

FLAMINGOS

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FLAMINGOS

SCIENTIFIC CLASSIFICATION

- A. Class – Aves (birds).
- B. Order – Ciconiiformes (also listed as Order Phoenicopteriformes).
1. Members of this order have long legs and long necks. Order Ciconiiformes also includes storks, herons, and ibises.
 2. The classification of flamingos has puzzled taxonomists for years. The skeletal structure, egg-white proteins, and behavior patterns cause scientists to link flamingos to various groups.
 - a. The pelvis and ribs of a flamingo are similar to those of storks.
 - b. The composition of egg-white proteins in flamingo eggs are similar to that of the herons.
 - c. Behavior patterns, especially those of chicks, link them closely to geese (Order Anseriformes). Flamingos also have webbed feet and waterproof plumage like geese.
 - d. More recently, taxonomists have grouped flamingos in their own Order – Order Phoenicopteriformes.
- C. Family – Phoenicopteridae.
- Flamingos are the only members of the family Phoenicopteridae. Distinguishing characteristics include long legs; a long, curved neck; and a gooselike voice.
- D. Genus, species.
- There are five species of flamingos divided into three genera:
1. *Phoenicopterus ruber* is divided into two distinct and geographically separated subspecies: *P.r. ruber* and *P.r. roseus*. Some scientists classify these as two separate species.
 - a. *P.r. ruber*, the Caribbean flamingo, is slightly smaller than *P.r. roseus*.
 - b. *P.r. roseus*, the greater flamingo, is the largest of the flamingos and has deep pink wings.
 2. *Phoenicopterus chilensis*, the Chilean flamingo. Chilean flamingos are slightly smaller than Caribbean flamingos and have gray legs with pink bands at the joints.
 3. *Phoenicopterus minor*, the lesser flamingo. (Still sometimes listed in the genus *Phoeniconaias*). This species is the smallest of all flamingos. The color of the lesser flamingo is brighter than the greater flamingo.
 4. *Phoenicoparrus jamesi*, the James' flamingo. This species is characterized by having all black flight feathers, including the secondary flight feathers, which are red in other species.

5. *Phoenicoparrus andinus*, the Andean flamingo. This is the only species of flamingo that has yellow legs and feet. It also has a red spot between the nostrils.
- E. Fossil record.
1. Fossil evidence indicates that the group from which flamingos evolved is very old and existed about 30 million years ago, before many other avian orders had evolved.
 2. The discovery and study of a fossil in 1976 suggested that flamingos arose from ancient shorebirds.
 3. Fossilized flamingo footprints, estimated to be seven million years old, have been found in the Andes Mountains.

DISTRIBUTION AND HABITAT

- A. Distribution.
1. All flamingos are found in tropical and subtropical areas.
 2. Populations of Chilean flamingos are found in central Peru, both coasts of southern South America (mainly in the winter), Argentina, Uruguay, Paraguay, Peru, Bolivia, and southern Brazil. Stragglers have been reported on the Falkland Islands and Ecuador.
 3. The lesser flamingo is primarily an African species. Populations are found in eastern, southwestern, and western Africa. In addition, a sizable population nests in India. Stragglers can be found as far north as southern Spain.
 4. The James' flamingo has the most restricted range of all flamingo species. They are found in southern Peru, northeastern Chile, western Bolivia, and northwestern Argentina.
 5. Andean flamingos are found in southern Peru, north-central Chile, western Bolivia, and northwestern Argentina.
 6. The Caribbean flamingo is found throughout the Caribbean (Cuba, the Bahamas, the Yucatan, Turks and Caicos), the Galapagos Islands, and the northern part of coastal South America.
 7. The greater flamingo has the most widespread distribution of all flamingo species. Populations are found in northwest India, the Middle East, the western Mediterranean, and Africa. Limited numbers of this species can be found over much of northern Europe and eastward to Siberia.
- B. Habitat.
1. The flamingo's most characteristic habitats are large alkaline or saline lakes or estuarine lagoons that usually lack vegetation. Lakes may be far inland or near the sea.
 2. A variety of habitats are used by flamingos: mangrove swamps, tidal flats, and sandy islands in the intertidal zone.

