WETLANDS INTERNATIONAL

IUCN
Species Survival Commission

FLAMINGO SPECIALIST GROUP

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NEWSLETTER N° 10
ANNUAL REPORTS
1998-1999-2000

May 2001

TOUR DU VALAT
FONDATION SANSOUIRE
Reconnue d'utilité publique

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Contents

Summary

This omnibus edition of the Flamingo Newsletter covers the years 1998-2000, and like most conservation bulletins depends heavily on reports from our many correspondents. During these 3 years, breeding by flamingos of all species has been reported from 16, 15 and 14 sites respectively. This apparent decline is, of course, due in large part to incomplete information. In fact, Greater Flamingos have colonised new sites in the Valle di Comacchio in Italy and the Laguna Petrola in Spain, and may have bred in Greece for the first time in recent history. Around 80,000 pairs of Greater Flamingos were recorded breeding in 12 colonies in 1998, and 98,000 in 2000.

Population numbers of all flamingo species, with the exception of the Andaen Flamingo, continue to be healthy. However, developments in Kenya give some cause for concern. The deaths are reported of very large numbers of Lesser Flamingos at Lake Bogoria, seemingly from heavy-metal poisoning. This is especially disturbing in light of existing concern regarding the possible impact on Lake Natron of the Kenyan government's hydro-power proposals and those of the Tanzanian government to allow industrial soda extraction from the Lesser Flamingos' most important breeding location.

One of the Group's main achievements during these past 3 years has been the organization of the 2nd World Flamingo Symposium, which was held in Miami in October 1998, and was well attended by biologists from both sides of the Atlantic. We are very pleased to be receiving more news from South and Central America. These regions, after all, contain 4 of the 5 flamingo species, and developments there are a source of great interest. New data on population sizes and the expansion of banding operations are particularly worthy of mention. In the Old World, long-term studies of Greater Flamingos in the western Mediterranean continue thanks to excellent cooperation between biologists in France, Spain and Italy, and it is hoped that these international studies can become a model for expanding research into other areas of this species' range.

As might be expected in a newsletter spanning 3 years, the list of recent literature is extensive, and of course includes the papers in the Miami Symposium proceedings.

Acknowledgements

The editor is most grateful to **Dianne Wilker**, **Carol Durand** and **Sandra Caziani** for their valuable assistance with the editing of this newsletter, and to Jevgeni Shergalin for reporting items of interest on flamingos and for translating titles and papers in Russian literature.

Vignettes by **Dianne Wilker, Carol Durand, Hilary Boys and Tobias Salathé**

1998

Breeding by the Greater Flamingo in 1998

Known breeding sites **not reported** in 1998

Known breeding sites **occupied** in 1998
(details in regional report)

Known breeding sites **with no reproduction** in 1998
(or unsuccessful attempts)

The map above shows all sites at which the Greater Flamingo has been reported breeding since 1940. The larger circles are the major sites, the smaller ones those colonised less frequently and/or by fewer birds.

News from the regions 1998

Old World

Compiled by Alan Johnson and Carol Durand.

SOUTHERN AFRICA

BOTSWANA (inf. Graham McCulloch)
The 1998-99 rainy season was average, with just over 450 mm of rainfall on the Makgadikgadi Pan and in the surrounding catchment area. This resulted in some parts of the pan being inundated from December 1998 to March 1999. Lesser Flamingos began breeding in November (see 1999 Annual report).

NAMIBIA (inf. Rob Simmons)
Namibia had low rainfall through March, when the wet season usually ends, with Etosha receiving only about 75% of normal rainfall and the rest of Namibia as little as 50%. The numbers of non-breeding flamingos at the coast in July were consequently fairly high, with Greaters peaking at 38,100 in Walvis Bay and Sandwich Harbour, while Lessers peaked at 26,800 in the same month.

WEST AFRICA

MAURITANIA (inf. PNBA, FIBA, Tour du Valat)
A PNBA-FIBA-Tour du Valat project has carried out regular aerial and ground surveys of birds breeding on the islands of the Parc National du Banc d'Arguin since 1997. In 1998, Greater Flamingos bred on both Petite Kiaone and Grande Kiaone. Counts by aerial photographs (April 2, May 5) revealed c. 2,500 pairs on the former island and 4,900 on the latter. Aerial photographs of June 4 revealed c. 950 chicks on Petite Kiaone and c. 3000 on Grande Kiaone. The oldest chicks were about 45 days old, indicating egg-laying started on Petite Kiaone about March 20, and on Grande Kiaone one month later.

WESTERN MEDITERRANEAN

SPAIN
Doñana: In 1997 and 1998, 700 and 1100-1200 pairs of flamingos respectively attempted breeding in the National Park. They produced 19 and 155 chicks respectively, but each year these were captured and reared at an animal welfare centre (inf. Manolo Mañez).

At the **Fuente de Piedra** Nature Reserve, Málaga (inf. M. Rendón Martos & J.M. Ramírez, A.M.A.) 19,500 pairs of flamingos bred and raised 15,387 chicks. These figures are nearly the same as in 1996, and may be linked to the level of flooding of the lagoon, which was exceptional both years. At least 143 of the nesting birds were originally banded in the Camargue. On 17 August, 1339 of the chicks and 125 adults were captured and ringed (c.f. p. 33).

El Hondo Natural Park: (inf. Alejandro de la Vega): For the second year in succession, breeding by Greater Flamingos was successful at El Hondo Natural Park (Alicante), where c.1000 pairs raised about 700 young.

Ebro Delta: The mid-January census of the Ebro Delta revealed 4124 flamingos wintering in this area (P.N.del Delta de l'Ebre, Informatiu 1998 No.11). For the sixth year in succession flamingos successfully bred in the saltpans at Punta de la Banya in the Ebro Delta. Egg-laying started at the beginning of April. An aerial census on April 30 revealed 1461 pairs incubating. On July 14 there were 476 chicks in the crèche (inf. A. Martinez Vilalta). Breeding success was lower than in previous years, perhaps because the water in the lagoon was maintained by the salt company at a lower level than in the past. Observations from 3-5 June, showed 113 adult banded birds of Camargue origin, and 137 from Fuente de Piedra. Twenty-seven of the Camargue birds were seen feeding chicks (inf., A.R. Johnson, M. Fasola).

Rather curiously, flamingos began nest building again in October when temperatures were exceptionally high for the time of year. About 550 nests were built in the same lagoon but not on an island. Flamingos visited this 'colony' throughout November during the very warm weather and finally abandoned it on December 1 when the weather turned cold. No eggs were laid (A. Martinez Vilalta *in litt.* - Parc Natural del Delta de l'Ebre).

Cuenca: In January 35-40 flamingos were seen at the Manjavacas lagoon near Mota del Cuervo in La Mancha. This is an inland lagoon 200 km west of Valencia where it is unusual to see flamingos

Navarra: On October 13, two young flamingos were seen feeding at la Balsa de la Estanca, Navarra. One was wearing a new Camargue ring, DBDF (Quercus 164, Oct. 1999).

FRANCE (inf. A. R. Johnson, Tour du Valat)
The mid-January 1998 census covering the whole of the species' range in Mediterranean France showed 24,385 wintering Greater Flamingos. In May, 35,000 flamingos were censused (counts by CEEP, GRIVE, LPO Aude, GOR, A. Tamisier, Tour du Valat). Flamingos have recently begun to winter on Corsica where there were up to 44 birds from September to the end of the year (inf. J-P. Cantera).

At the Etang du Fangassier, breeding birds colonised not only the purpose-built flamingo island, but also a nearby island built originally for terns. Birds also attempted nesting on the dyke facing each of these islands. Egg laying began on April 8 on Flamingo island and the dyke nearby, and on May 5 on Tern island and the dyke nearby. Counts on aerial photographs taken May 6 revealed 6100 pairs on Flamingo Island and 458 pairs on the dyke nearby. On May 15 aerial photographs of Tern Island and the adjacent dyke showed 7200 and 2910 pairs respectively. In sum, the number of breeding pairs in 1998 reached about 16,700. Many of those attempting to nest on the dyke failed, but some were successful and a total of 10,500 chicks, a record for the Camargue, took wing from the Fangassier this year.

The colony was under observation throughout the breeding season, and 1027 PVC

Camargue-ringed birds of 18 age classes (4-21 years) were identified breeding. In addition 19 birds banded as chicks at Fuente de Piedra (Málaga, Spain) also nested.

SWITZERLAND: It was quite an ornithological event when, on the morning of 1 September 1998, a group of 6 juvenile flamingos appeared on Lake Geneva, 450 km north of the Camargue. One of them was ringed, code DCJT, proving the wild origin of these birds, which hatched at the Etang du Fangassier (Camargue) about 3 months earlier. DCJT was banded on 29 July and was afterwards seen in the nursery of young at the breeding site until 21 August. On 2 September the six birds moved from Lake Geneva 65 km further north to the Fanel Nature Reserve on Lake Neuchâtel, causing great excitement for hundreds of Swiss birders. They were observed daily until the evening of 5 November when they were seen to depart. On 10 November, DCJT was relocated (alone) back in France, on the Lac de la Saulce (Hautes-Alpes) and in February 1999 it was back on the south coast, at the Etang de Bolmon. (inf. D. Landenbergue, Winkler 1999). (*The only previous sighting of flamingos known to be wild in Switzerland was in 1924. Ed).*

ITALY (inf. N. Baccetti, G. Albanese, M. Zenatello, INFS Bologna).
Apulia. For the third year, breeding was successful at the saltpans of Margherita di Savoia, where the flamingos bred in two waves. It is not known exactly how many pairs attempted breeding in the first group, but it was at least 380, and 112 chicks hatched. The first of these (35) were on the wing by June 6, indicating that egg-laying started around February 10. The second wave of breeders, which laid eggs in June, was very unusual. The colony was built in the form of two long parallel rows of nests on a stone wall surrounded by very deep water. It is not known how the flamingos jumped up onto the wall, but 81 chicks were counted there on August 5.

Sardinia (inf. A. Atzeni & S. Nissardi, A.P.M.): Flamingos bred for the sixth consecutive year at Molentargius-Quartu Lagoon, on the edge of the city of Cagliari. Two islands were colonised : 3200-3400 chicks fledged from the Molentargius Lagoon and 850-900 from the Quartu lagoon. Among the flamingos nesting at Molentargius were 87 birds originally banded in the Camargue. When it was time to catch and band the chicks at Quartu, as was done in 1997, the specially provided site was colonised by late breeding Avocets and terns. This being the only place suitable for catching chicks, there was no banding of flamingos in Sardinia in 1998.

EASTERN MEDITERRANEAN

CYPRUS

In January, there were regular reports of up to 3000 Greater Flamingos at Akrotiri Salt Lake, 1000 at Larnaca and 300 at Kiti/Meneou Pools (Cyprus Ornithological Society (1957) Annual Report 1998).

TURKEY

Tuz Gölü. A flight was made on June 30, 1998 over the flamingo breeding site towards the center of Lake Tuz, and over the Konya Channel inflow which is situated 17 km from the breeding islands. This was carried out by DHKD, the cost being covered by the Tour du Valat Flamingo Supporters' Scheme. Observers located a creche of around 6400 chicks at the Konya Channel, the oldest being aged about 6 weeks. There were also c. 100 flamingos still at the breeding site and 4 creches of younger chicks nearby totalling at least 5000. On

9 July S Karauz (pers comm.) reported 7,000-7,500 young at the Konya Channel inflow. Thus at least 12,000 pairs of flamingos bred at this lake in 1998.

Sultan Marshes. Between August and October 1998 there was an unusually large number of flamingos in the salt lake at Sultan Marshes (Kayseri). Some parts of this huge lake have poor access, but Jose and Ozlem Tavares estimate that there were 35,000-50,000 birds present.

ASIA

IRAN

Lake Uromiyeh : successful breeding by Greater Flamingos led to the capture and ringing of 650 chicks (inf. S.Sadeghi Zadegan *in litt.*).

KAZAKHSTAN (inf Altay Z.-U. Zhatkanbayenv)

Lake Tengiz. The breeding site of flamingos on Lake Tengiz was visited by Altay Z.-U. Zhatkanbayenv during the summer of 1998. During his visit on July 24-26 there was a creche of at least 12,000 chicks aged about one month. The breeding colony was situated on a new island (approx. 1300 m x 100 m) which appeared as the water receded. It lies at 50°28'N/69°08'E, and is only 120-150 m from the shore of the lake. The number of nests was estimated to be about 15,200. In 1995, S. Erohov & A. Koshkin (pers. comm. to A.Z.-U.Z), saw about 3000 adult flamingos and 1000 chicks at this lake.

INDIA (inf. Taej Mundkur, H.S. Sangha).

Little Rann of Kutch. On June 9, 1998, a cyclone destroyed the Lesser and Greater Flamingo colony at Cherwari on the Kutch coastline. In August, Gujarat Environmental Education & Research Foundation director, Mr. H.S. Singh, reported to the Times of India News Service that Lesser Flamingos had built 30,000 nests in the salt pans of the Little Rann of Kutch, about 20 km from the Wachchhraj Solanki Bet (islet), west of Jalandhar Bet (*Times* 14.10.1998). Corroborative accounts estimate the presence of nearly 70,000 pairs of birds, 35,000 chicks and 25,000 eggs. It is thought that breeding commenced in early July, some two months later than usual for the region. Mr. Pravez, an ornithologist at Gujarat University, said, "The design of this colony is spectacular. The salt pan bund acts as a wall, preventing chicks from running away. Mounds were in linear or parallel rows. We saw flocks of 6000 and more chicks." Breeding in such numbers has not been seen since 1973 in the Greater Rann, and has never been seen in the Little Rann on such a scale. Some concern was expressed regarding the salt company's willingness to allow the colony's continued existence

News from the regions 1998

New World

Compiled by Felicity Arengo.

CARIBBEAN

BAHAMAS

The population of Caribbean Flamingos is estimated at 50,000 – 60,000 (Timothy Bethel).

CUBA

In 1989 the population of Caribbean Flamingos was estimated at 151,000 individuals. In 1994, 90,000 active nests were counted during the breeding season (8.4 times more than a decade earlier), and at this rate the population is calculated to reach 250,000 by the year 2000. This dramatic increase can be attributed to a major investment from the Empresa Nacional para la Conservación de la Flora y Fauna that has supported the Proyecto Nacional para la Conservación del Flamenco since 1989. The project has invested in personnel (35 currently working on the project) and infrastructure (guard posts, captive rearing facilities, heavy equipment) and focuses on protection of foraging and nesting sites and water level management (José Morales Leal).

VENEZUELA

For the first time in 10 years, flamingos *(P. ruber ruber)* were found nesting at the Olivitos Wildlife Refuge in the state of Zulia. Biologists counted 200 active nests and 800-900 chicks in March of this year (Frank Espinoza).

SOUTHERN CONE

REGIONAL

The Grupo para la Conservacion de Flamencos Altoandinos (GCFA) composed of biologists and natural resource managers from Argentina, Bolivia, Chile and Peru, conducted two summer censuses in January 1997 and 1998, and a winter census in July 1998, of the James and Andean flamingos in the dry puna of the four countries. These represent the first efforts to count these two species simultaneously throughout their range, and will give us the first reliable estimates of the populations. Although the data are still being analysed, preliminary results show at least 63,000 *Phoenicoparrus jamesi* and 33,000 *P. andinus.* Support for this work was provided by the Wildlife Conservation Society.

The GCFA organised a training workshop on Monitoring of Ecological Conditions and Indicator Species in February 1998, in Laguna Pozuelos in Argentina, with the support of Wetlands for the Future (Ramsar Convention & Fish and Wildlife Service).

