

ANNUAL REPORT 2017

# NORDENS ARK



## NORDENS ARK IS MAKING A DIFFERENCE

There are so many positive things we want to accomplish, but it really feels as if time is slipping away. Structure and limitations don't always fit well when you're working with creative and passionate people. Yet on the other hand, it's exactly these qualities that drive our unique core activities. For us, it's a question of finding a balance. During 2017 we continued our long-term nature conservation projects, and new, exciting contacts were established around the world. Speaking for myself, I got a kick out of the professional video advert in which the CEO for Saab-Orio's US subsidiary talked enthusiastically about the Parts for Life collaboration with Nordens Ark, 'a non-profit foundation and animal sanctuary in Sweden working to ensure a future for endangered animals'.

In May, representatives from Nordens Ark and the board paid a visit to the Bialowieza Forest world heritage site on the border between Poland and Belarus. This study trip was one of the preparatory measures that began in earnest in 2017 with the objective of keeping European bison for breeding and landscape conservation here in our Ecopark. Our research director, Mats Niklasson, has links with the Swedish University of Agricultural Sciences in Alnarp and co-ordinates our exciting collaboration with Polish and Dutch landscape ecologists in Bialowieza. So the relationship is working well.

The magnificent and mythical European bison, which also goes by the name of wisent, is Europe's largest mammal and until the Bronze Age was found even up here in Sweden. The species has a very special place on the list of animals rescued from extinction at the 11th hour thanks to co-ordinated conservation action. On paper, Bialowieza is a protected national park with totally unique natural features. The reality, however, is rather different. Parts of this renowned virgin forest are already threatened on the Polish side by felling. This despite domestic and international opinion, and in violation of the EU's strict nature conservation legislation. So what news of Nordens Ark's bison project? Watch this space!

Nordens Ark has been a member of the IUCN, the International Union for Conservation of Nature, for a number of years. The IUCN is the world's largest conservation network, with states and indigenous peoples as well as non-profit environmental and interest organisations among its members. It's perhaps most well-known for developing the so-called Red List, which classifies the status of plant and animal species (expressed by extinction risk). Here in Sweden this is managed by the Swedish Species Information Centre and Environmental Protection Agency. Through Nordens Ark's participation in the national IUCN committee's regular meetings at the Ministry of the Environment and Energy, starting in 2017, we are further strengthening the ties between national conservation bodies and government agencies.

While striving to make a difference in the wider world, we at Nordens Ark are also looking after things at home, needless to say. Maintaining a high standard of animal facilities and buildings in our fabulous park, and welcoming visitors 365 days a year, clearly demands a lot of resources – particularly here in the changeable and salt-laden climate of Bohus county. Several urgent and long-term maintenance projects were started in the course of 2017, including a much-needed facelift of the hotel's outdoor and indoor areas and an expansion and modernisation of the separate restaurant section up at the Wolf Lodge – all in order to improve the experience for our guests. In doing so, we can welcome more happy and knowledge-hungry visitors and contribute further to the region's burgeoning tourism industry.

Mats Höggren, CEO



*Przewalski's wild horses from the breeding programme Nordens Ark participates in have been successfully reintroduced on the wide-open steppes of Altyn-Emel State National Nature Park in south-eastern Kazakhstan.*

## NORDENS ARK

Nordens Ark is a non-profit foundation that's working to give endangered animals a future.

Nordens Ark's vision is that endangered species should achieve healthy populations in their natural environments, and that biological diversity needs to be preserved. Our long-term goal is to create the conditions to enable species threatened with extinction to survive in sustainable populations in the wild.

---




### NON-PROFIT FOUNDATION SINCE 1989

---

Nordens Ark is situated on Sweden's west coast, 20km from Smögen and 120km north of Gothenburg.



The Foundation's key objectives are:

-  To contribute to efforts to save endangered animal species and breeds through breeding and nature conservation, as well as through releases of animals in their natural habitats whenever possible.
-  To carry out research and studies of animal species and breeds kept at Nordens Ark, thereby contributing to a greater understanding of them in order to increase these species' chances of survival.
-  To educate and spread knowledge about endangered animals and biodiversity.

*Her Royal Highness Crown Princess Victoria is patroness of Nordens Ark.*



## INNEHÅLL

Nordens Ark is making a difference.....	2
Nordens Ark.....	3
Nordens Ark around the world.....	6
Deep diving.....	12
Animal inventory at Nordens Ark .....	16
Administration report.....	20
Income statement.....	27
Balance sheet.....	28
Cash flow analysis.....	30
Accounting and valuation principles and notes.....	31
Audit report.....	39
Board of directors, auditors and staff.....	41
Partners and memberships.....	42



© Jenny Magnusson

### Back to the wild!

On behalf of Jönköping county administrative board, in October we took charge of an abandoned otter pup. On April 13, it was released back into the wild.

### Female foursome!

Four females were born to our wolverines.



© Erik Edvardsson



© Erik Edvardsson

### Eurasian eagle-owls fly free

During the spring, three Eurasian eagle-owl chicks were born. They were later sent to the Eagle-Owl Project for release in Skåne at the end of August.

### Scottish pair move in

Two Scottish wildcats arrived in the park in July as the first stage of our engagement with this species in the wild.



