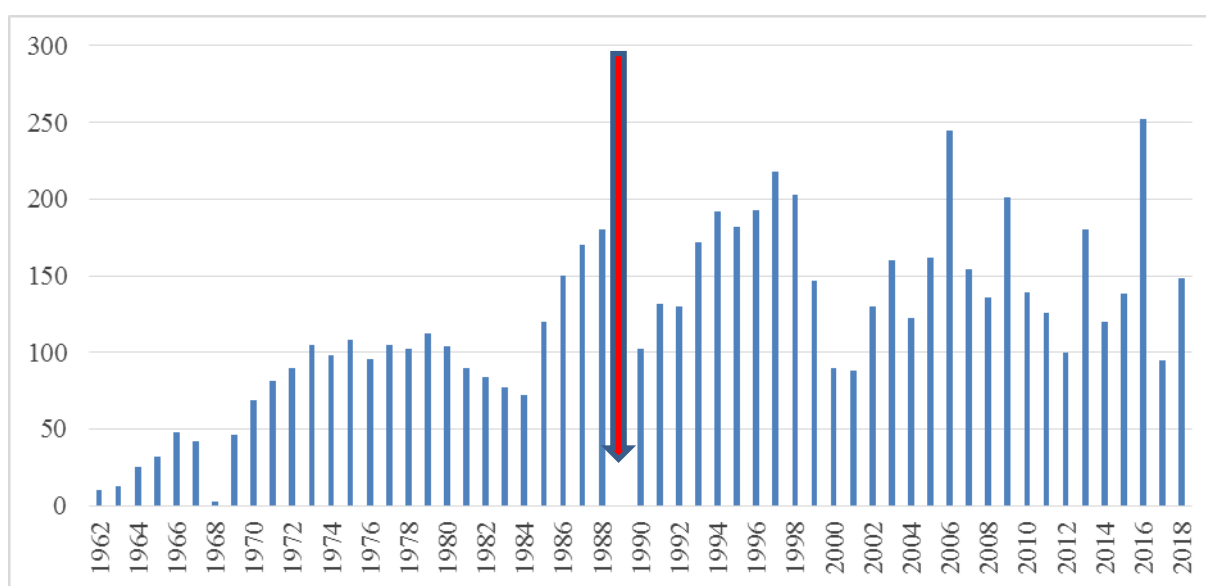


breeding pairs are established by counting apparently occupied nests from the photographs (Mikuska *et al.* 2005b).

Results and Discussion

During the 2016-2018 period Spoonbills continued to nest in three major colonies: Krapje Đol at Lonjsko polje Nature Park, Jasinje fishponds near Slavonski Brod, and Našice fishponds. Nesting was not confirmed at four other known sites known to host colonies in the period of 1962-2018: Kopacki rit Nature Park, as well as Grudnjak, Vrbovljani and Donji Miholjac fishponds. Breeding population peaked in 2016 with 252 pairs in total, while total of 148 pairs was recorded during 2018 (Figure 1).

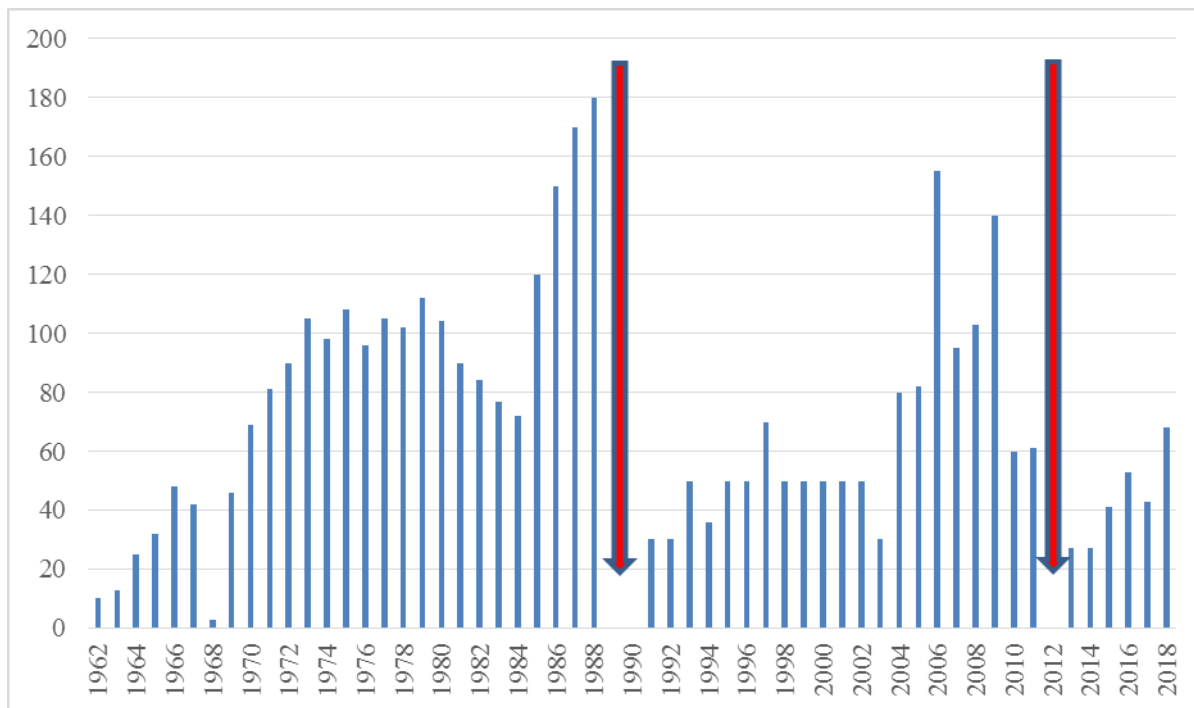
Figure 1. Size of Croatian breeding population of Eurasian Spoonbills from 1962-2018. Red arrow indicates 1989 when no breeding occurred in Croatia due to drought at Krapje Đol colony



At Krapje Đol colony Spoonbills, together with other nesting herons have changed the nesting micro-location 200 m from the old colony site during 2017 due to natural degradation of nesting habitats (willow trees) but such change did not impact on the breeding. During 2016-2018 period from 43-68 pairs were breeding in this colony (Figure 2).

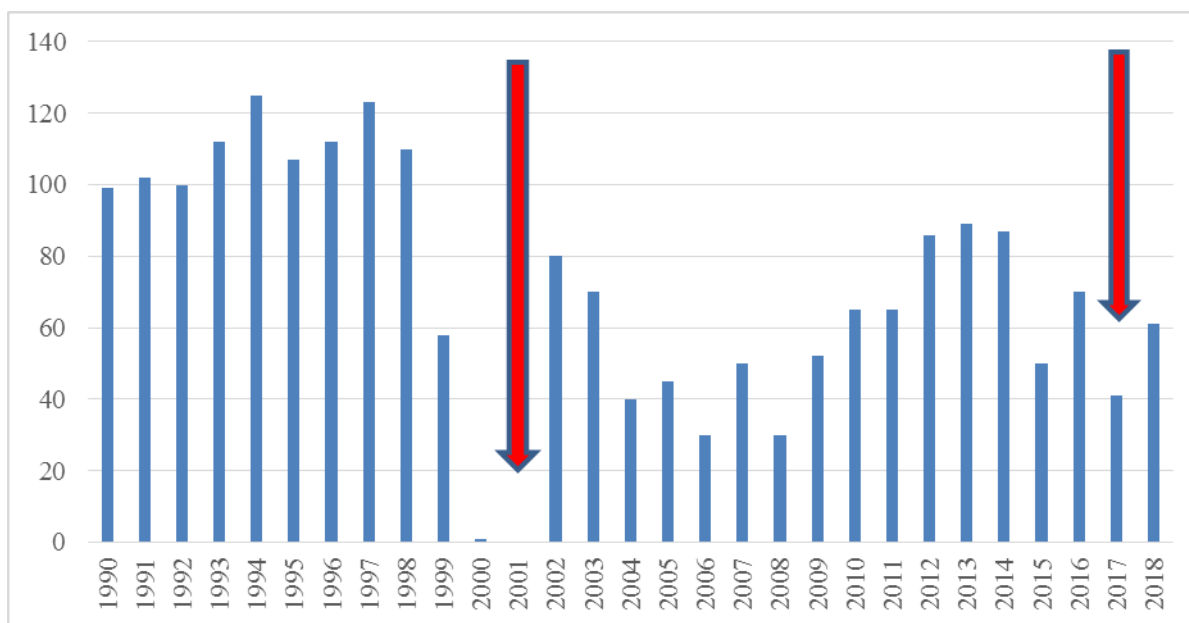


Figure 2. Development of Spoonbill breeding population at Krapje Dol colony from 1962-2018. Red arrows indicate years without breeding due to drought



During the 2016-2018 period from 41-70 pairs were breeding at Jasinje fishpond colony (Figure 3).

