

The Atacama Desert became an important tourist attraction and is among the top-three-destinations in Chile. The National Reserve "Los Flamencos" alone attracts more than a hundred thousand tourists per year.

Special attractions are the huge salt lake "Salar de Atacama", which is almost dried out, and the bizarre landscape formations like the "Valley of the Moon" or the hot springs "Tatio Geysers".

Compared to the huge mining industry, tourism is only a small threatening factor for Andean Flamingos. However, if the tourism development does not take place according to sustainable principles, negative impacts increase and cannot be easily compensated.

**The negative impacts of tourism in the Atacama Desert are:**

- Water scarceness
- Air pollution through transport
- Increase of waste and sewage water
- Disturbance of fauna by close approach and excessive noise
- Degradation of landscape and ecosystems through increased traffic and human settlement connected to the business activity

Due to the sensitivity of Andean Flamingos, the tourism development in the area can decrease the animals' breeding success, which leads to even smaller population numbers (due to general low productivity).

**Transport and Traffic in the "Reserva Nacional Los Flamencos"**

Road construction and 4x4-vehicles



**It is necessary, that tourism takes place according to sustainable principles**

These include:

1. Make optimal use of environmental resources that constitute a key element in tourism development, maintaining essential ecological processes and helping to conserve natural heritage and biodiversity.
2. Respect the socio-cultural authenticity of host communities, conserve their built and living cultural heritage and traditional values, and contribute to inter-cultural understanding and tolerance.
3. Ensure viable, long-term economic operations, providing socio-economic benefits to all stakeholders that are fairly distributed, including stable employment and income-earning opportunities and social services to host communities, and contributing to poverty alleviation. (UNWTO, 2004)

**IT'S UP TO YOU!**

You want to be a sensitive birdwatcher and act according to sustainable principles?

Then please consider the following:

- Only discover the area with a tour guide
- Look for qualified and experienced guides with expertise on and sensitivity for environmental protection
- Ask the Reserve's park administration or the organization CONAF for appropriate guides
- Avoid watching the birds during the breeding period (December – March)
- Approach the birds silently, without abrupt movements and at a minimum distance of a few hundred meters
- Use binoculars
  - They help you to see the flamingos well without close approach
- Try to wear earthy colors instead of too bright or flashy ones
  - This will help not to scare the birds off
- Do not call-up birds to make them fly or artificially change their behavior
  - This way you will not stress or force them to leave nests or chicks unattended
- Chose only one or two focus sites / salt lakes you like to watch
  - Like this you help to keep negative impacts on the birds' habitat low
- Only walk on official trails and avoid additional disturbance by creating or using unofficial ones
- Try to avoid motorized tours – better walk, hike or cycle to discover the beauty of the landscape and flamingos

**BE THE CHANGE!**

Be aware of improvements to be made in the "Reserva Nacional Los Flamencos"!

Please inform the Park administration or CONAF to improve.

Actions before starting a tour

- Inform yourself about the Reserve's characteristics and environmental policies and the availability of appropriate (sustainable) guides
- Please be aware of the above mentioned guidelines

Evaluation afterwards

- Please communicate to the staff what you liked and what you didn't liked:
- What do you think about tourism management in the Reserve?
- What kind of information or service did you miss?
- What else do you wish to see in the Reserve?
- What did you like most about the tour?

**Thank you for your attention!**

**The flamingos will be grateful for your support!**

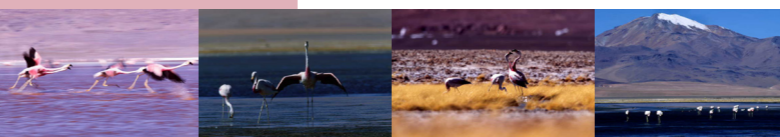
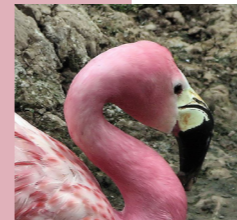


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**FLAMENCO IN THE ATACAMA DESERT**



This brochure is part of a Project "Analysis of the Andean Flamingo's Potential for a Sustainable Tourism Management exemplified by the 'Reserva Nacional Los Flamencos' in Chile" carried out in 2008/09 for the UNEP/CMS Secretariat in Bonn, Germany.

**Astonishing Facts**

- Flamingos are long-living birds reaching the age of 50 and above.
- Andean Flamingos have a high temperature tolerance ranging from -30° C to +30° C (-22° F to 86° F).
- Raising Andean Flamingos in captivity is difficult because they need to adapt to lowland conditions. However, the Berlin Zoo was successful with a newborn chick in July 2008.



