

**IWRB - ICBP
FLAMINGO RESEARCH GROUP**

Coordinators:

NEW WORLD

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OLD WORLD

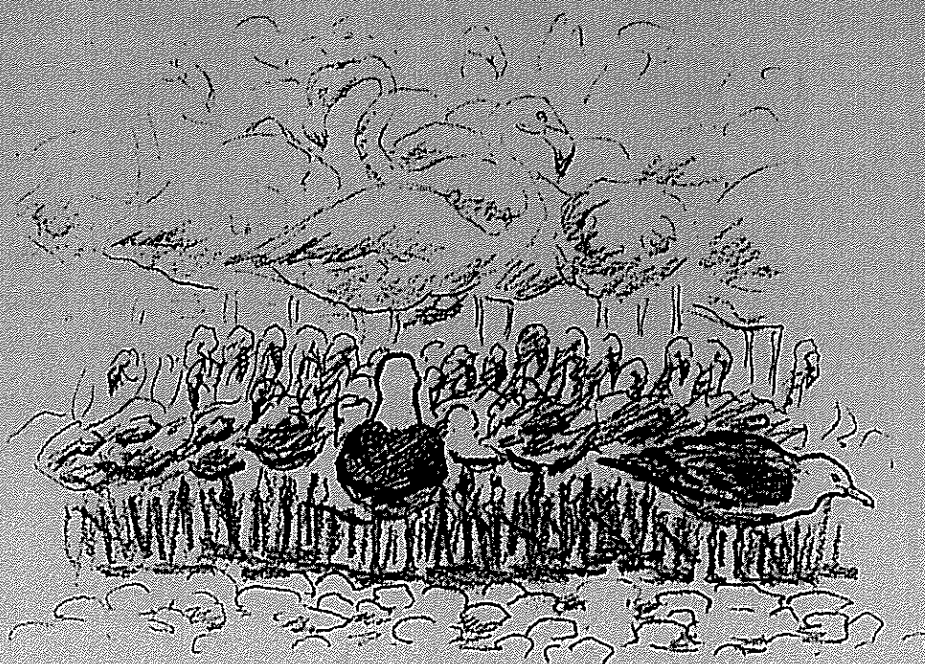
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NEWSLETTER N° 6

ANNUAL REPORT 1989

ANNUAL REPORT 1990

October 1992



*HAR . Faugetier
3/07/89*

The Editors of this newsletter apologise for the delay in publication.

We hope to have the 1991-1992 Newsletter ready for circulation within the next few months.

Thank you for your patience.

Alan R. JOHNSON

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ANNUAL REPORT

1989

BREEDING OF GREATER FLAMINGOS 1989



- Known breeding sites not reported in 1989
- Occupied in 1989
- ◐ no breeding in 1989

Large dots are the more regularly used sites

NEWS FROM THE REGIONS (OLD WORLD)

SOUTHERN AFRICA

BOTSWANA.

Good news from Botswana where Soda Ash Ltd. have agreed to bury high tension cables which cross the flight path of both Lesser and Greater Flamingos moving between the breeding colonies and the feeding areas on Sua Pan, Makgadikgadi (Sua News, Aug. 1989). Most birds undertake such movements in the evening and at night and many flamingos would surely have collided with overhead cables. The Soda Company is to be thanked for its generosity in taking into consideration the needs of wildlife in this remote part of Africa; cost P2.8 million.

Both Lesser and Greater Flamingos bred at Sua Pan during the 1988-1989 season (see Hancock 1990). The Greater Flamingos commenced courtship and nesting at the beginning of 1988 following a summer of above-average rainfall. In April 1988 aerial photographs revealed some 42-44,000 adult Greater Flamingos at the colony and they produced some 25-26,000 young.

In mid 1988 some 20,000 young Lesser Flamingos had been fledged and most appeared to have survived. A second group of chicks was not so lucky and about 2000 succumbed when the waters of Sowa dried up completely. During November another Lesser Flamingo colony was discovered in the middle of the pan with no water for kilometres around. From nest counts and aerial photographs it is estimated to have contained some 60,000 adult birds. They had obviously nested in anticipation of rain and, in fact, it did rain, and they were quite successful in rearing their young. A second batch of young were less successful and large numbers died (from Hancock 1990, based on research by T. Liversedge).

NAMIBIA

Greater Flamingos attempted breeding in the Etosha Pan. In May 1989, 3,000 empty nests and about 700 chicks of 4-6 weeks old were found on the dry pan. A rescue operation was mounted which captured 765 chicks at a 7% mortality rate. Since they were doomed they were donated to bird parks and zoos throughout Namibia and South Africa (from Dr. Rob Simmons, Directorate of Wildlife Conservation and Research, Windhoek 9000).

WEST AFRICA

SENEGAL.

J.L. Lucchesi and N. Hecker reported 6 000 Lesser Flamingos in the Djoudj National Park from 24-30.3.1989, the highest count yet reported for this species in West Africa, where breeding has been recorded only once (in 1965).

MAURITANIA.

Greater Flamingos seemingly bred at two sites, presumably at the Aftout es Saheli in the south and at the more regularly colonised island in the Baie d'Arguin. Breeding was not witnessed in the Aftout but the early appearance of juvenile flamingos in Spain (46 on 21/7/1989 ECV) and one in France aged ca. 4 months (July) make believe that this was so in view of the early appearance of these juveniles in Europe (it is known that there was no breeding in either Tunisia or Spain in 1989). Breeding in the Aftout takes place early in the year and was over when T. van Spanje made an aerial survey of the whole of the Mauritanian coast on 19-20 June 1989. He found about 1 500 prs. of flamingos breeding on the Ilot des Flamants in the Baie d'Arguin (P. N. Banc d'Arguin).

Aerial photographs revealed about 1 040 chicks crèching and 500-600 birds still on the nest with either eggs or newly-hatched chicks. The oldest chicks in the crèche were aged ca.30 days indicating that laying began soon after April 20.

WEST MEDITERRANEAN

ALGERIA.

Mid-January counts were carried out for the third successive winter by the I.N.A. over the majority of wetlands frequented by flamingos in Algeria. These revealed: Jan. 1987 4 075, Jan. 1988 3 195 and Jan. 1989 1 820 flamingos (inf. M. Bellatreche, B. Chalabi, J.P. Jacob, M. Paquay).

SPAIN.

Censuses covering the whole of the flamingo's range in Spain were carried out by the ECV team (University Complutense, Madrid). These revealed the following numbers: Jan. 17 170, March 22 591, May 29 186, July 19 529, Sept-Oct. 17 203.

There was no breeding at Fuente de Piedra because of low water levels following the rather dry autumn-winter and high rate of evaporation in early spring.

PORTUGAL (compiled by J. C.Farinha and R. Serra Guedes)

Monthly censuses of Greater Flamingo were carried out from January to July 1989 on the two main wetlands frequented by the species in Portugal, the Tejo Estuary and the salines at Castro Marim (Algarve). The results are given in the following table :

Monthly censuses of Greater Flamingo

	Jan	Feb	Mar	April	May	June	July
Tejo Estuary	240	p	0	230	530	1100	1170
Castro Marim	300	p	337	p	116	p	1040
Total	540	p	337	230+	646	1100 +	2210

FRANCE.

The mid-Jan. 1989 census over the wetlands of the Mediterranean coast revealed a wintering population of 22 873 flamingos, the highest number ever recorded at this time of the year (since counts began in 1965). The winter was extremely mild. Breeding took place at the usual site at the Etang du Fangassier in the Camargue. In spite of the retarded flow of water into the salines because of a strike, and disturbance and clutch losses due to the presence of an aggressive Black Swan* (*Cygnus atratus*), escaped from captivity somewhere, this was a highly successful year with 7 200 chicks raised from 10 200 breeding pairs. Laying did not begin until May 5th, the latest start to breeding ever recorded. The Tour du Valat Flamingo team monitored breeding by 278 leg-banded birds aged from 5-12 years ringed in the Camargue as chicks. A May census revealed a total of 45 000 flamingos in France.

On 9th August 1989 595 chicks were Darvic and metal banded, weighed and measured. This brought the total of chicks Darvic-marked since 1977 to 8 476.

* feral Black Swans bred in 1990 near Pau, S. France (La Bergeronnette, Bull.no 5, 1991)

EAST MEDITERRANEAN

GREECE

The mid-winter count of January 1989 revealed 2219 Greater Flamingos (44 juveniles) on six wetlands in Thrace (G. Handrinos).

TURKEY

The fourth successive mid-winter waterfowl count was carried out in January 1989 by Dijkssen & Blomert, who censused 9768 flamingos in western Anatolia.

M. Siki reports from the Camalti Tuzlasi Bird Sanctuary, Izmir, where about 100 pairs of Greater Flamingos have bred annually since 1982. In 1989 the first eggs were laid between May 20-30. About 75 young took wing from this small colony which was established on the remnants of a dyke in the salines.

CYPRUS.

A January visit was made in 1989 to Lakes Larnaca and Akrotiri in order to search for Darvic-banded flamingos from the western Mediterranean. Most of the birds wintering on Cyprus are thought to be of Asiatic origin (Turkey, Iran, Russia) but one Spanish and 5 French rings, the codes of which were read in the field, provided evidence of a mixing of birds from colonies far apart (Johnson 1990).

ASIA

PAKISTAN

The mid-winter waterfowl census in Sindh, Pakistan, in January 1989, conducted by F.J.Koning, Hamid Ali Khan and Najan Khurshid, revealed a total of 7,404 Greater Flamingos and 2,300 Lesser Flamingos on seven wetlands. This is only the second year that Lesser Flamingos have been reported in Pakistan. (Information from Mr. Abrar Husain Mirza.)

IRAN

Dr. B. Behrouzi-Rad reports 42 000 breeding pairs of Greater Flamingos on Lake Uromiyeh (formerly L. Rezaieyeh) in 1989 with 40,000 chicks raised.

THE WILDFOWL & WETLANDS TRUST FLAMINGO PROJECT

Dr. Simon PICKERING

The launch of the Flamingo Project at The Wildfowl & Wetlands Trust in 1989 was an exciting new development. The flamingos are some of the least understood birds in the world, and for the first time a co-ordinated international study is under way to provide the sound scientific basis essential for effective conservation measures.

The aim of the Flamingo Project is to begin to answer the questions essential to the management of wild flamingos and breeding captive flocks. Investigations into understanding annual changes in body weight and condition, growth and development of chicks, the amount of parental care given by each parent and factors influencing foraging behaviour are now under way.

Generous financial support has been received by Wessex Water and by the fund-raising efforts of Mr John Allport.

RESULTS OF 1989 WORK

1989 was the first season that detailed records on the breeding of the Slimbridge flamingos were made. For each flock the identity of every breeding bird, its partner, date of laying, date of hatching or failing and survival of chicks were recorded. 1989 was a particularly successful breeding season for flamingos at Slimbridge, with 15 Greater, 12 Caribbean and 12 Chilean chicks being reared. This was apparently due in part to the long dry summer. Both the Caribbean and Greater Flamingos began breeding much earlier in the summer than usual, producing a record number of surviving chicks. The Chilean Flamingos, however, began breeding much later than previously recorded over twenty summers at Slimbridge. In the wild, Chilean Flamingos typically breed high in the Andes at the beginning of the rainy season. It may well have been the lack of rain that prevented them from breeding earlier in the season at Slimbridge.

Observations on the display behaviour of Flamingos revealed that in the Greater and Caribbean Flamingos it was the non-breeding birds that displayed most frequently during the spring. In the Chileans, however, the whole flock, apart from yearlings and two-year olds, displayed prior to breeding. This tends to suggest that in Caribbean and Greater Flamingos the display is related to acquisition of a partner, while in the Chilean Flamingo it serves to ensure that the whole flock begins breeding at the same time.

In the Greater Flamingos belly profiles were shown to be useful indicators of body condition in females. Females which reared a chick successfully during 1989 were in the best condition prior to the breeding season. Soon after the chicks hatched most were weighed and measured. From this starting point their growth was monitored remotely by photographing the chicks against an object of known height (their parent's tarsus). Both parents feed the chick a special crop milk for the first few months. The share of parental duties appears to be divided equally between the sexes.

Although the Andean Flamingos did not lay any eggs in 1989 they did go through a period of displaying and nest building. These aspects of their biology were studied by two students.

A total of fourteen student volunteers worked with the project during 1989. Some carried out short studies of their own while most assisted with routine observations. Each was given basic training in ethological techniques and several were taught to develop and print black and white films.

PUBLICITY AND CONTACTS

Flamingos are very popular with visitors to The Wildfowl & Wetlands Trust Centres and the media. Significant time was spent providing interviews and photocalls for the press, radio and television, resulting on excellent publicity for the project. The Flamingo Project also dealt with numerous enquiries from the public and provided detailed advice to six other avicultural organisations which hold flamingos in Spain, USA and the U.K.

Simon Pickering attended an International Conference on flamingos in Andalucia, Spain in the autumn, along with 100 delegates from 14 countries. He gave two papers, on changes in the Western Mediterranean Greater Flamingo population over the last twenty years, and on the research work at Slimbridge.

THE PROGRAMME FOR 1990

In 1990 each flock's breeding was monitored during the season. In the wild, Lesser Flamingos typically breed in flocks of many thousands. Six large mirrors installed in the Lesser Flamingo house at Slimbridge to increase the apparent size of the flock and encourage our 30 individuals to breed. Detailed observations on the effect of the mirrors on flock behaviour and display rate are being made. A system for weighing flamingos without disturbing them has been developed and will monitor weight changes during the year.

In conjunction with Manchester Polytechnic a survey of flamingos in captivity in Britain has been carried out. This is being analysed, and a national database has been set up.

Simon Pickering
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Gloucester GL2 7BT

SITUACION DEL FLAMENCO EN LA LAGUNA DE FUENTE DE PIEDRA (ESPANA) DURANTE EL AÑO 1989.

por M. Rendon Martos

El año hidrológico 1988 - 1989, ha sido el más seco de los últimos seis años, con una precipitación de 377,5 mm., se encuentra por debajo de la media de esta zona (460 mm.). Las precipitaciones se han producido muy repartidas en el tiempo, por lo que la laguna ha mantenido un bajo nivel de agua durante todo el periodo, no sobrepasado los 22 cm. de lamina de agua en ningún momento (Figura 1). En los primeros días de mayo se alcanzó el nivel de desecación y posteriormente las precipitaciones de final de este mes favorecieron la presencia de agua durante unos días, siendo a partir de primero de junio cuando la laguna quedó seca definitivamente (1).

Al inicio del periodo reproductor, el número de flamencos censados en Fuente de Piedra no superó en ningún momento los 1.495. La mayor parte del periodo en que la laguna permaneció con agua, se observaron pequeños bandos nómadas, formados por algunas decenas o cientos de aves que abandonaban la laguna a la puesta del sol, o durante la noche, fluctuando el número de aves censadas de un día para otro, como se pone de manifiesto en la figura 1, la fluctuación numérica en el número de flamencos está relacionada con el periodo de inundación de la laguna, y al mismo tiempo los efectivos de esta especie no se mantienen constantes dentro de cada mes. Los grupos de cortejo observados fueron escasos y con poca actividad. Como consecuencia no se ha dado una importante concentración de aves previa al periodo reproductor, como ocurre los años que los flamencos crían en la laguna, que para el mes de marzo acoge a más de 13.000 aves.

Al no darse las condiciones necesarias para la formación de una colonia reproductora (2) : bajo nivel de agua en la laguna en primavera y falta de alimento, la Agencia de Medio Ambiente puso en marcha un Proyecto de Investigación en colaboración con el Departamento de Biología Animal de la Universidad de Málaga, con el fin de efectuar el seguimiento y control del Flamenco en Andalucía durante el periodo reproductor de 1989.

Se ha podido constatar, al menos cuatro intentos de reproducción en las siguientes localidades Andaluzas : Salinas del Cabo de Gata (Almería), Marismas del Guadalquivir (Sevilla), Marismas del Odiel (Huelva) y Salinas de la Bahía de Cádiz, ninguno de ellos con éxito (3).