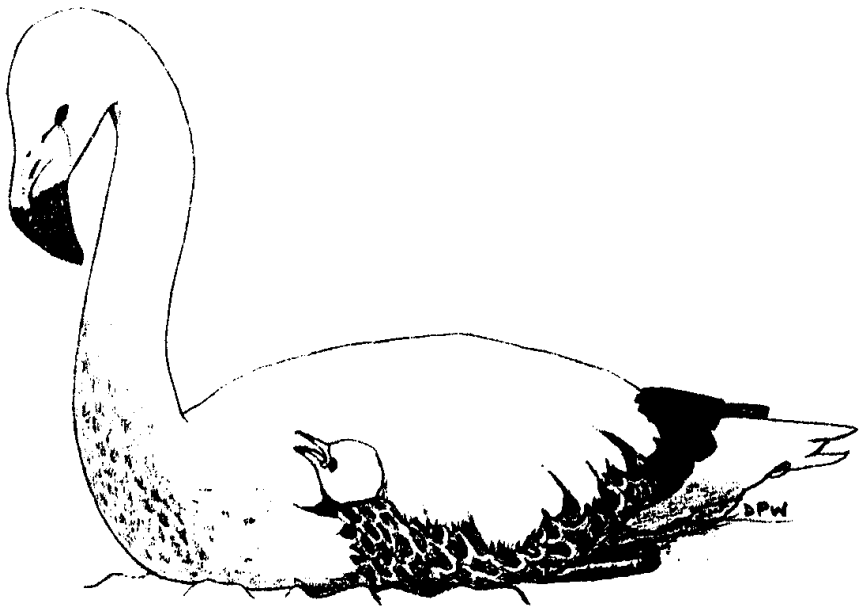
ARGENTINA

The Scott Neotropical Fund supported a 1994-1998 project conducted by Sandra Caziani and Enrique Derlindati of the Universidad Nacional of Salta, to correlate High Andes flamingo abundance and habitat characteristics. James flamingos were found in shallow, high-salinity lakes rich in diatoms and cyanophytes. Chilean flamingos were found in deep lakes, dominated by macrophytes and dense vegetation. Andean flamingos were found in intermediate character lakes (Sandra Caziani).

CHILE

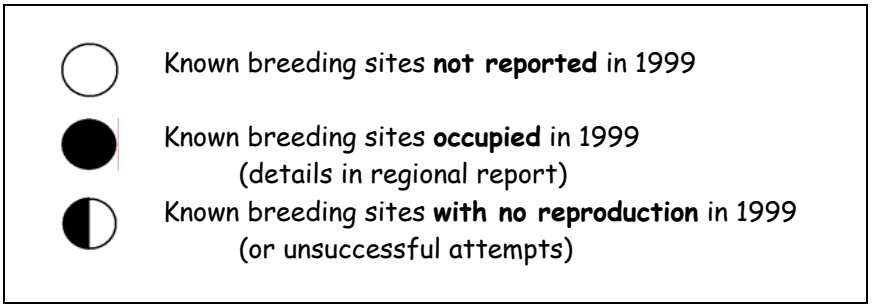
Twenty-four Andean flamingo chicks that were hatched in captivity and reared in the context of the "Incubation of Eggs in Artificial Conditions Project" were released at the Salar de Atacama. This project is aimed at developing management guidelines for use in flamingo recovery plans, and develops information on artificial diets, collection techniques, transport and incubation of eggs, behavioural apects, etc.

In 1998, the Corporacion Nacional Forestal (CONAF), responsible for the Proyecto de Conservacion de Flamencos, and several mining enterprises signed an agreement that will affect extraction activities in the salinas of the puna, by encouraging coordination of monitoring and research to minimize the impacts of mining.



1999

Breeding by the Greater Flamingo in 1999



The map above shows all sites at which the Greater Flamingo has been reported breeding since 1940. The larger circles are the major sites, the smaller ones those colonised less frequently and/or by fewer birds.

News from the regions 1999

OLD WORLD

Compiled by Alan Johnson

EAST AFRICA

KENYA

In the early 1990s, the Kenya Power Company (now KenGen) commissioned engineers in the UK to develop proposals for a multi-purpose hydro-power project in Kenya, and to carry out an environmental impact assessment. Planned developments originally included building a dam on the **River Ewaso Ngiro** (which flows into **Lake Natron**), diverting water from the **Amala** river into the Ewaso Ngiro above the dam, and cultivating land in the **Nguruman** area by irrigation downstream from the dam.

The results of the EIA were given wide circulation in the popular and scientific press (see Johnson & Bennun 1994, IWRB News 11: 10-11) and there was obviously much concern for the future of Lake Natron, the most important breeding site of the Lesser Flamingo in the world. Water levels would have changed, and the lake, a closed basin, would have received waste water from agriculture, contaminated with agro-chemicals.The project was temporarily shelved in 1993, after **Tanzanian** and other environmentalists registered objections to the potential damage to the ecosystems of **Lake Victoria**, Lake Natron and **Serengeti National Park**. However, it has now been revived by KenGen, but with plans modified to take into consideration the harmful effects predicted by the EIA.

KenGen has agreed to consider the recommendations of an independent board of consultants: a) that any water extracted from the Amala river be consumed upstream before reaching Lake Natron, and b) that proposals for agricultural development in Nguruman be dropped. However, this does not address a major concern, that the proposed industrial soda extraction from Lake Natron by Tanzania would dissolve the trona crust and dilute the brine below.

The alarming situation, with regard to the Lesser Flamingo in particular, was discussed during an IUCN workshop at Lake Bogoria in August, 1997, and at the Flamingo Symposium in Miami, October 1998.

SOUTHERN AFRICA

BOTSWANA (inf. Graham McCulloch)

The 1998-99 rainy season was average with just over 450 mm of rainfall on the Makgadikgadi Pan and in the catchment area. This resulted in some parts of the pan being inundated from December 1998 to the following March. Approximately 15,000 pairs of Lesser flamingos bred this year in several large colonies in the south of Sua Pan, starting in November (1998). Before the water evaporated in the deep northerly part of the pan, some 8000-10,000 chicks were left stranded in the far south of the pan and eventually perished. Some (approx 3-5000) did make it, however, and a small proportion of these was reported to have been seen by ornithologists at Kamfers Dam in South Africa, (Mark Anderson pers comm.) and Walvis Bay in Namibia, (Rob Simmons pers comm.)

Greater Flamingos also attempted breeding, with c. 5000 birds in attendance at a colony in the vicinity of the Lessers, and not at their traditional sites. The breeding attempt was late and no chicks seem to have survived.

December 1999 saw the start of unprecedented rains on the Makgadikgadi Pan and elsewhere in the country. Lesser Flamingos began breeding in December 1999 and Greaters shortly afterwards (see 2000 Annual report).

SOUTH AFRICA

Coordinated counts of flamingos were carried out at Kamfers Dam in the Northern Cape in March-April 1999 (see pp. 37-40).

NAMIBIA (inf.R. Simmons)

Coordinated counts of flamingos were carried out at Etosha Pan and in coastal areas (Sandwich Harbour, Walvis Bay) in March-April 1999 (see pp.37-40).

On 20 December 1999, 13,000 Lesser and 6000 Greater Flamingos were counted at Sandwich Harbour when there were roughly 6000 Lessers and 10,000 Greaters at Walvis Bay. On 30 December, flamingos were heard at night flying up the coast over Palmwag, possibly on their way to Etosha Pan where both Greater and Lesser Flamingos bred in 1999-2000 (see Annual report 2000).

WEST AFRICA

MAURITANIA (information by courtesy of PNBA and FIBA).

During an aerial survey of the Banc d'Arguin by PNBA on April 17, 27,500 Greater flamingos were counted, many of them on **Grand Kiaone**. About 13,060 pairs of Greater Flamingos bred on **Grande Kiaone** island (or **Kiaone ouest**) in 1999. The colony was in 2 parts with c. 10,300 pairs on top of the island (counted by aerial photographs of 1 April) and another group of c. 2760 pairs on the scree in the SE (counted by aerial photographs of 23 April). An aerial photograph on June 10 showed a total of 9718 chicks (4975 on the top of the island and 4743 on the shore). This was the only breeding site occupied in Mauritania in 1999.

On 13 September 1999, c.1750 Lesser Flamingos were observed at the Chott Boul in the Aftout es Saheli, 6 of these birds being juvenile. Five juveniles were present on 29 October (Hamerlynck & Messaoud 2000).

(*The origin of the Lesser Flamingos which are regularly observed in West Africa (S. Mauritania and Senegal in particular) is still not known. The only record of the species attempting to breed in West Africa is of an unsuccessful colony of 8-900 pairs established in the Aftout es Saheli 20 km north of the Chott Boul in 1965 (Naurois 1965, 1969). Since the restoration of the flood regime, flocks of up to 8000 Lesser Flamingos have been seen year-round (Hamerlynck & Messaoud 2000) Ed).*

WESTERN MEDITERRANEAN

SPAIN

Fuente de Piedra (Malaga). About 3240 pairs of flamingos bred at this lagoon in 1999**,** considerably fewer than in the past two years because of the much lower water level. The number of chicks raised was c.2205, and 868 of these were caught and ringed on 17 July (see p. 33).(Inf. M. Rendón Martos & J.M. Ramírez, AMA).

Laguna Pétrola (Albacete). A small colony of flamingos nested for the first time on record at this inland water body which lies at an altitude of 800+m and is 100 km from the Mediterranean coast. A total of 83 chicks is reported to have fledged from this lagoon (J. Picazo, Ardeola 46 (1999): 306-307). Several Camargue-ringed birds seen at the lagoon on August 24 possibly bred there (*info.* Sergio Arroyo Morcillo *pers. comm*., Reolid 2000).

Ebro delta (Tarragona). There was no breeding at this site in 1999, for the first time since 1993. This was seemingly because of a change of management practices in the salinas at Punta de la Banya.

FRANCE

During the mid-January waterfowl counts (Wetlands International) 26,518 flamingos were counted on the majority of the wetlands frequented by this species in the south of France. From 500 to 2000 flamingos habitually spend the winter on those wetlands not visited this year because of unfavourable weather. In Corsica a record 54 flamingos wintered at the Etang de Biguglia (inf. J.P. Cantera), increasing to 70 by the end of May, and all leaving by the end of June.

Breeding took place as usual at the **Etang du Fangassier**. Egg-laying began on April 13 and about 11,000 pairs of flamingos bred (aerial photograph 20/5/1999). The number of chicks fledged was 6600, counted on an aerial photograph taken on August 11. As part of the capture-recapture study, the colony was observed throughout the breeding season which allowed the team to confirm that 521 banded birds of Camargue origin and 18 of Fuente de Piedra origin were among the breeders. On 28 July, 800 chicks were captured, measured and weighed, and 400 of these were also sexed from blood samples.

The number of pairs of flamingos breeding in the Camargue in 1999 would have been greater had birds not been prevented from nesting on Tern Island, which during the winter was rehabilitated for breeding Gull-billed Terns, and on the adjacent dyke.

ITALY

The mid-winter census revealed the following numbers of Greater Flamingos: Margherita di Savoia: 1290, Orbetello: 2000, and Ombrone river mouth: 65 (inf. N. Baccetti). In Sardinia flamingos attempted unsuccessfully to breed in the Molentargius-Quartu lagoon in 1999, but in the salinas at Santa Gilla about 1,000 pairs raised c.800 chicks, the first being born in early June. On 7 August, 1999, 190 of these were captured and banded (see p.33) (inf. A. Atzeni, APM).

Apulia. At the Salinas of Margherita di Savoia, approximately 250 pairs of flamingos raised 200 chicks (inf. N. Baccetti).

TUNISIA

A mid-January count of Greater Flamingos in sixteen locations showed a total of 13,594 birds. Sidi Mansour and Sidi Kralifa were both dry (inf. Mike Smart). A further 6993 flamingos were counted in the SE of the Golfe de Gabès around the island of Djerba (Hichem AZAFZAF, Groupe Tunisien d'Ornithologie).

EASTERN MEDITERRANEAN

GREECE

The presence of Greater Flamingos was reported at two saltpans on **Lesbos**. The salina of Kalloni, which covers 260 ha and is in production, is an important breeding site for several species of waterbirds. More than 315 flamingos spent the summer there in 1999, and built 12-15 nests, but no eggs were laid. However, >1000 flamingos have spent the last two winters there. The 60 ha salina of Polichnitos is also active, but the pools are smaller and more subject to disturbance. Nevertheless, it is still important to several species of birds, and in October c.100 flamingos were seen there (inf. Hjalmar Dahm).

On August 20, 300 very young birds and 1000 adults were counted at the salina of **Aliki Kitros**, which has a large natural lagoon. Around 400 nests were found, but it is not certain that the flamingos bred there (inf. Savvas Kazantzidi). This sighting was confirmed by the information centre of the Axios Delta, which counted corresponding numbers on September 1 at the salina and the nearby salt-lake of Agathoupolis.

On August 12, 25 flamingos were seen at the salt-lake of Limni Aliki on **Limnos.** There is a plan to turn this lake into an industrial salina. On August 16, 18 flamingos were seen at lake **Pikrolimni,** north of Thessaloniki. Three hundred flamingos were seen with pelicans on September 11 at the salina of **Akiki Megalo Emvolo**. On the same day, between 500 and 1000 flamingos were feeding at the freshwater **Lake Koronias** (inf. Hjalmar Dahm).

TURKEY

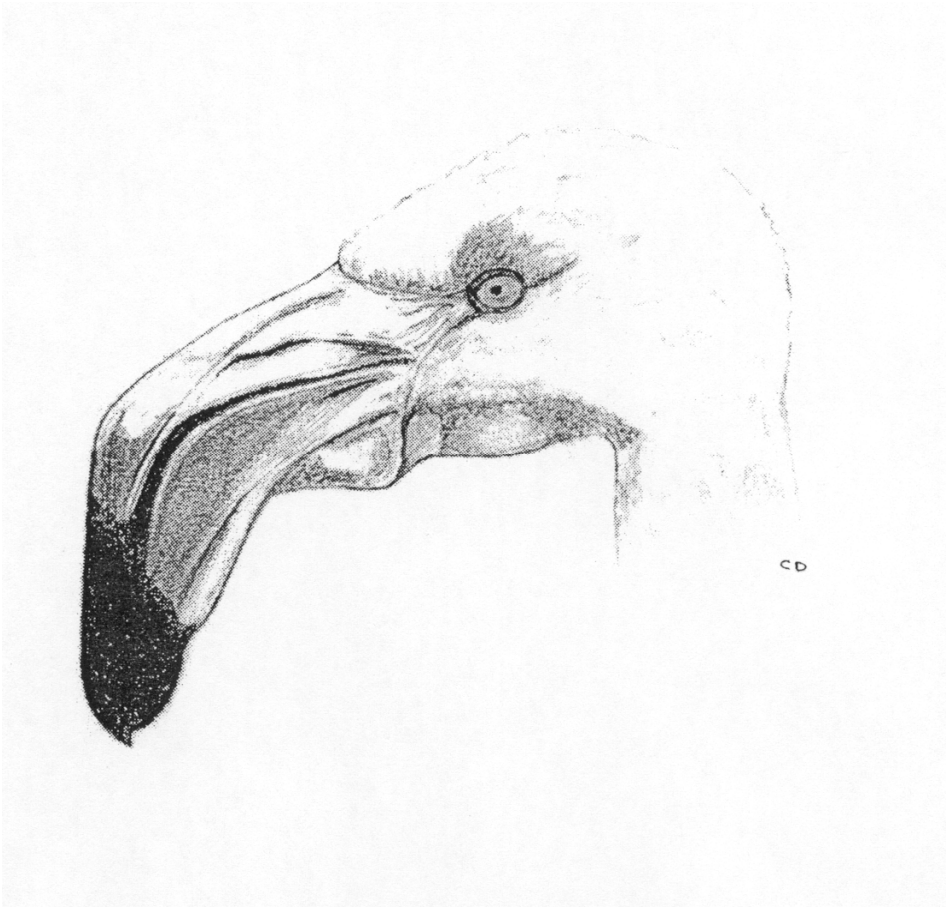
In January 1999, during the International Waterbirds Census (IWC), a total of 51,755 Greater Flamingos was counted on 17 wetlands in Turkey. Major concentrations of birds occurred on the west coast at Gediz delta (15,413), in the Menderes delta (14,889) and on the south coast at Akyatan Gölü (18,930) (inf. DHKD (1999) International Waterfowl

Census Turkey 1999. Biodiversity Programme Report N°9, Society for the Protection of Nature, Istanbul).

