Conservation and Management

CHAPTER 6
CONSERVATION AND MANAGEMENT

The flamingos are colonial nesters and as they do not nest until favourable conditions occur, nesting attempts may fail for several years. If this happens, the number of flamingos may go down drastically. Even after nesting, many times, the conditions become adverse which leads to total breeding failure (Krupanidhi, 1978; Himmatsinhji, 1991; Studer-Thiersch, 2000). Hence, the conservation of flamingos needs special attention.

Materials and Methods:

The threats to the flamingos, their habitats and nesting are identified and described. The management plans are suggested for their conservation.

Results:

The threats to the flamingos, their habitats and nesting are as follows.

6.1 Threats to the Flamingos:

(A) Poaching:

Like any other water bird, hunting of flamingos was recorded for their meat purpose. Being highly gregarious and colonially nesting birds, the flamingos are easily exploited for their meat and eggs and are considered as easy source of food by the local people. Hunting of flamingos, selling it to earn money or consuming its meat, were very common practice amongst the villagers/fishermen living at the edge of sea coast. During this study, the hunting activities by the local villagers/fishermen were recorded at Tada Talav, Vadgam, Khambhat, Jinaj of Anand District, Hansot and Sarod of Bharuch District and Gogha, Gopnath and Sartanpar of Bhavnagar district. The feathers of a poached Lesser Flamingo were recorded from its nesting colony at Purabcheria, in the Littler Rann of Kachchh, on July 3, 2004

Different methods used by the trappers for capturing the birds were:

a) Kite Flying:

This is the cruelest method of trapping the flamingos and used widely. A kite is flown in the area having large number of flamingos. Once the kite is flown high, other person disturbs the flock and forces the birds to fly in the direction of the kite. The flamingos cannot see the thread of the kite, their wings get entangled in the thread, get cut and as a result they fall on the ground. Such handicapped birds are collected by the trappers.

b) Use of Noose Trap:

The noose series are spread on the mudflats vertically. The flamingos are caught in the noose when they try to cross it. Once, trapped, theirs wings are folded or legs are broken so that they can not escape.

c) Fish Net:

The net is set in water for catching the fishes, however, sometimes flamingos are occasionally trapped, when flying low at night.

d) Striking with the Stick:

A small stick is thrown on the foraging flock from a short distance, which injures the birds when it strikes. The injured birds are collected.

The above information regarding the hunting activities and the hunting methods were collected from the local people without showing our identity. Strong proofs were collected about the poaching of water birds, particularly the flamingo. The Lesser flamingos were recorded being sold by fishermen, in a fish market of Hansot, 21 km south to Ankleshwar in Bharuch district, for Rs. 75/- only (Parasharya, 2001). Flamingo hunting was also reported at Sarod, Bharuch, where a couple with several Lesser Flamingos with broken legs was caught in camera by a team of the Maharaja Sayajirao University of Baroda, Vadodara (Padate, *Pers Comm.).* Newspaper reports also provide evidences that the flamingos are poached even in protected areas like Nal Sarovar (Indian Express May 20, 1999).

(B) Collision with Power Lines:

Striking of flamingos with high power lines was noted at many sites during the study period (Plate 6-1). Wherever there was a water body close to the power line, deaths due to collision with the wires was common. The birds which are landing or suddenly taking off near the power lines became victims. A large number of dead birds were found near Adesar, Shiranivandh and Bhirandiari. At Kumbharwada sewage, Bhavnagar, dead Lesser Flamingos were found on four different occasions (Table 6).

Death of a large number of flamingos due to collision with power lines during the cyclone of June 1998 was recorded at Surajbari, Gulf of Kachchh (Times of India, Ahmedabad edition, August 2, 1998; Singh *et al.*, 1999). Such collisions are frequently recorded at Porbandar Bird Sanctuary (Kishor Joshi, Bharat Rughani, *Pers. Comm.*).

