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AEWA

International Single Species Action Plan for the Conservation of the Eurasian Spoonbill

Platalea leucorodia

Eurosite

Vogelbescherming NEDERLAND

WETLANDS INTERNATIONAL

Syndicat Mixte Baie de Somme Grand Littoral Picard

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Agreement on the Conservation of
African-Eurasian Migratory Waterbirds (AEWA)

International Single Species Action Plan for the Conservation of the Eurasian Spoonbill

Platalea leucorodia

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List of range countries by populations, where the plan is to be implemented and national organizations in each country involved in the preparation of the action plan:

Platalea leucorodia leucorodia: Atlantic Population
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Luxemburg: Ministère de l'Environnement, LNVL - BirdLife Luxembourg
Mauritania: Parc National du Diawling (Mauritania),
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Sweden: Naturvardsverket Naturresursavdelningen
United Kingdom: Joint Nature Conservation Committee (UK), Royal Society for Protection of Birds (RSPB, UK)

Platalea leucorodia leucorodia: Central European Population (Panonnian population) & Southeast European Population
Albania: Albanian Society for the Protection of Birds and Mammals
Algeria: Bureau des zones humides, Direction Générale des Forêts
Austria: BirdLife Österreich
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Czech Republic: Agency for Nature Conservation and Landscape Protection
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Israel: Division of Science & Conservation Israel Nature & Parks Authority
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Kenya: National Museum of Kenya
Lebanon: Society for the Protection of Nature in Lebanon, A Rocha Lebanon
Libya: Nature Conservation Dept, Environment General Authority
Macedonia FYR: Bird Study and Protection Society of Macedonia, Macedonian Ecological Society
Mali: Wetlands International, Bureau du Mali
Malta: BirdLife Malta
Moldova: Eco-TIRAS
Montenegro: Center for Protection and Research of Birds
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Platalea leucorodia "major": Western Asian Population
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Russian Federation: Wetlands International, Moskwa Ringing Scheme, Bird Ringing Centre of Russia
Uzbekistan: Laboratory of Ornithology, Institute of Zoology of Uzbek Academy of Sciences

Platalea leucorodia archeri: Red Sea subspecies
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Egypt: Zoology Department, Faculty of Science, Suez Canal University
Eritrea: Eritrea's Coastal Marine and Island Biodiversity Project
Saudi Arabia: Avian Research and Monitoring Manager, National Wildlife Research Centre (NWRC), National Commission for Wildlife Conservation and Development (NCWCD)
Sudan: Sudan wildlife

Platalea leucorodia balsaci Mauritanian subspecies
Mauritania: Parc National du Banc d'Arguin, Parc National du Diawling, Ministère de l'Environnement et du Développement rural, Werkgroep Lepelaar

Milestones in the production of the Plan
Workshop: 22-26 October 2007, Djoudj National Park, Senegal
Draft 1: 15 November 2007, presented to all contributors
Draft 2: 31 January 2008, presented to the AEWA Technical Committee
Draft 3: 30 April 2008, presented to the Range States
Final draft: 25 July 2008, adopted by the 4th session of the Meeting of the Parties to AEWA in September 2008

Geographical Scope
The Spoonbill has a wide distribution from Europe to East Asia. Its distribution is partly included within the geographical range of the actions of AEWA. The present Action Plan covers the distribution in Europe, western Asia and Africa. The plan distinguishes five subspecies or populations:
The Atlantic Population *Platalea leucorodia leucorodia*
The Central European (Panonnian) & Southeast European Population *P. l. leucorodia*
The West Asian Population (so called "*P. l. major*")
The Red Sea subspecies (*P. l. archeri*)
The Mauritanian subspecies (*P. l. balsaci*)

Reviews
This International Single Species Action Plan should be reviewed and updated every ten years (first review in 2018). An emergency review will be undertaken if there is a sudden major change liable to affect one of the populations or subspecies.

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Picture on the cover: Adult Eurasian Spoonbill *Platalea leucorodia leucorodia* © Lars Soerink
Drawing on the inner cover: Eurasian Spoonbill *Platalea leucorodia* © Sarah Plazzotta

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7. Annexes – Can be found at:
http://www.unep-aewa.org/publications/ssap/eurasian_spoonbill/index.htm

Executive Summary

The Eurasian Spoonbill Platalea leucorodia is distributed from the East Atlantic to India and China (Fig. 2). Four or five populations/subspecies can be distinguished: Platalea leucorodia leucorodia, the nominate subspecies, is distributed from Western to Central Europe/ Southeast Europe. It is often separated into two populations, the Atlantic and Central/Southeast European, differing in their distribution and ecology, in particular during the breeding season. The population which breeds in eastern Europe and throughout Asia has been designated as a separate subspecies, Platalea leucorodia major on the basis that it is larger in size than the nominate subspecies. Two subspecies are found in Africa, P. l. balsaci whose distribution is limited to the Banc d'Arguin (Mauritania) and P. l. archeri, the Spoonbill of the Red Sea. These two populations are not migratory and mix with Eurasian Spoonbills during the winter.

The current estimate of the numbers of the Atlantic population, the only one to increase, is 4,800 breeding pairs with a wintering population of 19,000 birds. The Central/ Southeast European population is probably made up of of 5,000 to 6,000 breeding pairs (current estimate 5,500 breeding pairs). Its known wintering numbers are only between 7,000 and 8,000 birds, indicating many gaps in knowledge of the wintering sites. The discrepancy between numbers of breeding pairs and wintering numbers is even higher for the "*P. l. major*" population (5,000 breeding pairs against only 2,100 known wintering birds. Most of the "*P. l. major*" birds breeding within the AEWA area probably winter in Pakistan and India (and perhaps as far Sri Lanka and Bangladesh).

The *P. l. balsaci* population is presently the most at risk with now only 750 breeding pairs (1,610 pairs in 1985) and very high mortality among fledgings. The breeding population is restricted to a single site, the Banc d'Arguin (Mauritania). A large proportion of juveniles are killed by predators (jackals) and the breeding site faces an increasing risk of sea flooding.

The *P. l. archeri* population is composed of 1,100 to 1,200 breeding pairs, with, however, a lack of recent data from Sudan and Somalia. *P. l. archeri* is not protected in two countries, Djibouti and Eritrea. Some data indicate that colonies of this subspecies are often disturbed by human activities. Birds are often in non-protected areas and are liable to persecution.

The Central and Southeast Europe population, and probably the *P. l. "major"* population breed partly in non-protected sites and particularly in artificial fishponds. The decline of these populations seems to be due to a combination of several threats linked to human activities. Poaching is an important cause of death for this population.

The Spoonbill is classified as being of "Least Concern" in the 2006 IUCN Red List of Threatened Species but all populations are listed in Column A of Table I in the AEWA Action Plan.

The conservation priorities are to maintain (Atlantic population) or increase the number of breeding pairs in the different geographic areas beyond a critical level in particular for *P. l. archeri* and *P. l. balsaci*.

The Pannonian population is still subject to heavy illegal hunting pressure, particularly in staging areas between its breeding and wintering areas; reduction of illegal hunting in these staging areas is a priority. Rehabilitation of former wetlands is considered as important to improve post-fledging survival and would be also a major factor in promoting an increase in Spoonbills numbers. Cooperation with the owners of fishponds is important to protect the breeding sites.

The *P. l. major* population breeding in Eastern Europe and Western Asia is also thought to be subjected to hunting pressure on its migration and wintering sites.

For *P. l. archeri*, the priority is to encourage the relevant governments of the Range States to protect the subspecies and its key sites during the breeding and wintering periods. As the number of key sites seems to be limited, measures could probably be taken quite easily, except for states where the security situation makes this impossible.

Measures to be taken for *P. l. balsaci* include strict control of predators, in particular of jackals, as a high priority. The study of sea defences for protecting the nesting sites must start as soon as possible.

For each population, the study of migratory movements and demographic parameters is necessary. This will depend on colour ring schemes and, if possible, on satellite telemetry.

This Action Plan was prepared by the International Spoonbill Working Group, an informal group hosted by Eurosite. The present Action Plan is based on more or less complete answers from 75 countries. Implementation of this action plan is foreseen in 54 Range States.

1. Biological Assessment

1.1. General Information

The Eurasian Spoonbill *Platalea leucorodia* is about 60-70 centimeters long and weighs 1,800-2,400 grams. The bill is most characteristic, with a spoon-like shape. The plumage is predominantly white and, during the breeding season, adult birds have a large plume on the back of the head and an orange/yellow band across the breast. Juveniles and sub-adults show black tips on wing feathers. As a wading bird, it has long legs like herons and storks. Males are larger than females with longer bills and legs.

It lives in habitats with changing water levels such as tidal areas, river deltas, estuaries, alluvial wetlands, lakes and man-made wetlands such as carp fish farms or reservoirs. It is a colonially breeding species, breeding in mixed colonies with other waterbirds (herons, egrets, cormorants, gulls and/or tern species), nesting in trees, reedbeds, dunes, salt marshes and, in arid areas, in low shrubs or on the bare ground, surrounded by water. It forages in shallow open waters and prefers mudflats, searching for small fish species, shrimps or other aquatic invertebrates.

The species' distribution and numbers have recently decreased, especially the Mauritanian subspecies. Before 1900 they probably bred in all large inner river delta's and marine estuaries. Due to land reclamation, drainage, agriculture, house building and tourism, their habitats have disappeared or decreased in extent. Since the use of chemicals (mainly in agriculture/aquaculture) increased, pollution of their feeding habitat and accumulation of pesticides in their prey have resulted in a sharp decline in numbers and a restriction of their distribution. Some populations have recovered (i.e. the NW European and Hungarian populations) but other populations are still suffering.

It is a migratory species but African subspecies are resident. Migration distances of 4,000 kilometres are usual. During migration they use stop-over sites (stepping stones) to recover (sleep and feed) from the long distance flights.

1.2. Taxonomy

Phylum: *Chordata*
Class: *Aves*
Order: *Ciconiiformes*
Suborder: *Ciconiae*
Family: *Threskiornithidae*
Subfamily: *Threskiornithinae*
Genus: *Platalea*
Subspecies:

- *Platalea leucorodia leucorodia* Linneaus 1758, the nominate subspecies.
- *Platalea leucorodia archeri* Neumann 1928 (like *balsaci* but smaller, Cramp *et al.* 1977).
- *Platalea leucorodia balsaci* Naurois & Roux 1974 (bill completely; smaller than nominate subspecies (Cramp *et al*. 1977).
- *Platalea leucorodia "major"* Temminck & Schlegel, 1849 (considered to be larger than nominate subspecies Cramp *et al.* 1977; this subspecies is not considered as valid by del Hoyo *et al*. 1992).

1.3. Population Development

The Eurasian Spoonbill has a wide but fragmented Palearctic distribution, with a breeding range that extends from Europe to China, India, the Red Sea and Northwest Africa (Cramp & Simmons 1977; Hancock *et al*. 1992). The breeding range was formerly more extensive. The species bred in France in the estuary of the Loire during the sixteenth century, in southern England, the Netherlands and in Northern Germany and Denmark in the seventeenth century and on the Baraba Steppes, in western Siberia, during the nineteenth century. It also bred in the Pinsk marshes of Belarus and Poland, and, according to Vaurie (1965), has bred in northern Algeria (Lake Fetzara). The species is migratory throughout its range, except for the populations of Northwest Africa (*P. l. balsaci*) and the Red Sea (*P. l. archeri*). Wintering areas include the river estuaries of the Atlantic coast, the Mediterranean, Sub-Saharan countries, Pakistan, Iran, India, Sri Lanka, Japan and southern China.

The world population is estimated at 65,000-142,250 individuals (Wetlands International 2006). In most countries, breeding populations are declining except for Western Europe, Hungary, Romania and Italy.

The East Atlantic flyway population is well known and breeding sites are protected throughout its length. New colonies have recently been established in Morocco, Portugal, France, Spain, the Netherlands, Belgium, Germany and Denmark (and there are signs of recolonization in the United Kingdom), and the breeding population has increased to about 4,800 pairs (September, 2007). The total population has been estimated at 19,000 individuals (September, 2007).

In Central and Southeast Europe, the population is estimated to be from 4,910-6,160 breeding pairs (September, 2007). The population is increasing in Hungary (Kovács, Végvári & Kapocsi 2001), Italy (Fasola 2001) and in Romania (Papp & Sándor 2007), but decreasing sharply in Russia and Turkey (Osiek 1994, September, 2007). New colonies have recently been established in the Czech Republic and Slovakia.

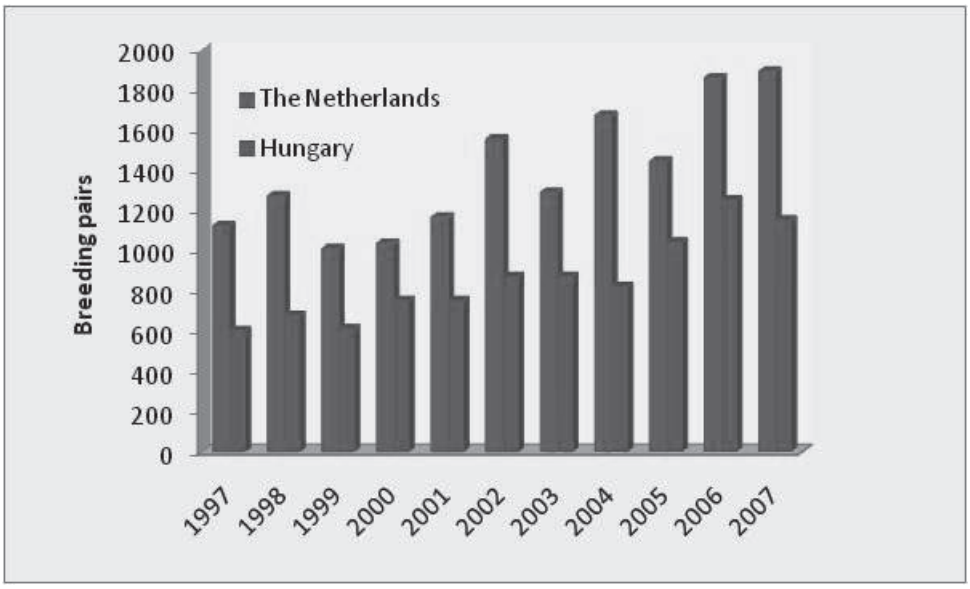

Fig. 1: Changes in the numbers of breeding pairs in The Netherlands and in Hungary

Recent counts show a serious decrease in the numbers of breeding pairs of the Mauritanian subspecies in the Banc d'Arguin, in fact numbers have decreased from 1,610 breeding pairs in 1985 (Gowthorpe & Lamarche 1996) to less than 750 pairs in recent years (O.Overdijk, T.Lok in prep).

Little detailed information is available on numbers of the *"P. l. major"* population breeding within the AEWA area from west of the Sea of Azov to Kazakhstan. Wetlands International (2006) indicates a population numbering over 25,000 individuals and a stable tendency, but there are indications of a decrease at breeding sites (present enquiry).

Detailed data are also lacking on population trends for the Red Sea subspecies *P. l. archeri,* but a decrease is likely given the lack of protection of the main breeding and wintering sites. Wetlands International data (2006) indicates a declining trend.

1.4. Geographical Distribution

The distinctions between breeding areas of the different populations/subspecies are often not clear, although the wintering areas can be distinguished with greater clarity (Fig. 2):

1. The westernmost "Atlantic" population (*P. l. leucorodia)*, the most clearly demarcated, breeds in Western Europe and migrates along the East Atlantic coast to winter mainly in coastal West Africa.

2. The Central and Southeastern European population (*P. l. leucorodia*) breeds in the Danube basin, northern Italy, Greece, the Black Sea region and Anatolia. Birds from the western breeding colonies winter mainly in the Eastern Maghreb, with small numbers crossing the Sahara to winter in the Sahel wetlands (mainly the Inner Niger Delta and Lake Chad). Birds from the eastern end of this population winter either along the Nile, as far south as Sudan, or in Israel, Syria and Iraq, with a few reaching the Gulf and even south western Pakistan and India. Some western birds may however also go to the Nile, while eastern breeders may winter in the Maghreb. Further studies may reveal whether two separate populations are involved. The status of birds breeding in Turkey is not clear; those from western Anatolia may belong to this population, those from eastern Anatolia may belong to the "*P. l. major*" population.

3. The Azov/Caspian population ("*P. l. major"*) breeds east of the Sea of Azov, some birds migrate via eastern Iran and Baluchistan to winter mainly in the Indus Delta in southern Pakistan; others cross eastern Afghanistan and the Hindu Kush to winter in northern Pakistan (Punjab) and along the Ganges in northern India (this enquiry). The status of birds nesting in Iran is not clear; they may winter along the Iranian coast of the Gulf, or may migrate to the Indus Delta in southern Pakistan. Figure 2b shows migration routes/flyways used by birds marked at the nest with darvic rings in Netherlands and Hungary and with metal rings in Turkey, Ukraine, Russia, Azerbaijan, Kazakhstan and Uzbekistan. Birds breeding in Syria and Iraq are considered to belong to the "*P. l. major*" population.

4. *P. l. archeri* is a subspecies, found in the Red Sea, with an estimated population of 860 to 1,270 breeding pairs, according to the present enquiry. It is mainly distributed along the coasts of the Red Sea and Indian Ocean (Somalia, del Hoyo *& al*. 1992). Most Spoonbills breeding on the Arabian side of the Southern Red Sea are likely to belong to this subspecies. The identity of the population breeding in the Northern Red Sea is unclear but may be the subspecies *P. l. major* (Jennings, in prep). In the Northern Egyptian Red Sea, the population appears to have declined by up to 50% (Jennings *et al*. 1985; Grieve & Millington 1999).

5. *P. l. balsaci* is another endemic subspecies with an estimated population size of 3,100 birds (Tamar Lok, pers. comm., O. Overdijk), breeding only in the Banc d'Arguin National Park (Mauritania). Birds are probably resident in the park, although a few observations have occurred elsewhere (notably in the Senegal Delta).