3. The presence or absence of fish may have a great influence on the use of lakes by some flamingos.
 - a. The Chilean flamingo is scarce or absent in lakes with fish. It is present, usually in large numbers, where there are no fish with which to compete for food.
 - b. The introduction of fish to some lakes may seriously affect the distribution of the Chilean flamingo as well as the greater and Caribbean flamingos, since they all feed primarily on invertebrates. Other flamingo species are not affected because of different food sources.

C. Migration.

1. Flamingos are generally non-migratory birds. However, due to changes in the climate and water levels in their breeding areas, flamingo colonies are not always permanent.
 - a. Populations that breed in high-altitude lakes, which may freeze over in the winter, move to warmer areas.
 - b. When water levels rise, birds may search for more favorable sites.
 - c. Drought conditions may force some flamingo populations to relocate.
 - d. Most flamingos that migrate will return to their native colony to breed. However, some may join a neighboring colony.
 - e. When flamingos migrate, they do so mainly at night. They prefer to fly with a cloudless sky and favorable tailwinds. They can travel approximately 600 km (373 miles) in one night at about 50 to 60 kph (31-37 mph). When traveling during the day, the flamingos fly at high altitudes, possibly to avoid predation by eagles.
2. The movements of the greater flamingo population living in Carmarque in southern France have been closely monitored since 1977.
 - a. Most flamingos that leave the colony go either southwest to winter in Spain, or southeast to winter in Tunisia and Turkey.
 - b. The percentage of birds that travel east or west seems to depend on the direction of the prevailing winds in the birds' first autumn.

D. Population.

1. The lesser flamingo is the most numerous of all flamingo species, with an estimated population of 1.5 to 2.5 million individuals.
2. The second most numerous flamingo species is the greater flamingo. Exact numbers of these birds are difficult to assess because of their extensive range and migration patterns.
3. The Chilean flamingo is the most numerous of the south American flamingos. Estimated total population is not more than 200,000 individuals, and the population is in a decline.

4. The James' flamingo has an estimated population of 64,000 individuals.
5. Estimated population of the Andean flamingo is 33,927 birds with a decreasing trend.
6. In 1956, the Caribbean flamingo numbers were estimated at only 21,500. Since then, the population has increased to a current estimate of 850,000 to 880,000 birds and a stable trend.

PHYSICAL CHARACTERISTICS

A. Size.

1. The greater flamingo is the tallest flamingo, standing 110 to 130 cm (43–51 in.) and weighing up to 3.5 kg (7.7 lb.).
2. The lesser flamingo is the smallest flamingo, standing 80 cm (31.5 in.) and weighing only 2.5 kg (5.5 lb.).
3. Males reach full size between one-and-a-half and two years.
4. Male flamingos are slightly larger than females, weighing more and having longer wingspans; however, visual sex determination of flamingos is unreliable.
5. The wingspan of flamingos ranges from 95 to 100 cm (37–39 in.) for the lesser flamingo to 140 to 165 cm (55–65 in.) for the greater flamingo. The Caribbean flamingo has a wingspan of 150 cm (59 in.).

B. Coloration.

1. Feather color varies with species, ranging from pale pink to crimson or vermilion.
 - a. Caribbean flamingos have the brightest coloration: crimson or vermilion.
 - b. The Chilean flamingo is pale pink.
2. Feather coloration is derived from carotenoid pigments found in a flamingo's food.
3. Male and female flamingo coloration is the same.
4. Newly-hatched chicks are gray or white.
5. Juveniles are grayish, taking approximately one to two years to obtain full adult coloration.
6. Parents may lose some of their pink coloration while raising young.
7. Coloration of a flamingo's legs and feet varies according to species – from yellow to orange or pink-red. The Andean flamingo is the only species that has yellow legs and feet.

C. Appendages.

1. Legs.

- a. The legs of adult flamingos are longer than the flamingo's body, measuring between 80 to 125 cm (31.5–49 in.), depending on the species.
- b. The ankle is located about halfway up the leg.
- c. The knee is located close to the body and is not externally visible.