SUMMARY

1988-1989 was the driest of the past six years at Fuente de Piedra, with only 377.5mm of precipitation compared to an average of 460mm. Rainfall was infrequent, and flamingo numbers fluctuated accordingly. The level of the lagoon never exceeded 22cm (Fig. 1) and dried up completely in early June. There were only 1495 flamingos in the lagoon in the early breeding season. In view of this situation the Agencia de Medioambiente (AMA) carried out surveys elsewhere in Andalusia and found that flamingos had nested in four other sites: Cabo de Gata (Almeria), Marismas del Guadalquivir (Sevilla), Odiel (Huelva), and salinas in the Bay of Cadiz. However, all of these attempts failed.

DINAMICA TEMPORAL de Ph. ruber

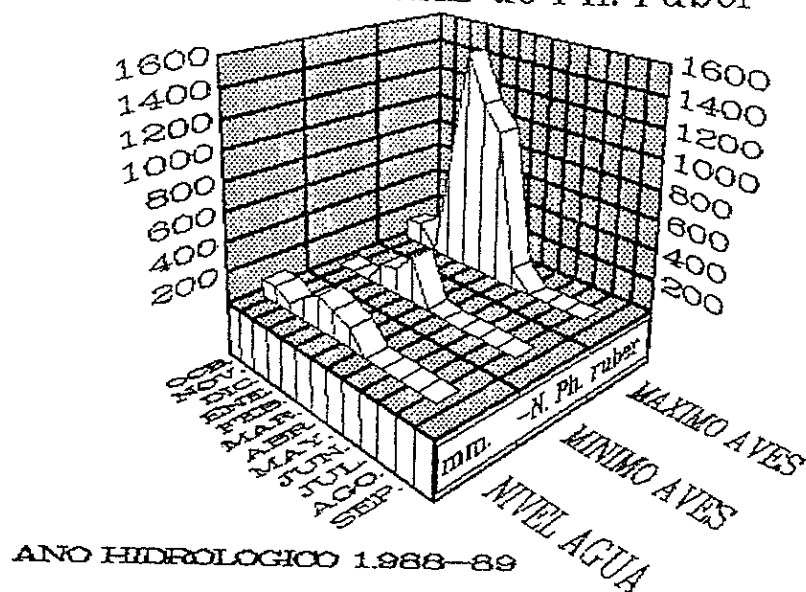


Figura 1 : Fluctuación numérica de los efectivos de flamenco (*Phoenicopterus ruber*) (número máximo y mínimo de *Ph. ruber* censados cada mes) y evolución del nivel de agua (en m.m.) en la laguna en Fuente de Piedra durante el periodo Octubre de 1.988 hasta septiembre de 1.989.

REFERENCIAS:

- (1) Instituto Tecnológico Geominero de España. (1.990) Observaciones climatológicas, hidrológicas e hidrogeológicas en la cuenca de Fuente de Piedra durante e año 1.988-89., 50 pg.
- (2) Rendón, M. (1.988). Estudio y conservación de la colonia de flamencos (*Phoenicopterus ruber roseus*) en Fuente de Piedra, España. Newsletter 4 : 11-13.
- (3) Ruiz, R., Linares, A. (1990). Estudio del flamenco (*Phoenicopterus ruber roseus*) en Andalucía durante el periodo reproductor de 1.989. Agencia de Medio Ambiente.

PRIMEROS RESULTADOS DE LOS ANILLAMIENTOS DE FLAMENCOS (*Phoenicopterus ruber roseus*) EN LA LAGUNA DE FUENTE DE PIEDRA.

Por José Miguel Ramírez González.

Durante los años 1986, 87 y 88 se han realizado campañas de anillamiento de pollos de flamencos en la laguna de Fuente de Piedra (Málaga), por parte de la Agencia de Medio Ambiente (A.M.A) de Málaga, en colaboración con la Estación Biológica de Doñana (España), el equipo de flamencos de la Estación Biológica La Tour du Valat de Camarga (Francia), y Departamento de Biología Animal de la Universidad de Málaga, entre otros.

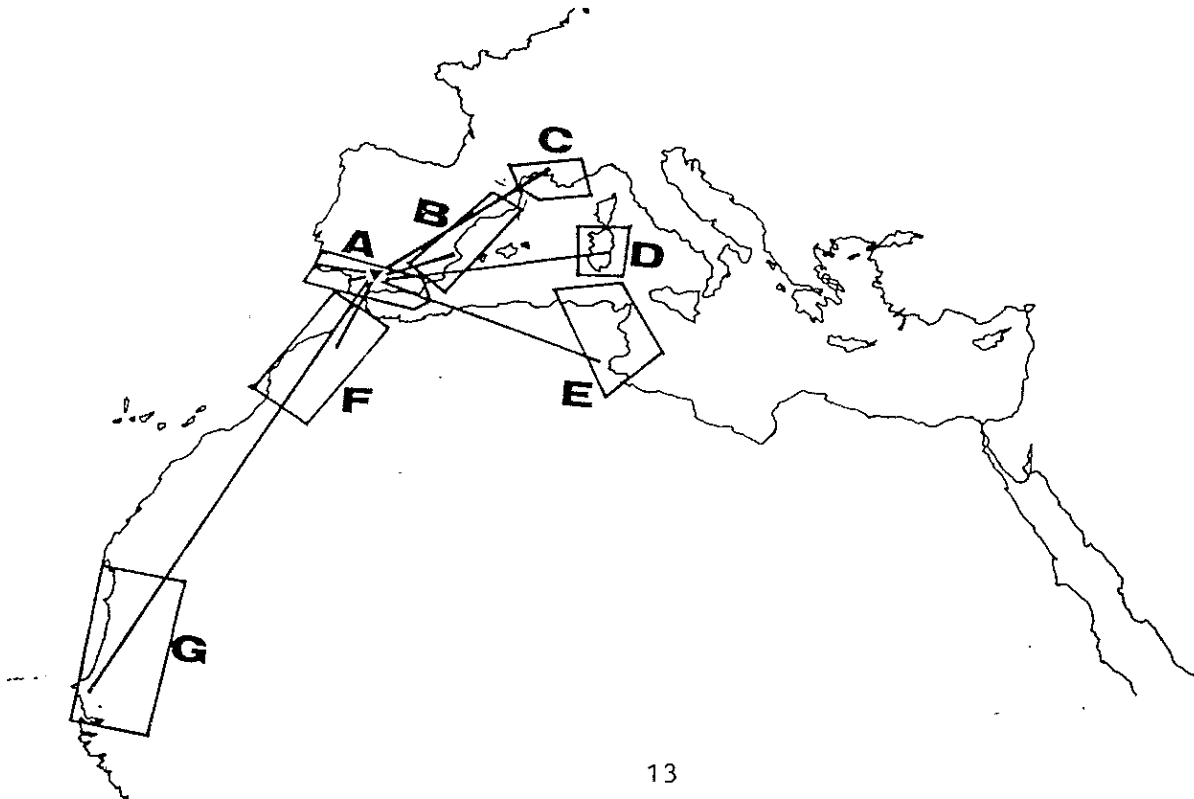
El número de pollos anillados en cada campaña ha sido el siguiente :

año 1986.....	622 pollos
año 1987.....	700 pollos
año 1988.....	1 000 pollos

Se consideran sólo los registros obtenidos por distintos observadores hasta Mayo de 1988, con lo que en realidad se utilizan solamente las observaciones derivadas de los dos primeros años de anillamiento. Por ello, todas las observaciones se refieren a aves que aun no son reproductoras.

Una primera aproximación de estos resultados ya fué expuesta en una de las ponencias en la pasada Reunión Técnica sobre la Situación y Problemática del Flamenco rosa (*Phoenicopterus ruber roseus*) en el Mediterráneo Occidental y Africa Noroccidental en Noviembre de 1989, Antequera (Málaga).

La interpretación de los datos de que se disponen debe estar sujeta a una cierta cautela, pues se ha puesto de manifiesto la distinta intensidad de muestreo zonal, así como una cierta falta de coordinación a la hora de reunir los datos de los distintos observadores.



Las zonas arbitrariamente establecidas para determinar la distribución de las anillas localizadas han sido :

- A : Sur Peninsula Ibérica
- B : Levante español
- C : Sur de Francia
- D : Cerdeña
- E : Túnez
- F : Marruecos
- G : Noroeste de Africa

Además, estas observaciones se distribuyeron en diferentes periodos dentro el ciclo anual y se denominaron de la siguiente forma:

- **DISPERSIÓN** (desde la fecha de anillamiento hasta el mes de Noviembre del mismo año).
- **INVERNADA** (meses de Diciembre y Enero posteriores al anillamiento).
- **REPRODUCCIÓN** (desde Febrero hasta la fecha del siguiente anillamiento).

Los controles se establecieron del siguiente modo : un ave observada varias veces en una zona durante el mismo periodo era un control ; un ave en dos zonas en un mismo periodo como dos controles; y un ave en dos periodos en una misma zona como dos controles.

El número de observaciones reales es muy superior, pero no han sido contabilizadas como controles por ser observaciones de la misma anilla en una zona dentro de un periodo determinado.

A partir del conjunto de los controles analizados cabe inferir los siguientes resultados:

- las aves que nacen en la Laguna de Fuente de Piedra se distribuyen por todas las zonas húmedas del Mediterraneo occidental y noroeste africano, donde se localiza la población considerada.
- el mayor número de controles se realiza siempre en la zona denominada como Sur Peninsula Ibérica, siguiéndoles la del Levante español y Sur de Francia. Además, el porcentaje de controles es siempre superior durante el periodo denominado de Dispersión, respecto al total anual.

	DISPERSIÓN	
	1er periodo %	2eme periodo %
Sur Peninsula Iberica	55.21	65.94
Levante espanol	21.28	18.04
Sur de Francia	13.30	9.02
Restantes zonas	11.20	7.00

(estos porcentajes están referidos al total de controles de este periodo).

El resto de los porcentajes no resultan muy representativos. Esto, únicamente, pone de manifiesto cuales són las zonas donde se establece una mayor intensidad de muestreos, así como el periodo en que estos se incrementan. El número de controles disminuye de manera muy notable tanto en el resto de las zonas como de periodos considerados.

A tenor de esta primera valoración se pone de manifiesto que los controles realizados hasta el presente han tenido repercusiones muy positivas :

- obtención de datos interesantes sobre el tránsito de aves desde la zona mediterranea europea hacia la africana y viceversa, estableciendose algunos controles intermedios en Cerdena.
- distribución de las aves anilladas en Fuente de Piedra.

Pero también es preciso insistir en la necesidad de futuras acciones coordinadas en la obtención periódica de controles, en distintas zonas húmedas del Mediterraneo occidental, por fortuna hoy bien conocidas, con objeto de evaluar desde un punto de vista estadístico los movimientos de la población a lo largo del año y determinar la importancia temporal de cada zona en el ciclo biológico de los flamencos. Tales consideraciones ya fueron puestas de manifiesto por algunos ponentes de la Reunión Técnica anteriormente citada.

Por todo ello, se sugiere la elaboración de un plan de coordinación de censos, para establecer un seguimiento de estas aves, de manera que se puedan efectuar comparaciones zonales. Para ello, sería necesario adecuar las fechas e intensidades de muestreo en todas las zonas de interés, ya que con los datos actuales estas comparaciones no son factibles.

Reserva Natural Laguna de Fuente de Piedra.
Apartado de Correos n°1 29520
Fuente de Piedra.
Málaga. España.

SUMMARY

In 1986, 1987 and 1988 respectively, 622, 700 and 1000 flamingo chicks were caught and ringed at Fuente de Piedra Lagoon. Many of these birds have been resighted throughout the western Mediterranean and in North-West Africa, with most observations coming from the Iberian Peninsula and southern France. These results represent the first detailed information on movements, dispersal and wintering of flamingos born at Fuente de Piedra, none of which have yet bred.

**TECHNICAL SEMINAR ON THE STATUS AND CONSERVATION
PROBLEMS OF THE GREATER FLAMINGO (*Phoenicopterus ruber roseus*)
IN THE WESTERN MEDITERRANEAN AND NORTH WEST AFRICA.**

A workshop was organised in Antequera, Malaga (Spain) by the Junta de Andalucia (the Andalusian Autonomous Government) from 9-11 November, 1989. This three-day technical meeting was attended by forty-five people from twelve countries, and nineteen papers were presented. Sessions were devoted to population size and distribution, biology, problems related to flamingo conservation in the Mediterranean and N.W.Africa, and the conservation status of the more important sites used by flamingos throughout this region.

The recommendations and conclusions of this meeting were published in a 238-page book, published by AMA, and are given below:

POPULATION: SIZE AND DISTRIBUTION

Conclusions

1. From the tracking of flamingos which were individually ringed in the two regular breeding colonies -- Camargue (France) and Fuente de Piedra (Spain) -- the area of distribution of the Greater Flamingo in the Western Mediterranean and North West Africa is defined as being southern France to the North, Sardinia, Italy and Tunisia to the East, Portugal to the West, and the 30°N latitude (Agadir) to the South.

2. To the present day this population of the Greater Flamingo, which has been counted for many years in the major flamingo locations, is estimated to be between 60,000 and 80,000 individuals. It has remained more or less stable for the last few years.

3. Within the present area of distribution numerous important habitats exist for the species, especially in North West Africa, where no regular surveys have been carried out.

4. A certain level of interaction has been confirmed between the populations of the Western Mediterranean, the Eastern Mediterranean and West Africa.

Recommendations:

1. To establish an annual assessment of the total size of the population.

a) This population survey could be coordinated by the IWRB Census of wintering birds, recorded on standardised census-sheets and sent back to the IWRB. In addition, the places where flamingos are not observed should be noted. The IWRB should set up and distribute a methodology for counts and age identification.

b) The population censuses should begin simultaneously in all sites using the same methodology (IWRB).

c) At least two annual censuses should be made: one in January and another in May, the winter count being the most important.

2. Annual assessment of survival.

a) The estimation of survival of birds in the different wintering areas should be achieved by reading the plastic rings. The actual estimates for the areas can only be obtained if data from ringed flamingos in France and Spain are studied jointly. The number of flamingos ringed in France and the number of those ringed in Spain should be registered separately.

b) The exchange of information on the surveillance of rings must be fostered between the teams and centres of investigation.

3. Annual Surveillance of the Breeding Population:

The number of nesting flamingos in the Western Mediterranean ought to be estimated annually in each colony by counting the maximum number of incubating birds (for greater accuracy). It may be necessary to fine-tune this method if the egg-laying period takes place over a longer period of time. The number of young should be estimated by a count preferably using aerial photography of the crèche when the chicks are at least half-grown.

4. Coordination of Research and Surveillance:

A subcommittee should be established within the IWRB Flamingo Research Group to collate and publish the estimates of the size of the population and the success of reproduction. The objective is to standardize the interpretation and the collection of data and to set up a general calculation for the population levels and their trends. The subcommittee's work will require an increase in cooperation between scientists who work on the flamingo with financial support for their meetings and publications. For effective cooperation between the researchers, a rapid despatch of data of sightings of ringed birds to the team which marked them must be established. At the same time, on the team's part, a history of each bird should be sent as soon as possible.

5. Identification of Places of Interest:

In selected areas or regions periodic counts need to be made as frequently as possible. This data is very valuable when combined with the register of ringed birds, for the identification of important areas of dispersal and migration. This data, expressed with greater precision, could also be used to determine the limits of the important wetland areas, identifying within them those that are partially sensitive and to identify those where the high-tension wires which cross them could cause the death of birds.

BIOLOGY OF THE GREATER FLAMINGO. PROBLEMS AND CONSERVATION OF THE SPECIES IN THE WESTERN MEDITERRANEAN AND NORTH WEST AFRICA

Conclusions.

1. Only two regular breeding areas survive in the Western Mediterranean: Camargue (France) and Fuente de Piedra (Spain), although flamingos breed sporadically in some other sites.
2. These areas are considered to be essential for the maintenance of the present day population.
3. The exceptional importance, for the Greater Flamingo, of the wintering areas is confirmed, especially the African habitats. Also the feeding areas within a radius of 150 km. around established breeding colonies have a great importance.

Recommendations.