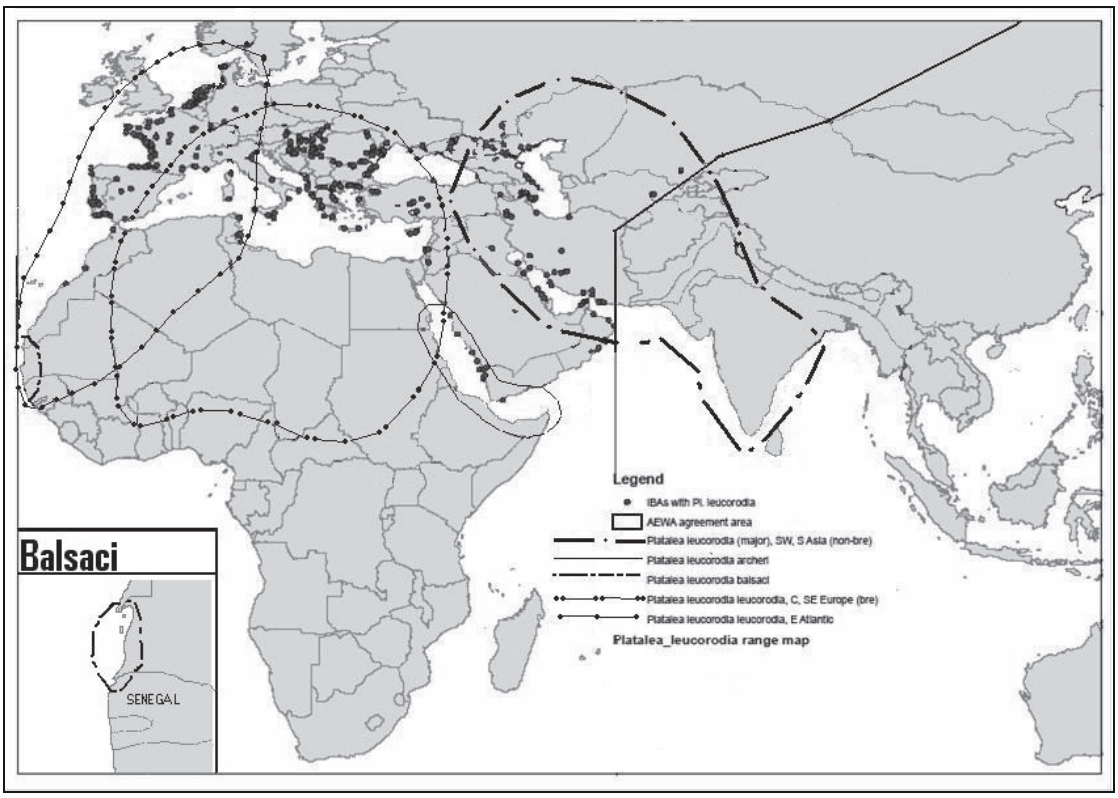

Fig. 2a: The distribution of the various populations and subspecies in the AEWA region.

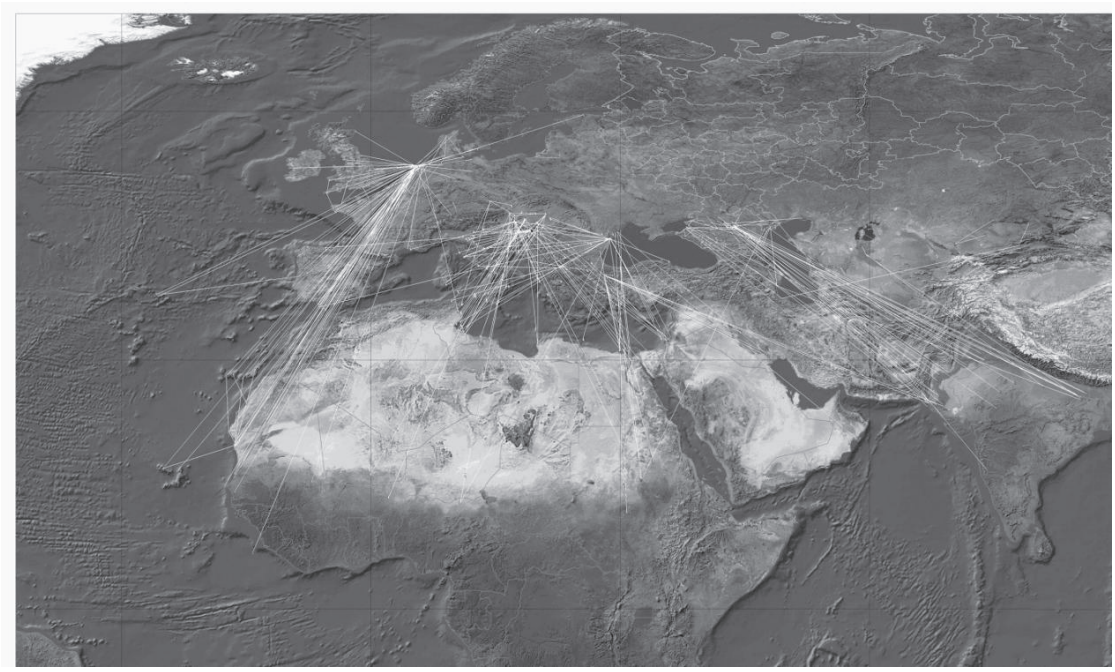

Fig. 2b: Spoonbill movements as shown by ring recoveries.

Table I: Geographical distribution of the Spoonbill

Y=Yes, N=No, V=Vagrant, W=Wintering, PM=Passage Migrant, S=Summering

***P. l .leucorodia:* The Atlantic Population**			***P. l. leucorodia:* The Central Europe/Mediterranean population**		
Country	**Breeding**	**Non breeding**	**Country**	**Breeding**	**Non breeding**
Belgium	Y	N	Albania	Extinct	W, PM
Denmark	Y	N	Austria	Y	N
France	Y	Y	Bosnia	Extinct	PM
Germany	Y	N	Bulgaria	Y	PM, W
Morocco	Y	PM, W	Croatia	Y	PM
Netherlands	Y	N	Czech Republic	Y	N
Portugal	Y	PM, W	Greece	Y	W
Spain	Y	PM, W	Hungary	Y	Y
United Kingdom	Y	PM, W	Italy	Y	PM, W
			Moldova	Y	PM
Cape Verde	N	V	Montenegro	Y	PM
Gambia	N	W	Romania	Y	PM
Luxemburg	N	V	Serbia	Y	PM
Mauritania	N	W, S	Slovakia	Y	Y
Senegal	N	W, S	Turkey	Y	PM
Sweden	N	V	Ukraine	Y	N
			Algeria	Extinct	W
			Burkina Faso	N	W
P. l. balsaci			Cameroon	N	W
Mauritania	Y	W	Chad	N	W
			Cyprus	N	PM
			Dem. Rep. Congo	N	V
			Egypt	N	PM, W, (S?)
			Israel	N	PM, W
			Jordan	N	V
			Kenya	N	W
			Lebanon	N	V
			Libya	N	W
			Macedonia FYR	N	PM
			Mali	N	W
			Malta	N	PM
			Niger	N	W
			Nigeria	N	W
			Poland	N	PM
			Slovenia	N	V
			Tunisia	N	W, S
			Uganda	N	V

P. l. major			*P. l. archeri*		
	Breeding	**Non breeding**		**Breeding**	**Non Breeding**
Armenia	Y	PM	Djibouti	Y	W
Azerbaijan	Y	N	Eritrea	Y	W
Iran	Y	PM, W	Egypt	Y	W
Iraq	Y	W, PM	Saudi Arabia	Y	W
Kazakhstan	Y	PM	Somalia	Y	W
Kuwait	Y	PM, W	Sudan	Y	W
Russian Federation	Y	PM	Yemen	Y	W
Syria	Y	W, PM	Ethiopia	N	V
Turkmenistan	Y	PM			
Uzbekistan	Y	N, PM			
Bahrain	n.a.	V			
Belarus	n.a.	V			
Georgia	n.a.	PM			
Oman	n.a.	W			
Qatar	n.a.	V			
Tajikistan	n.a.	PM			
United Arab Emirates	n.a.	W			
India*	n.a.	W			
Pakistan*	n.a.	W, PM			

* Countries outside the AEWA Agreement area

1.5. Distribution throughout the Annual Cycle

The breeding strongholds of the Atlantic population are in the Netherlands (particularly on the offshore islands of the Wadden Sea) and southern Spain (Odiel and Coto Doñana). The current breeding distribution is clearly a relict of a formerly much wider breeding area, the decrease caused by disturbance and above all wetland loss. In recent years, with improved protection and wetland restoration, some former breeding areas have been recolonized notably in France (Atlantic coast) and also in northern Morocco. In Germany and Denmark, the species was established as a breeder during the last two decades. These breeding populations migrate along the Atlantic coast, most birds crossing central Spain via Santoña, using an inland route over the Iberian peninsula to Morocco, to winter along the Atlantic coast of Mauritania and Senegal, where they mingle with the Mauritanian subspecies *P. l. balsaci* and the African Spoonbill *Platalea alba*. However, some of them follow the north coast of the Iberian Peninsula to overwinter in the estuaries of NW Spain and Portugal. Increasing numbers also remain in France to winter . Their movements have been intensively studied through colour ringing and by observations throughout the flyway which have shown that young birds spend their first three or four years in Africa, before returning to breeding colonies. Sightings of Dutch and Spanish breeding birds in the Mediterranean are rare.

Spring migration starts in Western Africa around 1 February and birds arrive at breeding sites by February (Southern Spain) and March / April in Northwestern Europe. Autumn migration starts in September and birds arrive at the wintering sites again in November.

The Central and Southeast European population breeds along the Danube and its tributaries: in the Danube Delta, on the Pannonian Plain (Carpathian Basin) in central and northern Greece and in Anatolia. The nest sites are mainly in man-made fishponds and reedbeds or flooded riparian forests, as well as on the ground on bare islands. Since about 1990 breeding Spoonbills have colonized northern Italy (Po Delta). Recoveries of ringed birds show that some winter south of the Sahara (the Inner Niger Delta and Lake Chad). A Hungarian and a Serbian bird have been monitored in Niger (J. Brouwer;

Pigniczki *in press*). Nonetheless, numbers are small and totals from Sub-Saharan Africa east of Senegal recorded by the International Waterbird Census were only 25 in 1995, six in 1996 and 54 in 1998 (Dodman *& al*. 1995, 1996, 1999) but 100-200 in Niger (Brouwer & Mullié 2001, Niger Bird Data Base, coordinator Joost Brouwer). Single Hungarian ringed individuals were reported from Mali and Nigeria (Pigniczki *in press*). Many more birds stay in freshwater or saltwater sites in the Mediterranean (mainly the tidal areas of southern Tunisia and Libya), thus avoiding a long trans-Saharan journey. New colour-marking programmes in the Danube Basin, Italian and Greek breeding colonies have provided more information on these wintering birds (Akriotis & Handrinos 2004). It is strongly suspected that young birds summer in Israel, Tunisia and probably Algeria too. Some Central and Southeast European Spoonbills migrate through the Nile Delta (curiously, very few appear to stay to winter in the Nile Delta itself (Goodman & Meininger 1989)) and along the Nile to winter in inland southern Egypt and Sudan, at latitudes similar to those where the Western European breeding population winters in Senegal and Mauritania; a few winter in the Gulf. A single Hungarian young individual and one Croatian bird during its third winter were seen in Morocco, along the main migration route of the Western European (Atlantic) population.

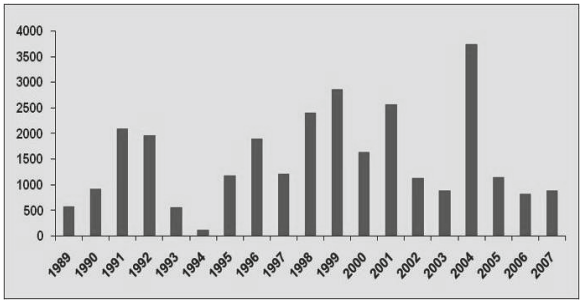

Fig. 3: Changes in numbers of wintering Spoonbills in the Senegal Delta

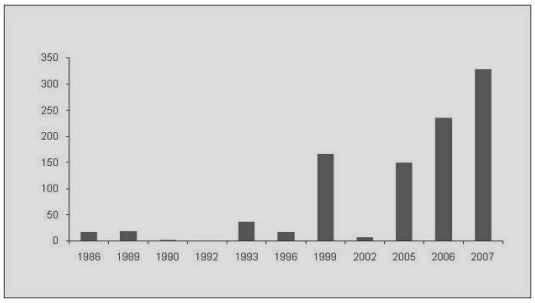

Fig. 4: Changes in numbers of wintering Spoonbills in Turkey

Central and Southeast European breeding Spoonbills thus have two main migration routes; one leads south-west over the Adriatic Sea, through Italy to North Africa, and another across the Sahara. The other route leads south-east, through the Balkans, Anatolia, the Middle East and the Nile Delta to the Egyptian and Sudanese sectors of the Upper Nile. A small number of birds from the eastern end of this population (whose eastern limit is poorly defined at present) migrate through Syria and Iraq and as far as the Gulf or even the Indus Delta in Pakistan. There is considerable crossover between the two main routes: most Austrian and Hungarian breeding birds winter in Tunisia, but some take the Nile route; Mullié *et al* (1989) list fifteen ringing recoveries in Egypt, nearly all from the period 1930 to 1957, with eleven in the general area of the Nile Delta: one from Neusiedler See in Austria, six from Kisbalaton in Hungary, three from Kus Gölü, Turkey and one from Romania. In addition they list four recoveries without precise places of ringing (one from Turkey and three from "Hungary/Yugoslavia"). Similarly many Greek and Romanian breeding birds winter along the Nile, but some take the southwestern route. The colour-ringing programme in the Romanian sector of the Danube Delta began in 2003 and recoveries in Spain, Tunisia, and Oman illustrate differing migration directions taken by these birds (Kiss *et al* 2007).

Some first-year Spoonbills may stay in the Carpathian Basin until as late as December in small numbers (2-20 individuals) and there have been reports of birds overwintering in Hungary since 2005. Recoveries of two- and three- year old Spoonbills from Central and Southeast European colonies show that immatures summer in Tunisa and southern Italy, notably in Sardinia. Some were found in Albania and Bulgaria between their wintering and natal areas during the summer; they may also reach the Carpathian Basin. Four-year old metal ringed Spoonbills were found in the Carpathian Basin in the breeding period, but over 100 km from their natal area in the 1900s (Pigniczki, in press). It is thought that half the colour-ringed Spoonbills bred over 100 km from their natal colony in Hungary in 2007,

mainly because of the condition of feeding areas around their natal area. Ringing recoveries support the meta-population hypothesis: two Italian and Romanian (from the Danube Delta) individuals appeared to breed in Hungary, and a Hungarian bird was recovered in Romania, outside the Carpathian Basin, in the breeding season (Pigniczki, in press).

The cutoff point between the Central and Southeast European breeding population and the population breeding in Northeastern Europe and western Asia (Azov/Caspian), the so-called "*P. l. major*" subspecies, is as yet unclear. Birds nesting in the eastern Black Sea and eastern Turkey may belong to the Central and Southeast European population, or to the Azov/Caspian population. A few birds have nested on the Kuwaiti islands of Warba and Bubaiyan since the 19th century, and a few birds summer in the Gulf. Most birds in the Gulf are winter visitors or passage migrants. Numbers vary from year to year, with highest numbers between September and April. Larger feeding concentrations from December to April are known from the coast of central Oman, including 270 at Bar al Hikman (in February).

P. l. major breeds from the east coast of the Sea of Azov to the lower Volga (north to Lake Sarpa, lower Ural, the Ilek and Khoboda rivers north to about 50 N and to about 54 to 55 E in the Ubagan valley north of Kustanai, south to the region north of the Caucasus (swamps of the lower Kuban and Terek rivers and of the Manych depression); also elsewhere in Kazakhstan from the east coast of the Aral Sea to the valley of the lower Syr Darya, at Lake Tengiz, and from Zaisan Nor east to the valley of the Kara Irtysh and Tanna Tuva; the breeding range of the Spoonbill extends further east (outside the AEWA area) as far as Mongolia, Manchuria and Ussuriland (Vaurie 1965). This West Asian population probably numbers at least 25,000 individuals (Wetlands International, 2006). In the wintering area, birds breeding within the AEWA area mingle with birds breeding further east, outside the AEWA area: the East Asian population is estimated to number 10,000 individuals (Wetlands International 2006), wintering in South Asia (mainly India and Pakistan) and East Asia (mainly China). The latest winter census data available relate to January 2002, 2003 and 2004 (Li & Mundkur 2007): the total number of wintering Eurasian Spoonbills counted in the whole of Asia were respectively 10,753 in 2002, 13,472 in 2003 and 14,044 in 2004. Of these 2,799 (2002), 4,063 (2003) and 6,069 (2004) were found in India and 975 (2002), 752 (2003) and 16 (2004) in Pakistan; numbers recorded in Bhutan, Nepal and Sri Lanka were much smaller. It should be emphaisized that these counts are undoubtedly under-estimates, as not all potential wintering sites were visited, but also that some of these birds had undoubtedly bred outside the AEWA area. Larger wintering numbers were noted in East Asia with 6,889, 8,329 and 7,729 birds respectively in 2002, 2003 and 2004.

Recoveries of Moscow ringed birds show that only a tiny number of birds from the western Asian population winter along the Nile Valley (though a few may join post breeding assemblies in the Sea of Azov). Most birds from the western part of the population migrate across the breeding range, (following a remarkably constant bearing between 120 and 140 degrees from their breeding place) and concentrating in north east Iran; they then appear to take one of two separate routes to reach their winter quarters: they either fly via Sistan and Baluchistan to reach wintering grounds along the Arabian Sea (mainly round the Indus Delta or the lower reaches of the river Indus); or they fly through Turkmenistan, Uzbekistan and eastern Afghanistan, over the Hindu Kush and Khyber Pass, to reach the Punjab and the Ganges plain, wintering in numbers as far east as 87E (this enquiry). Birds breeding in northern Iran appear to winter along the Iranian shores of the Gulf (D.A. Scott, *pers comm.*), or may move into Pakistan.

P. l. archeri occurs in the Red Sea. It breeds mainly on islands, from the Tiran archipelago at the mouth of the Gulf of Aqaba to Yemen. It is believed to be mainly sedentary, but the picture is complicated by the arrival of birds from Europe in winter, and birds nesting in the northern part of the Red Sea may indeed belong to *P. l. major* rather than to *P. l. archeri.* It is a gregarious bird by nature, but migrants and visitors often occur individually. Small parties, usually no more than about a dozen

together, may occur along all parts of the Red Sea coast where their subspefic identity is not clear (see Jennings, *in press.* for more comments on status and numbers).

P. l. balsaci breeds exclusively on the ground on bare islands in the Banc d'Arguin National Park in Mauritania. Only very small numbers breed in mangrove trees at a height of 2-3 meters. Mostly they breed in mixed colonies with Western Reef Herons and/ or Little Egrets, in trees also mixing with African Cormorants and Grey Heron. Breeding starts around March and continues to September or October. Most of them seem to winter around the breeding place, though a few may wander south to the Senegal Delta. In winter, they intermingle (and perhaps compete) with wintering birds from the Eastern Atlantic population of *P. l. leucorodia*.

1.6. Productivity and Survival

The age at maturity is well known in the Atlantic population: there are three observations of birds breeding at the age of two years (all males) in the Dutch database (T. Lok, O. Overdijk) but most birds start breeding at the age of four to five years. The average first breeding age is 3.6 years. Non-breeding birds either stay on the wintering grounds or come back to the breeding grounds during summer. Maximum observed longevity (in the Dutch Ringing Scheme data) is 26 years. Birds in captivity are reported to live for 29 years but they are subject to fewer threats.