Greater Flamingos presumably bred at **Tuz Gölü** in 1999, since on 24 June S. Karauz (*pers. comm.*) observed c. 1200 juveniles at the Konya Channel inflow. Breeding may also have been attempted at **Camalti Tuzlasi** in the Gediz Delta, but this was not successful.

ASIA

IRAN (inf. J. Mansoori pers.comm., S.Sadeghi Zadegan *in litt*.).
Lake Uromiyeh: successful breeding by Greater Flamingos was followed by the capture and ringing of 750 chicks, some of them with a PVC band in addition to the metal ring (see p.33).



News from the regions 1999

NEW WORLD

Compiled by Felicity Arengo & Alan Johnson

CARIBBEAN

MEXICO (inf. Rodrigo Migoya)
An aerial census of the population of *Phoenicopterus ruber ruber* was conducted on 24 March, 1999, along the northern coast of the Yucatan Peninsula from Holbox (Quintana Roo) in the east to Los Petenes (Campeche) in the west. The population was estimated at 27,227 individuals, with major concentrations in Celestún (55%), Uaymitún (32%), and Ria Lagartos (10%). Approximately 3000 active nests were counted in El Cuyo (Ria Lagartos) in the 1999 breeding season (April). On August 14, 390 of the 4200 chicks raised were captured and banded with PVC leg-bands (see p.33). Food samples were collected (Fort Worth Zoo) from 55 birds, and blood samples for research into avian encephalitis (Merida University) from 60 birds.

VENEZUELA (inf. Frank Espinoza)
Flamingos bred on a 28,000 ha wetland about 60 km east of **Lake Maracaibo**. On March 23, c.1300 pairs and 800 chicks were counted when more chicks were still hatching. Apparently, however, the colony suffered some disturbance. The Venezuelan Wildlife Service carried out a banding operation during which the surviving 53 chicks were caught and banded (see p.33).

SOUTHERN CONE

REGIONAL
The Grupo para la Conservacion de Flamencos Altoandinos (GCFA), composed of conservationists from Argentina, Bolivia, Chile and Peru, carried out the second comprehensive winter census of James' and Andean flamingos in the dry puna of the four range countries in August 1999. This census complements the two summer censuses conducted in January of 1997 and 1998, and the winter census of June 1998. Support for this work was provided by the Wildlife Conservation Society.

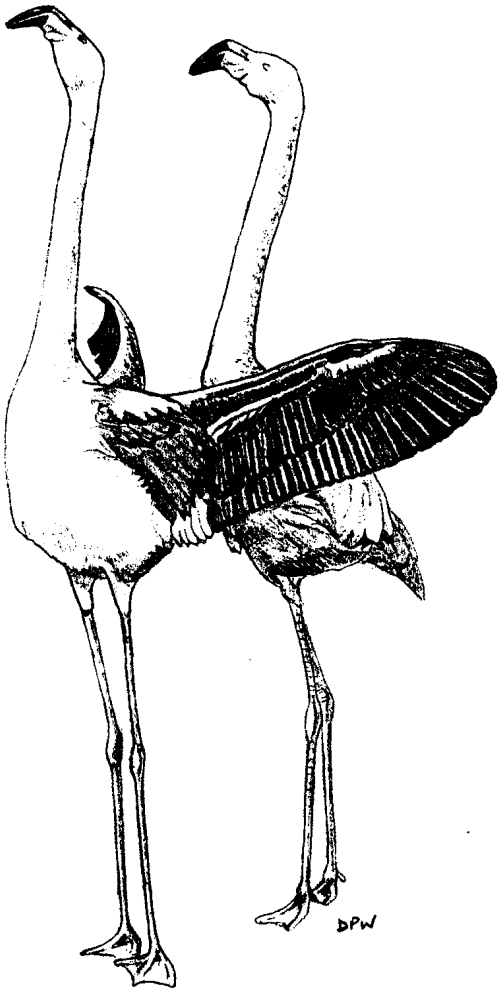
The GCFA conducted two new training workshops sponsored by Wetlands for the Future. One of them, on Public Use of Wetlands, was held in April 1999 at the Ramsar Site Laguna Colorada, in Bolivia. The other workshop took place in December 1999 at Antofagasta, Chile. The subject was the impact on altiplano wetlands of mining activities, pipelines, power lines and roads.

CHILE
During the 1998-1999 breeding season, 5000 chicks, mostly *P. chilensis*, were counted at Salar de Surire, 350 James' flamingo chicks were counted at Salar de Huasco, and 400

Andean flamingo chicks were counted in the lagoons of Salar de Atacama (inf. J.P. Contreras, E. Rodríguez, A. Santoro & M. Parada).

ARGENTINA

The Ramsar Convention sponsored a project to design and promote two protected areas in the Argentinian puna: the Pozuelos and Vilama National Reserves. Main conservation value of these areas are the populations of James and Andean Flamingos. National Park Administration (Patricia Marconi) and Salta University (Sandra Caziani and Enrique Derlindati) worked together in this project.



2000

Breeding by the Greater Flamingo in 2000

Known breeding sites **not reported** in 2000

Known breeding sites **occupied** in 2000
(details in regional report)

Known breeding sites **with no reproduction** in 2000
(or unsuccessful attempts)

The map above shows all sites at which the Greater Flamingo has been reported breeding since 1940. The larger circles are the major sites, the smaller ones those colonised less frequently and/or by fewer birds.

News from the regions 2000

OLD WORLD

Compiled by Alan Johnson

EAST AFRICA

KENYA

Several press releases refer to tens of thousands of flamingos dying at Lake Bogoria between July 1999 and the first half of 2000. 'Kenya's Pink Death – scientists fear pollution is killing country's famous flamingos' is the title of an article in the Washington Post (7 March, 2000) and 'Mystery disease threatens African flamingos'. Large numbers of Lesser Flamingos have died at Lake Bogoria, an estimated 30,000 since July 1999, and the deaths continue. The tissues of all carcasses examined reveal high levels of metals such as mercury, arsenic, cadmium, lead, chromium and copper, which it is thought the birds collect from industrial runoff into Lake Nukura lying 60 miles to the south of Bogoria. Traces of pesticides have also been reported

The main concentrations of flamingos have been in residence at Lake Bogoria for the past two years (J. Githaiga *in litt.*). Preliminary results of algal studies indicate low levels of Spirulina in Lake Bogoria and none in Lakes Nakuru, Elmenteita and Magadi.

SOUTHERN AFRICA

BOTSWANA (inf. Graham McCulloch)

The new millennium saw the highest rainfall in Botswana's history. Over twice the normal annual precipitation fell between December 1999 and May 2000 (850 mm). This produced a vast lake on Sua Pan, of which flamingos took advantage. Lessers began breeding in December 1999, at their traditional colony out in the middle of the south pan, and their numbers quickly rose to over 40,000 pairs. In January, Greater Flamingos also began breeding on a small sandy island. Numbers on this island quickly increased, and by the end of April over 40,000 pairs occupied nests. The Lesser Flamingos were forced to join the Greaters on this island when the rising water level washed away their traditional nesting colony. Some eggs were lost, but another 45,000 pairs of Lesser Flamingos were observed on nests adjacent to the Greater Flamingos, making a total of 85,000 Lesser Flamingo chicks that hatched during this rainy season. Very few chicks died in the colonies and predation was minimal thanks to the vast lake that surrounded them. Most of the chicks stayed at Sua Pan, as the north of the pan remained under water during 2000.

In sharp contrast to the previous wet season, rainfall in 2000-2001 has been low. However, with water remaining in the pan from the previous season, Lesser Flamingos began to breed again in November 2000.

NAMIBIA (inf. Rob Simmons)
Both Lesser and Greater Flamingos bred on Etosha Pan in 2000. Colonies were established at Rietfontein, at Okerfontein and at an unknown site. Observations were made by aerial surveys by N. Brain, W. du Plessis and T. Burger. Events are summarised below.

Rietfontein: 2 January: 2-3000 birds nest building. 26 January: 7-8000 Greater Flamingos present. 9 February: 1550 nests counted from aerial photos, with chicks hatching. 28 February: 2-3000 chicks c.3 weeks old.

Okerfontein: Both Lesser and Greater Flamingos nest building on 7 January. 26 January: >2000 Greater Flamingos at nests, many with eggs (3520 were later counted from aerial photos). 9 February: 900-1000 birds still at nests with chicks hatching. 28 February: c.2000 Greater Flamingo chicks c.3 weeks old. 12 April: 5880 chicks counted from aerial photos (from an estimated 3000 by eye). 17 April: About 3000 Lesser Flamingo chicks 2 km from the breeding site.

Of 3000 chicks on the pan at the end of the breeding season c. 2000 were Lesser Flamingos. An attempt was made to catch and band chicks but this first effort was not very fruitful, only 2 being caught and ringed with engraved green rings. One of these, however, was resighted 570 km away at Walvis Bay 8 months later, where it has since been seen again

Unlocated breeding by Greater Flamingos was heralded by the arrival of juveniles flying west over Namutoni on 6 March, in the direction of Fisher's Pan, where 70 were observed. Since the earliest that any chicks from the Etosha colonies could have been on the wing would have been the end of April, these young of the year originated from an undiscovered colony. (In Botswana breeding did not commence at Makgadikgadi Pan before mid-December 1999 at the earliest so the young from there would not have fledged before the end of March).

The salt works company at Walvis Bay, on the central Namibia coast, has constructed an experimental flamingo breeding island. Following suggestions by Keith Wearne to the managing director, Roy Stanton, the company decided to build an island based on an existing sand bar in a place ear-marked for flooding. The island is within a newly created evaporation pond and lies about 1 km from the southern Atlantic. Artificial clay nests were scattered on the island and the whole place flooded in November 2000. No birds were using it during the Jan 2001 wetland bird count, but many breeders were away in Botswana. It is adjacent to large concentrations of wintering flamingos numbering 10-20,000 birds, and was designed to be as far from human disturbance as possible.

WEST AFRICA

MAURITANIA

The mid-January IWC survey revealed totals of 2000 Lesser and 19,400 Greater Flamingos in the Aftout es Saheli, southern Mauritania (inf. Olivier Hamerlynck).

Banc d'Arguin: Flamingos bred only on **Grande Kiaone** in 2000. On 25 May, during an aerial survey by B. Lamarche, C. Barbraud, R. Bennetts and P. Campredon, a creche of 1500-2000 was seen on the top of the island, with several hundred abandoned eggs at the colony. The following day, **Grande Kiaone** was observed from the ground with A. Gueye, when it was possible to see that the chicks were aged c.10-30 days. Egg-laying would have started at the end (c.27) of March 2000. (information by courtesy of PNBA and FIBA).

WESTERN MEDITERRANEAN

SPAIN

Doñana: No breeding in the Marismas but false-nesting by some hundreds of birds at Veta de la Palma (inf. H. Garrido).

Fuente de Piedra: Egg-laying began on 26-27 March and the first chicks could be seen on April 23-24. About 11,500 pairs of flamingos bred and raised c. 8019 chicks. On 15 July, 863 of these were captured and banded when the lagoon was dry (inf. M. Rendón Martos & J.M. Ramírez, C.M.A. Andalucía). Eight adult breeding flamingos were captured at the end of the breeding season and marked with transmitters for satellite detection (see p.49).

Laguna Pétrola: Breeding for the second year in succession. Egg-laying began at the beginning of May and on May 18 there were 614 flamingos at the lagoon of which at least 176 were incubating. On July 14, 20 and 29 there were 212 chicks in the creche (inf. R. Ruiz López de la Cova, Consejería de Agricultura y Medio Ambiente, Castilla-La Mancha).

Ebro delta: Flamingos bred on the same island they have used each year since 1993 (except 1999), called Tora dels Conills, in the Salinas de la Trinitat. About 1,500 pairs bred and raised 1044 chicks. During a visit on 5-7 June, the island was empty and A.Johnson (Tour du Valat) estimated that the chicks in the nursery were aged c.10-30 days, indicating egg-laying from c. 6 April on. Of the band codes read on adults feeding their chicks, 45 were from the Camargue and 29 from Fuente de Piedra (inf. P.N.Deltebre, Tour du Valat).

FRANCE

The IWC revealed a total of 26,556 flamingos wintering along the Mediterranean coast of France from the Salins d'Hyères (Var) west to the lagoons of Roussillon (Pyr.Orientales), and a further 30 birds in Corsica. These counts are summarised below.

Region	Number of flamingos	Observer(s)
Hyères (Var)	588	CEEP [1]
Berre (Bouches-du-Rhône)	463	CEEP[1]
Plan du Bourg	1068	CEEP[1], A. Tamisier CNRS
Ile de Camargue	4982	Tour du Valat, A. Tamisier CNRS
Petite Camargue (B.du Rh.-Gard)	3335	Tour du Valat, A. Tamisier CNRS
Languedoc (Hérault)	12870	GRIVE[2]
Languedoc-Roussillon (Aude-Pyr.Or)	3250	LPO[3] Aude
Total	26556	

[1] Centre d'Etudes des Ecosystèmes de Provence
[2] Groupe de Recheches et d'Informations sur les Vertébrés
[3] Ligue pour la Protection des Oiseaux

Camargue: Breeding again took place at the Etang du Fangassier, with a record 22,200 pairs of flamingos occupying Flamingo Island, Tern Island and the dyke facing these. All four sub-colonies were successful and 14,500 chicks fledged, another record for the Camargue. An attempt was made to discourage flamingos from breeding on Tern Island (purpose-built for Gull-billed Terns in 1980) using flexible plastic screening, but this was damaged by the wind and trampled by the flamingos!

ITALY

Valle di Comacchio: Flamingos were discovered breeding for the first time in the Valle di Comacchio (Ferrara) on 19 April 2000, by M. Fasola & S. Volponi. This colony was not observed again until 1 May when N.Baccetti, A.Johnson and R. Bennetts visited the site. There were c. 80 occupied nests in 3 groups, 2 of which held 3-day old chicks. Egg-laying would have started c. 30 March. Several visits were made in May-June by G. Arveda to search for marked individuals and many banded birds from both the Camargue and from Fuente de Piedra were seen at the colony; 4 French and 2 Spanish birds were seen incubating or feeding chicks, and 5 more French birds were presumed to be breeding there. All banded birds were aged between 3 and 6 years. A total of 68 chicks was raised, 66 of which were banded by INFS (blue PVC bands and Bologna rings) on 5 July (see p.33).