1. To ensure that the population of the Greater Flamingo in the Western Mediterranean remains and maintains itself at the present level (60,000 to 80,000 birds) it is necessary to ensure the existence of at least two reliable breeding places, each able to support at least 10,000 breeding pairs, within the different countries of the region (as previously defined).
 - a) Prevention of public access within the protection zone around the colony during the breeding season, through increased vigilance, construction of fences and other appropriate means.
 - b) Prevention of disturbances to the breeding colonies caused by low-flying planes, for which it is necessary to contact the civil and military air authorities, so that flights over the colonies lower than 2000 m. (6000 ft.) will not be authorized.
 - c) Implementation of means to reduce predation of chicks and eggs and to maintain suitable levels of water around the colony before the egg-laying and until the young have grown their plumage.
 - d) Carrying out, where it may be necessary, means to reduce or restore the erosion in the nest site areas caused by rain, wave action and the activities of flamingos.

- e) Avoiding the development of factors that increase the disturbances by man in the breeding colonies, such as establishment of aquatic sports, etc.
2. The Greater Flamingo is found within Annex 1 of the Directive 79/409, CEE, on the protection of migratory birds, and it has been legally protected in all the countries of the Western Mediterranean. Nevertheless, it is necessary to make an effort to reduce the accidental or deliberate death of flamingos by establishing such measures as:
 - a) The strengthening of shooting laws.
 - b) The development of training courses for hunters.
 - c) Fencing in the wetlands in order to avoid disturbance and accidental death, for example by shooting.
 - d) Controlling the installation of new power lines, implementing suitable alterations in order to prevent deaths by collision and/or electrocution by these structures, including, if necessary, burying some dangerous sections.

CONSERVATION STATUS OF AREAS OF SPECIAL INTEREST FOR THE GREATER FLAMINGO

Conclusions.

1. Management of the wetlands used by flamingos, including the breeding grounds and the subsidiary localities of wintering and feeding, is required.
2. It is confirmed that the large movement of flamingos from Fuente de Piedra to the Marismas (marshes) of the Guadalquivir during the breeding season, is a response to the need of some birds to obtain sufficient nutrition. The growth in importance of the Marismas as a food source is probably influenced by the disappearance of other immediate habitats, implying the necessity to develop scientific research that evaluates the availability of nutritional resources, not only for flamingos but for other aquatic species of the Marismas of Guadalquivir, with the objective of ensuring an adequate equilibrium between the production and the biological communities which it sustains.
3. It is considered necessary to include in the Ramsar Convention the wetlands of importance to the flamingo, not included to this date, especially the areas for the temporary growth of the young and immature.
4. Given the fundamental importance of the habitats in the salt-making areas (the "salines") for the flamingo in the Western Mediterranean, the disappearance of the salines for economic reasons requires special caution so that their reconversion respects the ecological legacy that they contain.

Recommendations.

1. The establishment of an integrated management of the wetlands used by the flamingo. For each area used by the flamingos an "integrated management plan" should be developed. This should include:
 - a) Zoning and creation of strictly protected areas.
 - b) Confirmation of compatible human usage.
 - c) Where it seems appropriate, carry out campaigns to frighten away birds, to reduce the damage to rice crops and other agricultural crops.
2. To protect the wetlands used by the flamingo for feeding during the breeding season. All the wetlands situated within a radius of 150 km. around the breeding colonies must be protected, as the flamingos will require different types of wetland depending on the annual and seasonal variations of water levels and temperature. These variables can restrict the use of each one of the wetland zones. Measures to protect these places should include:

- a) Contact with the authorities and governments to secure the designation, as Ramsar zones, for all those wetlands that are important to the reproduction of the flamingo.
 - b) Prevention or restoration of changes to prevent any damage to the hydrology of the wetlands caused by the extraction of water, pollution or drainage.
 - c) Conservation of traditional uses of the wetlands, such as the extensive cattle ranching and the commercial production of salt by evaporation.
3. To protect wetlands visited by flamingos outside the breeding season:
 - a) Measurements should be adopted, similar to the counting methods of the previous section in the different places that maintain an important number of flamingos. The criterion for international importance must be that the place supports at least 1 % of the Western Mediterranean population.
 - b) Special consideration should be given to the resting places during long journeys through areas unfavourable to the species (eg. Sardinia and Algeria).
 4. Increase of vigilance in the "saline" habitats.
 5. Studies on the principal nutritional requirements and feeding habits of flamingos should be initiated, and therefore the processes that determine their improvement or degradation.
 6. Quantify the impact that flamingos have on food resources and habitats available for other aquatic birds. The impact of flamingos on the macrophytic submerged communities, which are an important food source for other aquatic birds and habitats for fish and invertebrates, should be quantified through observations in the field that might include the artificial exclusion of the flamingos in carefully selected areas.

FINAL CONCLUSIONS

1. Send the conclusions and recommendations of this Technical Meeting to all the governments and non-government organizations (such as those institutions of scientific character, etc...) of the Western Mediterranean where the flamingo occurs.
2. Set up a meeting within three years to evaluate the initiation and development of the recommendations of this paper and, where appropriate, to modify the lines of action.

BIOLOGY OF THE GREATER FLAMINGO IN THE GREAT VEDHARANYAM SWAMP, POINT CALIMERE SANCTUARY, INDIA

by Ranjit MANAKADAN

*Extracted from chapter 8 of Ecology of Point Calimere Sanctuary
(an endangered ecosystem). B.N.H.S. report October 1989,
by Daniel, J.C. & Rao, Y. N.*

INTRODUCTION

The Great Vedharanyam Swamp (Fig. 1) lies parallel to the Palk Strait from which it is separated by a sand bank. It is about 48 km in length (E - W) and varies in width from between 6 - 10 km. It covers a total area of 349 sq.km. There is a gradual slope from north to south.

Within the swamp there is a mangrove forest in the western part. Elsewhere there is considerable seasonal variation of the quality and quantity of water. During the monsoon and during the windy period in April-May (known locally as "Visakam") there is a continuous stretch of brackish or salt water as far as the northern boundary. During the dry season this gradually dries out from north to south when there are mudflats and pools of water and in very dry years only the two permanent water bodies remain. These are the Mullipallam Creek in the west (mangrove region) and the Seruthalaikkadu Creek in the east, both being in contact with the sea. Except during peak monsoons these two water bodies are always separated by a stretch of land. The water varies in depth from about 60 cm. to 120 cm., according to the season. During the monsoon a few small rivers drain into the swamp and there are some islets.

In 1963, the Mettur Chemical & Industrial Corporation Ltd. and Wimco Ltd. set up salt complexes in the swamp (Fig. 1). These salt complexes compose of a series of reservoirs and condensers for the storage and evaporation of the salt water. Mettur Chemical presently covers an area of 1415 ha. and Wimco an area of 1290 ha. They produce respectively 80,000 and 40,000 tons of industrial salt. This is used for the manufacture of caustic soda, chloride and other inorganic products in factories elsewhere in India.

In 1979, the Tamil Nadu Industrial Development Corporation (TIDCO) had a plan to convert 24,290 ha. of the Great Vedharanyam Swamp into an industrial salt complex. Following complaints by environmentalists on the possible adverse effects such a plant might have on the ecosystem as a whole, TIDCO commissioned the BNHS to investigate this aspect and to find a via media for harnessing the potential of the swamp, without adversely affecting the ecosystem. The one year study carried out (Ali 1981) gave an idea of the effects of salt industries on the environment and forwarded recommendations to the government with suggestions for areas that could be developed with less damage to the ecosystem. As a result only a 1,790 ha. salt extraction unit was set up in the extreme west of the swamp. However, TIDCO now has plans to set up an 80 crore ammonium chloride and soda ash plant near Vedharanyam for which a salt extraction plant will have to come up in the swamp for supply of the raw material. The government is hesitant about allowing this because of protests by environmentalists and complaints from local people who attribute an increasing salinity of the water in their wells to the storage of high concentrate brine in the salt complexes already existing.

Point Calimere Sanctuary is host to both Lesser (*Phoenicopterus minor*) and Greater Flamingos (*Phoenicopterus ruber roseus*). It was earlier presumed that they originated from the Rann of Kutch, the only known breeding ground of flamingos in India. However, some birds clearly come from further afield since there have recently been two recoveries of ringed Greater Flamingos, one from Iran and the other from Russia.

Study methods

During the first year of our study we looked into the following aspects:

- 1) Population size and fluctuations in numbers during the yearly cycle.
- 2) Distribution within the sanctuary in order to establish if there is a habitat preference.

Counts were made on at least three different days each week of the numbers of both Lesser and Greater Flamingos present in the eastern part of the sanctuary. Because of the extent of the swamp these had to be restricted to the area around the field station. Only the maximum count was retained for the weekly census. From June 1989, the whole of the swamp was censused by boat once a month but the results of these are not given in this paper.

RESULTS AND DISCUSSION

The numbers of both Lesser and Greater flamingos censused between August 1988 and August 1989 are shown in Figures 2 & 3. The population of Greaters peaked in November 1988 at 1650 birds and again in June 1989 with 1665 birds. Numbers were lowest in April-May (Fig. 2). Slightly fewer Lesser Flamingos were censused. Their numbers peaked at 1050 birds in April 1988 but similar numbers were again recorded in the second half of August and in January 1989. The species was absent only in March.

Ali & Hussain (1981) recorded a total of c. 40,000 flamingos, both species combined, in December 1980 with good numbers again in Nov. and Dec 1980 and January 1981. Much lower numbers were recorded by Ali & Sugathan (1985) for the period August 1984 to June 1985, the highest monthly mean being 145 for Greaters (Feb. 1985) and 124 for Lessers (March 1985). Ali's report (1986) for the period August 1985-July 1986 again refers to low numbers with the highest monthly mean of 192 Greaters (Jan. 1986) and only 0.16 Lessers (May 1986). The Asian Waterfowl Counts carried out in this same area over three consecutive winters revealed:

	Jan 1987	Jan 1988	Jan 1989
Greater Flamingo	953	3,595	9,024
Lesser Flamingo	150	0	210

These data show that the number of flamingos in the swamp varies greatly from year to year and that during the present study period numbers of both species were low.

Greater Flamingos clearly preferred the natural habitat (Fig. 4) in Aug-Sept. 1988 and again from April 1989 on. From Nov. 1988 to Feb. 1989 larger numbers occurred in the reservoirs. Never more than fifty individuals were seen in the condensers which very often held no birds at all. The Lesser Flamingos frequented exclusively the natural habitat until November (Fig 5). In December similar numbers occurred in the reservoir and only this habitat was used by them in January 1989. The reservoir afterwards (Feb-March) held few Lessers which from April to August kept exclusively to the natural habitat. This species was never seen in the condensers.

Our data suggest that :

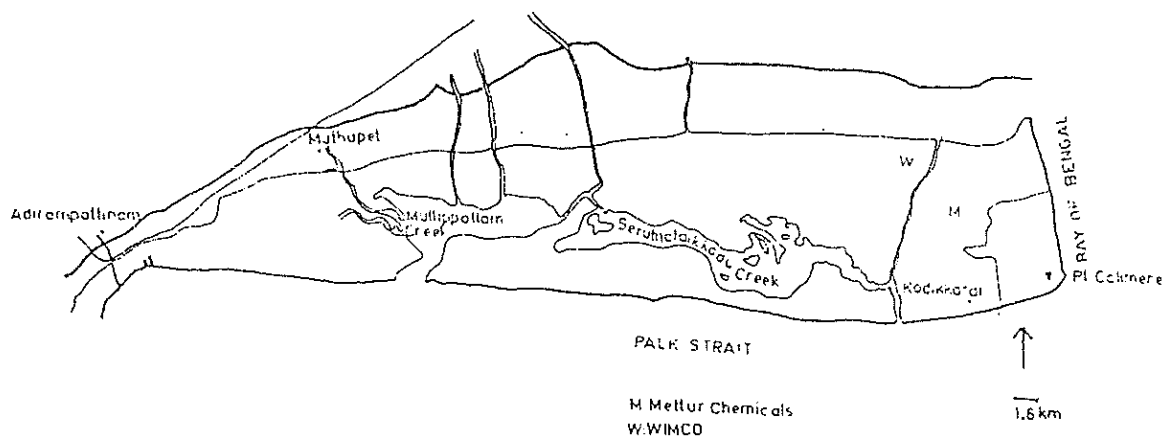
- 1) the natural habitat was preferred by both Greater and Lesser Flamingos between Aug. and Oct. 1988 and in December, then again during the period March-July 1989.
- 2) The N.E. Monsoon period i.e. October to January is the season when the flamingos frequent the reservoir.
- 3) the condensers are not used at all by Lesser Flamingos and Greater only use them occasionally and in small numbers.

PLAN FOR SECOND YEAR OF STUDY

Attempts will be made to correlate flamingo populations with rainfall, water levels, salinity and food availability. Some of these parameters were collected during the first year. As part of the study of the flamingos' diet 10 specimens of each species will be collected for gut analysis. (Permission to collect these was granted in February 1990).

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- Ali, S. & Hussain, S.A (1981) : Studies on the movement and population structure of Indian Avifauna. Annual Report 1 (1980 - 1981) Bombay Natural History Society, India.
- Ali, S. & Sugathan, R. (1985) : Studies on the movement & population structure of Indian Avifauna. Annual Report (1984 - 1985) Bombay Natural History Society, India.