The estimate for survival (probability of an adult bird surviving until the next breeding season) is 0.83 in the Netherlands (s.e. = 0.4) while survival rate average 0.87 (0.84-0.90) in Spain (de le Court 2001, Doctoral Thesis). The estimate for observation (probability of a bird being observed at least once a year if this bird has already been seen back in Holland as an adult, given that bird is alive) is 0.82 (s.e. = 0.4) while it is highly variable from year to year in Spain. The return rate of juveniles to the breeding grounds (at a modal age of 3 years) is 0.32 for the Dutch population (Bauchau *et al* 1998). Recent follow up study indicates that the survival of the Dutch Spoonbill population has decreased over the last 15 years from 0.92 in 1990 to 0.79 in 2005. This may be caused by density-dependent population regulation (T. Lok, pers. comm.). Recoveries suggest that a minimum of 11.7 - 16% of Spoonbills reach maturity (4 or 5 year old) in Hungary based on metal ringed recoveries from the 1900s (Pigniczki in press).

Reproductive success is heavily dependent on weather, food availability and/or predation. Droughts and floods can have a major influence on reproductive success. Larger colonies produce less hatched chicks per nest than smaller colonies (breeding success = 1.13 ± 0.91 (s. d.) on Schiermonnikoog 2007 and Figures 5 and 6). Under excellent circumstances (i.e. in NL / D Wadden Sea islands with little predation and a lot of food, shrimps, for the chicks), Spoonbills can raise three chicks in a season. If the first breeding attempt fails, Spoonbills may make a second attempt in the same season (sometimes even when they already had 2-weeks old chicks). Predation by ground predators (foxes, domestic cats, rats, wild boars, etc.) can destroy a whole cohort of juveniles. Spoonbills breed in trees as well as on the ground. It was shown in the Netherlands that after large scale predation in a colony the breeding population spread out over a larger area, discovering new breeding sites (O. Overdijk, pers. obs.).

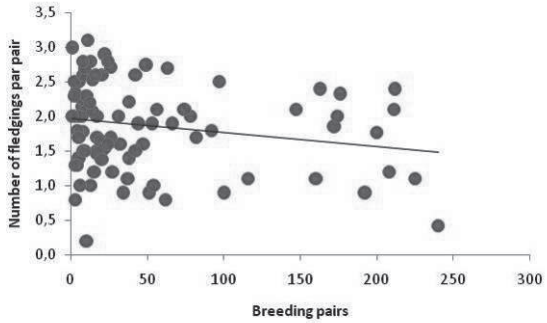

Fig. 5: Relationship between the size of colonies and the production of fledging birds (data from The Netherlands, France, Germany)

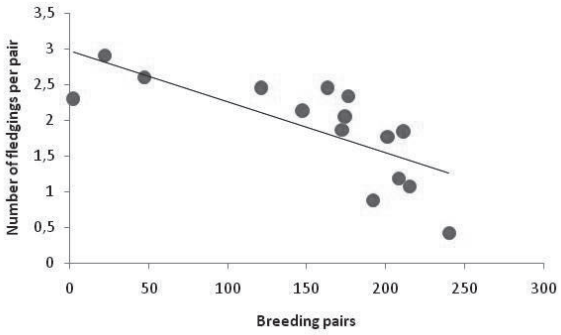

Fig. 6: Relationship between the size of one colony (NP Schiermonnikoog) and the production of fledging birds

Life history	**Breeding** The Spoonbill breeds in close proximity to shallow waters. The species is social, monogamous and sexually polygynous. Sexual dimorphism is slight (legs and bill size, de Voogt 2004). Pair formation occurs after arrival on the breeding grounds. Birds breed in large high density colonies, small colonies or alone, in reedbeds, on the ground or in shrubs or trees. Clutch size 2-6 eggs. Incubation 24-28 days. Chicks hatch some days apart; younger ones usually die if the food supply is poor. Fledging after 42 days. Mortality of eggs, chicks or young varied from 0 – 90%. After breeding almost 100% divorce (Overdijk, obs. pers). Males, females and their young disperse/migrate separately (Overdijk, obs. pers). Breeding may start as early as January in Spain, while it is not before March or April in the Netherlands. Southeastern European and Pannonian population usually starts breeding activity in March or mid-April and clutch size is 2-4 eggs. The last finish their	**Feeding** Alone or in social groups by day and night using shallow waters in alluvial or tidal wetlands, lakes, marshes and pastures. Diet composed of small fishes (sticklebacks) in freshwater, crustaceans (mainly shrimps), aquatic insects, frogs, leeches and other worms. In tidal areas mainly foraging during low tide. Birds need about 555 g of small fishes (fresh weight) per day (Kersten 1998). Sometimes in close co-operation with other fish-eating species such as cormorant, pelican and heron species. Interactions with cormorant, pelican and gull species (to steal or to eat waste food), are observed frequently during the feeding of juveniles by the adults. Grey Herons and Great White Egrets showed	**Outside breeding season** Migrates in large or smaller flocks or alone, rarely with other species (cormorants or herons observed). Spring migration starts in January and ends in mid-March or April. Autumn migration starts in August or September. Very small numbers winter in their natal area. Some disperse in nearby areas. Great difference in migratory strategy. Some make small steps (100-300 km) and rest for a few days at stop-over sites. Others make large steps (1,000-2,000 km) and stop for longer periods to recover. More birds of Atlantic population are wintering in the North than before (Overdijk 2002), probably in relation with the increase in numbers, the increase in quality of different sites in France and Spain, and possibly global warming.

	nesting in July. They breed in reedbed, usually next to little pools without vegetation, or on *Salix* bushes in Hungary. In Kazakhstan, inhabits steppe lakes with rich reedbeds, nests on trees along river channels, or bushes with shallow water nearby. Appears as early as mid-March, but usually only in April. Spring migration ends in mid-May. Settles in colonies, sometimes together with Grey Heron *Ardea cinerea*, Great Egret *Egretta alba* and Cormorant *Phalacrocorax sp*. Nest is built by both partners in reedbeds from reed stems, or in bushes and trees (willow) from dry twigs with some reed stems and leaves at a height of 2-7 m. Clutches of 3-5, more often 3-4 eggs in early May, but usually mid- May – early June. Juveniles hatch end of May – early June (Gavrilov & Gavrilov 2005). *P. l. archeri* breeds during or just after the rainy season from February until August/September. *P. l. balsaci* breeding starts in March and lasts until October or November. Breeds on volcanic rocky islands, on sandbanks and in mangroves. Nests made out of seagrass (*Zostera*) Garbage is used for nest-building, bird feathers and bones too.	cleptoparasitic activity against Spoonbills in Hungary (Pigniczki in press b). Spoonbills have been known to predate eggs from Lesser Black-backed Gulls (O. Overdijk, obs. pers). The west European population greatly depends on brackish habitats, most are intertidal ones, while central and eastern European birds mainly exploit fishponds and flooded areas after they return from their wintering sites in spring, and once again after the breeding season (Schneider-Jacoby 2002). Natron lakes are very important feeding areas especially in spring but from mid-summer dried out fishponds are the most important for Spoonbills (Hungary). In northern regions, the shallow sea does not contain fish when birds arrive in their nesting area as the seawater is still too cold. They need food resources in farmland, ditches or artificial lakes (fishponds) for early spring (Overdijk 1994).	

2. Available Key Knowledge

Survival rate and mortality factors are known for the Spanish and Dutch breeding populations. These are the best studied populations, but the bottlenecks for population development are still not known. A large gap in knowledge relates to the food situation for Spoonbills, especially about its availability at key wetlands present along the different flyways during the non-breeding season. In this context, although numbers are apparently influenced primarily by conditions in breeding or wintering areas (Newton 2004), many recent efforts have been made to clarify the influence of the conditions

experienced at stopover sites in population regulation of migratory waterbirds (e.g. Santoña Marshes for the Atlantic population; see Navedo 2005).

Atlantic Population	**Central Southeast European Population**	**Western Asian Population**	***P. l. archeri***	***P. l. balsaci***
Sensitive as during migration and winter, species is restricted to a few sites (O. Grove, Santoña marshes, Tajo Estuary, Ría Formosa, Guadalquivir marshes, Banc d'Arguin, Senegal Delta). During breeding restricted to three major sites. The current breeding distribution is the result of a long lasting historical decline.	Recovering from historical decline. Breeding sites of Pannonian population mostly on man-made wetlands, but feeding on temporary wetlands. South-east populations mainly use natural wetlands. Stop-over sites in the Balkans endangered, improving in Italy, unknown in Egypt and Sudan.	Status and population size are uncertain.	Small population size, declining. Breeding places are vulnerable to human disturbance. Low level of protection and knowledge, largely resident.	After 2000, major decrease: 750 breeding pairs in 2007. Total population size estimated at 2,800 in 2007, compared to ± 5,000 in 1997-2001. Generally, low breeding success. One main breeding colony. Mainly resident.

3. Threats

The main historic threat for Spoonbills is the loss of habitat for feeding and breeding. Feeding grounds have, over the years, been drained, regulated, empoldered, changed into intensive agricultural land or fish farms, abandoned, become overgrown by vegetational succession, lack of grazing or invasion by alien species, or used for recreation (disturbance) activities. Overfishing and water pollution also pose huge problems in some areas.

Breeding grounds are destroyed or abandoned by the species as a result of house building, or the management of water levels for agriculture, fish farming, industry, recreation, military activities and even forestry. In all cases, water management (usually drainage) is the key problem.

While Spoonbill habitat remains at risk throughout the range of the populations and subspecies under consideration in the present document, there is a growing acceptance of the need to preserve and restore Spoonbill habitats, and many major sites have been given protected status, notably: in the breeding area of the Atlantic population, in the breeding area of the Pannonian population, in the major West African sites of Banc d'Arguin, Diawling and Djoudj, in wintering areas in Tunisia, in some breeding areas in Turkey and southern Russia, in breeding and wintering grounds in Iran and in wintering areas in Pakistan and India. Nevertheless, there are still major areas where protected status is lacking or poorly applied, and much further work is needed.

In addition, particularly in Southeastern Europe and in the migration and wintering range of *P. l. major*, illegal hunting is a serious problem in some areas.

The highest non-natural cause of death in the Atlantic population during migration is poaching and collisions with electric power lines, especially in highly urbanized areas.

For the Central and Southeast European breeding population, most breeding areas now enjoy protected status, though some sites in Anatolia show a lack of protective measures. The principal threat on staging areas in the Balkans and Middle East is the heavy (generally illegal) hunting pressure, which causes direct mortality and also means that otherwise suitable feeding areas cannot be used because of disturbance; a shooting ban in Montenegro in spring 2006 (imposed because of the fear of Avian Influenza) led to increased numbers of Spoonbills using staging sites. Birds moving through Mesopotamia must also be exposed to illegal hunting.

Information is lacking on the conservation status of the breeding sites *P. l. major*, but it seems clear that, even where protected areas exist, funds for protective measures, monitoring and wardening are lacking. Little detailed information is available on hunting pressure in staging areas, but it appears highly likely that *P. l. major* Spoonbills are subjected to illegal hunting in migration routes through eastern Iran, Turkmenistan, Afghanistan and Pakistan.

Little information is available on threats to *P. l. archeri*, but it is clear that few of its breeding sites enjoy protected status and that such sites are open to predation and disturbance by fishermen and other visitors to breeding islands in the Red Sea. It is also likely that sites used outside the breeding season do not enjoy protected status, and that some birds are trapped and/or shot.

The source of the high mortality of *P. l. balsaci* recorded on the Banc d'Arguin over many years is still unknown. A high probability is predation by Jackal *Canis aureus* (i.e. in 2007, 43 of 45 young ringed birds were predated by Jackals within ten days ringing). Spoonbills breed on islands and Jackals can swim without difficulty. Jackals also breed on islands, sometimes in the middle of a Spoonbill colony. Another possibility is the increased frequency of flooding (due to sea level rise?) during extreme high tides. Other sources could be poisoning of vegetation (plankton) in the (warm) sea, because high mortality of other waterbird species was observed at the same time or predation by other bird species (Lesser Black-backed Gull, Slender-billed Gull). Further studies are necessary and some are underway.

Table II: Threats identified in each population/subspecies. Details of the main threats per country are given in Annex 2.

Critical	A factor causing or likely to cause very rapid declines (>30% over 10 years).	❶
High	A factor causing or likely to cause rapid declines (20-30% over 10 years).	❷
Medium	A factor causing or likely to cause relatively slow, but significant, declines (10-20% over 10 years).	❸
Low	A factor causing or likely to cause fluctuations.	❹
Local	A factor causing or likely to cause negligible declines.	❺
Unknown	A factor that is likely to affect the species but it is unknown to what extent.	⓪

	Problem	Description	*leucorodia (Atlantic)*	*leucorodia (Continental)*	*major*	*archeri*	*balsaci*
Migration	**Starvation (mainly juveniles)**	Juveniles arrive at unfamiliar sites and are not experienced enough to find food. Causes of problems: Farming operations, ducks hunting (France), uncontrolled tourism (canoe, dog walking, Wadlopen Netherlands), recreational shellfish collection, bird disturbing from fishponds (Israel, Croatia). Competition with individuals of the same species or with other fish feeders could add to the risk.	❸	❸	❸	⓪	❷
	Disorientation	No experience of where to go, getting lost (at sea) and dying. Cases from Cape Verde Islands.	❹				
	Collision with power lines	In river deltas with large ports or industry.	❸	❹	❹		
	Industrial spills	Bird feathers get dirty or food is polluted.	❺				
	Poaching	Direct mortality from illegal hunting, in the Balkans, in the area of the Caspian, and more especially in eastern Iran, Turkmenistan and Afghanistan.		❷	❷		
Wintering	**Starvation**	Not enough food available or they cannot find it in combination with disturbance. Causes: invasion of open water by plants (vegetation succession, invasive plant species), human settlements, overfishing, industrial and tourism development.	❷	❸ (SE) ❹ (SW)	❸		

	Problem	Description	*leucorodia (Atlantic)*	*leucorodia (Continental)*	*major*	*archeri*	*balsaci*
	Run-off of agricultural chemicals (in particular DDT)	DDT is still in use in rice cultures in Africa where birds may feed. DDT is stored in their body fat and found later later in embryos and chicks. When food availability is limited, the body fat will be used and birds are less alert. They die because of secondary causes of death (shot, collisions with power lines).	❹	❺	❹	⓪	⓪
	Competition	Food competition at certain wintering sites with congenerics or individuals of other species.	❺				
	Poaching	Birds are killed or wounded. Direct mortality from illegal hunting, notably in Egypt, also in Sudan (subsistence hunting) and Pakistan. Weak legislation on protection and little application of existing legislation.	⓪	❸ (SE) ❺ (SW)	❷	❸	
	Loss of habitat	Food competition at neighbouring sites. Dredging for navigation (Seine Estuary, Santoña, Spain), river diversion (irrigation), land reclamation (construction of infrastructures for tourism, fruit plantations, agriculture (Nile Delta), intensive fish-farming, water regime regulation (water transfers, dams).	❸	❷	❸		
	Disturbance	Loss of condition (no food or no sleep) and loss of energy (birds fly away in panic) and if they move to other sites, food competition. Causes: hunters, insensitive ecotourism, motorised shepherds, Jackals and feral dogs, firewood cutting.	❸	❸	❸	❹	⓪

	Problem	Description	*leucorodia*	*leucorodia*	*major*	*archeri*	*balsaci*
Reproduction	**Collision with power lines**	Birds collide with lines (they cannot judge the distance) and are hurt in the breast area or break their legs. They die sooner or later.	❸	❹	❹		
	Botulism/ cyanotoxins/ parasites	Mostly directly after fledging when the temperatures are quite high and botulism can break out among other waterbirds as well. Some tens or hundreds of birds may die very quickly. Depends heavily on the type of parasites and most are in the feathers. Birds spend a long time removing the parasites with their bill and while doing so, they cannot sleep or feed. Their body mass decreases and they may die.	❷	❺	❺	❺	❺
	Heavy rain and hail-storms in spring	Adult birds cannot leave the eggs or new born chicks alone to go to feed. If these weather conditions continue, adults have to feed and chicks become cold and wet and die in few days.	❷	❹	❹		
	Poaching	Birds are shot by poachers and are killed or wounded, mostly during feeding.		❺	❺	⓪	
	Starvation after fledging	After fledging the parents nurse the chicks for a short time and then family relation ends. The juveniles are left to be independent: some juveniles are able to find food, others not and these suffer or die. The causes are overfishing (shrimps), restricted migration of seafish to inland waters, possibly competition for food.	❸	❸	❸	⓪	
	Invasive plant species	In Doñana, invasion of *Azolla filiculoides.* In the Senegal Delta, *Typha*.	❸				
	Predation	Mainly unfledged juveniles are killed by the predator. Some predators also destroy eggs. Adults are not caught or only small numbers. Fox, wild Boar, Jackal.	❸	❹	❹	❹	❶

	Problem	Description	*leucorodia*	*leucorodia*	*major*	*archeri*	*balsaci*
	Flooding	Nests flood or eggs disappear from the nests. Small chicks can may get cold and die later. Sometime secondary predation by gulls occurs.	❷	❸	❸	⓪	❷
	Future effect of sea level rise and climate change	Reproduction will decrease or cease altogether.. Adult birds winter further to the north, with possible food problems. Sea level rise will affect (the number of) flooding events, the breeding sites and loss of existing feeding habitats; however, new habitats may be created. Global warming could cause drought in the Pannonian and Anatolian region, and could lead to loss of breeding and feeding areas.	❷	❷			❶
	Pollutants	Oil spills: oil may cover the breeding site. Birds cannot feed in the neighbourhood and get dirty. Pollutants: birds are less fertile, thus lower production or their body fat is polluted which will have effects during migration when using this body fat.	❸	❺	❺		❺
	Lack of water (drought, drainage)	Breeding areas are not protected by the water anymore and predators can come easily to the colonies. No feeding areas for the inland population, or the adults should fly large distance. Feeding areas overgrown by reed, and other vegetation. Spoonbills are not able to look for food on that site, so they have to fly longer distances to look for food, it costs more energy and results in a decrease in the number of chicks. Drought may affect but in a Mediterranean climate it does not cause a significant decline unless occurring continuously over many years. Fishpond abandonment and land reclamation are two other problems.	❷	❸	❸		

	Problem	Description	*leucorodia*	*leucorodia*	*major*	*archeri*	*balsaci*
	Loss of trees for nesting	Nests in trees are safe against ground predators. If lost, adults must build their nests in a less safe place. Colonial birds contribute to the death of trees, in Doñana and other colonies.	❷	❺			
	Competition for nesting places (Cormorant, large Gulls)	Adults need to spend energy in defending their nest (materials) and when they are chasing a competitor they abandon the nest which may be damaged by other birds. The faeces of Great Cormorants destroy the breeding habitat within 2-3 years.	❺	❹	❹		
	Disturbance	Tourism (including bird watchers): disturbance at breeding or feeding sites. Agricultural work also causes disturbance at feeding sites especially in early spring. Fisheries: food competition and disturbance at feeding sites. Exercises by military aircraft: this kind of disturbance is dangerous when planes fly above the colony for a long time, and the parents start to fly around the colony. It may cause the death of the eggs or small chicks, if the weather is rainy or/and cold.	❸	❹	❷		❺
	Overfishing	No food or less food available. Disturbance at feeding sites.					❷
	Urban and industrial development	Loss of habitat (bridges, wind farms...). Suboptimal water levels (flooding, varying levels, drought, shortage of freshwater). Drainage of feeding waters. Breeding habitats (wetlands) are degraded by water regime intervention, mainly for intensive agriculture.	❷	❷			
	Burning and cutting of reed	Loss of breeding habitat. Loss of nests when burning is carried out in breeding season.		❹			
	Isolated population	Inbreeding. No immigrants.					⓪

4. Treaties, Legislation and Policies Relevant for Management

The Spoonbill is classified as being of "Least Concern" in the 2006 IUCN Red List of Threatened Species, indicating that it has been evaluated but does not qualify for any other category.
If the IUCN criteria are applied at subspecies/population level, *P. l. archeri* should be assessed as belonging to the category "Vulnerable" as it has declined up to 50% in the last ten years.