Apulia: Flamingos began breeding in early spring in the Salinas at Margherita di Savoia where they have bred successfully each year since 1996. This year, however, the early attempts failed because the nests were flooded, and later breeders were disturbed by dogs (inf. N. Baccetti/INFS). Quite remarkably, more clutches were laid at the end of summer and on 29/09/2000 G. Albanese saw some 5-day old chicks in the colony (egg-laying from 26/8 on) with the majority of adults still sitting on eggs (inf.N.Baccetti 22/10/00). In early November G.A. counted 48-50 chicks and c.10 Nov, 122 chicks. This is the second time

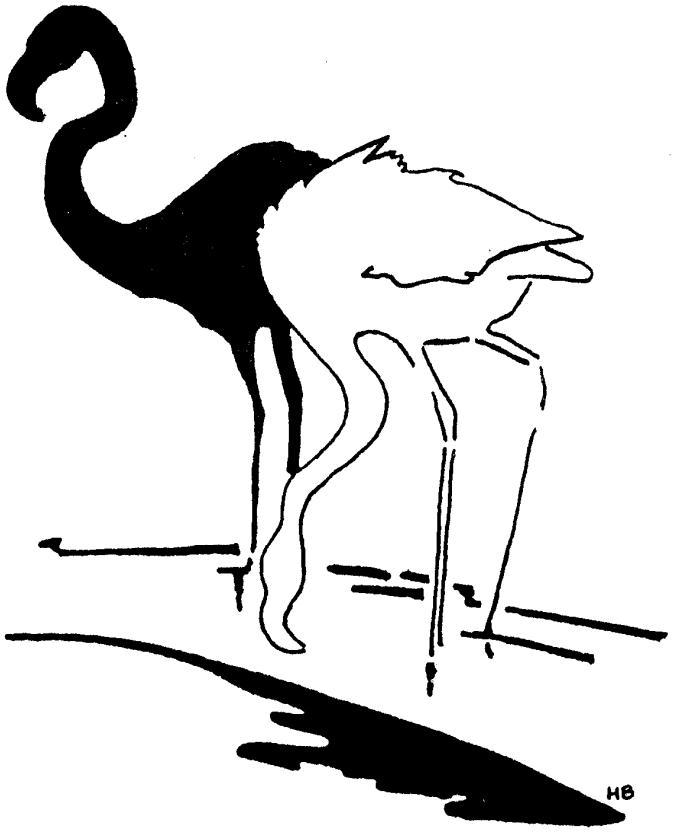
that flamingos have bred in autumn at this site; in 1996, 9 chicks took wing at the end of the year (Albanese *et. al*. 1997). It would be interesting to know what is so special about this site that flamingos can breed at the end of summer!

Cagliari: Flamingos (c. 2500 pairs) once more bred successfully in the lagoon of Molentargius-Quartu: The first chicks were seen on 31 May, indicating egg-laying starting at the beginning of May. About 2000 chicks fledged, of which 383 were captured and banded on 12 August (see p.33) (inf. A. Atzeni APM).

TUNISIA

The mid-January waterfowl census (13-16/1/2000) revealed the presence of 27,481 flamingos in southern Tunisia: Ile de Jerba 5214, Golfe de Bou Grara 20,000, Gourine 2267 (counts and information by Hichem Azafzaf and Groupe Tunisien d'Ornithologie).

Dredging work at the Lake of Tunis has caused the death of 250 flamingos which became stuck in the slurry pumped out of the lake and discharged into the neighbouring salt pans (inf. Association des Amis des Oiseaux).



EASTERN MEDITERRANEAN

GREECE

Flamingos occurred throughout the year in the two saltpans on the island of Lesbos, with c. 350 birds during summer 2000. One nest was built in the larger of the two saltpans (Alykes Kalloni), though no egg was laid. A count on 16 December 2000, revealed 1000 birds at Kalloni and 200 at Polichnitou (inf. Hjalmar Dahm).

Record numbers of flamingos were reported from Lake Koronia (Macedonia) at the end of summer. More than 10,000 birds were present from mid-September, with peak counts of 11,800 on 29 September, 2000 (inf. Maria Panayotopoulou, Lefteris Kakalis, Yannis Tsougrakis) and 11,000 on 2 October. Numbers have also increased on wetlands of the Ionian coast in the south west, as revealed by the January IWC counts at the Messolonghi Lagoons: 500 birds in 1999, 850 in 2000 and 1800 in 2001 (inf. Andrea Bonetti, Hellenic Ornithological Society).

CYPRUS

Only relatively small numbers of flamingos occurred at Akrotiri in autumn-winter 2000, the first 40 birds appearing on 28 November, immediately after a day of heavy rain. On 29 November there were 140, on 30 November 350, and on 1 December 750+. At Larnaca on 15 November there were 420, on 8 December 450+, and on 11 December 580 (inf. Edel McGurk, COS57).

TURKEY

Camalti Tuzlasi (Izmir): Flamingos did not breed in the saltpans from 1995 to 1999. In 2000, 405 nests were built but no birds bred successfully (inf. M. Siki).

Tuz Gölü: A visit was made to this lake at the inflow of the Konya Channel on 12 July 2000 by U. Özesmi, J. Tavares, A. Johnson & R. Bennetts. There was an impressive creche of several thousand chicks (8-10,000?) with 5-6000 adults nearby.

A welcome note: in November 2000, the Turkish Ministry of Environment declared the Tuz Gölü Basin as a Special Protected Area (SPA) (BirdLife in Europe 6 (1) March 2001).

Seyfe Gölü: U. Özesmi, A. Johnson & R. Bennetts visited this lake on 8-9 July 2000. The depression was half filled with water and there were c. 8000 flamingos present, but none were breeding.

ASIA

IRAN

Lake Uromiyeh: No breeding in 2000 (inf. Dept. of the Environment, A. Johnson, C. Barbraud).

Lake Bakhtegan: The following information (reported by J. Skinner) is from the Reuters News Service, September 1, 2000:

Young Iranians in bid to rescue flamingo chicks

Tehran: *Around 100 Iranian young people from the southern city of Shiraz have joined a rescue effort to save 2,000 flamingo chicks from certain death, state radio reported yesterday. Five thousand flamingo chicks were left stranded when the Bakhtegan Lake near Shiraz dried up earlier this summer. Three thousand chicks who were not old or strong enough to migrate have already died, a local environmental official said. The approximately 2,000 chicks still alive will face certain death if not relocated. The participants, mostly university students and schoolchildren, have joined employees of the environment department in efforts to take the remaining chicks to the nearby Tashak lake. But the rescue has been hindered by the general physical weakness of the chicks, the swampiness of areas where the remaining chicks have taken refuge and logistical problems, the official IRNA news agency said. A United Nations report said earlier this month that Iran's drought, the worst in 30 years, was reaching critical dimensions.*

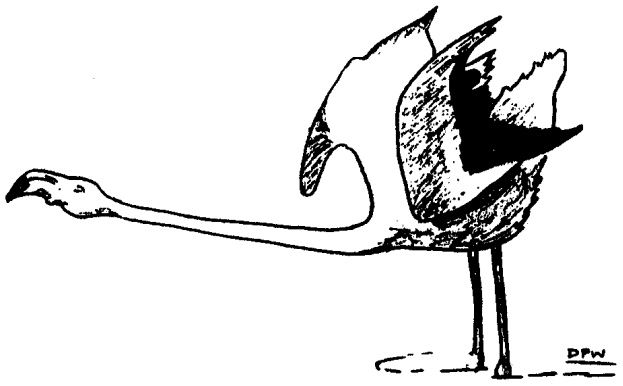
AFGHANISTAN

In July 2000, Ahmad Khan visited Lake Ab-i-Istada. Throughout the summer this lake was completely dry. He visited the two islands where flamingos are known to breed at times, and saw nests from former years. Further observations will be made at this site in 2001 (information by courtesy of George Archibald, International Crane Foundation).

Summary table of breeding by Greater Flamingos 1998 - 2000

Colony	Pairs 1998	Pairs 1999	Pairs 2000
Makgadikgadi Pans (Botswana)	0	0	40,000
Etosha Pan, Namibia	0	0	3520
Kiaones, Mauritania	7400	13,060	2000
Donana (Sevilla-Huelva) Spain	1100-1200	0	0
Fuente de Piedra (Malaga) Spain	19,500	3000	11,500
Laguna Petrola (Albacete) Spain	0	81+	300
El Hondo (Alicante) Spain	1000	0	0
Ebro delta (Tarragona) Spain	1461	0	1600
Camargue (B.du Rhône) France	16,700	11,000	22,200
Cagliari (Sardinia) Italy	4050-4300	1000	2,500
Margherita di Savoia (Apulia) Italy	460+	250	2,300
Comacchio (Ravenna) Italy	0	0	80
Camalti Tuzlasi (Izmir) Turkey	0	0	405
Tuz Gölü (Nigde-Konya-Ankara) Turkey	12,000	?	10,000
Lake Uromiyeh (Azerbaijan) Iran	650+	750+	0
Lake Bakhtegan (Shiraz) Iran	?	?	5,000
Lake Tengiz, Kazakhstan	15,200	?	?
Totals	**79,521--79,871**	**29,141+**	**97,885**

Most of the figures given here are approximations



News from the regions 2000

NEW WORLD

Compiled by Felicity Arengo & Alan Johnson

CARIBBEAN

CUBA

In December, 2000, Felicity Arengo of the Wildlife Conservation Society (WCS) visited Cuba and met with José Morales Leal, flamingo biologist for the Empresa Nacional de Flora y Fauna (ENFF). He has estimated the flamingo population in Cuba at about 100,000. This constitutes >60 % of the Caribbean Flamingo population. WCS and ENFF are planning a collaborative project to conduct aerial censuses at key wetlands to determine actual numbers. Banded flamingos are observed in Cuba (where banding of wild birds has not occurred), indicating that birds from the Bahamas (where flamingos were banded in the 70s) or Yucatan, Mexico (where birds were banded in the late 80s and late 90s) are flying to Cuba.

MEXICO (inf. Rodrigo Migoya)

Flamingos nested again in the Ria Lagartos Reserve, at the site called the "Peten". Breeding was successful although a jaguar entered the colony in June and caused some clutch losses. On 12 August, 380 of the 3000 chicks raised this year were captured and banded. Blood samples were collected from 200 birds and crop samples from >50.

SOUTHERN CONE

In Memoriam PABLO CANEVARI.

Those of us in the Southern Cone of South America will always remember Pablo Canevari as a friend and colleague who always encouraged us to submit proposals, organize workshops, do field work, and spread the word about those wonderful birds he loved so much, the flamingos. His loss will be felt not only by his loving family and human friends, but also by the birds and wetlands to which he dedicated his whole life.

REGIONAL

The Grupo para la Conservacion de los Flamencos Altoandinos (GCFA) carried out the project Priority Action for the Conservation of the High Andes Flamingos, sponsored by the Migratory Species Convention. Field activity was an International Winter Census 2000 in Argentina, Bolivia, Chile and Peru. In a regional workshop in Salta (Argentina) the International Censuses (1997 to 2000) were analyzed and 39 Management Units (MU) were defined, comprising groups of lakes which may be managed together. Twenty of these units are considered key areas based on flamingo abundance, breeding success, historical data on reproduction or as isolated habitats. Moreover a trinational agreement concerning conservation of altiplano wetlands was signed by natural resource authorities of Argentina, Bolivia and Chile, and a strategy for conservation and management was developed.

ARGENTINA

A project on flamingos' habitat assessment using LANDSAT TM images was developed in the altiplano of Argentina, Bolivia and Chile from 1999 to 2000. The main researchers were Sandra Caziani (Salta University, Argentina), Terence Boyle and Bob Whaltermire (US Fish & Wildlife Service) with support from the National Geographic Society. Several types of habitats could be distinguished (salt, mud with a film of water, shallow water, deep water, bogs and marsh) and related to habitat conditions and their use by the different species of flamingos.

Multivariate analyses of the bird communities censused at each lake indicate that birds were separated by a salinity gradient and water depth. Multivariate analyses of the chemical and physical data showed that the lakes had significant differences in water depth and transparency, in latitude, altitude and pH. One group of lakes was characterised by gravel bottoms. A habitat map is being produced to contribute to the International High Andes Flamingo Census.

In November, **Lagunas de Vilama**, a new Ramsar Site, was designated, mainly because of its significant populations of James and Andean Flamingos. Lagunas de Vilama is in the altiplano of Jujuy Province, northwestern Argentina, near the border with Bolivia at 4500 meters above sea level.

At **Mar Chiquita**, the Centro de Zoologia Aplicada is studying the possible impact of illegal dumping of 30 tons of Lindane, an insecticide that was buried at the northern end of the lake. This jeopardizes this entire closed lake system. Up to 100,000 Chilean Flamingos have been counted at this site, and over 42,000 chicks were produced in 1997 (inf. Enrique Bucher).

PERU (inf.Mariana Valqui, David Ricalde)

Asociación Peru Verde (APV) has signed an agreement with Proyecto Especial Binacional Lago Titicaca (PELT) to evaluate the conservation status of flamingos in the Aymara and Lupaca Reserves (300,000 has) in southern Peru, near Lake Titicaca, the only site in Peru that protects both breeding and wintering sites. Under this agreement, APV will assist in the annual flamingo census in these area, and train local students and indigenous communities in field methods. APV has also proposed to government and the private sector to use the High-Andean flamingos (Chilean, Andean, James') as a model for integrated conservation of wetlands and wildlife in the Peruvian Andes. APV is promoting the inclusion of flamingos and other spectacular avifauna as attractions to international tourists, especially in the off-season, for Lago Titicaca and the Aymara Lupaca Reserve. Of the 83,000 tourists that visit the country, very few have the opportunity to visit these important flamingo sites.

Flamingo marking schemes 1998-2000

OLD WORLD

Greater Flamingo *Phoenicopterus ruber roseus*

FRANCE

Locality: Etang du Fangassier, Camargue, Bouches-du-Rhône (inf. Station Biologique, La Tour du Valat).

1998: 800 chicks were marked on the left tibia with PARIS MUSEUM stainless steel rings, and on the right tibia with yellow PVC leg-bands engraved with four-letter codes commencing with DA--, DB--, DC-- or DD--, on 29 July 1998.

1999: 800 chicks were marked on the left tibia with PARIS MUSEUM stainless steel rings, and on the right tibia with yellow PVC leg-bands engraved with four-letter codes commencing with DF--, DH--, DJ-- or DL--, on 28 July 1999.

2000: 800 chicks were marked on the left tibia with PARIS MUSEUM stainless steel rings, and on the right tibia with yellow PVC leg-bands engraved with four-letter codes commencing with DN--, DP--, DS-- or DT--, on 26 July 2000.

SPAIN

Locality: Fuente de Piedra Reserve, Málaga (inf. M. Rendón Martos, (C.M.A Andalucía) and J.J. Chans, (E.B.D)).

1998: 1339 chicks and 125 full-grown flamingos (in moult) were marked on the right tibia with ICONA metal rings, and on the left tibia with white PVC leg-bands engraved with four digits: "0" , followed by a black line engraved completely around the band, followed by 3-letter codes: from 0/DZF to 0/LZZ, on 17 August 1998.

1999: 868 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: "0" , followed by a black line engraved completely around the band, followed by 3-letter codes: from 0/NBL to 0/RTZ, on 17 July 1999.

2000: 863 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: "0" , followed by a black line engraved completely around the band, followed by 3-letter codes: from 0/SAA to 0/VZZ on 15 July. Eight adults were marked with orange PVC leg-bands engraved with 3 digits (A/J0 to A/J7), and equipped with transmitters for satellite tracking, 12-20 July.

ITALY

Locality: Stagno di Santa Gilla, Cagliari, Sardinia (inf. A. Atzeni (APM), N. Baccetti (INFS).

1999: 190 chicks were marked on the left tibia with INFS metal rings, and on the right tibia with red PVC leg-bands engraved in white with 4-letter codes commencing with MC-- or MD--, on 7 August 1999.