2. Feet.

- a. The Chilean, greater, and lesser flamingos have three forward-pointing toes and a *hallux*, or hind toe.
- b. Andean and James' flamingos have three toes and no hallux.
- c. Webbing between the toes aids the bird in swimming and stirring up food.
- d. Coloration of the feet and legs is the same.

3. Wings.

- a. The wingspan of flamingos ranges from 95 to 100 cm (37–39 in.) on the lesser flamingo to 140 to 165 cm (55–65 in.) on the greater flamingo. The Caribbean flamingo has a wingspan of 150 cm (59 in.).
- b. There are 12 principal flight feathers located on each wing. These black feathers are visible when the wings are extended.

4. Neck.

The neck is long and sinuous. A flamingo has 19 elongated cervical (neck) vertebrae allowing for maximum movement and twisting.

D. Head.

1. Eyes.

- a. The eyes are located on either side of the head.
- b. Flamingo chicks have gray eyes for approximately the first year of life. Adult flamingos have yellow eyes.

2. Bill.

- a. An adult flamingo's bill is black, pinkish, or cream-colored. Coloration varies according to species.
- b. The bill is adapted for filter feeding. The upper and lower bill, or mandible, is angled downward just below the nostril.
 - (1) The upper mandible is thin and flat, and functions like a lid to the lower mandible. The lower mandible is large and trough- or keel-shaped.
 - (2) Tooth-like ridges on the outside of a flamingo's bill help filter food from the water.

- (3) Both the upper and lower mandibles contain two rows of a bristled, comb-like or hair-like structure called *lamellae*. When the mandibles come together, the lamellae of the upper and lower mandibles mesh.

The number of lamellae in a flamingo's bill varies according to species. The Andean flamingo has about 9 lamellae per cm (23 per in.). The James' flamingo has about 21 lamellae per cm (53 per in.). The Chilean flamingo has about 5 to 6 lamellae per cm (13–15 per in.).

- (4) James' and Andean flamingos have a deep, narrow trough-like lower mandible, which allows them to eat small foods such as algae and diatoms.
- (5) The lower mandible of Caribbean, greater, and Chilean flamingos is wide, allowing them to feed on larger foods such as brineflies, shrimp, and molluscs.

3. Tongue.

A flamingo's large, fleshy tongue is covered with bristle-like projections that help filter water and food particles through the lamellae.

E. Feathers.

1. Adult feathers have a small, delicate, accessory feather arising from the main feather at the point where the quill merges into the shaft of the feather. This is called an *aftershaft*.
2. There are 12 principal flight feathers located on each wing. These black feathers are visible when the wings are extended.
3. Flamingos have 12 to 16 tail feathers.
4. Contour feathers cover all of the body except the bill and scaled parts of the legs and feet. They protect the skin from damage and help streamline the flamingo for flight.
5. Flamingos molt (shed and replace) their wing and body feathers at irregular intervals ranging from twice a year to once every two years. The molt is related to the breeding cycle.
6. Molted feathers lose their color.

SENSES

A. Hearing.

Flamingos have good hearing. Vocalizations are important and may be used to keep flocks together and for parent-chick recognition.

B. Eyesight.

1. Vision plays an important role in helping flamingos synchronize collective displays of several hundred to several thousand birds.
2. Some biologists believe that a flamingo's night vision is poor, but better than a human's.
3. Like most birds, flamingos have well-developed color perception.
4. In zoological settings, flamingos recognize their uniformed keepers among visitors.

C. Tactile.

Tactile organs on the tongue can be used to ensure that only food is ingested.

D. Taste.

The sense of taste is poorly developed in birds.

E. Smell.

Flamingos have little or no sense of smell.

ADAPTATIONS FOR THEIR ENVIRONMENT

A. Swimming and wading.

1. Because flamingos have long legs, they can wade into much deeper water than most other birds. Webbed feet support them on soft mud.
2. When the water is beyond their wading depth, flamingos swim at the surface while feeding. Webbed feet allow the flamingo to swim quite readily.
3. There is no evidence that flamingos dive.
4. Flamingos are often seen in dense packs floating on the surface of the water.

