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Summary and editor's note

This newsletter covers the years 2002-2004. It contains reports on four workshops or symposia, two of these focused on studies of the Greater Flamingo in the Mediterranean and West Africa, another concerned flamingo studies in the Caribbean region and the fourth focused on the die-offs of flamingos on East Africa's Rift Valley lakes. There are details of breeding by between 40,000 and 80,000 pairs of Greater Flamingos in each of these years, spread over a total of 13 breeding sites. During the 3 years chicks have been banded in increasing numbers in the Mediterranean region and in 2004 alone over 3300 chicks were marked in 7 colonies. Several projects have involved tracking flamingos by satellite telemetry, and mention is made of some of the projects which received IFF funding. In Switzerland, well to the north of the flamingo's normal range, the banded bird DCJT made its fourth visit, in 2003, to Lake Neuchâtel while in the Basel Zoo one of the two veteran flamingos died aged at least 65 years.

Finally, in November 2004, Brooks Childress was elected Chairman of the FSG. Brooks will be assisted by regional coordinators, Felicity Arengo for the Western Hemisphere (as in the past) and Arnaud Béchet for the Eastern Hemisphere. As outgoing coordinator and editor of the newsletters, I would like to thank all those who have contributed to the newsletters and group activities over the years. I look forward to remaining in close contact with the group and to seeing this develop in a way that will both meet the requirements of the parent organisations and encourage scientists and conservationists worldwide to share their knowledge and enthusiasm in such a way that flamingos and the wetlands upon which they depend can benefit.

Alan JOHNSON
January 2005

2002

Annual report

News from the regions 2002

Old World

Compiled by Alan Johnson and Arnaud Béchet

EAST AFRICA

KENYA

A study of trends in the numbers of waterbirds on 4 lakes of major importance in the southern Rift Valley of Kenya (Naivasha, Elmenteita, Nakuru, Bogoria) during the period 1991-2000 revealed highly variable numbers of flamingos, with no long-term trends apparent for either the Greater or the Lesser Flamingo (see Owino *et al* 2002).

The January 2002 Wetlands International African Waterbird Census, covering all of the major inland and coastal wetlands resulted in total flamingo population estimates of 11,642 Greater Flamingos and 1,160,310 Lesser Flamingos. 91.4% of the Greater and 98.5% of the Lessers were on Lakes Nakuru and Elmenteita. Most of the rest were on Lake Bogoria. (inf. Brooks Childress based on data from the Department of Ornithology, National Museums of Kenya, Nairobi)

Four Lesser Flamingos were tagged with satellite transmitters at Lake Bogoria in October 2002 by Dr Brooks Childress of the Wildfowl & Wetlands Trust and Wim Van den Bossche of BirdLife Belgium as part of a long-term study of the movements of Lesser Flamingos in the Eastern (Gregory) Rift Valley. During the first three months, the four birds exhibited markedly different movement patterns. One moved 687 km, making seven visits to four different lakes (mean stay: 11.4d). Another made five visits to only three different lakes (mean stay: 18.5 days), travelling only 263km. On two occasions, it remained on one lake for long periods (34 and 70 days). A third moved among lakes in Kenya and Tanzania 44 times, visiting nine different lakes, spending an average of only 2.3 days at each and travelling a total of 4 792 km in the process. The fourth is believed to have been predated on Lake Bogoria at the end of the first month. (see Childress *et al.* 2004). A review of this study and its results can be seen on: www.wwt.org.uk/flamingo.

This continuing study is being conducted as part of the Earthwatch "Lakes of the Rift Valley" research programme under the auspices of the Department of Ornithology, National Museums of Kenya and the County Councils of Baringo and Koibatek who are jointly responsible for the management of the Lake Bogoria National Reserve.

TANZANIA

Lesser Flamingos are reported to have bred near Arusha. In February 2002 Ernst Waser observed a large concentration of birds with nests and small chicks out on one of the Momella lakes near the

Momella Lodge. There were also lots of nearly full-grown young close to the shore. (inf. Adelheid Studer-Thiersch).

An aerial and ground census of the flamingo populations on the major wetlands was conducted on 19-20 January 2002. The total number of flamingos in Tanzania at that time was estimated to be 634,440 (both species). Because the majority were counted from the air, distinguishing between the species was not possible, but using the usual ratio between Greater and Lesser of one Greater to every 100 Lessers, there were probably about 6,300 Greater and about 628,149 Lessers. 79% of the combined species were found on Lake Eyasi, with another 16% on Lake Natron, the main breeding lake for this species in East Africa. (inf. Brooks Childress, based on report by Tanzania Wildlife Research Institute)

In March and April 2002, three Greater Flamingos (*Phoenicopterus ruber*) from Tanzania were tagged with 48g battery powered satellite transmitters (PTTs) of Microwave Telemetry. The transmitters were programmed to transmit approximately every 8th day, and were expected to last for about two years.

This is a joint project of Neil and Liz Baker from Tanzania, Peter Berthold and Herbert Biebach from the Max Planck Research Centre for Ornithology and Wim Van den Bossche from BirdLife Belgium. The results of the study can be followed on:
http://home.no.net/stenil1/TZbirdatlas/flamingo_tracking.htm

SOUTHERN AFRICA

BOTSWANA

The 5 Lesser and 3 Greater Flamingos tagged with satellite transmitters in July 2001 at Makgadikgadi salt pans stayed on the flooded pans until February 2002. Two of the Greater left the pans between 18-20 February; one of these was tracked to the coast of Namibia 2 days later, 1230 km to the west of Makgadikgadi. The other was located one month later 580 km SE of the pans. Of the 3 Lesser Flamingos which were still on Makgadikgadi on 20 February, 2 were located 3 days later at Kamfers Dam in the Northern Cape Province of South Africa, 930 km SSE of Makgadikgadi. (*excerpt from McCulloch et al. 2003*).

Breeding conditions at Makgadikgadi during the 2002-2003 breeding season were poor, as the area was in the grips of a severe drought year. It is not sure if any chicks survived. (inf. Graham McCulloch).

WEST AFRICA

GUINEA

Observations in 1998-2000 by Trollet & Fouquet (2001) revealed the presence of up to 10,900 Lesser Flamingos and 600 Greater Flamingos at Khonibenki (c. 700 km S of the Senegal delta) on the coast of Guinea. These authors returned to this site on 9 January 2002 and observed 13,000 Lesser and 826 Greater Flamingos.

WESTERN MEDITERRANEAN

SPAIN

Flamingos bred, or attempted to do so, at 4 sites in Spain in 2002.

Marismas of the Guadalquivir: breeding attempted at El Burro but the colony was deserted on 2 May because of predation by wild boars (inf. J. Amat).

Fuente de Piedra: Breeding by c.17500 pairs. 10656 chicks were raised of which 800 were banded on 21 July. Blood samples were taken from all of these for sexing. Additional samples were taken for the study of dispersal using micro-satellites and for heavy metal analyses (30). (inf. M.Rendón-Martos).

Santa Pola (Salinas de Bras del Port). This colony was visited 1-4 July when 650 nests were counted. It is not known how many of these held eggs. There was a crèche of 220 chicks. Observations and inf. J.Amat and M.Rendón-Martos. This was the fourth or fifth year of breeding or attempted breeding at this site since 1973.

Laguna Petrola (Albacete): There was no breeding in 2002 (inf. M.Rendón-Martos).

Ebro delta: Colony established on usual island 'Torra dels Conills'. Egg-laying in two successive waves: 19 and 25 March. Aerial photo of colony on 24 April by Francesc Vidal i Esquerré revealed c.1677 breeding pairs. Observations by A. Bechet and A. Johnson on 27-30 May when c. 770 chicks counted in crèche, aged 20-40 days. 53 banded birds (49 from Camargue, 4 from Fuente de Piedra) were observed feeding chicks. A second study visit took place 25-27 June (A. Bechet, A. Arnaud) when there were c.600 chicks in the creche. Another 21 banded birds were seen feeding chicks, 8 of which (6 French, 2 Spanish) were newly-confirmed breeders.

FRANCE

The IWC revealed a total of 32269 flamingos wintering in January 2002 along the Mediterranean coast of France, from the Salins d'Hyères (Var) west to the lagoons of Roussillon (Pyr.Orientales) and a further 108 birds in Corsica. These counts are summarised below.

Region	Number of flamingos	Observer(s)
Hyères (Var)	419	CEEP ⁽¹⁾
Berre (Bouches-du-Rhône)	946	CEEP ⁽¹⁾
Plan du Bourg	1948	CEEP ⁽¹⁾ , A. Tamisier CNRS
Ile de Camargue	5294	Tour du Valat, A. Tamisier CNRS
Petite Camargue (B.du Rh.-Gard)	5612	Tour du Valat, A. Tamisier CNRS
Languedoc (Hérault)	12960	GRIVE ⁽²⁾
Languedoc-Roussillon (Aude-Pyr.Or)	5090	LPO ⁽³⁾ Aude
Corsica	108	
Total	32377	

(1) Centre d'Etudes des Ecosystèmes de Provence

(2) Groupe de Recherches et d'Informations sur les Vertébrés

(3) Ligue pour la Protection des Oiseaux

The spring census was carried out over this same area on 28-29 May 2002 and revealed a total of 52087 flamingos in Mediterranean France (observations by LPO PACA, LPO Aude, Pont de Gau, Tour du Valat, Palissade, SPN Agde, COGard, Vigueirat, GOR.) Tour du Valat and local amateur naturalists). (inf. A. Arnaud, A. Bechet, Tour du Valat).