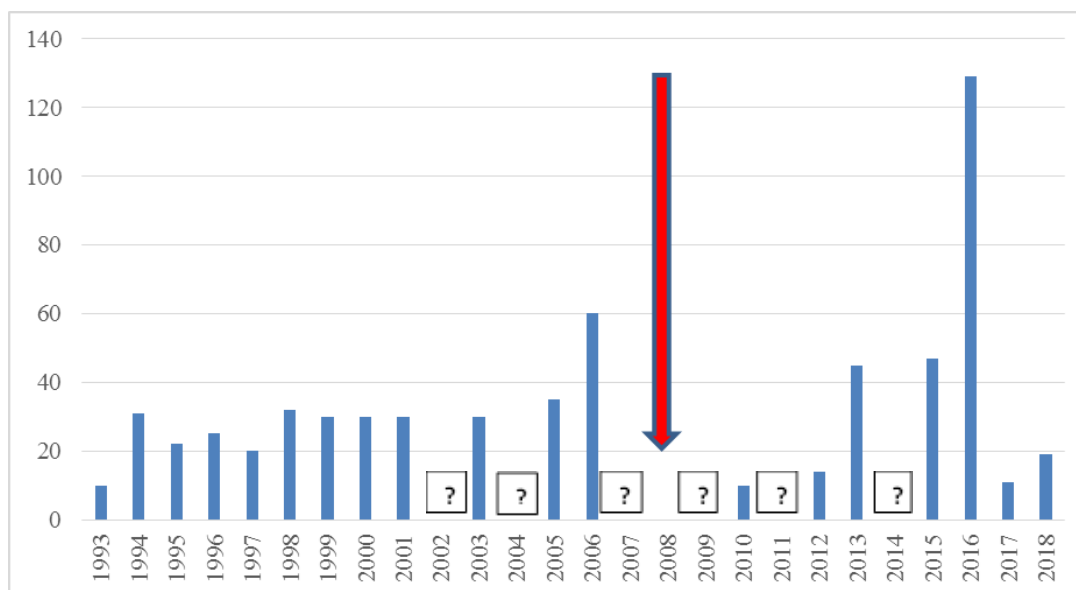
Figure 3. Development of Spoonbill breeding population at Jasinje fishponds colony from 1990-2018. Red arrows indicate years when Spoonbills changed breeding location due to habitat degradation



At Našice fishponds breeding population reached its maximum of 129 pairs in 2016 (Figure 4).



Figure 4. Development of Spoonbill breeding population at Našice fishponds colony from 1993-2018. Red arrow indicate year when Spoonbills changed breeding location due to habitat degradation or disturbance. Question marks indicate years without proper monitoring



During the 2017-2018 period the number of breeding Spoonbills declined despite the fact that other heron species are regularly breeding at the site. It is possible that Spoonbills had changed breeding location within the fishponds and formed a new colony.

Despite regular annual fluctuations observed at each site, the total national breeding population remained stable and it is fluctuating at around 150 pairs on average. The breeding population is completely dependent on human management of nesting sites, particularly on fishponds. The main threats to the breeding populations are habitat destruction during fishpond reconstruction for intensification of fish production (e.g. Grudnjak and Donji Miholjac colonies), abandonment of the fish production (e.g. Vrbovljani fishponds) and disturbance caused by hunting during the fall migration and wintering.

Acknowledgments

Monitoring effort during 2016-2018 period was financially sponsored by EuroNatur Foundation and Lonjsko polje Nature Park.

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Spoonbills from the Netherlands. Where Do They Go and When?

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Keywords: Fidelity, GPS transmitters, Migration, Stopover site use, Timing

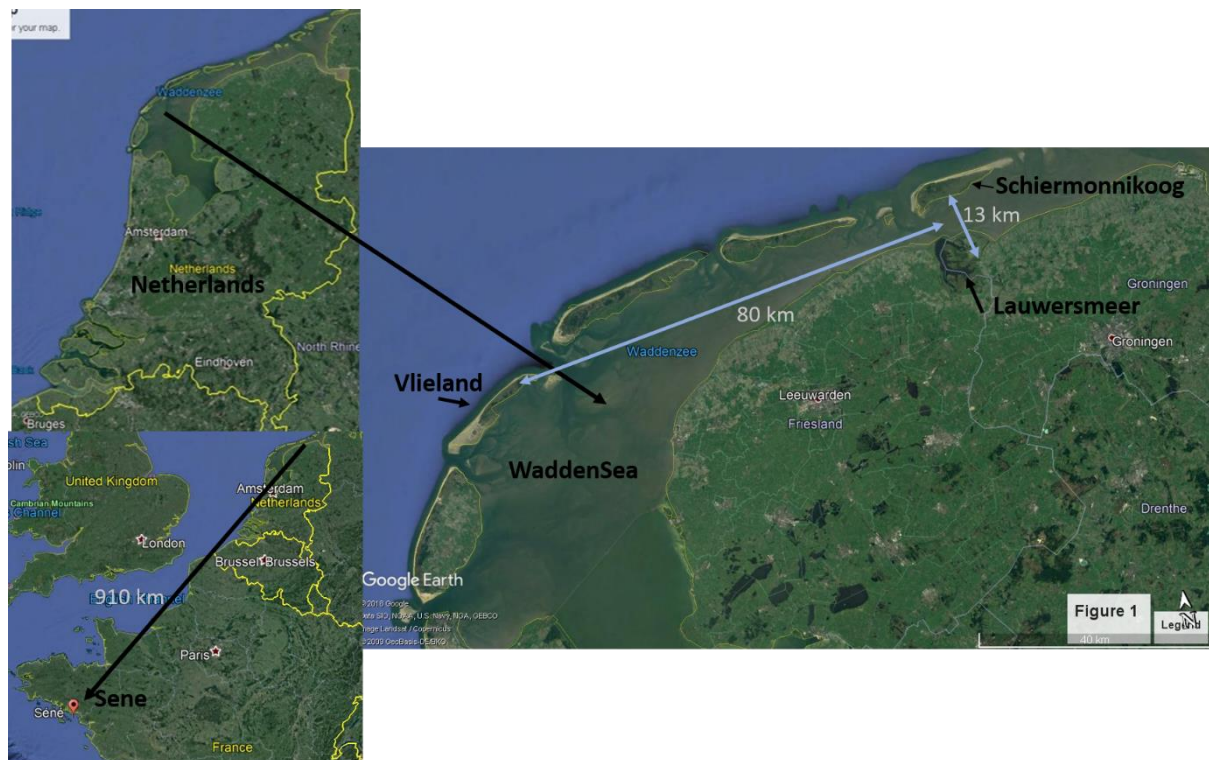
Colour-ringing data and data from Eurasian Spoonbills *Platalea leucorodia* with GPS-transmitters show the migration routes of the Dutch Spoonbills. We see the same patterns year after year. Spoonbills seem to be extremely site- faithful and time-faithful within the breeding areas, on migration and in wintering areas. But there are still parts of the migration route we hardly know anything about. Is it time for some more ring-reading activities in those areas?