Table 6: Collision of Flamingos with Power Line in Gujarat

Sr. No.	Date	Place	Co-ordinates	Species	No.	Power line
1	19-10-03	Shiranivandh: Great Rann of Kachchh	23° 54' 29.632"N; 70° 32' 32.624"E	LF	3	Electric
2	23-10-03	Shiranivandh· Great Rann of Kachchh	23° 54' 29.632"N; 70° 32' 32.624"E	LF	5	Electric
3	24-10-03	Nr. Adesar, Santalpur- 19 km;Banaskantha-Kachchh Boundary	23° 37' 33.867"N; 71° 02' 56.085"E	GF	26	Electric (220 KV)
4	13-12-03	Between Boria bet and Tuita Bet Great Rann of Kachchh	24° 17.045' N; 71° 00.610' E	GF	2	Telephone
5	13-12-03	Between Boria bet and Tuita Bet, Great Rann of Kachchh	24° 17.588' N; 71° 01.194' E	LF	3	Telephone
6	14-02-04	Near Bhirandiyara, 50 km north to Bhuj, Great Rann of Kachchh	23° 32.038' N; 69° 40.077 E	GF	2	Electric
7	14-01-04	Near Bhirandıyara, 50 km north to Bhuj, Great Rann of Kachchh	23° 32.038' N; 69° 40.077 E	GF	1	Electric
8	08-02	Nirma Salt pans	21° 54' 02.902"N; 72° 10' 27.508"E	GF	1	Electric
9	11-02	Kumbharwada Sewage, Bhavnagar	21° 46' 45.685"N; 72° 06' 28.144"E	LF	1	Electric
10	11-03	Kumbharwada Sewage, Bhavnagar	21° 46' 45.685"N; 72° 06' 28.144"E	LF	1	Electric

GF-Greater Flamingo; LF-Lesser Flamingo

(C) Predation:

Predation of the chicks of Lesser Flamingos by Steppe Eagles (*Aquila nipalensis*) was recorded at the Rann around Bela and Kuda (23^0 55.470' N; 70^0 49.737' E) on December 15, 2003 (Plate 6-2,3 and 4). It is described in more detail in chapter 4.8A.

(D) Disease / Poisoning:

There is no published record of mass death of flamingos due to disease or poisoning from India. However, in October 2004, about 20 flamingos died at Modern Salt pans, Avania near Bhavnagar due to an unknown reason. In Africa, Lesser Flamingos are known to die due to the toxin of blue- green algae (Codd, 2003).

6.2 Threats to the Habitat:

(A) Pollution:

The sea coast near Sarod, Bharuch district receives heavy load of effluents from the industries of Vadodara district which pollute the habitat extremely. The flamingos did not inhabit the areas where the effluents were being released. Gulf of Khambhat is heavily polluted as large number of industries located at Ankleshwar, Vadodara, Ahmedabad and Bhavnagar pour their industrial effluents into the Gulf.

The flamingos are constantly exposed to the industrial effluents at sewage pond, of Porbandar city. The flamingos are also exposed to domestic effluents of sewage ponds at Anand, Ahmedabad, Bhavnagar, Jamnagar, Rajkot and Porbandar (Plat 6-7,8).

Recently, pollution has increased in the Gulf of Kachchh and in the Gulf of Khambhat. Recent increase in oil import through Gulf of Kachchh and establishment of oil refineries have contributed to increasing incidences of oil spill. As a result, destruction of marine life and bird deaths are also reported.

6.3 Threats to the Nesting Colony:

(A) Disturbances by Human Beings:

I. Stealing of Eggs:

Egg collection by the villagers/fishermen after each nesting attempts was noted at Purabcheria (23^0 11'N; 70^0 46'E), near Cherwari, in Little Rann of Kachchh, during the entire study period.

On July 2, 2004, when this nesting site was visited, about 3,00,000 Lesser Flamingos along with 52 adult Greater Flamingos were recorded, in different groups, on the mudflats of Purabcheria. Most of the Lesser Flamingos were busy in displaying and about 600 adult Lesser Flamingos were involved in nest building and incubation. A total of 296 nests in 15 different groups were counted. Five eggs were observed in this colony of Lesser Flamingos. The colony was active and it seemed that it would result in successful breeding. However, on July 20, 2004 when the same colony was re-visited, the conditions were totally different. Only 79,143 Lesser Flamingos were recorded along with 7 Greater Flamingos. No flamingos were at the nest site as the nesting was abandoned. Totally, 964 nests in 52 different groups were recorded. However, no eggs were seen on any of the nests.