© Zoo-Berlin.de

**Flamingo and Flamenco – Just a coincidence?**

The Spanish name for flamingo is flamenco. On the one hand, Flamenco is a Spanish dance; on the other hand it is a bird. This name's double meaning does not occur by pure chance.

Why?

Around Christmas in the Western Hemisphere time zone, the summer time is approaching in the High Andes. In December and January, the Andean Flamingos start to look for a suitable partner to initiate the process of reproduction. Before gathering in pairs, male and female birds unite in groups of 30-150 animals to perform the courtship dance together. This dance is also called wedding march.

Every bird with its neck stretched to the sky, moves its head energetically from one side to the other and performs a special walk. A particular croaking strongly accompanies their steps. They are moving fantastically...

...not like this:



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...but like this:



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## APPEARANCE

The Andean Flamingo, *Phoenicoparrus andinus*, which is also called "Parina Grande" or "Jututu" is one of six flamingo species worldwide.



©Niall Riddell

It is the only flamingo with yellow legs and has a special colored plumage with a deep mauve-pink at the head, neck and upper breast. The lower breast and back have a paler pink mottled with red. Andean Flamingos have a yellow-black bill, with a unique shape. Apart from the Andean Flamingo, there are two other flamingo species living in the High Andes of South America.

### Watch the Difference!

Andean Flamingo – Jututu – James Flamingo – Chururu – Chilean Flamingo – Tokoko –



© Handbook of the birds, volume 1, picture adjusted, hbw.com

## HABITAT

The Andean Flamingos live in the High Andes at an altitude ranging from 2,500 m to 5,000 m above sea level. They migrate between four South American countries: Peru, Bolivia, Chile and Argentina.

When it is summer in the High Andes (January – March), the birds prefer the Northern part of the distribution area.

In winter (June – September) they tend to move to lower areas located further in the South.



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Summering and Wintering areas in the distribution countries

Scientists have found out that Andean Flamingos can travel long distances up to 1,100 km in a maximum of 4 days.

The Andean Flamingos' ecosystems are High Andean wetlands, which are an important source of water and have a singular biological diversity. They consist of freshwater lakes of glacial, volcanic and tectonic origin; salt pans, saline and brackish lagoons in areas formerly occupied by seawater. The area's hot springs and glaciers provide an important tourist attraction. Like the Andean Flamingo, many species of plants and animals in these ecosystems are endemic, which means that they only exist in these habitats. Therefore, they have to be specifically protected.

## NUTRITION

Flamingos have very specialized bills, which are equipped with gills. With them, they can filter small food particles out of the water as whales do.

Flamingos need to filter triple the amount of water in order to get their daily food portion. If the salt lakes, on which they feed, have a normal prey concentration of 3g per liter, the birds have to filter 20 liters water per day.

(!) They have their colorful feathers from the food particles, such as algae or tiny crustacean, which contain carotenoids. The birds absorb, digest and deposit them in their blood, lungs and feathers.

### No competition – it's all in the bill

Andean Flamingos can share the same habitat with Chilean and James Flamingos without competing for food.

The key to the secret lies in the shape of their bills and their mechanism. With their slightly differentiated beaks they filter food particles with less than a millimeter difference!



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## A NEW ANDEAN FLAMINGO IS BORN!

Regarding the raising of the chicks, both parents share the work. The partners help to build the cone-shaped nest consisting of mud with a shallow dip on the top. The nest is surrounded by 20 cm deep water. It helps the birds to keep the nest shape constant by providing new building material. No flamingo nest looks like the other. Their size and shape can vary substantially. The nest's height provides protection – the egg cannot be flushed away by higher water levels and it cannot be damaged by excessive heat.

### Flamingos lose their feathers to keep the egg warm:

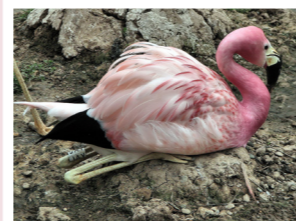
Before the breeding can take place, both parent birds are losing feathers at a certain part of their body – where the egg is supposed to come in contact with the adult birds' skin. This prevents the egg from getting too cold and ensures the young bird's survival. When the chick is born, it is protected from the cold and heat by hiding under the parent feathers.

### Feeding:

The chicks drink milk like mammals. Both partners feed them with crop milk – a secretion produced in their upper digestive tract.