B. Respiration.

Like other birds, flamingos breathe air with lungs. They hold their breath while feeding under water.

C. Sleep.

1. When flamingos are resting, they may sit down with their legs tucked beneath them or rest standing on one leg.
2. While resting, flamingos face into the wind. This stops wind and rain from penetrating their feathers. When resting on one leg, flamingos can be seen swaying back and forth in the wind.

D. Thermoregulation.

Flamingos frequently stand on one leg. Curling a leg under the body keeps the foot warm and conserves body heat. Flamingos stand on one leg in both cool and warm environments.

E. Flight.

1. To take off, a flamingo runs several steps, begins flapping its wings, and lifts off into the air. When landing the procedure is reversed: the bird touches down and then runs several paces.
2. A flamingo flies with its head and neck stretched out in front and its legs trailing behind.
3. Flight speed of a flock of flamingos can reach 50 to 60 kph (31–37 mph).
4. Flamingos have been known to fly 500 to 600 km (311–373 mi.) each night between habitats.

F. Adaptations for a high-salinity environment.

1. The majority of lakes where flamingos live have extremely high salt concentrations. The only source of fresh water for some of these birds comes from boiling geysers. Flamingos are capable of drinking water at temperatures that approach the boiling point.
2. Flamingos excrete salt through salt glands in the nostrils.

BEHAVIOR

A. Social structure.

1. Flamingos are very social birds. Breeding colonies of a few individual flamingos are rare, while colonies of tens of thousands of birds are common.
2. Flock size ranges from 2 to 340 birds with an average of 71 birds.

B. Social behavior.

1. Flamingos devote considerable time to collective displays before, during, and after breeding.
2. Several hundred to several thousand flamingos are all involved simultaneously with ritualized postures and movements to synchronize breeding.
3. Sometimes only one display is performed, but more often, a predictable sequence of displays are carried out. Not all flamingo species perform all of the described displays, and some perform the displays slightly different than described. Flamingo displays include the following;
 - a. “Head-flag” involves stretching the neck and head up as high as possible, with the bill pointing upwards, and then rhythmically turning the head from one side to the other.

- b. "Wing-salute" is performed by spreading the wings for a few seconds, showing their striking contrasted colors, while the tail is cocked and neck outstretched.
- c. In the "inverted wing-salute", the flamingo angles its head down, cocks its tail, and orients its body so that the tail is higher than the chest. The wings are then held partially open above the back with the black flight feathers pointing up and the bend in the wing pointing down.
- d. "Twist-preen" entails the bird twisting its neck back and appearing to preen quickly, with its bill behind a partly open wing.
- e. "Wing-leg stretch" involves the leg and wing on the same side stretched out and to the rear.
- f. "Marching" is performed by a large group of flamingos that cluster together, stand erect, and then move in quick, synchronized steps in first one direction and then another.

C. Individual behavior.

- 1. Flamingos spend most of the day feeding, *preening* (distributing oil from a gland at the base of their tail to their feathers for waterproofing), resting, and bathing.
- 2. Breeding birds feed day or night. Non-breeding birds feed at night and spend the day sleeping or involved in activities such as preening and bathing.
- 3. Flamingos spend about 15% to 30% of their time during the day preening. This is a large percentage compared to waterfowl, which preen only about 10% of the time. Flamingos preen with their bills. An oil gland near the base of the tail secretes oil that the flamingo distributes throughout its feathers.
- 4. Flamingos swim readily and bathe in shallow fresh water, submerging the whole body.

D. Interaction with other species.

Two or more species of flamingos can coexist in the same area at the same time.

COMMUNICATION

- A. Vocalizations.
 - 1. Flamingo vocalizations range from nasal honking to grunting or growling. Flamingos are generally very noisy birds. Variations exist in the voices of different species of flamingos.
 - 2. Vocalizations play an important role in keeping flocks together as well as in ritualized displays. Specific calls are used in conjunction with certain behaviors.
 - 3. Vocalizations are used in parent-chick recognition.
- B. Visual displays.

Flamingos communicate with a broad range of visual displays.