Locality: Stagno di Molentargius, Cagliari, Sardinia (inf. A. Atzeni (APM), N. Baccetti (INFS).

2000: 383 chicks were marked on the left tibia with INFS metal rings, and on the right tibia with red PVC leg-bands engraved in white with 4-letter codes MCBD to MHAZ, on 12 August 2000.

Locality: Comacchio saltpans (Emilia Romagna) (inf. N. Baccetti (INFS).

66 chicks were marked on the left tibia with INFS metal rings, and on the right tibia with blue PVC leg-bands engraved in white with 3-letter codes IBV to IHZ, on 5 July 2000.

IRAN
Locality: Lake Uromiyeh, Azerbaijan (inf. J. Mansoori, S. Sadeghi-Zadegan)

1999: 750 chicks were ringed with metal rings, and 295 of these were also banded with green PVC leg bands. These bands have alphanumerical codes (in white) but are not individually recognisable because of repetitions.

NAMIBIA
Locality: Etosha Pan (inf.Rob Simmons)

2000: A chick and an adult were captured and ringed on the right tibia with a green PVC band engraved (in white) with a 3-letter code (NGR and NGV) and on the left tibia with a metal ring, on 17 April 2000.

NEW WORLD

Caribbean Flamingo *Phoenicopterus ruber ruber*

VENEZUELA (inf. Frank Espinoza (PROFAUNA), M. Rendón-Martos CMA Andalucía)
Locality: Ciénaga (refugio) de Los Olivitos, Maracaibo, Zulia

1999: 50 chicks were marked on the left tibia with PROFAUNA stainless steel rings, and on the right tibia with white PVC leg-bands engraved with a combination of 3-letter codes from AAA to ACX, on 7 August.

2000: 131 chicks were marked on the left tibia with PROFAUNA stainless steel rings, and on the right tibia with white PVC leg-bands engraved with a combination of 3-letter codes from ADD to ATD, on 2 September.

MEXICO (Rodrigo Migoya)
Locality: Ria Lagartos, Yucatan

1999: 390 chicks were marked on the right tibia with yellow PVC leg-bands engraved (in black) with a 4-letter code FW—to FW—on 14 August.

2000: 380 chicks were marked on the right tibia with yellow PVC leg-bands engraved (in black) with a 4-letter code FW—to FW—and on the left tibia with a metal ring, on 12 August.

The 1998 Flamingo Specialist Group Meeting

Catherine E. KING, MEETING LEAD ORGANIZER

The Flamingo Specialist Group held a meeting from 24 - 26 October 1998 in Miami (USA) in conjunction with the annual Colonial Waterbird Society meeting. The primary purpose of the meeting was to develop conservation recommendations for the Wetlands International/IUCN-SSC Flamingo Action Plan. Additionally it provided an opportunity for field and zoo workers to exchange the most recent information on flamingos, and to explore ways in which zoos can contribute to *in situ* conservation.

There were 92 participants from 22 countries at the meeting. Twenty-three oral presentations and 17 poster presentations were given on a wide range of topics. Much of the time was devoted to working group sessions. Four of the five working groups were regionally oriented: Africa, Asia and the Mediterranean, the Caribbean (including northern South America), and South America (not including Caribbean flamingo areas). There was also a captive working group. The working groups concentrated on development of action plan recommendations. They were also asked to supplement and correct information relevant to flamingo conservation and management compiled by Wieke Galama (Amsterdam Free University). The African and South American working groups were also asked to review the species accounts for BirdLife International´s Globally Threatened Species Programme, into which three flamingo species are being considered for inclusion: the Lesser Flamingo, the James Flamingo and the Andean Flamingo.

One of the most exciting initiatives to be undertaken, if possible in January 2001, is a broadscale simultaneous census of flamingos at important sites in Asia (Pakistan, India) and Africa. Emphasis in Africa will be on the Lesser Flamingo, as the lack of knowledge about this species' movements currently precludes estimating population size with any accuracy. It is hoped that visual estimates can be strengthened by sampling using aerial photography for some of the larger gatherings. In the Caribbean efforts will be made to establish a similar census, as there is similarly no clear picture of the movements of the Caribbean flamingo. Simultaneous censuses of flamingos in the high Andes are already being performed in Argentina, Bolivia, Chile and Peru and serve as an example for other efforts.

The Caribbean working group also developed a proposal for a colour banding programme to determine to what degree mixing occurs between different sites of this species, and what the survivability of cohorts is. The South American group developed proposals for five projects: risk assessment of wetlands critical to the Chilean flamingo, completion of assessment of information on abundance and distribution of James and Andean flamingos in nesting areas and throughout entire range, assessment of movements (intra- and inter-seasonal) of James and Andean flamingos, characterization and protection of nesting colonies of James and Andean flamingos in the high Andes, strengthening of existing natural reserves and creation of new ones in key areas for survival of James and Andean flamingos. It appears that there are only 2 or 3 main breeding sites for Andean and James' Flamingos in the whole of South America and all are at risk. Laguna Colorado, in Bolivia, by far the most important site for James', now has guards to control the effects of some ten thousand visitors per year, although they often don't have enough money to buy petrol for patrol vehicles!

In addition to developing an outline for how to proceed with a pan-African census in 2001, priority projects that were put forth by the African working group were a study of hydrological and food availability characteristics critical to Lesser Flamingos at the three major breeding sites, Sua Pan in the Makgadikgadi Pan complex (Botswana), Etosha Pan (Namibia) and Lake Natron (Tanzania) coupled with the nearby Magadi Lake (Kenya). A breeding ecology study in the Makgadikgadi Pans that includes radio tracking of movements should be done. It was also suggested that protection of the three sites, all Ramsar sites, should be reemphasized. Relevant studies on breeding biology, physiology and feasibility of farming *Spirulina* could be carried out in captivity.

The Mediterranean-Asian working group proposed a ringing project at Lake Uromiyeh (Iran) to identify the wintering grounds of Greater Flamingos breeding there and their interchange with the western Mediterranean population. Other actions include identification of important wintering and possibly breeding sites of flamingos in the Gulf states, clarification of status of flamingos in India and Pakistan, determination of the extent of hybridization with exotic species, and implementation of the western Mediterranean action plan developed in Antequera, Spain in 1989.

The captive working group proposed production of North American/European flamingo husbandry guidelines, development of regional and global action plans, evaluation of potential problems with hybridization, restocking and rehabilitation efforts, development of educational projects on flamingo conservation, and identification of research projects that would benefit *in situ* conservation efforts. A great deal of progress has been made in development of the captive flamingo husbandry guidelines since this meeting. The guidelines will be produced as a joint effort between the American Zoo and Aquarium Association (AZA), the European Association of Zoological Parks and Aquaria (EAZA) and the British Zoo Federation, and are expected to be available in early 2000.

Several channels for flamingo communications are now available. The Flamingo Specialist Group Newsletter produced by Alan Johnson can be found at the web site http://www.tour-du-valat.com, where other flamingo related documents will also be available in the future. A North American zoo flamingo listserv has been set up, and interested parties can join this listserv by notifying: flamingo@aza.org. A listserv for flamingo workers will also be set up through the Avian Demography Unit at the University of Cape Town in South Africa. Interested people can contact Cathy King (Cathy.E.King@inter.nl.net) for information on how to join that listserv.

The proceedings of the 1998 Flamingo Specialist Group meeting, and papers of some people who wished to attend but could not, have been published as a Waterbird Society Special Publication (see p.47). Compilation of the Wetlands International/IUCN-SSC Flamingo Action Plan is also underway. Funds to subsidize the attendance of a number of workshop participants at the meeting, to publish the proceedings and to help with action plan costs have been contributed from a variety of sources and these will be acknowledged in the forthcoming publications.

Flamingo survey in Namibia, Botswana and South Africa

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Flamingo numbers fluctuate, particularly from November onwards when birds arrive from elsewhere (probably East Africa) to breed in Sua Pan or Etosha Pan. We set out to gauge just how many birds occur in southern Africa at such times, by organising a survey in March 1999 covering the main areas where large numbers congregate each year. This process was aided by the presence of on-going research at Sua Pan by G. McCulloch, who determines flamingo numbers by aerial photography over the pan, and a network of Namibian and South African counters (acknowledged below).

Regions covered: Instantaneous counts are the only way to count these highly mobile birds so counters were asked to count in a one week period from 28 March to 3 April, or as close to it as possible. Areas covered included coastal areas and Etosha Pan and surrounds in Namibia, Sua Pan in Botswana and Kamfers Dam and Lake St Lucia in the Northern Cape, South Africa. These are all areas that either hold significant wintering populations or have experienced breeding activity. Because of the short notice, other areas with lower numbers in past years were not counted in South Africa. It is unlikely that these areas would make a substantial difference to the totals because none are known to hold breeding flamingos.

Total numbers: Overall numbers of Greater Flamingos were high at Namibia's two main coastal wetlands, Walvis Bay and Sandwich Harbour. Greater flamingos numbered 48,623 birds at these two wetlands alone (96% of Namibia's total: Table 1). Walvis Bay had a record 35,970 birds, and Sandwich Harbour had a record 12,653 birds. Only two young birds were apparent in these totals. Including all other Namibia wetlands, the total for Namibia was 50,690 Greaters, itself a record number compared with previous instant estimates in July 1997 when 42,984 Greaters were counted in Namibia (Simmons 1997).

In South Africa, counts from Kamfers Dam, a permanent pan fed by treated sewage water on the outskirts of Kimberley, were also high at this time. A mid-March count found 8439 Greater Flamingos. A count exactly one month later found fewer Greaters (387) as the water level of the dam fell. A minimum of 150 Greaters was counted at Lake St Lucia. No Greater Flamingos were recorded at Sua Pan which was deserted by the last 10,000 birds on March 10th.

Combining these figures we see that the total count for Greater Flamingos in Southern Africa in late March 1999 was just under 59,000 adults. Only two young birds were seen. The total Lesser Flamingo population was just under 52,000 birds of which 0.3% were juveniles (Table 1).

Lesser Flamingos were still breeding in Sua Pan at the time of these counts (G. McCulloch). We counted 15-20,000 Lesser Flamingos on the pan at the end of March. While some young birds had left (200-300), many later chicks (10-15,000) suffered an all too familiar fate and perished as the water in the Nata River inflow and the pan dried up. It was no surprise, given the breeding activity in Botswana, that the numbers in Namibia were fairly low at 24,507 birds.

At Kamfer's Dam 7200 Lessers were present in mid-March (Table 1). A count exactly one month later (mid-April) found increased numbers of Lessers (13,845), which coincided with lowered water levels. Included in this figure were some juvenile Lessers, presumably from the breeding event at Sua. By mid-May (2 months later) numbers had swollen to 19,356 Lesser Flamingos of which 239 were juveniles (M. Anderson). On the Kwazulu-Natal coast of South Africa, Caroline Fox reported no Lesser Flamingos at the southern end of Lake St Lucia, but was unable to fly to the northern end of the St Lucia estuary to assess numbers. Thus her count is a minimum estimate.

Movements

Since these counts were being made at a time when birds were breeding and movements were likely, we expected to see large changes in numbers as well as young birds moving in from breeding events in Sua Pan, Botswana. In Etosha young (brown) Lesser Flamingos were first seen arriving in the eastern Fisher's Pan the week before the counts (c. 22 March: T. Stohls), and adult Greaters were clearly passing through as evidenced by the 900+ birds seen on 24 March on the main pan (between Stinkwater and Leeunes peninsulars) and their disappearance by 30 March (N. Brain). On the western edge of Etosha a small group of 30 juveniles arrived on 2 or 3 April and had disappeared a week later (W. Versfeld). This suggests youngsters do not travel with their parents back to the coast.

At the coast, influxes of young Lesser Flamingos were more dramatic. At the time of the main count in Walvis Bay, no brown/grey juveniles were seen in among 20,000 Lessers. One day later (29 March) 35 were counted, and nine days later 150 were apparent (6 April). A large influx occurred that night and 700 young birds were counted the next day (K. Wearne). Note that these birds are not included in the totals. Thus, large movements of young and adult birds were apparent between 24 March and 7 April moving in a westerly direction. Since no breeding took place on Etosha in 1999, these birds were probably from Sua where over 20,000 pairs bred between December 1998 and March 1999.

Young Lesser Flamingos also occurred at Kamfers Dam after the count when 761 grey birds were found one month later (mid-April: M.A.). Greater Flamingo movements were also evident since totals declined by just over 8000 birds to 387 birds.

Conclusion

From this rapid survey of flamingos in Namibia, Botswana and South Africa we can conclude that healthy populations were present in southern Africa, particularly Namibia, in March/April 1999. Indeed the totals were the highest recorded for Greater Flamingos in recent years. The previous highest instantaneous count for Namibia was 43,000 birds in July 1997. Clearly, large movements went on just after these counts and young birds in particular were leaving Sua Pan where breeding took place, and in the absence of adults

made their way back through Etosha to the coast in the first week of April. Birds also arrived at Kamfers Dam sometime between mid-March and mid-April.

We are unable to gauge the success of Lesser Flamingos breeding on Sua Pan, but we do know that 700 young birds arrived at Walvis Bay shortly after the main counts and 761 youngsters arrived in Kimberley at the same time. How many grey juveniles winged their way to East Africa is unknown.

Thanks to simultaneous counts in Botswana and the main areas of concentration in South Africa and Namibia, we know that a minimum of 59,000 Greater Flamingos and 52,000 Lesser Flamingos occurred in southern Africa just as breeding concluded in March 1999. How many
stayed as "residents" should be revealed by January 2000 counts.

Table 1: Numbers of Greater and Lesser Flamingos counted in Namibia, Botswana and northwestern South Africa in late March/early April 1999. Juveniles (young of the year in brackets) are included in the totals.

NAMIBIA	Counters	Date	Greaters (juv)	Lessers (juv)
Sandwich	Rob Simmons Kate Simmons	31.3.99	12,653 (2)	65 (48)
Walvis Bay	Keith Wearne + Tony Tree	27.3.99	35,970 (0)	20,610 (0)
Mile 4	S. Johnson, H. Hamunyela	09.4.99	554 (0)	494 (0)
Cape Cross	A. Uwe-khaeb, Rod Braby	29.3.99	140 (0)	450 (0)
Luderitz	Patrick Lane	08.4.99	300 (0)	200 (0)
Etosha Pan	Nad Brain	24.3.99	900 (0)	0
Etosha – Aruu	Nad Brain	07.4.99	0	150 (0)
Etosha – Fisher's	Tim Osborne	30.3.99	171 (0)	2684 (78)
Etosha – Oponono	Wilfred Versfeld	30.3.99	2 (0)	24 (0)
Etosha – Okondeka	Wilfred Versfeld	02.4.99	0	0 (30)
NAMIBIAN TOTAL			50 690 (2)	24 677 (156)
SOUTH AFRICA				
Kamfers Dam	Mark Anderson *	17.3.99	8439(0)	7200 (0)
Kamfers Dam (1 mo later)	Mark Anderson	15.4.99	387 (0)	13,845 (761)
Kamfers Dam (2 mo later)	S. Kruger, M. Badenhorst	17.5.99	649 (0)	19,356 (239)
Lake St Lucia	Caroline Fox	16 April	150	0
BOTSWANA Sua Pan	Graham McCulloch	30.3.99	0	20,000
TOTALS	12 sites		59,279 (2)	51,877 (856)

*M. Anderson stated that at the time of these counts, South Africa's Bushmanland was very dry and the pans there were very unlikely to hold water, so no flamingos. Since other areas in South Africa and Botswana rarely hold either breeding flamingos or numbers over 1000 birds (bar the Berg River estuary), we believe these figures to be within about 3000 birds of the actual total for each species.