© Emil Nygren



## New grazing animals in the Ecopark

At the end of October, a herd of Väne cattle from Hornborgasjön arrived at Nordens Ark.

© Marie Mattsson

## New inhabitants at the Wetlands

When European crayfish moved into the Wetlands, one more animal group was added to our animal collection: Crustaceans



© Marie Mattsson



© Erik Edvardsson

## Longed-for arrival

For the first time in several years, a lamb was born to our Tadjik urials – an important little female for this particularly vulnerable species.

## New stallion for the herd

The wild horse herd was boosted with a new stallion.



© Erik Edvardsson

The world's biological diversity is deteriorating at an ever-faster rate. If action isn't taken, we risk losing three-quarters of the Earth's species. More and more scientists are warning that the world is on the brink of a sixth mass extinction, caused this time by us humans. But there is still time to reverse the trend.

EVERY  
KRONA  
COUNTS

If all of us gain a better understanding of biodiversity and how we are affecting animals and nature, then together we can make a difference.

For us at Nordens Ark, that difference is important. What we do can mean the difference between survival and extinction, even for an entire species. We cannot make a difference alone; it takes

Strong measures will be needed to create a more sustainable use of the planet's natural resources and to significantly increase conservation efforts to save endangered species.

collaboration, at both local and international level. It requires money, hard work and a lot of commitment.



## YOU CAN HELP!

There are various ways you can support Nordens Ark's work:

- Adopt an animal
- Bequeath money
- Become a sponsor
- Make a donation
- Make a gift

Every contribution, large or small, is invaluable and makes a real difference for our work within the park and around the world.

Revenue from foundations and funds, as well as from sponsors and the public part of the park, are also important sources of income.

Nordens Ark is a recognised holder of a 90-account, which guarantees that every gift is used in the proper way. Each contribution goes to Nordens Ark's work, in line with Swedish Fundraising Control criteria.

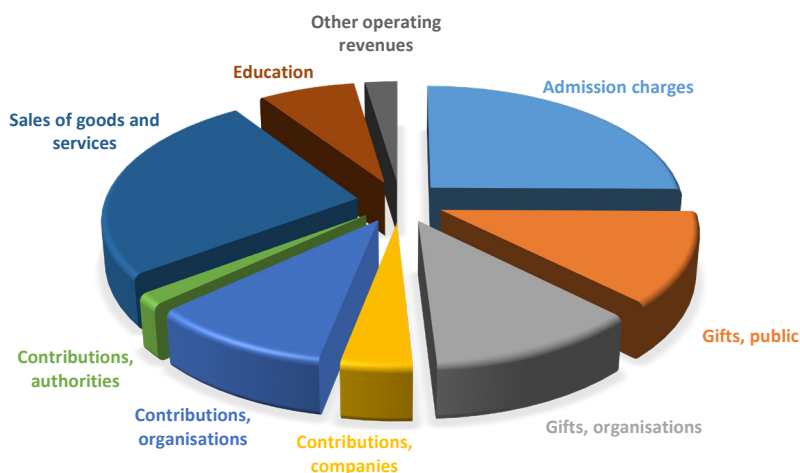


The Nordens Ark members' association is a non-profit, independent members' society whose purpose is to support Nordens Ark's activities. Membership lasts for a calendar year and includes, among other things, free entry to the park.

**THIS YEAR, 8,129 MEMBERS GAVE 2.5 MILLION KRONOR**

The association arranges many different events during the year to raise money for Nordens Ark's development. The traditional midsummer festivities and the harvest market at the Nordens Ark farm every September are two of the society's major events that bring in hundreds of visitors.

Over 27 years, the society has raised a total of 32 million kronor for Nordens Ark's work.



**A BIG THANK YOU TO EVERYONE WHO CONTRIBUTED DURING THE YEAR**

*Our work to make a difference for endangered animals, locally as well as globally, is made possible thanks to gifts and donations from private individuals, companies and organisations, as well as income from entry tickets, the shop and hotel.*



Social media is a vital channel for Nordens Ark's targeted and worthy messages. Our objective is to put Nordens Ark on the map as a player with a clear goal: to ensure there is a future for animals threatened with extinction.



Facebook increased by 7 per cent to 13,552 followers.



Instagram increased by 28 per cent to 5,285 followers.

## LESSER WHITE-FRONTED GOOSE

The Lesser White-Fronted Goose Project is run together with the Swedish Association for Hunting and Wildlife Management. In 2017, 86 geese were released into a breeding area in the Swedish mountains. Every individual was fitted with a special coloured leg ring to make later observations easier.

TAKING FLIGHT

years. That so many of the released birds were spotted suggests a high survival rate, and that the flocks stayed in the core area over the summer. This gives the birds a strong imprint on the area – an important step in successfully building up a viable wild population.

### BIG NEWS – THE GEESE RETURN HOME

Fifty-five of these marked birds were later found to be in the core area, a high proportion compared with previous

The release date is not random but is chosen carefully, says Christer Larsson, the project leader at Nordens Ark. It needs to be co-ordinated with the arrival in the area of wild lesser white-fronted geese. For the release, the geese are flown by helicopter up to the breeding site on the mountain. They are placed in release cages to allow them to get used to their surroundings before they are let out.



