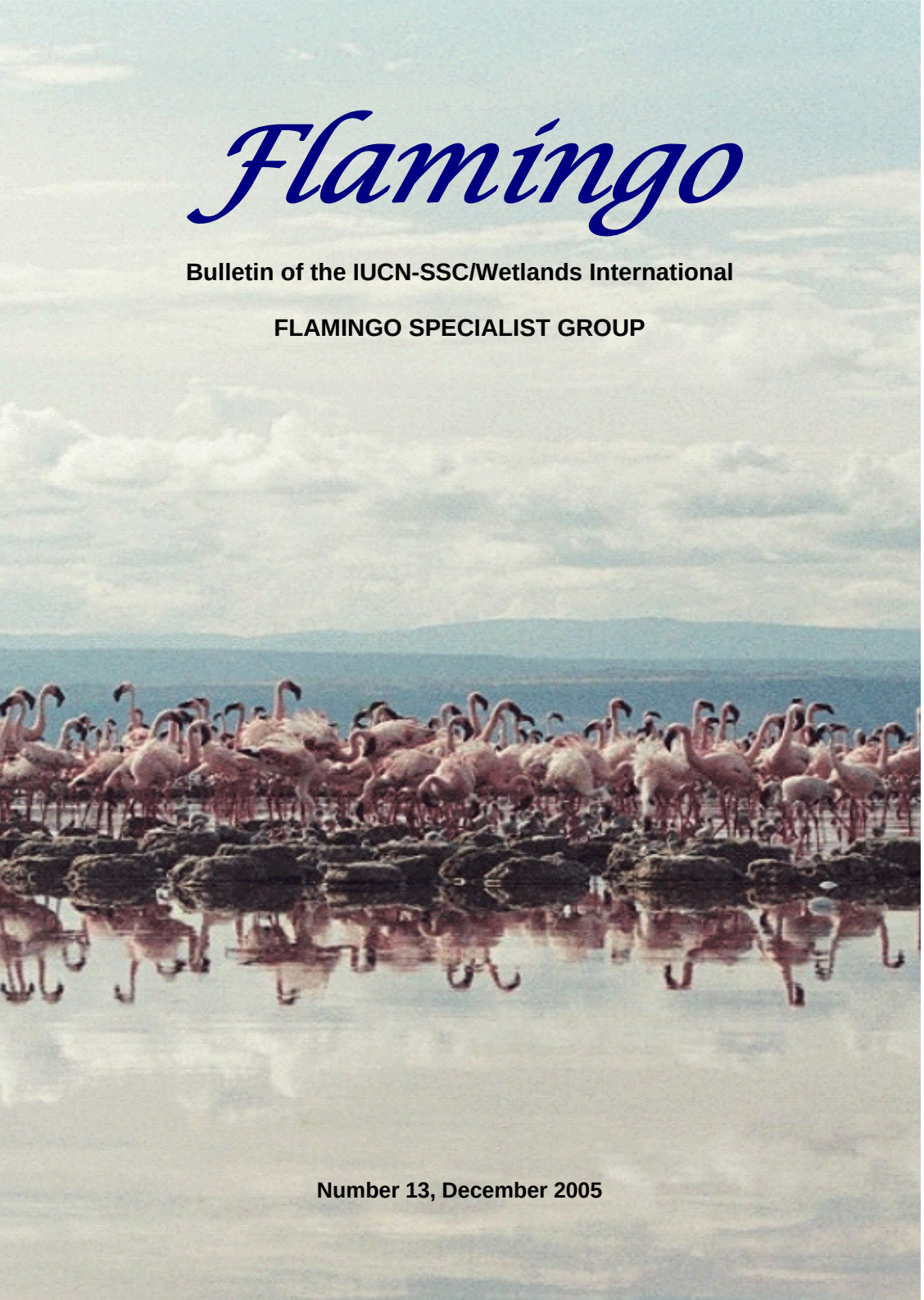
Flamingo

Bulletin of the IUCN-SSC/Wetlands International

FLAMINGO SPECIALIST GROUP



Number 13, December 2005

ABOUT THE GROUP

The Flamingo Specialist Group (FSG) was established in 1978 at Tour du Valat in France, under the leadership of Dr. Alan Johnson, who coordinated the group until 2004 (see profile at www.wetlands.org/networks/Profiles/January.htm). Currently, the group is coordinated from the Wildfowl & Wetlands Trust at Slimbridge, UK, as part of the IUCN-SSC/Wetlands International Waterbird Network.

The FSG is a global network of flamingo specialists (both scientists and non-scientists) concerned with the study, monitoring, management and conservation of the world's six flamingo species populations. Its role is to actively promote flamingo research and conservation worldwide by encouraging information exchange and cooperation amongst these specialists, and with other relevant organisations, particularly IUCN - SSC, Ramsar, WWF International and BirdLife International.

FSG members include experts in both *in-situ* (wild) and *ex-situ* (captive) flamingo conservation, as well as in fields ranging from field surveys to breeding biology, diseases, tracking movements and data management. There are currently 165 members around the world, from India to Chile, and from France to South Africa. Further information about the FSG, its membership, the membership list serve, or this bulletin can be obtained from Brooks Childress at the address below.

Chair	**Assistant Chair**
Dr. Brooks Childress Wildfowl & Wetlands Trust Slimbridge Glos. GL2 7BT, UK Tel: +44 (0)1453 860437 Fax: +44 (0)1453 860437 *Brooks.Childress@wwt.org.uk*	Mr. Nigel Jarrett Wildfowl & Wetlands Trust Slimbridge Glos. GL2 7BT, UK Tel: +44 (0)1453 891177 Fax: +44 (0)1453 890827 *Nigel.Jarrett@wwt.org.uk*
Eastern Hemisphere Chair	**Western Hemisphere Chair**
Dr. Arnaud Béchet Station biologique Tour du Valat Le Sambuc 13200 Arles, France Tel : +33 (0) 4 90 97 20 13 Fax : +33 (0) 4 90 97 20 19 *bechet@tourduvalat.org*	Dr. Felicity Arengo American Museum of Natural History Central Park West at 79th Street New York, NY 10024 USA Tel: +1 212 313-7076 Fax: +1 212 769-5292 *arengo@amnh.org*

Citation: Childress, B., Béchet, A., Arengo, F. & Jarrett, N. (eds.) 2005. *Flamingo*, Bulletin of the IUCN-SSC/Wetlands International Flamingo Specialist Group, No. 13, December 2005. Wildfowl & Wetlands Trust, Slimbridge, UK.

Cover photograph: Lesser Flamingos breeding at Lake Natron by Andrew Burton

Flamingo
Number 13, December, 2005

ISSN 1680-1857

CONTENTS

Printed by Clarendon Press, Wotton-under-Edge, Gloucestershire, UK (0)1453 843571

2004-05 ANNUAL REPORT

Aim of the Group

The aim of the Flamingo Specialist Group (FSG) is to actively promote study, monitoring, management and conservation of the world's six flamingo taxa by:

- Developing and maintaining an active and comprehensive international network of *in situ* and *ex situ* flamingo conservation specialists (both scientists and non-scientists)
- Stimulating and supporting information exchange among flamingo conservation specialists
- Developing and implementing conservation action plans for all six taxa
- Promoting innovative conservation approaches, such as coordinated management of wetland networks to secure flamingo population processes (e.g. dispersal and seasonal movements) and reconciliation of water conservation for people and for flamingos in the context of climate change and predicted water shortage
- Providing information and advice in support of the programmes of Wetlands International, IUCN - SSC, BirdLife International, Ramsar and others that promote the conservation of flamingos and their habitats

Significant short and long term projects

To accomplish its strategic objectives, the FSG has organised its 2004-08 work plan into four programme areas corresponding to the objectives:

Programme 1: Developing and maintaining an active and comprehensive international network of *in situ* and *ex situ* flamingo conservation specialists

Four-year objective: To develop an international FSG membership that includes as many as possible of the flamingo specialists in each flamingo range state, those working on flamingo conservation at zoological societies and scientific institutions, and others interested in flamingo conservation, wherever located. Provide a consultation listing of the expertise and special interests of each member, by species and special interest (e.g. population counts, aerial surveys, satellite tracking, ringing/ banding, taxonomy, health, movements, etc.)

We propose to achieve this objective by:
1. Updating the FSG membership list extant at the end of 2004, including contacts, focal species and expertise or special interests
2. Conducting an active membership drive early in 2005, with the goal of increasing the geographical coverage and expertise of the membership
3. Updating the membership list continuously during the three-year period

Programme 2: Stimulating and supporting information exchange among flamingo conservation specialists

Four-year objective: Develop and maintain convenient facilities and opportunities for FSG members to exchange information and ideas

We propose to achieve this objective by:
1. Developing and promoting an FSG list-serve (e-mail forum) for use by members and others concerned with flamingo conservation
2. Developing a new tri-lingual (English, French and Spanish) FSG web site
3. Developing and publishing an up-graded bulletin annually
4. Organising international workshops

Programme 3: Development and implementation of conservation action plans for all six taxa

Four-year objective*:* Develop a single-species action plan for Lesser Flamingos for submission to the fourth Meeting of the Parties (MOP 4) of the African-Eurasian Migratory Waterbird Agreement (AEWA) in 2008. Develop single-species action plans for Andean and James's flamingos for presentation to the ninth Congress of Parties (COP 9) of the Convention on Migratory Species (CMS) also in 2008. Develop an action plan for the Caribbean Flamingo for endorsement by the appropriate authorities.

We propose to achieve this objective by:
1. Compiling a global status report containing current data for each species on population size (in the wild and in captivity) and trends, conservation status, threats and priorities for future conservation action from information supplied by FSG members and specialists in each of each of the species' range states
2. Organising and supporting regional conservation assessment workshops to finalise the conservation priorities for each species and region
3. Drafting, reviewing and editing the Lesser Flamingo action plan for submission to the AEWA Technical and Standing Committees in early 2008, and to MOP 4 in late 2008.
4. Drafting, reviewing and editing of the action plans for the Andean and James's flamingos for submission to the CMS Technical Committee in early 2007 and to COP 9 in late 2008.

Programme 4: Provide information and advice in support of the programmes and publications of Wetlands International, IUCN-SSC and others that promote the conservation of flamingos and their habitats

Four-year objective: Provide information on the plans and activities of the FSG, including a new quadrennial work plan and annual updates, liaise closely with Wetlands International and IUCN-SSC and provide the most recent research information and advice, as requested, in support of their programmes and publications, as well as the programmes of others (e.g. BirdLife International) concerned with the conservation of flamingos and their habitats.
To achieve this by:
1. Producing a quadrennial work plan for 2005-2008, with annual updates
2. Liaising closely with relevant staff at Wetlands International and IUCN-SSC
3. Providing input for updates of Wetlands International's *Waterbird Population Estimates*, *No. 4* and the IUCN *Red List of Threatened Species*.

Members

169 members from 49 countries
121 concerned with "in-situ" conservation
48 concerned with "ex-situ" conservation

Country	No. Members	Country	No. Members
Algeria	**6**	**Mexico**	**2**
Argentina	**6**	**Morocco**	**1**
Belgium	**4**	**Namibia**	**1**
Bolivia	**1**	**Netherlands Antilles**	**1**
Botswana	**2**	**Paraguay**	**2**
Canada	**1**	**Peru**	**2**
Chile	**9**	**Poland**	**1**
Cuba	**1**	**Portugal**	**1**
Cyprus	**3**	**Senegal**	**3**
Czech Republic	**2**	**South Africa**	**7**
Denmark	**1**	**Spain**	**3**
Djibouti	**1**	**Suriname**	**1**
Egypt	**1**	**Switzerland**	**3**
Eritrea	**1**	**Tanzania**	**3**
Ethiopia	**2**	**The Netherlands**	**7**
Finland	**1**	**Tunisia**	**2**
France	**8**	**Turkey**	**1**
Germany	**4**	**Uganda**	**1**
Guinea-Bissau	**1**	**United Arab Emirates**	**3**
India	**8**	**United Kingdom**	**22**
Iran	**2**	**Uruguay**	**1**
Italy	**3**	**United States**	**25**
Kenya	**4**	**Venezuela**	**1**
Libya	**1**	**West Indes**	**1**
Mauritania	**1**		

Major conferences, meetings or workshops

Year: 2004
Meeting: 3rd International workshop on Greater Flamingos in the Mediterranean region and North-west Africa, in conjunction with the 11th Pan African Ornithological Congress
Venue: l'Hôtel Vincci Alkantara, Djerba, Tunisia
Number of participants: 33
Key outputs: New data on the status and distribution of Greater Flamingo breeding and movement in the Mediterranean region and north-West African were presented. The region-wide ringing and re-sighting programme was reinforced. The redesigned Greater Flamingo banding and re-sighting database at Tour du Valat was unveiled. 19 new FSG members were recruited.

Year: 2005
Meeting: Flamingo Specialist Group and Grupo para la Concervación Flamencos Altoandinos action plan scoping meeting for the flamingo species of the high Andes, in conjunction with Simposio de Humedales Altoandinos.
Venue: Hotel Casa Real, Salta, Argentina
Number of participants: 12
Key outputs: New population estimates for western hemisphere species agreed for Waterbird Population Estimates, 4th edition. IUCN Red List species information sheets reviewed and recommended revisions agreed. Overall approach and format for the production of altoandino species action plans were discussed and agreed. 13 new FSG members were recruited.

Year: 2005
Meeting: EAZA Ciconiiformes and Phoenicopteriformes TAG Meeting
Venue: Zoo Heidelberg, Germany
Number of participants: 15
Key outputs: FSG recruiting presentation made; 10 new members were recruited.

Year: 2005
Meeting: EAZA Ciconiiformes and Phoenicopteriformes TAG Meeting, held in conjunction with the 22nd Annual EAZA Conference
Venue: University of Bath, UK
Number of participants: 59
Key outputs: FSG recruiting presentation made; 18 new members were recruited.