Breeding was attempted by Greater Flamingos at the **Pont de Gau Ornithological Park** near Les Saintes-Maries-de-la-Mer where c.1000 birds spend much of the winter, and hundreds occur at other times of the year. Artificial nests have been moulded on a specially-built island for the past three years in an attempt to attract birds to breed in the park. It is the first year that eggs have been laid: 1st egg 20/3, 2nd egg 21/3. As in previous years, the breeding birds were attracted to the **Etang du Fangassier** once conditions there were favourable, and the nests at Pont de Gau were abandoned (inf. Pont de Gau, ARJ).

Etang du Fangassier: This lagoon was flooded by the salt company on 20-21 March 2002. Flamingos (c.500) first visited the breeding island on 26 March and the first eggs were laid on 2 April. The island was $\frac{3}{4}$ occupied by 3 April. On 8 April the salt company forbid access to the salt pans by researchers from the Tour du Valat and other 'ecologists' and for the rest of the season the colony could only be observed from a distance. An aerial survey on 9 April revealed that the island was almost fully occupied and on 17 May there were an estimated 10068 occupied nests. There were heavy rains on 24 May which it is believed were responsible for the loss of many clutches, and on 28 May there were only 5730 pairs remaining on the island (counts from aerial photos). An aerial photograph of the creche on 9 July revealed 3638 chicks. This represents a rather low breeding success (36%).

No chicks were banded in 2002, interrupting the programme begun in 1977.

ITALY

Comacchio: An early breeding season with birds sitting on nests on 8 March. Also a much larger colony than in 2001 with 667 nests counted after breeding (G. Arveda). An aerial photograph taken on 28 June revealed at least 510 chicks in the creche. Most were large with the eldest close to fledging, but there were also 10-20 much smaller chicks. Capture and banding of 356 chicks on 2 July 2002 (blue PVC bands on right tarsus codes IKP to IBDS all reading up). Blood samples were taken from 300 of the chicks. (inf. G. Arveda, N. Baccetti).

Sardinia: Between 3000 and 3500 pairs of flamingos bred near Cagliari in 2002; 2600-3000 of these on the dyke at Quartu S. Elena and 500-550 on the specially-modified island at Molentargius. Egg laying extended from 25 April to 5-6 May at Quartu and from 8 to 25 May at Molentargius. Following last year's breeding failure the colonies were closely wardened this year by APM and they produced 2450-2700 chicks and 390-490 chicks respectively (inf. Alessia Atzeni, Sergio Nissardi, Pier Francesco Murgia, Carla Zucca).

Orbetello: There was no breeding at this site in 2002 although some birds colonised the island used in 1994 for a short time at the end of August (inf. N Baccetti).

Margherita di Savoia: a colony of c.200 nests with eggs was destroyed by a fox in mid-July (inf. N.Baccetti).

EASTERN MEDITERRANEAN

GREECE

Greater Flamingos attempted to breed in 2002 in the Salinas at Kalloni. Lesvos, where there were 400 birds throughout the spring. Nests were built in April but only seen from a distance. On 8 June a quick visit to the colony revealed 60 nests, 34 of which held eggs. Unfortunately, a few days later this breeding attempt failed when the nests were submerged during high winds, some of the eggs being close to hatching (info. Hjalmar Dahm).

TURKEY

Greater Flamingos bred at Tuz Gölü in central Anatolia again in 2002. During a survey of wetlands around this salt lake on 28-30 July, U. Özesmi censused a total of 3662 adult flamingos and 4750 flightless young, these latter at the Konya Channel inflow into Lake Tuz.

ASIA

KAZAKHSTAN

Lake Tengiz: Flamingos are reported to have bred at this site in 2002 (inf. Tour du Valat mission report by Johnson & Van der Ven).

INDIA

Flamingos in Ajmer (Rajasthan). On 17 November there were 2500 Lesser and 1000 Greater Flamingos on the Anna Sagar Lake in the midst of the bustling city of Ajmer (inf. N. Shiva Kumar).

Feral Flamingos

GERMANY-HOLLAND

The mixed group of Caribbean, Greater and Chilean Flamingos again bred at Zwillbrocker Venn in Germany. Two pairs of Chilean Flamingos raised chicks which were banded (see p.35) (inf. Joop Treep).

New World

Compiled by Felicity Arengo

COLUMBIA

A study was conducted from June 2002 to January 2003 in Navío Quebrado y Musichi, Department of La Guajira to determine habitat characteristics that favour flamingo presence. Temperature, pH, salinity and water temperature were measured and sediment samples were taken to analyze organic matter and benthic organisms. Flamingo presence, abundance and behavior were recorded also at both sites. The results show that food availability varied over space and time, and flamingo presence and foraging were correlated with abundance in food availability at both sites. (inf. Alejandra Pantaleon-Lizarazu, Diego Rodriguez-Gacha, Universidad Jorge Tadeo Lozano, Santa Marta and Rebeca Franke- Ante, Unidad Administrativa Especial del Sistema de Parques Nacionales Naturales).

USA

On 20 October 2002, a group of 15 Caribbean flamingos was seen in Everglades National Park, Florida. There was one flamingo in the group with a yellow band with black letters DFJV on the right leg and a metal band on the left leg. This bird was banded at Rio Lagartos, Mexico in 2000 (inf. Roy Wood, Park Ranger at Everglades National Park).

LESSER ANTILLES

A single adult Caribbean Flamingo was seen on June 27th 2002 on the Great Salt Pond in St. Kitts, Lesser Antilles, West Indies. It had been observed there since at least early 2001 according to the St. Christopher Heritage Society. It is banded on the right tibia with a greenish metallic band with black numbering with the numerals 98. The ring is bordered top and bottom with a thin black line. (inf. Edward Massiah, St. James, Barbados).

BONAIRE

2002, a regional workshop was held on 5-6 November in Bonaire, organized by the Insular Government of Bonaire, the Department of Physical Planning Section of Environment and Natural Resources Bonaire (DROB), the Ministerio del Ambiente y Recursos Naturales of Venezuela (MARN), and FUDENA, Venezuela. The workshop was sponsored by Ministry of Agriculture of the Netherlands, the Government of Bonaire, Cargill Salt of Bonaire and the Tourism Corporation of Bonaire. Researchers and conservationists from Bonaire, Curaçao, Mexico, Cuba, Suriname, Venezuela, the Netherlands, Spain, and the United States were present. The objectives were to evaluate the current situation of the Caribbean Flamingo, identify gaps in knowledge, build a regional network and evaluate the possibilities of engaging in regional research and conservation activities (see p 39).

SURINAME

During a series of surveys (sponsored by Ducks Unlimited) carried out between 7 March and 30 April, 2002, between 156 and 425 Caribbean Flamingos were counted along the coast during 5 different counts covering the entire coastline. (inf. Otte Ottemen, Stinasu, Foundation of Nature Conservation in Suriname).

BOLIVIA

In November 2002, the Lago Poopo-Uru Uru was declared a Ramsar wetland of international importance. This is an important wetland for migratory birds, endemic shorebirds, and flamingos.

Regional South America

Grupo de Conservación de Flamencos Altoandinos (GCFA) has implemented a regional banding program that includes an integrated system of band codes, data management and dissemination. The Corporación Forestal Nacional (CONAF) in Chile has been carrying out a successful banding program of since the 1980s. In 2002, flamingos were banded for the first time in Bolivia in the context of the regional program.

In April 2002, 155 James' Flamingo chicks were banded at Laguna Colorada, in the Reserva Nacional de Fauna Andina Eduardo Avaroa.

ARGENTINA

Five Andean Flamingos were tagged with non-rechargeable battery-powered satellite transmitters in the *altiplano* region (high-altitude plateau at 3,000–4,500m) of the high Andes in Argentina by Felicity Arengo, Sandra Caziani and their colleagues. This multi-year tracking program is designed to discover the wintering sites of the Andean Flamingo, determine its dispersal patterns over spatial and temporal gradients, determine proportional habitat use in time and space and identify priority areas for Andean Flamingo conservation. During 2002-04, the researchers plan to tag 15 Andeans with satellite transmitters. (inf. Felicity Arengo).

2003

Annual report

News from the regions 2003

Old World

Compiled by Alan Johnson, Arnaud Béchet and Brooks Childress

EAST AFRICA

KENYA

The annual January 2003 Wetlands International African Waterbird Census, covering all of the major inland and coastal wetlands resulted in total flamingo population estimates of 4,850 Greater Flamingos and 1,173,243 Lesser Flamingos. 96.0% of the Greater and 91.8% of the Lessers were on Lakes Nakuru and Elmenteita. Most of the rest were on Lake Bogoria. (inf. Oliver Nasirwa).