© John Söderlindh

Recently released lesser white-fronted geese in Lapland.



## WHITE-BACKED WOODPECKER

The outlook for the white-backed woodpecker, our most endangered bird, is critical, with only a handful of nesting pairs left in Sweden today. To help conserve the species, youngsters are reared at Nordens Ark for later release into the wild. The breeding group was reinforced this year with four wild-born youngsters from Norway, which are currently being hand-fed until they are old enough to be released into an aviary.

Just over a decade ago, Nordens Ark decided to try to breed white-backed woodpeckers by getting the birds to breed in an enclosure. No one had tried this before. It took a few years to work out what was required for the birds to thrive and breed, but now it's working well, and Nordens Ark became the first in the world to breed white-backed woodpeckers in an enclosure. Today, Skansen and Järv zoo are collaborating in the work to rear youngsters.

### NINE WHITE-BACKED WOODPECKERS RELEASED

This year's breeding tally for the white-backed woodpecker was 12 chicks, nine of which were later released. Four white-backed woodpecker chicks were collected from West Agder in south-west Norway, where the species is not threatened. The idea is that they will boost the breeding population at Nordens Ark and that their young will later be released into the wild. Adding new genes will ensure we have a genetically healthy breeding population.



© Erik Edvardsson

## SNOW LEOPARD

Tracking a cat through snow in steep mountains means taking your life in your hands, and even then, it will soon lose you.

It was only when new technology emerged in the 2000s that studies could begin in earnest. The collars in use today have a GPS receiver that records the animal's position at regular intervals. When a location is received, a satellite phone sends the position to the internet.

IN THE FIELD  
IN ASIA

Collecting scat in order to examine prey remains and record where the snow leopards have been also proved to be difficult before the advent of DNA analysis. It turned out that without DNA testing, it's not possible definitively to distinguish snow leopard scat from that of other species, such as wolves and foxes.

### SNOW LEOPARD FEMALE TRACKED SINCE 2012

In 2017, our researchers in Mongolia managed to fit GPS collars to four snow leopards. One was a female who had been photographed by a camera trap back in 2009 and who was given her first collar in 2012. She is the wild snow leopard researchers have managed to track for longest – something that's extremely important for them.

During the year, three females with young were identified. Two had year-old cubs and the third litter was from 2016. Snow leopard cubs stay with their mother for 18 months to two years. Two youngsters were also found in a den, and scientists took the opportunity to chip them. The discovery of the den was significant in helping us understand the kind of places snow leopards choose, and the chip-marking allows researchers to track the youngsters over a longer period.



*One of the spring snow leopard litters in Mongolia.*  
© Gustav Samelius, Snow Leopard Trust

The solution was to try to capture snow leopards and fit them with radio collars. In the 1980s and 1990s, scientists succeeded in equipping 13 leopards with radio collars. It soon became clear that in practical terms it was impossible to follow the animals in the mountains, since that involved hiking enormous distances to pick up the signals from the collars.



## AMUR TIGER

When the Amur tiger project began in 2011, there were five tigers in Anuisky National Park. Now, six years later, the total has climbed to 15, thanks to the hard work put into the project.

As the work continues, the focus will be on initiatives to ensure there is enough food for both the tigers and their prey. By working together with hunting areas bordering the national park, we hope to be able to encourage the tigers to spread in the region.

### 5 IS NOW 15

So-called Tiger Friendly Management involves developing more sustainable hunting in the region, among other things by allocating an area for growth and investing in winter feeding in the wild.

The project has been a success, and the tiger population in the

region is recovering. This is a positive development, but more tigers means more conflicts with humans. Therefore we're continuing to support the Wildlife Protection Subdivision, which is concentrating on preventing and reducing the problems that can arise.



*Camera traps are a vital tool for the study of Amur tigers in their natural habitat.*

## GREEN TOAD

Breeding of green toads produced a record number in 2017 for release on Öland. As well as yearlings, a large group of toads born the previous year were released.

In total, 4,600 individuals were released in northern Öland, in the harbour at Högby and at various sites around the lighthouse on Öland's southern tip. Nordens Ark arranged a meeting with county administrative boards from southern Sweden in the hope of increasing the rate of releases and speeding up restoration efforts. It was decided that



### RECORD NUMBER OF TOADS RELEASED

Nordens Ark should try to build up a breeding population at the park, starting in 2018.



© Susanne Forslund

Release of green-backed toads on Öland.