Year: 2005
Meeting: Wetlands International Specialist Group Coordinators Meeting
Venue: Tour du Valat, Le Sambuc (Camargue), France
Number of participants: 16
Key outputs: Proposals for developing and improving Specialist Group functions and effectiveness, and the 2004-05 FSG annual report were presented.

2005 Publications

Johnson, A. & Arengo, F. (Eds.) 2005. Newsletter No. 12, Annual Reports 2002-2004. Wetlands International / IUCN - SSC Flamingo Specialist Group.

Childress, B., Bechet, A., Arengo, F. & Jarrett, N. (eds.) 2005. *Flamingo*, Bulletin of the IUCN-SSC/Wetlands International Flamingo Specialist Group, No. 13, December 2005. Wildfowl & Wetlands Trust, Slimbridge, UK.

Brooks Childress, Co-ordinator

BREEDING NEWS ROUNDUP

South America

Argentina

Breeding period: December-February

There are nine known flamingo breeding sites in Argentina, but it is not know whether or not there was breeding at any of these sites during 2004-05 (E. Derlindati, *in litt.*)

Laguna Brava (P. andinus)
Lago Mar Chiquita (P. andinus & P. chilensis)
Laguna de Llancanelo (P. chilensis)
Laguna Melincué (P. chilensis)
Laguna Pozuelos (P. chilensis)
Laguna Vilama (P. jamesi)
Laguna los Aparejos (P. jamesi)
Laguna Honda (P. jamesi)
Laguna Grande (P. chilensis)

Bolivia

Breeding period: December-February

There are 10 known flamingo breeding sites in Bolivia. The following 2004-05 breeding reports were provided by O. Rocha.

Reserva Nacional de Fauna Andina Eduardo Avaroa
Salar de Chalviri (P. jamesi & P. chilensis): No breeding in 2005
Laguna Colorada (P. jamesi): ~4,800 chicks fledged
Laguna Pelada, (P. andinus & P. jamesi): 511 chicks, combined species
Laguna Busch o Kalina (P. andinus, P. jamesi): 907 chicks, combined species
Laguna Cachi (P. andinus & P. jamesi): 89 nests and 56 chicks, combined species
Laguna Chiar Khota (P. andinus): No breeding in 2005
Laguna Khara (P. andinus & P. jamesi): 241 chicks, combined species
Lago Loromayu (P. chilensis): No breeding in 2005
Lago Poopó (P. jamesi, P. chilensis): Not visited in 2005
Salar de Uyuni (P. jamesi & P. chilensis): Not visited in 2005

Peru

There were no reports of breeding in Peru during 2005. (M. Valqui Munn, *in litt.*)

Lago Junin (P. chilensis)

Chile

Breeding period: December-February

There are 15 known flamingo breeding sites in Chile. The following 2004-05 breeding reports were provided by E. Rodriguez Ramirez.

***Alto Reserva Nacional Los Flamencos (P. andinus)*:** No breeding in 2005
Bajo Reserva Nacional Los Flamencos - Salar de Atacama (P. andinus, P. jamesi, P. chilensis)
Salada: 95 *P. andinus* chicks fledged
Barros Negros: ~400 *P. andinus* chicks fledged
Salar de Coposa (P. andinus, P. jamesi, P. chilensis): No breeding in 2005
Laguna Huambune (P. chilensis): No breeding in 2005
Salar de Huasco (P. andinus, P. jamesi, P. chilensis): ~300 *P. chilensis* chicks fledged, no *P. andinus*, no *P. jamesi*
***Salar de Loyoques (P. chilensis)*:** No breeding in 2005
El Parque Nacional Nevado de Tres Cruces
Salar de Maricunga (P. andinus): No breeding in 2005
Laguna Negro Francisco (P. andinus): No breeding in 2005
Nevado Tres Cruces (P. andinus, P. jamesi): No breeding in 2005
***Salar de Piedra Parada (P. jamesi)*:** No breeding in 2005
Salar de Pujsa (P. chilensis, P. andinus): No breeding in 2005
Salar de Punta Negra (P. andinus): No breeding in 2005
*Salar de Surire (P. andinus **& P. chilensis & P. jamesi**)*: ~400 *P. andinus* and ~1,000 *P. chilensis* chicks fledged in 2005, no *P. jamesi*
Salar de Tara (*P. jamesi & P. chilensis*): No breeding in 2005

Bahamas & Caribbean

Bahamas (*P. ruber*)

Breeding period: April-June

Lake Rosa, Great Inagua: An aerial survey during the first week in May (see also *Research Reports*), found no breeding on Great Inagua for the fourth consecutive year. However, the 2005 hurricanes have broken the drought that has apparently kept birds from breeding at this traditional breeding site for the last four years. As a result, I am hopeful that they will breed here next year (as long as it STOPS raining eventually and doesn't flood them out). (N. Clum, *in litt.*)

Cuba (*P. ruber*)

Breeding period: April-June

El Refugo de Fauna Rio Maximo: The largest breeding site for the Caribbean Flamingo (*Phoenicopterus ruber*) has produced between 17,000 and 42,000 chicks annually from 1998 to 2004 (Table 1.). (J. Morales Leal pers com, see also Morales Leal and Vázquez Ramos In press in Recent Scientific Articles).

There have been no reports on the breeding in Cuba during 2005, or the effects of this year's many hurricanes.

Table 1. Estimated number of *P. ruber* nesting pairs and chicks fledged at El Refugo de Rio Maximo, 1998-2004.

Year	Nesting Pairs	Chicks Fledged	Year	Nesting Pairs	Chicks Fledged
1998	34,000	31,600	2002	29,000	25,000
1999	36,000	29,000	2003	51,600	44,350
2000	39,000	36,000	2004	22,000	17,000
2001	45,000	42,000			

Mexico (*P. ruber*)

Breeding period: April-September

Ria Lagartos: Breeding on three islands: Petén Hu, Yalmakán and Punta Mecoh. Approximately 12,500 breeding pairs fledged an estimated 10,000 chicks in 2005. Breeding was not disturbed by the numerous hurricanes in the area during this year's hurricane season, although the most recent hurricane (Wilma) is reported to have threatened the breeding islands. (R. Migoya, *in litt.*)

Venezuela (*P. ruber*)

Breeding period: October-March

Refugio de Fauna Silvestre y Reserva de Pesca "Ciénaga de Los Olivitos": Approximately 6,200 pairs fledged an estimated 4,800 chicks in 2004-05, and a colony of approximately 4,600 individuals was beginning to breed again in Oct 2005. The many hurricanes in the Caribbean this year have not tracked as far south as Venezuela. However, one possible consequence has been a wetter, extended rainy season with increased breeding by all wetland birds. (F. Espinoza, *in litt.*)

Bonaire (*P. ruber*)

Breeding period: October-March

Pekelmeer: Approximately 1,100 chicks were produced in 2005. Breeding was not disturbed by the Caribbean hurricanes this year. (P. Montanus, *in litt.*)

West Africa & Mediterranean

Breeding by *P. roseus* was recorded at eight sites in West Africa and the Mediterranean during 2005. Almost 58,000 pairs attempted to breed at the eight sites, from Grande Kiaone Island in Mauritania to Lake Tuz in Turkey and an estimated 25,000 chicks were fledged. The two remarkable events of this breeding season were the complete absence of breeding in Spain (from Catalunya to Andalucia), an area gripped by one of the worst droughts in the last 60 years, and the first recorded breeding in Algeria. The last breeding confirmed in North-Africa was in Tunisia at Chott Djerid and Sebkkhet Sidi Mansour in

1991. As of the date of this report, we have no information regarding breeding in Kazakhstan. This summary and the following reports were provided by A. Béchet and members of the Greater Flamingo Network.

Mauritania (*P. roseus*)
Breeding period: April-June

Banc d'Arguin National Park (Grande Kiaone Island): 13-16,000 pairs attempted to breed, and an estimated 10,650 chicks were fledged.

Algeria (*P. roseus*)
Breeding period: April-June

Garaet Ezzemoul: 5,379 pairs attempted to breed; ~5,000 chicks fledged

Spain (*P. roseus*)
Breeding period: April-June

Due to severe drought, there was no Greater Flamingo breeding in Spain during 2005.

France (*P. roseus*)
Breeding period: April-June

Camargue (Etang du Fangassier): 9,582 pairs attempted; 4,132 chicks fledged.

Italy (*P. roseus*)
Breeding period: April-June

Comacchio saltpans: ~802 pairs attempted to breed and ~401 chicks were fledged. 438 nests were abandoned in early May (disturbance during hatching).

Margherita di Savoia: 564 pairs attempted to breed and >180 were fledged. There were three colonies, of which one of 112 nests were abandoned before laying; chicks were counted when many adults were still incubating.

Molentargius, Sardinia: No breeding attempts during 2005.

Saline di Macchiareddu (Santa Gilla, Sardinia): ~8,000 pairs attempted to breed and ~6,950 chicks were fledged.

S'Ena Arrubia (Oristano, Sardinia): No breeding attempts during 2005.

Turkey (*P. roseus*)
Breeding period: April-June

Camalti Tuzlasi saltpans (Izmir): ~7,400 pairs attempted to breed and ~4,000 chicks were fledged.

Tuz Gölü: ~11,500 pairs attempted to breed and ~3,300 chicks were fledged.

Southwest & South Asia

Iran (*P. roseus*)
Breeding period: May-June

Uromiyeh Lake: About 300 pairs attempted to breed and an unknown number of chicks were fledged (H. Ranagad pers. comm.).

India (P. minor & P. roseus)
Breeding period: Erratic, depending on the rains, but mainly September-November

"Flamingo City", Great Rann of Kachchh: The pans did not flood until September, and there was no sign of breeding in October 2005 (B. Parasharya, *in litt.*).

East Africa & Southern Africa

Tanzania (*P. minor & P. roseus*)
Breeding period: Erratic, depending on the rains, but mainly November-February

Lake Natron: There were no observations reported from Lake Natron during the 2005 breeding period (N. Baker, *in litt.*)

Botswana (*P. minor & P. roseus*)
Breeding period: Erratic, depending on the rains, but mainly November-February

Sua Pan: On 26th January 2005, 34,990 pairs of *P. minor* and 699 pairs of *P. roseus* were breeding, and approximately 5,000 chicks had already left their nests and joined large crèches. The pan quickly dried up during a very hot February and March, and by mid-March crèches of tens of thousands of chicks were roaming the dry southern basin in search of the last remaining pools of water. Some had already fledged, while others, mostly the youngest, died on the dry pan (G. McCulloch, *in litt.*).

Namibia (*P. minor & P. roseus*)
Breeding period: Erratic, depending on the rains, but mainly November-February

Etosha Pan: In the 2004-05 season < 500 Lesser Flamingo chicks and < 200 Greater Flamingo chicks were fledged (W. Versfeld, *in litt.*).

RINGING NEWS ROUNDUP

South America

There was no flamingo banding reported from South America in 2005.

Bahamas & Caribbean

Mexico (*P. ruber*)

383 chicks were banded at Ria Lagartos on 13th August (R. Migoya, *in litt.*).

Venezuela (*P. ruber*)

No flamingos were banded in Venezuela during 2005 (F. Espinoza, *in litt.*).

West Africa & Mediterranean

An estimated 25,000 Greater Flamingo chicks were fledged from West African, North African and Mediterranean breeding sites in 2005, of which 1,594 were ringed at four sites (Camargue (France), Saline di Macchiareddu (Sardinia, Italy), Commachio (Italy) and Çamalti (Turkey). This is below the objective of banding 10% of chicks produced each year. Several birds ringed in Europe in previous years were sighted in Tunisia.

France

643 Greater Flamingos were ringed with PVC bands on 27 July at the Fangassier colony in the Camargue. This was fewer than the 800 planned; we closed the corral early because some chicks started to pile up in the deep mud at the entrance. The rest of the operation went smoothly (A. Béchet, *in litt.*).

Germany

On 8 July, nine juvenile feral flamingos in the Zwillbrocker Venn breeding colony were ringed: six Chilean Flamingos, two Greater Flamingos and one hybrid Greater x Caribbean Flamingo. Red PVC rings with the codes ZV28 until ZV36 were used on their right tibia, and metal rings from Vogelwarte Hiddensee (ringing station in Germany) on their left tibia. The ringing was done by a mixed German/Dutch team of 25 persons (J. Treep, *in litt.*).

Italy

On 7 July, 255 Greater Flamingos were ringed at the Comacchio salt pans. Two methodological remarks that might be useful for others: instead of normal straw to cover the corral floor, we used dry Lucerne (alfalfa, medic) this year. It was not a good idea. Although the result looked normal, and the three chasers inside didn't feel anything wrong under their bare feet, the dry stems must have had something sharp because some of the birds soon started showing small, bleeding scratches on their feet and tarsi -- nothing really serious, but this caused many 'false alarms' and a queue of porters at the vet enclosure. A positive remark: for the first time we nearly made no use of metal nets in the fences. 'Cintoflex' plastic net worked very well, a 100 m roll was set by 2 people very quickly and no birds were injured in the netting (N. Baccetti, *in litt.*).

Sardinia

On 6 August, 426 chicks were ringed at Saline di Macchiareddu. There were no major problems. White rings from MLPJ to MPLZ were used (N. Baccetti, *in litt.*).

Spain

Due to severe drought, there was no Greater Flamingo breeding or ringing in Spain during 2005 (J. Amat, *in litt.*).

Tunisia

On 28 August, nine newly-fledged birds were sighted at Sejoumi with rings from European breeding colonies: two juveniles from the Camargue colony (white rings on right leg with black letters FPAD and FSJF), five juveniles from the Molentargius colony in Sardinia (white rings on left leg with black letters MNDV, MNNB, MNPL, MPCP and MPJB) and two juveniles from the Comacchio colony in Italy (dark blue rings on right leg with white letters IFJZ and IFVD, or perhaps IFJZ (M. Smart, *in litt.*).