Map 1 The Great Vedharanyam Swamp

Fig.2 GREATER FLAMINGO POPULATION

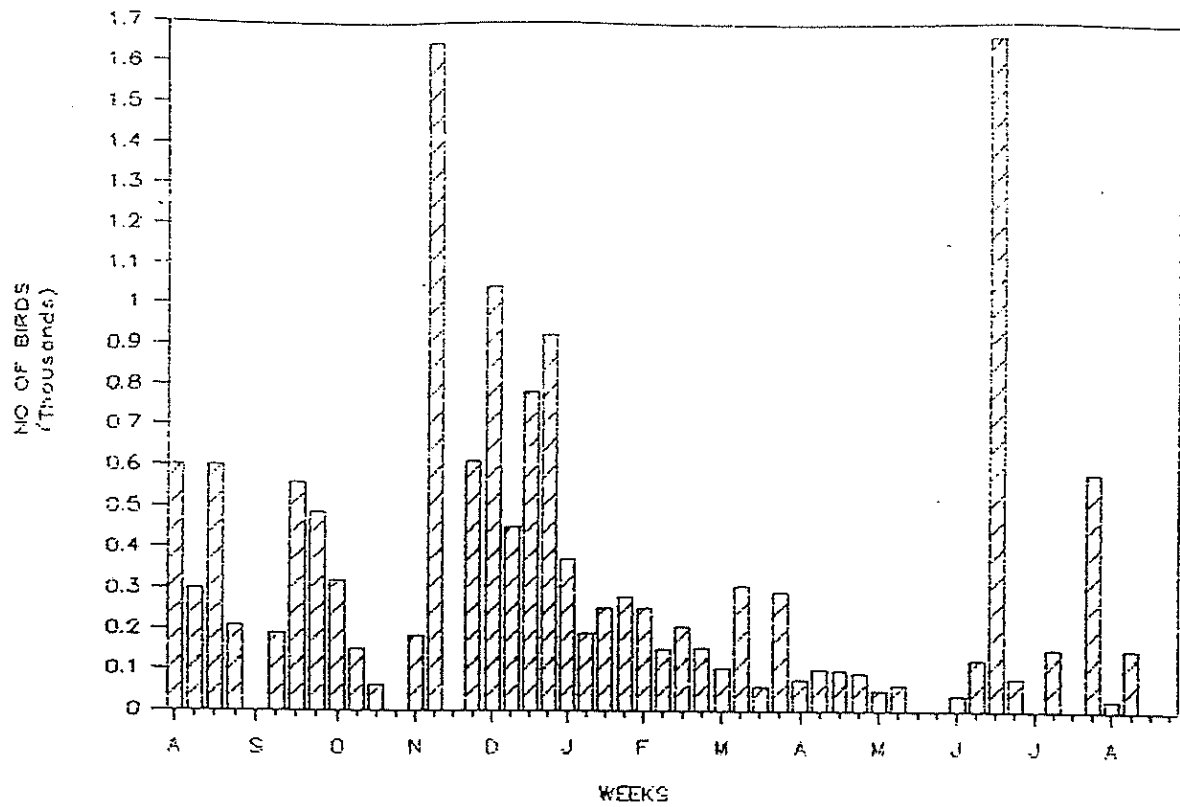


Fig.3 LESSER FLAMINGO POPULATION

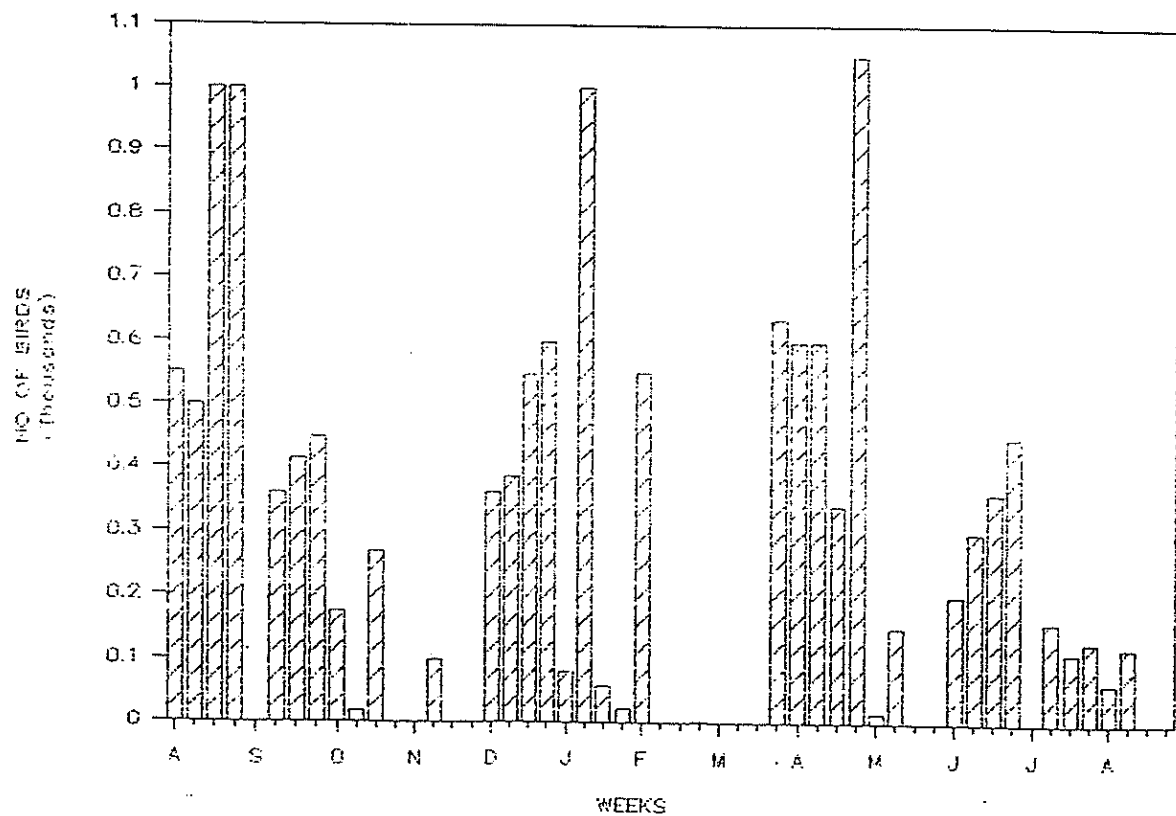


Fig.4 DISTRIBUTION OF GREATER FLAMINGO

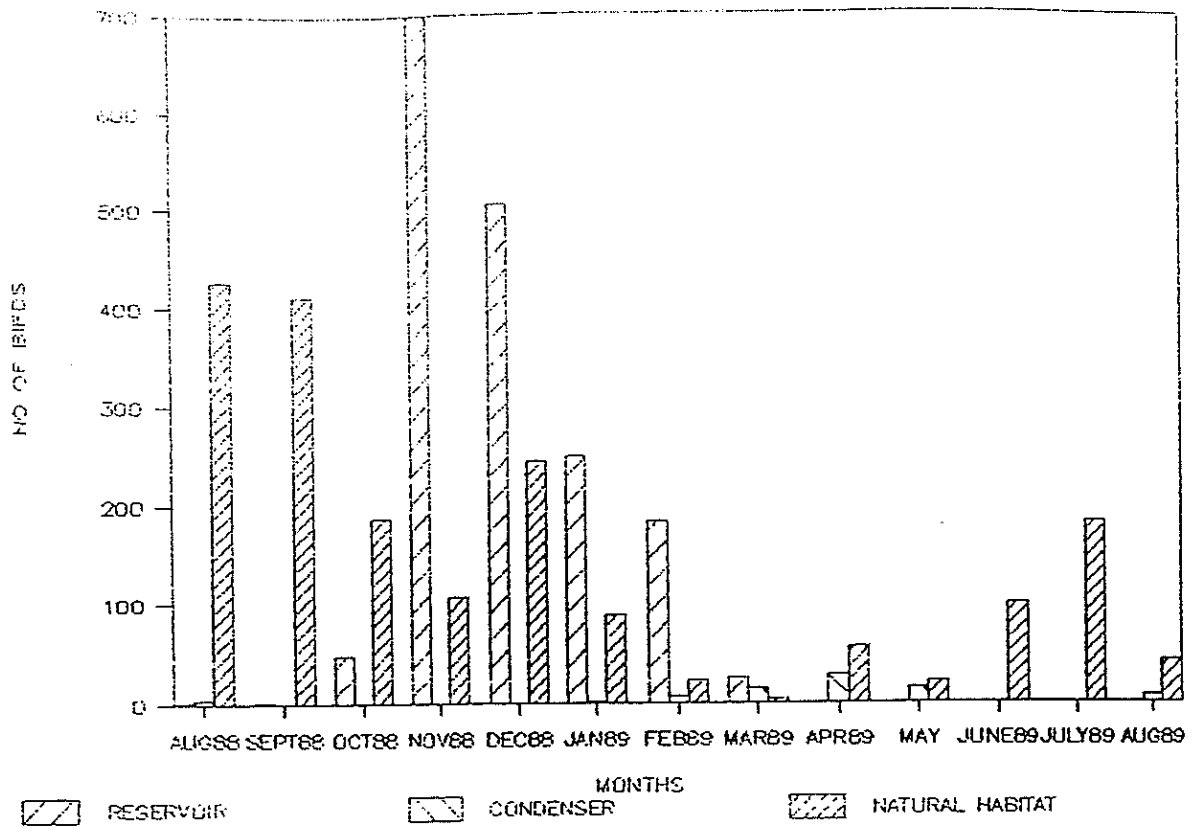
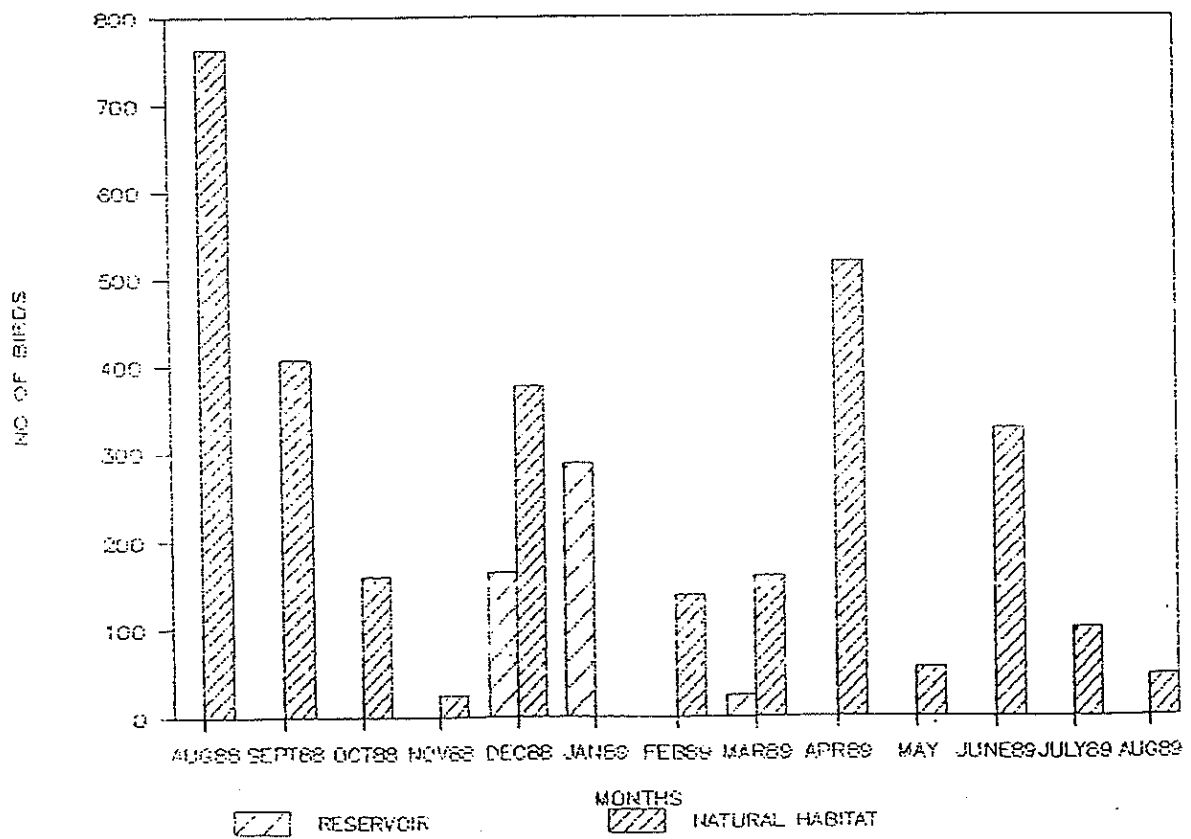


Fig.5 DISTRIBUTION OF LESSER FLAMINGO



ANNUAL REPORT

1990

BREEDING OF GREATER FLAMINGOS 1990



○ Known breeding sites not reported in 1990

● Occupied in 1990

○ no breeding in 1990

Large dots are the more regularly used sites

NEWS FROM THE REGIONS (OLD WORLD)

SOUTHERN AFRICA

NAMIBIA

Greater Flamingos attempted breeding in 1990 on Etosha Pan where they are known to have bred from 1984-1986 and in 1989, but because of quickly receding water the colony failed. There is no evidence that Lesser Flamingos nested during these years. (From Dr. Rob Simmons, Directorate of Wildlife Conservation and Research, Windhoek 9000)

WEST AFRICA

GUINEA BISSAU

Although of frequent occurrence, flamingos are not often reported from Guinea Bissau where there are few observers. In March-April 1990, C. Martimor (Mission Française de Coopération) reported up to 1,500 Lesser and 130 Greater Flamingos some 27 kms north of Bissau.

SENEGAL

On 23 March 1990, J-L Lucchesi and game wardens at the Djoudj National Park censused 15,000 Lesser Flamingos on the Grand Lac, the highest count yet recorded for West Africa. They also observed, 25 March 1990, 6 juvenile Greater Flamingos less than one month of age.

WEST MEDITERRANEAN

MOROCCO.

The mid-January census was carried out by a team of observers from the Tour du Valat (Camargue). All of the most important wetlands for this species were visited, south as far as Puerto Cansado (Laguna Knifiss) and 1763 Greater Flamingos were counted of which 1650 were in the northern half of the country.

An October census by V. de Bouard and O. Pineau revealed a total of 1350 flamingos on wetlands along the Atlantic coast south as far as Oued Massa.

ALGERIA.

The mid-January census carried out by M. Bellatreche and B. Chalabi revealed a total of 1425 Greater Flamingos (Oranie 287, Boughzoul 300, Constantine region 78, S.E. region 760). The May census revealed 150 flamingos on Boughzoul (inf. B. Chalabi).

TUNISIA.

T. Gaultier and members of the G.T.O. censused 20,000 flamingos in mid-January on most of the Tunisian wetlands. Several of the temporary chotts in the south of the country in the Gafsa-Tozeur area were not visited,

however. These were seen in March by members of the Dutch WIWO Eastern Mediterranean Wader Project who reported water in the depressions and the presence of flamingos.

Exceptionally heavy rains had fallen in the Tozeur area in January and ARJ visited Tunisia in May-June in order to carry out an aerial survey with T Gaultier, of the remote southerly depressions in search of breeding flamingos. This mission was realised on June 20, 1990 when two colonies were found. The first was a crèche of ca. 3000 chicks, the oldest just able to fly, in the Chott Fedjadj. The second was on the Chott Guettar where breeding was only just starting.

This was the second record of breeding in the Chott Fedjadj, the last being in 1974, and the first record of attempted breeding in the Chott Guettar. On June 20 about 300 flamingos occupied nests with eggs. One month later T. Gaultier and A. Allouche visited the site on 29 July. The water was rapidly receding and fox tracks led to the abandoned colony. The observers counted 1200 nests. There were 80 dead chicks from 1-10 days of age and some eggs were hatching, indicating a recent desertion of the colony. Laying had been spread between 15 June and 15 July, which is exceptionally late, and it is hardly surprising that this colony failed.

It was difficult to estimate the total number of adults present in Tunisia in May-June as birds were clearly moving around the country as water levels dropped but there were at least 20 000 flamingos, half of these being on Lake Kelbia.

ITALY.

Almost 500 flamingos were recorded in September 1990 at the Orbetello Lagoons (Grosseto), one of the largest groups of flamingos reported from mainland Italy (inf. N. Baccetti).

SARDINIA.

Counts were carried out by members of the Zoological Institute, Cagliari, in mid-January and mid-March on most of the wetlands used by flamingos in Sardinia. These revealed 2726 birds in January and 924 in March. The winter of 1989-1990 was exceptionally dry. In December, 1990, 2,447 flamingos were censused on 13 wetlands throughout the island. (A. Mocci Demartis, Census Coordinator.)

PORTUGAL

Monthly counts of flamingos were made in 1990 on all of the most important Portuguese wetlands for this species: 524 birds were counted in January and 30 in May. Peak numbers (2590) occurred in October. A full report will be published by the observers J.C.Farinha, R.B.Serra Guedes & R.Croft de Moura (in press Airo).

SPAIN.

The ECV team (University Complutense, Madrid) made complete censuses of the flamingos in Spain in both mid-January and mid-May when 10,754 and 28,947 birds were censused respectively. The winter-spring period brought heavy rains to Andalucia and 1990 was the best year on record for breeding at Fuente de Piedra (see a full report on this event by M. Rendon elsewhere in this issue).

FRANCE.

The mid-winter census covering the whole of the flamingo's distribution in southern France revealed a total of almost 18,000 birds in January 1990. The winter was very mild. A May survey was also carried out, when a total of 24,000 flamingos was censused. Breeding again took place in the Camargue (8,600 prs.) at the Etang du Fangassier. Continuous observations were made at the colony throughout the breeding season and 1725 different Darvic-ringed individuals of Camargue origin were seen. Of these, 533 were identified breeding and one bird of

Spanish origin also attempted breeding. Colony success was relatively high: 5886 chicks were raised. 598 of these were ringed in July. (Observations by Tour du Valat flamingo team).

EAST MEDITERRANEAN

EGYPT.

Between mid-December 1989 and January 1990 the most comprehensive survey so far carried out was made of waterbirds wintering on Egyptian wetlands (WIWO report September 1990). On this occasion 20408 Greater Flamingos were counted on Lakes Maryut, Burrulus, Manzala, Qarun, El Malaha and Bardawil. Members of this mission made a special effort to recover rings from hunters and collected data on four flamingo recoveries, three from birds ringed in Iran and the other from the Camargue (France). More detailed information on this survey can be found in a Tour du Valat mission report by John Walmsley.

GREECE.

The mid-January 1990 waterfowl census revealed 2707 Greater Flamingos (163 juveniles) in Thrace. Although protected by law, many flamingos are shot in Greece. (G. Handrinos)

TURKEY.

During the mid-January 1990 waterfowl census by L.J.Dijksen & A.M.Blomert, 17,477 Greater Flamingos were censused on 10 wetlands of western Anatolia.