We illustrate the site- and time fidelity for three Spoonbills with a UVA-bits-GPS-transmitter of which we had several years of breeding-and migration-data. We looked at the timing of breeding, stay at stopover-sites and wintering sites. We also looked whether they were site faithful to breeding areas, stopover-sites and wintering-sites.

Spoonbill 651 was born on the island of Vlieland in the Dutch WaddenSea. She got her transmitter (nr 651) when an adult in 2013 on the island of Schiermonnikoog. The year after that, she moved back to her birth-island, where she has bred since then. She bred in the same colony in the dunes for the first three years, but due to disturbance, the whole colony moved 1 km further. Every year in early spring she comes for a short period to the freshwater lake Lauwersmeer and mudflats south of the island of Schiermonnikoog before reaching Vlieland to breed (Figure 1). The arrival date differs within 4 days difference between years and departure date within 6 days. She breeds during the months April-June on the island of Vlieland. After breeding, she moves back to the mudflats south of Schiermonnikoog and stays there about a month to fatten up. She leaves every year between 10 and 23 of September to her wintering area in Brittany in France. She arrives in Brittany with 3 days difference depending on the year and stays in an area near Sene of approximately 8 x 8 km the whole winter.



Figure 1. Movements of the adult Eurasian Spoonbill with transmitter # 651



The second Spoonbill is 763, a male that was born on Terschelling in 2005. He got his transmitter (nr 763) in 2012 while breeding on the island of Schiermonnikoog. Every winter since 2012 he stays near Sevilla in Spain in the ricefields and fishponds of Isla Mayor, except in 2017 when he stayed 40 km south of Isla Mayor. He leaves his wintering area between 22 February and 10 March depending on the years. He breeds every year on the island of Schiermonnikoog. The maximum distance between the nests in the different years is ca.1 km. After breeding he stays for around a month 11 km south of the island on the mudflats, then he leaves for his autumn migration between 22 and 27 September. Every year he makes a stopover in Maraix d'Or at the end of September/beginning October where he stays from 1 up to 15 days depending on the years. He arrives in the ricefields near Isla Mayor between 3 and 25 October.

The third Spoonbill is 6066, a male that was born on Schiermonnikoog in 1998. In 1999 he was seen wintering on the Banc d'Arguin for the first time. He wintered there for sure in 2000, 2001, 2006, 2008, 2009, 2014, 2015, 2016, 2017 and 2018 always on the islands of Nair and Arel, but might have stayed there also in other years. In 2002 he was back on Schiermonnikoog for the first time for breeding, and since then he has bred there at least 12 times. In 9 years he was seen on the post-breeding site, the freshwater lake Lauwersmeer (Figure 1). He is only seen a few times on migration: 4 times on southward migration (post-breeding migration) of which 3 times in SW France, one time in Huelva and 2 times on northward migration (pre-breeding migration), once time in Huelva and once time in Oued Sous Agadir Morocco. He got a GPS-logger in 2014.



We could follow him up and down two times to the Banc d'Arguin and then we found out that he used many stop-over-sites in Morocco, Spain and France (Table 1).

Table 1. Number of stop-over sites per country of Spoonbill 6066 during 2 southward and 2 northward migrations. Table indicates if the stopover lasts less or more than one day. MAU stands for Mauritania, MOR for Morocco, ES for Spain, FR for France and NL for the Netherlands

Country	Southward 2014	Northward 2015	Southward 2015	Northward 2017
NL ≤ 1 day	1	1	1	1
NL ≥ 1 day	1			1
FR ≤ 1 day	1	5	1	1
FR ≥ 1 day	1			3
ES ≤ 1 day	2		2	3
ES ≥ 1 day	1	1	1	3
MOR ≤ 1 day	2	3	6	5
MOR ≥ 1 day		8	1	2
MAU ≤ 1 day	1			
MAU ≥ 1 day	3			1

From the GPS-data from adult 6066, we discovered that a Spoonbill might need many more stopover sites during migration than believed from colour-ring resightings only. For example, Spoonbill 6066 used 21 locations on northward migration in 2015 and 20 in 2017. These areas were not all the same areas during the two different years. Only Isla Mayor near Sevilla in Spain is a place where the Spoonbill was hanging out for more than 15 days on southward migration in both years and El Aaiun in Morocco was also used in both years.

Especially for the Spoonbills that go to Mauritania and Senegal we do not know much about the use of stopover sites in North-West Africa. We hope we can start organising a ring-reading programme along the coast of Morocco with participants of the Eurasian Spoonbill International Expert Group and assess the quality of the wetlands used by Spoonbills for short and long stop-over.



Eurasian Spoonbill *Platalea leucorodia* in Camargue: History, Trends and First Results

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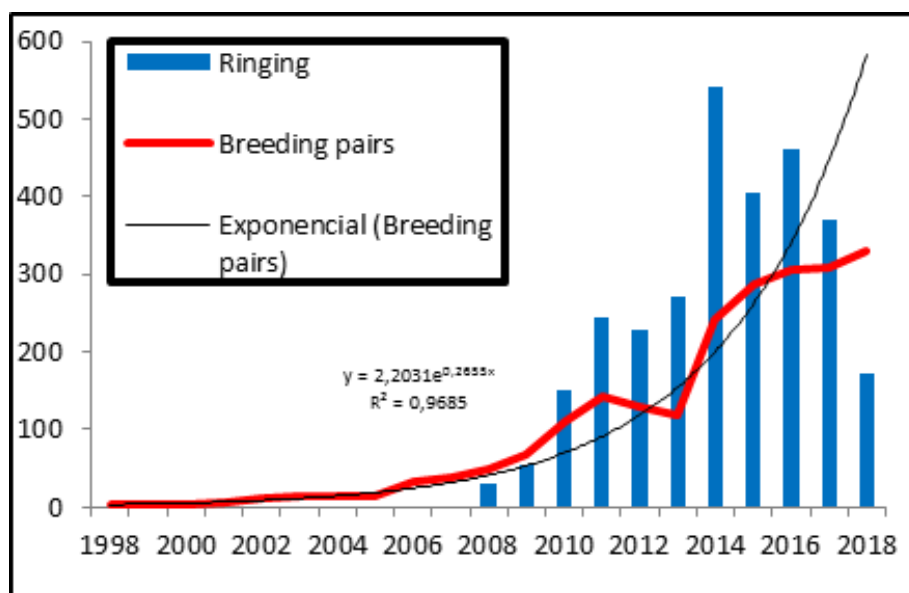
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Keywords: Growth rate, GPS tracking, France, Settlement

While the Eurasian Spoonbill *Platalea leucorodia* was only observed twice during the first half of the 20th century in Camargue, Spoonbill become regular since 1980 and the first breeding took place in 1998. The population has recently increased with an exponential growth until 2015 (median growth rate of +27 % year, 1st quartile (5%), 3rd quartile (50%). We observed since 2015 an apparent stabilisation of the population size around three hundred breeding pairs in 2018 (Figure 1). In Camargue two recurrent breeding sites have been used with success until 2017 and three in 2018.

Figure 1. Evolution of the number of breeding pairs and number of birds ringed annually per year



The first resightings of colour-ringed birds on the colony (2007-2010) showed that the colony formed from birds with Dutch (22 birds), Italian (9 birds) and Serbian (1 bird) origins (Blanchon *et al.* 2010). Since 2008, a ringing scheme of juveniles born in



Camargue has been carried out, leading to the ringing of 2927 birds (Figure 1) and more than 7,000 resightings.