### The family is calling!

The parent flamingos can distinguish their chick from hundreds or thousands of others in the flock. This is because, before the chicks have hatched, they make a special sound in the egg, to which the parents answer.

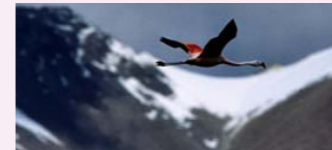


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## What have a Peruvian liberator and a Spanish dance in common?

### They were both inspired by a gorgeous and fascinating bird: The Flamingo!

According to a legend, one fine day in 1820, the Peruvian liberator José de San Martín stranded at the Peruvian coast and fell into a deep sleep after a long journey. When he woke up again, he was dazzled by the beauty of flamingos flying in the sky with outstretched wings reflecting the sunlight. The bright reflection of the wings inspired him to the red stripes on the left and right side of the current Peruvian flag.



## WHY DO THE BIRDS MIGRATE

Rainfall and drought determine the movements.

If there is enough rainfall and a sufficient water level in the salt lakes or lagoons, increasing the food abundance, the flamingos stay at one place to breed. However, too much rainfall increases the danger of natural disasters like floods so the nests may be destroyed or not be built before breeding.

Where water scarceness occurs the prey concentration in the salt lakes decreases to 1 g per liter or less. At this point, feeding becomes worthless because the energy used is higher than the energy obtained from the food. In this case, moving patterns become important because the birds have to look for another salt lake with more nutritional value.

When it is too dry, flamingos are exposed to predators like foxes, which can approach them easier and plunder their nests or become a danger to the young chicks.

## CLIMATE CHANGE A BIG ISSUE FOR THE BIRDS' EXISTENCE

Andean Flamingos show a low flexibility regarding the adaptation to other living conditions than High Andean wetlands, which increases their sensitivity for habitat destruction or loss because they depend on particular ecosystems.

This leads to an unpredictable habitat use or choice for settling or nesting sites. Some scientists even say that the birds show a "chaotic migration behavior".

The Andean Flamingos' sensitivity of not accepting other living conditions than those in the High Andean wetlands, and, their dependence on climate conditions, imply that Andean Flamingos are more likely to suffer from climate change than other species.

The threats like drought and heavy rainfalls increasing with climate change, together with the birds' inflexibility, further decrease the chances of the species' survival.

## Why should we protect this bird?

At the moment there are only 34,000 individual birds left on the globe. Therefore the Andean Flamingo is listed in the IUCN-Red-List of endangered species as "vulnerable". Flamingos only reproduce in flocks of 50 or more individuals, which decreases the probability of smaller populations to start the reproduction phase. In addition, Andean Flamingos only lay a single egg per year. Sometimes they do not reproduce every year, which makes the survival of the species difficult. The birds become mature only at the age of six, which means that it takes some time until the birds can contribute to reproduction. CMS and Chile, Bolivia and Peru have already signed the MoU concerning the conservation of the population of Andean Flamingos in December 2008.



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## A closer look at the ATACAMA DESERT and the "RESERVA NACIONAL LOS FLAMENCOS", Chile

### THREATS

In general, Andean Flamingos are threatened by air and water pollution, water scarceness and human disturbance, such as mining and tourism.

### Mining

Copper, salt, borax and other natural resources are abundant in Chile. It is no wonder, that especially in the Atacama Desert, where many of these resources can be found, there is a huge industry of exploitation. There are several mines close to the "Reserva Nacional Los Flamencos". Two of them are called "Minería Escondida" and "Chuquicamata". Together, they produce 1,600,000 tons of copper per year, which has an enormous negative impact on the environment of the area. Especially the air pollution with arsenic makes working in, and living next to the mine, very unhealthy. Although the mines present an important source of income for locals, their ecological impact is quite negative. Additionally, many companies do not take sufficient measures to compensate the negative effects of mining.



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### Water is scarce – especially in the desert

The most severe problem is that mining needs a lot of water, which is taken from the groundwater. This threatens to dry out wetlands - the habitats and nutritional grounds of Andean Flamingos. This issue is even more severe in the desert. The Atacama Desert is one of the driest places on earth where water resources are scarce anyway. The fact that the mining industry is still expanding, aggravates the problem.

## HUMAN DISTURBANCE – unregulated tourism

Human disturbance like noise, sounds, rapid or close movements can urge birds that breed or raise chicks, to fly away and leave their eggs or chicks unattended. This can lead to the egg's destruction or to the chick falling out of the nest - into the water surrounding it causing the chick's death. In this case, reproduction is lost – at least for one year.