Darwin Initiative Project: Flamingo Conservation, and Ramsar Site Management at Lake Bogoria

The Earthwatch Institute, in association with the University of Leicester (UK), has received Darwin Initiative funding from the British government for three years from July 2003 to further the conservation of the Lesser Flamingo and assist the management of the Lake Bogoria National Reserve develop a management plan for this Ramsar site. The project will identify the essential lake ecosystem properties of Lake Bogoria that sustain populations of flamingos and other waterbird species, and collect the baseline data needed to understand the birds' response to changes in these properties. It will hope to explain the reasons for their mass movements to and from this lake and neighbouring lakes (Nakuru and Elmenteita) by concurrent monthly monitoring of the three lakes and by satellite tracking of seven individual flamingos. It will also seek to explain the irregular events of mass mortality in recent years by building up a flamingo health database. The project will play a central role in the process of developing an effective and well-informed management plan for Lake Bogoria, a critical site for the Lesser Flamingo, in three key areas, by:

- (1) Investigating the effects of changes in environmental factors on the abundance, species composition and distribution of phytoplankton with particular reference to the health of *Spirulina platensis*, their only food source in the lakes
- (2) Investigating changes in the number, distribution and status of Cape teal and Black-necked Grebes in relation to flamingo numbers, limnological factors and the life history changes in density/abundance of benthic chironomids
- (3) Establishing a health-monitoring programme for the Lesser Flamingo by recording morphological details, blood sampling and leg banding.

The project leader is Dr David Harper, Senior Lecturer in the Department of Biology at the University of Leicester. He will be assisted in the satellite tracking aspects of the study by Dr Brooks Childress. Brooks is a Research Associate of the Wildfowl & Wetlands Trust (Slimbridge, UK) and of the Department of Ornithology, National Museums of Kenya, Nairobi.

Four Lesser Flamingos tagged with solar-powered transmitters added to satellite tracking programme

In June-July 2003, the satellite tracking study reported in the 2002 annual report was expanded from three to seven birds with the addition of four birds carrying solar-powered satellite transmitters. During the first 15 months of the study, there were no flights outside East Africa. The main flyway consisted of a 940 km north-south range between Lake Logipi in the north of Kenya to Bahi Swamp in central Tanzania. The network of sites used by the study birds consisted of eight alkaline lakes in Kenya and Tanzania and an ephemeral wetland in central Tanzania (Bahi Swamp). The conservation status of these nine sites varies from well-protected to completely unprotected. (Childress, B., Hughes, B., Harper, D., Van den Bossche, W., Berthold, P. and Querner, U. *In press*. Satellite tracking documents East African flyway and key site network of the Lesser Flamingo (*Phoenicopterus minor*). Proceedings of the Waterbirds Around the World Conference, 2005.

TANZANIA

Lesser Flamingos were breeding in large numbers on Lake Natron on 7 December 2003 when Neil Baker flew over this lake. He observed several crèches of chicks of differing ages and some adults were still incubating.

The 3 satellite tagged Greater Flamingos marked in Northern Tanzania in 2002 were still indicating their whereabouts in December 2003 (inf. Neil and Liz Baker).

SOUTHERN AFRICA

BOTSWANA

Breeding conditions at Makgadikgadi during the 2002-03 breeding season were poor, as the area was in the grips of a severe drought. It is not sure if any chicks survived. (inf. Graham McCulloch)

SOUTH AFRICA

In June 2003, c.36,000 Lesser Flamingos were counted at Kamfers Dam, Kimberley (Anderson 2004).

NAMIBIA

There were few, if any, breeding attempts at Etosha Pan in the 2002-03 breeding season because of drought conditions. (inf. Rob Simmons).

WEST AFRICA

MAURITANIA

Diawling: no breeding in Dec 2003 during flight by Yelli Diawara.

On 26 April, Yelli Diawara made an aerial survey of the Banc d'Arguin, from Mamghar in the south to Pointe Minou in the north. Flamingos were breeding only on Grande Kiaone. The colony was photographed from the air and it is estimated that 8200 pairs of Greater Flamingos were then breeding. About 4500 chicks fledged (Inf. Yelli Diawara PNBA).

WEST MEDITERRANEAN

SPAIN

Flamingos bred at 3 sites in Spain in 2003.

Marismas of the Guadalquivir: 15-16,000 pairs of flamingos bred at the Vetones del Burro, Doñana. This wetland dried out before the chicks fledged and only 1209 chicks were raised. These were captured and moved to water at the Lucio Cerrado Garrido where 500 of them were banded on 8 August (inf. Manuel Mañez, EBD).

Fuente de Piedra: Breeding by 15,900 pairs of flamingos on the Isla Senra. 3668 chicks were raised of which 611 were banded on 12 July (inf. M.Rendón-Martos).

Two flamingos, a male and a female, were tagged with satellite transmitters and banded on 15 and 17 June respectively, and their movements between Fuente de Piedra and the feeding grounds in Andalucía tracked by Juan Amat.

Ebro delta: Colony established on usual nesting island 'Torra dels Conills'. Breeding was early and the first chicks could be seen at the end of April, indicating egg-laying beginning at the end of March. A total of 1355 pairs nested and raised 406 chicks. As observed in previous years, some birds curiously assembled in November on one of the dykes in the salt pans where they built nests (inf. Francesc Vidale, P.N.Deltebre).

Laguna Petrola (Albacete): No breeding in 2003 (inf. M.Rendón-Martos).

Satellite transmitters, offered by Tour du Valat to Juan Amat, were placed on one adult male and one adult female flamingo at Fuente de Piedra in June 2003. The transmitter on the male unfortunately stopped transmitting after one month. The female spent the winter in the Marismas.

FRANCE

The IWC revealed a total of 31874 flamingos wintering in January 2003 along the Mediterranean coast of France, from the Salins d'Hyères (Var) west to the lagoons of Roussillon (Pyr.Orientales) and a further 64 birds in Corsica. These counts are summarised below.

Region	Number of flamingos	Observer(s)
Hyères (Var)	1087	CEEP ⁽¹⁾
Berre (Bouches-du-Rhône)	653	CEEP ⁽¹⁾
Plan du Bourg	1088	CEEP ⁽¹⁾ , A. Tamisier CNRS
Ile de Camargue	7927	Tour du Valat, A. Tamisier CNRS
Petite Camargue (B.du Rh.-Gard)	5260	Tour du Valat, A. Tamisier CNRS
Languedoc (Hérault)	11130	GRIVE ⁽²⁾
Languedoc-Roussillon (Aude-Pyr.Or)	4729	LPO ⁽³⁾ Aude
Corsica	64	
Total	31938	

(4) Centre d'Etudes des Ecosystèmes de Provence

- (5) Groupe de Recherches et d'Informations sur les Vertébrés
- (6) Ligue pour la Protection des Oiseaux

The spring census was carried out over this same area on 15-20 May 2003 and revealed a total of 39,191 flamingos in Mediterranean France (observations by LPO PACA, LPO Aude, Pont de Gau, Tour du Valat, Palissade, SPN Agde, COGard, Vigueirat, GOR., Tour du Valat and local amateur naturalists). (inf. A. Arnaud, A. Bechet, Tour du Valat).

For the 2nd year in succession there was a breeding attempt by Greater Flamingos at **Pont de Gau Ornithological Park** where c.1000 birds spend much of the winter and hundreds occur at other times of the year. Artificial nests have been moulded on a specially-built island for the past four years in an attempt to attract birds to breed in the park. It is the second year that eggs have been laid, 19?? in all. All were taken by Yellow-legged Gulls when the parents left the nest to feed. Date of laying?? As in previous years, the breeding birds were attracted to the **Etang du Fangassier** once conditions there were favourable (inf. Pont de Gau, ARJ).

An aerial census of the breeding birds at **Fangassier** was made on 16 May when it is estimated there were 12,990 pairs. The nursery of chicks was photographed from the air on 17 July when 4686 chicks were counted. Although no observations were made of the colony the salt company agreed to allow the capture and banding of chicks and 786 were marked on 29 July 2003. Blood samples were taken from 766 chicks for sexing and from 115 for the study of arboviruses, in particular the West Nile virus (inf. Arnaud Béchet, Antoine Arnaud, Tour du Valat).

ITALY

Comacchio: This colony continues to increase in size and in 2003, 865 pairs of flamingos bred (in 3 groups). More than 400 chicks were raised of which 195 were captured and ringed on 25 June (inf. G. Arveda, N. Baccetti).

Sardinia: Flamingos attempted breeding at 3 sites in Sardinia in 2003. From 4600-5000 pairs bred on the specially-modified island at Molentargius and they raised more than 4000 chicks. A further 1400-1600 pairs nested in the salinas at Macchiarreddu and raised 850-950 chicks of which 312 were captured and banded. The third site was at S'Ena Arrubia where 8-10 pairs built nests but did not breed successfully. No eggs were seen. (inf. Alessia Atzeni, Sergio Nissardi, Pier Francesco Murgia, Carla Zucca, Waltar Piras, Lara Bassu).