FOOD AND FORAGING

- A. Food preferences and resources.
 - 1. Blue-green and red algae, diatoms, larval and adult forms of small insects, crustaceans, molluscs, and small fishes make up the main diet of flamingos.
 - 2. A flamingo's pink or reddish feather, leg, and facial coloration come from a diet high in alpha and beta carotenoid pigments, including *canthaxanthin*. The richest sources of carotenoids are found in the algae and various invertebrates that make up the bulk of a flamingo's diet.
 - 3. The shape of flamingo's filtering bill determines its diet. A flamingo will either have a shallow or a deep-keeled bill.
 - a. Lesser, James', and Andean flamingos have deep-keeled bills and feed mainly on algae and diatoms.
 - b. Greater, Caribbean, and Chilean flamingos have shallow-keeled bills and feed on insects, aquatic invertebrates, and small fishes. Caribbean flamingos eat larval and pupal forms of flies and brine shrimp as their main food.
 - 4. Slight differences in diet and habits prevent competition among flamingos that share feeding grounds.
- B. Food intake.
 - 1. Lesser flamingos eat an estimated 60 g (2.1 oz.) dry weight to fulfill their daily food requirements. Through slow-motion photography, researchers discovered that these birds pump water through their bills 20 times a second to filter their food.
 - 2. A much slower filtration rate was found in the Caribbean flamingos—only 4 to 5 times a second to filter out their daily food requirements of 270 g (9.5 oz.) dry weight.
- C. Methods of collecting and eating foods.

1. Standing in shallow water, flamingos lower their necks and tilt their heads slightly upside-down, allowing their bills to hang upside-down facing backward in the water.
 2. Flamingos sweep their heads from side to side just below the surface of the water to collect their food if they have a deep-keeled mandible. If the mandible is shallow-keeled, a flamingo sweeps its head from side to side deeper into the mud to collect its food.
 3. A flamingo filters its food out of the water and mud with a spiny, piston-like tongue that aids in sucking food-filled water past the lamellae inside the curved bill. The fringed lamellae filter out food, and the water is passed back out of the bill.
 4. In addition to filtering food into the bill, lamellae also exclude foods that may be too large or small for the flamingo.
 5. Standing in water, flamingos may stamp their webbed feet to stir up food from the bottom.
- D. Flamingos are fed a varied diet in zoological environments in order to maintain their pink coloration, as well as their general health.
1. SeaWorld and Busch Gardens feed flamingos a diet that includes all the nutrients needed for optimal health. The flamingos are fed in a specially designed feeding trough.
- E. Water intake.
Flamingos seek out fresh water for drinking.

REPRODUCTION

- A. Sexual maturity.
Flamingos reach sexual maturity several years after hatching and usually begin to breed at about six years of age.
- B. Breeding seasons.
1. Flamingo colonies may breed at different times of the year. Breeding success is based on synchronous nesting of a flamingo colony so that chicks of a colony hatch around the same time in any one year. Colonies very rarely nest more than once a year.
 2. Breeding and nest building may depend on rainfall and its effect on food supply.
- C. Courtship.
1. Groups of flamingos perform ritualized stretching and preening when courting begins.
 2. Males group together and often run with bills pointed toward the sky and necks held straight out.

3. Birds interested in one another call to each other frequently and in unison.
- D. Pair bonding.
- Pair bonding is very strong, and flamingos may be monogamous. However, flamingos have been observed to mate with more than one partner.
- E. Copulation.
1. A female will most often initiate copulation by walking away from the group. A male follows close behind.
 2. The female stops, lowers her head, and spreads her wings. This behavior is an invitation to the male to mount her.
 3. Mating occurs in the water. The male jumps onto the female's back from behind, firmly planting his feet on her wing joints.
 4. After mating, the male stands on the female's back, then jumps off over her head.
- F. Nesting.
1. Flamingos build nest mounds made of mud, small stones, straw, and feathers. These mounds can be as high as 30 cm (12 in.).
 2. Mound building begins up to six weeks before the eggs are laid.
 3. Using their bills, both male and female participate in mound building by bringing mud and other objects toward their feet.
 4. As they slowly construct the mound, the parents make a shallow well on the top, where the female will lay the egg.
 5. Mounds serve as protection against the extreme heat and flooding that occurs at ground level.
 6. Mound building continues during incubation, as the flamingos pick up materials close to the nest.