Turkey

On 31 July, 270 Greater Flamingos were ringed with PVC rings at Gediz Delta, Camalti Saltpans (A. Béchet and Özge Balkiz, *in litt.*).

Southwest & South Asia

There was no flamingo ringing reported from southwest or southern Asia in 2005.

East Africa & Southern Africa

There was no flamingo ringing reported from East Africa or southern Africa in 2005.

RESEARCH REPORTS

Bahamas & Caribbean

During May 2005, the first ever archipelago-wide aerial survey for flamingos in the Bahamas was conducted. Its purpose was to document the number and distribution of flamingos within the Bahamas during the breeding season. The survey was funded by a Wildlife Conservation Society SSF Conservation Award and an International Flamingo Foundation grant. Only 3300-3800 flamingos were seen scattered throughout the Bahamas, and no breeding was recorded. N. Clum, in litt.)

East Africa

The three-year research programme 'Flamingo Conservation and Ramsar Site Management at Lake Bogoria, Kenya', completed its second year during 2005. The primary aims of the research are to identify the essential lake ecosystem properties that sustain key populations of waterbird species on Lake Bogoria, explain the mass movements of the Lesser Flamingo between Lake Bogoria and neighbouring lakes, discover the causes of unpredictable mass die-offs of Lesser Flamingos on Lake Bogoria and neighbouring lakes, and advise on measures to minimise the risk to this species. The research is supported by a Darwin Initiative grant to the Earthwatch Institute and the University of Leicester, UK.

Counts of four key waterbird species (Lesser Flamingo, Greater Flamingo, Cape Teal and Black-necked Grebe, along with densities of the algae *Arthrospira fusiformis* (the Lesser Flamingo's primary diet on the saline lakes of the Rift Valley) and benthic invertebrates are taken every six weeks on lakes Bogoria, Nakuru and Elmenteita, the primary feeding lakes of the Lesser Flamingo in Kenya. The density of *A. fusiformis* in Lake Bogoria remains lower than at any time since 2000, and this has resulted in low numbers of Lesser Flamingo at the lake throughout the period. The density of the detritivorous chironomid whose larvae live in the oxygenated mud (usually under 1.5 m depth) of the lake has recovered from 2004 however, supporting an increase in teal, grebe, Greater Flamingos and hirundines.

Lesser Flamingo health has been good throughout the past 12 months with no outbreak of mortality recorded. Morphometric measurements and intensive post-mortem analysis of those few dead birds found at the lake in July 2005 appeared to confirm that a number of microbial diseases are endemic in the population and that birds injured by physical skeletal damage and unable to feed effectively succumb to one of these diseases. Blood samples were taken by Dr Lindsay Oakes for more detailed analysis. Analysis of cyanobacterial toxins had revealed only low levels in lake water, spring water or tissues; further samples will be taken in 2006. The most likely cause of P. minor mortality outbreaks on these lakes seems to be that disease outbreak, from one of the endemic microbial contaminants, occurs as a consequence of a widespread environmental stressor. (D. Harper, Principal Investigator, in litt.)

OTHER NEWS

The Flamingos' Nearest Relatives are Grebes!

The controversy surrounding the identity of the flamingos' nearest relatives, recently thought to be the spoonbills, continues. van Tuinen *et al.* (2001) proposed the completely new hypothesis of a sister-group relationship between flamingos and grebes, based on their analyses of mitochondrial and nuclear DNA sequences.

In 2004, based on the most taxonomically inclusive survey to date of DNA sequences in non-passerine bird families and orders, Matthew Fain and Peter Houde of New Mexico State University, Las Cruces, USA discovered that many bird families that exhibit similar behaviour, fill similar ecological niches and that were once thought to be related (e.g. flamingos and spoonbills) are not related at all.

Also in 2004, Gerald Mayr of Forschungsinstitut Senckenberg, Section of Ornithology, Frankfurt, Germany found support for the flamingo-grebe sister-group hypothesis based on a cladistic analysis of 70 morphological characters. All three papers, along with their abstracts are included in the Recent Scientific Articles and Reports section of this bulletin. (B. Childress)

Failure in Detecting Past and Present Avian Influenza, Newcastle Disease and West Nile Viral Infections in Young Flamingos of the Comacchio Colony, Italy

Vittorio Guberti, Mara Scremin & Nicola Baccetti
Istituto Nazionale per la Fauna Selvatica, Ozzano Emilia, Italy
vittorio.guberti@infs.it

In the framework of a general monitoring scheme of avian infectious diseases, a total of 286 Greater Flamingos were sampled at the Comacchio colony during three recent breeding seasons: 34 individuals out of a total of 310 fledged birds in 2001; 89 out of 510 in 2002 and 163 out of 400 in 2003. Sampled birds, being a part of those captured for ringing purposes, were 30-75 days old. Our sampling intensity would allow us to detect at least one positive bird (95% CL) if the prevalence of the infection - or the presence of antibodies - were equal to or higher than 8% of the fledgling number in 2001, 3.3% in 2002 and 1.5% in 2003 (transmissible infections do usually show prevalence higher than 10%). Due to antibodies life span, the individuals should not show any passive immunity derived from maternal antibodies. A serum blood sample and a cloacae swab have been taken from each animal. According to standard techniques and in collaboration with the National Reference Centre for Avian Diseases (IZS Tre Venezie, Padua) and the National Reference Centre for Exotic Diseases (IZS Abruzzo e Molise, Teramo), sera were examined in order to detect antibodies against Avian Influenza Virus (AIV), Newcastle Disease Virus (NDV) and West Nile Disease Virus (WNV). Cloacal swabs were analysed for directly detecting the same pathogens.

AIV and NDV are important diseases of poultry, recognised as having a very high economical impact. Specific eradication programs are implemented at the EU level. WNV

is a zoonosis, wild birds and mosquitoes (mainly *Culex* spp) representing the epidemiological reservoir of the infection. All tested samples resulted negative. AIV and NDV are relatively common in the same wetland where flamingos were tested, in ducks (mallards, in particular) and great cormorants. WNV has never been detected in the area. According to the results of the present survey, young flamingos cannot be considered a reliable sentinel for detecting these infections; ecological barriers, rather than species susceptibility (flamingos do acquire these infections, at least in captivity), are likely to prevent the spreading of infection in the wild. Our project was funded by the Italian Ministry of Health and the European Commission.

Spotted Hyenas Added to List of Terrestrial Predators of the Lesser Flamingo

Oliver Nasirwa

Department of Ornithology
National Museums of Kenya
Nairobi, Kenya
onasirwa@africaonline.co.ke

During the third week in May, I visited Lakes Elmenteita and Nakuru in the Great Rift Valley of Kenya. The Lesser Flamingos where there in their thousands. I estimated >50,000 on Lake Elmenteita and >300,000 on Lake Nakuru. The birds were in their flashy pink breeding plumage and most birds on both lakes were participating in the unique Lesser Flamingo pre-breeding display.

On Lake Nakuru, some birds were building nests and many appeared to be incubating, although Lesser Flamingos are not known to breed successfully on this lake. About one kilometre from these nesting birds, we saw a park of five spotted hyenas, one adult and four young, running along the shore, with the adult leading the pack about 20 meters ahead of her young. Suddenly, she turned into the lake and grabbed a Lesser Flamingo by the wing before it could take off. The other flamingos in that flock flew off. The hyena then carried the carcass to the shore and shared it with her four young, eating it alive. They ate everything not leaving even a feather.

This incident took place on 20th May 2005 at around 8:45 a.m. On this trip we also recorded Silver-backed Jackals, Marabou Storks and African Fish Eagles all of which are known to predate Lesser Flamingos. Documented incidences of predation by terrestrial predators such as the Spotted Hyena, Silver-backed Jackal, Olive Baboon and Marabou Stork, which is a terrestrial predator of flamingos even though it can fly, show why Lesser Flamingos are not able to successfully breed in lakes other than Lake Natron within East Africa. On Lake Natron, terrestrial predators are unable to reach the flamingo breeding colonies, which are well out in the lake.

First Flamingo Record from Mongolia

In 1997, friends of mine were working with a Chinese scientist in Mongolia who had shot a flamingo and had it hanging by the head on the wall of his hut. It was most likely a Greater Flamingo, based on its size, and the bird was probably killed in 1995 or 1996. I believe it was somewhere in the region of Lake Hovsgol and the Bayan valley (not part of the Bayan-Ulgii political area in the west of the country). (J. Balance, *in litt.* to the FSG E-Group).

This observation of a Greater Flamingo in Mongolia is of interest as I have not seen any previous records from this country. However it is not very surprising that the bird is found here as they breed in neighbouring Kazakhstan and it has been reported as a stray in western China. I have forwarded your report to colleagues in Mongolia to try and get a better understanding of the distribution of the species. (T. Mundkur, *in litt.* to the FSG E-Group).

New Makgadikgadi Wetlands Working Group Formed to Protect Key Flamingo Breeding Site in Botswana

One of the largest ephemeral wetlands in Africa, the Makgadikgadi salt pan complex in Botswana is home to hundreds of thousands of flamingos during seasonal flooding and comprises one of the most important breeding sites in Africa for both Greater and Lesser Flamingos. The new Makgadikgadi Wetlands Working Group, comprising a coordinated team of stakeholder and community participants, aims to encourage the sustainable development and long-term conservation of the Makgadikgadi wetlands. The new group has been formed by Dr. Graham McCulloch with funding from the Whitley Fund for Nature and Tusk. "Promoting the Makgadikgadi's value as a sustainable natural resource, while protecting its integrity, biodiversity and status as one of the most important breeding sites for flamingos in Africa, through effective management and policy implementation is the ultimate goal", said Dr. McCulloch. Still in its infancy, the project has already gained much support, including a partnership with BirdLife Botswana and potential links with research institutions within and outside Botswana (B. Childress).

New Flamingo Husbandry Guidelines Published

After several years of international collaboration, a new set of guidelines for the successful maintenance of flamingos in captivity has been published by the American Zoo and Aquarium Association and the European Association of Zoos and Aquaria, in cooperation with the Wildfowl & Wetlands Trust.

The new guidelines represent recommendations of husbandry techniques given the scientific data currently available and the successful experiences of their members. Guidelines for the renovation of existing facilities or the construction of new exhibits are also included. The editors, Christopher Brown, AZA Ciconiiformes TAG, Dallas Zoo and Cathy King, EAZA Ciconiiformes/Phoenicopteriformes EEP, Rotterdam Zoo say that "while much data have been compiled for these guidelines, there is still much to be learned about the husbandry of flamingos. It is our intention that these guidelines be the catalyst for scientific inquiry into the management of flamingos in captivity."

An added bonus with this publication is the inclusion of Dr. Jeanette Boylan's extensive flamingo bibliography, containing over 2,600 references of scientific and other articles regarding flamingos. The bibliography is divided into two sections – an historical bibliography and a current bibliography. The historical bibliography contains references before 1975 and is ordered by author's last name. The current bibliography contains references from 1975 to 2005 and is divided into sections for ease of finding articles (Captive management and behaviour; Conservation, Disease and veterinary aspects; Distribution, breeding sites and population size; Natural history and ecology; Species accounts, guide books; Taxonomy; and Miscellaneous). Those wishing to know more about the new husbandry guidelines should contact Dr. Christopher Brown, Curator of Birds, Dallas Zoo, USA (CDBROWN@mail.ci.dallas.tx.us).

FEATURE ARTICLES AND REPORTS

New Flamingo Population Estimates for Waterbird Population Estimates, Fourth Edition

During 2005, the Flamingo Specialist Group proposed several revisions to the flamingo population estimates in the Wetlands International publication *Waterbird Population Estimates. No. 3*, in anticipation of the publication of the new fourth edition. These proposed revisions were based on new surveys and extensive consultations among FSG members. New or reconfirmed population estimates for the three South American species were proposed based on the results of a coordinated census of all important wetland sites in January 2005, and revisions to the Caribbean Flamingo population estimates were also proposed based on recent surveys.

The most substantial proposed revisions involved the East African and southern Asian populations of the Lesser Flamingo, and the Western Palearctic population of the Greater Flamingo. The estimated population of the Lesser Flamingo in East Africa was proposed to be reduced from 2.0 - 4.0 million to 1.5 - 2.5 million, while the southern Asian population was proposed to be increased from 150,000 to 390,000. The Western Palearctic population of the Greater Flamingo was proposed to be increased from 430,000 to between 510,000 and 540,000, with the eastern Mediterranean segment of the population being separated from the Asian populations. The new estimates that will be published in *Waterbirds Population Estimates, No. 4* are shown in Table 1 and two papers reviewing the background for the Lesser and Greater Flamingo estimate revisions follow.

Flamingo Population Estimates for Africa and Southern Asia

Brooks Childress
The Wildfowl & Wetlands Trust
Slimbridge GL2 7BT, UK
brooks.childress@wwt.org.uk

East Africa

Uganda: Approximately 10,000 Lesser Flamingos had regularly been recorded on the saline craters in the western Rift Valley prior to 2003. However, very few were recorded in the July 2003 African Waterbird Census, and the situation was similar in 2005 (A. Byaruhanga, *in litt.*).

Kenya: The January African Waterbird Census counts of Lesser Flamingos in Kenya declined 75% between 2003 and 2004, and have continued at the lower level in 2005 (O. Nasirwa, *in litt.*). From 2001 through 2003, the mean number of Lesser Flamingos counted on the main flamingo feeding lakes in Kenya (Childress *et al.* 2005 in press) in January was approximately 1,130,000, with a range from 1,052,583 to 1,173,242.

Table 1. Flamingo population estimates for Waterbird Population Estimates, No. 4.