The present studies of *P. l. balsaci* indicate that this subspecies should be considered as "Endangered" due to its sharp decline in the last ten years.

The following section briefly reviews the obligations of the Range States arising from the major international conventions and agreements. The species is also affected by national conservation legislation and policies.

4.1. International Directive, Conventions and Agreements

4.1.1. At European Union level: Bird Directive

The terms of reference for the application are given in paragraphs 1 and 2 of Article 4 of the Directive, which is given in full below:
1. The species mentioned in Annex I shall be the subject of special conservation measures concerning their habitat in order to ensure their survival and reproduction in their area of distribution. In this connection, account shall be taken of:
(a) species in danger of extinction;
(b) species vulnerable to specific changes in their habitat;
(c) species considered rare because of small populations or restricted local distribution;
(d) other species requiring particular attention for reasons of the specific nature of habitat.
Trends and variations in population levels shall be taken into account as a background for evaluations.
Member States shall classify in particular the most suitable territories in number and size as special protection areas for the conservation of these species, taking into account their protection requirements in the geographical sea and land area where this Directive applies. In this respect, Special Protection Areas have to be established to assist conservation measures. According to article 6, Member States shall take appropriate steps to avoid, in the special areas of conservation, the deterioration of natural habitats and the habitats of species as well as disturbance of the species for which the areas have been designated, in so far as such disturbance could be significant in relation to the objectives of this Directive.

4.1.2. The Convention on the Conservation of European Wildlife and Natural Habitats (Bern Convention)

Annex II: Special protection (appropriate and necessary legislative and administrative measures) for the animal taxa listed, including:

- All forms of deliberate capture and keeping and deliberate killing;
- The deliberate damage to or destruction of breeding or resting sites;
- The deliberate disturbance of wild fauna, particularly during the period of breeding, rearing and wintering, in so far as disturbance would be significant in relation to the objectives of this Convention;
- The deliberate destruction or taking of eggs from the wild or keeping these eggs even if empty;
- The possession of and internal trade in these animals, alive or dead, including stuffed animals and any readily recognisable part or derivative thereof.

4.1.3. Convention on the Conservation of Migratory Species of Wild Animals (CMS)

Annex II of the Bonn Convention

This Appendix refers to migratory species that have an unfavourable conservation status or would benefit significantly from international co-operation organised by tailored agreements. The Convention encourages the Range States to conclude global or regional Agreements for the conservation and management of individual species or, more often, of a group of species listed in Appendix II.

4.1.4. The Agreement on the Conservation of African-Eurasian Migratory Waterbirds (AEWA)

The taxa in Column A Category 1 meet one or more of the following criteria:

Category 1: (a) Species which are included in Appendix I to the Convention on the Conservation of Migratory species of Wild Animals;

(b) Species which are listed as threatened in Threatened Birds of the World (BirdLife International 2000); or

(c) Populations which number less than around 10,000 individuals.

Category 2: Populations whose numbers are comprised between 10,000 and 25,000 individuals.

Table III: Classification of the different Spoonbill populations/subspecies according to their numbers

Populations/Subpecies	Population covered by the SSAP	Table 1 Column A	Global Conservation Status
Platalea leucorodia leucorodia	Western Europe & Northwest Africa	2	LC
Platalea leucorodia leucorodia	Central. & Southeastern Europe/Mediterranean, Mesopotamia and Sub-Saharan Africa	2	
Platalea leucorodia major	West Asia/Southwest & South Asia	2	
Platalea leucorodia archeri	Red Sea & Somalia	1c	
Platalea leucorodia balsaci	Coastal West Africa (Mauritania)	1c	

4.1.5. Ramsar Convention on Wetlands

The Convention on Wetlands provides the framework for the conservation and wise use of wetlands and their resources through local conservation activities.

The Convention requires that each Contracting Party should designate at least one suitable wetland within its territory for inclusion in a List of Wetlands of International Importance maintained by the Ramsar Bureau, but the parties are encouraged to designate all wetlands of international importance meeting the Ramsar criteria.

The Convention establishes guidelines for the formulation and implementation of national wetland management and conservation policies, including establishing inventories of wetlands, determining

priorities for each site, requiring impact studies for all projects that may affect wetlands, regulating the use of wild flora and fauna to avoid over-exploitation, and drafting legislation that encourages wetland conservation, taking into account international responsibilities for the conservation, management and wise use of migratory stocks of waterfowl.

4.1.6. Convention on International Trade in Endangered Species of Wild Flora and Fauna (CITES)

The 'Washington' Convention on International Trade in Endangered Species of Wild Fauna and Flora, more commonly known as CITES, aims to protect certain plants and animals by regulating and monitoring their international trade to prevent it reaching unsustainable levels.

The Spoonbill is listed in Appendix II, which lists species that are currently not necessarily threatened with extinction but may become so unless trade is closely controlled. International trade in specimens of Appendix II species may be authorized by the granting of an export permit or re-export certificate.

4.2. National Institutions, Laws and Policies Affecting Bird Conservation

There is a wide diversity of situations relating to institutions and laws dealing with bird protection in the countries covered by the species range. Some countries have no bird protection administration at all, while in others, the responsible body for the protection is either in the Ministry of Environment or it is linked to other offices (forestry, agriculture, even interior).

Surprisingly, the species is not protected everywhere. The Atlantic, Central and Southeastern European breeding populations are fully covered by legislation. The West Asian breeding population is protected almost everywhere. The *archeri* subspecies does not benefit from any real legal protection. In some African countries, the Eurasian Spoonbill is not protected, but it benefits from confusion with the African Spoonbill *Platalea alba* which is protected there.

Table IV: The legal status of the different populations/subspecies

	Protected	**Not protected**	**Unknown**
Atlantic breeding population	12	0	3
Central & Southeast European breeding population	31	4	0
Western Asian breeding population	10	2	3
P. l. archeri	4	2	1
P. l. balsaci	1	0	0

5. Framework for Action

The aim of this Action Plan is to improve the conservation status of the different populations of Spoonbills and in particular to meet the measures below.
Some priorities do not follow the criteria, but as monitoring or estimations will not prevent the population decline, it is essential to find the best measures which will really prevent the decline.

***P. l. leucorodia* Atlantic population**
Belgium, Cape Verde, Denmark, France, Gambia, Germany, Luxembourg, Mauritania, Morocco, Netherlands, Portugal, Senegal, Spain, Sweden, United Kingdom.

***P. l. leucorodia* Central and SE European population**
Albania, Algeria, Austria, Bosnia, Bulgaria, Burkina Faso, Cameroon, Chad, Croatia, Czech Republic, Cyprus, Dem. Rep. Congo, Egypt, Greece, Hungary, Israel, Italy, Jordan, Kenya, Lebanon, Libya, Macedonia FYR, Mali, Malta, Moldova, Montenegro, Niger, Nigeria, Poland, Romania, Serbia, Slovakia, Slovenia, Sudan, Tunisia, Turkey, Uganda, Ukraine.

P. l. major
Armenia, Azerbaijan, Bahrain, Belarus, Georgia, Iran, Iraq, Kazakhstan, Kuwait, Oman, Qatar, Russia, Syria, Tajikistan, Turkmenistan, United Arab Emirates, Uzbekistan.
Countries outside the Agreement area: India, Pakistan.

P. l. archeri
Djibouti, Eritrea, Egypt, Saudi Arabia, Somalia, Sudan, Yemen, Ethiopia.

P. l. balsaci
Mauritania.

Significance of the symbols used in the following tables

Critical	Result needed to prevent a major decline in the population, which could lead to extinction.	❶
High	Result needed to prevent a decline of more than 20% of the population in 20 years or less.	❷
Medium	Result needed to prevent a decline of less than 20% of the population in 20 years or less.	❸
Low	Result needed to prevent local population declines or events likely to have only a small impact on the population across the range.	❹
Not a priority	Local measure which has no significant impact on the population.	❺

Key to time scale criteria:
🔔🔔🔔 **Short:** to be completed within the next 1-3 years
🔔🔔 **Medium:** to be completed within the next 1-5 years
🔔 **Long:** to be completed within the next 1-10 years

NCA National Conservation Authorities
GNG Governmental and non-governmental conservation organisations
NRA National and regional authorities and non-government conservation organisations
SI Scientific institutions
PAM Protected areas managers

Table V: The long and short term targets for the different populations/subspecies

	Long term target	**Short term target**
Atlantic breeding population	Maintain and increase current population size and promote conditions which will help expansion in Western Europe towards former breeding range or expansion of the breeding range in Central Europe, taking account of any possible effect on the *balsaci* subspecies.	The combination of survival and reproduction rates is sufficient to maintain a growing population.
Central and South-East European breeding population	Increase the breeding population in order to recolonise all suitable wetlands.	The combination of survival and reproduction rates is sufficient to maintain a growing population.
West Asian "*major*" population	Increase the breeding population in order to recolonise all suitable wetlands.	The combination of survival and reproduction rates is sufficient to maintain a growing population.
Red Sea "*archeri*" subspecies	Remove the subspecies from its present vulnerable status by increasing the size of the population to 3,000 breeding pairs (i.e. 10,000 individuals).	The decline of the population is arrested and increased by 20% compared to 2007 level.
Mauritanian "*balsaci*" subspecies	Restore the population to at least 1,400 breeding pairs or 3,000 mature individuals with enough reproduction to ensure a stable population.	The combination of survival and reproduction rate is sufficient to maintain a growing population. A 5-year average reproduction rate of 1.4 fledged young per breeding pair is maintained.

This aim will be achieved by actions applied at different levels.

At the species level

Objective	Activities	Priority
Coordinated research and monitoring	Continue and expand the internationally coordinated colour marking scheme as the crucial tool for determining and monitoring survival rates and metapopulation structure, investigate possibilities of satellite telemetry, and apply results.	❷
	Maintain a central / coordinated database to collect, store and analyse data on metal and colour rings, count data, survival rate and breeding success.	❷
	Develop standardised methodology for monitoring.	❷
	Count breeding pairs at key colonies and wintering birds on an annual basis.	❷
	Use recent techniques and models to analyse the trends in the populations (i.e. TRIM, MARK programmes, etc).	❸
	Adapt the International Single Species Action Plan to each country.	❷
Increased awareness about the need for collaboration between countries along the flyways **Networking** **Use the species as flagship**	Strengthen and expand activities of the International Spoonbill Working Group and encourage exchange of experience between the personnel of key sites.	❸
	Organise regional meetings in Montenegro (2009) and in Tunisia (2011).	❸
	Produce an AEWA poster.	❸
	Develop a new travelling exhibition.	❹
	Encourage fundraising activities to support Spoonbill conservation (e.g. adoption of birds/key sites).	❸
	Improve collaboration between countries along the Central Asian Flyways.	❸
	Increase education and public awareness of the Spoonbill, related species and wetlands.	❸
Training	Organise training courses in management techniques for staff of protected areas.	❷
	Organise training courses in monitoring techniques for observers (volunteers and wardens).	❷
	Organise training courses in nature-friendly fishpond management for fishpond owners.	❷

At population and subspecies level

Aim	The Action Plan	Activities	Success Indicators	Sources of Validation	Responsible organisations	*lecorodia (Atlantic)*	*leucordia (Continental)*	*major*	*archeri*	*balsaci*
Survival rate is sufficient to maintain a growing population.	Designate the species as protected in all countries along the flyways in all the Range States.	Authorities responsible for the conservation of the species are identified, and convinced of the need to protect the species.	The subspecies are protected in all countries.	A national protection law is approved in all countries.	NCA			❶	❶	
	Maintain the integrity of the coastal ecosystem at Banc d'Arguin.	Environmental Impact Assessment (EIA) of activities in surrounding area is effective (industrial shellfishing).	Regular measures of prey densities.	Banc d'Arguin National Park database.	NCA					❷
	Designate and maintain key breeding, feeding and stop-over sites as Protected Areas (European Union Special Protection Areas in EU countries) and Ramsar sites.	Implementation of national politics for wetlands conservation. Use IBA and Ramsar criteria for designation.	Protected area status of sites listed in the Annex of the action plan is maintained and sites stay in good ecological conditions.	The lists of protected areas and of Ramsar sites are improved.	NCA	❸	❷	❷	❶	

Aim	The Action Plan	Activities	Success Indicators	Sources of Validation	Responsible organisations	*lecorodia (Atlantic)*	*leucordia (Continental)*	*major*	*archeri*	*balsaci*
	Restore former feeding areas and prevent drainage of existing feeding areas.	Give priority to known and threatened sites. In Senegal, a priority must be to restore the Guembeul reserve.	Lower mortality due to natural causes.	National reports.	GNG	❷ 🔔🔔	❷ 🔔🔔	❷ 🔔🔔	❷ 🔔🔔	❷ 🔔🔔
	Prevent overgrowth of feeding areas by management of vegetation succession and/or invasive plants.	Develop training sessions about invasive plants species for wetlands managers and integrated management of sites, including the vegetation aspects.	Decrease in the number of overgrown sites by vegetation.	National reports.	GNG	❷ 🔔🔔	❷ 🔔🔔	❷ 🔔🔔		
	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	Reduce disturbance through information, education and surveillance and visitor management.	Lower mortality due to natural causes.	Database of ornithological ringing stations.	GNG	❸ 🔔	❷ 🔔	❷ 🔔	❷ 🔔	❷ 🔔

Aim	The Action Plan	Activities	Success Indicators	Sources of Validation	Responsible organisations	*lecorodia (Atlantic)*	*leucordia (Continental)*	*major*	*archeri*	*balsaci*
	settlements and infrastructures, development, regulation of rivers).	Include site and species conservation in any project of development. Investigate the impact of oil exploration, exploitation and transport on key sites and survival and take appropriate mitigation measures. Forbid gravel extraction in and around key wetlands.								
	Maintain the area of fishponds managed extensively in Central Europe, and adjust their management to the needs of the species.	Promote integrated management of fishponds.	Number of colonies and number of breeding pairs on fishponds.	Database of Ornithological Associations.	GNG		❷	❷		

Aim	The Action Plan	Activities	Success Indicators	Sources of Validation	Responsible organisations	*lecorodia (Atlantic)*	*leucordia (Continental)*	*major*	*archeri*	*balsaci*
	Develop management plans for key breeding, feeding and stop-over sites.	Strengthen staff capacity at protected areas both for administrative and surveillance tasks. Provide assistance for planning and management of key sites.	All key sites have a management plan.	Data on each site are updated in the IBA and the Ramsar databases.	GNG	❸	❷	❷	❷	
	Reduce mortality caused by collision with overhead power lines.	Identify critical sections of powerlines. Replace existing lines with underground cables or mark them with warning signs obvious to flying birds where necessary. Avoid sitting new lines near	Fewer birds are found beneath overhead power lines.	Database of ornithological ringing stations.	NRA	❷	❸	❸		

Aim	The Action Plan	Activities	Success Indicators	Sources of Validation	Responsible organisations	*lecorodia (Atlantic)*	*leucordia (Continental)*	*major*	*archeri*	*balsaci*
		breeding or feeding areas through Environmental Impact Assessment (EIA).								
	Reduce direct mortality caused by poaching.	Enforce nature policy. Information in hunting magazines is regular. Provide information, education and surveillance at key sites. Stop spring hunting in all countries along the flyways. Designate no-hunting zones at key sites.	Fewer birds are found dead, killed by poachers.	Database of ornithological ringing stations.	NCA	❹	❷	❷	❷	

Aim	The Action Plan	Activities	Success Indicators	Sources of Validation	Responsible organisations	*lecorodia (Atlantic)*	*leucordia (Continental)*	*major*	*archeri*	*balsaci*
	Reduce direct mortality caused by toxins.	Create an early warning system that helps to detect early cyanotoxin blooms so appropriate management can be carried out (remove dead birds, manage water levels).	Decrease in this semi-natural cause of mortality.	Database of ornithological ringing stations.	NCA	❸	❹	❸	❸	❷
	Phase out organochlorines (especially DDT) along the entire migratory flyways.	Monitor level of pollutants in eggs, chicks and dead birds.	Decrease in the intensity of non natural causes of mortality.	Database of ornithological ringing stations.	NCA	❷				❷
Reproduction rate is sufficient to support an increase in the population to the target level.	Restore wetlands for breeding, maintain adequate water level at colonies and create water supply systems.	Conduct a strategy for protecting wetlands and waterbirds, in particular in and around existing colonies.	Increase in the number of appropriate breeding sites.	Data on each site are updated in the SPA, IBA and the Ramsar databases.	GNG, NCA	❷	❸	❷		

Aim	The Action Plan	Activities	Success Indicators	Sources of Validation	Responsible organisations	*lecorodia (Atlantic)*	*leucordia (Continental)*	*major*	*archeri*	*balsaci*
	Protect colonies threatened by flooding.	Use measures appropriate to fit local conditions (if there is higher risk of flooding with sea level rise). Manage fishponds for conservation or through integrated management.	Reduced mortality due to natural causes.	Database of ornithological ringing stations.	GNG	❸	❸		❷	❶
	Preserve colonies from burning and cutting reed, by avoiding such activities around colonies.	Cut reed on a 3-year plan and prohibit cutting and burning during breeding period.	Colonies in reedbeds increase their breeding success.	Database of Ornithological Associations.	GNG		❸	❷		
	Take measures to protect threatened colonies against excessive predation (notably by fox, wild boar or jackal).	Study the best way to do so and use appropriate means.	Reduced mortality due to natural causes.	Database of protected areas (for measures) and of ornithological ringing stations.	NCA	❹	❹	❷	❷	❶

Aim	The Action Plan	Activities	Success Indicators	Sources of Validation	Responsible organisations	*lecorodia (Atlantic)*	*leucordia (Continental)*	*major*	*archeri*	*balsaci*
	Manage competing species if necessary and appropriate.	Try to understand of the relation between the species and the Sacred Ibis. Study the real impact before any possible intervention (*Larus michahellis).* Study the possible competition between *P. l. leucorodia* and *P. l. balsaci.*	Increase in numbers of breeding pairs in colonies.	Database of Ornithological Associations.	GNG, SI	❹ 🕭🕭	❺ 🕭🕭🕭	❹ 🕭🕭🕭	❷ 🕭🕭🕭	❶ 🕭🕭🕭
	Protect nesting colonies from disturbance.	Protect by restricted/ prohibited access or by visitor management. Increase surveillance in order to reduce disturbance factors by public, land-users,	Fewer birds found dead. Increase in the breeding success, decrease in nest abandonment or colony desertion rate.	Annual checks of the colonies.	PMA, NGN	❷ 🕭🕭🕭	❷ 🕭🕭🕭	❷ 🕭🕭🕭	❷ 🕭🕭🕭	❹ 🕭🕭🕭