## CARIBBEAN'S GIANT DITCH FROG

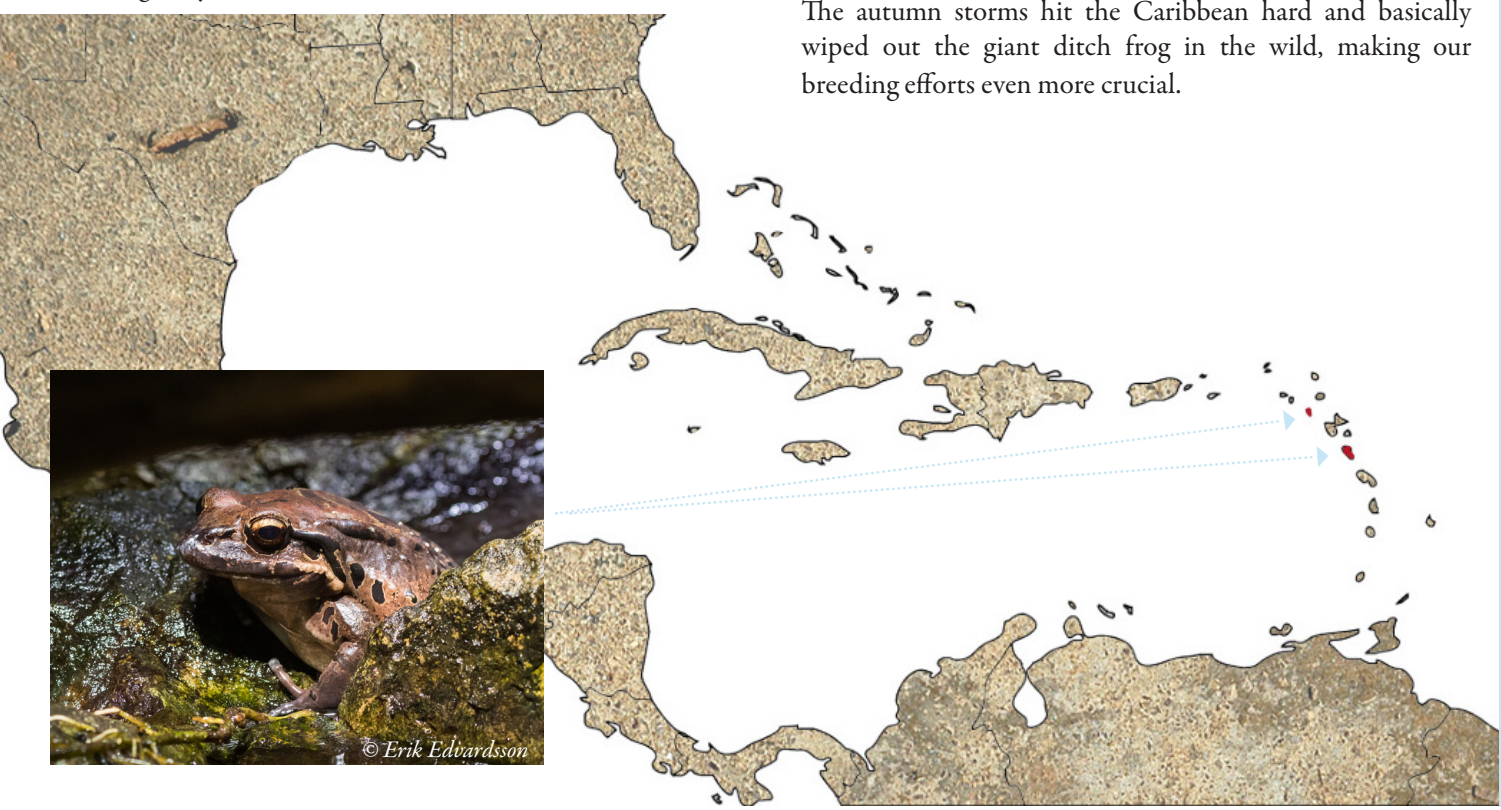
Nordens Ark is participating in ex-situ work to save the Caribbean's giant ditch frog by holding a breeding group in biosafe conditions.

Ahead of the 2017 breeding season, the number of breeding pairs was increased from one to four. All the pairs produced nice foam nests where they laid their eggs, but abandoned them after about six to ten days, so there was no reproduction during the year.

Although the breeding was not successful, we learned a lot. We'll be making certain changes before next season in the hope that it results in successful reproduction, which is important for the species' continued survival.

### AUTUMN STORMS WIPE OUT FROGS

The autumn storms hit the Caribbean hard and basically wiped out the giant ditch frog in the wild, making our breeding efforts even more crucial.



© Erik Edvardsson

## ECOPARK

The Ecopark project continues apace, with grazing and restoration of meadows and pastureland.

The grazing is now beginning to make a visible difference in the pastures, an improvement that is particularly obvious when they are compared with the test areas that are not grazed at all.



© Lisa Sihlberg

Our domestic cattle grazing the meadows by Åbyfjorden.

For the fourth year, the country's top experts carried out species-determination of moths from the two traps, one by the Åby fjord and the other at Lillehultet. At the end of 2017, a compilation of all the species data collected over the Ecopark's first five years got under way.

A unique research study is going on right now in the Ecopark to find out more about how grazing and burning affect the

## NEAR AND FAR

landscape. Sites have been set aside for the survey and a lot of work is needed before the trees to be studied are planted, starting with spruce, pine, birch, oak and linden.

First the new sites have to be cleared of wild-growing trees to make space for the new ones. Then the parts of the test areas intended for burning must be burnt off, so that they start from a similar point. The burning is done under controlled conditions and always against the wind, to minimise the risk of fire spreading.



Planting is done by hand with a planting drill – heavy work when it's 25C outside. But eventually all the planting is done and it's time for the cattle to do their bit over the summer. Hopefully, most of the plants will take, so we can follow their progress for several years.