Species/Population	WPE3 Estimate	Proposed WPE4 Estimate
Phoenicopterus roseus		
West Africa	40,000	45,000-95,000
East Africa	35,000	35,000
Southern Africa	65,000-87,000	65,000-87,000
Western Mediterranean	100,000	100,000-165,000
Eastern Mediterranean, SW & Southern Asia	290,000	
Eastern Mediterranean		60,000
SW & South Asia		240,000
Aldabra	25-50	25-50
Phoenicopterus ruber		
Galapagos Islands	435	490
Bonaire, Venezuela	34,000	50,000
Mexico	30,000	40,000
Bahamas, Cuba	260,000	167,000-242,000
Phoenicopterus minor		
West Africa	15,000	15,000-25,000
East Africa	2.0-4.0 million	1.5-2.5 million
Southern Africa	55,000-65,000	55,000-65,000
South Asia	150,000	390,000
Phoenicopterus chilensis		
Southern South America	200,000	200,000
Phoenicoparrus andinus		
Southern South America	34,000	34,000
Phoenicoparrus jamesi		
Southern South America	64,000	100,000

However, in 2004 and 2005, the mean number of Lesser Flamingos on the same lakes in January has been only about 285,000. The only important flamingo feeding lake not included in the surveys was Lake Logipi.

During these same periods, the numbers of Greater Flamingos declined from about 21,000 in 2001 to only 4,850 in 2003 before recovering to 43,275 in 2005 (O. Nasirwa, *in litt.*). The decline in the number of Lesser Flamingos on Kenyan lakes appears to have begun in the first half of 2003, as the July 2003 count on Lake Nakuru, the only Kenyan lake surveyed in July in most years, was down 62.5 %, from 739,177 in July 2002 to 277,236 in July 2003 (O. Nasirwa, in litt).

Tanzania: There have been two coordinated January counts in Tanzania, in 2002 and 2005. Both counts used aerial surveys extensively, resulting in an inability to distinguish between the species (N. Baker, *in litt.*). These surveys included all of the key Flamingo sites plus 8-9 smaller sites. The total number of flamingos in these two surveys was virtually the same in both years (634,440 in 2002 and 614,027 in 2005, N. Baker, *in litt.*). If a ratio of 65 Lesser Flamingos to every Greater Flamingo is used, the mean species numbers would be approximately 615,000 Lesser Flamingos and 10,000 Greater Flamingos. This was the mean ratio between the species found in African Waterbird Censuses of 1999 - 2001 (Dodman & Diagana 2003).

The January counts for Kenya and Tanzania, the range states accounting for the vast majority of the flamingos in East Africa, indicate that there were approximately 1.8 million Lesser Flamingos and 20,000 Greater Flamingos in the two countries in 2002. In 2005, the combined totals were approximately 895,000 Lesser Flamingos and 55,000 Greater Flamingos. However, it is not believed that these results indicate changes of these magnitudes in the flamingo populations. Rather, there is general agreement among Flamingo Specialist Group members familiar with the East African situation that the best estimates for the East African populations of these two species are between 1.5 and 2.5 million Lesser Flamingos and approximately 35,000 Greater Flamingos.

South Asia

Large breeding populations of Greater and Lesser Flamingos (500,000 - 1,000,000 birds of combined species) have been reported sporadically in the Ranns (Great and Little) of Kachchh in Gujarat state in northwestern India for at least 60 years (Ali 1945, 1954 & 1960). The birds have a well-established breeding location (locally known as “Flamingo City”), and census numbers are highest there during the breeding season (October-February). This perhaps indicates that in non-breeding periods, the birds are dispersed on smaller wetlands around the Ranns, and in other regions of India, making them more difficult to census. January 2003 counts of non-breeding birds in some sites of Gujarat state were 42,723 Greater and 388,198 Lesser Flamingos (Jadhav & Parasharya 2004).

Because of the long-term existence in India of such large breeding populations of flamingos (perhaps ~ 20% Greater and ~ 80% Lesser, based on the ratios recorded in 2003), and the lack of counts in 2001 or 2002, prior to the large decline in East Africa, it is impossible to know whether the 900,000 Lesser Flamingos “missing” from Kenya moved to India in 2003 or not.

Southern Africa

Based on coordinated counts from April 1999 by Mark Anderson (South Africa), Graham McCulloch (Botswana) and Rob Simmons (Namibia), it is believed that the resident populations of southern Africa are between 50,000 and 60,000 Greater Flamingos and about 50,000 Lesser Flamingos (Simmons, in prep.). These populations increase during good breeding years; 80,000 breeding pairs of Lesser Flamingos were counted in 2000 (a record); 85,444 individual Lesser Flamingos were counted at Sua Pan in March 2005, along with 27,631 Greater Flamingos (G. McCulloch, *in litt.*). Breeding numbers at Sua Pan may be increased by birds from Angola and Mozambique in good breeding years (G. McCulloch, *in litt.*).

Due to severe drought conditions, there was no flamingo breeding at Sua Pan in Botswana in either the 2001-02 or the 2002-03 breeding seasons (November – March; G. McCulloch, *in litt.*). In 2003-04, conditions for breeding at Sua Pan were also poor, with the result that breeding was limited to 5,210 pairs of Lesser Flamingos and 6,700 pairs of Greater Flamingos, with very few surviving chicks. Certainly no large numbers of East African flamingos would have been tempted south by these conditions. In 2004-05, flamingo breeding at Sua Pan was more successful, with 35,000 pairs of Lessers spotted breeding via aerial survey.

There was little or no breeding at Etosha Pan in Namibia in the 2002-03 breeding season (R. Simmons, *in litt.*). Breeding resumed in the 2003-04 season (R. Simmons, *in litt.*), but failed in the 2004-05 season due to drought conditions (W. Versfeld, *in litt.*).

Acknowledgments

I would like to thank the many members of the Flamingo Specialist Group and Grupo para la Conservación de Flamencos Altoandinos who provided information for this report and who participated in the lively discussions via the FSG E-Group. I am particularly grateful to Neil Baker, Tim Dodman, Graham McCulloch, Oliver Nasirwa, B. Parasharya, Rob Simmons and Chris Tuite for their contributions.

References

Ali, S. 1945. More on the flamingos in Kutch. J. Bombay Nat. History Soc. 45: 586-592.

Ali, S. 1954. The birds of Gujarat. J. Bombay Nat. History Soc. 52(3): 374-458.

Ali, S. 1960. Flamingo City re-visited: nesting of the Rosy Pelican (*Pelicanus onocrotalus* Linnaeus) in the Rann of Kutch. J. Bombay Nat. History Soc. 57(2): 412-415.

Childress, B., Hughes, B., Harper, D., Van den Bossche, W., Berthold, P. & Querner, U. In press 2005. Satellite tracking reveals the East African flyway and key site network of the Lesser Flamingo (*Phoeniconaias minor*). Proceedings of the Waterbirds Around the World Conference. Edinburgh.

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.

Jadhav, A. & Parasharya, B.M. 2004. Counts of Flamingos at Some Sites in Gujarat State, India. Waterbirds 27: 141-146.

Simmons R.E. In prep. In: Roberts Birds of Southern Africa, 7th ed. Hockey, P.A.R., Dean, W.R.J., Ryan, P.G. & Maree, S. (eds.) Black Eagle Publishing, Cape Town.

Greater Flamingo Populations in the Western Palearctic and their Estimated Sizes in 2005

Arnaud Béchet
Station Biologique de Tour du Valat
Le Sambuc, 13,200 Arles, France
bechet@tourduvalat.org

The Western Palearctic Metapopulation of the Greater Flamingos

Resightings of flamingos banded in the Mediterranean together with ring recoveries from Iran and Kazakhstan suggest that the western Palearctic population of the greater flamingos could be considered as one large population extending from, at least, West Africa (Niger, Guinea, Guinea Bissau-Senegal and Mauritania) to the Mediterranean, south-west Asia (Iran and Kazakhstan) and south Asia (India and Pakistan; Behrouzi-Rad 1992; Johnson 1997; Diawara *et al.,* In press, Balkiz et al., In prep.). However, within this continuous geographic range, it seems that exchanges between the two extreme parts of the range are rare. We thus propose to split this continuum into four population regions: West Africa, the western Mediterranean, the eastern Mediterranean, and a combined south and south-west Asian region.

The Estimated Size of the Four Western Palearctic Greater Flamingo Sub-populations

Breeding Counts

In West Africa, breeding is regular at the Banc d'Arguin with almost 15,000 pairs breeding on the Kiaone islands in 2005 (45,000 individuals including non-breeding bitrd; Diawara *in litt.*). In the western Mediterranean, colonies from Spain, Italy and France gathered about 55,000 breeding pairs (165,000 individuals, including non-breeding birds) in 2003 and 2004 (Béchet & Germain 2003; Béchet & Germain 2004). In the eastern Mediterranean, Turkish colonies totaled from 8,000 to 13,000 pairs in 2003 and 2004 (Balkiz *et al. in prep.*). In south-west Asia, an average of 32,000 pairs was recorded breeding at Lake Uromiyeh, Iran until 1999 when reproduction stopped following the drought of the lake. Around 10,000 pairs were counted breeding at Lake Tengiz in Kazkhstan in 2003 (30,000 individuals including non-breeding birds; Johnson & Van der ven 2003). This leads to a rough estimate of about 90,000 breeding pairs, with a resulting breeding season population estimate of about 270,000 (including non-breeding birds) in the Western Palearctic.

Winter Counts

Considering winter counts, the last total count for West Africa was in 2001, with 55,160 flamingos in Banc d'Arguin, 18,900 counted in the south of Mauritania (Aftout es Saheli, Diawling and Chat Tboul), 21,430 in Senegal, 902 in Guinea Bissau, 600 in Guinea and 32 in Niger for a total of more than 97,000 flamingos for West Africa (Dodman & Diagana 2003).

In the western Mediterranean, the only recent count available is from France with 39,291 birds in January 2005 (Béchet & Arnaud, unpublished data), so that using the last counts available from other Mediterranean countries (18,921 in Italy in 2000 [Baccetti *et al.* 2002], 5,000 in Spain in 1997 [Manuel Rendon-Martos pers. comm.], 5,000 in Morocco in

1995 and 5,950 in Algeria in 1996 [Delany *et al.* 1999] and 28,922 in Tunisia in 2003 [Hichem Azafzaf and Association les Amis des oiseaux, pers. comm.]) lead to a wintering population estimate of approximately 100,000 birds.

In the eastern Mediterranean, 39,000 flamingos were counted in Turkey in 2005, and adding up the latest counts from other eastern Mediterranean countries (7,465 in Greece and 1,253 in Cyprus in 1999 [Gilissen *et al.* 2002], 12,000 in Syria in 2004 [Johnson & Arengo 2004], 381 in Israel in 2001 [Johnson & Arengo 2003] and 775 in Libya in 2005 [Mike Smart, comm. pers.]) indicates that an estimated 60,000 birds winter in this region.

The most recent non-breeding Greater Famingo counts in south-west Asia totaled 196,000 in 1998, mostly in Iran (Gilissen 2002). In south Asia, 42,000 were counted in India in January 2003 (Jadhav & Parasharya 2004). Ring recovery data suggest combining the populations of these two areas, which would result in an approximate total Greater Flamingo population in south-west and south Asia of about 240,000.

The approximate total Greater Flamingo population in the Western Palearctic appears to be between 510,000 to 540,000. However, this figure must be taken with caution, as it results from counts made in several different years, when important changes in winter distribution may have occurred, following cold spell events for example.

Acknowledgments

I would like to acknowledge the members of the Greater Flamingo Network for having provided the breeding and wintering counts used in this report, together with Alan Johnson who carefully recorded papers, reports and unpublished data on the Greater Flamingos counts during the last 25 years. I am also grateful to Derek Scott for providing comments on an earlier draft of this manuscript.

References

Baccetti, N., Dall'Antonia, P., Magagnoli, P., Melega, L., Serra, L., Soldatini, C. & Zenatello, M. 2002. Risultati dei censimenti degli uccelli acquatici svernati in Italia : distribuzione, stima e trend delle populazioni nel 1999-2000. Instito Nazionale per la Fauna Selvatica "Alessandro Ghigi".

Balkız, Ö., Béchet, A., Özesmi, U., Sıkı, M., Arnaud, A., Germain, C. & Eken, G. In prep. The Greater Flamingo (*Phoenicopterus roseus*) in Turkey: Status and conservation issues.

Béchet, A. & Germain, C. 2003. Summary of the flamingo breeding season in the Mediterranean and West Africa in 2003. Sta. Biologique, Tour du Valat, Arles, Fr.

Béchet, A. & Germain, C. 2004. Greater Flamingo breeding report for the Mediterranean and West Africa, 2004. Station Biologique, Tour du Valat, Arles, Fr.

Behrouzi-Rad, B. 1992. On the movements of the Greater Flamingo, *Phoenicopterus roseus*, in Iran. Zoology in the Middle East, Aves 6: 21-27.

Delany, S., Reyes, C., Hubert, E., Pihl, S., Rees, E., Haanstra, L. & van Strien, A. 1999. Results from the International Waterbird Census in the Western Palearctic and Southwest Asia 1995 and 1996. Wetlands International, Wageningen, The Netherlands.

Diawara, Y., Arnaud, A., Araujo, A. & Béchet, A. Submitted. Nouvelles données sur la reproduction et l'hivernage des flamants roses en Mauritanie et confirmation d'échanges avec les populations méditerranéennes. Ostrich.

Dodman, T. & Diagana, C.H. 2003. African Waterbird Census. Les dénombrements d'Oiseaux d'Eau en Afrique 1999, 2000 & 2001. Wetlands International, Wageningen. The Netherlands.

Gilissen, N., Haanstra, L., Delany, S., Boere, G. & Hagemeijer, W. 2002. Numbers and distribution of wintering waterbirds in the Western Palearctic and Southwest Asia in 1997, 1998 and 1999. Wetlands International, Wageningen, The Netherlands.