Orbetello: There was no breeding at this site in 2003 (inf. N Baccetti).

Margherita di Savoia: 550 pairs of flamingos bred in these salinas in 2003 and raised 132 chicks. The nests were in 3 groups at the junction of former dykes (inf. N Baccetti).

EAST MEDITERRANEAN

GREECE

Lesbos: no breeding attempted in 2003 (inf. Hjalmar Dahm)

CYPRUS

Lake Larnaca: In February 2003 about 50 flamingos died of lead poisoning at this lake. The birds had picked up and ingested lead pellets from the substrate of the lake, in the neighbourhood of a clay-pigeon shooting range (inf. M. Charalambides, A. Demetropoulos, N. Kassinis).

Lake Akrotiri: Flamingos built 50-70 nest mounds at this lake in June-July but this was probably not a true breeding attempt and no eggs or chicks were observed (inf. N. Kassinis).

TURKEY

Lake Tuz: survey flights were made by Ozge Balkiz on 9 April and 11 June. These revealed respectively 1040 breeding pairs of Greater Flamingos and 3059 chicks. Most birds clearly began breeding after the first flight, and during the second flight there were still 955 adult flamingos on the nest (inf. Özge Balkız, Arnaud Béchet).

Camalti (Izmir): breeding initiated in May with 50-60 pairs but only 1-2 eggs laid by 9 May (inf. M. Sıkı). It is not known exactly how many pairs eventually bred at this site but a nest count at the end of the season revealed 2540 mounds. In mid-August, however, the number of chicks in the nursery was estimated to be around 3200, meaning that some nests either had been destroyed by trampling or erosion, or were used by two successive breeding pairs or some chicks came from Tuz where breeding was sooner. On 17 August, 200 of the chicks aged from c.6-10 weeks were captured and banded. (inf. Özge Balkız, Arnaud Béchet, Antoine Arnaud).

Lake Seyfe: This site was visited on 9 April when 2700 flamingos were present but none were breeding (inf. Ozge Balkız, Arnaud Béchet, Antoine Arnaud).

ASIA

KAZAKHSTAN

Lake Tengiz is the most northerly breeding site of flamingos in the world (50°25'N/69°E). Alan Johnson and Joost van der Ven visited this 56,000 ha reserve from 25 June to 1 July 2003 on a fact-finding mission. They were accompanied in the field by one of the reserve's scientists Alexei Koshkin and Nikolai Andrusenko who studied flamingos at this lake from 1979 to 1994. They discovered a flamingo colony in the south of Lake Tengiz which could only be seen from a distance. Most or all of the breeding birds had chicks gathered in 4 nurseries and it is believed that there were c. 8-10,000 breeding pairs. Since 1976 the flamingos have bred at 7 different localities on this lake and they have bred in 20 of the past 28 years (1976-2003). The last detailed report of breeding (Newsletter 10) was of c.15,200 pairs in 1998 and these observations confirm that L. Tengiz is still one of the most important breeding sites in the world for the Greater Flamingo (inf. Tour du Valat mission report by Johnson & Van der Ven).

INDIA

Counts of flamingos in Gujarat State. Flamingos were counted from the ground between 11 and 26 January 2003 on a selection of wetlands in Gujarat State. These visual estimates revealed totals of 28,333 Greater and 369,901 Lesser Flamingos. This is the highest number of Lessers ever recorded in India. They occurred exclusively on coastal wetlands, as did most of the Greaters, with 80% of the Lessers in the Gulf of Khambhat. Numbers of both species are much higher than those reported during the Asian Waterfowl Census. There was no evidence of breeding which has not been recorded in the Rann of Kachchh since 1991. (Summary of article by Jadhav & Parasharya in *Waterbirds* 27).

During an October 2003 expedition to the Great Rann of Kachchh in north-western India, Dr B M Parasharya a flamingo specialist from the Ornithology Biological Control Lab, Gujarat Agricultural University, Gujarat, India and his student Anika Jadhav counted and photographed three huge flocks of Lesser Flamingos totalling more than one million birds, all in non-breeding plumage.

This is the largest number of Lesser Flamingos ever recorded in India, and together with a 2002 census of Lesser Flamingos in East Africa that found only 2.5 million birds, rather than the expected four

million, raises again the question of whether there might be interchange between these two widely separated areas.

Flamingo watch in Mumbai. On 17 May 2003, the Bombay Natural History Society and Bombay Port Trust organised a flamingo watch at Sewree Mahul mudflats, near Mumbai on the Arabian Sea coast. This wetland area of mudflats and mangroves is 10 km long and 3 km wide, and is an IBA which can host over a thousand flamingos (both Lesser and Greater occur). The event, which was sponsored by the Indian Bird Conservation Network, attracted over 1,000 people. (Inf. Zafar-ul Islam, BNHS).

Further counts of flamingos and breeding in Gujarat State.

Flamingos of both species have been recorded in very large numbers since 2002 in NW India. Estimations have referred to more than a million Lesser Flamingos and more than 250,000 Greater in the Great Rann of Kachchh in October 2003. It was a year of good rainfall and Lesser Flamingos bred in the eastern part of the Great Rann where a nursery of 11,000 chicks was photographed on 23 October. Greater Flamingos also bred in the Rann. (inf. B.M. Parasharya, P.S. Thakker. P.S. Lahiri, M.B. Khatri, M. Zafar-ul Islam).

Feral Flamingos

GERMANY-HOLLAND

The mixed group of Caribbean, Greater and Chilean Flamingos again bred at Zwillbrocker Venn in Germany. Three pairs of Chilean Flamingos, one pair of Greater and a hybrid pair Caribbean x Greater raised chicks (*inf. Joop Treep*).

New World

Compiled by Felicity Arengo

ARGENTINA

In June, a sixth Andean Flamingo was added to the satellite tracking project being conducted by Sandra Casiani, Felicity Arengo and colleagues. (inf. Felicity Arengo)

2004

Annual report

News from the regions 2004

Old World

Compiled by Alan Johnson, Arnaud Béchet & Brooks Childress

EAST AFRICA

KENYA

The annual January 2004 Wetlands International African Waterbird Census, covering all of the major inland and coastal wetlands resulted in total flamingo population estimates of 15,751 Greater Flamingos and 292,121 Lesser Flamingos. 76.7% of the Greater were on lakes Bogoria, Nakuru and Elmenteita, while 92.8% of the Lessers were on these three lakes. (inf. Oliver Nasirwa)

TANZANIA

The annual January 2004 Wetlands International African Waterbird Census, covering all of the major inland and coastal wetlands resulted in total flamingo population estimates of 70,550 Greater Flamingos and 366,180 Lesser Flamingos. 82.9% of the Greater were on lakes Manyara and Blangida, while 92.8% of the Lessers were on Lake Manyara. (inf. Neil Baker, based on: Mungaya, E. and Matilya, G.J. 2004 Tanzania Waterbird Count Report January/February 2004. Wildlife Conservation Society of Tanzania)

Mass deaths of Lesser Flamingo in Lake Manyara – June/July 2004

A mass die-off of waterbirds, involving mainly Lesser Flamingo, but also a few Greater Flamingo, Maccoa Duck and Egyptian Geese began in mid-June. This is the first massive die-off of birds every recorded in this lake. Clinical signs of the birds showed staggering and uncoordinated movements before death. Deaths occurred on the wet sandy lakeshore out of the water. At the time, Lake Manyara was hosting an estimated flamingo population of over three million individuals, probably as a result of drying off of other neighbouring soda lakes. (This population estimate seems questionable, in view of the total East African population estimate of about two million flamingos of both species from the January counts, and the fact that approximately 750,000 Lesser Flamingos were on Lake Nakuru in Kenya in July. B. Childress)

Veterinary doctors from Tanzania Wildlife Research Institute (TAWIRI), Tanzania National Parks (TANAPA) and Ngorongoro Conservation Area Authority (NCAA), together with experts from Veterinary Investigation Centre (VIS) and Tropical Pesticide Research Institute (TPRI) joined to investigate the problem. They took water and dead Lesser Flamingo tissue samples for analysis at their respective laboratories. In addition, samples were sent to Berlin, Germany.

The tests for pesticides indicated trace amounts of Fenvelerate (a derivative of summethion, used as a cotton pesticide) at insignificant levels, and do not support the possibility of pesticide poisoning of the birds. No pathogenic bacteria were found in the flamingo organs or lake water samples analysed.

Following similar mass die-offs that have occurred over the past decade in Kenya's alkaline lakes (e.g. Bogoria, Nakuru and Elmenteita) and in Tanzania at lakes Natron and Empakai Crater in 2002, a toxin from cyanobacteria was found. Deaths were again observed in Lake Elmenteita in September 2003.