Weekly counts of flamingos were made at the Cukurova delta from March-May. Over 6000 birds were present in early March after which numbers gradually decreased to 1500 by mid-May (WIWO report).

At Camalti Tuzlasi (Izmir) c.600 pairs of Greater Flamingos bred, laying beginning in mid-April. This colony was highly successful and c.550 chicks were raised, 5 of which were ringed. (Inf. M.Siki.)

Hundreds of Greater Flamingos were amongst many thousands of birds which fell victim to a 15-20" hailstorm of exceptional violence at the Goksu delta on 13 Dec. 1990, as witnessed by members of the DHKD. (Inf. G.Magnin, DHKD, also OSME Bull. 26:37.)

ASIA

INDIA.

A note on breeding by Greater Flamingos in the Great Rann of Kutch in 1990-1991 will appear in the 1991 Annual Report.

PAKISTAN.

During the 1990 mid-winter waterfowl census by Hamid and Koning, 3150 Lesser Flamingos were observed; 1250 at Jubho and 1900 at Lakhidhand. Greater Flamingos were reported from six sites with a total of 32,855. (Inf. A. Hussain Mirza, Sindh Wildlife Management Board, Karachi.)

LESSER FLAMINGOS IN THE WESTERN MEDITERRANEAN

There were several reports in 1989-90 of Lesser Flamingo (*Phoenicanaias minor*) being seen in countries bordering the western Mediterranean: Merzouga, Morocco April 1988 (British Birds 83:8) Salobrar Mallorca, Balearic Islands, May 1989, Berre, S. France June 1989. This latter bird was not ringed but flew strangely, drooping one of its wings, just as did the bird seen earlier at Salobrar.

Although it cannot be ruled out that birds from West Africa may occasionally reach the Mediterranean it seems more likely that the above observations concern birds escaped from captivity since G. Fernandez reports that at least 12 Lessers are known to have escaped from a zoo in the Balearic islands.

Observers tired of seeing "just" Greater Flamingos now have the possibility of seeing Caribbean, Chilean and Lesser around the Western Mediterranean. Let's hope they conclude that the local sub-species is just as attractive as the exotics. (ARJ).

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FLAMINGO RINGING IN 1989 AND 1990 (OLD WORLD)

All reports concern Greater Flamingos only

FRANCE - Etg. du Fangassier, Camargue (Bouches-du-Rhône)
(inf. Station Biologique, La Tour du Valat)

1989: 594 chicks were marked on the left tibia with PARIS MUSEUM stainless steel rings and on the right tibia with yellow P.V.C. leg-bands engraved with a combination of four-letter codes commencing with AT--, AV-- or AZ--. on 9th August.

1990: 598 chicks were marked on the left tibia with PARIS MUSEUM stainless steel rings and on the right tibia with yellow P.V.C. leg-bands engraved with a combination of four-letter codes commencing with BA--, BB-- or BC--. on 18th July.

SPAIN - Fuente de Piedra Reserve (Malaga)
(inf. M. Rendon (AMA), J. Calderon (EBD))

1990: 976 chicks were marked on the right tibia with ICONA metal rings and on the left tibia with orange P.V.C. leg-bands engraved with three letters or numbers, the first two of which are separated by a black line engraved completely around the ring, on 18th August.

IRAN - Lake Uromiyeh (Azarbaijan) (inf. B. Behrouzi-Rad)

1989: 1100 chicks were ringed on the tarsus with TEHRAN metal rings (late July-early August). More chicks were marked in 1990 bringing the total ringed from 1970-1990 to 35,000. All rings bear an LL serial number.

TURKEY - Camalti Tuzlasi, Izmir (inf. M. Siki)

1990: Five chicks ringed IZMIR TURKEY 001-005.

SOME NOTEWORTHY RECOVERIES - RESIGHTINGS (OLD WORLD)

GREATER FLAMINGO

An overview of flamingo movements based on sightings of ringed birds and of juveniles away from the breeding sites is given in JOHNSON, A. R. (1989) Movements of Greater Flamingos in the Western Palearctic. With thousands of flamingos being ringed each year in Kazakhstan, Iran, Spain and France and a considerable effort being made to read rings in the field much new light is being thrown on our knowledge of flamingo movements and longevity. Some of the more interesting recoveries reported recently are given below.

Ringed at Fuente de Piedra (S. Spain) (inf. EBD, AMA).

- Code K-01, ICONA 9-002750 ringed 25/6/1986
resighted 1/8/1986 Odiel (SPAIN), 30/8/1986 Aude (FRANCE),
6/1/1987 Camargue (FRANCE) and 21/1/1989 L. Akrotiri, CYPRUS
(inf. A.R. Johnson).

This is the first resighting (or recovery) on Cyprus of a flamingo ringed in Spain.

Ringed in Camargue (S. France) inf. Tour du Valat.

- Code ASZF, PARIS P1786 ringed 20/7/1988
Shot (7/1/1989) 200 km N. of Gao, MALI (inf. CRBPO).
This is the first record of a Camargue-ringed Flamingo in Mali.

- Code AKVA, PARIS P 1016 ringed 22/7/1987
Recovered 0/12/1989 Lake Manzala, Ezbet el Burg, EGYPT
(inf. WIWO).

- Code ATBB, PARIS P 1817 ringed 9/08/1989
Found dead Baharia Oasis, EGYPT (inf. CRBPO).
These are the first two recoveries in Egypt of flamingos ringed in the western Mediterranean.

- Codes AKY (ringed 20/7/1977), 434, 457 (ringed 24/7/1984),
AJCD, AKJX (ringed 22/7/1987) all resighted at Lakes Larnaca
or Akrotiri, CYPRUS in January 1989 (inf A.R.Johnson).
These are the first resightings (or recoveries) of Camargue ringed flamingos on Cyprus.

Ringed at Lake Uromiyeh (Iran) inf.B. Behrouzi-Rad.

- TEHRAN KK 2261 ringed 8/8/1989 Ashk Island.
Found Stagno Petrosu, Orosei, SARDINIA (inf. M.Spagnesi)

- TEHRAN LL 14804 ringed 5/8/1986 Ashk Island.
Recovered 9/12/1989 Souassi, TUNISIA (inf.M. Smart).

LESSER FLAMINGO

Ringed at L. Magadi, KENYA on 31/10/1962 and recovered (killed)
at L. Turkana on 10/10/1982 (inf. D. Turner).

Ringed at L. Magadi, KENYA on 1/11/1962 and recovered at L. Manyara, TANZANIA on 20/5/1987.

A SHORT REPORT ON THE 1990 SLIMBRIDGE (U.K.) FLAMINGO BREEDING SEASON

by Simon PICKERING

Greater Flamingos

Movements and additions.

In March 1990 ten (five male, five female) Greater Flamingos were moved to Martin Mere, thus bringing the Martin Mere flock up to twenty-three individuals (eleven female, twelve male). The birds moved from Slimbridge were all Slimbridge-bred birds. They were:

MALES		FEMALES	
Darvic ring	Year hatched	Darvic ring	Year hatched
AXI	1982	AJC	1988
AXL	1983	AJX	1988
AYX	1983	ATL	1980
AZX	1982	AVV	1983
AZY	1979	AZV	1983

In August 1990 sixteen Greater Flamingos were confiscated by H.M. Customs officers. Initially it was thought they could be returned to Africa, but this proved to be impossible, and the birds were passed on to the Trust. To comply with the quarantine regulations they were initially held at our quarantine station in Slimbridge village. After their period in quarantine they were weighed, measured and ringed. They are currently being held with our main flock.

Breeding: In 1990 the first egg was laid on 18 April, five days later than in 1989, and the last on 27 July, a hundred days later. There were two distinct egg-laying periods; the first from 18 April to 18 May, and the second from 20 June to 27 July.

Early period: In the early period twenty-nine eggs were laid, of which the parents of twenty-six were known, and two eggs were first seen in the mud or on the bank with no parents incubating them. One of these eggs was picked up and placed in an incubator. Five eggs were lost during incubation. One egg was abandoned (by AZJ and AYV) and also put in an incubator. One of the eggs placed in the incubator was fertile and was given to a pair with an infertile egg (nest 19, ALA and ASX). One pair that lost an egg laid another fourteen days later. Of the twenty eggs that were incubated to thirty days, fourteen hatched. One chick died on hatching and a further two chicks failed to survive to sixty days. Breeding success during this first period was 38% (11/29) and estimated fertility was 70% (14/20). Any eggs reaching thirty-two days' incubation were removed from the nest and candled to check that they were non-viable.

Later period: The second egg-laying period began on 20 June, thirty-two days after the last egg in the first period was laid. Thirteen eggs were laid in this second period. Of the twelve pairs re-laying (one pair laid twice in the second period) two were pairs that lost their first egg, six were pairs that failed to hatch their first egg, and three were pairs that bred in 1989 but were laying for the first time in 1990. There was also a female that was part of a trio rearing a chick. This female re-paired with a young male not previously recorded as breeding. Eggs were candled regularly and those incubated for ten days or more showing no signs of development were removed to an incubator. These all proved to be infertile. One pair (AVB and AIX) with a fertile egg were pushed off their nest by another pair with a chick (AZA and AVP). The egg was removed to an incubator and then put on the nest of

a pair of Chilean Flamingos where it hatched and is now being reared by its foster parents. Of the thirteen eggs laid in this second period two were lost, two were infertile, and nine (69%) hatched.

Nestsite use: This season twenty-one nest bases were prepared for the flock and 17 (81%) were used. Five were used by two pairs and two by three pairs in succession. A further seven nests were built by the birds themselves, and of these three were used once, two by two pairs, one by three pairs and one by four pairs in succession.

Mate Fidelity: Of the thirty pairs and one trio making a breeding attempt in 1989, twenty-eight pairs and the trio bred together again in 1990 (93%). Only two pairs changed partners. One female from the trio that had been observed incubating and feeding a chick paired during the second egg-laying period with a male that did not breed in 1989. They are now rearing a chick. Of the seventeen pairs rearing a chick in 1990 (one chick is being reared by Chilean foster parents) ten pairs also reared a chick in 1989 and the remaining seven pairs all made breeding attempts in 1989.

Overall breeding success: In total forty-two eggs were laid of which eleven were lost, thirty-one were incubated to thirty days and twenty-three hatched. One chick died on hatching and a further four failed to survive. This flock will probably rear eighteen chicks this year -- three more than in 1989 which was a record season. Overall breeding success was 42.8% (18/42) compared to 34% (15/44) in 1989.

Caribbean Flamingos.

This flock was re-ringed with three-letter grey Darvic rings in March 1990. At the beginning of April the nest site was completely re-worked and extended, creating sixty-seven new mud nest bases. Forty-two were on the new nest site and twenty-five on the traditional nesting area.

Breeding: The first egg was laid on 21 May and the last on 7 June. A total of twenty-six eggs were laid of which four were lost during incubation. Twenty-two were incubated to thirty days of which thirteen (59%) hatched. One chick died at two days old with the remaining twelve being reared successfully, equalling last year's record season for the number of chicks reared. The overall breeding success (46%, 12/26) was slightly higher than in 1989 (40%, 12/30).

Nest site use: Although forty-two nest bases were created on the new nest site, all the eggs were laid on the traditional nesting site. Twenty-two (88%) of the nest sites on the traditional area were used and a further four nests were built by the birds themselves.

Mate Fidelity: As the flock was not ringed until 1990, estimates of the fidelity of pairs breeding in 1990 or the number of pairs which bred in both seasons were made using bill patterns to identify individuals from one year to the next. Of the twenty-nine pairs that bred in 1989 eighteen pairs definitely bred together in 1990, and two pairs appeared to have changed partners from one season to the next. Nine pairs almost certainly did not breed in 1990. A further eight pairs bred in 1990 but did not in 1989. Mate fidelity was 89% between seasons.

Chilean Flamingos.

The Chilean flock was re-ringed in April 1990, replacing the small two-letter ring with a larger three-letter ring above the tarso-tibia joint.

Movement: A small group of eight Chilean Flamingos (four male, four female) from Child-Beale Wildlife Trust came to Slimbridge in May 1990. These were all ringed, weighed, measured and pinioned before being released into the South American area with the main flock. It is proposed to move a similar number of birds to other collections in the country during the winter.

Breeding: The flock was first seen displaying on 19 April and displayed regularly until 3 June. The first egg was laid on 2 July and the last on 29 August.

In 1989 eighteen (36%) Chilean Flamingo eggs were lost. Most of these were apparently knocked out of the nest or smashed by inexperienced parents or by birds fighting over nest sites. Losses were greatest in the early part of the season. In 1990 all the early eggs were removed to an incubator and replaced with dummy wooden eggs (woods). Throughout the egg-laying period eggs were candled every week to check fertility. This practice allowed us to manipulate the flock following these general rules:

- a) All early eggs were removed and wooded to reduce egg loss.
- b) The flock was manipulated to increase the number of chicks reared by swapping eggs between nests. Fertile eggs were given to pairs with clear eggs and the woods removed from fertile pairs to encourage them to re-lay.

The decisions on the movements of eggs were made on a week by week basis. If there were no fertile eggs needing foster parents, woods were removed from pairs with clear eggs to encourage them to re-lay. Also, if no suitable foster parents were available, fertile eggs were returned to their parents. The situation was further complicated by the arrival of a fertile Chilean Flamingo egg from Peakirk which had been placed in an incubator when the flock deserted their nest site. This was placed under a pair that had been incubating for only sixteen days. Fortunately the parents were able to feed the chick. Also a Greater Flamingo egg required foster parents and was successfully hatched and is being reared by a pair of Chilean Flamingos.

In all, forty-two eggs were laid at Slimbridge of which seven (16%) were lost. Of the thirty-five candled, twenty (57%) were fertile and fifteen clear. Four of the fertile eggs addled before hatching. Sixteen chicks hatched and there are at present thirteen surviving chicks.

As a result of the various manipulations, the number of eggs lost (16%) was less than half that of 1989 (36%). The only eggs lost were those laid later in the season that were not wooded immediately after laying. One egg was intentionally smashed by a flamingo that attacked the egg while both parents were off the nest. The same bird had been seen attacking both a freshly laid egg and a wooden egg earlier in the season. Five of the nine (56%) fertile pairs whose eggs were removed re-laid, one egg was lost, two of these second eggs were clear and two fertile eggs hatched. Two (50%) of the infertile pairs also relaid after the removal of their eggs (or woods); one egg was lost and the other was fertile and hatched. The manipulation resulted in four more fertile eggs being laid and hatched; an increase of 33%. Knowing which eggs were fertile also allowed us to easily provide foster parents for the abandoned Chilean egg from Peakirk and the abandoned Greater Flamingo egg.

New Birds: Four of the birds that came from the Child-Beale collection paired and laid eggs. All birds bred with birds from the Child-Beale. One pair (HCH and HCZ) laid a fertile egg but this addled before hatching. These birds had been kept at the Child-Beale Wildlife Trust for sixteen years and had never bred.

Mate Fidelity: Of the twenty-nine pairs that bred in 1990, ten pairs bred together in 1989. Seven pairs did not breed in 1989. Four of these birds (two pairs) were birds from the Child-Beale Wildlife Trust. The remaining twelve pairs were birds that did not breed together in 1989. In four pairs only one partner bred in 1989, while sixteen birds bred with different partners in the previous season. Of birds which bred both in 1989 and 1990 these figures represent 45.4% mate fidelity from one season to the next.

Andean and James' Flamingos.

Breeding: Extra mud was added to the Andean and James' flamingo nest site in April and then re-worked again in May. The Andean flock was seen displaying during the Spring and there was a period of intensive nest building during June and July but no eggs were laid. The first James' egg was laid on 30 May by AAZ and ABT. This egg proved to be infertile and was removed after fifteen days. This pair then re-laid and AAV and ABA also laid. These eggs also proved to be clear. The James' Flamingos at Slimbridge first laid in 1985. A total of ten eggs, including those this year, have been laid. All have been infertile.

LESSER FLAMINGOS.