Jadhav, A. & Parasharya, B.M. 2004. Counts of Flamingos at Some Sites in Gujarat State, India. Waterbirds 27: 141-146

Johnson, A.R. 1997. Long term studies and conservation of Greater Flamingos in the Camargue and Mediterranean. Colonial Waterbirds 20: 306-315.

Johnson, A. & Arengo, F. 2003. Annual report 2001. IUCN-SSC/Wetlands International Flamingo Specialist Group Newsletter No. 11, December 2003. Station Biologique, Tour du Valat, Arles, France.

Johnson, A. & Arengo, F. 2004. Annual reports 2002-2004. IUCN-SSC/Wetlands International Flamingo Specialist Group Newsletter No. 12, December 2004. Station Biologique, Tour du Valat, Arles, France.

Johnson, A. & Van der Ven, J. 2003. Visit to Greater Flamingo breeding site at Lake Tengiz Korgalzhyn State Nature Reserve, Kazakhstan. Station Biologique Tour du Valat, Arles, France.

Methods of Capturing and Handling Wild Lesser Flamingos for Research

Brooks Childress and Nigel Jarrett
Wildfowl & Wetlands Trust, Slimbridge, UK
brooks.childress@wwt.org.uk

Reprinted from Afring News 34(1), 2005, with the kind permission of the South African Bird Ringing Unit, Avian Demography Unit, University of Cape Town, SA

This describes capture and handling methods that have been used successfully with wild adult Lesser Flamingos at Lake Bogoria in Kenya. The capture method involves placing traps in shallow water along the shore of a lake where Lesser Flamingos gather to rest and preen. An earlier version of this capture method was developed by Dr. Ramesh Thampy of WWF, in conjunction with William Kimosop, Senior Warden of the Lake Bogoria National Reserve.

The Trap

The base of the trap consists of a 120 cm x 245 cm rectangular wire mesh grid made with strands of 3 mm wire placed across and down at 7.5 cm intervals and welded where they cross (Figs. 1 & 2). To prevent birds and researchers from impaling themselves on the ends of the wires, a border of 5 mm wire is welded to the ends of the interior wires around the outside edge of the rectangle.

R. Webster

Fig 1. Preparing trap by opening nooses

Nooses of dark-coloured (brown is preferable) 50 lb test polyethylene fishing line are attached to the wire mesh grid where the wires cross. In the grid described, there are 512 places where the wires cross. If a noose is tied to every third crossing in each direction, approximately 50 nooses per grid (5 x 10) will result.

Each noose is made from a piece of fishing line approximately 75 cm long. Small (2 cm) loops are tied at both ends of the line. One loop is used to tie the line to the grid, while the other is used to make the noose by slipping the main length of line back through the loop. Fifty-pound test line is used, not for strength, but for thickness, to keep the loops from injuring the birds' legs when they are caught. Dark-coloured line is important as the birds are less likely to see the line under the water.

Before deploying the grid, the nooses need to be opened up to form "circular" openings about 20-25 cm in diameter (Fig. 1). This is easier said than done, as the fishing line will retain the memory of the spool it came on and will try to recoil into a tight circle. To help prevent this, stretch the 75 mm lengths of line in the sun for an hour or so before using them. This can be done by, for example, attaching one set of end loops to a hook and the other end to a weight.

The Trapping Site

At Lake Bogoria, when not feeding, Lesser Flamingos tend to gather to rest and preen in shallow areas along the shore where the bottom is flat mud or sand, and they often walk back and forth along the shore in these areas. An ideal trapping site would be one with these characteristics and one that is also near a source of fresh water.

Placement of the Traps

Place the grid(s) perpendicular to the shoreline at one or more locations along the shore where the flamingos walk (Fig 2). The water should be sufficiently deep to obscure the loops from view. The specific depth will vary depending upon where the flamingos have been walking and how high the loops float in the water in each particular situation. Use some type of markings on shore (*e.g.* arrows in sand) to indicate where the grid is located in the water, as Lesser Flamingos are suspicious of markers in the water and avoid the areas around them.

We often use more than one grid at a time at the same location. As Lesser Flamingos quickly discover the location of the first grid and walk around it in deeper water, a second grid can be placed in deeper water at the same location, but offset diagonally from the first.

Capturing and Extracting Caught Birds

The grids should never be left unattended, even for a few minutes, because it is important to be able to get to the birds quickly after they are caught to prevent them from injuring themselves or being predated. To avoid scaring the flamingos away from the trapping sites, the attendants need to remain out of sight behind a vehicle or vegetation, and to be quiet.

R. Webster

Fig 2. Placing the trap

When a Lesser Flamingo gets its foot caught in one of the nooses, it flaps its wings and struggles to get free. The other flamingos around it will begin to move away, and this is when the attendants must get to the trapped bird as quickly as possible, but without running. Running will cause all of the birds in the area to fly away and spoil the trapping session. The untrapped birds will fly away anyway, when the attendants the trapped bird, but the objective should be to accomplish this with as little disruption as possible.

Retrieving a trapped bird should always involve two people trained in the safe handling of birds, one person to control the bird, and the other to remove the noose from its foot (Fig 3). The first objective when retrieving a trapped Lesser Flamingo is to get its body safely under control and out of the water. Excessive soaking of the feathers not only leads to hypothermia, but also makes it more difficult, if not impossible, for the bird to fly when released. The first move should be to safely control the wings by using the two-handed grip. In the two-handed grip, one hand is placed on each side of the bird near its shoulders and its wings are gently folded back against its body. (Birds should never be lifted or controlled solely by holding onto their wings or their necks as this may lead to serious injury.) Once the wings are against the bird's body, the fingers of each hand should be curled under the bird's chest and abdomen in a gentle but firm grip.

The firmness of this grip is critical and can only be learned through proper guidance and practice. If the grip is too loose, the bird may partially escape and injure itself, or the handler may injure the bird trying to regain control. If it is too tight, there is a risk that it may restrict breathing and heart function and lead to internal injury or death. Like those of all birds, Lesser Flamingo bones are hollow and easily cracked or broken.

Photographer not known

Fig 3. Extracting a Lesser Flamingo from the trap

The second step is to get the bird's legs under control. The skin on Lesser Flamingo legs is very thin, and the birds can damage their own legs by knocking them together in struggling to get free, either from the trap or from the handlers. Therefore, it is important for the person controlling the legs to use a grip that keeps the legs apart. This is best done by holding both legs in one hand with the middle finger between the joints at the lower end of the tibias (Figs 3 & 4). The third step is to extract the bird's foot from the noose. This is the job of the second person, who will need both hands to loosen the noose, extract the foot and reopen the noose before placing it back in the water.

In spite of the most careful handling, trapped birds will occasionally inflict minor injuries to the thin skin on their legs and feet in their struggle to get free. These minor injuries are easily treated with surgical spirit, Ethanol or an oxytetracycline spray such as Oxyne G.V. Another useful product is Preparation H (an ointment for treating haemorrhoids), which can be obtained at many chemist shops. This ointment contains shark liver oil which promotes healing. It also has the advantage of being water resistant so it stays on the wound (M. Brown, pers. comm.).

J. Rollings

Fig 4. Correct method of holding a Lesser Flamingo in transit

After the bird's foot is extracted from the noose, the bird should be handed to the second person to take it to the research station, the place where the research (e.g. ringing, measurements, blood samples) is being carried out. In handing the bird to the second person, the first person should place the body of the bird, with its wings still held closely to its sides, under the second person's left arm with its head facing toward the back of the person. The second person should control the bird's body and wings in the crook of his or her left arm and hold the bird's legs apart with the left hand, again placing the middle finger between the joints below the tibias, keeping the legs angled downward from the body (Fig 4). The right hand should then be placed on the back of the bird to keep its wings under control. The downward angle of the legs is important to avoid spraining or dislocating the knee joints at the top end of the tibias.

Research Station

Flamingos are large birds that usually occur in locations where there is full sun. In order to reduce stress and avoid injury during the research process, it is important to have a suitable research station set up to accommodate them. The ideal station would consist of a sheltered work surface out of the wind and sun. A sturdy plastic table and a tarpaulin that can be erected to provide shade are ideal (Fig 5).

J. Rollings

Fig 5. Sample research station

Bird Handling During Research

Usually, it is best if the person who brought the bird from the trap continues to hold it during the research operations, which should only be undertaken by experienced bird handlers with the required permits. Care should be taken not to position oneself directly behind the bird as the stress of being held captive and measured often results in explosive projectile diarrhoea. Plastic aprons are helpful in protecting clothing during handling.

The Release

Releasing Lesser Flamingos on dry land produces superior results to releasing them in the water. Flamingos need to run to gain momentum to take off and this can be done more easily on land. In preparation for the release, the person who did the research should take the bird from the person who has been holding it during the research operation(s). The body of the bird should be held gently with one hand against the chest of the person taking it, with the stomach and legs facing outward. The person's other hand should control the legs as described earlier. To release the bird, find a relatively flat area with easy access to the water. Squat and release the bird's legs so that it gets a feel of the ground. When the bird becomes steady on its legs, the body can be released and the bird allowed to run/fly away (Fig 6).

J. Rollings

Fig 6. Releasing Lesser Flamingo after research

Wintering Populations, Breeding Attempts and Lead Poisoning of the Greater Flamingo *Phoenicopterus roseus* on the Salt Lakes of Cyprus

Michael Miltiadou
BirdLife Cyprus
P.O. Box 28076, 2090 Nicosia, Cyprus
birdlifecy@cytanet.com.cy

Introduction

Cyprus has three salt lakes: Akrotiri in Limassol District (brackish), Larnaca in Larnaca District (hypersaline) and Paralimni in Famagusta District (brackish). The first two annually host wintering flocks of Greater Flamingos while the third is only occasionally used by flamingos (Flint & Stewart 1992).

Lakes Akrotiri and Larnaca differ substantially in their size, water chemistry and the species of aquatic organisms that inhabit them. Akrotiri Salt Lake, 1,350 ha, has a salinity of only 12 ppt and is inhabited by the shrimp *Brachinella spinosa* (Thamnocephalidae), while Larnaca, 587 ha, has a salinity of 100+ ppt and is inhabited by *Artemia salina* (Artemidae). On the northwest, Akrotiri Salt Lake borders the remnants of the once extensive Zakaki marsh and on the southwest it is connected by a channel to the freshwater Phassouri Reed Beds. This is the reason the lake is brackish and occupied by the Mediterranean Tooth Carp *Aphanius fasciatus* (Cyprononti dae). In very wet winters Akrotiri connects to the sea to the east, facilitating the entry of Grey Mullet *Mugil* sp fry into

the lake. Akrotiri also supports the aquatic plant *Zannichellia palustris* (Zannichellicaeae). Larnaca has neither fish nor plants (Ministry of Agriculture and Natural Resources 1992).

Wintering Populations

Records have been kept of the Greater Flamingos wintering on the island of Cyprus since 1957. The flamingos usually arrive in November and depart in March (Cyprus Ornithological Society 1957,1957-2001; Cyprus Ornithological Society 1970, 1970-1990; BirdLife Cyprus 2002; BirdLife Cyprus 2003).

Annual records since 1980 seem to indicate that the arrival and departure dates, as well as the size of the winter flocks, depend on annual rainfall and the resulting water levels in Akrotiri and Larnaca.

Although these records represent mid-winter January counts, other winter observations have also shown that numbers fluctuate throughout winter between the lakes as birds move back and forth between the local wetlands. Sudden partial departures and immigration of new flocks is a common event. (Cyprus Ornithological Society 1957, 1957-2001; Cyprus Ornithological Society 1970, 1970-1990; BirdLife Cyprus 2002; BirdLife Cyprus 2003; Flint and Stewart, 1992).

During the past 25 years, the highest wintering populations were 1981, 1988, 2004 and 2005, with numbers exceeding 10,000 birds in these years (Table 1). The lowest wintering populations were 1987 (1,030 birds) and 1989 (1,200 birds).

Table1. Total mid-winter (January) counts of Greater Flamingos at Larnaca and Akrotiri salt lakes from 1980 to 2005.

Year	Larnaca	Akrotiri	Totals	Year	Larnaca	Akrotiri	Totals
1980	200	5000	7000	1993	254	6,000	6,254
1981	300	10,000	10,300	1994	31	3,300	3,331
1982	1,500	6,000	7,500	1995	3,000	5,500	8,500
1983	27	8,000	8,027	1996	375	4,500	4,875
1984	8,000	180	8,180	1997	1,000	3,000	4,000
1985	2,000	5,000	7,000	1998	1,300	3,000	4,300
1986	500	4,000	4,500	1999	1,400	1,000	2,400
1987	800	330	1,030	2000	400	7,400	7,800
1988	240	10,000	10,240	2001	1,705	2,400	4,105
1989	1,200	0	1,200	2002	2,960	4,800	7,760
1990	946	2,000	2,946	2003	3,050	0	3,050
1991	20	2,000	2,020	2004	4,000	6,530	10,530
1992	1,000	2,500	3,500	2005	3,000	7,150	10,150

Seasonal Population Fluctuations

If water remains in the lakes throughout the summer, small numbers of adult and immature birds will remain in Cyprus throughout the summer as well. Since December 2004, BirdLife Cyprus has been carrying out mid-month (on the 20th of each month) waterbird counts at 21 wetlands. The results from December 2004 to September 2005 are presented in Figure 1 (Miltiadou 2005a & 2005b).