Analysis of Lesser Flamingo organ samples from lakes Bogoria and Nakuru carried out at both the Leibniz Institute of Fresh Water Ecology and Inland Fisheries in Berlin found cyanobacteria toxins in the livers. Two hepatoxins (microcystin-LR and RR) and the neurotoxin anatoxin-a were found in estimated harmful concentrations. The only sources of these toxins are cyanobacteria. Cyanobacteria are the main diet of the Lesser Flamingo in East Africa (but not in South Africa, where these die-offs have not occurred [B. Childress]). Anatoxin-a being a neurotoxin is consistent with opisthotonus observed at post mortem (as well as the staggering behaviour during the dying process [B. Childress]). (source: www.tanzaniaparks.com)

SOUTHERN AFRICA

BOTSWANA

The 2003-2004 breeding season at Makgadikgadi experienced late rains which washed away one of the Lesser Flamingo breeding colonies and only a small colony survived to produce chicks. Most of the chicks died on the dry pan as the breeding occurred too late. However, some Lesser and Greater chicks (some few hundreds) have been seen since on the pan. (inf. Graham McCulloch).

SOUTH AFRICA

In Jan.2004 there were 14,500 Lesser Flamingos and c.530 Greater at Kamfers Dam, Kimberley. Both species attempted breeding but failed (Anderson 2004).

NAMIBIA

There was flooding on Etosha pan in the 2003-04 breeding season with breeding in the Okerfontein section of the pan. A mixed-species flock of approximately 20-30,000 individuals (Greater and Lesser) were involved in the breeding attempt and approximately 5000 chicks of each species were produced. (inf. Rob Simmons).

WEST AFRICA

MAURITANIA

During an aerial survey of the PNBA by Yelli Diawara on 7 May 2004, 19000 Greater Flamingos were censused. There was an early breeding on Grande Kiaone where there was a creche of 5800 chicks, most of these from clutches laid 1-10 March 2004. Antoine Arnaud and YD observed this nursery from the ground on 2-6 June and were able to read 29 bands of French and Spanish origin, 2 birds (1 French, 1 Spanish) being breeders (seen feeding a chick).

WESTERN MEDITERRANEAN

SPAIN

Doñana: About 13,000 pairs of flamingos bred in seven colonies at Doñana in 2004 (at Vetones del Burro, V. del Hierro, Verta Reguera, V. de los Ansares) and raised c.3500 chicks. On 13 August, 350 chicks were caught from 4 of the colonies and ringed at Vetones del Burro. (inf. Manuel. Mañez).

Fuente de Piedra: About 19,000 pairs of flamingos bred and raised c.7500 chicks, of which 600 were caught and ringed on 7 August 2004 (inf. Manuel Rendón-Martos).

Laguna Petrola: no breeding in 2004 (inf. Manuel Rendón-Martos).

Ebro delta: about 1500 pairs of flamingos bred at Torra dels Conills and raised c.900 chicks, of which 399 were caught and ringed on 4 July. The creche was observed by Antoine Arnaud and Christophe Germain in June when 90 banded birds were confirmed breeding (inf. Francesc Vidal PNDE).

FRANCE

Etang du Fangassier: Breeding by c.13,980 pairs installed on both Flamingo Island and Tern Island. First chicks hatched c.3 May, indicating early start of breeding c.3 April. 9089 chicks were counted on aerial photos of which 823 were caught and ringed on 22 July. No observations were carried out during incubation but the creche was observed in the evenings end-July and in August (inf. Arnaud Béchet, Antoine Arnaud, Tour du Valat).

ITALY

Comacchio salt pans: 970 pairs of flamingos bred and raised 595 chicks of which 395 were caught and ringed on 6 July 2004 (inf. Giovanni Arveda, Nicola Baccetti).

Margherita di Savoia: 680 pairs of flamingos bred and raised 228 chicks (inf. Giuseppe Albanese, Nicola Baccetti).

SARDINIA

Molentargius: An early breeding attempt by c.1500 pairs of flamingos failed (inf. Sergio Nissardi, Carla Zucca, Pier-Francesco Murgia, Alessia Atzeni).

Machiareddu (Santa Gilla): 6500 pairs of flamingos bred and raised around 2000 chicks of which 499 were caught and ringed on 31 July 2004 (inf. Sergio Nissardi, Carla Zucca, Pier-Francesco Murgia, Alessia Atzeni).

S'Ena Arrubia (Oristano): see flamingos built nests but no eggs were observed (inf. Sergio Nissardi, Carla Zucca, Walter Piras, Lara Bassu).

SICILY

Some flamingos built nests in October at Pantano di Vendicari, Siracusa (inf. Fabio Cilea).

SWITZERLAND

An immature flamingo aged 3-4 years stayed at the Réserve de Chablais (Fanel) at Cudrefin (Vaud) from 16 to 23 June. This bird was not ringed. (inf. François Turrian).

TURKEY

Camalti Tuzlasi salt pans (Izmir): Breeding started to settle on the island on 16 April. 3619 pairs of flamingos bred and 247 of the chicks raised were caught and ringed on 1 August 2004 (inf. Özge Balkız).

Tuz Gölü: Breeding; 7312 chicks were counted on an aerial photo of the crèche (inf. Özge Balkız).

SYRIA

An expedition supported by OSME visited many of the wetlands in Syria in Jan-Feb 2004. Over 12000 Greater Flamingos were censused at Sabkhat al-Jabbul on 10-12 February and over 9800 on 27 February (inf. Murdoch *et al.* 2004).

FERAL FLAMINGOS

GERMANY-HOLLAND

The flamingos returned very early to their breeding grounds this year. On 26 March more than 30 were present and a mixed group of Chilean, Greater and Caribbean Flamingos was fully displaying. The first eggs were laid on 20 April (some 10 days earlier than ever before). Many nests failed however (although conditions seemed quite right) and some relaying occurred. Displays went on until May (normally display ends when the colony starts breeding, at the beginning of April). This may have been caused by the presence of 5 young Chilean Flamingos (ZV09, ZV10, ZV11, ZV23 and ZV24) from the years 2001 and 2002, and some relatively young Greater Flamingos (an alu-banded female from 1993, an alu-banded male from 1994, and ZV22). The scattered and therefore extended breeding period caused a big interval between the hatching of the first pair of chicks (c. 20 May) and the second pair (c. 25 June). Two or more hatchlings in between did not survive. For the first time in history the banding of the young flamingos in the Zwillbrocker Venn was performed on two separate days; on the 5 July a Chilean (ZV21) and a hybrid Greater x Caribbean (ZV25) were ringed. On 9 August two Chilean Flamingos (ZV26, ZV27) were ringed. In the second half of August ZV21 and ZV25 left the Zwillbrocker Venn and have since been observed in The Netherlands. ZV26 and ZV27 look fit, but were still not on the wing in early September (inf. Joop Treep).

News from the regions 2004

New World

Compiled by Felicity Arengo & Brooks Childress

BAHAMAS (see article on aerial survey of Andros by Baltz).

MEXICO

Breeding by Caribbean Flamingos on 3 islands at Ria Lagartos. Breeding was started at Petén Hu but this island was abandoned in mid April when feral dogs disturbed the colony. Yalmakán was then fully colonised and birds which could not find nesting space there moved to Punta Mecoh (*inf. Rodrigo Migoya*)

BARBADOS

A young Caribbean Flamingo appeared on Barbados in mid-May 2004, the first recorded occurrence of the species on this island. It was seen in St.Philip on 22 May and stayed there until at least 5 June. Prior to this it had been seen some days earlier on a south coast beach and then in the north. Its arrival in Barbados coincided with very uncharacteristic weather for the time of the year with very wet conditions and southerly winds extending up from Venezuela over the whole eastern Caribbean (*inf. Edward Massiah, Hipac Ltd., P.O.Box 143, Bridgetown, Barbados*).

BOLIVIA

In May 2004, a group of scientists from the Bronx Zoo-based Wildlife Conservation Society (WCS) recently braved frigid temperatures, high winds, and altitudes of over 11,000 feet to fit bands on 300 threatened James' flamingo chicks. Working in Eduardo Avaroa Faunal Reserve in southern Bolivia, the banding effort is part of a multi-nation study on flamingo movements and population dynamics.

REPORT ON AN AERIAL FLAMINGO SURVEY OF ANDROS ISLAND, BAHAMAS, 12-13 JUNE 2004

Submitted to: The International Flamingo Foundation, 22 September 2004. Prepared by: Michael E. Baltz, Ph.D., The Nature Conservancy of Illinois, 139 Rustic Campus Drive, Ullin, IL 62992, Email: mbaltz@tnc.org

I. Background and survey objectives

The Caribbean Flamingo (*Phoenicopterus ruber ruber*), the national bird of The Bahamas, occurred historically throughout the archipelago, with records of breeding colonies from Abaco, Andros, Rum Cay, Exuma, Long Island, Ragged Island, Acklins, Mayaguana, and Great Inagua (Allen 1956).

Andros Island had a population of "over 30,000" flamingos as recently as 1940 (Zahl 1947), but by 1949 the birds no longer bred on the island (Zahl 1951). During the last decade however, there have been numerous reports of flamingos from the west side of Andros, especially North Andros. But these recent observations, that include photographs and videos, have not been quantitative and have not established the breeding status of flamingos on the island.