Aim	The Action Plan	Activities	Success Indicators	Sources of Validation	Responsible organisations	*lecorodia (Atlantic)*	*leucordia (Continental)*	*major*	*archeri*	*balsaci*
		fisherman, reedcutters, farmers and other factors. Change flying techniques for military planes above the colonies in breeding season.								
Key gaps in knowledge necessary for more effective conservation of the population are filled.	Determine and monitor breeding success and calculate the values necessary to meet the target in relation to survival rate.	Use the same methods in the different countries.	Breeding success known from different colonies of each population.	Annual reports published in the Spoonbill Newsletter.	SI	❷	❷	❷	❸	❶
	Determine and monitor survival rate through colour ringing and satellite telemetry.	Use the same methods in the different countries.	Survival rate known from different colonies of each population.	Scientific publications.	SI	❷	❷	❷	❸	❶
	Identify limiting factors with a view to promoting further expansion of the breeding range and to creating an early warning	Use the same methods in the different countries.	Increase in numbers of colonies and of breeding pairs.	Annual National reports on breeding.	SI	❷	❷	❷		

Aim	The Action Plan	Activities	Success Indicators	Sources of Validation	Responsible organisations	*lecorodia (Atlantic)*	*leucordia (Continental)*	*major*	*archeri*	*balsaci*
	system against potential threats.		in colonies.	colonies.						
	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).	Develop and update the database in annex of the action plan, through surveys in poorly known sites. Develop local and coordinated studies on site occupancy by birds in different conditions.	Increase in the known number of sites and of wintering birds.	Wetlands International database.	SI	❷	❸	❷	❷	❷
	Identify any potential age and gender differences in use of stop-over and wintering sites.	All key sites participate in the study.	Better knowledge of the role of the sites and development of adequate measures in a framework of optimal migration.	Scientific publications.	SI	❸	❸	❷		

Aim	The Action Plan	Activities	Success Indicators	Sources of Validation	Responsible organisations	*lecorodia (Atlantic)*	*leucordia (Continental)*	*major*	*archeri*	*balsaci*
	Determine migratory status and the migratory flyways (study movements during non-breeding season using colour-ringing and satellite tracking).	Use the same methods in the different countries.	Better knowledge of all the sites used by the species during its migrations.	Scientific publications.	SI	❹ 🔔	❷ 🔔	❷ 🔔	❷ 🔔	❷ 🔔
	Complete full survey for breeding areas (Turkey as a priority).	Develop networks of observers.	Number of breeding sites, number of breeding pairs, breeding success.	National reports and publication in the Spoonbill Newsletter.	SI		❷ 🔔🔔🔔	❷ 🔔🔔🔔		
	Study the sensitivity of Spoonbill to disease and toxins.	Monitor disease outbreaks and identify causes of mortality (botulism, cyanotoxins, avian flu etc). Check veterinary state by regular sampling (blood, feather).	Better knowledge of potential mortality factors.	Scientific publications.	SI	❸ 🔔🔔				
	Identify key mortality factors and hot spots.	Investigate the impact of oil exploration,	Predictions of single and multisite	Scientific publications.	NGN	❷ 🔔🔔🔔	❸ 🔔🔔🔔	❷ 🔔🔔🔔	❷ 🔔🔔🔔	❷ 🔔🔔🔔

Aim	The Action Plan	Activities	Success Indicators	Sources of Validation	Responsible organisations	*lecorodia (Atlantic)*	*leucordia (Continental)*	*major*	*archeri*	*balsaci*
		exploitation and transport on key sites and species survival and take appropriate mitigation measures.	models help to determine appropriate measures to apply on different sites.							
	Collect and analyse genetic samples (Turkey, Hungary). Clarify the delineation between "*P. l. major*" and Central and South East European populations.	Use the same methods in the different countries.	Analysed number of colonies and individuals birds.	Scientific publications.	SI		❷	❹		
	Study the feeding ecology of the species.	Use the same methods in the different countries.	Prey, feeding and ingestion rate, according to the prey species.	Scientific publications.	SI	❸	❹	❹	❹	❹

Measures by Countries

When no score is given, it is necessary to use the population/subspecies score

***P. l. leucorodia* (Atlantic)**

❶ **Critical:** Result needed to prevent a large decline in the population, which could lead to extinction. ❷ **High:** Result needed to prevent a decline of more than 20% of the population in 20 years or less. ❸ **Medium:** Result needed to prevent a decline of less than 20% of the population in 20 years or less. ❹ **Low:** Result needed to prevent local population declines or events likely to have only a small impact on the population across the range. ❺ Not a priority	**Belgium**	**Denmark**	**France**	**Germany**	**Morocco**	**Netherlands**	**Portugal**	**Spain**	**Senegal**
Designate and maintain key breeding, feeding and stop-over sites as Protected Areas (European Union Special Protection Areas in EU countries) and Ramsar sites.			❸		❸		❸		❷
Restore former feeding areas and breeding sites and maintain the sites in good ecological conditions (esp. in favourable hydrological conditions and water quality).	❷	❹	❷	❹	❷	❷	❷	❸	❷
Prevent overgrowth of feeding areas by management of vegetational succession and/or invasive plants.								❷	❶
Take measures to limit activities which may reduce the availability of food (e.g. overfishing, disturbance (including bird disturbing at fishponds, shellfish collection), constructions which may limit movement of prey species, wind farms, gravel mining, intensive fish farms, human settlements, infrastructures).	❸	❹	❸	❹	❸	❸	❸	❷	❸
Develop management plans for key feeding and stop-over sites addressing off-site threats at basin-level (e.g. pollution, water regime).	❸	❹	❸	❹	❸	❸	❸	❸	❸
Reduce mortality caused by collisions with overhead power lines.	❷	❹	❷	❹	❷	❷	❷	❷	
Reduce direct mortality caused by poaching.			❹						
Reduce direct mortality caused by toxins.								❸	
Phase out organochlorins (especially DDT) along the entire flyways.									❷
Restore wetlands for breeding, maintain adequate water level at colonies and create water supply systems.	❷		❷			❷	❷	❷	
Protect colonies threatened by flooding.						❸		❶	
Take measures to protect threatened colonies against excessive predation.		❹	❹	❹		❹	❹	❸	
Manage competing species if necessary and appropriate.		❹	❹	❹		❺	❺	❺	
Reduce disturbance through information, education and surveillance and visitor management.	❷	❹	❷	❹	❷	❷	❷	❷	❷
Determine and monitor breeding success and calculate the value necessary to meet the target in relation to survival rate.	❷	❹	❷	❹	❷	❷	❷	❷	❷
Determine and monitor survival rate necessary to achieve the desired population growth through colour ringing and satellite telemetry.		❹	❷	❹		❷	❷	❷	
Identify limiting factors for each breeding sub-population with a view to promoting further expansion of the breeding range and to creating an early warning system against potential threats.		❹	❷	❹		❷	❷	❷	
Identify additional wintering and stop-over areas along the flyways.			❷		❷		❷	❷	❷
Identify any potential age and gender differences in use of stop-over and wintering sites.			❸		❸		❸	❸	❸
Determine migratory status and the migratory flyways (Study movements during non-breeding season using colour-ringing and satellite tracking).	❸	❹	❸	❹	❸	❸	❸	❷	❸
Study the sensitivity of spoonbill to disease and toxins.		❹	❸	❹		❸	❸	❸	
Identify key mortality factors and hot spots.	❷	❹	❷	❹	❷	❷	❷	❷	❷
Study the feeding ecology of the species.	❸	❹	❸	❹	❸	❸	❸	❸	❸

***P. l. leucorodia* (Continental)**

	Albania	Austia	Bosnia	Bulgaria	Croatia	Czech Republic	Greece	Hungary	Italy	Moldova	Montenegro	Romania	Serbia	Slovakia	Turkey	Ukraine	Algeria	Cyprus	Israel	Jordan	Libya	Macedonia FYR	Malta	Tunisia
Designate and maintain key feeding and stop-over sites as Special Protection Areas and/or Ramsar sites.	❹		❷	❷	❹					❺	❷	❷	❷	❷	❷	❷	❷		❷	❷	❷	❷		❷
Restore former feeding areas and breeding sites and maintain the sites in good ecological conditions (esp. in favourable hydrological conditions and water quality).	❷	❷	❷	❷	❷		❷	❷	❷	❶	❷	❷	❷	❷	❷	❷	❸	❷	❷	❷		❷		❷
Prevent overgrowth of feeding areas by management vegetational succession and/or invasive plants.	❸	❷		❹	❷		❶	❸		❺			❷						❺	❸		❸		
Take measures to limit activities which may reduce the availability of food (e.g. overfishing, disturbance (including bird disturbing at fishponds, shellfish collection), constructions which may limit movement of prey species, wind farms, gravel mining, intensive fish farms, human settlements, infrastructures, regulation of rivers).	❸		❷	❷	❶		❷	❷	❷	❷	❷	❷	❷	❷	❷	❷	❹		❷	❷		❸		
Maintain the area of extensively managed fishponds and adjust their management to the needs of the species.	❸		❷	❸	❶			❷		❸		❷	❶	❷			❹		❸	❷		❷		
Develop management plans for key feeding and stop-over sites addressing off-site threats at basin-level (e.g. pollution, water regime).	❸	❷	❷	❷	❷			❷	❷	❷	❷	❷	❷	❷	❷	❷	❷		❷	❶	❷	❷		❷

	Albania	Austia	Bosnia	Bulgaria	Croatia	Czech Republic	Greece	Hungary	Italy	Moldova	Montenegro	Romania	Serbia	Slovakia	Turkey	Ukraine	Algeria	Cyprus	Israel	Jordan	Libya	Macedonia FYR	Malta	Tunisia
Reduce mortality caused by collisions with overhead power lines.	❹	❸	❸	❸	❷	❸	❸	❸	❸	❸	❸	❸	❸	❸	❸	❸	❸	❸	❺	❸	❸	❸	❹	❸
Reduce direct mortality caused by poaching.	❶	❷	❷	❸	❷		❶	❸	❸	❺	❷	❷	❸	❷	❷		❷	❷	❺	❶	❷	❷	❹	
Reduce direct mortality caused by toxins.	❹		❹	❹	❹		❹	❹	❹	❷	❹	❹	❹		❹	❹			❺			❷		
Restore wetlands for breeding, maintain adequate water level at colonies and create water supply systems.	❸	❸	❸	❸	❸	❸	❸	❸	❸	❸	❸	❹	❸	❷	❸	❸	❸		❺	❸	❸	❷		❸
Protect colonies threatened by flooding of fishponds, either by managing them solely for conservation or through integrated management of fishponds.	❸			❹	❹			❹		❺			❶	❶					❺			❹		
Preserve colonies from burning and cutting of reed through avoiding such activities around colonies.	❷			❸	❹			❸		❷		❸	❷	❷					❺			❷		
Take measures to protect colonies against predation.				❷	❷	❷	❷	❷	❷			❷	❷		❷	❷								
Manage competing species if necessary and appropriate.								❺		❺			❹						❺			❷		
Reduce disturbance through information, education and surveillance and visitor management.	❶	❷	❷	❷	❷			❷	❷	❸	❶	❷	❷	❸	❷	❷	❷		❺	❸		❷		
Determine and monitor breeding success and calculate the value necessary to meet the target in relation to survival rate at key colonies and/or at post breeding gathering sites.				❷					❷	❹			❹	❸		❷								

	Albania	Austia	Bosnia	Bulgaria	Croatia	Czech Republic	Greece	Hungary	Italy	Moldova	Montenegro	Romania	Serbia	Slovakia	Turkey	Ukraine	Algeria	Cyprus	Israel	Jordan	Libya	Macedonia FYR	Malta	Tunisia
Determine and monitor survival rate through colour ringing and satellite telemetry.	❷	❷	❷	❷	❷		❸	❷	❷	❸		❷	❸		❹									
Identify limiting factors for each breeding sub-population with a view to promoting further expansion of the breeding range and to creating an early warning system against potential threats.	❷	❷	❷	❷	❷	❷	❷	❷	❷	❷	❷	❷	❷	❷	❷	❷	❷	❷	❷	❷	❷	❷	❷	❷
Identify additional wintering and stop-over areas along the flyways.	❸	❸		❸	❷		❸	❸		❸		❸	❷	❹					❹			❸		
Identify any potential age and gender differences in use of stop-over and wintering sites.		❸		❸	❹		❷	❸		❸			❹						❺			❸		
Determine migratory status and the migratory flyways (study movements during non-breeding season using colour-ringing and satellite tracking).	❷	❷	❷	❷	❷			❷	❷	❸		❷	❸	❸	❹				❺			❸		
Complete full survey of breeding areas.															❷									
Identify key mortality factors and hot spots.	❷	❷		❷			❸	❷					❸						❺			❷		
Collect and analyse genetic samples.								❷																
Study the feeding ecology of the species.				❹	❹		❹	❹	❹	❹		❹	❹		❹	❹								❹
Organise regional meeting in North Africa, Montenegro				❸						❺	❷	❸	❸						❺					❸

	Albania	Austia	Bosnia	Bulgaria	Croatia	Czech Republic	Greece	Hungary	Italy	Moldova	Montenegro	Romania	Serbia	Slovakia	Turkey	Ukraine	Algeria	Cyprus	Israel	Jordan	Libya	Macedonia FYR	Malta	Tunisia
Determine and monitor survival rate through colour ringing and satellite telemetry.	❷	❷	❷	❷	❷		❸	❷	❷	❸		❷	❸		❹									
Identify limiting factors for each breeding sub-population with a view to promoting further expansion of the breeding range and to creating an early warning system against potential threats.	❷	❷	❷	❷	❷	❷	❷	❷	❷	❷	❷	❷	❷	❷	❷	❷	❷	❷	❷	❷	❷	❷	❷	❷
Identify additional wintering and stop-over areas along the flyways.	❸	❸		❸	❷		❸	❸		❸		❸	❷	❹					❹			❸		
Identify any potential age and gender differences in use of stop-over and wintering sites.		❸		❸	❹		❷	❸		❸			❹						❺			❸		
Determine migratory status and the migratory flyways (study movements during non-breeding season using colour-ringing and satellite tracking).	❷	❷	❷	❷	❷			❷	❷	❸		❷	❸	❸	❹				❺			❸		
Complete full survey of breeding areas.															❷									
Identify key mortality factors and hot spots.	❷	❷		❷			❸	❷					❸						❺			❷		
Collect and analyse genetic samples.								❷																
Study the feeding ecology of the species.				❹	❹		❹	❹	❹	❹		❹	❹		❹	❹								❹
Organise regional meeting in North Africa, Montenegro.				❸						❺	❷	❸	❸						❺					❸

	Armenia	Azerbaijan	Iran	Iraq	Kazakhstan	Kuwait	Russia	Syria	Tajikistan	Turkmenistan	Uzbekistan	Oman	United Arab Emirates
Identify limiting factors for each breeding sub-population with a view to promoting further expansion of the breeding range and to creating an early warning system against potential threats.	❸		❷		❷								
Identify additional wintering and stop-over areas along the flyways.	❹		❶		❷								
Identify any potential age and gender differences in use of stop-over and wintering sites.	❺				❷		❷						
Determine migratory status and the migratory flyways (Study movements during non-breeding season using colour-ringing and satellite tracking).	❺				❷								
Complete full survey of breeding areas.		❷	❷				❷						
Identify key mortality factors and hot spots.	❷		❷		❷	❷							
Clarify the delineation between the "*major*" and Central and South East European populations.		❹	❹		❹		❹	❹					
Study the feeding ecology of the species.		❹	❹		❹		❹	❹					
Improve collaboration between countries along the flyways under the framework of the Central Asia Flyways initiative and strengthen collaboration between the Central Asian Flyways initiative and AEWA.	❸	❸	❸	❸	❸	❸	❸	❸	❸	❸	❸	❸	❸

P. l. archeri* and *P. l. balsaci

	Djibouti	Egypt	Eritrea	Saudi Arabia	Somalia	Sudan	Yemen		Mauritania
Grant the species, and in particular the subspecies, with legal protection in all its range states.	❶	❷	❶		❶				
Maintain the integrity of the coastal ecosystem at Banc d'Arguin.									❷
Designate and maintain key feeding and stop-over sites as European Union Special Protection Areas (if appropriate) and/or Ramsar sites.	❶	❶	❶	❶	❶	❶	❶		
Restore former feeding areas and maintain the sites in good ecological conditions (esp. in favourable hydrological conditions and water quality).	❷	❷			❷	❷			❷
Take measures to limit activities which may reduce the availability of food (e.g. overfishing, disturbance (including bird disturbing at fishponds, shellfish collection), constructions which may limit movement of prey species, wind farms, gravel mining, intensive fish farms, human settlements, infrastructures).	❷	❶							❷
Develop management plans for key feeding and stop-over sites addressing off-site threats at basin-level (e.g. pollution, water regime).	❷	❶	❷		❷	❷			
Reduce direct mortality caused by poaching.	❷	❷	❷	❷	❷	❷	❷		
Reduce direct mortality caused by toxins.	❸	❶	❷						❷
Phase out organochlorins (especially DDT) along the entire flyways.	❹	❶	❷						❷
Protect colonies threatened by flooding.	❺	❺							❶
Take measures to protect threatened colonies against excessive predation.	❶	❹							❶
Manage competing species if necessary and appropriate.	❶	❺							❶
Protect nesting colonies from disturbance by restricted/prohibited access or by visitor management.	❷	❶	❷						❹
Determine and monitor breeding success and calculate the value necessary to meet the targeted survival rate.	❸	❶	❷						❶
Determine and monitor survival rate through colour ringing and satellite telemetry.	❹		❷						❶
Identify additional wintering sites.	❷	❷	❷	❷	❷	❷	❷		❷
Study movements during non-breeding season using colour-ringing and satellite tracking.	❹	❷	❷	❷	❷	❷	❷		❷
Improve a national census of the species during the breeding season and the winter period.	❷	❷	❷	❷	❷	❷	❷		❷
Identify key mortality and hot spots.	❷	❶	❷			❷			❷
Study the feeding ecology of the species.		❹	❹	❹	❹	❹	❹		❹

6. Bibliography

6.1. General References

Allen, R.P. (1942) *The Roseate Spoonbill*. Dover publications New York.
BirdLife International (2000) *Threatened Birds of the World*. p.634. Lynx Edicions and BirdLife International. Barcelona and Cambridge, UK.
Brown, L.H., Urban, E.K. & Newman, K. (1982) *The Birds of Africa*, Vol. I. pp. 216-219. Academic Press, London.
Burfield, I. & van Bommel, F. (2004) *Birds in Europe: Population Estimates, Trends and Conservation Status*. – BirdLife International, Cambridge.
Diagana, C.H. & Dodman, T. (In press) Numbers and distribution of waterbirds in Africa / Results of the African Waterbirds Census - Effectifs et distribution des oiseaux d'eau en Afrique / Résultats des Dénombrements d'Oiseaux d'Eau en Afrique, 2002, 2003 & 2004 Dakar.
del Hoyo, J., Elliott, A., & Sargatal, J. (eds) (1992) *Handbook of the Birds of the World*. Vol 1. pp. 525-526. Lynx Edicions, Barcelona.
Dodman, T. & Taylor, V. (1995) *African Waterfowl Census 1995.* Wetlands International, Slimbridge, UK, 206 pp.
Dodman, T. & Taylor, V. (1996) *African Waterfowl Census 1996.* Wetlands International, Wageningen, The Netherlands, 206 pp.
Dodman, T., Beibro, H. Y., Hubert, E. & Williams, E. (1999) *African Waterfowl Census 1998.* Wetlands International, Dakar, Senegal, 292 pp.
Dodman, T. (2002) Waterbird Population Estimates in Africa. Unpublished report to Wetlands International.
Dodman, T. & Diagana C.H. (2003) *African Waterbird Census / Les Dénombrements d'Oiseaux d'Eau en*
Afrique 1999, 2000 & 2001. Wetlands International Global Series No. 16, Wageningen, The Netherlands.
Hancock, J.A., Kushlan, J.A. & Kahl, M.P. (1992) *Storks, ibises and spoonbills of the world*. London, Academic Press Limited.
IUCN (2006) *2006 IUCN Red List of Threatened Species*. www.iucnredlist.org
Hagemeijer, W. & Blair, M. (eds.) (1997) *The EBCC Atlas of European Breeding Birds*. − T & A-D Poyser, London.
UNEP-WCMC. (2005) *Checklist of birds listed in the CITES Appendices and in EC Regulation 338/97*. 8th Edition. JNCC Report No. 381.
Wetlands International (2006) *Waterbird Population Estimates - Fourth Edition*. Wetlands International, Wageningen, The Netherlands.