Figure 2 Resightings sites of Spoonbills ringed in Camargue



Location of these resightings (Figure 2) revealed that this population overlaps the two known flyways for this subspecies *Platalea leucorodia leucorodia* (Atlantic and central European flyways). We also found a high fidelity to flyways (only 11 of 700 birds changed flyway). Some individuals winter in Italia and Tunisia, others in Spain, Mauritania and Senegal and around 200 individuals winter in Camargue. In 2016, three juveniles were seen wintering in South Sudan, more than 4,000 km from their ringing site (Blanchon *et al.* 2017).

Figure 3. Tracks of Spoonbills from Camargue with GPS loggers (N = 3), one other remained in Camargue and two others died before postbreeding migration





Between 2016 and 2018, 6 GPS-GSM transmitters were put on 4 adults and 2 juveniles (Figures 3-4). It gave insights on the migration route and stopover used by those birds as well as habitat range during breeding season. Up to date data is available on www.movebank.org

Figure 4. Tracks (June 2016) of one female breeder (APVA) during chick feeding period, showing foraging sites



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The Ontogeny of Migration: the Importance of Genes and the Early-Life Environment in Shaping Migration Strategies of Spoonbills

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Keywords: Development, Evolution, Migration, Social learning, Translocation

Eurasian Spoonbills *Platalea leucorodia* show considerable individual variation in both the distance and direction of their migrations. For example, Spoonbills that breed in The Netherlands have migration distances ranging from 1,000 km one-way to winter in France up to 5,000 km for Spoonbills wintering in Senegal. Moreover, while Dutch Spoonbills migrate in a south- westerly direction, many Spoonbills breeding in the Camargue migrate in a south-easterly direction to winter in North Africa. For the Dutch breeding population, individuals that migrate shorter distances have higher fitness, yet many Spoonbills still make long-distance migrations to West-Africa. To understand why they do so, we need to know more about the effects of genes and early-life environment in shaping individual migration strategies.

One hypothesis is that juvenile Spoonbills learn the migration route from their parents (like for example geese do). To test this hypothesis, we equipped 15 juveniles and (one of) their parents with GPS-trackers between 2016 and 2018 and followed them during post-fledging and migration. In Figure 1, you see an example of the tracks during post-fledging of one of the two Spoonbill families in which both parents and their chick were transmitted. In Figure 2, the distance between this juvenile and its father and mother is plotted. In this example, the juvenile hardly had any contact moments anymore with its father from mid-July onward, and with its mother from the start of August onward. Departure on migration was also performed independent from its parents. This scenario was representative for all 15 tracked Spoonbill families. In none of the cases, the



Figure 1. Tracks of 2.5 month old female juvenile and her father and mother during 25 July – 13 August 2016 in the surrounding of the breeding colony on the island of Schiermonnikoog (The Netherlands)

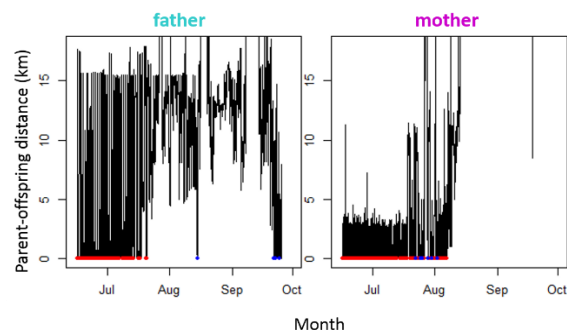


Figure 2. Distance of the female juvenile to its father and mother. Plot starts at the day the juvenile received its transmitter (when one month old)



juvenile migrated together with its father or mother. It can thus be concluded that, after the pre-fledging period of parental care of one month, parental care during post-fledging lasts another 1-2 months and that Spoonbills do not learn their migration routes from their parents.

Research on the ontogeny of migration will be continued in 2019 and 2020, in which I plan to perform a translocation experiment between Schiermonnikoog (The Netherlands) and Camargue (France) to disentangle genetic and environmental effects on migration routes. Juveniles will be followed using sophisticated GPS-trackers. The collected data are downloaded via the GSM-network and directly visible for the general public on www.movebank.org and the Animal Tracker mobile phone app. This allows citizens to go into the field to search for the transmitted juveniles and collect valuable information on habitat characteristics and social environment (age of group members as well as the presence of colour-ringed individuals) to assess the importance of habitat quality and social information in shaping migration routes of Spoonbills.



Delayed Recruitment of First Natives

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Keywords: Demography, Dispersal, Settlement, Immigration

Introduction

Strong pressure exists on wetlands as a consequence of urbanisation, agriculture, fish farming, industry, hunting, recreation, forestry or military activities. As a result, the birds breeding sites are regularly destroyed or abandoned. However, new colonies can potentially emerge to compensate lost ones. As such, we can identify four critical aspects essential for new colonies formation: 1) Natal or breeding dispersal (De le Court & Aguilera 1997, El Hamoui *et al.* this volume); 2) suitable new sites that provide protection from disturbance and feeding grounds (Marion, this issue); 3) colony growth and 4) stabilization. Here we focused on the Eurasian Spoonbill *Platalea leucorodia* Camargue colony located in Southern France that is growing exponentially (Blanchon *et al.* this volume) to document the process of colonization. Specifically, we quantified early-life demographic parameters and compared them with those from older new born colony from Italy.

Methods

Estimating early-life survival and recruitment are challenging due to younger age classes that dispersed broadly and young individuals that are not sighted before recruiting. To this end, we used a multi-event capture-recapture model to estimate age at first breeding. We took into account the survival and imperfect detection of breeders, and tested for time and density effects. We applied the model to long-term resighting data of more than 2,500 Eurasian Spoonbills ringed in the Camargue over the last ten years. The results were compared with published literature from Italian and Dutch colonies.

Results and Discussion

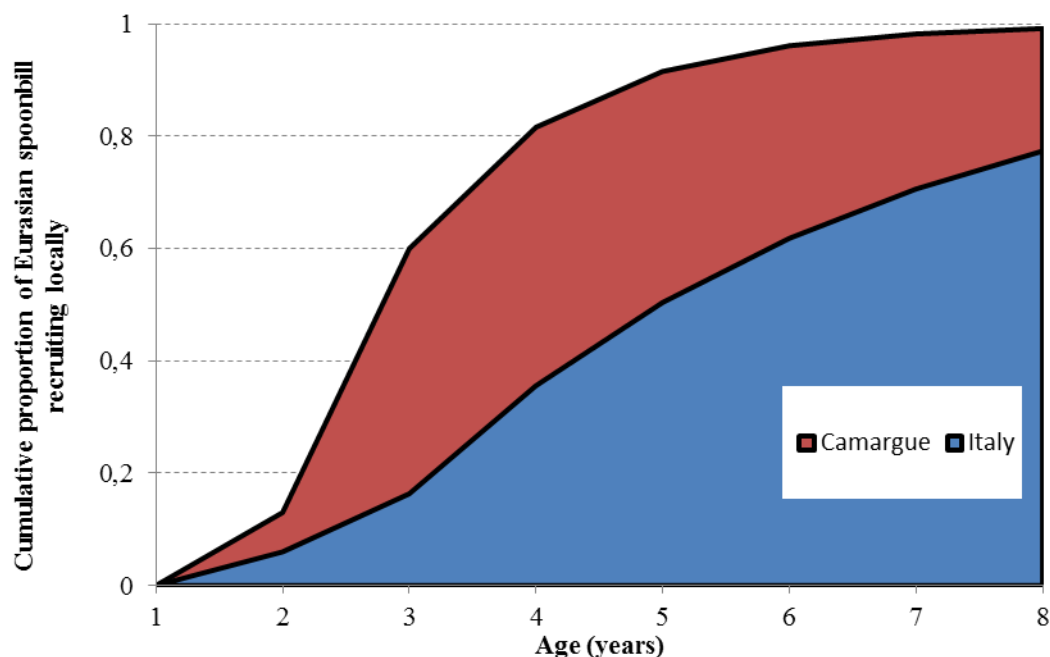
We found that the probability of surviving the first year (0.33; 95CI [0.24-0.45]) and the probability of surviving after surviving their first year (0.90; 95CI[0.81-0.95]) are in agreement with other studies on the species (Lok, Overdijk & Piersma 2015; Tenan *et al.* 2017).