## PALLAS'S CAT

The conservation project Pallas's Cat International Conservation Alliance (PICA) is an international collaboration between Nordens Ark, the Royal Zoological Society of Scotland, the Snow Leopard Trust and the Segré Foundation.



The project encompasses conservation efforts for Pallas cats in the wild, with a focus on creating a worldwide action plan with tangible conservation measures.

In the course of 2017, the project put together two different questionnaires, one aimed at herders / villagers and the other at researchers, to investigate Pallas cat numbers and the threats they are facing.

The project has also created educational materials for the countries where Pallas cats are found, in the form of posters, leaflets and a pocket guide. Both the questionnaires and the training

materials were translated into several languages and distributed in several of the Pallas cat nations.

The collage includes several educational materials:

- Geografiskt utbredningsområde:** A map showing the distribution of Pallas's cats in the mountains of Central Asia.
- Livsmiljö:** Information about the high-altitude, mountainous habitat, noting it is up to 5000 meters.
- Fakta:** Key facts about the species, including its status as a vulnerable species and its habitat requirements.
- Rovdjur som lever i baklandet:** A list of predators found in the region, such as snow leopards and wolves.
- Gömslen:** Details about the Pallas's cat's camouflage and hunting behavior.
- Utseende:** A detailed illustration of the Pallas's cat, highlighting its thick fur and unique features.
- Världspopulationen:** A graph showing the population trend, which is declining.
- Stöt:** Information about the threats to the species, such as poaching and habitat loss.
- Är du en förkämpare för pallas-katten?:** A call to action for people to support the conservation efforts.

We are focusing on our use of electricity and fuel and materials – purchases as well as waste. To be able to reduce these, we need to monitor them, make business plans, carry through changes and review the results.

Nordens Ark has been environmentally certified since 2010. Our ambition is to work more closely with environmental matters on a daily basis. This means that we'll be striving constantly to minimise Nordens Ark's impact on the environment.

It helps that we have a quality standard set by Swedish Environmental Base, with whom we are certified. This is a confirmation of our environmental work and is an assurance of quality.

We have an environmental management system that logs the park's environmental impact and plans, carries out and evaluates environmental improvements. This tool is helping the park reduce its energy consumption and use of raw materials, as well as the amount of rubbish and other waste. The work we do at Nordens Ark every day contributes directly to a number of the UN's sustainability goals. These efforts form a natural part of the park's activities.

In order to strengthen this environmental work throughout our organisation, a working group was set up with representatives from different departments at Nordens Ark and is working both on a daily basis and strategically with internal environmental questions.




---

## CARS WITH CLAWS

---

We want environmental thinking to permeate the entire operation – even the car park. Two new hybrid cars and two purely electric cars have been acquired, and there are plans to further expand and revamp the parking area.



We do our best to serve Swedish and locally produced meat, where there is a guarantee of good animal husbandry and short transport distances, as well as MSC-marked fish to support sustainable fishing.

---

## FOOD WITH HEART

---

We are also careful to choose ecologically and ethically certified versions of, for example, tea and coffee, and we offer products totally free of palm oil. In this way we don't risk contributing to destruction of rainforests.

## NATIVE BREEDS – (ALMOST) CONSIGNED TO THE HISTORY BOOKS

Can a cow be endangered? Yes, the fact is that almost half of the domestic animals kept by our forefathers are on the verge of extinction. As agricultural methods were modernised, many draught animals were replaced by machines, and breeds such as the Värmland sheep and mountain cow couldn't compete when new ones which produced more milk and more meat were introduced from the continent. Now the role of the domestic breeds is being reassessed, and today they are regarded as valuable both as a gene bank and as a means of conserving the landscape. At Nordens Ark, visitors can currently see 21 native breeds, with sheep and cattle grazing with the aim of restoring the former cultural environment of Bohus county.

Living side by side with animals has had a direct influence on the course of human evolution. One of the most important events in our history has been the domestication of wild animals and plants. As man began to alter other species through breeding and plant cultivation and adapt them to his needs, it was not just our own evolution that changed, but theirs too.

It wasn't until about 10,000 years ago that we stopped our wandering, put down roots and built communities. With animals at home and wheat in the soil, availability of food became more reliable compared to the days when we lived as hunters and gatherers. With cultivated crops came a more settled way of life, and the so-called Neolithic revolution, when we changed from hunter-gatherers to settlers, would come to change the lifestyle of the majority of humanity.

---

### WILD BECOMES TAME

---

Taming an animal is not the same thing as domesticating it. An individual wild animal can be tamed, but a domesticated animal belongs to a species that has lived under man's influence for so many generations that it has altered both its appearance and its behaviour. In exchange for advantages such as food and shelter, these domesticated species lost many of the qualities needed to survive in the wild.

The variation found in domesticated species reveals that many wild animals contributed to the former gene pool. In several cases researchers have seen signs of a two-way flow of genes between domestic stocks and wild animals over a long period after domestication. For some species, such as the domesticated reindeer, which roams freely and still resembles its wild relative, this confusion exchange continues to exist.