On June 27, 2003 when the same site was visited, 300 freshly abandoned nests were observed. A flock of 300 Lesser Flamingos was flying around. No eggs were recorded. From the local inquiry, it was learned that the Lesser Flamingos have been attempting to nest at this site since several years (three generations of a present fisherman of Cherwari), though, the nesting has never been successful. The reason behind this is only stealing of eggs by the local villagers.

As soon as the flamingos laid the eggs, they were collected by the fishermen of nearby village. Egg stealing at this site was also reported earlier by Mundkur *et al* (1989). This nesting site falls within the Wild Ass Sanctuary and is easily approachable

by the local villagers. The flamingos never got an opportunity to incubate the eggs and raise the young ones, and this colony never turned into a successful nesting site.

Relatively large sized eggs of flamingos provide nourishment to the entire family without any cost. Hence the poor fishermen find it as a good option of food compared to the vegetables or any other food source.

II. Visits of the Active Nesting Colonies:

Several groups of individuals were reported visiting the active nesting colonies of flamingos, at Flamingo City, in the Great Rann and of Lesser Flamingos near Zinzuwada, in Little Rann of Kachchh, ever since the information of breeding of flamingos leaked out (Hussain, 1991; Varu 1999; Thakar, 1999). The individuals caused a great deal of disturbance to the adult birds and chicks, by approaching the nesting colony closely and taking photographs and video films.

The flamingos are very sensitive to the presence of alien in their nesting areas. The proximity of people near nests for prolonged period cause the birds to leave the nest, thereby leading to possible deterioration of eggs. On disturbance, incubating bird hurriedly leaves the nest and as a result egg rolls down the nest.

Hussain (1991) reported that, the video shooting parties had chased chicks and adults to record "Action" shots. Some eggs and smaller chicks were also manipulated to shoot close ups. He found several broken eggs with spoiled contents as well as dead chicks even at a distance of 100 m from the main nesting colony at the Flamingo City. He believed that both chick mortality and destruction of eggs were due to human disturbance, as possible cause of natural mortality was not noticed. In 1998, same type of human disturbances to the active colony of Lesser Flamingos was noted near Zinzuwada in Little Rann of Kachchh (Thakar, 1999; Varu, 1999; Singh *et al.*, 1999).

The Lesser Flamingos breed at the salt pans in the Little Rann every year during the southwest monsoon. Since the entire Rann gets inundated during the monsoon, the

salt pans are abandoned by the miners/labourers, which are used by flamingos for nesting. The flamingos start breeding from late July and continue till September. The miners visit the salt pans during Navratri *i e* during September to reactivate the salt pans. Hence, the late breeders get disturbed by the movements of miners/ labourers and their vehicles.

(B) Natural Calamities:

The flamingos nest when favourable conditions occur. Some times the favourable conditions do not occur, and at times the favourable conditions become adverse, affecting the active nesting of flamingos, resulting in unsuccessful breeding. Some of such natural calamities are:

I. Cyclone:

On June 8, 1998, the cyclonic disaster which hit Kandla port, destroyed the active nesting colony of flamingos near Cherwari. Large numbers of adults, young ones and eggs of the flamingos were destroyed along with the nests (Times of India, August 2, 1998).

II. Flood during Active Nesting:

A total of 1,500 Lesser Flamingos and 3,000 Greater Flamingos had gathered at the salt pans near Zinzuwada, in the Little Rann of Kachchh. Their number kept on increasing. Finally, on August 15, 2003 a total of 25,000 individuals of both the species of flamingos were recorded near the nesting site. On August 29, 2003 a total of 30,000 individuals of both species were found nesting in the salt pans and 5,000-6,000 nests were recorded (Parajia 2003, *Pers Comm.*). The water from Rupen river rushed into the Little Rann of Kachchh, on August 31, 2003. This flooding destroyed the active nesting colony of flamingos. The site was visited on September 11, 2003 and large numbers of eggs were found collected along the length of bunds, due to flood water (Plate 6-5). Normal water flow of Rupen River would not have destroyed the colony. But the water flow in the form of sudden flood destroyed the colony.