6.2. Population Size, Distribution and Movements

Aja, J.J., Navedo, J. &González, F. (2002) La Espátula en la Reserva Natural de las Marismas de Santoña y Noja. *Quercus* Cuaderno nº 201.
Akriotis, T., & Handrinos, G. (2004) *Bird Ringing Report* (1985-2004). Hellenic Bird Ringing Centre. Mytilini, Greece, 164 p.
Allouse, B.E. (1953) *The avifauna of Iraq* . Iraq Nat.His. Mus.Pupl Vol. No. 1
Adamian, M.S. & Klem, D. Jr. (1999) *Handbook of the Birds of Armenia*. Oakland: American University of Armenia, California.
Amari, M. & Azafzaf, H. (2001) Tunisia. Pp 953-973 *in* L.D.C. Fishpool and M .I. Evans, eds. *Important Bird Areas in Africa and associated islands: Priority sites for conservation.* Newbury Cambridge, UK: Pisces Publications and BirdLife International (BirdLife Conservation Series n°. 11).
Aydemir, G., Kurt, B. & Eken, G. (2002) *Mid-winter waterfowl counts in Turkey, 1999*, DHKD, İstanbul, (In Turkish).

Azafzaf, H. (2002). *Rapport de recensement des oiseaux d'eau en Tunisie, janvier 2002.* Cyclostyled report by Association "Les Amis des Oiseaux", 7 p.
Azafzaf, H. & Feltrup-Azafzaf, C. (2004) *Rapport de recensement des oiseaux d'eau en Tunisie, janvier 2003.* Groupe Tunisien d'Ornithologie, Association « Les Amis des Oiseaux », 19 p.
Azafzaf, H., Smart, M. & Dlensi, H. (2006) "**T**he Eurasian Spoonbill *Platalea leucorodia* in Tunisia". EUROSITE, *Spoonbill Network, Newsletter Vol* 4, 2006 March.
Azafzaf, H. & Feltrup-Azafzaf, C. (2007). *Rapport de recensement des oiseaux d'eau en Tunisie, janvier 2007.* Groupe Tunisien d'Ornithologie, Association « Les Amis des Oiseaux ».
Azafzaf, H., Baccetti, N., Defos du Rau, P., Dlensi, H., Essghaier, M.F., Etayeb, K., Hamza, A. & Smart, M. (2005). *Report on an Ornithological Survey in Libya from 3 to 17 January 2005.* Cyclostyled report to the Regional Activities Centre/Special Protected Areas (MAP/UNEP), Environment General Agency, Libya and to the African-Eurasian Waterbird Agreement (UNEP/AEWA), 94 pp.
Azafzaf, H., Baccetti, N., Defos du Rau, P., Dlensi, H., Essghaier, M.F., Etayeb, K., Hamza, A. & Smart, M. (2006). *Report on an Ornithological Survey in Libya from 19 to 31 January 2006.* Cyclostyled report to the Regional Activities Centre/Special Protected Areas (MAP/UNEP), Environment General Agency, Libya and to the African-Eurasian Waterbird Agreement (UNEP/AEWA), 31 pp.
Ayrumyan, K.A. & Movsesyan, S.O. (eds.) (1987) *Red Data Book of the Armenian SSR*. 'Hayastan' Press, Yerevan, Armenia. [In Russian]
Baccetti, N., Dall'Antonia, P., Magagnoli, P., Melega, L., Serra, L., Soldatini, C. & Zenatello, M. (2002) Risultati dei censimenti degli uccelli acquatici svenanti in Italia: Distribuzione, estimate trend delle popolazioni 1991-2000. *Biol. Cons. Fauna* 111: 1-240.
Baha El Din, S. (1999) *Directory of Important Bird Areas in Egypt.* BirdLife International.
Barachon, V., Aulert, C. & Hémery, D. (2005) La Spatule blanche *Platalea leucorodia* en migration prénuptiale dans l'estuaire de la Seine (France). *Aves* 42: 43-56.
Bennun, L. A. & Njoroge, P. (1999) *Important Bird Areas in Kenya*. Nairobi: Nature Kenya.
Bertrand, A. (1979) Hivernage de la Spatule blanche *Platalea leucorodia* dans l'île de Ré. *La Trajhasse* 9: 89-90.
Bino, T. (1998) *L'avifaune aquatique du système lagunaire méditerranéen de Karavasta (Albanie) et sa conservation.* Cyclostyled doctorate thesis, 177 pages + annexes, University of Montpellier.
Bino, T., Tourenq C., Kayser Y., Busuttil S., Crozier J., Dore B. J. & Bego F. (1996) *Recensement des oiseaux d'eau hivernants en Albanie (14 -31 janvier 1996)*. Station Biologique de la Tour du Valat and Natural History Museum, Tirana. Cyclostyled report 102 pp.
Bino, T. & Jorgo G. (2002) *Conservation status and threats over Albanian wetlands.* Albanian Society for the Protection of birds and Mammals. Cyclostyled report 47 pp.
Binsbergen, N. (1995) *De lepelaars van de Muy*. Het open boek, Den Burg, Texel.
Bonaccorsi, G. (1995) Statut de la spatule blanche *Platalea leucorodia* en Corse.-*Trav.Sci.Parc Natl. Reg. Res. Nat. Corse* 51: 83-86.
Brichetti, P., De Franceschi, P. & Baccetti N. (1992) *Fauna d'Italia. Vol. I. Calderini* Editore, Bologna.
Brouwer, J. & Mullié, W.C. (2001) A method for making whole country waterbird population estimates, applied to annual waterbird census data from Niger. *Ostrich* Supplement No. 15: 73–82.
Brown, A. & Grice, P. (2005) *Birds in England.* T. & A.D. Poyser, London. 694 p.
Bundy, G. (1976) *The Birds of Libya: An annotated check-list*. Check-list No. 1, British Ornithologists' Union, London.
Chernov, V.Yu. (1990) Rare waterbirds of the Sarykamysh lake. Rare and insufficient studied birds of Central Asia. *Tashkent. Fan.*: 46-49.
Costa, L. T. & Rufino, R. (1997). Contagens de aves aquáticas em Portugal – Janeiro de 1997. Airo 8: 25-32.
Costa, L. T., Nunes, M., Geraldes, P. & Costa, H. (2003). *Zonas Importantes para as Aves em Portugal. SPEA*. Lisboa. pp. 160.

Çağlayan, E., Kılıç, T., Per, E. & Gem, E. (2005) *Mid-winter waterfowl counts in Turkey, 2005, Doğa Derneği, 2005* (In Turkish).
Dahl, S.K. (1954) *Fauna of the Armenian SSR. Vertebrates.* Academy of Sciences Press. Yerevan, Armenia. [In Russian]
Dakki, M., Qninba, A., El Agbani, M.A. & Benhoussa, A. (2002) Recensement hivernal d'oiseaux d'eau au Maroc: 1996-2000. *Trav. Inst. Sci., Série Zoologie, n° 45, 28 p.*
De le Court, C. & Aguilera, E. (1997) Dispersal and migration in Eurasian Spoonbills *Platalea leucorodia*. *Ardea* 85: 193-202.
Dementiev, G.P. & Gladkov, N.A. (eds) (1951) *Birds of the Soviet Union.* Vol. 2, Nauka, Moscow, in Russian.
De Voogd, M. (2004) *Methods to sex juvenile Spoonbills and sex-specific migration in Spoonbills.* Master thesis Rijksuniversiteit Groningen.
Diagana, C.H. & Dodman, T. (2006) Coastal waterbirds along the West African seaboard, January 2006. Wetlands International Dakar 2006.
Diawara, Y. & Overdijk, O. (2006) Wader count in the Banc d'Arguin National Parc (Mauritania) 2006, internal report PNBA, Natuurmonumenten, Nouackchott (RIM) 's-Graveland (NL).
Dijksen, L.J. & Blomert, A.M. (1989) *Midwinter Waterfowl Census Turkey January 1989*, WIWO Report 31.
Dolgushin, I.A. (1960). *The Birds of Kazakhstan.* V.1. - Alma-Ata. 469 pp. (in Russian).
El Hamoumi, R., Dakki, M. & Benhoussa, A. (2002) Evolution de la population hivernante de la Spatule blanche *Platalea leucorodia* au Maroc. *Wetland management of Spoonbills and associated species*, Texel, 12-16.
Etayeb, K., Essghaier, M.F., Hamza, A., Smart, M., Azafzaf, H., Defos Du Rau, P. & Dlensi, H (2007): *Report on an Ornithological Survey in Libya from 3 to 15 February 2007.* Cyclostyled report to the Regional Activities Centre/Special Protected Areas (MAP/UNEP) and the Environment General Authority, Libya, 46 p.
Gašić, B. (2001) Rezultati novih istraživanja faune ptica Republike Srpske. *Ciconia* 10: 108-127.
Gaskell, J. (2005) Recent changes in the status and distribution of birds in Libya. *Sandgrouse* 27(2): 126-138.
Gavrilov, E. I. & Gavrilov, A. E. (2005) "The Birds of Kazakhstan". Almaty,
Gergelj, J., Tot, L. & Frank, Z. (2000): Birds of Tisa area from Kanjiza to Novi Becej. *Ciconia* 9: 121−158. (In Serbian, with English summary)
Girard, O. (1990) La Spatule blanche *Platalea leucorodia* dans le marais d'Olonne (Vendee). *Oiseau R.F.O.* 60: 286-297.
Girard, O. (1991) Les observations de Spatule blanche (*Platalea leucorodia*) en France. *Oiseau R.F.O.* 61: 293-304.
Gjiknuri, L. & Peja, N. (1992) *Albanian Lagoons: their importance and economic development*. In Finlayson C M, G E Hollis & T J Davis (Eds): *Managing Mediterranean wetlands and their birds.* IWRB Special Publication No 20, p 130-133.
Goodman, S. M. & Meininger, P. L. (eds) (1989) *The birds of Egypt*. Oxford University Press, Oxford.
González, F. & Aja, J.J. (1999) *Migración e invernada de la Espátula Común en la Reserva Natural de las Marismas de Santoña y Noja*. II Jornadas Ornitológicas Cantábricas (Libro de resúmenes).
González Sánchez, F. & Aja, J.J. (2000) Análisis de la Migración e Invernada de la Espátula *Platalea leucorodia* en la Reserva Natural de las Marismas de Santoña y Noja. *Actas de la 3ª Reunión Eurosite Espátulas Gestión de los humedales y Conservación de las Espátulas y otras aves acuáticas. Marismas del Odiel (Anadalucía) 5-8 de abril de 2000.*
Hantum, B., Swart van, K. & Horts, B.v.d. (1998) Microverontreinigingen in Lepelaarkuikens uit het Zwanenwater. Institute for Environmental Studies, Vrije Universiteit Amsterdam.
Herrero, A. & García, A. (1997) La espátula (*Platalea leucorodia*): pasos migratorios e invernada en las marismas de Santoña. *Actas de las I Jornadas Ornitológicas Cantábricas. Avilés (Asturias)*. Ed. Coordinadora Ornitolóxica d´Asturies (COA).

Holling, M. & the Rare Breeding Birds Panel (2007) Rare breeding birds in the United Kingdom in 2003 and 2004. *British Birds* 100: 321-367.
Iankov, P. (ed.) (2007) *Atlas of the breeding birds in Bulgaria*. Bulgarian Society for the Protection of Birds. Conservation Series, Book 10. BSPB. Sofia, Bulgaria.
Isenman, P. (2006) *The birds of the Banc d'Arguin*. CNRS Montpellier.
Jabbarova, A.F. (2006) [Number of Ciconiiformes at the Aggyol National Park on the breeding]. Materials of conference devoted to post graduated students of Azerbaijan National Academy of Science, Baku, p. 246-251 (in Azeri).
Jabbarova, A.F. (2007) [Number of Ciconiiformes and Greater Flamingo at the Gizilagache reserve]. "News" of Azerbaijan National Academy Science of Nakchivan Autonomy Republic. 2007 (in Azeri) IN PRESS.
Jennings, M. C. (in prep). The Atlas of the Breeding Birds of Arabia. *Journal of the Fauna of Arabia.*
Kayser, Y., Bino T. & Gautier-Clerc, M. (1995) *Recensement des oiseaux d'eau hivernants en Albanie 17 janvier – 7 février 1995*. Station Biologique de la Tour du Valat. Cyclostyled report 79 p.
Kayser, Y., Bino, T., Bego, F., Fremuth, W. & Jorgo, G. (1997) *Recensement des oiseaux d'eau hivernants en Albanie (3- 19 janvier 1997).* Station Biologique de la Tour du Valat and Natural History Museum, Tirana. Cyclostyled report 52 p.
Kenjegulov, K. (1965) About nesting of Night Heron, Spoonbill and Pygmy Cormoran on the Korakojabah lake. *Herald of the Karakalpak branch of Academy of Sciences of Uzbek Soviet Social Republic. N 2. Nukus*. p. 68-80. (in Russian).
Kılıç, D.T. & Eken, G. (2004) Important Bird Areas in Turkey, 2004 Updated Version, The Nature Society, Ankara (in Turkish).
Kiss, J. B., Sándor, D. A., Marinov, M. jr., Overdijk, O. (2007) New data regarding the migration of spoonbills (*Platalea leucorodia*) breeding in the Danube Delta, based on color ring resightings. *Analele Ştiinţifice ale Institului Delta Dunării* 13: 45-50.
Kurt, B., Özbağdatlı, N., Bozkurt, A.K., Arslangündoğdu, Z. & Gürsoy, A. (2002) *Mid-winter waterfowl counts in Turkey, 2002*, DHKD, İstanbul, (In Turkish).
Kuşbank (Bird) Database-Erciyes Üniversity, the Nature Society, Royal Society for the Protection of Birds, BL International, www.kusbank.org.
Lakatoš, J. (1977) *Birds of Apatin region*. − NIIU "Glas Komune", Apatin. (In Serbian, with English summary).
Lanovenko, E.N., Kreuzberg, E.A. & Zagrebin, S.V. (2005) Sudochye lakes system – important bird area for conservation of rare birds in the South Aral Sea region. Selevinia. *The zoological year-book of Kazakhstan.* p.97-104 (in Russian with English summary).
Li, Z.W.D. & Mundkur, T. (2007) *Numbers and distribution of waterbirds and wetlands in the Asia-Pacific region. Results of the Asian Waterbird Census: 2002–2004.* Wetlands International, Kuala Lumpur, Malaysia.
Lorenzo, M. (1998) Situación actual de la población invernante de Espátula Común *Platalea leucorodia* en la Ensenada de O Grove (Galicia, España). Actas Simpósio sobre Aves Migradoras na Península Ibérica. *SPEA e Universidade de Évora*: 79-81.
Lorenzo, M. (1991) Invernada de la Espátula (*Platalea leucorodia*, L.) en la Ensenada de O Grove, Ría de Arousa. *Actas I Con. Gal. Orn*. p: 23-22. SPIC Univ. Santiago de Compostela.
Lorenzo, M. & Á. Rodríguez (1999) Situación de la Espátula Común (*Platalea leucorodia*) en Galicia. *Chioglossa* 1: 1-13.
Lorenzo, M. & de le Court, C. (2007) *Spoonbill winter population in the Iberian Peninsula and Balearic Islands*. Poster. 31 st Annual Meeting of the Waterbird Society. Barcelona, Spain
Lyaister, A. F. & Sosnin, G. V. (1942) *Materials on the ornithofauna of the Armenian SSR*. (in Russian).
Lukač, Š. & Lukač, A. (1992) Ornithofauna of the fishpond "Bečej". *Ciconia* 4: 4−27. (in Serbian, with English summary).
Luka, Š. & Ternovac, T. (1997) Heron colony on the Carska bara. − *Ciconia* 6: 115. (in Serbian, with English abstract).

Lukashevich, R.V. (1990) Some rare species of Ciconiiformes in delta of Amudarya river and problems of their protection. Rare and insufficient studied birds of Central Asia. *Tashkent. Fan*.: 54-57 (in Russian).

Lukashevich, R.V. (1990) *Influence of water factor on structure and functioning of hydrophilous ornithocomplexis in delta of the Amudarya river.* Author's abstract of candidate degree dissertation. Moscow. 13 p. (in Russian).

Mahdi, S. (1982) *Aquatic birds of Iraq*. Iraq- Baghdad.

Meininger, P. L. & Mullié, W. C. (1981) The significance of Egyptian wetlands for wintering waterbirds. The Holy Land Conservation Fund, New York.

Mošanský, A. & Danko, Š. (1985) Prvé hniezdenie lyžičiara bieleho (*Platalea leucorodia*) na Slovensku. Zborník Východoslovenského múzea, *Prírodné vedy* 25: 171-175.

Mullié, W.C., Brouwer, J., Codjo, S.F. & Decae, R. (1999) Small isolated wetlands in the Sahel: a resource shared between people and birds. In: A. Beintema and J. van Vessem (eds), Strategies for conserving migratory waterbirds - *Proceedings of Workshop 2 of the 2nd International Conference on Wetlands and Development held in Dakar, Senegal, 8-14 November 1998*. Wetlands International Publication 55, Wageningen, The Netherlands. pp. 30-38.