### DEEP DIVING

Some stocks of domesticated animals have also returned to the wild, such as America's mustangs. And new studies show that Przewalski's wild horses may be descended from the earlier stocks of domestic horses that became wild.

#### Tough survivors with down-to-earth qualities

From the early domesticated animals, breeds gradually developed. Today, when we talk about native breeds, we are simply referring to the animals kept by our ancestors immediately before the large-scale modernisation of agriculture which started in the 1800s and intensified in the post-war years. In flat countryside, the native breeds had to yield earlier than in more barren regions in favour of imported breeds principally from Holland and Germany, a development that was driven hard by the Swedish Rural Economy and Agricultural Society and breeding associations. In Sweden, there are native breeds of cattle, goats, rabbits, horses, pigs and poultry such as hens, ducks and geese. The domestic breeds are characterised by their tolerance of and adaptability to the local environment.

#### Unique gene bank

Each specific adaptation of the native breeds means that they have a legacy, or gene variant, for that particular characteristic. The domestic breeds that survive today therefore represent a unique living gene bank that is in the process of being lost. Unlike the modern breeds, native breeds have evolved slowly and under sometimes challenging conditions. Being strong and healthy was crucial, even though individuals that produced more milk or eggs were probably favoured, lived longer and produced more offspring. For breeding animals within modern races, it is their productiveness that is important, with less attention paid to their health. Furthermore, the development of today's breeds has proceeded relatively quickly, and much genetic variation has been lost along the way. This is due principally to inbreeding, as well as the fact that a handful of males considered particularly suitable for breeding are too often overused.

The poor genetic variation in modern animal breeds means in theory that they are not so well equipped to adapt to a changing environment. At a time when our very existence is under threat from climate change and antibiotic resistance, it's hard to see what future generations' needs will look like. In a comparative genetic study of native breeds living in northern Europe and modern breeds, the native breeds were estimated to account for 70 per cent of legacy variation. The native breeds therefore represent a vital genetic resource that could become as significant for us in years to come as it was for our forefathers. Already, a breeding project in Germany Holland is under way that aims to recreate, with the help of domestic breeds, the aurochs that led to the majority of today's cows.

## Grazing animals that are shaping the landscape

In various parts of Sweden, work is under way to recreate the open, species-rich forest and cultural landscapes that existed during the 1700s and 1800s – not least at Nordens Ark, where the work with the Ecopark and restoration began in 2011. This open landscape is characterised by grazing animals and is an environment in which thrive many endangered meadow flowers, butterflies, insects and birds. The native breeds are helping to keep these environments clear, mainly because they graze in a different way from modern breeds and are prepared to tackle nettles when the tastiest grass is gone. Many native cattle breeds are also well suited for inaccessible pastureland since they are lighter and easier to handle than their heavy modern cousins. There is an international consensus among researchers and politicians that these environments form part of a cultural heritage that should be preserved for future generations. Many of us believe, too, that the cultural environments are beautiful and valuable for recreation. From a larger perspective, the existence of the native breeds is regarded as closely connected to the conservation of local cultures – so-called biocultural diversity.

That we still have native breeds left in Sweden is down to individual farmers, enthusiasts and native breed societies. With no financial compensation, they have for a long time been carrying out important conservation work. These people understood, probably long ago, that when a breed disappears, a little piece of our history vanishes for ever. Several native breeds now have societies run by volunteers who spread knowledge about the breed and battle for its conservation. In this way, we're working to ensure that our forefathers' animals, with their unique qualities, can remain by our side long into the future.

### DEEP DIVING



© Erik Edwardsson



© Erik Edwardsson



© Erik Edwardsson



© Elin Eriksson Byröd

## THE STUDBOOK: A FAMILY TREE FOR ENDANGERED ANIMALS

Studbooks are a vital tool for wildlife parks caring for endangered animals. They are the basis for effective breeding work, and they help in the preservation of genetic diversity.

Around the globe, intensive efforts are under way to try to stem the enormous loss of species caused by human development. Within the conservation projects Nordens Ark is involved in, we focus, among other things, on saving threatened species through breeding and by reintroducing animals into the wild, when conditions permit. For an animal population to thrive after being released in the wild, a clever breeding strategy is required. The challenge is to find the perfect partner from the genetic selection in the studbook. The studbook leader keeper has an important task in co-ordinating this international work, with parks often collaborating in a number of conservation projects.

### A life history

The studbook makes it possible to follow an individual through his or her life. It records when and where the animal was born, the parents, whether the subject has bred and reproduced, and if so with which partner. In this way, those working with the breeding programmes can locate the right partner for future pairings and give the next generation the best possible chance of a healthy and productive life. Studbook work is co-ordinated within EAZA, the European Association of Zoos and Aquaria.

Nordens Ark holds the studbooks for the yellow-throated marten, wolverine, forest reindeer, snow leopard and Roti Island snake-necked turtle. The studbook keeper's duties include recording every individual, planning an optimum breeding strategy and operating as an information hub for the parks holding stocks of the species in question. These days, like almost everything else, studbooks are digitised, and within the web-based database there are also a number of analytical programmes that make it possible to assess the level of genetic variation and potential inbreeding in a particular population. Most of the species at Nordens Ark are managed by some kind of a studbook.