Breeding: This flock began displaying on 3 January, 1990. By the time the six mirrors were installed in February the flock had stopped displaying, but began again almost immediately. They stopped displaying in late March. During the 1989 summer the flock spent most of its time outside the house on the nest site or the bank. However in early summer 1990 they spent most of their time inside the house standing next to the mirrors. They showed no sign of mating or nest building activity. On 16 June, 1990 they were moved out into the main African area. They were observed displaying in this area and several pairs began nest building. Two attempted matings were observed but no eggs were laid.

Parental Investment: During the 1990 breeding season an investigation into parental investment by flamingos was carried out. The aim of the study was to compare differences between male and female parents, between pairs rearing chicks of each sex, and interspecific differences. Some of these studies are still in progress or the data has not yet been fully analysed. However, initial results concerning Greater Flamingos have shown that during the first two weeks of life both parents are equally likely to be tending their chick, but between two and four weeks of age, and beyond six weeks, the father was significantly more likely than the mother to be tending the chick. The average chick parent distance increased with chick age. For the first two weeks the mean chick-parent distance was significantly less when the mother was tending the chick. After four weeks of age this distance was significantly less when the father was tending the chick, indicating that as the chick gets older the father takes a greater share of the parental care.

Chick Growth Rate: The growth of individual Greater, Caribbean and Chilean Flamingo chicks is being studied by photographing each chick twice a week standing next to an object of known length (ie. a parent's leg or a post marked with a scale). While this study is not yet finished initial results show that Greater Flamingo chicks grow between 2 and 5mm per day during their first thirty days of life. At between fifty and seventy days of age a number have shown a dramatic drop in growth rate. It is possible that these are females which, when adult, are typically 20% smaller than males.

Summary.

For the three species which bred at Slimbridge in 1990 it has been a very successful season, with a total of forty-three flamingo chicks being reared, four more than in 1989. Replacing the early Chilean Flamingo eggs with woods clearly reduced early egg loss and the later egg swapping maximised the number of chicks hatched by the flock. It is also likely that the combination of the hot dry summer and the removal of all the Greater Flamingo eggs at thirty-two days encouraged birds to re-lay. The fact that the two pairs of Chilean Flamingos from the Child-Beale collection began breeding within three months of arriving at Slimbridge indicates that given suitable conditions many more flamingos held in British collections would probably breed. The Curator of the Child-Beale noticed that the birds started nest-building when accidentally offered exposed mud in 1989, a factor in the decision to move them. However, it is impossible to determine whether it was the provision of a suitable nesting area or the increased flock size that encouraged these birds to breed.

Mate fidelity between 1989 and 1990 was very high in Greater (93%) and Caribbean (89%) Flamingos but significantly lower in the Chilean flock (45%). There was no evidence that fidelity in Chilean Flamingos was related to the outcome of their previous breeding attempts. At this stage it is not possible to determine whether this difference in mate fidelity is due to flock size or differences in their breeding biology.

NEWS FROM THE REGIONS (NEW WORLD)

by Bart de BOER

La sección de informes sobre flamencos en el Mundo Nuevo es más corta que la de los años anteriores. Lastimamente no recibimos informes para el boletín de Venezuela, Bolivia, Chile, Colombia, y Argentina. Esperamos que para el próximo año los grupos y personas activas en estos países mandarían sus reportes a tiempo para mantenernos informados del desarrollo de sus investigaciones.

Muchas personas nos pidieron por las actas del taller de flamencos realizado en Chile en 1988. Todavía no hemos recibido estas actas ni sabemos cuan lejos es este trabajo. Esperamos recibir informes de Chile sobre este.

De Colombia necesitamos direcciones nuevas porque las cartas se vuelvan. Aparentemente no tenemos la dirección correcta de L.Cruz y de los otros participantes en el proyecto de los flamencos colombiano.

MEXICO

TALLER PARA EL MANEJO, PROTECCION Y CONSERVACION DEL FLAMENCO Y SU HABITAT EN LA ZONA DE RIA LAGARTOS, YUCATAN

Resumen

El refugio faunístico de Ría Lagartos, creado en el mes de junio de 1979 por decreto presidencial, es un área que posee una gran riqueza florística y faunística y en la que se hallan varias especies endémicas de plantas. Además, es reconocida su importancia como sitio de anidación del flamenco *Phoenicopterus ruber*, cuyas poblaciones han venido recuperándose paulatinamente desde hace aproximadamente poco más de una década. También, a partir de julio de 1986, esta reserva de 4 7480.00 Ha. se encuentra incluida dentro de la lista de humedales de importancia internacional, especialmente como habitat de aves acuáticas de la Convention de RAMSAR.

Sin embargo, las acciones de conservación realizadas por el Gobierno Federal no han sido suficientes para lograr la restauración del ecosistema y amortiguar las causas que originan su deterioro, entre las que destacan las actividades humanas en la región, misma que han afectado significativamente al estero de Ría Lagartos.

Por otro lado, la falta de conocimiento acerca de los componentes del estero ha propiciado que muchas de las medidas adoptadas para evitar la afectación del estero y el área terrestre que lo circunda, así como para la protección y conservación de las especies que en él habitan, no posean la eficacia que de ellas se ha esperado.

Aunado a lo anterior, la península de Yucatán y en particular el área de Ría Lagartos fue seriamente dañada como consecuencia del huracán "Gilberto", afectando gravemente la vegetación natural, principalmente en manglares y dunas costeras; la hidrodinámica del estero modificando la salinidad y el nivel del agua; así como provocando una gran mortandad en la población silvestre del flamenco.

Por lo antes expuesto, en la Dirección General de Conservación Ecológica de los Recursos Naturales de la SEDUE surgió la inquietud de llevar a cabo un evento en el que se actualizara la información respecto a la situación y problemática en la que se encuentra la reserva de Ría Lagartos. Así también, para proponer alternativas de solución en coordinación con las instituciones de investigación científica y enseñanza superior de la región, así como con las entidades gubernamentales involucradas.

En razón de todo esto, se realizó el "Taller sobre Manejo, Protección y Conservación del Flamenco y su Habitat en Ría Lagartos, Yucatán" en la ciudad de Mérida del 20 al 23 de abril de 1989. En este evento concurrieron

diferentes especialistas involucrados con la investigación en el refugio faunístico y del flamenco. Entre las instituciones participantes se conto con la asistencia de representantes de la Dirección General de Conservación Ecológica de los Recursos Naturales/SEDUE, Dirección General de Normatividad y Regulación Ecológica/SEDUE, Delegación Estatal de SEDUE en Yucatán, Gobierno del estado de Yucatán, Centro de Investigaciones y Estudios Avanzados (CINVESTAV) del Instituto Politécnico Nacional, Universidad Autónoma de Yucatán, Ducks Unlimited de Mexico (DUMAC), Servicio de Pesca y Vida Silvestre de los Estados Unidos (U.S. Fish and Wildlife Service) y del Grupo de Especialistas de Flamenco de la Unión Internacional para la Conservación de la Naturaleza (IUCN).

El taller constó de dos partes : una teórica en la que fueron expuestas las diferentes ponencias de los participantes y una visita al área del refugio faunístico de Ría Lagartos.

OBJETIVO DEL TALLER

Elaboración, coordinación e implementación de estrategias de manejo para la protección y conservación del flamenco, y el uso racional y sostenido de los recursos naturales de Ría Lagartos, Yucatán.

OBJETIVOS PARTICULARES

1. Discutir los diferentes planteamientos y puntos de vista acerca de la problemática existente en el humedal, considerando los diferentes aspectos involucrados con este.
2. Plantear y discutir las alternativas para la conservación y protección del flamenco en Ría Lagartos, Yucatán.
3. General los lineamientos que fundamenten la elaboración de estrategias de manejo para la conservación del flamenco, y uso racional y sostenido de los recursos naturales de Ría Lagartos, Yuc.
4. Identificar el grado actual de conocimiento sobre la especie y su habitat a fin de establecer los mecanismos de coordinación con instituciones de investigación y educación superior para la ejecución de acciones y estudios tendientes a su conservación.

CONCLUSIONES Y RECOMENDACIONES

De las discusiones llevadas a cabo durante la mesa redonda realizada al final del evento se desprendieron las siguientes conclusiones:

1. Elaborar trabajos conducentes para el planteamiento de un programa de manejo del refugio faunístico de Ría Lagartos, Yucatán.
2. Fomentar la realización por instituciones nacionales de proyectos de investigación que apoyen al diagnóstico del área y al planteamiento de su estrategia de manejo.
3. Promover la participación de los distintos niveles de gobierno, así como del sector social y privado en las acciones de conservación del área y particularmente del flamenco a través de la generación de los instrumentos legales necesarios
4. Fortalecer los mecanismos de cooperación internacional ya existentes y buscar la generación de nuevos vínculos para la investigación, asistencia técnica y capacitación, destacando el valor ecológico de la población yucateca de flamencos respecto de la comunidad de la especie a nivel mundial.

5. Establecer el marco jurídico vigente y antecedente que permita la restauración y conservación del habitat de las especies protegidas.

Asimismo, se establecieron las siguientes recomendaciones :

1. Desarrollar estudios de la ecología básica, geología, e hidrodinámica del estero y marina de Ría Lagartos y Celestun.
2. Promover estudios necesarios para el análisis de la legislación vigente y antecedente, con el fin de restaurar el habitat de las especies protegidas.
3. Conformación de una estrategia de manejo diseñada de acuerdo a las características ecológicas y socioeconómicas de Ría Lagartos y Celestun.
4. Llevar a cabo un estudio de ordenamiento ecológico que contemple la evaluación del impacto ambiental de las actividades humanas, particularmente las de producción de sal, pesca, turismo y asentamientos humanos.
5. Elaborar e instrumentar un programa de educación ambiental formal y no formal para las reservas de Ría Lagartos y Celestun, priorizando en los niveles de educación básica y media en la península de Yucatán.
6. Se incluya a Ría Celestun en la lista de humedales de importancia de la convención de Ramsar y se trabaje para la obtención de financiamiento para la investigación dirigida a elaborar el plan de manejo.
7. Formar un comite encabezado por la SEDUE para supervisar las actividades humanas y determinar las acciones futuras en Ría Lagartos y Celestun.

REPORTE DE LA VISTA AL ECOSISTEMA LAGUNAR DE LA RIA LAGARTOS

Eduardo BATLLORI, Jorge CORREA, Raul MURGULA y Eckart BOEGE.

EL CINVESTAV realizó una visita al sistema lagunar costero de Ría Lagartos los días 27 de enero y 27 de marzo de 1989, observando la siguiente problemática :

1. -Disminución de la barra arenosa de la duna costera, ocasionando apertura de bocas por la acción de huracanes y marejadas.
2. -Cinco de las siete bocas abiertas por los huracanes han sido cerradas por la empresa ISYSA, una se cerró de forma natural y la más grande aun queda abierta.
3. -La entrada de agua de mar a la laguna se ve favorecida por el bajo nivel del cerramiento de los bocas.
4. -Existe permeabilidad en el borde de cerramiento
5. -Las actividades de la empresa ISYSA para cerrar las bocas estan alterando los sitios de alta incidencia de especies vegetales, exclusividas de la península de Yucatán.
6. -Introducción de maquinaria pesada a la zona por parte de la empresa ISYSA.
7. -Uso de desperdicios en el proceso de ceerramientos de bocas que podrán causar contaminación en el ecosistema.
8. -Azolvamiento del cuerpo de agua.
9. -Descensso de la avifauna como consecuencia de los huracanes en la zona.
10. -Tensión de la fauna por la introducción de maquinaria pesada y vehículos en la zona.
11. -Inestabilidad de la sexta boca, desplazamiento de la barrera de contención.
12. -Disminución del manglar en la costa.
13. -Disminución de la captura de peces, tanto en la laguna como mar afuera.
14. -Alcantarillado deficiente en la zona, por lo que pueden verse afectadas las áreas de anidación del flamenco por inundaciones.
15. -Erosión del pedraplen y de los soportes de tubería de agua potable.
16. -Disminución de la salinidad de la laguna (zonas de anidación del flamenco).

Los autores sugieren la asesoría tanto al Gobierno del Estado, como a la empresa ISYSA para evitar el deterioro de la Ría.

CENTRO DE INVESTIGACION Y ESTUDIOS
AVANZADOS-MERIDA.
I.P.N.

DIAGNOSTICO DE LOS PROBLEMAS QUE AFECTAN AL REFUGIO FAUNISTICO DE RIO LAGARTOS

Jorge CORREA y Eckart BOEGE.

CENTRO DE INVESTIGACIÓN Y ESTUDIOS AVANZADOS-MERIDA I.P.N.

La Ría de Lagartos fue declarada en 1979 Refugio Faunístico por Decreto Presidencial. En 1969 la zona se inscribió en el Convenio de Humedales de Importancia Internacional (RAMSAR).

El refugio Faunístico Río Lagartos se encuentra ubicado al Norte del Estado de Yucatan, contiene varios tipos de vegetación (manglares, tulares, marismas, pastizales, etc.).

En su playas desovan *Chelonia mydas* y *Eretmochilus imbricata*. Es área sede de 250 especies de aves migratorias y residentes y es el único sitio donde se reproducen los flamencos en Mexico.

PROBLEMATICA :

- No existe definición de la situación de la tenencia de la tierra en el Refugio.
 - Los procesos de deforestación se dan por dos actividades principales : ganadería y agricultura (tumba-roza-quema).
 - Los drenes insuficientes del terraplén del Cuyo, causan las inundaciones en las colonias reproductoras del flamenco.
 - Destrucción de la zona de anidación del pájaro tho (*Euromota superciliosa*).
 - Las especies *Thrinax radiata* y *Pseudophoenix sargentii* únicas en el mundo e inscritas en la lista de especies vegetales en peligro de extinción, son explotadas para afianzar los bordos de las charcas salineras.
 - La actividad de la compañía salinera, ha provocado múltiples problemas que se ven reflejados sobre la vegetación y la fauna del lugar.
 - Los asentamientos humanos en la zona sin control, han dado origen a problemas que van desde la especulación del suelo urbano, hasta problemas del orden de salud pública.
 - La falta de coordinación de los organismos gubernamentales genera problemas de diversa índole como desmonte en áreas del refugio, falta de notificación de las actividades de diversas dependencias ante la SEDUE, entre otros.
- En base a la problemática planteada se establece la necesidad de tomar acciones para evitar el deterioro del Refugio.

- a. - Plan de manejo,
- b. - incremento de la investigación,
- c. - coordinación de los diferentes sectores sociales,
- d. - intensificar la vigilancia,
- e. - regular el intercambio entre los cuerpos de agua,
- f. - proteger las zonas de anidación del pájaro tho,
- g. - evitar la deforestación,
- h. - implementar un sistema de acuicultura en la ría y el mar,
- i. - evitar la entrada a la ría de drenajes, basura y otros contaminantes,
- j. - es necesario que la SEDUE supervise la actividad de la salinera en la región.

Por tanto, se concluye que las acciones que han deteriorado la zona estan sustentados en la falta de manejo y protección de los organismos gubernamentales responsables.

C U B A

De Dr. D.Legon Boada, Director del Jardin zoológico de la Habana recibimos una sobrevista sobre la situación en Cuba :

En Tunas de Zaza hay una población estable de unos 6 000 ejemplares, desde 1963. Dr Legon ha realizado conteos en esta área dos veces al año (Abril y Octubre) desde esa época. Hay poblaciones estables además en Las Salinas, Cienaga de Zapatas, laguna Guanaroca en la provincia de Cienfuegos y Golfo de Guacanayabo cerca de la Bahía de Manzanillo, en la costa sur de la isla. En la costa norte hay poblaciones abundantes en Cayo Picua, Bahía La Gloria y una población muy abundante en la ciénaga que se forma en la desembocadura del Río Maximo en la Costa Norte de la provincia de Camaguey. En la costa de los cayos adyacentes a las provincias de Ciego de Avila y Camaguey hay una población de más de 50 000 ejemplares.

No es cierto que la población de Gran Inagua sea la misma de Cuba. Ejemplares anillados en la cuenca y desembocadura del río Zaza, Poblado de Tunas de Zaza, al sur de la Ciudad y Provincia de Sti-Spiritus fueron capturadas en Cayo Picua en el norte del poblado de Carahatas, al norte Quemado de Guínes en 1984.