In order to document the status of flamingos on Andros it was necessary to survey the entire west side of the island in a short period of time. Aerial surveys have been used as an effective way to search

large areas for flamingos and to identify breeding colonies (Espinoza 1995; Felicity Arengo, Wildlife Conservation Society, pers. com.). As such, with the financial support from the International Flamingo Foundation, an aerial survey of Andros Island was conducted 12-13 June 2004 with the following objectives:

- 1) To establish a survey method that could be repeated on Andros and employed throughout the archipelago.
- 2) To generate a quantitative estimate of how many flamingos were on Andros during what should be the middle of breeding season.
- 3) To potentially establish the breeding status of flamingos on the island. [Note: In the Bahamas egg-laying begins early May so flamingos should still be incubating or have flightless young in mid-June (Chapman 1905; Nancy Clum, Wildlife Conservation Society, pers. com.).]

II. Description of the survey area (from Nickrent et al. 1988)

The saltwater marsh is perhaps the most desolate and inhospitable of all the areas on Andros and occupies hundreds of square miles. This is certainly the impression one gets while viewing the numerous ponds and lakes when approaching Andros by air from the west. The ground is a soft calcareous mud which is often covered by algal mats. Northrop (1902) states:

The scenery was monotonous and desolate. In many places as far as the eye could reach, the ground seemed perfectly flat and covered with small mangroves (*Rhizophora mangle*), salt bush (*Avicennia germinans*) and a low form of button wood (*Conocarpus erectus*), none more than a few feet in height. The plants were in reality quite scattered and a considerable distance apart...

Herbaceous plant life such as *Salicornia virginiana*, *Suaeda linearis*, *Batis maritima*, *Juncus roemerianus*, and *Atriplex arenaria* are also prevalent.

III. Results and Discussion

Objective 1) Establish an aerial survey method: The survey plane was a Cessna Skyhawk (single engine, 4-seater, high-wings) equipped with an Garmin95 GPS receiver. There were three observers and a pilot. The survey was conducted from approximately 8 a.m. until Noon on consecutive days under partly cloudy conditions. We flew a north-south grid with approximately 1.5 miles between segments at an average altitude of 1000 feet. Way points were recorded manually at each turn. A map of the island (from an Atlas of the Bahamas, 1985 revised edition) was used to keep track of our general position. We surveyed the western half of North Andros to Northern Bight on 12 June. On 13 June we surveyed the western half of South Andros (south of the Southern Bight including the entire southern tip south of Little Creek). (We also flew back to the location on North Andros where we had seen flamingos on 6 June.) Total flight time was nine hours (including round trip flight from Nassau to North Andros on both days and time spent observing flock on North Andros). We photographed birds with both a digital still camera (Kodak EasyShare DX6490) and a digital video camera (Sony Digital8 HandyCam Camcorder).

Overall, the survey method worked very well. Flying a grid with 1.5 miles between passes appeared to allow complete visual coverage of the area. Multiple observers helped insure that there was at least one pair of eyes looking out each side of the plane at all times. One thousand feet (1000') was low enough to clearly see individual birds (e.g. we saw several lone white egrets) and high enough so that the flamingos weren't spooked by the plane. Flamingos became skittish when we dropped below 800 feet and they began to take flight when we dropped below 500 feet.

Still photography worked best for getting pictures that could subsequently be used to estimate flock size. The method that produced the clearest image was to hold the camera inside the plane and photograph through the open window. Pictures taken at between 800-1000' were sharp enough so that individual birds could be counted. But I'd recommend photographing large flocks in a series to take maximum advantage of a camera's zoom capabilities.

Objective 2) Generate a quantitative estimate of how many birds were on the island: We saw one flock of birds on North Andros in the same location on both 12 and 13 June. We did not see any birds on South Andros on 13 June. My count from the 13 June was 937 individuals (N. Clum counted 913), but the actual number is likely higher as the picture got blurry when enlarged. I was not able to get a count from the 12 June close-up, but both Nancy Clum and I agree that the 12 June flock looked bigger than the 13 June flock. So, we saw at least 1000 birds, and possibly 1500-2000.

Objective 3) Potentially establish the breeding status of flamingos on the island: We did not see birds on nests, or birds with chicks, nor did we see nests. However, that does not mean that flamingos are not breeding on Andros. First, since we didn't survey every inch of the island (most notably missing parts of the Middle Bight) it is possible that we missed a group of flamingos on nests. But we did survey the parts of the island where birds were most likely to be breeding and where they had bred historically. Second, it is possible that we did not see the nests associated with the flock that we saw foraging. If the flamingos that we saw bred unsuccessfully, we could have missed an abandoned colony, especially if their nests were in mangroves, a type of nesting which has been observed on South Andros (Zahl 1947). [Note: If the flamingos we saw had bred successfully, there would have been a comparable number of adults tending the nests (Allen 1956) that we would likely have seen.] Third, it's possible that flamingos on Andros did not attempt to breed in 2004. Flamingos are intermittent breeders and are known to go several years between breeding attempts (Allen 1956). For example, on Inagua the flamingos did not nest in 2002-2004 (Lynn Gape, Bahamas National Trust pers. com.). One possible explanation for a failure to nest, at least in 2004, would be drought, as the Bahamas experienced an extended dry season this year.

There have been recent undocumented reports of flamingos nesting on North Andros. There have also been documented observations of sub-adult flamingos on North Andros. The light colored birds we saw are likely between two and four years old (based on Johnson et. al 1992). However, the presence of sub-adults alone does not mean that birds have bred there in recent years. For example, a flamingo banded in April in Chile as a chick was seen in Bolivia in June of the same year, around 600km from its breeding site (F. Arengo, pers. com.).

It is worth noting that the large flamingo breeding colonies described by Chapman (1905) and others were found on South Andros in the Grassy Creek Area. The flyover of that area made it clear that potential breeding areas are much more accessible by water than much of the potential breeding habitat on the west side of North Andros. Perhaps this accessibility and subsequent disturbance by people has kept flamingos from returning to the Grassy Creek Area.

IV. Additional outcomes and next steps

- 1) The planning for this survey precipitated conversations with Felicity Arengo (assistant director of Latin American/Caribbean program WCS International), who in turn put me in touch with Nancy Clum (assistant curator of ornithology for WCS Living Institutions). Nancy is the new board member for the Bahamas National Trust and is on the verge of initiating research on the flamingos nesting on Inagua.
 - a. Nancy participated in and was a valuable addition to the survey effort. Subsequently she provided the video included as Appendix 1, analyzed the photos

of flamingos, and reviewed this report. She has promised to include a funding request for an archipelago-wide flamingo survey in appropriate grant proposals.

- b. This report will be submitted to the Flamingo Specialists Group (via F. Arengo) and will represent the first quantitative data on flamingos in the Bahamas in decades.
- 2) The survey encouraged conversations in the Bahamas between the Conservancy's Bahamas Program director (Eleanor Phillips) and potential donors regarding funding for an archipelago-wide flamingo survey.
- 3) In meetings with Eleanor Phillips (TNC) and the president of the Bahamas Sportfishing and Conservation Association (Prescott Smith) after the survey we established a mutual interest in launching an effort to monitor observations of flamingos in the Bahamas. To this end, I have developed a flamingo report form that could be distributed to members of the BSCA (Appendix 2). In addition, there is discussion regarding a workshop to educate fishing guides about flamingos.
- 4) Observations and discussions during the survey suggest that an effort to equip flamingos on Andros with satellite tracking devices would be feasible. This would be an important step in understanding how birds are using the island and potentially understanding the dynamics of flamingo movements in the West Indies.

V. Acknowledgments:

Funding for this survey was provided by the International Flamingo Foundation. The Nature Conservancy's Bahamas Program staff provided logistical support in the Bahamas. Nancy Clum (WCS) and Paul Dean provided invaluable support as members of the survey team. Michael Garraway donated flight time. The College of the Bahamas provided lodging for Nancy Clum and Paul Dean during their stay on Andros. Harrington and Margarette Frazier provided lodging for Michael Baltz on Andros.

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VII. Appendix

- 1) Video of west side of Andros (by Nancy Clum, WCS)
- Draft BSCA Flamingo Report Form

FLAMINGO MARKING SCHEMES 2002-2004

Old World

KENYA

2002: 142 Lesser Flamingos were ringed at Lake Bogoria during 2002, bringing the total ringed at this site since the programme began in 2001 to 229. Each bird ringed has a Ringing Scheme of Eastern Africa metal ring placed on its right tibia and an orange PVC ring with black letter combinations placed on its left tibia. The metal rings are sequentially numbered W 0301 – W 0500 and W 1001 – W1031. The first 37 orange Darvic rings have no individual letter ID markings. Letter ID markings begin with AA on W 0339 and continue through PS, using combinations of only 18 letters of the alphabet, as is customary with this type of ring pioneered by the Wildfowl & Wetlands Trust. (inf. Brooks Childress, ringer)

2003: 30 Lesser Flamingos were ringed at Lake Bogoria in 2003. The ring number sequences used were: metal: W 1032 – W 1061; Darvic: PT – TL (inf. Brooks Childress, ringer)

2004: 37 Lesser Flamingos were ringed at Lake Bogoria in 2004. The ring number sequences used were: metal: W 1062 – W 1100; Darvic: TN – XC (inf. Brooks Childress, ringer)

SPAIN

Marismas of the Guadalquivir

2002: 6 adult flamingos were marked with bands coded 1/90 to 1/94 and 1/1P and 2 1st year birds with bands coded 4/J8 and 4/J9. These bands are all orange with black digits.