## DEEP DIVING

### Genetic variation

Genetic variation is what breeding work is all about. In a breeding programme, the aim is to maintain as much genetic variation as possible. Every individual within a species has the same set of genes (genetic makeup), but the genes come in different variants – and it's this that makes us all different. Genetic variation, the difference between individuals,

constitutes the raw material for development and adaptation. If all individuals in a species are genetically similar, the species' ability to survive in a changing environment is diminished. A rapid change, such as a viral infection, can wipe out an entire population if individuals are genetically the same.

Even in the protected environment of a zoo, poor genetic variation can carry a risk, since it's easier for a faulty gene to be propagated within a captive population. Thanks to their sheltered habitat, zoo animals with a genetic makeup that in the wild would put them at a disadvantage have a greater chance of survival. To ensure the animals are equipped for future conservation initiatives, the studbook keeper plans the breeding so as to preserve genetic variation as far as is possible.

## PICKING AND CHOOSING

For a studbook keeper, there are often individuals that are more genetically valuable than others. For example, there might be a new female who is not closely related to any other animal in the park, or a male who has not previously been used much in the breeding programme. One way of finding such animals, and of boosting genetic variation in a population, can be to exchange breeding animals between parks.

From time to time, the studbook keeper may decide to exclude an individual from breeding if he or she appears to carry a gene that is not desirable. For instance, one that is behaving oddly could be barred from breeding if there is a risk that the behaviour is gene-related inherited. It's also possible that some animals may have characteristics that work well in a protected environment but not in the wild.

In 1997, a wild horse foal was born at Nordens Ark with a coat the colour of a bay horse. Normally, Przewalski's wild horses are sand-coloured – the perfect camouflage for evading predators on the steppes of Mongolia. Bay-coloured horses have occasionally been recorded in the wild population, but not in increasing numbers. Being bay-coloured thus does not appear to be any advantage; on the contrary – not having the herd's camouflage possibly reduces the chances of survival and reproducing. In a future reintroduction of wild horses into their natural habitat, it's preferable if they are the usual sand colour. For a foal to be bay-coloured, both the mare and stallion must have this genetic predisposition. It was therefore

decided to DNA-test all stallions, and that those carrying the bay-colour gene should be taken out of the breeding programme. This means that the bay colour remains may remain in the population but is not often expressed – just as in nature.



## DEEP DIVING

### **The structure of the group is also important**

Aside from genetic variation, another important consideration for a viable population is to maintain a favourable age distribution. The optimum is a pyramid shape, with many younger individuals forming the base, and fewer older animals. An inverted pyramid risks making the group more susceptible to outside influences. Should an outbreak of a ‘childhood illness’ coincide with a loss of fertility among the older stock, for example, the population could collapse entirely.

### **Breeding work at various levels**

Breeding is always tailored to the biology of a species. The highest demands are placed on populations and individuals that are destined to be released into the wild. For these, it is vital to have an even age distribution and to strive constantly for the optimal genetic variation.

The work with studbooks, and in planning and implementing movements of animals between wildlife parks to create the best possible conditions for the endangered species we hold, happens behind the scenes. Yet it is one of the most important tools we have to ensure that the populations we keep in wildlife parks retain the qualities they need to thrive right now, and to cope with a potential future in the wild.

*Native breeds – (almost) consigned to the history books &  
The studbook: a family tree for endangered animals:  
Written by Mia Olsson*

	Global endangerment		Management level	1 jan 2017	Births	Arrivals	Deaths	Departures/ Released into the wild	31 dec 2017
<b>INSECTS</b>									
<b>Great capricorn beetle</b> <i>Cerambyx cerdo</i>	VU	CR		0.0333				0.0112	0.0221
<b>Long-horned beetle</b> <i>Plagionotus detritus</i>		EN			0.0225			0.0225	0
<b>Pine hoverfly</b> <i>Blera fallax</i>		LC				0.096		0.096	
<b>Clouded apollo butterfly</b> <i>Parnassius mnemosyne</i>		EN		125	149	21	125		170
<b>FISHES</b>									
<b>European catfish</b> <i>Silurus glanis</i>	LC	EN		0.02		0.01	0.01		0.02
<b>Freshwater pearl mussle</b> <i>Margaritifera margaritifera</i>		EN		0		0.03			0.03
<b>European crayfish</b> <i>Astacus astacus</i>		-		0		4.20	1.10		3.10
<b>AMFIBAMPHIBIANSIER</b>									
<b>Kaiser's spotted newt</b> <i>Neurergus kaiseri</i>	CR			7.96	0.08	0	0.01	0.06	7.97
<b>Green toad</b> <i>Bufo viridis</i>		CR		18.23.833		0.015000	0.010367	0.04600	18.23.865
<b>Natterjack toad</b> <i>Bufo calamita</i>	LC	VU		7.9			0.3		7.6
<b>Yellow-banded poison arrow frog</b> <i>Dendrobates leucomelas</i>	LC			3.47					3.47
<b>Blue poison dart frog</b> <i>Dendrobates tinctorius</i>	LC			1.1.17			0.02		1.1.15
<b>Golden poison dart frog</b> <i>Phyllobates terribilis</i>	EN			0.01					0.01
<b>Mission golden-eyed tree frog</b> <i>Trachycephalus resinifictrix</i>	LC			5.6.59			0.1.21	0.0.10	7.31
<b>White's tree frog</b> <i>Pelodytes caerulea</i>	LC			0.0.8					0.0.8
<b>Lemur leaf frog</b> <i>Agalychnis lemur</i>	CR		ESB	1.1.18			0.1		7.12
<b>Splendid leaf frog</b> <i>Cruzeiobryla calcarifer</i>	LC			2.2			1.1		1.1
<b>Mnt. chicken frog</b> <i>Leptodactylus fallax</i>	CR		EEP	13.10.2		0.1	0.3		14.9
<b>Tomato frog</b> <i>Dyscophus guineti</i>	LC			4.0					4.0
<b>Pool frog</b> <i>Rana lessonae</i>	LC	VU		34.25			4.4		30.21
<b>Marsh frog</b> <i>Rana ridibunda</i>				1.6.25			0.1.2		20.9
<b>Bamboo tree frog</b> <i>Polypedates leucomystax</i>	LC			0.0.40			0.0.7		0.0.33
<b>Tonkin bug-eyed frog</b> <i>Theloderma corticale</i>	DD			0.0.3					3.0