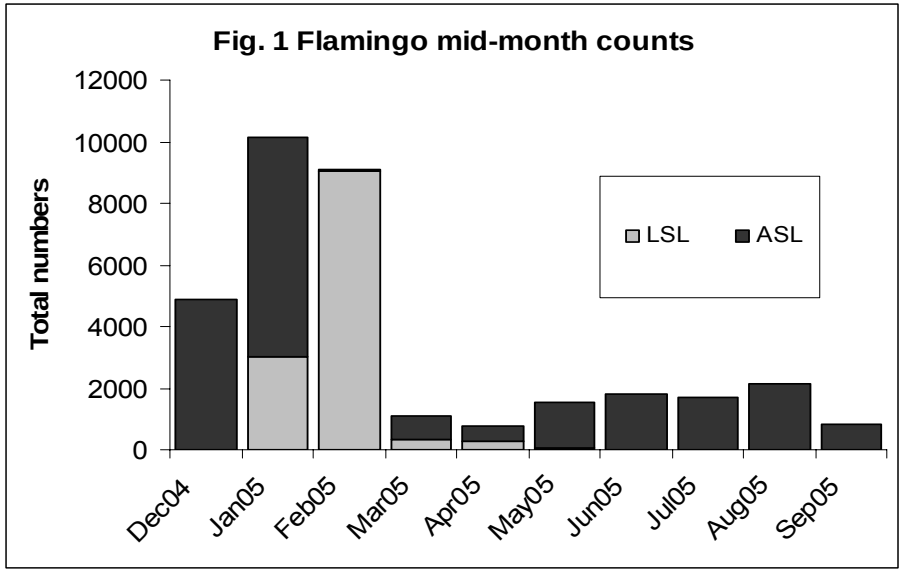


Figure 1. Monthly (on the 20th of each month) counts of Flamingos at Larnaca (LSL) and Akrotiri (ASL) two salt lakes from December 2004 to September 2005.

Breeding Attempts

Breeding attempts were observed at lakes Larnaca and Akrotiri in 2001, 2003 and 2005 (Cyprus Ornithological Society 1957. 2001, Kassinis 2005). From the winters of 2000 and 2001 onwards Cyprus experienced unusually high rainfall with one or both lakes retaining water late into summer or even autumn. This resulted in the flamingos attempting to breed (Table 2).

Table2. Flamingo breeding attempts in Cyprus from 2001 to 2005 on Larnaca and Akrotiri salt lakes.

Year	Lake	No. of nests	No. of eggs	No. adult birds present
2001	Larnaca	40	0	4,000
2003	Akrotiri	35	0	300
2005	Akrotiri	50	25	1,500

The first attempt was recorded in August 2001 when BirdLife Cyprus Chairman Melis Charalambides discovered 40 disused nest mounds at Larnaca Salt Lake. Four very young juveniles were observed in the post-breeding flock and assumed to have hatched locally (Cyprus Ornithological Society 1957, 2001).

On 4 July 2003 the Cyprus Game Fund Research Unit, headed by Game Biologist Nicos Kassinis, while conducting their annual survey of the nesting birds at Akrotiri Salt Lake discovered 35 abandoned nest mounds at the east of the salt lake. No eggs were found. The survey of 2004 failed to discover any nest mounds.

On 8 June 2005 the Cyprus Game Fund Research Unit, again headed by Nicos Kassinis, discovered c.50 nest mounts, 25 of which contained a single egg each, on the northwest side of Akrotiri Salt Lake on a sand bank overgrown with halophytic vegetation (*Juncus* sp.). Additionally, two eggs were found close by in the water and a dead adult female flamingo was found on one of the nest mounds. The bird was sent to the Veterinary Services for autopsy and was found to contain a single egg in her oviduct. During this period there were 1,500 flamingos at the lake.

During June and July the area was regularly surveyed by Game Fund personnel who noted the absence of incubating birds. On 7 July, a visit at the site confirmed that the nest mounds had been abandoned and all eggs had been predated (Kassinis, 2005).

The reasons for the continuous failure of breeding attempts by flamingos in Cyprus seem to be the rapid lowering of water levels of the lakes during summer with subsequent predation of nests by ground predators (e.g. foxes, feral dogs).

Lead Poisoning

During the winters of 2002-03 and 2003-04, 108 and 74 flamingos died of lead poisoning, respectively, at Larnaca Salt Lake. No other species seemed to have been affected although waterfowl, such as shelduck *Tadorna tadorna* and several other *Anas* species, especially shoveler *Anas clypeata*, utilize the lake during winter. The flamingos were investigated by the Veterinary Service and found to have succumbed to lead poisoning. According to the Environment Service and the Fisheries Department this was due to the operation of a local clay-pigeon shooting club situated at the northern shore of the lake that had been closed down in 2001. Although the club had been in operation since the mid 1970's no birds had died because the water of the lake had never reached the area where the shotgun pellets were deposited. Heavy rainfall during the winter of 2002-03 resulted in the lake's water extending to the area where the shooting range was located. Flamingos fed on the newly available shallows that contained a high density of lead-shot pellets.

On realization of this, the Environment Service undertook cleaning operations with the removal of tons of sand from the polluted area. The area adjacent to the shooting club building, that was dry at the time, was left to be cleaned the following year. Unfortunately the winter of 2003-04 witnessed the heaviest rainfall in 70 years. The lake's waters expanded yet again and this time included the previously dry area adjacent to the shooting club that was saturated with lead-shot pellets and resulted in 74 additional flamingo deaths for that year (Miltiadou, 2004).

Since the winter of 2004-05 there have been no deaths by lead poisoning. The polluted sand has been removed and although waterfowl shooting is lawful on a smaller lake close to the main salt lake, hunting has been prohibited as a precaution against lead poisoning. Thus, all wetlands in Cyprus are currently protected from hunting.

References

BirdLife Cyprus 2002. Annual Report 2002. BirdLife Cyprus, Nicosia, Cyprus.

BirdLife Cyprus 2003. Annual Report 2003. BirdLife Cyprus, Nicosia, Cyprus.

Cyprus Ornithological Society 1957. 2001. Report 48. Cyprus Ornithological Society 1957, Nicosia, Cyprus.

Cyprus Ornithological Society 1957. 1957-2001. Annual Reports 1-48. Cyprus Ornithological Society 1957, Nicosia, Cyprus.

Cyprus Ornithological Society 1970. 1970-1990. Bird Reports 1-20. Cyprus Ornithological Society 1970, Nicosia, Cyprus.

Flint, P.R. & Stewart, P.F. 1992. The Birds of Cyprus. B.O.U. check-list No. 6, British Ornithologists' Union: London (second edition).

Kassinis, N. 2005. Report on the nesting attempts of the Greater Flamingo *Phoenicopterus ruber roseus* at Akrotiri Salt Lake from 2003 to 2005. BirdLife Cyprus News, Autumn 2005, Issue No. 3, Nicosia, Cyprus.

Miltiadou, M. 2004. Greater flamingo *Phoenicopterus ruber roseus*. BirdLife Cyprus News, February and March 2004, Issue No. 2, Nicosia, Cyprus.

Miltiadou, M. 2005a. Monthly monitoring of wetland birds. BirdLife Cyprus News, Winter 2004-05, Issue No. 1, Nicosia, Cyprus.

Miltiadou, M. 2005b. Results of monthly wetland counts. BirdLife Cyprus Monthly Newsletters, March to September 2005, Issues No. 5-10, Nicosia, Cyprus.

Ministry of Agriculture and Natural Resources 1992. Environmental study and management plan for Akrotiri Salt Lake and wetlands. Ministry of Agriculture and Natural Resources, Water Development Department, Nicosia, Cyprus.

Greater Flamingo Range Extension in Portugal

David Rodrigues[1], Paulo Tenreiro[2] & M. Ester Figueiredo[3]
[1] *Departamento Florestal – Escola Superior Agrária de Coimbra, Bencanta 3040-316 Coimbra, Portugal*
[2] *Coordenação de Coimbra – Instituto da Conservação da Natureza, Mata Nacional do Choupal, 3000 Coimbra, Portugal*
[3] *Departamento de Engenharia Florestal – Instituto Superior de Agronomia, Tapada da Ajuda, 1349-017 Lisboa, Portugal*
drodrigues@esac.pt

Summary
The numbers of Greater Flamingo using the Vouga River Lowlands and the Mondego Estuary were counted from August 2004 to October 2005. The Mondego Estuary appears to be the new northern limit of the regular distribution of this species along the Atlantic coast, as the birds were seen there regularly. The maximum number of Greater Flamingos counted was 796 individuals in March 2005.

Introduction
Although not breeding in Portugal (Rufino, 1989), the Greater Flamingo is regularly present in the country (Farinha *et al.*, 1992). The northern limit of its regular distribution on the Atlantic coast was considered to be the Tagus River Estuary, although it occasionally occurred in the Mondego Estuary and the Vouga Lowlands in central Portugal (Farinha & Costa, 1999). In recent years, the occurrence and numbers of Greater Flamingo using the Mondego Estuary has increased. In this study, we wanted to document the extent to which this species now occurs in central Portugal and how its occurrence varies seasonally during the year.

Methods
Populations were estimated at least monthly by point counts (Poysa & Nummi, 1992) at Ria de Aveiro (Vouga River Lowlands) and Mondego River Estuary. Two age groups were counted: juveniles and immatures/adults. Colour rings were also counted on each occasion. Counts were performed from August 2004 to October 2005.

Results
In the Mondego Estuary surveys, all potential places were scanned (except in August and September 2004). In Ria de Aveiro the coverage was incomplete because many sites that potentially could be used by flamingos could only be accessed by boat, and we did not have the use of a boat. The counts obtained during our surveys are summarised in Table 1. In the Mondego Estuary, the birds used salt pans, fish rearing tanks and mud flats in the estuary and around Murraceira Island (40º08'N 08º50'W). Occasionally, rice-fields near the estuary were used by a few birds. Only during May 2004, did the birds move inland using Foja Farm rice-fields (40º12'N 08º42'W), but this observation was made by local farmers. In Ria de Aveiro, flamingos were observed on mudflats and salt pans near Aveiro city (40º38'N 08º40'W), but after the end of duck hunting, birds were also observed a bit further north in the estuary (40º43'N 08º40'W). In Ria de Aveiro we only noticed the presence of flamingos between December 2004 and March 2005. The maximum count in Mondego Estuary was 796 individuals in March 2005. In Ria de Aveiro, the maximum count was 212 in January 2005.

Discussion
Flamingos were present all year around on Mondego Estuary, shifting the northern limit of their regular presence along the Atlantic coast to 200 km north of Tagus Estuary. The numbers counted were important in a Portuguese context, although fewer than the 6,273 individuals counted in Portugal in January 1999 (Gilissen *et al.*, 2002). The importance of the Mondego Estuary is also indicated by the substantial number of Greater Flamingos using the estuary during the year, the high proportion of juveniles at certain times of the year, and the large number of colour rings observed, all of which indicate a substantial turnover of individuals. The low number of juveniles present after the breeding season of 2005, a year during which there was no flamingo breeding in Spain due to drought, tends to confirm the previous colour ring data that indicated that most Greater Flamingos along the Atlantic coast of Porugal were from the Spanish colonies, as Rosa & Cardoso (1998) showed. It is Interesting to note that even with the reduced number of juveniles in 2005, the counts of October 2005 were similar to those in October 2004, which suggests that the growth in the use of this wetland by Greater Flamingos is continuing.

Acknowledgements
This work was possible due to funding within project POCTI/AGG/49475/2002 – FCT (FSE/FEDER). We thank João Petronilho for help with the counts.

Table 1. Number of Greater Flamingos counted in Ria de Aveiro and Mondego Estuary, from August 2004 to October 2005.

Date	Place	Juveniles	Immatures/Adults	Total	Ringed
19-08-2004	Murraceira Island			220	4
25-09-2004	Murraceira Island			208	8
11-10-2004	Mondego Estuary	267	261	528	36
20-10-2004	Mondego Estuary	213	199	412	22
27-10-2004	Mondego Estuary			600	40
18-11-2004	Mondego Estuary	275	371	646	19
29-11-2004	Mondego Estuary			586	35
14-12-2004	Ria de Aveiro	55	17	72	2
15-12-2004	Mondego Estuary	280	297	577	32
	Total	335	314	649	34
23-12-2004	Mondego Estuary	32	228	260	7
29-12-2004	Mondego Estuary	22	56	78	2
04-01-2005	Ria de Aveiro	118	94	212	13
05-01-2005	Mondego Estuary	241	131	372	22
	Total	359	225	584	35
13-01-2005	Mondego Estuary	90	521	611	35
28-01-2005	Mondego Estuary	95	585	680	55
14-02-2005	Mondego Estuary	214	422	636	12
18-02-2005	Ria de Aveiro	79	9	88	3
	Total	293	431	724	15
02-03-2005	Mondego Estuary	315	339	654	19
04-03-2005	Ria de Aveiro	78	13	91	2
	Total	393	352	745	21
21-03-2005	Mondego Estuary	190	206	396	24
31-03-2005	Mondego Estuary	442	354	796	53
11-04-2005	Mondego Estuary	49	281	330	22
19-04-2005	Mondego Estuary	157	335	492	3
22-04-2005	Mondego Estuary	194	74	268	16
24-05-2005	Mondego Estuary	158	98	256	12
15-06-2005	Mondego Estuary			105	4
23-07-2005	Mondego Estuary			145	4
25-08-2005	Mondego Estuary		99	99	2
24-09-2005	Mondego Estuary	6	198	204	11
25-10-2005	Mondego Estuary	53	576	629	25

RECENT SCIENTIFIC ARTICLES AND REPORTS

With abstracts where available

Amat, J.A., Rendon, M.A., Rendon-Martos, M., Garrido, A. and Ramirez, J.M. 2005. Ranging behaviour of greater flamingos during the breeding and post-breeding periods: Linking connectivity to biological processes. Biological Conservation 125: 183-191.