More interestingly, recruiting was null until the local population reached a threshold of 200 breeding pairs, six years after the first ringing of fledglings in the colony. It means that until reaching this threshold, it is likely that the colony was growing as a result of immigration. Indeed, Tenan *et al.* (2017) suggested that settlement decision (local recruitment and immigration) is affected by the abundance of conspecifics. In larger colonies, Spoonbills find higher chance to meet suitable mates, and colony size may also be an indicator of habitat quality.

After reaching a colony size of 200 breeding pairs, local recruitment was occurring at a very early age, with 13% 95CI[5%-24%] of two-year-old Spoonbills recruiting locally (Bauchau, Horn & Overdijk 1998). Local recruitment occurred far more rapidly than the new-born colony located in the Po delta, North East Italy (Figure 1).

Figure 1. Cumulative proportion of breeders across age classes within two separate populations (Camargue in red and Italy in blue). Data from Italy are extracted from Tenan *et al.* (2017)



Conclusions

Colony growth is the result of both immigration process and local recruitment. We showed here that local recruitment in Camargue is crucial from the moment the colony reached a threshold of approximately 200 breeding pairs. By contrast, in the Po Delta, immigration is the primary driver of the population growth, contributing more than local recruitment (Tenan *et al.* 2017). There, breeding pairs distribute in 2 to 4 sites, distant 10-32 km each, occupying small spots of suitable nesting habitat located in strictly protected areas and any of these sub-colonies has never reached the threshold of 200 pairs. We can hypothesize that Camargue habitat is very attractive and no density-dependent process occurred yet, leading to the absence of competition among age classes for access to breeding.

After a phase of growing population, stabilization of the colony occurs with density-dependent processes that take place and limit breeding accessibility to suitable breeding site to early breeders. Those processes have been well documented in the Wadden sea by Lok *et al.* (2013) and Oudman *et al.* (2017).



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Estimate the Number of Birds Using a Stopover Area: a Study Case with Eurasian Spoonbill During Fall Migration

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Keywords: stopover site, migration, color rings, length of stay, water level management

Designated as Ramsar site, the Réserve Naturelle du Marais d'Orx is a 1,000 ha wetland strategically located on the Atlantic flyway in the south-west of France. On the basis of previous counts of Eurasian Spoonbill *Platalea leucorodia* during autumnal migration, we predict a big part (> 30%) of the North-Atlantic population use this area like stopover. The main objective of the study is to evaluate the importance of this area for this flagship specie and to understand parameters which influence the time of stopover. A daily count of the number of Spoonbills was undertaken every morning from 7:00 am between 07 August and 11 October in 2016, 2017 and 2018. Also, we registered all the PVC-ringed between 15 August and 10 October to estimate the time of stopover. Finally, we registered the daily location of flocks to understand the use of the area by Spoonbills. A total of 7,385 (2016), 4,257 (2017) and 16,052 (2018) individuals have been counted during the study periods. We registered 470 PVC-ringed Spoonbills in 2016, 351 in 2017 and 657 in 2018 of which respectively 316, 197 and 168 accurately identified. Wintering birds or birds with “abnormal” moving behavior were not included in analyses. Most of the birds came from the Netherlands but we also listed birds from France (Lake of Grand-lieu and Camargue), Germany, Belgium, Denmark, Hungary, Romania and Spain. The average time of stopover during the study period was significantly different between 2018 (2.49 ± 0.15 days) and 2016-2017 (1.19 ± 0.11 and 1.14 ± 0.14). Correcting the total number of birds counted by the average time of stopover, we obtain a total of 6,154 (2016), 3,702 (2017) and 6,447 (2018) different individuals who made a stopover at the Réserve Naturelle du Marais d'Orx during the fall migration. Differences can be partially explained by the water level management. Because of a cyanobacteria issue, it was not possible to use pumps in 2017, with a water level 32 cm higher on the central part of the natural reserve. The food availability seems to play a key role in the time of stopover. Spring flooding occurred in 2018, resulting in a massive fish reproduction with lot of fry. Except in 2017, a possible effect of food depletion has been observed during 2016 and 2018. The time of stopover was significantly higher during the first part of the study period (1.34 ± 0.07 vs 1.01 ± 0.06 in 2016; 3.27 ± 0.41 vs 1.84 ± 0.38 in 2018). If we consider the North Atlantic population estimation of 19 000 individuals so 32.3% of birds made a stopover in 2016, 19.5% in 2017 and 33.9% in 2018. Preliminary results show the importance of the area for this migratory species but also the importance of water level management for food resource of piscivorous birds.



2

Abstracts





Status of the Eurasian Spoonbill *Platalea leucorodia* in Numidia, Northeast Algeria

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Threskiornithidae in Algeria is represented by two species Glossy Ibis *Plegadis falcinellus* and Eurasian Spoonbill *Platalea leucorodia*; a third species Northern Bald Ibis *Geronticus eremita* went extinct three decades ago.

For over a decade, we focused on the dynamics and reproduction of the Glossy Ibis but, recently, we started monitoring the Eurasian Spoonbill, a regular wintering species. We mapped the distribution and carried out count of the Eurasian Spoonbill across Numidia, Northeastern Algeria between April 2015 and April 2018.

We also systematically attempted to detect ringed birds. Data analysis of more than 70 rings indicated that wintering Eurasian Spoonbill mainly originated from three countries: Hungary, Italy, and France.

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

Breeding Biology of the Eurasian Spoonbill *Platalea leucorodia leucorodia* in a New Colony at Ouedel-Maleh Dam, Casablanca, Morocco

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The nominate subspecies of the Eurasian Spoonbill *Platalea leucorodia leucorodia* is a rare breeder in Africa. Until the installation of a new colony at Oued el-Maleh Dam near Casablanca in 2017, the Smir colony located in the north of Morocco used to be the only breeding colony in Africa.

In 2017, a new colony has been installed at Oued El Maleh Dam, Ramsar site, near Casablanca (W 7° 18' at W 7° 22' and N 33° 27' at N 33° 33'). In 2018, the Spoonbills returned to breed at the same site. This colony is installed on tamarisk trees *Tamarix gallica* at the upstream of the dam in an area with difficult access. The trees are asphyxiated by prolonged immersion consequent to the increase of the level of water. The Spoonbill colony is established in a mixed heronry with Black-crowned Night Heron *Nycticorax nycticorax*, Squacco Heron *Ardeola ralloides*, Grey Heron *Ardea*



cinerea, Purple Heron *Ardea purpurea* and the Western Marsh Harrier *Circus aeruginosus*.

To estimate the reproductive success, the Spoonbill colony has been intensively monitored during two successive breeding cycles of 2017 and 2018. At each visit, the number of active nests (with at least one egg) and their contents (number of eggs and/or chicks) were reported.

During the study period, the number of Eurasian Spoonbill nests observed was 40 nests; 20 nests in 2017 and 20 nests in 2018. The egg-laying period extended from early March until the middle of May. The number of eggs per nest ranged from 1 to 4 eggs. Clutches with three eggs were the most frequent.

Based on resightings of marked birds at the colony, it seems that this population is sustained by Spanish population.

In order to follow the movements of the young from this colony, a ringing operation was carried out in May 2018. The rings are made of white PVC and have a 4-digit alphanumeric inscription: M (for Morocco) followed by three digits; the first ring is numbered M001. The ring is placed on the right leg of the chick.