Navedo, J.G. (2006) Identifying stopover wetlands for the conservation of an endangered waterbird species: the role of Santoña Marshes for the Spoonbill *Platalea leucorodia* during autumn migration. in: III *EUROSITE Spoonbill Newsletter* 4: 48-51.

Navedo, J.G. (2006) Importancia de las Marismas de Santoña para la Espátula común durante el paso migratorio prenupcial. *Monte Buciero* 12: 149-160.

Navedo, J.G. & Aja J.J. (2003) Proyecto pionero de conservación de una especie protegida e integración de internos penitenciarios. in: *Libro de resúmenes IV Jornadas Ornitológicas Cantábricas. Plaiaundi-Txingudi (Guipúzcoa, Spain)*.

Navedo, J.G. & González, F. (2002) The crucial importance of the Marismas de Santoña y Noja Nature Reserve (Cantabrian Coast, Spain) during the autumn migration of Spoonbill *Platalea leucorodia*. in: *Report of the 68th EUROSITE Spoonbill Workshop. Wetland management for Spoonbills and associated waterbirds. Ed. Jan Veen & Olga Stepanova. Texel (The Netherlands)*.

Navedo, J.G. & Herrera, A.G. (in press). Perturbaciones de origen antrópico en una zona de sedimentación clave para las aves acuáticas durante la migración otoñal: el caso de las espátulas en las Marismas de Santoña. in: *Actas del VI Congreso Galego de Ornitología y V Jornadas Cantábricas de Ornitología*.

Navedo, J.G., González, F., Aja J.J. & Alcántara M.A. (2000) Seguimiento de la migración postnupcial de la Espátula Común *Platalea leucorodia* en la RN Marismas de Santoña y Noja. in: *Actas de las XV Jornadas Españolas y I Jornadas Ibéricas de Ornitología. Sociedad Española de Ornitología (SEO/BirdLife). Huelva, Spain*.

Nome (1982) *Wintering waders on the Banc d'Arguin*. Report of the Netherlands Ornithological Mauritanian expedition 1980. Wadden Sea Working Group.

Obratil, S. (1968) Pregled istraživanja ornitofaune Bosne i Hercegovine II (Gaviiformes, Podicipediformes, Pelacaniformes, Ciconiiformes, Anseriformes). *GZM BiH (PN) NS* 6: 227-254.

Obratil, S. (1971) *Ptice Hutova blata*. *GZM BiH (PN) NS* 8: 87-143.

Obratil, S. (1974) Ornitofauna ribnjaka Bardača kod Srbca. *GZM BiH (PN) NS* 11-12: 153-193.

Obratil, S. (1984) Naselja ptica (*Aves*) u kopnenim biocenozama kraških polja Hercegovine. *GZM BiH (PN) NS* 23: 147-184.

Obratil, S. (1985) Ornitofauna Hutovog blata do izgradnje akumulacionog jezera PHE "Čapljina". *GZM BiH (PN) NS* 24: 175-209.

Obratil, S. (1992) Prilog poznavanju avifaune Buškog jezera (Bosna) i užeg priobalnog područja. *GZM BiH (PN) NS* 30, 155-168.

Obratil, S. (2006) Ekološka diferencijacija faune ptica Livanjskog polja. *GZM BiH (PN) NS* 32: 45-81.

Obratil, S. & **Matvejev S. (**1989) Predlog "Crvene liste" ugroženih ptica SR Bosne i Hercegovine. *Naše starine* 18-19: 227-235.

Ommering, van G. & Walter J. (1994) *Soortbeschermingsplan Lepelaar*. Ministerie van Landbouw, Natuurbeheer & Visserij**.**
Overdijk, O. (1999) *Lepelaartellingen in West Afrika in januari/februari 1999*. Werkgroep Lepelaar & Vereniging Natuurmonumenten. Schiermonnikoog's Graveland.
Overdijk, O. (1999) De ontwikkeling van het aantal broedparen van de lepelaar (*Platalea leucorodia*) in Nederland in de periode 1994 – 1998. *Limosa* 72: 41-48.
Overdijk, O. (2001) Development of Spoonbill populations in NW Europe. In: *Wetlands management and conservation of spoonbills and other waterbirds*". 3rd Eurosite Workshop meeting, Huelva, Spain.
Overdijk, O. (2002) Lepelaar *Platalea leucorodia* In: SOVON Vogelonderzoek Nederland 2002. *Atlas van Nederlandse broedvogels 1998-2000*. Nationaal Natuurhistorisch Museum Naruralis/KNNV/EIS, Leiden.
Overdijk, O. (2002) More northerly wintering of Dutch breeding Spoonbills. *Wetland Management for Spoonbills and associated species*, Texel: 9-11.
Overdijk, O. (2004) De lepelaar als een ambassadeur voor bescherming van de internationale trekroutes. Limosa 77 (2004) 93-103.
Overdijk, O., de le Court C. & Gueye A. (2001) Spoonbill count on the Banc d'Arguin, Mauritania, January 2000. WIWO-report 70. WIWO & PNBA, Zeist – Nouakchott.
Overdijk, O., Marion L. & Sall M. A. (2004) *Spoonbill count on the Banc d'Arguin, January 2001*. WIWO-report, Zeist – Nouakchott.
Overdijk, O. & Horn H. (2005) Broedende lepelaars in Nederland in 1999 – 2004. *Limosa* 78 (2005) 97-102
Overdijk, O. & **Zwart F.** (1997) Development of the NW-european Spoonbill breeding population and some results of the survival-rate estimation. In Gélinaud G. et Triplet P., *Second Spoonbill Workshop*, Séné 19-21 nov. 1997. p. 3
Overdijk, O. & Zwart F. (2003) The actual state of the Spoonbill in Europe. pp 7−8. In: Veen, J. & Stepanova, O. (eds.): *Wetland management for Spoonbills and associated waterbirds*. − EUROSITE, Tilburg.
Papp, T. & Sándor, A. (Eds) (2007) *Important Bird Areas in Romania*. SOR & Milvus Association, Tg Mures. 131 p.
Patrikeev, M.V. (1991) [On Ciconiiformes and Cormorants at the Lake Makchmudchala (Southern Azerbaijan)]. "Modern notes on distribution and ecology of birds of North Caucasus", Stavropol, p. 88-89 (in Russian).
Patrikeev, M.V. (1991) [On spring-summer avifauna of South-East Shirvan and surrounding territories]. "Fauna, population and ecology of North Caucasus", Stavropol, p. 30-55 (in Russian).
Pekić, B. (1958) A contribution to the knowledge of the birds of Carska Bara and its environment. *Zaštita prirode* 14: 11−19. (in Serbian, with English sumary).
Pigniczki, C. S. (in press) Migration and vagrancy of Spoonbills (*Platalea leucorodia*) based on recoveries of metal ringed individuals. *Aquila* 114:
Pineau, J. & Giraud-Audine, M. (1979) Les oiseaux de la péninsule tingitane. Bilan des connaissances actuelles. *Travaux de l'Inst. Sci., Sér. Zool.* n° 38, 147 p.
Poorter, E. (1982) Migration et dispersion des Spatules néerlandaises. *L'Oiseau et R.F.O.* 52 : 305-334.1982**.**
Poorter, E.P.R. (1990) Pleisterplaatsen van de Nederlandse Lepelaars *Platalea leucorodia* in de Europese trekbaan. Technisch Rapport Vogelbescherming 4, Vogelbescherming Nederland**.**
Prieta, J. (2001) Primeros datos de cría con éxito de las espátulas en Extremadura. *Quercus* 186: 10.
Richardson, C. (1990) *The Birds of the United Arab Emirates*. Hobby, Warrington.
Richardson, C. (Ed.) 1995 – 2000. (2003) *Emirates Bird Report No. 20*
Rocamora, G. & Maillet, N. (1996) Stationnements de Spatules blanches *Platalea leucorodia* en France au cours d'un cycle annuel.*Ornithos* 3: 14-21.
Results of the International Waterfowl Census Turkey 1992, DHKD Report, İstanbul, December 1992.
Results of the International Waterfowl Census Turkey 1993, DHKD, İstanbul, December 1993.
Sagitov, A.K. (1987) Pelekaniiformes. Ciconiiformes. *Birds of Uzbekistan. V.1. Tashkent. Fan.*. p.29-54. (in Russian).

Serra, G., Murdoch, D., Turkelboom, F., Travert, F., Mujawer, Y. & Scott, D. (2006) Sabkhat al-Jabbul, a Threatened Ramsar Wetland in Syria. *Sandgrouse* 28: 127-141.

Shernazarov, E. (1996) *Anthropogenic transformation of fauna, population and ecology of waterbirds in Uzbekistan*. Author's abstract of doctoral degree dissertation. Tashkent. 63 p. (in Russian with English summary).

Shernazarov, E. (2006) Spoonbill. *The Red Data Book of the Republic of Uzbekistan. V.II. Animals. 2-nd edition, revised and supplemented.* Tashkent. Chinor. p.138-139.

Schneider-Jacoby, M., Mikuska, T., Kovačić, D., Mikuska, J., Šetina, M. & Tadić, Z. (2002) Dispersal by accident – the spoonbill *Platalea leucorodia* population in Croatia. *Acrocephalus* 22: 191-206.

Schneider-Jacoby, M. & Štumberger, B. (2003) *Rapid Assement of the Livanjsko polje, Cetina River basin (Bosnia and Herzegovina)*. FAKT – Informationen der Stiftung Europisches Naturerbe, Septembar 2003, internal draft.

Schneider-Jacoby, M., Rubinić, B., Sackl, P. & Štumberger, B. (2006) A preliminary assessment of the ornithological importance of Livanjsko polje (Cetina River Basin, Bosnia and Herzegovina). *Acrocephalus* 27 (128-129): 45-55.

Schollaert, V. & Franchimont, J. (1996) Chronique ornithologique du GOMAC pour 1995. *Porphyrio* 8 (1/2): 94-150.

Schüz, E. (1957) Ornithology at Manyas Lake, Turkey. *Die Vogelwarte* 19: 41-44.

Shobrak, M., Alsuhaibany, A. & Newton, S. (2002) *Status of Breeding Seabirds in the Red Sea coast of Saudi Arabia*. PERSGA, National Commission for Wildlife Conservation and Development. 24 p.

Smart, M., Azafzaf, H. & Dlensi, H. (2007) The 'Eurasian' Spoonbill (*Platalea leucorodia)* in Africa. *Ostrich* 78*:* 495–500.

Smart, M., Essghaier, M.F., Etayeb, K., Hamza, A., Azafzaf, H., Baccetti, N. & Defos Du Rau, P. (2006). *Wetlands and wintering waterbirds in Libya, January 2005 and 2006. Wildfowl & Wetlands Trust*. 56: 172-191.

Smith, K.D. (1957). An annotated check list of the birds of Eritrea. *The Ibis* 99(1):1-26, 307-337

Šoti, J. & Dimitrijević, S. (1974) Beitrag zur Kenntnis der Wasserwögel des west – Banats (*Gaviiformes*, *Podicipediformes*, *Pelecaniformes*, *Ciconiiformes* und *Anseriformes*). *Zbornik za prirodne nauke matice srpske* 46: 127−160. (in Serbian, with German sumary).

SOVON (2002) *Atlas van de Nederlandse broedvogels* (pp. 88-89)

Stastny, K. & Bejcek, V. (2003) The Red List of birds of the Czech Republic. pp. 95-120 *in* Plesnik J., Hanzal V., Bejskova L. (eds.) *Red List of Threatened Species in the Czech Republic*. Vertebrates. AOPK Praha.

Stumberger, B., Schneider-Jacoby, M., Schwarz, U., Sackl, P., Dhora, D. & Saveljic, D. (2005) Ornithological value of the Bojana/Buna Delta. Universiteti i Shodres "Luigj Gurakuqi" *Bul.Shk., Ser.Shk.Nat.* : 55:136-158.

Subbuteo. The Belarusian ornithological bulletin. Vol.6, 2003 - p.37, 52

Subbuteo. The Belarusian ornithological bulletin. Vol.7, in press

Sultanov, E.H. (2000) [Gizilagache]. Azerbaijan Potentional Ramsar Sites. Baku, Wetlands International, p. 30-36 (in Azeri and Russian).

Sultanov, E.H. (2000) [Lake Aggyol]. Azerbaijan Potentional Ramsar Sites Baku, Wetlands International, p. 106 (in Azeri and Russian).

Szlivka, L. (1959) Einiges über die Vogelwelt in der Vojvodina. *Larus* 11: 29−36. (in Serbian, with German summary).

Temme, M. (2000) Überwinterung von Löfflern *Platalea leucorodia* im westlichen Algarve, Portugal. *Ornithologische Mitteilungen* 52: 415-419.

Thévenot, M., Vernon, R. & Bergier, P. (2003) *The Birds of Morocco*. B.O.U. Check-List n°20, British Ornithologists' Union & British Ornithologists' Club, 594 p.

Triplet, P. & Yésou, P. (1999) La Spatule blanche hivernant dans le delta du Fleuve Sénégal. *Malimbus* 21: 77-81.

Triplet, P., Benmergui, M., Schricke, V. & Leray, G. (2004) European spoonbill: high number in the Senegal delta in January 2004. *Spoonbill Newsletter*. 1: 2 p.
Triplet, P., **Diop, I., Schricke, V. & Leray, G.** (2006) Origin of the Spoonbills wintering in the Senegal delta. *Spoonbill Newsletter* 4: 31-34.
Volponi, S., Fasola, M. & Canova, L. (2003) L'uso di contrassegni colorati per il monitoraggio di lungo termine della popolazione italiana di spatola (*Platalea leucorodia*): aspetti demografici, dispersione, siti di stop over e svernamento. *VIII Meeting of Italian Ringers.*
Wassink, A. & Oreel, G. J. (2007) *The Birds of Kazakhstan*. De Cocksdorp. Texel.
Vermeersch, G., Anselin, A., Devos, K., Herremans, M., Stevens, J., Gabriëls, J. & Van Der Krieken, B. (2004) *Atlas van de Vlaamse broedvogels 2000-2002*. Mededelingen van het Instituut voor Natuurbehoud 23, Brussel, 496 p.
Yarar, M., Magnin, G. & Tireli, A.İ. (1996) *Mid-winter waterfowl counts in Turkey,1996*, DHKD, İstanbul, (In Turkish).
Yipov, A.V. & Bochkarev, S.M. (1996) *Rare vertebrate animals on the territory of former Abdusamatskiy reserve. Proceeding of zapovedniks of Uzbekistan. V.1*. Tashkent. P: 83-86.
Zhatkanbayev, A.Z. (1996) Eurasian Spoonbill. *The Red Data Book of Kazakstan. V.1. Animals. Part I. Vertebrates. 3 edition*. Almaty, p. 100-101. (in Russian).

6.3. Breeding Behaviour and Biology

Aguilera, E. (1990) Sexual differences in nest attendance and chick-feeding rythms of White Spoonbills. *The Auk* 107(2):416-420.
Aguilera, E. (1990) Parental infanticide by White Spoonbills *Platalea leucorodia*. *Ibis* 132:124-129**.**
Aguilera E. (1994) Parental roles in the White Spoonbill (*Platalea leucorodia*): the sperm competition hypothesis. *Ardeola* 41(1):19-28**.**
Aguilera, E. & Álvarez F. (1990) Señales sociales de la Espátula (Platalea leucorodia) durante el período reproductivo. *Doñana Acta Vertebrata* 17(2):183-203.
Arroyo, G. M., Hortas, F., de le Court, C., Perez-Hurtado, A. & Rubio, J. C. (1997) The Cadiz Bay, a new breeding site for the spoonbill (*Platalea leucorodia*) in south Spain: strategies for conservation. In Gélinaud G. et Triplet P., *Second Spoonbill Workshop*, Séné 19-21 nov. 1997. p. 4-7.
Aspinall, S. (1996) *Conservation and Status of the Breeding Birds of the United Arab Emirates*. Hobby, Dubai & Liverpool.
Balog, I. (1997) Results of ringing herons at the Becej fishpond. *Ciconia* 6: 17. (In Serbian, with English abstract).
Barna, K. & Matović, Č. (2001) Results of ringing of herons in some breeding colonies in Vojvodina during 1998 – 2000. *Ciconia* 10: 27−29. (in Serbian, with English abstract).
Bauchau, V., Horn, H. & Overdijk, O. (1998) Survival of Spoonbills on Wadden Sea islands. *J. Avian Biol.* 29: 177-182.
Benmergui, M. & Crouzier, P. (2007) La Spatule blanche *Platalea leucorodia* nicheuse en Dombes. *Ornithos* 13 : 378-381.
Campredon, P. (1987) La reproduction des oiseaux d'eau sur le Parc National du Banc d'Arguin (Mauritanie) en 1984-1985. Alauda 55 :187-210.
Campredon, P. (2000) Entre le Sahara et l'Atlantique, le Parc National du Banc d'Arguin. (p. 122). Arles, Tour du Valat.
Canova, L. & Fasola, M. (1989) Prima nidificazione di Spatola. *Platalea leucorodia*, *Italia. Riv. Ital. Orn*. 59:265-267.
Canova, L, Volponi, S. & Fasola, M. (2003) Demografia della popolazione di Spatola *Platalea leucorodia* nidificante in Italia (1989-2002). *Avocetta* 27: 130.
Călinescu, R. (1939) Lopătari (*Platalea leucorodia* L.) [Spoonbills (*Platalea leucorodia* L.)]. *Natura* 28: 195-198.
Cătuneanu, I. I. (1958) Coloniile de cuibărit din Delta Dunării şi necesitatea creării unor rezervaţii ornitologice [Breeding colonies in the Danube Delta and the necessity the creation of ornithological reserves.]. *Ocrotirea Naturii* 3: 79-115.