The flood of August 2003 also affected the nesting colony in the Great Rann of Kachchh. Large numbers of eggs of flamingos were drawn by the water in different areas of Great Rann of Kachchh. The eggs were also reported to be drawn along with the flood water at the Nada bet, Asara near Mavasari village, Khemli village near Jakhotara, and Mowana in Great Rann of Kachchh. The abandoned eggs were collected for measurements from Gatka (23^0 49.047' N; 70^0 56.0915' E) and Masali villages (24^0 04.049' N; 71^0 17.868' E) after the flooding effects.

III. Over Flooding of Nesting Grounds:

In 1979, the area around the Flamingos city was heavily flooded with water (Plate 4.6-2); the water level was up to the stomach of camel. The flamingos did not attempt to nest in that year, in such heavily flooded area (Himmatsinhji, 1991).

IV. Drought Years:

During the years with very little or no rain around the Great Rann of Kachchh, the Greater Flamingos did not attempt to nest, as inundation was not sufficient. Some of the drought years were 1972, 1975, 1999, during which the flamingos were not recorded nesting in the Great Rann of Kachchh. (See Chapter 4.6 for more details).

V. High Rates of Receding Water:

The water, around the nesting colony at Flamingo City, started receding at a high rate in April 2004, which resulted in high salinity of water and consequently depletion of food. As a result, the adults deserted the colony leaving the chicks unable to fly. Such chicks could not survive because of starvation and deposition of salt on their body and hence, heavy chick mortality occurred (Plate 6-6). A large number of Lesser Flamingo chicks died due to the same reason in December 2003. (See Chapter 4.8 for more details).

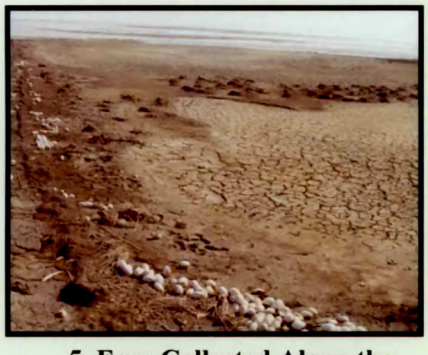
Plate 6 : Conservation and Management

1. Dead Flamingo Near Electric Line

2. Steppe Eagle Near Flock of Chicks

3. Steppe Eagle (*Aquila nipalensis*)

4. Carcass of Juvenile Preyed Upon



5. Eggs Collected Along the Bund After Flood

6. Chick Mortality After Sudden Receding of Water

7. Lesser Flamingos in Industrial Area, Bhavnagar

8. Lesser Flamingos in Industrial Area, Porbandar

6.4 Management Options:

1. Education and Awareness:

Most of the local people surrounding the coastal and mudflats areas, are illiterate and are unaware about the importance of fauna and its conservation. Most of them are involved in traditional fishing activity only, and are poor. They are also not aware about the 'Wildlife Protection Act' and the provisions of punishment on violation of law. Government should take serious steps to educate these people and provide knowledge about the conservation of fauna.

2. Social Upliftment and Alternative Source of Income Generation:

At the villages such as Cherwari, where there is no other activity except fishing, and the people are involved in poaching and egg stealing, government should provide some other earning activities to cope with their poverty and for their social development. Their involvement in other activities can divert them from poaching and egg stealing activities.

3. Enforcement of Law:

The poachers, the sellers, the buyers as well as the consumers of the water birds should be punished strictly to prevent the poaching activities.

4. Flamingos in Legislation:

Both the species of flamingos are listed in Schedule IV of the wildlife protection Act (1972). Both the species need to be shifted to the Schedule I of the act. Such a step will help to provide better legal protection to them.

Recently, Birdlife International (2001) has categorized Lesser Flamingo as 'Near Threatened' species; however, the Greater Flamingo is not considered to be threatened in Asia. Since Greater Flamingos are equally threatened as far as reproduction is concerned, they too should be categorized as 'Near Threatened'. If the threats are not identified and

corrective measures (including legislative measures) not taken up on time, it will be very difficult to conserve the species.