Talk given during the session "Migratory connectivity"

Ecological Study of the Eurasian Spoonbill *Platalea leucorodia leucorodia* in Its Atlantic Coastal Migration Areas of Senegal

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Senegal is located in the flyway of the Eurasian Spoonbill *Platalea leucorodia*, one of the 10 species of waterbirds targeted by the Coastal Migratory Bird (CMB) project. This country of West Africa welcomes each year thousands of individuals of this species of water bird. The main sites frequented by Eurasian Spoonbills in Senegal are the Parc National des Oiseaux du Djoudj (PNOD), the Dakar Niayes periurban wetland and the Saloum Delta which are part of the network of Importance bird and biodiversity areas (IBAs). The PNOD and the Saloum Delta are listed among the 10 critical sites of the Birdlife International CMB project. The lack of in-depth scientific studies on Eurasian Spoonbills in Senegal motivated the selection of this species as part of our thesis work. The main objective of our study is to follow behavior and ring readings in order to determine the fluctuations that may exist between the PNOD (N 59°23'16''; W 25°14'16''), the Niayes of Dakar (N 16°45'14''; W 48°24'17'') and the Palmarin reserve in the Saloum Delta (N 00°01'14''; W 00°46'16''). Thus, we conducted monthly monitoring at these three sites throughout 2017. The preliminary results of this study show that the PNOD and the Palmarin community nature reserve are priority sites for migration of Spoonbills, while the periurban wetland of the Niayes of Dakar is a secondary site during the migration. The highest numbers of Eurasian Spoonbill are recorded in Palmarin during the month of October with 573 individuals against 132



individuals at the PNOD. This trend is reversed in February during which we counted 77 individuals in Palmarin against 1,149 individuals in the PNOD. These results show that when Spoonbills arrive in Senegal, the largest numbers go to the Saloum Delta which is the southern limit of the range of this subspecies. It was not until the return to Europe that large numbers were observed at PNOD in northern Senegal. However, we believe that a closer monitoring of these birds in Senegal will provide more sustained scientific information on their bioecology, essential for the development of management plans for better conservation of these resources.

This abstract was presented during the poster session.

Is There a Differential Age-Migration Timing in Spoonbills? Preliminary Analysis on a Crucial Migratory Corridor in the Iberian Southwestern Coast During Autumn

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Different migratory strategies may influence the reproductive success and survival of individuals. Because potential spatio-temporal competence once *en route* and the benefits of arriving first to wintering areas, adults could adjust migratory timing depending on population size. Despite this, few studies have examined the potential age-differential migration within migratory populations. Here we present results of a five-year study (2012-2016) during fall migration of the Atlantic population of Eurasian Spoonbill *Platalea leucorodia leucorodia* in the migratory corridor called “Playa de la Barrosa-Cabo Roche” discovered in southwestern Spain in 2012. Based on continuous (12:00 h) volunteer observation during daylight period from mid-July until mid-November, we were able to observe the big majority of Atlantic Spoonbill population that overwinter in Africa. Taking advantage of this approach, we examine for potential differences in migration timing between juvenile and adult Spoonbill population. Our results showed that adults consistently precede juveniles, indicating an age-differential migration in this population. These results are discussed in a context of the increasingly size in the Atlantic population of Spoonbills.

Talk given during the session “Ecology and Behaviour”



Dispersal and Survival of Adult Eurasian Spoonbills in Croatia

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The colour-ringing of Eurasian Spoonbill *Platalea leucorodia* in Croatia started in 2003 and until 2017, 785 birds were ringed. About 700 observations were processed, together with almost 350 observations of birds ringed in other countries, mostly Hungary and Serbia. The migration and stopover sites of juvenile and immature birds have already been studied, while analysis of data for adult birds has not been undertaken yet.

Observations of adult birds (fourth year and older) during the breeding period (April July) were analysed. In total, there were 104 observations of 41 individuals. Eight birds (nine recoveries) were reported as breeding, while additional 11 birds (19 recoveries) were observed in the close vicinity of breeding colonies. Although some of these observations might indicate prospecting rather than breeding, they all indicate the dispersal range of Croatian Spoonbills and were analysed together. Spoonbills hatched in Croatia disperse in Croatia, Hungary, Serbia, Czechia and Italy, and were found breeding in these countries, at distances of up to 510 km. At Croatian colonies, Spoonbills hatched in Hungary, Serbia, Italy and France (Camargue) were observed.

The survival of Croatian birds was modelled based on live encounters using Cormack-Jolly-Seber (CJS) models in programme MARK. Only birds with at least one recovery were included in the analysis, therefore the survival rate of first-year birds was not calculated. 701 recoveries of 193 individuals were entered in the model. The most parsimonious model had 18 parameters. It showed that survival differed between three age classes and was constant, while observation probabilities were time-dependent. Apparent survival rates calculated on the basis of the most parsimonious model were 0.67 ± 0.33 for immatures and 0.808 ± 0.042 for adults. The oldest bird was in its fifteenth year.

Although the amount of records collected during the breeding period is still limited, this analysis gives preliminary data about the dispersal and survival rates of adult Spoonbills from Croatian population.

Talk given during the session "Tracking Spoonbills"



Spoonbill-Tracking in Hungary: What Do We Know, and What Are the Missing Data?

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It is essential for nature conservation to know migration routes and wintering areas of protected birds. Eurasian Spoonbill *Platalea leucorodia* marking with metal rings started in 1908 in Hungary, and we started to use colour-rings in 2003. These data provide long-term spatiotemporal dataset on the movement of the Spoonbills between Carpathian Basin and wintering areas. Two adult and five juvenile Spoonbills have GPS-GSM loggers to follow them. Tracking activity with GPS-GSM loggers has been running in Hungary since 2017. Based on the regular observation of colour-ringed individuals it was possible to predict two migration routes used by Spoonbills: the South and North Adriatic Flyways. Movement of Spoonbills with GPS-GSM loggers supported our predictions, and detailed records were collected on the timing of migration, stop-over sites, and stop-over durations. A tracked individual provided information for a possible trans-Saharan path to the middle of the Sahara, but the logger stopped. Possible migration routes to the coast of East Atlantic and Eastern Mediterranean Basin are poorly known. Due to recoveries and ring readings, we have general information on wintering areas used by Spoonbills during the last 110 years. These data show that Spoonbills move to winter in the central Mediterranean Basin, mainly to Tunisia and in a lesser extent to Italy. It was proved recently that Central European Spoonbills might mix with the members of East Atlantic population in the wintering areas at the eastern coast of Atlantic Ocean. We have only limited information on sub-Saharan wintering areas: that area is a vast area in the Sahel between Sudan and Senegal or Mauritania. Furthermore, there are pieces of evidence on Spoonbills with Hungarian origin using Saharan wetlands in Algeria. No recent observations are available on wintering Spoonbills from Egypt, although it used to be an important wintering area until the 1950s. It could be the result of shifting migration routes, but also could be the result of lack of observers. The role of Turkey is also poorly known. Wintering in the Carpathian Basin became more regular now than during the last decades. Climate change may be responsible for the more frequent wintering birds in the Carpathian Basin.

Talk given during the session "Tracking Spoonbills"



Importance of Tunisia as Wintering and Stopover Area for the Eurasian Spoonbill *Platalea leucorodia*: Analyses of 20 years of Data Collection (1998-2018)

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The Eurasian Spoonbill *Platalea leucorodia* is seen throughout the year in Tunisia during migration and in summer and more importantly, as a wintering bird (from July/August to February/March). The present paper aims to draw attention to the importance of Tunisian wetlands, especially some Important Bird Areas (IBAs) and Ramsar sites in the Gulf of Gabes, in the annual cycle of the “Eurasian” Spoonbill and particularly as wintering areas for adults, stopover sites for migrants, and a year round haven for immatures in the early years of their life. Analyses of Spoonbill data from field observations and annual mid-winter counting collected over the last 20 years (1998-2018), are indicating where special conservation efforts for the species need to be done in Tunisia, particularly in the inter-tidal zones of the gulf of Gabès in South Tunisia, to effectively protect 80% of the wintering population of the species in Tunisia.