El resultado de la nidificación es bueno y los enemigos son pocos pues tienen una veda permanente que no permite la captura, solamente hubo una afectación considerable en 1985 por un ciclón que se movió por la costa norte de la isla.

En estos momentos la Dirección de Flora y Fauna del Miniterio de Agricultura está investigando poblaciones, migraciones y cría artificial o controlada.

La dirección de Dr. Legon es : Calle 26 y Ave del Zoologico
Ciudad de la Habana
Cuba.

PERU

The Ornithological Working Group of the Association of Ecology and Conservation ECCO is ready to start a pilot project on flamingos : "Ecología y Conservación de Flamencos en tres Lagunas del Sur del Perú", supported by the Peruvian government. The study area is located in the Southern Andes of this country and the lakes to be studied are Viscachas, Loriscota and Suches. Here, flamingos of the three South American species have been reported in high numbers so it was decided to start working on these birds in this place. The main objectives of the project are:

- to determine the status of flamingos in the area,
- to determine the status of the lakes from the tropic point of view,
- to set the basis for a conservation program not only of flamingos but the whole ecosystem.

We are interested in contacting other researcher who have done similar studies to exchange information and suggestions to help us to develop a programme. If you would like to contact us for this purpose, please write to

Jorge Pejovés
Apartado Postal 21-0132 Lima 21 Peru

or

Anthony Luscombe
Asociación de Ecología y Conservación
ECCO
Vanderghen 560-2A
Lima 27, Peru

Banded Flamingo found in Brazil

On May 23 a banded flamingo was found in South Brazil. The bird was a subadult with grey feathers on the body and pink/reddish underwing feathers. It was the first record for the species for the state (Santa Catarina). It turned out to be a *P. andinus*, banded in Salar de Punta Negra on March 20, 1989. It was born between December 20 and 25 1988 at the same place.

(info submitted by Paulo de Tarso (Br)
and Juan Pablo Reyes M (Ch))

GRUPO PHOENICOPTERIDAE SUR ANDINA

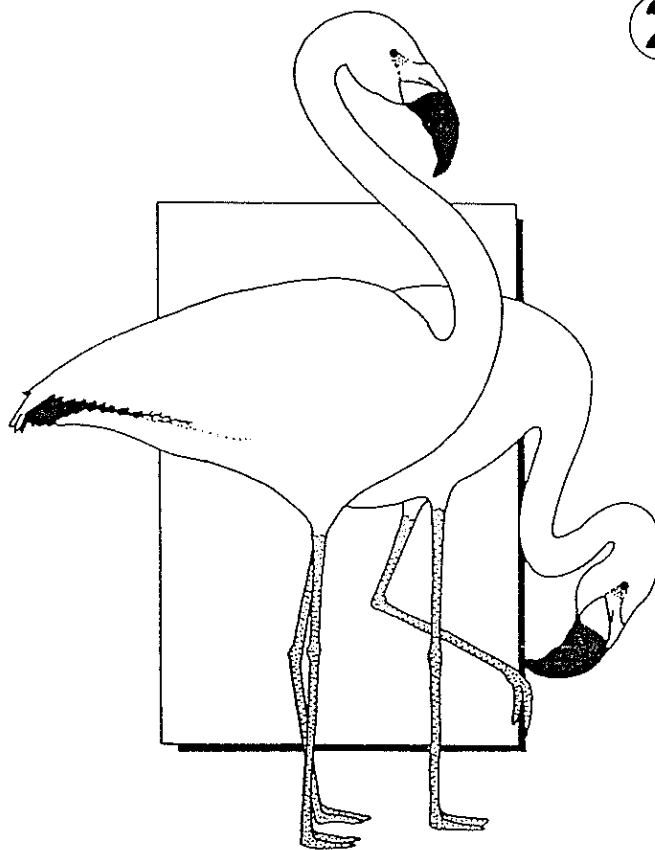
The South Andean Flamingo Group was established in 1990 in order to give technical advice on matters related to the conservation of flamingos in Chile, Argentina, Bolivia and Peru. Two newsletters were circulated in 1990 (No. 1 June, No. 2 November). These can be obtained from the regional secretary, CONAF, Avenida Argentina 2510, Antofagasta, Chile.

There are articles on breeding and censuses of flamingos (three species) in Argentina and Chile, details of ringing in Chile and on the creation of a national reserve for flamingos in the Antofagasta region of northern Chile.

BOLLETTIN

GRUPO PHOENICOPTERIDAE SUR ANDINA SECRETARIA REGIONAL

②



THE FLAMINGO COLONY AT THE LAGUNA DE LLANCANELO (PROVINCIA DE MENDOZA) ARGENTINA

by Erik CARP

The Laguna de Llanquanelo (Mendoza) is a salt lake of about 40,000 ha. situated at an altitude of ca. 1,200 m. It lies on a vast steppe plateau in the foothills of the Andes, S.W. of San Rafael and 40 km from the small town of Malargue. Montserrat Carbonell, (Fundacion Vidasilvestre), Erik Carp (IWRB Consultant), Hebert Jose Sosa, Enrique Horacio Garcia and Facundo Martinez camped beside this lake from 10-13 April 1990 and witnessed breeding by Chilean Flamingos.

About 20,000 flamingos were present on the lake. It was the end of the breeding season and many young birds were on the wing but there was a crèche of about 2,000 chicks near the breeding island, not quite able to fly. The island held 7,900 nests. Chilean Flamingos are known to have bred at this lake in 1989 and it is probably a regular breeding site for the species.

The southern half of the lake, which is surrounded by private land used for cattle grazing, is a protected area. The lake is shallow, very rich in algae and also supports large numbers of Black-necked Swans *Cygnus melanocoryphus*, which seemingly moult in great numbers on the lake.

LA REPRODUCCION DEL FLAMENCO (*Phoenicopterus ruber roseus*) DURANTE 1990 EN LA RESERVA NATURAL LAGUNA DE FUENTE DE PIEDRA (MALAGA).

J.M. RAMIREZ y M. RENDON

Varios factores se deben destacar a la hora de referirse a la reproducción del flamenco (*Ph. ruber*) en la laguna de Fuente de Piedra (Málaga - S. de España) a lo largo de 1990. En primer lugar se debe hacer mención de las excepcionales características del régimen pluviométrico del periodo octubre 89 - septiembre 90, durante el cual la lluvia registrada en la zona ascendió a 713,5mm. Este es un valor muy superior a la media, que para el periodo 1962-1989 era de 459,8mm/año. Esta alta tasa de precipitaciones (especialmente durante el mes de noviembre 89) posibilitó que los niveles de agua, tanto en la laguna de Fuente de Piedra como en las otras zonas húmedas cercanas, fueran altos y se mantuvieran elevados durante una gran época del año. Por otra parte, se debe mencionar el nuevo record de flamencos nacidos en un único lugar de reproducción de todo el mediterráneo occidental, con un total de 10.417 pollos de flamenco nacidos en Fuente de Piedra en 1990.

La incidencia de los altos niveles de agua en la laguna sobre la presencia y reproducción del flamenco (*Ph. ruber roseus*) se ponen de manifiesto por el alto número de individuos censados, que alcanzan el máximo en agosto de 1990 con un total de 50.010, incluyendo adultos y pollos nacidos ese año.

Las condiciones hidrológicas de la laguna al comienzo del periodo reproductor provocaron que la zona de habitual asentamiento de la colonia (digue central) se encontrase sumergida, por lo que las aves tuvieron que desplazar su localización habitual, a las terras emergidas localizadas al S-SW de la laguna y el escaso territorio emergido en la zona norte de los diques de la "L" y la "T", aunque la superficie de acogida era muy escasa y no ofrecía condiciones de acogida suficientes para el gran número de flamencos presentes en la laguna que presentaban pautas de reproducción. Para contrarrestar estas condiciones se realizaron distintas actuaciones por parte de la Agencia de Medio Ambiente de Andalucía (A.M.A.), encaminadas a ofrecer un lugar adecuado para el asentamiento de una gran colonia (para conocer estas actuaciones, ver el capítulo referente a gestión que figura en este mismo volumen).

Finalmente, se asentaron cinco colonias de cría de flamencos desfasadas en el tiempo y en el espacio, cuyos resultados al final del periodo reproductor fue de 13.316 parejas reproductoras, contabilizándose un total de 10.417 pollos (recuento realizado sobre foto aérea).

El número máximo mensual de flamencos censados durante el periodo oct. 89 - sept. 90 (Fig.1), así como el nivel de agua y precipitación para el mismo periodo (Fig.2), pueden compararse con otro año con un régimen normal de lluvias (Fig.1 y 2). En este sentido, se debe destacar que el máximo de flamencos censados en un año normal aparece en el mes de mayo, mientras que en 1990 este máximo se presenta en el mes de agosto, cuando el nivel de agua en la laguna era de 70cm, lo que favoreció el acceso de los flamencos a los recursos asociados al sedimento. En los meses anteriores el alto nivel de agua les impedía, en gran parte de la laguna, acceder a este sedimento y los flamencos debían capotar para alimentarse. En años anteriores la laguna se encontraba completamente seca durante el periodo estival, por lo que la búsqueda de alimento la debían realizar fuera de la laguna de manera exclusiva. En ambos casos se observa una estabilidad en el número de ejemplares durante la época de asentamiento de la colonia, ofreciendo una disminución durante el periodo estival de un año normal debido a que los adultos debían realizar desplazamientos fuera de la laguna para la búsqueda de alimento. Mientras que en 1990 las condiciones de la laguna permitían obtener este alimento en Fuente de Piedra, por lo que el número de individuos presenta un aumento durante la época estival, ya que a los efectivos de pollos nacidos (que se pueden considerar similares en ambos años comparados), se les añaden los adultos e inmaduros que permanecieron en la laguna.

Con estos resultados se puede considerar el año 1990 como excepcional para la reproducción del flamenco en la laguna de Fuente de Piedra. A esto ha contribuido tanto las condiciones meteorológicas antes citadas, como las medidas de protección y conservación llevadas a cabo por la A.M.A.

El seguimiento intensivo de la colonia de reproducción ha permitido la obtención de numerosos datos, cuyo seguimiento en próximos años permitirá conocer aún más la biología reproductora de la especie. Los datos de este año se pueden considerar abundantes si se comparan con otros periodos de seguimiento de la colonia.

<u>Año</u>	<u>Nº de criadores anillados y controlados</u>
1986	44 anillados en Camarga
1987	27 anillados en Camarga
1988	198 anillados en Camarga
1990	254 anillados en Camarga + 28 anillados en Fuente de Piedra

Estas condiciones excepcionales han favorecido no sólo la reproducción del flamenco, sino de muchas otras especies entre las que se debe destacar la del gran número de especies de anátidas buceadoras como la malvasia (*Oxyura leucocephala*) por ejemplo.

Un aspecto importante que se ha podido observar una vez que descendió el nivel del agua, fue la de la gran erosión sufrida por la zona habitual de localización de la colonia de cría del flamenco, lo que exigirá la adopción de medidas para su conservación.

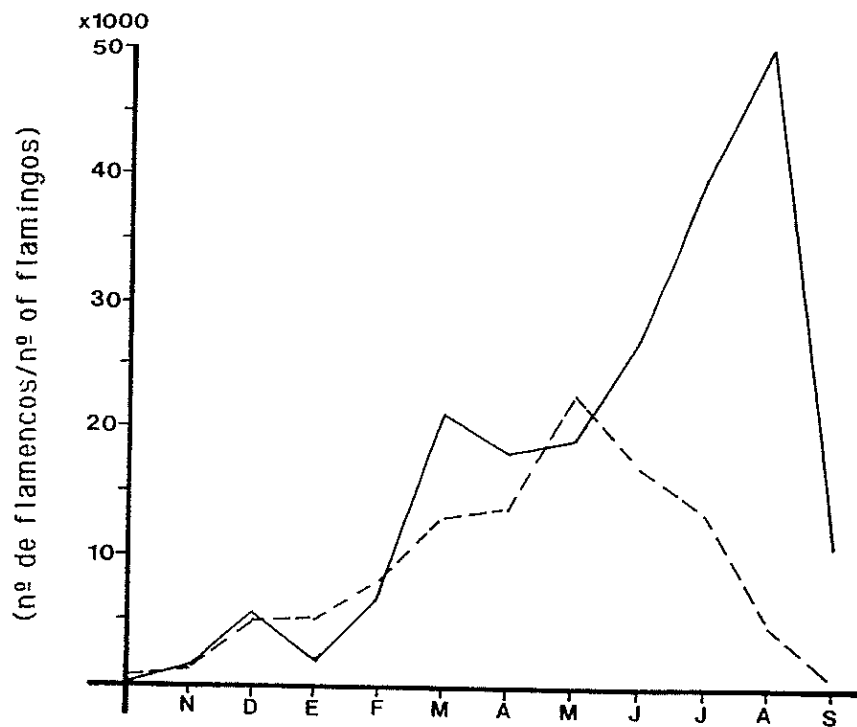


Fig.1. Numero de flamencos censados en la laguna de Fuente de Piedra durante el periodo oct.87 - sept.88 (-----), oct.89 - sept.90 (—————).

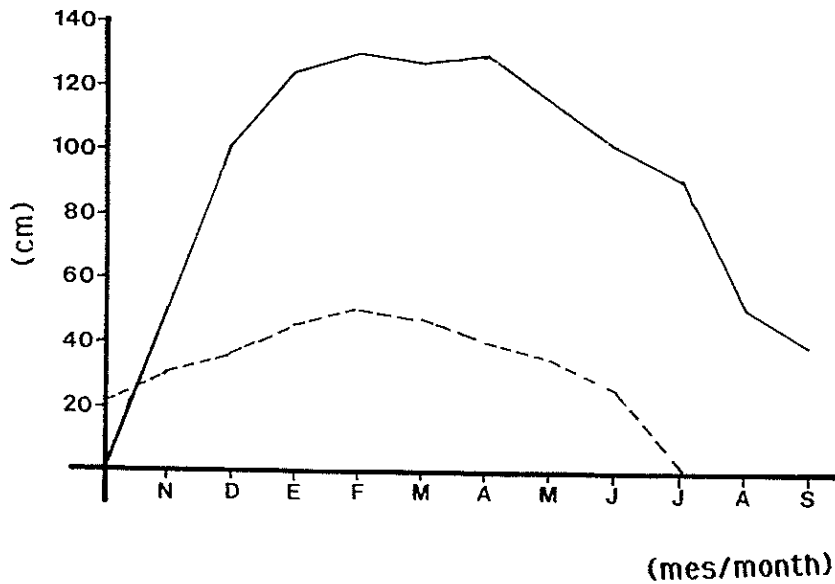


Fig.2. Nivel de agua (cm) en la laguna de Fuente de Piedra durante el periodo oct.87 - sept.88 (-----), oct.89 - sept.90, (—————).

SUMMARY

Exceptionally heavy rain fell in Andalusia between October 1989 and September 1990, especially in November 1989 -- a total of 713.5mm, compared with an annual average of 459.8mm between 1962 and 1989. The correspondingly high level of the lagoon and other wetlands in the area attracted unusually large numbers of flamingos, with a maximum count of 50010 birds in August 1990. During the normal yearly cycle, peak numbers usually occur in May, and the lagoon is completely dry in summer. A total of 13,316 pairs of flamingos attempted breeding, and they hatched a record 10,417 chicks.

Reserva Natural Laguna de Fuente de Piedra
Apartado de Correos N°1. 29520
Fuente de Piedra (Malaga)
Espana

LA GESTION DE LA COLONIA DE FLAMENCOS
(*Phoenicopterus ruber roseus*) EN
FUENTE DE PIEDRA, ESPANA,
DURANTE EL AÑO 1990.