2003: 500 chicks hatched at the colony at Vetones del Burro were banded on 8 August when they were released at the Lucio Cerrado Garrido, orange bands coded (black digits) 3/X0 to 3/XX, 7/HM to 7/LX, 7/MT to 7/XX, 8/OJ to 8/CX, 8/L5 to 8/PX, 8/T5 to 8/TX, 8/V5 to 8/WW.

2004: 350 chicks were caught from 4 of the colonies established at Donaña and ringed at Vetones del Burro on 13 August. Codes used are 1/MO - 1/XX, 3/VV - 3/WW, 4/3R – 4/3R – 4/3X, 4/75 – 4/7X, 4/CH – 4/CX, 4/HP – 4/HX, 4/RF – 4/RX, 4/W4 – 4/XW, 5/FF – 5/FJ, A/91.

Fuente de Piedra (Málaga).

2002: 800 chicks were marked on the right tibia with ICONA metal rings, and on the left tibia with white PVC leg-bands engraved with four digits; a '1' followed by a black line engraved completely around the band, followed by 3-letter codes: from 1/BL- to 1/FHH, on 21 July 2002. Blood samples were taken from all chicks for sexing and additional blood samples were taken for the study of dispersal using micro-satellites and 30 more for heavy metal analyses (inf. M. Rendón).

2003: 611 chicks were marked on the right tibia with ICONA metal rings, and on the left tibia with white PVC leg-bands engraved with four digits; a '1' followed by a black line engraved completely around the band, followed by 3-letter codes: from 1/FHI to 1/IJN, on 12 July.

2004: 600 chicks were caught and ringed on 7 August. Codes used were 1/IJP - 1/LLV.

Ebro delta:

2004: 399 chicks were caught and ringed on 4 July. Francesc-MRM. Codes used were X/000 – X/399. This was the first time that any chick ringing has been carried out in the delta.

Blood samples were taken from all chicks for sexing (inf. M. Rendón).

FRANCE

Etang du Fangassier, Camargue (Bouches-du-Rhone).

2002: for the first time since 1977 there was no banding of chicks.

2003: 786 chicks were marked on the left tibia with PARIS MUSEUM stainless steel rings (codes X 1920 – X 2706), and on the right tibia with yellow PVC leg-bands engraved with four-letter codes commencing with FB--, FC--, FD-- or FF--, on 29 July (inf. Station Biologique, La Tour du Valat). Blood samples were taken from all chicks for sexing

2004: 823 chicks were caught and ringed on 22 July (Tour du Valat). Codes used were FHAA - FNPZ. Feather samples were taken from all chicks for sexing

ITALY

Comacchio salt pans (Emilia Romagna).

2002: 346 chicks were marked on the left tibia with a metal BOLOGNA ring and on the right tibia with blue PVC bands engraved with codes (white letters) from IKP to IZZ, IAAA to IBDS, all reading up, on 2 July. Blood samples were taken from 300 of the chicks. (inf. G. Arveda, N. Baccetti).

2003: 195 chicks were marked on the left tibia with a metal BOLOGNA ring and on the right tibia with blue PVC bands engraved with codes (white letters) from IANS to ICDJ, all reading up, on 25 June. No blood samples were taken (inf. N. Baccetti, C. Germain, D. Cohez).

2004: 395 chicks were caught and ringed on 6 July 2004. Codes used were ICAJ - IDZJ.

SARDINIA

Stagno di Machiareddu (Cagliari).

2003: 312 chicks were banded with white PVC bands engraved with black letters coded MHBA to MJJT on

2004: 499 chicks were caught and ringed on 31 July 2004. Codes used were MJJV - MLPH, MVJN.

TURKEY

Camalti salt pans (Izmir).

2003: 199 chicks were banded on 17 August with white PVC bands (black digits) coded T/AAA to T/AVF. Feather samples were taken from all chicks for sexing

2004: 247 chicks were caught and ringed on 1 August 2004. Codes used were T/AZA - T/CAK. Feather samples were taken from all chicks for sexing

Feral Flamingos

GERMANY

2002: Two Chilean Flamingo chicks raised at Zwillbrocker Venn in Germany were marked on the right tibia with a red PVC band (codes ZV23, ZV24) and on the left tibia with a Vogelwarte Hiddensee ring (inf.Joop Treep).

2004: A Chilean Flamingo chick (ZV21) and a hybrid Greater x Caribbean Flamingo chick (ZV25) were banded on 5 July and two more Chilean (ZV26, ZV27) were banded on 9 August at Zwillbrocker Venn (inf.Joop Treep).

Telemetry studies

TANZANIA

The 3 Greater Flamingos satellite-tagged in 2002 in Northern Tanzania were still transmitting in January 2004 (inf. Neil and Liz Baker).

SPAIN

Two flamingos, a male and a female, were tagged with satellite transmitters on 15 and 17 June respectively, at Fuente de Piedra. They were also given orange PVC leg bands engraved (black digits) with the codes 4/J6 and 4/J7 (inf. Juan Amat, EBD Doñana). *See above*

SOME NOTEWORTHY RECOVERIES AND RESIGHTINGS

DCJT returns once more to Switzerland

Flamingo code DCJT was one of 6 juvenile Greater Flamingos to visit Switzerland in 1998. It was banded on 29 July at the Etang du Fangassier where it was last observed on 21 August, just 9 days before being seen in Switzerland. After a brief stop at Les Grangettes Nature Reserve on the Lake of Geneva on 1 September, the flock moved 65 km further north the following day, to the Fanel Nature Reserve on Lake Neuchâtel, where the birds were observed daily until their departure on 5 November 1998. This locality is 450 km to the north of the Mediterranean coast, the northern limit of the species' normal range in western Europe, and the first sighting in Switzerland of a wild, banded flamingo. On 10 November DCJT was relocated back in France. It was observed alone on the Lac de Saulce (Hautes Alpes). It was then not seen again until February 1999 when it was observed back on the Mediterranean coast, at the Etang de Bolmon, 50 km to the east of its place of birth.

It was a long wait for further news of DCJT until it surprisingly returned in 2001 to the Fanel Nature Reserve, this time alone, where it stayed from 21 September to 30 October. Following this it was not relocated for almost a year until it quite remarkably returned for the third time to the Fanel Nature Reserve, staying from 30 August to 26 October 2002, once more alone. Following this it disappeared again for almost a year before being spotted and recognised by the very keen flamingo band reader Mike Smart. Mike found DCJT in Tunisia on 15 August 2003, on Lake Sejoumi, near Tunis. This wetland is just 1200 km south of the Fanel Nature Reserve. And this is not the end monitoring the movements of DCJT who, now aged 5 years, remarkably reappeared one month later at the Fanel Nature Reserve, along with 10 juvenile flamingos. These birds stayed on the reserve from 15 to 17 September before presumably heading south once more. We hope in the future to be able to report further on the remarkable movements of the notorious DCJT.

(inf. D. Landenbergue, M. Smart, A. Johnson, Schweizer & Maumory 2003, Turrian 2004).

1962 ringing effort adds important knowledge of Lesser Flamingo longevity and movements

In 1962, the Kenyan ornithologist Leslie Brown, along with Alan Root, the wildlife cinematographer, and several other members of the East Africa Natural History Society took advantage of an unusual breeding event at Lake Magadi in Kenya to capture and ring 8,000 juvenile Lesser Flamingos, using methods pioneered by Dr. Lucas Hoffmann with Greater Flamingos at the Tour-du-Valat in the Camargue region of France. The rings were obtained from the British Museum and the records now reside with the British Trust for Ornithology.

In a recent review of the recovery records from this ringing effort, it was discovered that one of the Lesser Flamingos ringed on 30 October 1962 was recovered at Lake Bogoria in Kenya on 13 July 2003 by Robert Ndeti of the Kenya Wildlife Service and John Githaiga of the Department of Zoology, University of Nairobi. When found, the bird, which had recently died, was 40.7 years old, making it the longest-lived Lesser Flamingo known to-date.

On 1 July 2003, a live Lesser Flamingo was spotted at Lake Bogoria in Kenya with a metal "clip" ring on its left tibia. The bird was amongst a mixed flock of approximately 150 immature and adult Lesser Flamingos. Based on the style and condition of its ring, this bird also is believed to be one of the Lesser Flamingos ringed in 1962 at Lake Magadi, making it 40.7 years old as well. The difference between this bird and the previously reported bird is that this one was still living when spotted.

During the same review of ringing records from 1962, it was discovered that another of the Lesser Flamingos ringed by the Brown-Root group was recovered by A. Baddouz in Western Sahara on 28 September 1997 near Laayoune, Western Sahara, probably along the shore of "Flamingo Lake", a small little-known and officially unnamed lake amongst the sand dunes near Laayoune that frequently

holds large numbers of flamingos. The direct distance between Lake Magadi in Kenya and Laayoune is reported to be 6,197 kilometres. How or when this Lesser Flamingo got from one to the other is completely unknown. However, this is the first ring record of an interchange between the East African and western African populations.