Talk given during the session “Conserving wetlands and Spoonbills”



The Split of the Central and South-east European Populations

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AEWA recognised three populations, one of which is Central and South-eastern European population (C & SE Europe). International Single Species Action Plan (ISSAP) for the Conservation of the Eurasian Spoonbill *Platalea leucorodia* (Triplet *et al.* 2008) described the Central and South-eastern European population as one population breeding in the Danube basin, Northern Italy, Greece, the Black Sea region and Anatolia. In the same time, information was lacking and Triplet *et al.* (2008) quoted: “Further studies may reveal whether two separate populations are involved” because the distinct wintering areas of birds from western and eastern colonies already suggested two separate populations. To date, increasing number of data and published results since 2008 based on colour-ring resightings clearly confirmed different migration routes and wintering areas for populations from Central Europe and South-eastern Europe.

In 2017, the Eurasian Spoonbill International Expert Group (ESIEG) wanted to present those evidences to the AEWA Technical committee. Nevertheless, the AEWA Secretariat did not accept this submission to AEWA Technical committee considering that more informations and evidences were needed. Discussions among ESIEG members will allow taking decisions about the strategy and defining our position against AEWA Secretariat. The discussion should be done considering that the ISSAP expired in 2018 and AEWA Technical committee recommended an extension for another 10 years of ISSAP in spite of revising it.

Talk given during the session “Conserving wetlands and Spoonbills”



Spatio-Temporal Factors Affecting Habitat Use by Eurasian Spoonbill *Platalea leucorodia* in the Gulf of Gabès, Tunisia

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Understanding ecological factors and processes affecting site-occupancy is a major question in ecology and important for conservation purposes. Studies dealing with the determinants of waterbird site-occupancy have mainly been concerned with European wetlands. Less attention has been paid to coastal areas in North Africa, despite some particular sites within this geographic region, such as the Gulf of Gabès in southern Tunisia. From August 2016 to May 2017, we investigated the factors influencing the Eurasian Spoonbills *Platalea leucorodia* site-occupancy on 50 sites in the central part of the Gulf of Gabès. We examined the role of date, habitat characteristics and the intensity of human presence in determining site-occupancy by Spoonbills. We found that the site-occupancy by Spoonbill's showed a peak between October and February. After this period, the Spoonbills gradually became rare, as a result of the adults' migration to northern breeding areas. In addition, our results showed that Spoonbills more frequently occurred in mudflats, characterized by high numbers of tidal channels, elevated amounts of mud and important covers of seagrass, than in sandy beaches. The formers are likely to present more attractive feeding habitats because of their higher prey availability and accessibility. However, human presence (fishermen and shellfishers) did not appear to affect site-occupancy of this species. Further investigations of habitat selection processes on other Mediterranean stopover and wintering areas are however needed to more profoundly understand if this species would adopt the same habitat selection pattern.

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



First Breeding Record of Eurasian Spoonbill *Platalea leucorodia archeri* (Newman, 1928) at Dungonab Bay Marine Park on the Sudanese Red Sea Coast

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Because the Red Sea lies amidst one of the driest ecosystems in the world, the significance of such relatively small marine water body for birdlife is unique. What is remarkable about the Red Sea is that it lies in the second most important route of the Africa-Eurasian flyway. The Sudanese Red Sea Coast is approximately 750 km long including bays and inlets. Dungonab Bay is located on the northeastern coast of Sudan. The Bay encompasses numerous small islands and a variety of wetlands that provide important habitats for resident and migratory birds, and the entire area is considered as an IBA. *Platalea leucorodia archeri* is a resident subspecies, found in the Red Sea. It is mainly distributed along the coasts of the Red Sea and the Indian Ocean. Most Eurasian Spoonbill breeding on the Arabian side of the Southern Red Sea is likely to belong to this subspecies. This report documents the first tropical breeding record of subspecies *Platalea leucorodia archeri* at Dungonab Bay on the Sudan Red Sea coast. We provide notes on the nesting ecology related to the nesting area. We report the only clutch size data for this subspecies. Two nests with breeding pairs of Eurasian Spoonbills were first observed on 25 June 2010 at a remote and uninhabited island of Shagal (N 21° 07' 05", E 037° 13' 19") which lies on a distance of almost 9 km east from the main island. Nests with eggs from breeding pairs were found at a distance of 0.2 m from each other. Nests were a platform of sticks and vegetation constructed on the island ground. Nests were located at the southern edge of the island with proximity to Western Reef Heron *Egretta gularis* nest and inactive Osprey *Pandion haliaetus* nest. The Eurasian Spoonbill is considered uncommon to Dungonab Bay. To our knowledge, this is the first record of breeding grounds for *Platalea leucorodia archeri* on the Sudan Red Sea Coast. We believe that this breeding record may help establish the Northern limit of the range of this subspecies in the Red Sea.

This abstract was presented during the poster session.



Foraging Success and Group-feeding Size in Eurasian Spoonbills

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Studying the relationship between food intake rate and group size is useful to assessing the adaptiveness of group living in birds. Several hypotheses argue that foraging in groups can be beneficial in terms of feeding rate but an overall assessment of the evidence was lacking. We examined this relationship in Eurasian Spoonbill *Platalea leucorodia* by gathering data during March and April 2018 in Sfax salina, Tunisia. We measured individuals feeding rate and number of steps completed while foraging in groups of different sizes. The results indicate that foraging success is likely related to group size. Solitary birds and members of groups of two to four birds caught significantly more preys than those in larger groups. We suggest that Eurasian Spoonbills were attracted to areas by the presence of other Eurasian Spoonbills but this led to unsuccessful foraging of large groups.

This abstract was presented during the poster session.

Working with an Ex Situ Population of Eurasian Spoonbill in Amsterdam Royal Zoo in the Netherlands

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Eurasian Spoonbills *Platalea leucorodia* in the zoo represent European wetlands and clean water. This is why you often see this species in zoos. In Amsterdam we have had this species for a long time in the collection. We keep the Spoonbill in a large natural group (65 adult birds). The care of these animals is at a high level and is unique. The birds are very well approachable in the breeding season. Therefore we could support nature researchers with measuring weights or other body features.

This presentation reflects the breeding season of 2018. This year we have fledged 35 chicks. All the facets are shown here, so that there is a clear picture of how we take care of them in the zoo. Hopefully this gives inspiration for the conservationists and they see how we could support them.

This abstract was presented as a supplementary talk.