Connectivity among habitat patches has mainly been studied in relation to species-specific behaviours. However, the movements of animals among patches may have different functions, and tolerance to gaps between habitat patches may vary between these functions. We tracked the movements of greater flamingos during the breeding and post-breeding periods with the aim of illustrating how the degree of connectivity may vary depending on the biological processes underlying the movements between wetlands. Most foraging sites used by breeding adults in a colony in southern Spain were within 200 km of the colony site, although some birds eventually moved 400 km. After the breeding season, the adults remained for several weeks in specific wetlands, moving to other sites located 280-2100 km away to over-winter. During these movements the birds may use stopover sites, the conservation of which may be critical to facilitate long-range movements. Our results suggest that wetland connectivity during chick rearing does not seem to be determined by whether or not central-place foraging flamingos are able to reach wetlands located at the longest distance that they are able to fly during non-stop flights (>1000 km), but by whether they are able to sustain the energetic costs derived from frequent commuting. In contrast, long-distance movements were occasionally undertaken during the post-breeding period. The energetic costs of such flights could be paid by flamingos because these movements were infrequent. Thus, in the case of flamingos, connectedness thresholds between wetlands vary depending on the biological process involved (chick rearing or post-breeding movements).This emphasizes the need to consider different types of connectivity in conservation planning.

Anderson M.D. 2004. Lesser Flamingo breeding attempt at Kamfers Dam, Kimberley. Bird Numbers 13(2): 19-22.

Ballot, A., Krienitz, L., Kotut, K., Wiegand, C., Metcalf, J.S., Codd, G.A. and Pflugmacher, S. 2004. Cyanobacteria and cyanobacterial toxins in three alkaline rift valley lakes of Kenya - Lakes Bogoria, Nakuru and Elmenteita. Journal of Plankton Research 26: 925-935.

For decades frequent mass mortalities of Lesser Flamingos (*Phoeniconaias minor* Geoffroy) have been observed at alkaline-saline Kenyan Rift Valley lakes. To estimate the potential influence of toxic cyanobacteria on these mass deaths, the phytoplankton communities were investigated in Lakes Bogoria, Nakuru and Elmenteita. Cyanobacterial toxins were analyzed both in the phytoplankton from the three lakes and in isolated monocyanobacterial strains of *Arthrospira fusiformis*, *Anabaenopsis abijatae*, *Spirulina subsalsa* and *Phormidium terebriformis*. Lake Bogoria was dominated by the cyanobacterium *A. fusiformis*. In L. Nakuru and L. Elmenteita the phytoplankton mainly consisted of *A. fusiformis*, *A. abijatae* and *Anabaenopsis arnoldii*, and in L. Nakuru an unknown Anabaena sp. was also found. Furthermore, this is the first time *A. abijatae* and

the unknown Anabaena sp. have been found in Kenyan lakes. Phytoplankton wet weight biomass was found to be high, reaching 777 mg L-1 in L. Bogoria, 104 mg L-1 in L. Nakuru and 202 mg L-1 in L. Elmenteita. Using HPLC, the cyanobacterial hepatotoxins microcystin-LR, -RR -YR, -LF and -LA and the neurotoxin anatoxin-a were detected in phytoplankton samples from L. Bogoria and L. Nakuru. Total microcystin concentrations amounted to 155 mug microcystin-LR equivalents g(-1) DW in L. Bogoria, and 4593 mug microcystin-LR equivalents g(-1) DW in L. Nakuru, with anatoxin-a concentrations at 9 mug g(-1) DW in L. Bogoria and 223 mug g(-1) DW in L. Nakuru. In L. Elmenteita phytoplankton, no cyanobacterial toxins were found. *A. fusiformis* was identified as one source of the toxins. The isolated strain of *A. fusiformis* from L. Bogoria was found to produce both microcystin-YR (15.0 mug g(-1) DW) and anatoxin-a (10.4 mug g(-1) DW), whilst the *A. fusiformis* strain from L. Nakuru was found to produce anatoxin-a (0.14 mug g(-1) DW). Since *A. fusiformis* mass developments are characteristic of alkaline-saline lakes, health risks to wildlife, especially the Arthrospira-consuming Lesser Flamingo, may be expected.

Beauchamp, G. and McNeil, R. 2004. Levels of vigilance track changes in flock size in the Greater Flamingo (*Phoenicopterus ruber*). Ornithologia Neotropical 15: 407-411.

Childress, B., Harper, D., Hughes, B. and Ferris, C. 2005. Sex determination in the Lesser Flamingo *(Phoenicopterus mino*r) using morphological measurements. Ostrich 76: 148-153.

Morphological measurements and blood samples were taken from 154 Lesser Flamingos *Phoenicopterus mino*r, including adults (>3 years old), immature sub-adults (2–3 years old) and first-year juvenile birds of both sexes, captured at Lake Bogoria, Kenya (0°11-20' N, 036°06' E) during 2001 and 2002. PCR amplification of the CHD-Z and CHD-W genes using DNA extracted from the blood samples was used to determine the sex of each bird. There were significant differences in mass and tarsus length among the three age groups, indicating that Lesser Flamingos continue to grow in skeletal size and mass between fledging and the attainment of adult plumage at 3–4 years of age. On average, males were significantly larger than females in all age groups, although there was substantial overlap between the sexes in all morphological measurements. The element with the least amount of overlap was head and bill length. Discriminant functions utilising head and bill length that correctly predict the sex of juvenile and immature birds with approximately 93% accuracy are presented. By adding tarsus length, the gender of wild adult Lesser Flamingos is correctly predicted with approximately 98% accuracy. The same discriminant function developed for wild adult birds predicted the gender of 19 captive adult Lesser Flamingos of known sex with 100% accuracy.

Childress, B., Hughes, B., Harper, D., Van den Bossche, W., Berthold P. and Querner, U. in press 2006. East African flyway and key site network of the Lesser Flamingo (*Phoenicopterus minor*) documented through satellite tracking. In: Proceedings of the Pan African Ornithological Congress XI, 20-25 November, 2004, Djerba, Tunisia.

In October 2002, four adult Lesser Flamingos were tagged at Lake Bogoria, Kenya: two with solar-powered PTTs and two with battery-powered PTTs, one of which stopped transmitting after 38 days. In July 2003, an additional four birds were tagged with solar-powered PTTs. During the first two years (November 2003 - October 2004), flight patterns of the tagged birds were independent. Interlake flight distances ranged from 16 km to 441 km (mean: 111.5 km, N = 243); 68.3% being less than 100 km, and 96% less than 300 km. There was no significant difference among the birds in the median length of their interlake flights. The number of days spent at each stopover ranged from 0 (less that 1d) to 153d (mean: 14.4d, N = 250). There was a significant difference among the birds in the number of days spent at each stopover. This difference was due to one very active bird that made 133 interlake flights during the period, visiting 12 different sites, spending a mean 5.2 d at each and travelling 12,600 km. There was no significant difference among the other six birds. The seven birds' flights were confined to a 940 km north-south range within the Rift Valley between Lake Logipi in northern Kenya and Bahi Swamp in central Tanzania. Their key site network consisted of eight alkaline lakes (Logipi, Bogoria, Elmenteita, Nakuru, Natron, Empakai Crater Lake, Manyara and Eyasi), and Bahi Swamp, an ephemeral wetland in central Tanzania. The conservation status of these nine sites varies from well-protected to completely unprotected. None of the birds appears to have bred during either the 2002-03 or the 2003-04 breeding seasons (October to January), although other Lesser Flamingos bred at Lake Natron during both seasons, Lake Natron being the only East African site where the Lesser Flamingo has bred successfully during the past 40 years.

Ellis, T.M., Bousfield, R.B., Bissett, L.A., Dyrting, K.C., Luk, G.S.M., Tsim, S.T., Sturm-Ramirez, K., Webster, R.G., Guan, Y. and Peiris, J.S.M. 2004. Investigation of outbreaks of highly pathogenic H5N1 avian influenza in waterfowl and wild birds in Hong Kong in late 2002. Journal of Avian Pathology 33: 492-505.

Outbreaks of highly pathogenic H5N1 avian influenza have occurred in Hong Kong in chickens and other gallinaceous poultry in 1997, 2001, twice in 2002 and 2003. High mortality rates were seen in gallinaceous birds but not in domestic or wild waterfowl or other wild birds until late 2002 when highly pathogenic H5N1 avian influenza occurred in waterfowl (geese, ducks and swans), captive Greater Flamingo (*Phoenicopterus ruber*) and other wild birds (Little Egret *Egretta garzetta*) at two waterfowl parks and from two dead wild Grey Heron (*Ardea cinerea*) and a Black-headed Gull (*Larus ridibundus*) in Hong Kong. H5N1 avian influenza virus was also isolated from a dead feral pigeon (*Columba livia*) and a dead tree sparrow (*Passer montanus*) during the second outbreak. The first waterfowl outbreak was controlled by immediate strict quarantine and depopulation 1 week before the second outbreak commenced. Control measures implemented for the second outbreak included strict isolation, culling, increased sanitation and vaccination. Outbreaks in gallinaceous birds occurred in some live poultry markets concurrently with the second waterfowl outbreak, and infection on a chicken farm was detected 1 week
after the second waterfowl park outbreak was detected, on the same day the second grey heron case was detected. Subsequent virus surveillance showed the outbreaks had been contained.

Fain, M.G. & Houde, P. 2004. Parallel radiations in the primary clades of birds. Evolution 58: 2558–2573.

Knowledge of avian phylogeny is prerequisite to understanding the circumstances and timing of the diversification of birds and the evolution of morphological, behavioural, and life-history traits. Recent molecular datasets have helped to elucidate the three most basal clades in the tree of living birds, but relationships among neoavian orders (the vast majority of birds) remain frustratingly vexing. Here, we examine intron 7 of the β-fibrinogen gene in the most taxonomically inclusive survey of DNA sequences of nonpasserine bird families and orders to date. These data suggest that Neoaves consist of two sister clades with ecological parallelisms comparable to those found between marsupial and placental mammals. Some members of the putative respective clades have long been recognized as examples of convergent evolution, but it was not appreciated that they might be parts of diverse parallel radiations. In contrast, some traditional orders of birds are suggested by these data to be polyphyletic, with representative families in both radiations.

Jarrett, N., Mason, V., Wright, L. and Levassor, V. 2003. Using egg density and egg mass techniques for incubation stage assessment to predict hatch dates of Greater Flamingo *Phoenicopterus roseus* eggs. Wildfowl 54: 131-142.

The egg density and the egg mass techniques for incubation stage assessment were developed to predict the hatch dates of Greater Flamingo *Phoenicopterus roseus* eggs laid in captivity at WWT, Slimbridge, England. The accuracy of each technique was tested on 20 parentally incubated eggs by comparing actual hatch date with predicted hatch date. For the egg mass technique a strong positive correlation existed between actual and predicted fresh mass, suggesting that model accuracy was high. Both techniques predicted hatch dates within two days 80% of the time. These techniques were found to be useful for accurate incubation stage assessment of Greater Flamingo eggs and the authors encourage aviculturalists managing captive colonies to use them.

Martin, G.R., Jarrett, N., Tovey, P. and White, C.R. 2005. Visual fields in flamingos: chick-feeding versus filter-feeding. Naturwissenschaften 92 (8): 351-354.

In birds, the position and extent of the region of binocular vision appears to be determined by feeding ecology. Of prime importance is the degree to which vision is used for the precise control of bill position when pecking or lunging at prey. In birds that do not require such precision (probe and filter-feeders), the bill falls outside the binocular field, which extends above and behind the head, thus providing comprehensive visual coverage. Flamingos Phoenicopteridae are highly specialised filter-feeders. They employ a unique technique that does not require accurate bill positioning in which the inverted head is placed between the feet. Feeding flamingos often walk forwards with the head pointing “backwards”. Here we show that in Lesser Flamingos *Phoeniconaias minor* visual fields are in fact the same as those of birds that feed by precision pecking and that feeding flamingos are blind in the direction of their walking. We suggest that this is due to the requirement for accurate bill placement when flamingos feed their chicks with “crop-milk”, and possibly when building their nest. We propose that chick-feeding may be the ultimate determinant of visual field topography in birds, not feeding ecology.

Mayr, G. 2004. Morphological evidence for sister group relationship between flamingos (Aves : Phoenicopteridae) and grebes (Podicipedidae). Zoological Journal of the Linnean Society 140: 157-169.

A recent molecular analysis strongly supported sister group relationship between flamingos (Phoenicopteridae) and grebes (Podicipedidae), a hypothesis which has not been suggested before. Flamingos are long-legged filter-feeders whereas grebes are morphologically quite divergent foot-propelled diving birds, and sister group relationship between these two taxa would thus provide an interesting example of evolution of different feeding strategies in birds. To test monophyly of a clade including grebes and flamingos, I performed a cladistic analysis of 70 morphological characters which were scored for 17 taxa. Parsimony analysis of these data supported monophyly of the taxon (Podicipedidae + Phoenicopteridae) and the clade received high bootstrap support. Previously overlooked morphological, oological and parasitological evidence is recorded which supports this hypothesis, and which makes the taxon (Podicipedidae + Phoenicopteridae) one of the best supported higher-level clades within modern birds. The phylogenetic significance of some fossil flamingo-like birds is discussed. The Middle Eocene taxon Juncitarsus is most likely the sister taxon of the clade (Podicipedidae + (Palaelodidae + Phoenicopteridae)) although resolution of its exact systematic position awaits revision of the fossil material. Contrary to previous assumptions, it is more parsimonious to assume that flamingos evolved from a highly aquatic ancestor than from a shorebird-like ancestor.

McCulloch, G. and Irvine, K. 2004. Breeding of Greater and Lesser Flamingos at Sua Pan, Botswana, 1998-2001. Ostrich 75: 236-242.