M. RENDON y J.M. RAMIREZ

El año hidrológico 1989 - 1990, se ha caracterizado, por unas precipitaciones excepcionalmente elevadas (713,5mm), lo que permitió que la laguna alcanzase un alto nivel de agua, aproximadamente 1,3m. Las repercusiones sobre el territorio de cria de los flamencos en el Dique Central fueron negativas, al quedar cubierto por una lámina de agua de 40cm, siendo por tanto imposible su ocupación por una colonia de cria, en la figura 1 se compara la situación normal de la laguna y el aspecto que presentaba en 1990, observándose como las únicas tierras emergidas existentes eran los Canchones del Suroeste, así como pequeñas zonas de los diques de las salinas.

Como en años anteriores, se inicio el periodo reproductor con la llegada de los grupos de aves en celo a mediados de enero, durante el mes de febrero la afluencia era ya masiva intensificándose las pautas de cortejo y observándose grupos que procedían a localizar un territorio donde situar la colonia de cria. Un centenar de parejas pudo instalarse en una pequeña zona del dique de la "L" que emergía de las aguas (figura 1), posteriormente otro pequeño núcleo de 12 parejas ocuparía otro islote del dique de la "T", en ambas colonias, los nidos eran destruidos por el oleaje. La zona de cria de la colonia de flamencos en el dique central permanecía bajo las aguas, al igual que la mayor parte de los diques de las salinas, no existiendo ningún islote que reuniese condiciones para acoger una colonia de cria.

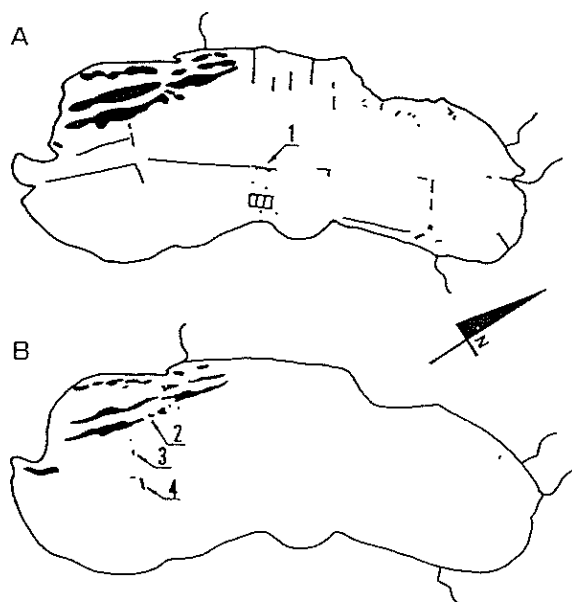


Figura 1: A) Mapa de la Laguna de Fuente de Piedra en un año de precipitación media. En él se resalta la situación del territorio de cria habitual de la colonia de flamencos (1). B) Mapa de las tierras emergidas durante el año 1990, destacándose la colonia de cria principal en los Canchones del Suroeste (2), el islote de la "T" (3) y el de la "L" (4).

MANEJOS REALIZADOS:

Para esta fecha, última semana de febrero, solo se disponían de tres semanas para realizar los manejos necesarios para fijar una colonia de cría, ya que la ocupación de la colonia comienza en la primera quincena de marzo, como es tradicional en Fuente de Piedra. Ante esta situación se plantearon las siguientes actuaciones:

1. Localización de un islote lo más distante posible de la orilla en Los Canchones del Suroeste (Figura 1), únicas tierras emergidas en la Laguna. Con este fin se procedió a realizar un vuelo en avioneta sobre la Reserva para localizar y fotografiar el mejor emplazamiento para una colonia de cría, que posteriormente sería confirmado con una visita a la zona. La isla elegida (Figura 2) tenía forma ovalada con una superficie emergida de unos 3.600 m² y sus dimensiones eran 90 x 40 m. Lo que permitiría, como mínimo, el asentamiento de una colonia de 7.200 parejas.
2. Acondicionamiento de la isla para acoger una colonia de flamencos. Las obras consistieron en el aclareo del matorral halófilo disminuyendo la cobertura de un 65% a un 10%, excavación de cavidades en toda su superficie y la construcción de 200 nidos artificiales (figura 2) en tres pequeños núcleos, en el mayor de ellos con un centenar de nidos se depositaron cascarones de huevo de gallina sobre los conos.

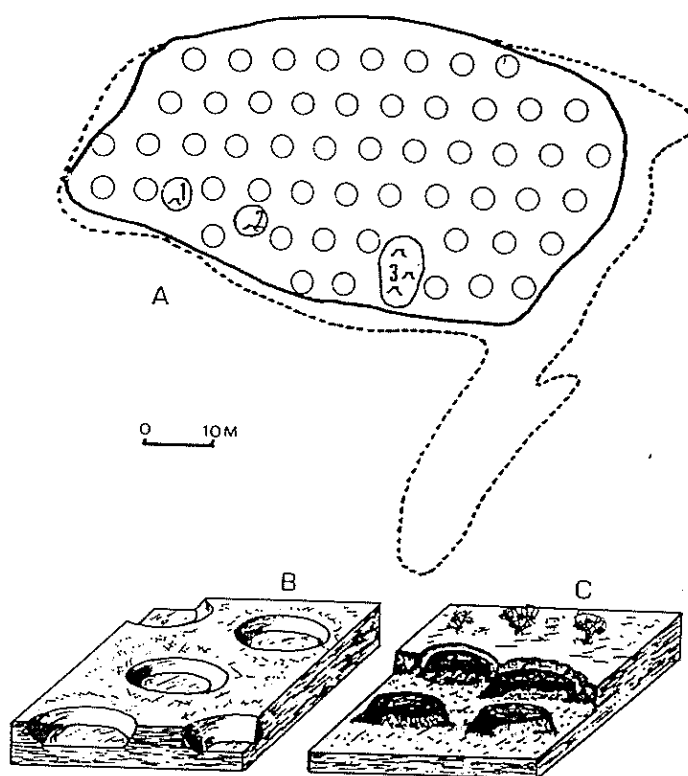


Figura 2: A) Croquis de la isla de los Canchones del Suroeste remodelada como territorio de cría para la colonia de flamencos. Se muestra la superficie acondicionada con cavidades (representadas por círculos) y los tres núcleos de nidos artificiales (1, 2 y 3). B) Esquema de las cavidades excavadas en toda la superficie de la isla. C) Esquema de los nidos artificiales contruidos por excavación.

3. Para el desarrollo del programa de investigación del flamenco en la Reserva era necesario disponer de una nueva torre de observación en las inmediaciones de la futura colonia de cría, a una distancia que permitiese leer con catalejo la anillas de las aves marcadas. Con este fin se diseñó una estructura desmontable de cuatro metros de altura con una caseta de observación, donde los investigadores pudiesen pasar los dos días de observación por turno. La construcción se realizó en un taller de Fuente de Piedra y fue transportado e instalado en dos días, a 200 metros de la futura colonia de cría.

Todos los manejos se realizaron a final de febrero en un tiempo record de diez días. Tanto para el transporte del personal como para los materiales del observatorio fue necesario utilizar una barca ya que el nivel del agua en la zona superaba el metro de profundidad.

RESULTADOS:

Los resultados obtenidos con estos manejos fueron los deseados. Las aves comenzaron a visitar la isla la tarde del día 13 de marzo, las primeras parejas se situaron sobre los nidos artificiales con cascarrón de huevo y a partir de ese momento, la colonia continuó creciendo, día tras día hasta ser ocupada en su totalidad. Posteriormente, cuando la isla estuvo completa, se formaron dos núcleos reproductores en sus inmediaciones: uno al sur formado por 250 parejas y otro al norte con 1.900 parejas. Por último, y cuando las primeras parejas reproductoras salieron de la isla con sus pollos, un nuevo grupo formado por unas 2.300 parejas ocuparon los nidos abandonados.

El total de parejas de flamencos que este año han criado en Fuente de Piedra se eleva a 13.316, de estas más de 10.000 lo ha hecho en la isla acondicionada con este fin, el resto en las inmediaciones a pocos metros. Los pollos nacidos fueron 10.417 (contados en fotografía aérea), lo que vuelve a suponer para Fuente de Piedra y para las colonias de cría de flamencos en el Mediterráneo Occidental un nuevo record histórico.

SUMMARY

Following exceptionally heavy rain in 1989-90 the usual flamingo breeding island was under 40cm of water in early Spring, 1990. Large numbers of flamingos arrived in the lagoon and in late February an aerial survey was made to find the most appropriate island where the flamingos could breed. One of the furthest from shore was chosen. Much of the vegetation was cleared, 200 artificial nests were built, and broken egg shells were scattered around. Finally a new observation post was built. All this work was done in 10 days at the end of February. The island was successfully colonised from 13 March, the first pairs using the nests with broken shells. Over 10,000 pairs of flamingos bred on the island and a record 10,400 chicks hatched.

TRACE METAL EXPOSURE OF CAMARGUE FLAMINGOS

by D. PAIN

Recent research (Cosson et al. 1988 a & b) has shown some adult flamingos collected in the Camargue to have elevated tissue and feather concentration of some heavy metals. Such contamination could have originated from the Camargue or anywhere else in the flamingo's range. To investigate the possibility of local contamination, feathers were taken during ringing from 50 nestling (ca. 2 month old) flamingos from the Camargue breeding colony in 1988. The analysis of external feather deposits, i.e. deposits of atmospheric origin, indicated a local contamination by cadmium, copper and lead. As the mistral (north/north west) was the prevalent wind for several months prior to sampling, it is likely that industry in the Rhône valley contributed to this aerial pollution. It is of interest to establish the significance of such contaminants in various elements of the flamingo's diet locally.

The results of this research will be published shortly in *Environmental Pollution*: Amiart-Triquet, C., Pain, D. & Delves, H.T. Exposure to trace elements of flamingos living in a Biosphere Reserve, the Camargue (France).

Cosson, R.P., Amiart, J.C. & Amiart-Triquet, C. (1988a) *Ecotoxicol. Environ. Saf.*, 15, 107-116.

Cosson, R.P., Amiart-Triquet, C. & Amiart, J.C. (1988b) *Water, Air, Soil Pollut.* 42, 103-115.

ETUDE DE LA CONTAMINATION DES FLAMANTS DE CAMARGUE PAR QUELQUES ELEMENTS TRACES: Cd, Cu, Hg, Pb, Se et Zn

by Richard P. COSSON & Claire METAYER

The following is a summary of the above article which is due to be published in the *Bulletin of Ecology*.

Trace elements (Cd, Cu, Hg, Pb, Se, Zn) were measured in seven organs (liver, kidney, breastmuscle, lungs, breastbone, stomach, feathers) of twenty-two specimens of Greater Flamingo (*Phoenicopterus ruber* [Pallas]) from the Camargue, in the Rhône river delta. The birds had died, trapped in frozen salt ponds during the severe winter 1984-85. Quantitation of Metallothionein-Like Protein (MTLP) was performed using Differential Pulse Polarographic analysis (DPP) on heat treated hepatic and renal cytosols. Organs which have exchange surfaces with the external medium are penetration routes for toxics. Some individuals exhibit markedly higher levels of Hg and Se in lungs, and/or Cd, Hg and Pb in stomach, than mean level for Flamingos from this study, or than levels cited by authors for other birds. Elemental relationships (correlations) between organs (inter-organic) or within the same organ (intra-organic) led us to propose the hypothesis of an atmospheric contamination for Cd, Cu, Pb and Hg, plus a trophic contamination for Cd and Cu. Multiple regression analysis established that the amount of MTLP in heat denatured cytosols was related linearly, first to the amount of Zn and secondarily to the amount of Cu and to the joint amounts of Zn and Cu. Emerging from this study is the fact that Flamingos of the Biosphere Reserve of Camargue, are exposed to direct (aerial) or dietary uptake of heavy metals although they live in a protected area.

WHAT IS THE POTENTIAL LIFE-SPAN OF A GREATER FLAMINGO ?

by A.R. JOHNSON

If this question can be answered it is undoubtedly by Basel Zoo which can boast six of the oldest flamingos known in the world. Adelheid Studer continues to study the Basel flock of Greaters and has sent the following note:

An unknown number of flamingos were imported to the Basel Zoo in 1932 and in 1938. Prior to more birds being acquired in 1954, those surviving were marked with numbered aluminium rings permitting individual identification. Six of these birds were still alive in 1989. Since neither the year they arrived nor their age upon arrival are known we are only sure that they are at least 52 years of age.

Five of these birds still breed nearly every year. One male, paired with a "younger" female, has regularly raised young in recent years. A female, paired with one of her sons, raised a chick in 1989. The failure to breed in the other three birds is due to pinioning which makes copulating difficult though some individuals do learn to mate in spite of this handicap.

The oldest known flamingo in the wild is one ringed as a chick in the Camargue 1954 and seen in the field (ring read) in 1988 at the age of 33 yrs. 10 months (Newsletter N°. 5: 40)

WORKSHOP ON CAPTIVE FLAMINGOS IN THE U.S.

A workshop was held on 27 March, 1990 to discuss the status of wild flamingos and the management of captive flamingos in the United States. The meeting was held in conjunction with the American Association of Zoological Parks and Aquariums (AAZPA) Western Regional Conference in Sacramento, California and was attended by approximately sixty people from zoos across the country. The morning was devoted to the presentation of formal papers. In the afternoon, several short papers were given and the remainder of the day was devoted to discussion of selected topics.

Prior to the meeting, an eight-page survey based on the 1973 Slimbridge survey was distributed to 129 American zoos known to house flamingos. At the time of the workshop 79 returns had been recorded. The results gathered provided general information on the current state of flamingo management, and several papers were generated directly from the survey. Formal presentations included an overview of flamingos, captive demographics, captive diet, reproduction data, hand rearing, display synchrony, status of the Hialeah Racetrack flock, exhibit design, and winter management. During the afternoon discussions, topics included population management, display v. breeding groups, irregular breeding, artificial incubation and egg manipulation, husbandry problems, extended parental care, studbooks or registries, research needs, and a regional literature repository.

The formal papers will be published in the 1990 AAZPA Regional Conference proceedings. These papers plus additional information generated during the discussion session and a further analysis of the survey results will be compiled into a separate proceedings package that will be made available to survey respondents and other interested parties. Inquiries should be sent to Peter Shannon, Curator of Birds, Audubon Park Zoological Garden, P.O. Box 4327, New Orleans, Louisiana 70178, U.S.A.

AIMS OF THE FLAMINGO GROUP

- 1) Develop a network of correspondents to report on changes in status of flamingo populations or threats to the integrity of flamingo habitats.
 - (a) For action by pertinent National Sections
 - (b) For action by Central Secretariat
 - (c) For consideration for inclusion in Red Data Book
 - (d) For inclusion in the President's Letter or other pertinent publication
- 2) Draw up an inventory of flamingo habitats for eventual publication and to guide research and the deployment of observers.
 - (a) Location of area, physical dimensions, brief description
 - (b) Relative importance to flamingos, i.e. feeding, breeding
- 3) Organise censuses on a meaningful time schedule of all areas known, or thought, to harbour flamingos, including captive populations.
- 4) Determine legislative status of flamingos and their habitats.
 - (a) Existing protective measures, both national and international.
 - (b) Development of proposals for increased legal protection for Flamingos and their habitats.
- 5) Coordinate and promote research of all phases of flamingo biology and conservation, screen, recommend and promote research proposals for funding.
- 6) Render advice on the development or improvement of conservation programmes for flamingos in response to crisis situations.
- 7) Develop a bibliography and library on flamingos.
- 8) Organise meetings or conferences on flamingo conservation and issue or sponsor publications as the need or opportunity arises.

The Group circulates its annual report in the form of a newsletter.

ACKNOWLEDGEMENTS

Michel-Antoine Réglade for the illustration of Yellow-legged Gull (*Larus cachinnans*) harrassing flamingo chicks at etang Fangassier, Camargue, Southern France.

Marie-Antoinette Diaz, Dianne Wilker and John Watkin for their help in editing this newsletter.

REQUEST FOR SIGHTINGS OF RINGED FLAMINGOS

Since 1977, over 12,000 Greater Flamingo (*Ph. ruber roseus*) chicks have been ringed in the western Mediterranean with coded plastic leg bands. These are engraved in black with alpha-numerical codes of 3 or 4 digits. French rings (yellow or white) from the Camargue are placed on the right tibia, and Spanish (orange) rings from Fuente de Piedra (Malaga) 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 on the bird's life history.

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