Underpinning the Conservation of Spoonbills and other Migrating Waterbirds: Monitoring the Weak Links in ‘Chains’ of Wetland Habitats

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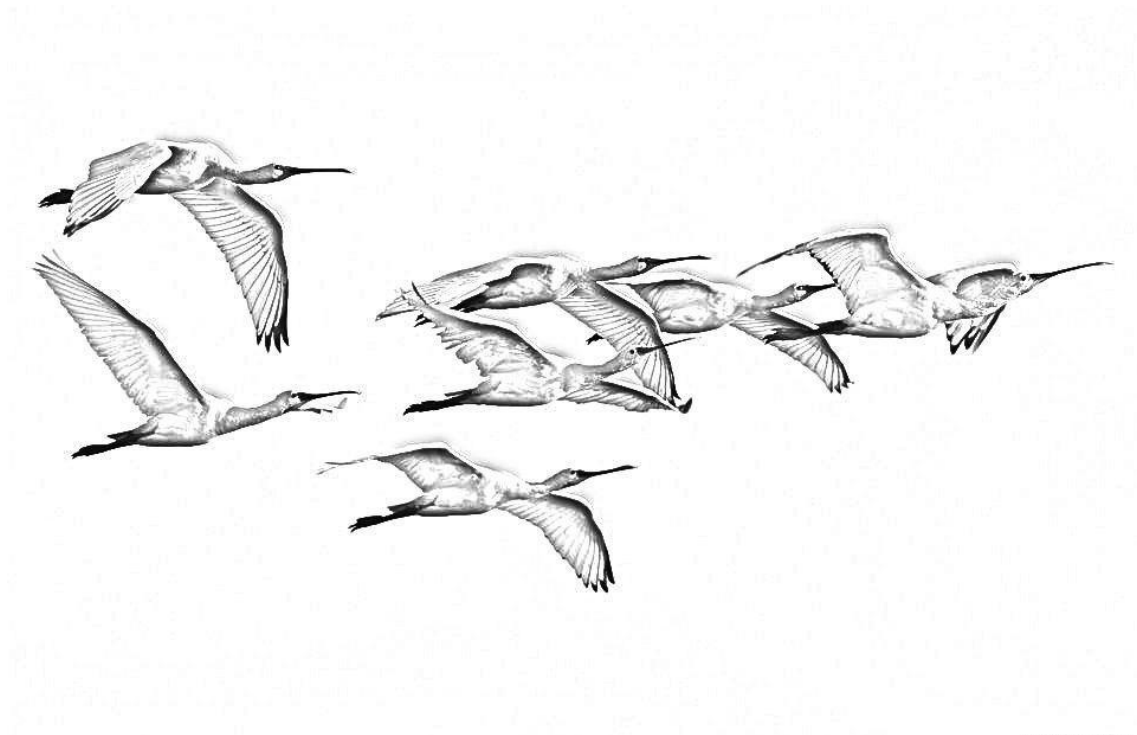
As food-specialists and as an otherwise demanding sort of animals, Eurasian Spoonbills *Platalea leucorodia* tend to occur in particular habitats, sometimes few and far between. The habitats selected by Spoonbills and other shorebirds, for various reasons, also attract people and their activities, and this can both be good news and bad news. In fact, the reliance of Spoonbills on particular wetland habitats makes them vulnerable, but would also seem to make it easy for targeted benign management practices to chance declines into increases. In an increasingly man-made world the positive and negative changes are happening at the same time. To keep doing the right thing, we have to know what we are talking about. Over the last few decades we, a world-wide consortium which goes under the name of Global Flyway Network, have tried to ecologically and evolutionary understand the population dynamics of migratory shorebirds including Spoonbills, to apply to the problems and opportunities they face. I will review how ecologically informed demographic studies can help identify population bottle-necks. Such demographic studies actually are a multi-edged sword: the discovery trails keep people interested and motivated, it leads to fundamental scientific discoveries (leading to a research agenda that attracts science-funding), whilst also yielding management suggestions and providing a tool to monitor the results of restorative actions.

This abstract was given as a plenary talk.



3

Conclusions





IX Spoonbill Workshop Conclusions

WORKSHOP

1. 24 participants from 10 countries attended the workshop. Tunisia hosts important numbers of wintering Spoonbills amongst the more than 40 Ramsar sites. Organizing the ESIEG workshop in Tunisia was a long-standing wish of former coordinators to strengthen the network in North Africa. We acknowledge the great organization by l'Association des Amis des Oiseaux/Birdlife Tunisia (AAO) and Tour du Valat that allowed the success of the workshop.
2. ESIEG regrets the lack of means that prevents the participation of more representatives, especially from Eastern Europe, Asia, and Africa. Financial support of sponsors (Euronatur, Cotusal, and CMB2) allowed the venue of representatives from Hungary, Croatia, Tunisia, Senegal, and Morocco.
3. ESIEG expresses its disappointment to AEWA regarding the ESIEG proposal to split Central Europe and South East European flyways. The proposal was written by the experts on the species and submitted in 2017 accordingly to the AEWA procedure. Nevertheless, it has been not submitted to the technical committee for evaluation and was rejected. ESIEG feels that its expertise was undermined.
4. The AEWA Action Plan for the Spoonbill was evaluated 10 years after its implementation. An evaluation of achievements was performed. Realistic objectives on each flyway were proposed for the next three years.
5. A database on mortality cases reported for Spoonbill including poisoning, illegal killing and, collisions will be implemented in order to identify main threats to the species.

TRENDS AND MAIN RESULTS

6. East Atlantic flyway
 - a. While the East Atlantic population is increasing on many sites (including establishment of a new colony in UK), monitoring and participation of representatives of the flyway are challenged by the decrease of interest (and funds) in Eurasian Spoonbill in most policy agendas.
 - b. The lack of information gathered prevented estimation of the Atlantic flyway population size.
 - c. A new colour-ringing project was launched in Morocco



7. Central European flyway

- a. The Central European population seems stable, or with a moderate decline. Monitoring of wintering birds in Tunisia showed decreasing unexplained trend. It is plan to analyse the trend of Central European flyway using available breeding data of the Carpathian Basin population, Czech and Italian populations and compare it with wintering population trend.
- b. A comparative analysis on the survival of East Atlantic and Central European flyway should be initiated. Differences in survival may help in understanding why Central European population is not increasing.

8. South East European flyway

- a. No representative of this flyway was present, preventing update of the knowledge on this region.
- b. We encourage and support colour-marking and tracking studies in the SE European flyway including Greece and Danube delta, using available funds.
- c. A project using GPS tracker will be submitted to delineate limits of SE European flyway.

9. *P. l. archeri*

- a. A representative from Sudan allowed focusing on the status of the *Archeri* subpopulation in this region and planning actions for its better monitoring.

10. *P. l. balsaci*

- a. There was, unfortunately, no representative of Mauritania to discuss the present status of this subspecies, and any update from the last workshop was impossible.
- b. There is a need to encourage local people to count the nests in all colonies to estimate population size. A lack of funding prevents monitoring the annual breeding success of the Banc d'Arguin colonies and resighting marked birds on the colonies to perform survival analysis.
- c. The total number of Spoonbills in the Banc d'Arguin during the non-breeding season has been more or less stable over the past 10 years, but distinguishing *P. l. balsaci* from *P. l. leucorodia* is difficult.



COMMUNICATION

11. Thanks to l'Association des Amis des Oiseaux, the workshop benefited from large media coverage with regional radio and national television reports.
12. It has been decided to increase the number of contributors to increase the visibility of the group on the ESIEG Facebook page.
13. A diffusion list was created to facilitate internal communication among ESIEG members.
14. A logo of the group will be created.

ESIEG ORGANISATION

15. In order to improve the visibility of ESIEG and implementation of the Action Plan two groups were formed: the communication group included Petra de Goeij, Hichem Azafzaf and Francisco Hortas, and the fundraising group included Jocelyn Champagnon, Mohamed Ali Dakhli and Petra de Goeij.
16. Juan Navedo, current chair of ESIEG announced its resignation. ESIEG suggested Jelena Kralj from the Institute of Ornithology of Croatia, as the new coordinator of the group and Jocelyn Champagnon, current coordinator, to become the chair of the group. We deeply acknowledge Juan Navedo for his leadership of the ESIEG over the last years.

NEXT STEP

17. Next ESIEG workshop will be organized in 2021 in the core of the Central European flyway in Croatia by the Croatian Society for Birds and Nature Protection.

Djerba Island, Tunisia, 18th November 2018

AEWA Eurasian Spoonbill International Expert Group



IUCN-SSC

Stork,
Ibis and
Spoonbill

Specialist Group

<http://storkibisspoonbill.org/>

ISBN 978-2-491451-00-4



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