Aerial surveys of flamingo breeding colonies were conducted during three consecutive breeding seasons between October 1998 and July 2001, in the south of Sua Pan, Makgadikgadi, Botswana. Rainfall during the rainy seasons of 1998-1999, 1999-2000 and 2000-2001 was 442 mm, 851 mm and 348 mm, respectively, and had a major effect on breeding success of both Lesser and Greater Flamingos. In January 1999, 16, 430 pairs of Lesser Flamingos were recorded breeding, but the number of chicks that survived to fledging was unknown owing to the rapid drying of the pan in late March 1999. No Greater Flamingo breeding was seen that season. Exceptional flooding during 1999-2000 produced highly favourable breeding conditions, with numbers of Greater and Lesser Flamingos breeding estimated to be 23,869 and 64,287 pairs, respectively, the highest ever recorded on Sua Pan. Chick survival rate was high and an estimated 18,498 Greater Flamingo chicks and 30,646 Lesser Flamingo chicks fledged. Reduced rainfall in the 2000-2001 wet season resulted in poor breeding conditions, with the total number of adults on the colonies estimated to be 651 pairs of Greater Flamingos and 19,340 pairs of Lesser Flamingos. Rapid drying of the pan in 2000-2001 forced many chicks to walk for over 50 km to the last remaining water in the north of the pan, with an estimated 3,000 Lesser Flamingo chicks surviving.

Morales Leal, J. de la C. y Vázquez Ramos, L. In press 2006. Programa para la conservación del flamenco *Phoenicopterus ruber* (Linnaeus 1758) en Cuba. In: B. Hiddinga and W. Van Lint (Eds.) Proceedings of the EAZA Conference 2005, Bristol/Bath, EAZA Executive Office, Ámsterdam.

Cuba regularly holds more than 50% of the total world population of the Caribbean Flamingo, estimated to be approximately 303,110 individuals. In 1978, the National

Company for the Conservation of the Flora and the Fauna (NCCFF) of the Ministry of Agriculture began long-term research into the biology of the species, and in 1989, initiated a national conservation program consisting of five sub-programmes: protection, monitoring, investigation, handling and environmental education. The first project was a national aerial and terrestrial survey to determine the abundance, distribution and breeding sites of the Caribbean Flamingo in Cuba. This survey enabled the NCCFF to establish a protection programme for the more than 80 percent of the national territory where the Caribbean Flamingo is found. All of the breeding sites are now within the National System of Protected Areas of Cuba, and the estimated population in Cuba increased from 124,000 in 1989 to 192,000 in 2003, before declining to 176,000 in 2004. El Refugio de Fauna “Río Máximo”, a Ramsar wetland of international importance and the first BirdLife Important Bird Area (IBA) in Cuba, is the most important breeding site for the Caribbean Flamingo. The approximate number of nests at "Río Máximo" has increased from 12,000 in 1989 to 51,000 in 2003, before declining to 22,000 in 2004, and the estimated number of chicks fledged increased from 31,600 in 1998 to 44,350 in 2003, before declining to 17,000 in 2004. This important research and conservation work is financed by a CITES-approved programme of annually hand-rearing 400 chicks that hatch late in the breeding season, and which would probably not survive otherwise, and supplying the resulting adult birds to zoological parks around the world. (Abstract by B. Childress)

O'Connell-Rodwell, C.E., Rojek, N., Rodwell, T.C. and Shannon, P.W. 2004. Artificially induced group display and nesting behaviour in a reintroduced population of Caribbean Flamingo *Phoenicopterus ruber*. Bird Conservation International 14: 55-62.

We used artificial social stimulation (decoys, vocalization playbacks, and artificial nests) to initiate group displays in six (two females, four males) Caribbean Flamingos *Phoenicopterus ruber* that had not successfully bred since their introduction to Guana Island, British Virgin Islands, in 1992. During a control period prior to the introduction of stimuli, flamingos exhibited no social displays or nest building activities. All flamingos were observed approaching the decoy area as a flock within four hrs of the decoys being introduced, and Head-Flagging displays were exhibited by two birds within the first 24 hrs. In a 12-hr watch conducted two-weeks post decoy introduction, there were significantly more group display behaviours, as well as nest-building, as compared with the control period and immediately after the introduction (3.6% as compared with 0% and 0.35%). Two individuals performed the majority of group displays (although at least one social display posture was observed for each bird) and three birds exhibited nest-building behaviour. Overall, individuals spent most of their time feeding and resting/sleeping (> 95%) during all observation periods. We show for the first time that decoys and vocalization playbacks could have a positive impact on breeding success in the wild by inducing group displays and nesting behaviours in this group of introduced flamingos. We suggest that social attraction techniques may be a useful tool to stimulate breeding in small captive and wild small populations of flamingos.

van Tuinen M., Butvill, D.B., Kirsch, J.A.W. & Hedges, S.B. 2001. Convergence and divergence in the evolution of aquatic birds. Proceedings of the Royal Society of London B 268: 1345–1350.

Aquatic birds exceed other terrestrial vertebrates in the diversity of their adaptations to aquatic niches. For many species this has created difficulty in understanding their evolutionary origin and, in particular, for the flamingos, hamerkop, shoebill and

Pelecaniformes. Here, new evidence from nuclear and mitochondrial DNA sequences and DNA-DNA hybridization data indicates extensive morphological convergence and divergence in aquatic birds. Among the unexpected findings is a grouping of flamingos and grebes, species which otherwise show no resemblance. These results suggest that the traditional characters used to unite certain aquatic groups, such as totipalmate feet, root-propelled diving and long legs, evolved more than once and that organismal change in aquatic birds has proceeded at a faster pace than previously recognized.

IN MEMORY, DR. SANDRA CAZIANI

A driving force for flamingo conservation in the Andean wetlands

The FSG received with great sadness the news of Dr. Sandra M. Caziani's passing on July 1, 2005, after a long battle with cancer. Sandra was a driving force behind many conservation initiatives in Argentina and had a long history as a key figure in a regional program for flamingo research and conservation. Sandra worked in the Andean wetlands of the Central Dry Puna, home to three of the worlds' six flamingo species. Her interest focused on flamingos, but was by no means limited to these birds, as she engaged in research on wetland habitats and community ecology. She was a founding member of the Grupo para la Conservacion de Flamencos Altoandinos (GCFA, or High Andes Flamingo Conservation Group), an initiative of the four South American flamingo range countries (Argentina, Bolivia, Chile, Peru) and other collaborators that has been active in flamingo and wetland research and conservation activities since 1997.

As a professor at the Universidad Nacional de Salta, and career researcher at the Consejo Nacional de Investigaciones Cientificas y Tecnicas (CONICET, or National Council of Scientific and Technical Research) Sandra had several research projects in Andean wetland habitats with students and collaborators from around the world. Sandra's interests however, were not solely academic; she loved the Puna in all its vast dramatic beauty and worked to ensure its sustainability well into the future. She worked closely with the National Parks Administration and provincial agencies in management and conservation planning. Her work was instrumental in providing information for the designation of the Laguna de los Pozuelos and Laguna de Vilama wetlands as Ramsar sites in Argentina.

Sandra was a tireless fighter in her professional and personal life, confronting adversity with great strength and determination. She is a true inspiration and role model through her distinguished accomplishments as a scientist, conservationist, and teacher. Those of us fortunate to have known her will fondly cherish our shared moments. Sandra's keen intellect, forward thinking, humour, and warmth will be greatly missed by her partner Dr. Pablo Perovic and their young son Marco, along with friends and colleagues throughout the world. (Felicity Arengo)

INSTRUCTIONS FOR AUTHORS

Flamingo publishes articles on the world's six species of flamingo. We welcome reports on the status, movements, breeding and biology of species in the wild or in captivity on a regional or local scale, short papers with original data, progress reports of *in-situ* or *ex-situ* conservation projects, ringing reports, news items, etc. Articles may be submitted in English, French or Spanish, should be no longer than 2,000 words, and should include summaries in English as well as in the language used for the article. There are c. 500 words per printed page. The word limit includes *all references*, and should also take into account any *tables* or *figures* in the text. A figure reproduced as a half-page in the final newsletter equates to approximately 250 words, a full page table to c. 500 words, etc. Manuscripts longer than the word limit may be returned for shortening prior to being published.

Full articles should have the standard sections, generally selected from the following list: Introduction, Study Area, Material, Methods, Results, Discussion, Acknowledgements and References. First level headings should be in capitals, in boldface, and left-justified. Second level headings should be in upper and lower case, in boldface, and left-justified. Avoid lower-level headings.

The editors will assist with summaries in the languages other than the one in which the paper is submitted, and reserve the right to make typographical, spelling and grammatical corrections without consulting the authors. Articles will not be peer reviewed, but authors may be asked for clarification of certain points by the editors. If appropriate please include a map of the geographical area referred to in each article. Please send files by e-mail, preferably as MS Word (.doc), rich text (.rtf) or portable document (.pdf) files. Figures should be reproduction quality and be sent as MS Excel, .eps, .pdf or .jpg files. Black and white images/ photographs accompanying the text should be sent as .eps or .tif files.

Please e-mail all material to the appropriate editor to arrive before the deadline for the issue in which you want your contribution to appear.

Flamingo Editors

Articles in English: Dr. Brooks Childress (brooks.childress@wwt.org.uk)
Articles in French: Dr. Arnaud Béchet (bechet@tourduvalat.org)
Articles in Spanish: Dr. Felicity Arengo (arengo@amnh.org)

INSTRUCTIONS POUR AUTEURS

Flamingo publie des articles sur les six espèces de flamants du monde. Nous encourageons les auteurs à soumettre des manuscrits sur le statut, les mouvements, la reproduction et la biologie des flamants sauvages ou en captivité, que ce soit à une échelle régionale ou locale. Nous accueillons également favorablement des notes succinctes rapportant des observations originales, des rapports sur l'état d'avancement de projets de conservation *in-situ* ou *ex-situ* ainsi que des compte-rendus des programmes de baguage, ou des nouvelles de dernière minutes...Les articles peuvent être soumis en anglais, en français ou en espagnol. Ils ne doivent pas dépasser 2 000 mots et doivent inclure un résumé en anglais. Il y a environ 500 mots par page imprimée. La limite de mots inclut toutes les références, et doit également tenir compte de tous les tableaux ou figures présents dans le texte. Une figure reproduite comme demi-page dans le bulletin final vaut approximativement 250 mots, un tableau de pleine page environ 500 mots, etc... Les manuscrits dépassant la longueur autorisée pourront être retournés aux auteurs afin d'être réduits avant édition.

Les articles standards devraient avoir les sections habituelles, choisies parmi la liste suivante : Introduction, région d'étude, matériel, méthodes, résultats, discussion, remerciements et références. Les titres de premier niveau seront en caractères gras majuscule justifié à gauche. Les titres de deuxièmes niveau seront en caractères gras majuscule et minuscule justifié à gauche. Évitez les titres de niveau inférieur.

Les éditeurs aideront à rédiger les résumés dans les langues autres que celle dans laquelle le texte est soumis, et se réservent le droit de faire toute modification typographique, orthographique ou grammaticale nécessaire. Les articles ne seront pas envoyés à des référés, mais les éditeurs pourront demander aux auteurs de clarifier certains points. Si approprié, vous pouvez inclure une carte du secteur géographique couvert par l'article. Veuillez soumettre vos manuscrits par courriel, de préférence sous format .doc, .rtf ou .pdf. Les figures devraient être d'une qualité suffisante pour la publication et être envoyées en format xls, jpg ou eps. Les photographies noires et blanc d'images accompagnant le texte doivent être envoyées comme fichier tif ou eps.

Envoyez s'il vous plait vos documents à l'éditeur approprié avant la date limite fixée pour le numéro dans lequel vous souhaitez que votre contribution apparaisse.

Editeurs de *Flamingo*

Articles en Anglais: Dr. Brooks Childress (brooks.childress@wwt.org.uk)
Articles en Français: Dr. Arnaud Béchet (bechet@tourduvalat.org)
Articles in Espagnol: Dr Felicity Arengo (arengo@amnh.org)

INSTRUCCIONES PARA AUTORES

Flamingo publica artículos sobre las seis especies de flamenco del mundo. Aceptamos informes sobre el estado de poblaciones, movimientos, reproducción y biología de flamencos en estado silvestre o en cautiverio, a escala regional o local. Las contribuciones pueden ser trabajos cortos con datos originales, informes de avance de proyectos de conservación in-situ o ex-situ, informes de anillamientos, noticias, etc. Artículos pueden ser en inglés, francés o español, de no más de 2.000 palabras, y deben incluir resúmenes en inglés y en el idioma original del artículo. Caben alrededor de 500 palabras por página impresa. El límite de palabras incluye toda la bibliografía y deben incluirse las tablas y figuras en el texto. Una figura reproducida en media página en la edición final equivale a alrededor de 250 palabras, una tabla de una página a 500 palabras, etc. Trabajos presentados que excedan el límite pueden ser devueltos para revisión antes de ser publicados.

Artículos completos deben tener las secciones usuales, generalmente seleccionadas de la siguiente lista: Resúmen (Abstract en inglés), Introducción, Área de Estudio, Material, Métodos, Resultados, Discusión, Agradecimientos, Bibliografía. Los títulos de primer nivel deben tener todas las letras en mayúscula, negrilla y pegadas a la izquierda. Los títulos de segundo nivel deben empezar con mayúscula, en negrilla y pegadas a la izquierda. Eviten títulos a otros niveles.

Los editores asisitirán con los resúmenes en inglés y francés, y se reservarán el derecho to hacer correcciones tipográficas, ortográficas y gramáticas sin consultar a los autores. Los artículos serán sin referato por pares pero los editores pueden pedir aclaraciones a los autores. Si es adecuado, por favor, incluyan un map del área geográfica a la que se hace referencia en el artículo. Por favor envíen los archivos por correo electrónico, preferentemente como archivos .doc en MS Word. Las figuras deben ser de calidad de reproducción y mandadas como archivos de MS Excel o formato .jpg. Imágenes en blanco y negro o fotografías que acompañen el texto deben ser enviadas como archivos .tif.

Por favor envíen todo el material por correo electrónico al editor correspondiente antes del plazo para la emisión en la que quieran que aparezca.

Editores de *Flamingo*

Artículos en Inglés: Dr. Brooks Childress (brooks.childress@wwt.org.uk)
Artículos en Francés: Dr. Arnaud Béchet (bechet@tourduvalat.org)
Artículos en Español: Dr. Felicity Arengo (arengo@amnh.org)

NOTES