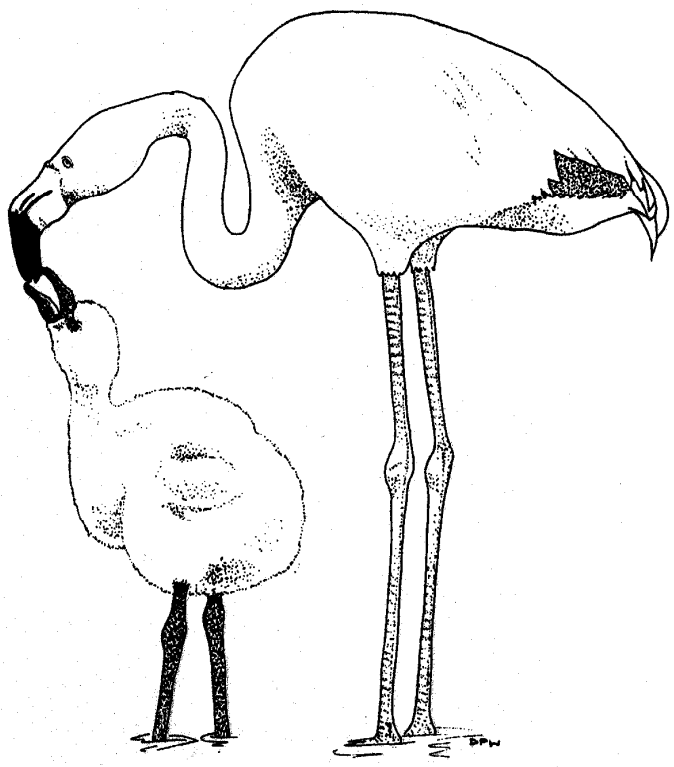
Acknowledgments. This survey was made possible by the numerous counters who generously gave their time in assisting with flamingo conservation and population monitoring. Special thanks to Sharmaine Kruger, Maxie Jonk and Marileen Badenhorst for

assistance with waterbird counts in the Northern Cape, and Keith Wearne and the Etosha staff for follow-up counts to assess movements.

Reference

Simmons, R.E. 1997. The Lesser Flamingo in Southern Africa. In: Howard, G. (Ed.) Conservation of the Lesser Flamingo in Eastern Africa and beyond. Pp. 50-61. IUCN Lake Bogoria, Nairobi, Kenya.

(*Supplementary figures received from Graham McCulloch from Lake Makgadikgadi, indicate that in addition to the 20,000 pairs of Lesser Flamingos that bred in the south of Sua Pan, approximately 5,000 Greater Flamingos attempted breeding in the same area – their traditional breeding site being flooded - but due to the lateness of the attempt no chicks survived*.).



Flamingo observations in Tunisia in 1998

Mike SMART

Tunisia is an extremely important country for Greater Flamingos *Phoenicopterus ruber roseus*. The birds occasionally breed in the remote southern salt lakes when rainfall is sufficient in the preceding winter, but in recent years this has happened only at intervals - in 1972, 1974, 1976, 1990 and 1991 (Johnson 1997). More importantly, Tunisia is a major wintering area for flamingos with numbers reaching up to 40,000, or half the population occurring in the West Mediterranean (Green *et. al*. 1989). These birds are mainly those that breed in colonies in Spain, France and Italy, as has been demonstrated by many observations of individually colour-marked Darvic bands, placed on young birds in the Camargue, at Fuente de Piedra and in Sardinia. A small number of flamingos nesting in Iran and Kazakhstan also reach Tunisia in winter, as shown by recoveries of metal rings (Johnson 1989). Furthermore, sub-adult birds from the French, Italian and Spanish colonies often spend the first three or more years of their life in Tunisia, before they move to one or the other of the breeding colonies. Tunisia is thus clearly an important kindergarten for west Mediterranean flamingos.

Unfortunately, there is no systematic programme of flamingo studies in Tunisia and during my two visits in 1998, in June and July/August, I therefore spent a great deal of time searching for banded individuals from the European colonies.

It is almost certain that there was no large colony of breeding flamingos in Tunisia in 1998, since the preceding winter was relatively dry and suitable conditions for nesting did not occur in the main breeding sites. A very small number may have nested in the Chott Djerid, while at the Thyna salinas near Sfax a number of young birds made rudimentary nests, as they often do.

In June 1998, 247 bands were read at Sejoumi, at the Lake of Tunis and at Korba. Coverage at Sejoumi (where there was a high proportion of adult birds) was particularly satisfactory. At Korba there was an unusually large concentration of over 1000 flamingos, practically all of them sub-adults. Of 247 bands read there, 185 were from the Camargue (France), 18 from Molentargius (Sardinia, Italy) and 44 from Fuente de Piedra (Andalucia, Spain). Of the 185 French birds, 58 were adults (more than four years old); a surprisingly high number of these adults (21 out of 58) had been recorded at breeding colonies in the 1998 breeding season, some of them in the second half of May. This indicates that many flamingos return very early from the breeding colonies to the wintering areas – presumably failed breeders or non-breeders. Of the 127 French-banded sub-adults, only 3 had been observed at colonies in the 1998 breeding season. The Italian bands all came from the 1997 cohort, mostly with short life-histories, several previously seen in Tunisia. None of the 44 Spanish-banded birds (6 adults and 38 sub-adults) had been seen at breeding colonies in 1998; most of the previous observations of sub-adults were in Tunisia.

In August 1998, 520 bands were read, 367 from France, 27 from Italy and 126 from Spain. The higher number of bands reflects a longer stay and coverage of the very important flamingo sites of Thyna salt pans near Sfax, which unfortunately could not be visited in June. Of the 367 French bands, 130 were adults and 44 of these had been recorded at

colonies during the 1998 breeding season. Of the 237 sub-adults, only 3 had been recorded at a colony in 1998. Once again the Italian birds were all from 1997 and had only short life histories. None of the Spanish birds had been recorded at a breeding colony in 1998, and it would appear that Spanish birds, once they reach Tunisia, are much less likely to return to a colony than are the French.

These observations confirm once again the importance of Tunisia as a refuge for flamingos outside the breeding season, both for adults returning from colonies, and for sub-adults which remain mainly sedentary in their first years of life. Most previous studies of colour-banded flamingos have concentrated on aspects related to breeding (i.e. Cézilly et. al. 1995, 1996, 1997, Pradel et. al. 1997). More detailed analyses of these Tunisian observations are in progress, in order to investigate the behaviour of the birds outside the breeding season.

References:

Cézilly, F. & Johnson, A.R. (1995). Re-mating between and within breeding seasons in the Greater Flamingo *Phoenicopterus ruber roseus*. Ibis 137 : 543-546.

Cézilly, F., Viallefont, A., Boy, V. & Johnson, A.R. (1996). Annual variation in survival and breeding probability in Greater Flamingos. Ecology 77 (4) : 1143-1150.

Cézilly, F.., Boy, V., Tourenq, C.J. & Johnson, A.R. (1997). Age-assortative pairing in the Greater Flamingo *Phoenicopterus ruber roseus.* Ibis 139 : 331-336.

Johnson, A. R. (1989) Movements of Greater Flamingos *Phoenicopterus ruber roseus* in the western Palearctic. Terre et Vie, Rev.Ecol. 44: 75-94.

Johnson, A.R. (1997). Greater Flamingo pp 15-23 and Lesser Flamingo p 25 *in* BWP Update, Vol. 1 (1). Oxford University Press.

Green, R. E., Hirons, G. J. M. & Johnson, A. R. (1989) The origin of long-term cohort differences in the distribution of Greater Flamingos *Phoenicopterus ruber roseus* in winter. Journ.Anim.Ecol. 58: 543-555.

Pradel, R., Johnson, A.R., Viallefont, A., Nager, R.G. & Cézilly, F. (1997). Local recruitment in the Greater Flamingo : a new approach using capture-mark-recapture data. Ecology 78(5) : 1431-1445.

Flamingos continue to colonise new sites in the Mediterranean

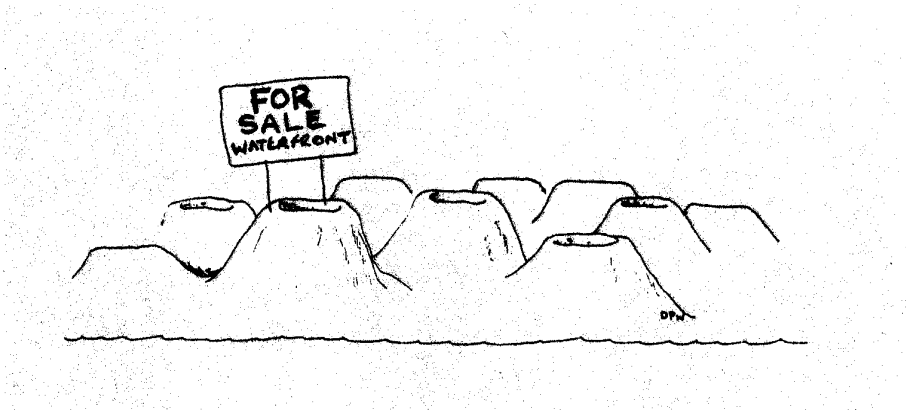
Alan JOHNSON

During the past decade Greater Flamingos have occurred on many Mediterranean wetlands where they were formerly scarce or absent (in Spain, Italy including Sardinia, Corsica, Greece). They have also bred in several wetland areas where they had not formerly done so, at least in the recent past. Colonies became established in 1993 in the Ebro delta (Spain) and near Cagliari (Sardinia); in 1994 at Orbetello (Tuscany), in 1996 at Margherita di Savoia (Apulia) and in 1997 at El Hondo near Alicante (Spain). In 1999, 2 additional sites were colonised, one near Albacete in Spain and the other at Aliki Kytros in Greece*. Breeding has been successful at all of these sites, some of which have been used each year since their initial occupation.

From 1972 to 1992, flamingos bred regularly in the Mediterranean only in the Camargue and at Fuente de Piedra, and occasionally at Doñana and in Tunisia. The appearance of new colonies may be a cumulative effect of an increasing population over the past decade combined with saturation of the traditional sites in the Camargue and at Fuente de Piedra.

Most of these colonies are in areas which are, or have been, industrialised saltpans. Such wetlands appear to be suitable feeding and breeding sites, and consideration of their value to waterbirds needs to be undertaken in light of an uncertain future in the Mediterranean. Water regimes are of particular importance for successful breeding in flamingos and as such are an important part of the flamingo's future in the Mediterranean.

**Ed. note*: *Since the above note was published in the WI newsletter (April 2000, 9: 11) flamingos have colonised yet another site in Italy, at the Valle di Commachio (Emilia Romagna) in 2000, and they bred again near Albacete (Laguna Petrola) in Spain. With regard to the reported breeding in Greece this is more an assumption than proof of breeding, based on the observation of newly-fledged juveniles at Alyki Kytros in August (see Annual report 1999).*



Greater Flamingo *Phoenicopterus ruber* and Rufous-tailed Scrub Robin *Cercotrichas galactotes* : two new species for China

Ma Ming

Greater Flamingo *Phoenicopterus ruber*

Two Greater Flamingos were captured in Xinjiang, China, in late 1997. The first one was obtained from local inhabitants by the staff of Hami Forestry Bureau at Erbao (42°09'N 93°01'E) in September 1997 (exact date unknown). Later in November of the same year, a group of about ten birds flew past the suburb of Urumqi. An injured bird among the group was captured and examined. Photographs of the bird while still alive are available and one specimen has been kept by the Epidemiological Institute of Xinjiang. It has also been ascertained that the birds were not imported or escapes. The body length and weight of one of the specimens were 930 mm and 1,700 g, respectively, both being roughly 20% less than the lowest figures given in del Hoyo et al. (1992). Both birds were subadults, probably first-year birds.
The nearest known breeding grounds of the Greater Flamingo are in northern Kazakhstan (Flint et al. 1989), some 1,500 km to the north-west of Urumqi and 2,000 km from Hami. Whether these records in Xinjiang indicate the existence of a previously unknown breeding site nearby, or occasional nomadic movements as discussed by Ali and Ripley (1987), is not clear. These records added not just a species, but also a new family to the China bird list.

Extracted from Forktail 15 (1999) p.105.

Basel Zoo's veteran flamingos

Adelheid Studer-Thiersch

Two Greater Flamingos, survivors of two groups imported into Basel Zoo (Switzerland) in 1932 and 1938, were still alive at the end of 2000. They were by then at least 62 years old, and probably 65 or more, since they were in adult plumage when they arrived. The female seems to have lost interest in breeding; she occasionally joins her current partner at the colony but rarely sits on the nest of his choice. The old male, on the contrary, incubated and raised a chick in 2000, although he may not have been the genetic father. The chick was hatched from the second of a clutch of two eggs, laid 7-9 days apart. In the intervening period the female was seen copulating with another male while her mate was incubating. The old male was a good father, or stepfather, and as usual he fed the chick longer than did the female.

The South American Flamingos in Laguna de Pozuelos Biosphere Reserve

Virginia MASCITTI

Laguna de Pozuelos in the Argentinean Altiplano is an important habitat for the three species of South American flamingos, *Phoenicoparrus andinus*, *Phoenicoparrus jamesi* and *Phoenicopterus chilensis*. The lake is located in the northwest of Jujuy province, Argentina (66°00'W and 22°19'S), at 3600 m above sea level. It has a total surface area of 70 km², shallow water (120 cm in centre), a high salinity (20,717 mg/l) and sparse vegetation. Pozuelos constitutes the main body of water at the Laguna de Pozuelos Biosphere Reserve, also a RAMSAR site and designated a national protected area.

An aerial census of the lake in 1977 by Hurlbert (1978) revealed 26,000 flamingos. During summer 1990, approximately 40,000 flamingos of three species were counted on the lake, and a census of nests showed 5000 breeding pairs of *P.chilensis* (Mascitti and Nicolossi, 1992). Flamingo populations from Laguna de Pozuelos were studied between 1990 and 1995, in order to establish a pattern of species abundance and to monitor seasonal variations. *P. chilensis* was the most abundant species (57%) and the only one breeding in the lake. The proportion of *P. andinus* (20%) and *P. jamesi* (23%) was higher during the dry season (winter and spring) than in the rainy season (summer and autumn), when most individuals migrate to nest and feed at higher altitudes in the Argentinean, Chilean and Bolivian salt lakes.

Beginning in 1992, a long-lasting drought reduced the water surface to 5% of its normal area and water depth fell to a maximum of 5 cm. This natural phenomenon caused a decrease of the flamingo populations, as well as changes in their specific proportions. In the early stages of the drought (1992-1993), *P. chilensis* and *P. andinus* were proportionately the most abundant species, but, contrary to expectations, the highest overall flamingo abundance was recorded in the wet season. Between 1993 and 1994, the numbers of *P. chilensis* and *P. andinus* decreased, and *P. chilensis* was the predominant species only in the spring. At the same time, *P. jamesi* numbers increased, and throughout the last year of the study (1994-1995), this was the predominant species.

Knowledge of flamingo ecology in Laguna de Pozuelos (Mascitti, 1997) suggests that these changes can be explained by reduction of the habitat and food availability following drought. While no zooplankton was recorded, there was an increase in the proportion of the smallest diatoms (20-60µm). *P. chilensis* and *P. andinus* were the most affected species, because they prefer to forage in deeper water than *P. jamesi*. Furthermore, *P. chilensis* mainly filters seeds and zooplankton, while *P. andinus* feeds on diatoms > 80µm.