5. Protection from High Tension Power Lines:

The high power line should be tagged with colored radium tags, which can shine at night and are clearly visible during daytime. This will help the birds to avoid power lines and hence collisions. Such tags have been used successfully elsewhere in the world (Bevanger, 1993)

6. Management of Pollution:

The habitat of flamingos should be kept free from contaminants to maintain healthy food web. The polluted areas commonly inhabited by flamingos should be treated regularly. The chemical effluents of the industries should be treated properly before release into the environment. A regular monitoring of the habitats should be done to keep them pollution free.

7. Protection of Purabcheria Nesting Site:

The nest site at Purabcheria, in the Little Rann of Kachchh should be given total protection to ensure successful breeding. A forest post for guarding this area should be established in this area and the entry of the local people or fishermen should be checked during the breeding season of flamingos.

8. Protection of Active Nesting Colony:

The Border Security Force and Dept. of Forest, Govt. of Gujarat should not allow any one to enter the nesting areas of flamingos during active nesting period, except the research group. However the permission to the non-research group can be given after confirmation of completion of nesting activity or at the end of nesting cycle to avoid disturbances. The banding, tagging or ringing programmes for migration study should be taken up towards the end of nesting season.

In the Little Rann, nesting activity of Lesser Flamingo is badly affected by the movement of salt pan labourers. Activity of salt pan labourers and vehicular movement should be totally banned during active nesting periods from June 15, to September 30, each year. The reactivation of salt pans should be done after the completion of nesting.

9. Rescue and Rearing of the Young Ones:

The deserted young ones of flamingos, too small to fly, can be rescued from the site and raised in the Zoo and then released to the environment. Thousands of chicks died after thick soda ring formation on the ankles, in 1962 at Lake Magadi, Kenya. A major rescue operation was done by the local naturalists at that time. A total of 1,00,000 chicks were affected of which about 27,000 were caught and released in a safer area after removing the soda rings (Ogilvie and Ogilvie, 1986).

On May 6, 2004, 9 young ones of Greater Flamingos which were very weak and under stress were rescued from the Flamingo city. The birds were kept on artificial diet. After a week, two young ones survived and were released back to nature at Chharidhandh by the forest staff (Present Study).

10. Inundation of Nesting Grounds:

When the water starts receding before the completion of the breeding of flamingos, the water can be added into the habitat and the water level should be maintained around the nesting colony till the breeding is over.

The water can be brought from a long distance by pipeline or be lifted from the ground using diesel pump. In the Little Rann, salt farming is done by lifting ground water using diesel pumps.

11. Habitat Protection / Designating Flamingo Habitat as Ramsar Sites:

There are several sites, which support 1% geographic population of one or both the species of flamingos. Moreover, some sites support 20,000 birds of either species of flamingos in addition to thousands of other waterbirds. Such sites certainly fulfill the

criteria of 'Ramsar Site'. The flamingos largely occur on coastal wetlands. Hence, if some of the coastal wetlands are given legal protection, it will give immense help to waterfowl conservation. Recently, Vijayan *et al* (2004) have suggested having 'Protected Inland Wetland Network'. Keeping flamingos as 'flagship species', if a few coastal wetlands are incorporated in this national Grid, it will immensely help in conservation of waterfowls in general and flamingos in particular.

12. Tourism:

Tourist activity at the breeding ground has proved to be fatal in Gujarat (Hussain, 1991, Mundkur, 1997; Varu, 1999; Thakar, 1999; Singh *et al.,* 1999; present study) and elsewhere in the world (Gichuki and Ndiritu, 1997). Hence, tourists should be discouraged to visit breeding grounds during active breeding season.

However, at other foraging sites of flamingos, the tourist activity help in generating income to the local people and thereby help in conservation. Flamingos are remarkable species which become attractant to many tourists in protected areas of Gujarat State like Nalsarovar Bird Sanctuary, Marine National Park, Thol Bird Sanctuary and Khijadia Bird Sanctuary. The sites other than the protected areas, where flamingos occur in large numbers such as salt pans of Bhavnagar, Jamnagar, Charakla, and the sewage area of Ahmedabad, Anand, Bhavnagar and Jamnagar should be promoted to attract tourists.