HATCHING AND CARE OF YOUNG

- A. Egg laying.
1. Flamingos most often lay one large egg. Eggs range in size from about 78 by 49 mm (3 x 1.9 in.) and 115 g (4 oz.), to 90 by 55 mm (3.5 x 2.1 in.) and 140 g (4.9 oz.).
 2. The egg is oblong in shape, similar to that of a chicken.
 3. The egg is usually chalky white, but may be pale blue immediately after it is laid.
 4. Females have been known to lay two eggs, but this is rare.
- B. Incubation.

1. Incubation begins soon after the egg is laid. The incubation period is between 27 and 31 days.
 2. Both the male and female take turns incubating the egg by sitting on top of the nest mound.
 - a. During incubation, flamingos will stand, stretch their wings, and preen themselves frequently.
 - b. A parent bird carefully lifts and turns the egg with its bill.
 3. Eggs that fall from the nesting mound are not retrieved.
- C. Hatching.
1. Hatching takes between 24 and 36 hours.
 2. The chick calls frequently as it breaks out of the shell.
 3. The chick breaks through the shell using a growth on its bill called an “egg tooth.” The egg tooth is not a true tooth and falls off soon after the chick hatches.
 4. Flamingo parents appear anxious while their chick is hatching. They stand, look at the egg, and vocalize.
 5. The adult stands, looks down, and gently preens and nibbles at the emerging chick.
- D. Chick at hatching.
1. Newly-hatched chicks have gray or white down feathers, a straight red bill, and plump, swollen red or pink legs.
 2. The leg swelling decreases approximately 48 hours after hatching, and the red bill and legs turn black in seven to ten days.
 3. After hatching, a flamingo chick is not very agile. Movement is limited to pushing its wings or lifting its head.
- E. Care of young.
1. Parents are able to recognize their own chick by sight and vocalizations. They will feed no other chick.
 2. A flamingo chick will leave the nest after four to seven days, when it is strong enough to stand and walk. Parents keep a close, protective watch on their chick as it explores its habitat.
 3. Chicks gather in large groups called *creches* (French for “crib”). Parents are able to locate their own chicks in the creche at feeding time.
 4. Adults feed their chicks a secretion of the upper digestive tract referred to as “milk.” “Milk” secretion is caused by the hormone *prolactin*, which both the male and female flamingo produce.
 - a. “Milk” is 8% to 9% protein and 15% fat, similar to mammal milk.

- b. "Milk" is red in color due to the pigment canthaxanthin. Chicks store this pigment in the liver, to be deposited in their adult feathers when they grow.
- F. Chick development.
- 1. Flamingo chicks are able to swim before they are typically old enough to leave the nest for good.
 - 2. Young chicks have been seen imitating feeding methods while standing in shallow water.
 - 3. Chicks begin to grow their flight feathers after 11 weeks. At the same time, the bill begins to hook, allowing the chick to feed itself.
 - 4. Chicks lose their juvenile gray or white color gradually over a two- or three-year period, at which time their pink feathers begin to show.

LONGEVITY AND MORTALITY

- A. Longevity.
Experts have not yet determined how long flamingos live.
- B. Predators.
- 1. Most flamingo predators are other species of birds.
 - a. The lesser flamingo's eggs and chicks are preyed upon by several birds.
 - (1) The lappet-faced and white-headed vultures feed on eggs, young flamingos, and dead flamingos.
 - (2) The Egyptian vulture feeds mostly on flamingo eggs. This bird has also been observed dropping and destroying eggs that it does not eat.
 - (3) The Marabou stork and tawny eagle prey on flamingo eggs and chicks.
 - (4) The black kite, a scavenger, feeds on flamingo carcasses left behind by other birds and land animals.
 - b. The greater flamingo's eggs and chicks are prey for the Marabou stork.
 - 2. Remote breeding grounds make it difficult for terrestrial predators to feed regularly on flamingos. Land predators will, however, enter the flamingo breeding grounds when water levels are low. These predators vary according to the species of flamingo and environment in which the flamingo lives.
 - a. The lesser flamingo is preyed upon by lions, leopards, cheetahs, and jackals. Pythons have also been known to attack flamingos.
 - b. The Andean flamingo is preyed upon by the Andean fox and Geoffrey's cat.