The relative increase in *P. jamesi* numbers in the third year after the drought may be explained by its preference for foraging on 21-60µm diatoms along the lake shore. The changes in the observed pattern before the drought suggest dispersal of flamingos towards more productive wetlands within their range. Similar behavior was reported by Johnson (1989) to explain flamingo movements in the Camargue, when food resources declined.

These observations demonstrate the importance of a regional approach to conservation strategies.

References:

Hurlbert, S. (1978). Andean Lake and Flamingo Investigation. Technical Reports no. 1 National Geographic Society.

Johnson, A. (1989) Population Studies and Conservation of Greater Flamingos in the Camargue. pp. 49-63 In Wetlands en Watervogels. A.L.Spaans, Ed. Pudoc, Wageningen.

Mascitti, V., and Nicolossi, G. (1992) Nidificación del Flamenco Común (Phoenicopterus chilensis) en la Laguna de Pozuelos, Puna de Jujuy. El Hornero 13 (3) pp 240-242.

Mascitti, V. (1997) Partición del recurso en la comunidad de flamencos de la Laguna de Pozuelos, Jujuy, Argentina. (PhD thesis) Facultad de Ciencias Exactas y Naturales. Universidad de Buenos Aires.

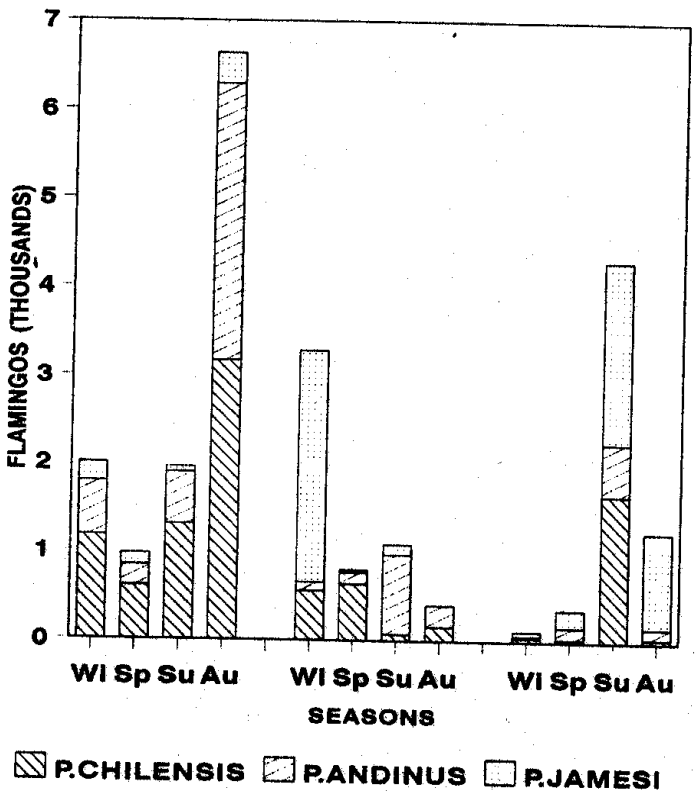


Figure 1. Flamingo censuses at Laguna de Pozuelos 1992-1995

Announcements

CONSERVATION BIOLOGY OF FLAMINGOS
Waterbirds 23 Special Publication (1)
edited by G.A. Baldassarre, F. Arengo, and K. Bildstein. 2000.

These are the Proceedings of the 2nd Flamingo Specialist Group Symposium held in Miami in October 1998. It is a collection of 29 papers divided into six sections (Europe and the Mediterranean, Africa, The Caribbean, South America, Captivity, Summary and Future Directions), and undoubtedly constitutes the most significant contribution to flamingo literature in 3 decades - since the 1st 1973 symposium. If ordering from North, Central and South America, copies are available from: Felicity Arengo, Wildlife Conservation Society, 2300 Southern Blvd., Bronx, NY 10460, USA. TEL: 718-220-5276, FAX 718-364-4275, EMAIL: farengo@wcs.org. Price US$15.00 includes shipping and handling. (Payments must be in US dollars, checks must be drafted on US accounts. Please make checks or money orders out to Wildlife Conservation Society).

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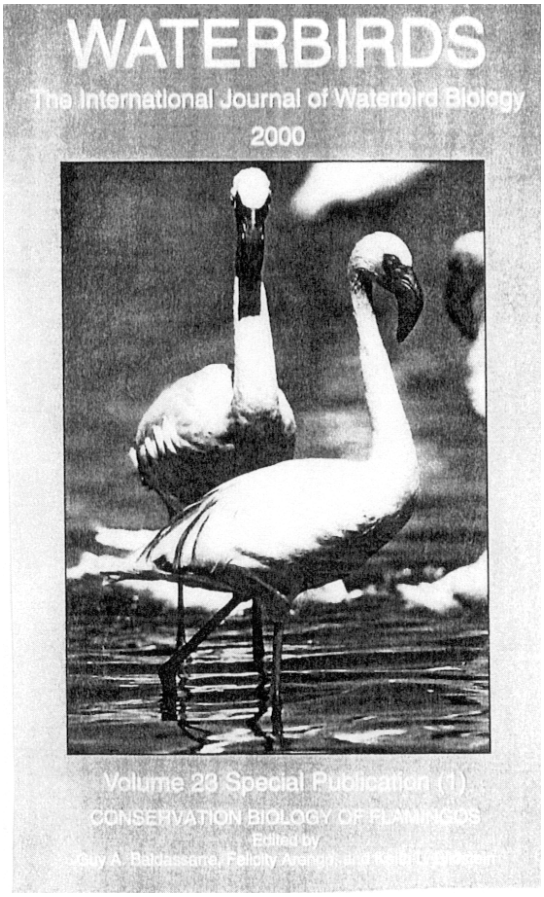

LAGUNAS DE VILAMA, JUJUY PROVINCE, ARGENTINA

Argentina's authorities have designated their 8th Ramsar site, Lagunas de Vilama (157,000 hectares, 22°36'S 066°55'W), which comprises more than ten Andean highland lagoons that occupy endorrheic depressions in Jujuy province, in the extreme northwest of the country, at 4,500 meters above sea level. The lagoons have diverse characteristics, from saline and deep to hypersaline and shallow. They provide habitat for a very rich aquatic bird life, with a good number of endemic and/or endangered species (flamingos *Phoenicoparrus andinus*, *P. jamesi*, and coots *Fulica cornuta*); in addition, a diversity of Nearctic migrating species finds a feeding place here. In the plains that surround the lagoons, locally called "ciénegos", other endangered species like vicuña and ñandú (South American ostrich; *Pterocnemia pennata garleppi*) are present. These "ciénegos" also provide grazing resources for herds of domestic camelids (llamas, alpacas, vicuñas, etc.) and sheep of the local people, who practice traditional modes of transhumance. In addition to these plains, the most prevalent vegetation is characteristic of shrub steppes and Andean highland pastures. Numerous archeological sites attest to significant human populations from 5000 years ago, and the lagoons continue to hold ritual significance. The area of the Ramsar site is part of the provincial Reserva Altoandina de la Chincilla.

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AN INTERNATIONAL FLAMINGO FOUNDATION

This is an organization established in 2000 in Colorado, U.S.A. in order to support flamingo-oriented research projects, disseminate information, assist with flamingo habitat preservation projects and work in close association with Wetlands International and IUCN-SSC Flamingo Specialist Group.

WORKSHOP ON THE CONSERVATION OF ANDEAN FLAMINGOS

Peru Verde is organizing the First Workshop on the Conservation of Andean Flamingos in Peru as part of the IV National Ornithology Meetings from 11-15 July, 2001 in Puno.

SATELLITE TRACKING OF GREATER FLAMINGOS DURING THE BREEDING AND POST-BREEDING PERIODS

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Eight adult breeding Greater Flamingos were captured at Fuente de Piedra lake in southern Spain between 12-20 July 2000, and equipped with Platform Transmitter Terminals (PTT) for satellite tracking. One of the transmitters failed shortly after being installed. Fuente de Piedra usually dries up to a large extent before the chicks fledge, so breeding adults utilise other wetlands as foraging areas, which are located >100 km from the lake (Rendón-Martos et al. 2000). Radio tracking indicated that Veta la Palma (Guadalquivir marshes), located 130 km from the lake, was the main foraging area, although other areas in the Guadalquivir marshes, Salinas de Cabo de Gata (230 km) and wetlands in Alicante province (360 km) were also eventually utilised. The adults spent 4-5 days in foraging areas, before returning to Fuente de Piedra, where they remained for 1-2 days to feed their chicks before returning to foraging areas. All movements between wetlands were nocturnal (see Rendón-Martos et al. 2000). After the breeding season, the marked adults dispersed to several wetlands in southern Spain (3 in Veta la Palma, 1 in Alicante, 1 in Fuente de Piedra) and NW Africa (1 in Tunisia, 1 in Algeria). The birds remained in these sites for long periods. When the batteries failed in late November – mid December, 3 birds were in Veta la Palma, 2 in Algeria, 1 in Tunisia and 1 in Mauritania. The three birds that remained in southern Spain and the one whose transmitter failed were resighted in Fuente de Piedra in April 2001 (identified by PVC rings). More detailed information on these data will be presented elsewhere.

This study was financially supported by ENDESA, Cogeneración y Renovables, S. A., and GAMESA Energía, S. A. Nico Varo and Manolo Vázquez skilfully helped to trap the birds.

Reference

Rendón-Martos, M., Vargas, J. M., Rendón, M. A., Garrido, A. and Ramírez, J. M. 2000. Nocturnal movements of breeding Greater Flamingos in southern Spain. Waterbirds 23 (Special Publication 1): 9-19.

(We have just received the above summary of a new and exciting project which we include here because we feel it is of great interest and we look forward to being able to include full results in the next newsletter. Ed).

CONGRATULATIONS

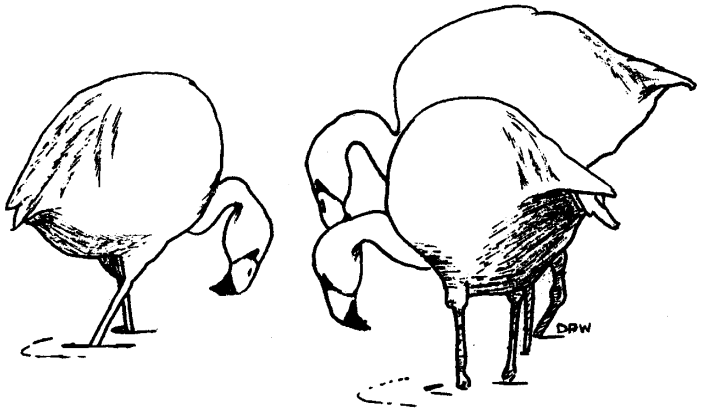
Dr. William CONWAY, long-time flamingo researcher and enthusiast, retired from his position as President and General Director of the Wildlife Conservation Society at the end of 1999. The Flamingo Specialist Group appreciates his many years of work on behalf of flamingos and wishes him the best in his future endeavors.

Enrique DERLINDATI successfully defended his Licenciatura Thesis “James and Andean flamingos: abundance patterns and habitat characteristics in the high-Andes lakes of northeastern Argentina” at the Universidad Nacional de Salta in Argentina, August 1998.

Alessia ATZENI, successfully defended her 'tesi de Laurea' (BSc) on the Structure of the population of flamingos migrating through and wintering in the wetlands of Cagliari 1993-1998. University of Cagliari, Sardinia, Italy in November 1998.

Christophe TOURENQ successfully defended his PhD Thesis “Values and functions of ricefields for waterbirds in the Camargue" (in French) at the University of Montpellier II on 14 December 2000. In the Camargue, rice crop damage by flamingos occurs most years in spring during the germination phase and the importance of landscape parameters, such as hedges, in deterring flamingos has been assessed in this study.

Giacomo TAVECCHIA successfully defended his PhD Thesis "Potentialité et limites des analyses de recapture et reprise en biologie des populations: une approche empirique" at the University of Montpellier II on 20 December 2000. Shortened abstract: Potential and limits of analyses of recapture and recovery data in population biology: an empirical approach. Individual based data (live recapture or dead recovery) are a useful tool for the study of population dynamics. However their analysis might be problematic due to a small volume of data or to the non-identifiability of the parameters of interest. The current flexibility of models coupled with pertinent biological hypotheses have been studied to see how they might help to reduce these problems. In this report, within the context of the single-site recapture analysis, attention is drawn to model selection procedures and to the use of constraints to achieve more parsimony and biological pertinence. The Greater Flamingo is one of the three case studies presented as part of this thesis.



Some recent literature on Flamingos and their environment

Anderson, M. (2000). The status of flamingos in the Northern Cape Province, South Africa. Ostrich 71: 430-434.

Anon. (1998). Confirmada la muerte de flamencos y malvasias por plumbismo en El Hondo. Quercus 146: 47

Anon (2000). Ringing Greater Flamingos in the Mediterranean. Wildfowl & Wetlands 134: 7.

Aragonese, J. & Echevarrías, J.L. (1998). El flamenco vuelve a criar en los humedales del sur de Alicante. Quercus 144: 16-18.

Arengo, F. & Baldassarre, G. A. (1998). Potential food availability and flamingo use of commercial salt impoundments in the Ria Lagartos Biosphere Reserve, Mexico. Colonial Waterbirds 21: 211-221.

Arengo, F. & Baldassarre, G.A. (1999). Resource variability and conservation of American Flamingos in coastal wetlands of Yucatan, Mexico. Journal of Wildlife Management 63: 1201-1212.

Ash, J.S. & Miskell, J.E. (1998). Birds of Somalia. Pica Press, Sussex, U.K.

Baldassarre, G.A., & Arengo, F. (2000) A review of the ecology and conservation of Caribbean Flamingos in Yucatan, Mexico. Waterbirds 23 Special Publication (1): 70-79.

Baldassarre, G.A., Arengo, F. & Galicia, E. (1998). The grace of the Mexican flamingo. Pronatura 4: 39-43.

Bernués, M. (1998). Humedales espa-ñoles inscritos en la lista del Convenio de Ramsar (2nd edition). Colección Técnica, Ministerio de Medio Ambiente.

Bertault, G., Joulia, D. Johnson, A.R. & Raymond, M. (1999). Sex determination in Greater Flamingo chicks through DNA analysis. Waterbirds 22: 282-284.

Bertault, G., Raymond, M., Rousset, F., Cézilly, F & Johnson, A.R. (2000). Evidence of seasonal sex ratio manipulation in the Greater Flamingo. Waterbirds 23 Special Publication (1): 20-25.

Bildstein, K.L., Baldassarre, G.A., & Arengo, F. (2000). Flamingo science: current status and future needs. Waterbirds 23 Special Publication (1): 206-211.

Borello, W.D., Mundy, P.J. & Liversedge, T.N. (1998). Movements of Greater and Lesser Flamingos in southern Africa. In Lesham, Y., Lachman, E. & Berthold, P. (eds). Proceedings seminar : Migrating birds know no boundaries. The Torgos no.28, Tel-

Aviv, Israel.

Boylan, J.T. (2000). Sonographic analysis of the vocalizations of Chilean and Caribbean Flamingos. Waterbirds 23 Special Publication (1): 179-184.

Bucher, E.H., Chani, J.M. & Echevarria, A.L. (2000). Andean Flamingos breeding at Laguna Brava, La Rioja, Argentina. Waterbirds 23 Special Publication (1): 119-120.

Bucher, E.H., Echevarria, A.L., Juri, M.D. & Chani, J.M. (2000). Long-term survey of Chilean Flamingo breeding colonies on Mar ChiquitaLake, Córdoba, Argentina. Waterbirds 23 Special Publication (1): 114-118.