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Mexican flamingo in Florida

Caribbean Flamingo code DFJV was banded at the Petén Hu Peninsula in Ria Lagartos Biosphere Reserve in Yucatán, Mexico, on 12 August 2000. It was observed on 26 June 2001 and on 11 March 2002 at Celestún in the Yucatán before being observed and photographed in the Everglades National Park in Florida on 20 October 2002. It is the first observation in Florida of a flamingo known to be of Mexican origin (*inf. Rodrigo Migoya, Roy Wood*).

FLAMINGO WORKSHOPS

Workshop on flamingos in the Mediterranean region, Tour du Valat (Camargue) France 4-6 March 2002

This workshop, the 2nd in the Mediterranean region (the 1st was held in Antequera, Spain in 1989) was attended only by participants who were existing partners involved in the study and conservation of flamingos in the Mediterranean region, or who were invited to join the team in a cooperative effort to cover a greater part of the range of the Africa/Eurasian population of the Greater Flamingo. The partner organisations with which conventions exist, or are being established, are: **France**: Tour du Valat, CEFE, Lab.Génétique (Montpellier), **Italy**: Bologna, APM, **Spain**: AMA, E. B. Doñana, **Turkey**: Erciyes University.

Proceedings of this workshop can be found at www.tourduvalat.org, >greater flamingo> network

3rd International workshop on Greater Flamingos in the Mediterranean region and North-west Africa.

This took place in Djerba on 26 November 2004, following the 11th Pan African Ornithological Congress. It was organised by Arnaud Béchet (Tour du Valat) and attended by 33 participants from 10 countries of the Mediterranean and North-west Africa. A summary of the main points from this meeting will appear in the journal 'Ostrich' and can be found at www.tourduvalat.org (>Greater Flamingos>The network)..

Symposium on Mass Die-offs of Lesser Flamingos (*Phoeniconaias minor*) in Africa' This was held at the College of Veterinary Medicine, University of Illinois at Urbana-Champaign, September 24-26, 2004 (see under Latest News).

Workshop on flamingos in the Southern Caribbean, Bonaire, Netherlands Antilles, 5-6 November 2002

Rodrigo Migoya von Bertrab

Summary. On **Bonaire**, flamingo censuses have been carried out since 1981. Breeding, takes place in the salt pans and can occur throughout the year, but is most frequent January-March. The breeding area is a sanctuary of 55 ha. Some of the breeding birds from Bonaire feed in wetlands in Suriname and Venezuela. In **Suriname**, flamingo censuses in January-April, (financed by Ducks Unlimited), have revealed 300-400 flamingos on average with a peak of 700 in January. José Morales Leal presented data from **Cuba** where six flamingo censuses were carried out on 6 wetland areas between October and March 2001. These revealed 157,000 flamingos. Flamingos breed at 13 sites in the country. At Ría Máximo there were 45,000 nests in 2001 and 29,000 in 2002. In August 2001 400 chicks were banded. Recoveries have come from the Bahamas (22) and Yucatán (5, banded in 1990). RMB presented conservation work carried out in **Mexico** between 1975 and 2002, particularly at Ría Lagartos and Celestún,. Frank Espinoza presented the results of monthly censuses at the principal sites for flamingos in **Venezuela** and gave details of the banding of 450 chicks in 1999, 2000 and 2001. Finally, Manuel Rendón Martos summarised breeding by flamingos at Fuente de Piedra in **Spain** and presented the capture and banding scheme in progress there since 1986. He spoke about management practices carried out for flamingos at this lagoon and mentioned how the breeding birds make feeding flights of up to 200 km.

During this workshop it was agreed that flamingos would be censused on a monthly basis in Bonaire and Venezuela, with bi-monthly counts whenever possible. It was hoped that monthly censuses would also be made in Cuba, Mexico, the Bahamas and the Dominican Republic. When reporting on breeding, it was suggested that observers record the number of pairs, number of nests and number of individuals breeding. Band codes should be read whenever possible, both in the colonies and elsewhere. Each team should maintain a database and make this accessible to a common database for the Caribbean. Each foreign band must be reported to the country of origin. Metal bands should be of stainless steel.

LATEST NEWS

The Greater Flamingo: *Phoenicopterus ruber roseus* or *Phoenicopterus roseus*?

An article by Knox et al. (2002) proposes that the Greater Flamingo be considered a species *Phoenicopterus roseus* and not a sub species *Phoenicopterus ruber roseus* of the Caribbean Flamingo. The authors claim this on the grounds of consistent differences in several functional systems: plumage coloration and pattern, coloration of bill and legs, displays and vocalizations. They claim this also for the Chilean Flamingo *Phoenicopterus chilensis* which has for some time been widely accepted as a separate species.

Basel Zoo Veteran dies

The male of the two veteran Greater Flamingos in Basel Zoo, imported in either 1932 or 1938, was found dead in its enclosure at the end of 2003. This bird was aged at least 65 years, and probably nearer 70, since it was in adult plumage when it arrived at the zoo. If it arrived in 1932, it was of course over 70 when it died. The veteran female, which also arrived in either 1932 or 1938, is still alive (see Adelheid info in mail of 8/2/2004).

Flamingo Conservation Network Group

The Flamingo Conservation Network Group has been established to provide a strong active networking vehicle for individuals involved in flamingo conservation across the globe by establishing an international network of flamingo experts involved in all aspects of flamingo biology and health, and to work towards a coordinated program of flamingo conservation and research. The group was established following the 'Trans-disciplinary Symposium on Recent Mass Die-offs of Lesser Flamingos (*Phoeniconaias minor*) in Eastern and Southern Africa' at College of Veterinary Medicine, University of Illinois at Urbana-Champaign, September 24-26, 2004. (inf. Brooks Childress)

The International Flamingo Foundation

In January 2003 the IFF sponsored a joint WCS and University of Salta expedition in Argentina to equip 3 Chilean Flamingos with PTT's. IFF also provided some funds and a laptop computer for flamingo studies in Cuba and Bill Hunt and George Archibald visited 'Fefo' Leal, director of the Rio Maximo Reserve in summer 2003. In the summer of 2004, further funds were made available for a follow-up visit carried out by Dr. Chris Brown of Dallas Zoo and Rodrigo Migoya of Ninos and Crias (Mexico). In June 2004 IFF also funded work by Mike Baltz of the Nature Conservancy to make an aerial survey of the flamingos on Andros Island in the Bahamas, and gave some support to Dr. Ahmet Khan for his work on flamingos in Pakistan.

Lesser Flamingo conservation research in the Rift Valley of Kenya

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The University of Leicester (UK), sponsored by the Earthwatch Institute and supported by The Wildfowl & Wetlands Trust, is undertaking long-term *in-situ* conservation studies of the Lesser Flamingo at Lake Bogoria in the Rift Valley of Kenya. Lake Bogoria, a Ramsar wetland of international importance, is a small (c. 3,000 ha), shallow (10.5 m max) alkaline lake located approximately 30 km north of the equator. It is one of the main feeding lakes for the Lesser Flamingo in East Africa and frequently many hundreds of thousands gather to feed here, creating one of the world's most stunning wildlife spectacles.

The research being conducted is currently focused in the following areas:

Health

Although the most numerous of the flamingo taxa, the Lesser Flamingo is classified as “near-threatened” due to their dependence on very few breeding sites (only one in all of East Africa) and a narrow range of breeding conditions that occurs infrequently. One recent study estimated that their world population (almost all in Africa) has declined by about 20% in the past 20 years, and mass die-offs at lakes Bogoria and Nakuru in Kenya have caused worldwide concern. The current research, using blood samples from both well and sick birds, attempts to discover the cause of these die-offs and to develop a protocol for monitoring the species' health in the wild.

Ecology & behaviour

Lesser Flamingos are not regularly migratory in the accepted sense but are highly nomadic, moving often in large numbers from lake to lake within the Rift Valley and between salt pans within southern Africa. These movements have historically been thought to be associated with food abundance. However, there is no general agreement on this and the evidence is not consistent. Our research uses ecological monitoring to identify the essential lake ecosystem properties that sustain large numbers of Lesser Flamingos and to understand the birds' response to changes in these properties. We are also documenting distribution on the lake at various times during the day, habitat usage and time budgets in different climatic conditions.

Ringling programme

A long-term ringling programme has been established to accumulate a large, current biometric dataset and to study this species' migration patterns and longevity. To-date, 135 individuals have been measured and ringed, and approximately 150 new individuals will be ringed each year.

Gender determination & condition indices

Like all flamingos, the Lesser Flamingo is monomorphic. While it is true that they are also dimorphic, with males being about 20% larger than females on average, there is also substantial variability in the biometrics within gender, so there is currently no certain way of determining the gender of an individual without using invasive methods. Discriminant analysis of the biometrics has been used to develop a model for doing this with over 95% accuracy. Principal component analysis is being used to develop condition indices for the various ages and genders as an additional method for monitoring the well being of this species.

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