Ciochia, V. (1992) *Păsările clocitoare din România [Breeding birds of Romania]*. Ed. Stiințifică. Bucureşti. p. 40–56, 263 - 268.
Cook, R.T. (1992) T*race metals and organochlorides in the eggs and diet of Dalmatian pelicans* (*Pelecanus crispus*) and spoonbills (*Platalea leucorodia*) in Northern Greece. MSc. Univ. of Manchester, UK. 150 p.
Costillo, E. (2002) *Biología de la Espátula Común Platalea leucorodia en zonas húmedas del interior peninsular*. Trabajo de Grado. Universidad de Extremadura.
Country Report for Central Asian Flyway Overview, Uzbekistan, 2005, CMS/CAF/Inf.4.7
Dahl, S. K. (1954) *Fauna of the Armenian SSR. Vertebrates*. Academy of Sciences Press, Yerevan, Armenia. In Russian.
Danko, Š. (2006) Changes in avifauna of the fishpond area Iňačovce – Senné and the National Nature Reserve Senné in 1995-2004. *Tichodroma* 18: 1-30.
de le Court, C. (2001) *"The life-history strategy of the Spoonbill (Platalea leucorodia) how to live in an unpredictable environment. Doctoral thesis.*. University of Antwerp, Belgium.
De le Court C., Migens E. & Rubio J. C. (2000) La conservacion de la Espatula en las marismas del Odiel. *Quercus* 174: 22-27.
De le Court, C., Aguilera E. & Recio F. (1995) Plasma chemistry values of free-living white Spoonbills *Platalea leucorodia*. *Comp. Biochm. Physiol* 112 A: 137-141.
De le Court, C., Maez, M., García, L., Garrido, H. & Ibáñez, F. (2004) *La Espátula Común Platalea leucorodia.* In: A. Madroño, C. González & J.C. Atienza (Eds). *Libro Rojo de los Vertebrados Amenazados de España*. Dirección General para la Biodiversidad-SEO BirdLife. Madrid. Pp. 76-77.
Dević, I. (1995) The ornithofauna of the fishpond "Uzdin". *Ciconia* 5: 32−44. (In Serbian, with English abstract).
Ecsedi, Z., Kovács, G. (2004) Kanalasgém. In: Ecsedi, Z. (ed) *A Hortobágy madárvilága*. Hortobágy Természetvédelmi Egyesület – Winter Fair; Balmazújváros – Szeged.
Eken *et al* (2007) *The Book of Important Key Areas*, The Nature Society, Ankara, 2007.
El Agbani, M.-A., Bayed, A., Dakki, M., Qninba, A. (2002) Découverte d'une colonie reproductrice de Spatule blanche *Platalea leucorodia* dans le nord-ouest du Maroc. *Wetland management for Spoonbills and associated species*, Texel 2002: 38-39.
E Sehhatisabet, M., Balouch, M., Bahmanpour, A., Khaleghizadeth, A. & Elahi-Rad, Z. (2006) Ringing four breeding waterbird species at Lake Tashk. *Sandgrouse 28 (2): 106–113*
Ens, B., Piersma, T., Wolff, W.J. & Zwarts, L. (1989) *Report of the Dutch–Mauritanian project Banc d'Arguin 1985 – 1986*. WIWO report 25 and RIN report 89/6. Zeist / Texel.
Eybert, M.C., Bonnet, P., Geslin, T. & Hedin, J. (2005) La reproduction de la Spatule blanche *Platalea leucorodia* en Brière (Loire-Atlantique, France). *Alauda* 73: 53-58.
Fasola, M., Canova, L. & Volponi, S. (2001) Colonisation of a new spoonbill breeding site in NE Italy. In "*Wetlands management and conservation of spoonbills and other waterbirds*". 3rd Eurosite Workshop meeting, Huelva, Spain.
García, L., Amat, J.A. & Rodríguez, M. (1983) Spoonbills breeding during winter in Spain. *British Birds* 76: 32-33.
George, G. (2005) *The Birds of the State of Kuwait*, Skegness, England.
Gómez-Ariza, J.L., Morales, E., Giradles, I. & Sánchez-Rodas, D. (2001) Influence of pollutants in eggs and chick spoonbill in two colonies. *in* Wetlands management and conservation of Spoonbills and other waterbirds. *Proceedings of the 3th Eurosite Spoonbill Workshop* pp. 28-29. Huelva, Spain.
Gonin, J. & Caupenne, M. (2007) Nouveau cas de reproduction de la Spatule blanche *Platalea leucorodia* en Charente-Maritime. *Ornithos* 14: 66-69.
Gowthorpe, P. & Lamarche, B. (1995) Les oiseaux nicheurs et principaux limicoles paléarctiques du Parc National du Banc d'Arguin (Mauritanie) : dynamique des effectifs et variabilité dans l'utilisation spatiale et temporelle du milieu. (essai de synthèse). *Bulletin Du Parc National du Banc d'Arguin* 1: 1-83.
Gowthorpe, P. & Lamarche, B. (1996) Guide des oiseaux du Parc National du Banc d'Arguin (Mauritanie). 321p. Nouakchott: PNBA.

Ham, I. (1977) Avifaunal dynamism in Vojvodina. *Arhiv bioloških nauka* 29: 83−87. (in Serbian, with English summary).
Ham, I. (1989) Changes in heron populations on wider area of the Carska bara. *Arhiv bioloških nauka* 41(3/4): 13P−14P.
Husting, F. & Van Dijk, K. (1994) *Bird Census in the Kızılırmak Delta, Turkey, in spring 1992*, WIWO Report 45.
Isenmann, P., Gaultier, T., El Hili, A., Azafzaf, H., Dlensi, H. & Smart, M. (2005). *Oiseaux de Tunisie / Birds of Tunisia.* Société d'Etudes Ornithologiques de France, Paris.
Karauz Kıraç,. S. & Kıraç, C. (1996) "A Short Breeding Birds Survey of Kulu Lake in 1995". *Sandgrouse* 18: 58-60.
Karauz, S. (1999) *The Final Report on the Ornithological Research of Tuz Lake Basin, 1998-99 "the sub-project of Biological Research of Tuz Lake Basin*" carried by Hacettepe University, Ministry of Environment Report, December, Ankara. In Turkish
Karauz, E. S. *et al*. (In preparation) The Result of Monitoring Research on Breeding Waterbirds Population in the Bolluk Lake, Tuz Lake Basin (1996-2007).
Karauz Er, E. S., Özbek, M., Altınayar, G., Çakır, F. & Yıldırım, F. (2007) *Breeding Waterbirds Monitoring Research in the Manyas Lake's Ramsar Site*, The Ministry of Environment & Forestry, The General Directory of Nature Conservation and National Parks, Wetland Division, Miscellaneous Publication, No:2, Ankara. (in Turkish).
Kılıç, D.T. & Eken, G. (2004) Important Bird Areas in Turkey, 2004 Updated Version, The Nature Society, Ankara (In Turkish).
Kovács, G (1998) Kanalasgém. In: Haraszthy, L. (ed) Magyarország madarai. Mezőgazda Kiadó, Budapest.
Kovács, G., Végvári, Z. & Kapocsi, I. (2001) Population trends and conservation of Spoonbills in the Hortobagy National Park. In "*Wetlands management and conservation of spoonbills and other waterbirds*". 3rd Eurosite Workshop meeting, Huelva, Spain.
Lamarche, B. (2000). *Atlas des oiseaux nicheurs. Notes sur les modalités de nidification et l'utilisation spatio-temporelle du milieu*. Fascicule 1. 78 p. Nouakchott: Cabinet Mauritanien de Conseil.
Lyaister, A. F. & Sosnin, G.V. (1942) *Materials on the ornithofauna of the Armenian SSR*. ARMFAM, Yerevan. In Russian.
Marčetić, M. (1955/56) Spoonbill, *Platalea leucorodia*, no longer a permanent nester of marsh bird colonies in Vojvodina. − *Larus* 9/10: 169−171.
Mikuska, T., Mikuska, J., Šetina, M. & Kralj, J. (2006) Spoonbills in Croatia during 2005 – status, breeding distribution and importance of Kopacki rit wetlands during post-breeding dispersal and fall migration. *Spoonbill newsletter* 4: 15-21.
Müller, C.Y. (1984) Bestandsentwicklung und Zugverhalten der Löffler (*Platalea leucorodia* L.) im österreichisch-ungarischen Raum. *Egretta* 26: 43-46.
Müller, C.Y. (1987) Nahrungs- und Ruhehabitate des Löfflers *Platalea leucorodia* am Neusiedlersee (Österreich). *Ornithol.Beob*. 8 : 237-245.
Paspaleva, M., Kiss, J.B. & Tălpeanu, M. (1985) Oiseaux coloniaux dans le Delta du Danube. *Trav. Du Mus. d'Hist. Nat. Gr. Antipa*. 26: 289-304.
Peal, R.E.F. & Peal, E. (1995) Nidification de la Spatule blanche (*Platalea leucorodia*) dans le Nord du Maroc. *Porphyrio* 7: 92.
Pelle, I., Ham, I., Rašajski, J. & Gavrilov, T. (1977) Überblick über Brutvögel der Vojvodina. − *Larus* 29/30: 171−197. (in Serbian, with German summary)
PERSGA/GEF (2003) *Status of Breeding Seabirds in the Red Sea and Gulf of Aden*. PERSGA Technical Series No. 8. PERSGA, Jeddah.
Perrier, S. (2003) *Méthodologie d'étude des pics de mortalité dans les populations d'oiseaux sauvages : application aux spatules blanches Platalea leucorodia du banc d'Arguin (Mauritanie) et aux eiders à duvet Somateria mollissima de la mer de Wadden (Pays Bas) entre 1997 et 2002*.Toulouse : These Ec. Natle Vet. 86 p.

Platteuw, M. & Kiss, J.B. (2001) Donau-delta: terreingebruik van visetente kolonielvogels in een ongerept wetland. *Limicola* 74: 161 – 162.
Platteeuw, M., Kiss, J. B. & Sadoul, N. (2002) Survey of colonial breeding birds in Romanian Danube Delta, May-June 2001. *Analele Ştiinţifice ale Institului Delta Dunării* 8: 192-195.
Platteeuw, M., Kiss, J. B., Zhmud, M. Y. & Sadoul, N. (2006) Large colonial waterbirds in the Romanian and Ukrainian Danube Delta: a complete survey in 2001/2002. *Analele Ştiinţifice ale Institului Delta Dunării* 12: 103-108.
Platteeuw, M., Kiss, J. B., Sadoul, N. & Zhmud, M.Y. (2004) *Colonial Waterbirds and their habitat use in the Danube Delta*. RIZA Report 2004.002., 157 p.
Puzović, S. (1995) Savremeni ekološki okvir Obedske bare. *Povratak Obedskoj bari* 1: 1−19. (in Serbian).
Puzović, S. (1998) Ramsar areas in Serbia and their function in preservation of diversity of birds in watery habitats. *Zaštita prirode* 50: 283−290. (in Serbian, with English summary).
Puzović, S., Gergelj, J. & Lukač, Š. (1999) Heron and cormorant colonies in Serbia 1998. *Ciconia* 8: 11−114. (in Serbian, with English summary).
Puzović, S., Simić, D., Saveljić, D., Gergelj, J., Tucakov, M., Stojnić, N., Hulo, I., Ham, I., Vizi, O., Šćiban, M., Ružic, M., Vučanović, M. & Jovanović, T. (2003) Birds of Serbia and Montenegro – breeding population esimates and trends: 1990 – 2002. *Ciconia* 12: 35-120.
Radović, D., Kralj, J., Tutiš, V. & Čiković, D. (2003) *Red Data Book of Birds of Croatia*; Ministry of Environmental Protection and Space Planning; Zagreb. Pp: 44-46.
Rashkevich, N.A. (1969) Colony of fish-eating birds on the southern bank of the Aral Sea. *Ornithology in the USSR. Book 2. Ashkhabad.* p.530-533.
Sándor, D. A. (2003) Ringing Spoonbills in the Danube Delta, Romania. Spoonbill Newsletter 4: 4.
Shurulinkov, P., Nikolov, I., Demerdzhiev, D., Bedev, K., Dinkov, H., Daskalova, G., Stoychev, S., Hristov, I., & Ralev, A. (2007) On the actual numbers of colonially breeding herons and cormorants in Bulgaria. *Ornithologische Mitteilungen* 59 : 370-378.
Trotignon, J. (1991) *Mauritanie, carrefour des oiseaux*. 113 p. Paris, Nathan.
Tucakov, M. (2004) Changes of breeding numbers and habitat of Spoonbill *Platalea leucorodia* in Vojvodina (N Serbia). *Acrocephalus* 25 (121): 73-80.
Turaev, M. & Shernazarov, E. (2006) Nesting birds of Tudakul water reservoir (South-Western Uzbekistan). Selevinia. *The zoological year-book of Kazakhstan*. p.206-207. (in Russian with English summary).
Utmar, P. (1998) Prima nidificazione di Spatola, *Platalea leucorodia*, nel Friuli-Venezia Giulia. *Riv. Ital. Orn.* 68:126-127.
Volponi, S. & Emiliani, D. (1991) Nidificazione di Spatola, *Platalea leucorodia*, a Punte Alberete (Ravenna). *Riv. ital. Orn*. 61:73-75.
Voslamber, B. (1994) History of the Dutch Spoonbill *Platalea leucorodia* breeding population, 1961-1993. *Limosa* 67: 89-94.
Welch, G. & Welch, H. (1998) *The Breeding Bird Research of Uluabat Lake*, DHKD Report, Istanbul, (In Turkish).
Wieland, A. P. (1999) *Surveys of flora and fauna in the Senné fishponds area, Slovakia, spring 1997, with supplement August 1998*. WIWO report. Nr. 65.
Yfantis, G. & Kazantzidis, S. (2004) *The heron colonies in Greece* p. 265-271. In Dimitrakopoulos P., G. Matsinos, G. Kokoris & D. Koutsoumbas. Procceedings of Conference of The Greek Ecologists Union and The Hellenic Zoological Society. Mytilini, Greece, 18-21 November 2004 (in Greek with English summary).
Zal, N., Eczacıbaşı, G.B. & Karauz Er, E.S. (2006) *The Planning of Lower Meriç Valley Flood Plain as Biosphere Reserve*, The Ministry of Environment & Forestry, Central Anatolia Forestry Research Institute Publication, No:69, Ankara.
Zekhuis, M. J. & Tempelman, D. (1998) *Breeding birds of the Albanian wetlands, spring 1996*. WIWO report Nr 64, Zeist, Netherlands.

6.4. Diet, Feeding Behaviour, Biology and Ecology

Aguilera, E., Ramo, C. & de le Court, C. (1996) Food and feeding sites of the Eurasian Spoonbill *Platalea leucorodia* in Southwestern Spain. *Colonial Waterbirds* 19 (Sp Publ. 1): 159-166.
Kersten, M. (1995) The energy requirements of Spoonbills and waders on migration. In *Proceedings of the 23 Eurosite nature management workshop* p. 25-29.
Boileau, N. (2001) Sensibilité de la Spatule blanche *Platalea leucorodia* aux dérangements. *Alauda* 69: 419-428.
Boileau, N. & Plichon, A. *(1999)* Stratégie alimentaire de la Spatule blanche *Platalea leucorodia* en halte migratoire. *Alauda* 67: 347-348.
Boileau, N. & Plichon, A. *(2000)* Stratégie alimentaire de la Spatule blanche *Platalea leucorodia* en halte migratoire. *Actes du 3ème Colloque Eurosite sur la Spatule blanche Platalea leucorodia. Huelva, Espagne.*
Boileau, N. & Plichon, A. (2002) Ecologie et choix des sites alimentaires chez la Spatule blanche *Platalea leucorodia* en halte migratoire. *Alauda* 70: 363-376.
Boileau, N. & Plichon, A. (2003) Prey selection in the Spoonbill: relations with habitats, age and feeding techniques. *In* Veen J. & Stapanova O. (Eds) *Wetland mangement for Spoonbills and associated waterbirds. Report of the 68th Eurosite Workshop*. Van Denderen bv Groningen.
Gonin, J. (2006) *Gestion expérimentale de milieux lagunaires pour la production d'invertébrés aquatiques (Crustacés décapodes, Natantia) sur la Réserve Naturelle de Moëze-Oléron. Agence de l'eau Adour Garonne - LPO.*
Pigniczki Cs. (in press b) Kanalasgémektől (*Platalea leucorodia*) békát (Rana sp.) és ezüstkárászt (*Carassius carassius*) raboló szürke gémek (*Ardea cinerea*) és nagy kócsagok (*Egretta alba*). *Aquila* (In Hungarian with English summary)
Sandberg, E. (2005) *Delfland – Lepelland. 16 jaar Lepelaars; waarnemingen en onderzoek*. Vogelwacht Delft en omstreken. Den Haag.
Wetten van, J.C.J. & Wintermans, G.J.M. (1986) Voedselecologie van de lepelaars van het Zwanenwater en Texel. *Graspieper* 6: 96-109

6.5. Ecology of Key Habitats

Alerstam, T & Lindström, A. (1990*) Optimal bird migration: the relative importance of time, energy and safety*. In: Bird Migration: Physiology and Ecophysiology (Gwinner E. ed.), pp. 331-351. Berlin: Springer-Verlag.
Blanchon, J.-J., Delaporte, P. & Egreteau, C. (1993) *Protection et restauration des haltes migratoires pour les Spatules blanches en France*. Rapport technique final Eurosite. LPO. Rochefort.
de le Court, C., Aguilera, E., Ramo, C. & Rubio, J. C. (1995) Problématique de gestion et conservation de deux colonies de Spatules blanches *Platalea leucorodia* dans le sud de l'Espagne. In *Proceedings of the 23 Eurosite nature management workshop* p. 57-60.
Navedo, J.G. (2007) Different stopover timing in juvenile and adult spoonbill during southward migration. V Spoonbill Newletter.
Newton, I. (2004) Population limitation in migrants. Ibis 146, 197-226.
Schneider-Jacoby, M. (2002) Croatia, home of the last Central European Spoonbill population in alluvial wetlands. *Wetland management for Spoonbills and associated species*, Texel: 17-21
Tucakov, M. (2004) Can nature tolerate the destruction of sensitive habitats by fire? *DEF Bulletin* 1/2004: 4−5.
Tucakov, M. & Žuljević, A. (2005) How to protect colonies of Eurasian Spoonbill *Platalea leucorodia* on carp fish farms in Serbia? *Spoonbill Newsletter* 4: 10-14.
Végvári, Z., Kovács, G. & Kapocsi, I. (2002) Population trends, conservation, and colony site selection of Spoonbills in the Hortobagy National Park, Hungary. *Wetland management for Spoonbills and associated species*, Texel: 31-34.

Vespremeanu, E. (1967) Rolul factorilor abiotici în dinamica populațiilor de lopătar *Platalea leucorodia* L. (Aves, Ciconiformes) din Lunca Dunării. [The role of abiotic factors in the spoonbill *Platalea leucorodia* L. (Aves, Ciconiiformes) population dynamics in the Danube valley.]. *Studii şi Cercetări de Biologie, Seria Zoologie* 19: 279-284.
Vespremeanu, E. (1968) Distribution and biology of the spoonbill in Romania. *Ardea* 56: 160-176.
Vespremeanu, E. (1968) Lopătarul (*Platalea leucorodia* L.), monument al naturii, răspîndire, biologie, ocrotire. [The spoonbill (*Platalea leucorodia* L.), nature monument, distribution, biology, conservation.]. *Ocrotirea Naturii* 12: 181-192.
Vespremeanu, E. (1969) Contribuții la cunoaşterea elementelor dinamicii populației speciei *Platalea leucorodia* L. (*Aves, Ciconiformes*). [Contribution to the knowledge of population dynamics of the species *Platalea leucorodia* L. (*Aves, Ciconiformes*).]. *Lucrările primei sesiuni ştiințifice pe țară de Ecologie animală (22-28 mai 1968)* p. 405-413.
Weber, T.P. & Hedenström, A. (2000) Optimal stopover decisions under wind influence: the effects of correlated winds. *Journal of theoretical Biology* 205: 95-104.

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