Burch, L.E. & Gailband, C. (2000). Comparison of hand-reared Caribbean and Lesser Flamingos at SeaWorld California. Waterbirds 23 Special Publication (1): 193-197.

Casler, C.L. & Esté, E.E. (2000). Caribbean Flamingos feeding at a new solar saltworks in western Venezuela. Waterbirds 23 Special Publication (1): 95-102.

Caziani, S. M. & Derlindati, E.J. (2000). Abundance and Habitat of High Andes Flamingos in Northwestern Argentina. Waterbirds 23 Special Publication (1): 121-133.

Caziani, S. M. & Marconi, P. (1997). Evaluación del estado de conservación del Monumento Natural Laguna de los Pozuelos y propuesta de manejo integrado de este y otros humedales de la Puna Argentina. In: Liberman, M. & C. Baied (Eds.). Desarrollo Sostenible en Ecosistemas de Montania: Areas Fragiles en los Andes. Instituto de Ecológia, Universidad Mayor de San Andres, Bolivia.

Cloarec, C. (1999). Flamants nains La vie en rose. Science et Nature 92: 42-53.

Conway, W. (2000). Overview and future directions: the summing-up. Waterbirds 23 Special Publication (1): 212-213

Coulter M. C. & Frederick, P.C. (1997). Movements and population dynamics of colonial waterbirds as guides for the temporal and spatial scales of conservation. Colonial Waterbirds 20(2): 295-297.

Copete, J.L. (ed.). 1998. Anuari d'ornitologia de Catalunya. 1996. Barcelona: Grup Catala d'Anellament.

Copete, J.L. (ed.). 2000. Anuari d'ornitologia de Catalunya. 1997. Barcelona: Grup Catala d'Anellament.

Cramm, P. (1999). L'hivernage des oiseaux d'eau sur la frange littorale du Languedoc-Roussillon, hors petite camargue. Meridionalis 1: 18-39.

Derlindati, E. (1998). Los flamencos de James y andino (Phoenicoparrus jamesi y P andinus): patrones de abundancia y caracteristicas de sus habitats en los lagos altoandinos del noroeste de Argentina. Tesis de Grado, Licenciatura en Ciencias Biologicas, Universidad Nacional de Salta, Argentina.

Espinoza, F., Parra, L., Aranguren, J., Martino, A., Quijada, M., Pirela, D., Rivero, R., Gutierrez, T., Jimenez, N., Leal, S. & Leon, E. (2000). Numbers and distribution of the Caribbean Flamingo in Venezuela. Waterbirds 23 Special Publication (1): 80-86.

Esté, E.E. & Casler, C.L. (2000). Abundance of benthic macroinvertebrates in Caribbean Flamingo feeding areas at Los Olivitos Refuge, western Venezuela. Waterbirds 23 Special Publication (1): 87-94.

Fox, V.E., Lindeque, P.M., Simmons, R.E., Berry, H.H., Brain, C. & Braby, R (1997). Flamingo "rescue" in Estosha National Park: technical, conservation and economic considerations. Ostrich 68 (2-4): 72-76.

Galaz, J., Brevis, C., Jara, C., Mathieu, C. Donoso, S. & Rubilar, L. (1998). Estado sanitario de una cohorte de flamenco chileno en el Salar de Surire, norte de Chile. IV Congreso Internacional sobre Gestión de Recursos Naturales, Puyehue, Chile.

Galaz, J., Gaytan, P., Rubilar L. & Brevis C. In press. Presencia de Mallophaga parásitos en crias de flamenco chileno (Phoenicopterus chilensis). Salar de Surire, Región de Tarapacá, Chile. Boletín Chileno de Ornitología.

Gloe, P. (1998). Ringförmige Spuren deh Nahrungsaufnahme von Rosaflamingos *Phoenicopterus ruber*. Ornithologische Mitteilungen 50:344-345.

Grussu, M. (1999). La nidificazione del Fenicottero *Phoenicopterus ruber roseus* in Sardegna. Aves Ichnusae 2: 3-46.

Hamerlynck, O. & Messaoud, B. ould. (2000). Suspected breeding of Lesser Flamingo *Phoeniconaias minor* in Mauritania. Bulletin of the African Bird Club 7(2): 109-110

Hill, G.E. (1999). Is there an immunoligical cost to carotenoid-based ornamental coloration? American Naturalist 154: 589-595.

Hughes, B. & Jarrett, N. (2000). Saving the world's threatened waterfowl. Wildfowl & Wetlands 134: 14-16.

Johnson, A.R. (2000). An overview of the Greater Flamingo ringing program in the Camargue (southern France) and some aspects of the species' breeding biology studied using marked individuals. Waterbirds 23 Special Publication (1): 2-8.

Johnson, A.R. (2000). Flamant rose. In Seriot et. al. Les oiseaux nicheurs rares et menacés en France en 1998. Ornithos 7(1): 1-18.

Johnson, A.R. (2000). Flamingo Specialist Group: past, present and future activities Waterbirds 23 Special Publication (1): 200-205.

King, C.E. (2000). Captive Flamingo populations and opportunities for research in zoos. Waterbirds 23 Special Publication (1): 142-149.

Lopez Huertas, D. (1999). Un jovenzuelo despitado. Quercus 155: 7.

Madrigal Diaz L. (1999). Flamencos y manchegos. Quercus 155: 7.

Marion, P. (2000). Observations ornithologiques dans la réserve naturelle du lac Tengiz (Kazakhstan, ex-URSS). Alauda 68(3): 243-246.

Mascitti, V. (1998). James' Flamingo foraging behavior in Argentina. Colonial Waterbirds 21(2): 277-280.

Mascitti, V. & Caziani, S. M. (1997). La retracción de la Laguna de los Pozuelos (Argentina) y los ambios asociados en la comunidad de aves acuaticas. In: Liberman, M. y C. Baied (Eds.). Desarrollo Sostenible en Ecosistemas de Montania: Areas Fragiles en los Andes. Instituto de Ecologia, Universidad Mayor de San Andres, Bolivia.

McCulloch, G. (2000). Flamebirds of the Makgadikgadi. Wildfowl & Wetlands 133 (Autumn): 18-22.

McCulloch, G. & Borello, W. (2000). The importance of the Makgadikgadi salt pans in Botswana for flamingos in Africa. Waterbirds 23 Special Publication (1): 64-68.

McNair D.B. & J.A. (1998). Assessment of occurrences of Flamingos in northwest Florida, including a recent record of the Greater Flamingo (*Phoenicopterus ruber*) Florida Field Naturalist 26(2): 40-43.

Nasirwa, O. (2000). Conservation status of flamingos in Kenya. Waterbirds 23 Special Publication (1): 47-51.

Passarella, M., Altieri, E., Bena, M., Boschetti, E., Tenan, S & Verza, E. (1999). Svernamento di Fenicottero Phoenicopterus ruber nel Delta del Po (Rovigo). Avocetta 23: 59.

Pickering, S. (1998). In the Pink. Wildfowl & Wetlands 126: 17-21.

Pirela, D.E. (2000). Monitoring Caribbean Flamingos at Los Olivitos Wildlife Refuge, western Venezuela. Waterbirds 23 Special Publication (1): 103-108.

Ramadan-Jaradi, G. & Ramadan-Jaradi, M. (1999). An updated checklist of the Birds of Lebanon. Sandgrouse 21: 132-170.

Rendón-Martos, M. (2000). Flamencos en Venezuela y Colombia. Medioambiente (Junta de Andalucia) 34: 16-22.

Rendón-Martos, M., Mario Vargas, J., Rendón, M.A., Garrido, A. & Ramírez, J.A. (2000). Nocturnal movements of breeding Greater Flamingos in southern Spain. Waterbirds 23 Special Publication (1): 9-19.

Rendón-Martos, M., Ramírez Gonzálev, J.A. & Rendón-Martos, M. A. In Bernués, M.

(1998). Humedales espa-ñoles inscritos en la lista del Convenio de Ramsar (2nd edition). Colección Técnica, Ministerio de Medio Ambiente.

Reolid, J.M. (2000). El mejor humedal de Albacete para las aves, en peligro por el regadío. Quercus 172: 50.

Riera, X. (1999). Crónica de la desaparición del Flamenco Común en el Delta del Ebro. La Garcilla 105: 30.

Sadler, A.E. & Sadler, J.E. (1998). Cyprus Ornithological Society Annual Report 45.

Sarmiento, J., Barrera, S. Caziani, S. & Derlindati, E. (1998). Región 6 Andes del Sur (Argentina). In: Canevari, P., D. E. Blanco, E. H. Bucher, G. Castro y I. Davinson (Eds.). Los Humedales de la Argentina: Clasificación, Situación Actual, Conservación y Legislación. Wetlands International Publ. 46, Buenos Aires, Argentina, 208 pp.

Schepers, F. J. , Keijl, G. O., Meininger, P. L. & Rigoulot, J. B. (1997). Oiseaux d'eau dans le Delta du Sine Saloum et Petit Côte, Sénégal. WIWO report 63.

Schifter, H. & Schifter, T. (1998). Zwergflamingo. P. 182 in Brut- und Zugvogelbeobachtungen auf Fuerteventura, 1992-1994. Bonner Zoologische Beiträge 48: 179-203.

Shannon, P.W. (2000). Plumages and molt patterns in captive Caribbean Flamingos. Waterbirds 23 Special Publication (1): 160-172.

Shannon, P.W. (2000). Social and reproductive relationships of captive Caribbean Flamingos. Waterbirds 23 Special Publication (1): 173-178.

Sielfeld, W. N. Amado, J. Herreros, R. Peredo & A. Rebolledo. 1996. La avifauna del Salar de Huasco, Primera Región, Chile. Boletín Chileno de Ornitológía 3:17-24.

Sielfeld, W. Amado, N., Herreros, J., Peredo, R., & Gallardo, P. (1998). Población de flamencos en el Salar de Huasco durante el verano 1993-1994. Boletín Chileno de Ornitología 5: 10-15.

Simmons, R.E. (2000). Declines and movements of Lesser Flamingos in Africa. Waterbirds 23 Special Publication (1): 40-46.

Simmons, R.E., Barnard, P.E. & Jamieson, I.G. (1998). What precipitates influxes of wetland birds to ephemeral pans in arid landscapes? Observations from Namibia. Ostrich 70: 145-148.

Simmons, R.E. & Borello, W. (1999). Flamingo migration routes – a challenge for Mocambique. Bird Numbers 8: 13-15. (reprinted in Afr. Wildlife (1999) 53: 4-6)

Spiekman, H.W., Keijl, G.O. & Ruiters, P.S. (1993). Waterbirds in the Kneiss area and other wetlands, Tunisia; Eastern Mediterranean Wader Project, Spring 1990. WIWO- report 38.

Studer-Thiersch, A. (2000). What 19 years of observation on captive Greater Flamingos suggests bout adaptations to breeding under irregular conditions. Waterbirds 23 Special Publication (1): 150-159.

Studer-Thiersch, A. (2000). Behavioral demands on a new exhibit for Greater Flamingos at the Basle Zoo, Switzerland. Waterbirds 23 Special Publication (1): 185-192.

Tourenq, C., Aulagnier, S., Mesléard, F., Durieux, L., Johnson, A., Gonzalev, G., & Lek, S. (1999). Use of artificial neural networks for predicting rice crop damage by Greater flamingos in the Camargue, France. Ecological Modelling 120: 349-358.

Treep, J.M. (2000). Flamingos presumably escaped from captivity find suitable habitat in western Europe. Waterbirds 23 Special Publication (1): 32-37.

Tuite, C.H. (2000). The distribution and density of Lesser Flamingos in East Africa in relation to food availability and productivity. Waterbirds 23 Special Publication (1): 2-63.

Ugarte-Núñez, J.A. (2000). Assessment of the threat to flamingos at the Salinas and Aguada Blanca National Nature Reserve (Arequipa, Perú). Waterbirds 23 Special Publication (1): 134-140.

Underhill, L.G., Tree, A.J., Oschadleus, H.D. & Parker, V. (1999). Review of ring recoveries of waterbirds in southern Africa. Avian Demography Unit, University of Cape Town.

Valqui, M., Caziani, S.M., Omar Rocha, O. & Eduardo Rodriguez, R. Abundance and distribution of the South American Altiplano Flamingos. Waterbirds 23 Special Publication (1): 110-113.

Winkler, R. (1999). Flamant rose. Pp 34-35 in Avifauna de Suisse. Nos Oiseaux supplement 3.

Yosef, R. Individual distances among Greater Flamingos as indicators of tourism pressure. Waterbirds 23 Special Publication (1): 26-31.

Zwarts, L., van der Kamp, J., Overdijk, O., van Spanje, T., Veldkamp, R., West, R. & Wright, M. (1998). Wader count of the Banc d'Arguin, Mauritania, in January/February 1998. Wader Study Group Bulletin 86: 53-69.

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Africa

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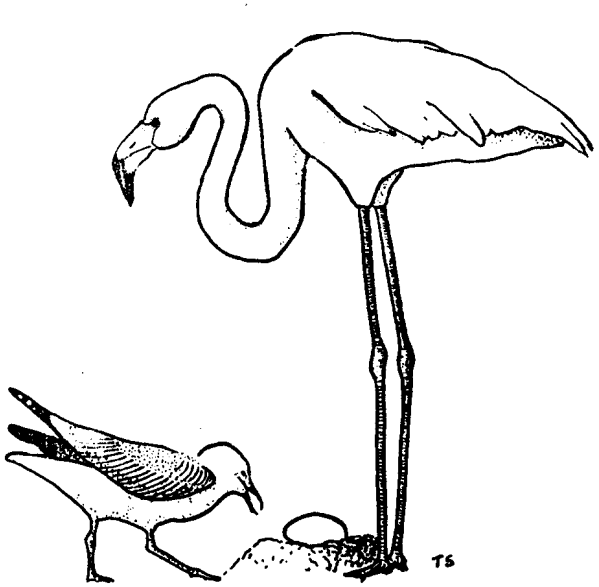

Request for sightings of banded flamingos

Since 1977, over 20,000 Greater Flamingo (*Phoenicopterus ruber roseus*) chicks have been marked in the western Mediterranean with coded plastic leg bands. These are engraved in black or white with alpha-numerical codes of 3 or 4 digits. French rings (yellow or white) from the Camargue are placed on the right tibia, Spanish (orange or white) bands from Fuente de Piedra (Malaga) on the left tibia and Italian (blue or red) on the left tibia. The black line engraved between the first two digits of the Spanish rings must be recorded to avoid confusion with other codes. These birds may be encountered in all Mediterranean countries, in Western Asia and in West Africa. All sightings will be acknowledged with a report of the bird's life history.

Recoveries and resightings should be addressed to:

Alan R. JOHNSON
Station Biologique
La Tour du Valat
Le Sambuc
13200 ARLES (France)

Anillamiento
Estación Biológica de Doñana
Pabellón del Perú
Avenida Maria Luisa s/n
41013 SEVILLA (Spain)

Nicola BACCETTI
INFS
Via Ca' Fornacetta 9
40064 OZZANO
DELL'EMILIA
(Italy)

E-mails France: <johnson@tour-du-valat.com>
Spain: <charina@cica.es>
Italy: <infszumi@iperbole.bologna.it>

Recoveries and resightings of Caribbean Flamingos (*Phoenicopterus ruber ruber*) banded in Venezuela and Mexico should be addressed to :

Frank ESPINOZA
Ministerio del Ambiente y
de los Recursos Naturales
Direccion General de Fauna
Apdo. 184
Maracay (Venezuela).
Fax: 58 043 838 264.
Emails: <profauna@marnr.gov.ve>
<ferlogan@cantv.net>

Rodrigo MIGOYA,
Reserva de la Biosfera Lagartos
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