- c. In Africa, hyenas will enter a flamingo's environment when the ground is dry and can hold the animals' weight. Hyenas cause more panic among the birds than actual mortalities.
 - d. Records indicate that bobcats, coyotes, raccoons, foxes, minks, and dogs have killed flamingos in zoological environments.
 - e. On Great Inagua Island in the Bahamas feral pigs prey on flamingos.
3. About 5% of the flamingos living at Lake Magadi in Africa die of predation.
- C. Human interaction.
- 1. Habitat destruction by humans has had a negative effect on the breeding and feeding grounds of flamingos.
 - a. Construction of roads and highways make the flamingo's environment more accessible to people and land predators.
 - b. Coastal desert irrigation has altered water levels in many flamingo habitats.
 - c. Mining of boron, lithium, nitrates, potassium, and molybdenum has caused habitat disturbances for the flamingos.
 - d. Low-flying aircraft bringing tourists, bird enthusiasts, and photographers into flamingo nesting and feeding grounds cause disturbances and affect the birds' lifestyle.
 - 2. People have used flamingos and their eggs as food.
 - a. Historically, people have used flamingo eggs as a primary food source and delicacy. Today, in some places, flamingo eggs are removed from nests and sold at markets.
 - b. In early Roman times, flamingo tongues were carefully prepared, pickled, and served as a delicacy.
 - c. Andean miners have killed flamingos for their fat, believed to be a cure for tuberculosis.
 - 3. Greater and lesser flamingo chicks in the Magadi colony in Africa were banded in the 1960's with the hope of finding out more about these birds' lifestyles and migration patterns. Unfortunately, only a few of the banded birds have been recovered. It is believed that the bands may have dissolved because of the high alkaline content in the water where these birds live.
 - 4. Human activity on Great Inagua Island in the Bahamas has helped flamingo populations. Salt production has added many acres of suitable habitat, stabilized water levels, and provided additional food sources.

CONSERVATION

- A. Status.
1. In 1924, the James' flamingo was believed to be extinct. It was rediscovered in 1957 sharing the habitat of the Chilean flamingo.
 2. No species of flamingo is listed as "endangered" under the U.S. Endangered Species Act.
- B. Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES).
1. All species of flamingos are listed in CITES Appendix II. This Appendix lists species that are in need of protection and are considered to be threatened and likely to become endangered if trade isn't regulated.
- C. IUCN/The World Conservation Union is a worldwide conservation organization. This organization links together government agencies, non-government agencies, and independent states to encourage a worldwide approach to conservation.
1. The Caribbean and greater flamingos are listed as "least concern" (species is widespread and abundant) by the IUCN. The lesser, James', and Chilean flamingos are listed as "near threatened" (species is close to being classified as "threatened" in the future), and the Andean flamingo is listed as "vulnerable" (species faces a high risk of extinction in the wild).
- D. U.S. Migratory Bird Act.
- Caribbean, Chilean, and greater flamingos are protected under the U.S. Migratory Bird Act of 1918.
- E. Zoological parks.
1. With a population of more than 300 flamingos, Busch Gardens Tampa Bay has the largest flock of Caribbean flamingos of any zoological park in the world.
 2. Hialeah Park, located near Miami, Florida, is a racetrack with a flock of Caribbean flamingos numbering approximately 500. Hialeah Park has a lake with four islands. The flamingos nest on these islands. To assist in preserving the flamingo flock of Hialeah Park, the Hialeah Park Flamingo Consortium was formed. The Consortium provides birds to other institutions to increase the population of captive flamingos. The consortium includes SeaWorld, Discovery Island, and the Los Angeles Zoo.
 3. Zoological parks have had success in breeding Chilean, Caribbean, and greater flamingos. SeaWorld is one of the few North American zoological parks that have successfully bred lesser flamingos.