	Global endangerment	Global endangerment	Management level	1 jan 2017	Births	Arrivals	Deaths	Departures/ Released into the wild	31 dec 2017
<b>TURTLES</b>									
European pond turtle <i>Emys orbicularis</i>	NT		ESB	1.11			0.1.0	0.3.0	1.7.0
Annam leaf turtle <i>Mauremys annamensis</i>	CR			1.4.3					1.4.3
Hermann's turtle <i>Testudo hermanni</i>	NT			2.1					2.1
Snake-necked turtle <i>Chelodina mccordi</i>	CR		ESB	3.6.1					3.6.1
<b>LIZARDS</b>									
Brown basilisk <i>Basiliscus vittatus</i>				1.3			0.1.0		1.2
Yellow-headed day gecko <i>Phelsuma klemmeri</i>	EN		ESB	1.4				1.4	0.0
Standing's day gecko <i>Phelsuma standingi</i>	VU			2.2				1.1.0	1.1
Guichenot's giant gecko <i>Rhacodactylus ciliatus</i>	VU			1.1.1	0.0.1		0.1.0		1.0.2
Sand lizard <i>Lacerta agilis</i>	LC	VU		13.11	0.0.3		0.1.1		13.10.2
<b>SNAKES</b>									
Grass snake <i>Natrix n. gotlandica</i>		NT		3.1.9			0.0.1		3.1.8
Bommon adder <i>Vipera berus</i>	LC			3.1.6			1.1.0	0.2.0	2.4
<b>BIRDS</b>									
Lesser white-fronted goose <i>Anser erythropus</i>	VU	CR		23.22.1	25.20.14		1.4.1	32.25.2	15.13.12
Baer's pochard <i>Aytya baeri</i>	CR			0.0.0		2.2			2.2
White stork <i>Ciconia ciconia</i>	LC	RE	SAZA/SDF	3.3	0.0.6		0.0.3	0.0.3	3.3
Northern bald ibis <i>Geronticus eremita</i>	CR		EEP	6.6	0.0.7				6.6.7
Peregrine falcon <i>Falco p. peregrinus</i>	LC	VU		8.8	1.2.5		2.1	1.2.5	6.7
White-naped crane <i>Antigone vipio</i>	VU		EEP	3.1	2.0.0			2.2.0	3.1.0
Manchurian crane <i>Grus japonensis</i>	EN		EEP	1.1					1.1
Eurasian eagle owl <i>Bubo b. bubo</i>	LC	NT		1.1	2.1			2.1	1.1
Great grey owl <i>Strix nebulosa lapponica</i>	LC	NT		1.1			0.1		1.0
Ural owl <i>Strix u. uralensis</i>	LC	-		1.0					1.0
European roller <i>Coracias garrulus</i>	NT	RE		1.1	1.1.1		0.1.1	1.0.0	1.1
Eurasian hoopoe <i>Upupa epops</i>	LC	RE		1.0		0.1.0			1.1
White-backed woodpecker <i>Dendrocopos leucotos</i>	LC	CR		14.16	7.5	2.2	0.2	11.7	12.14

MAMMALS									
European souslik <i>Spermophilus citellus</i>	VU			5.11	15.20	13.16	2.4	5.11	
Pallas' cat <i>Felis m. manul</i>	NT		EEP/ISB	1.0		3.0		4.0	
Euroasian wild cat <i>Felis s. silvestris</i>	LC			2.0		2.0		0.0	
Scottosh wild cat <i>Felis silvestris</i>	LC			0.0		1.1		1.1	
Eurasian lynx <i>Lynx l. lynx</i>	LC	NT	ESB/SAZA-SDF	1.1				1.1	
Amur leopard <i>Panthera pardus orientalis</i>	CR		EEP/ISB	1.1				1.1	
Persian leopard <i>Panthera pardus saxicolor</i>	EN		EEP/ISB	3.1				3.1	
Amur tiger <i>Panthera tigris altaica</i>	EN		EEP/ISB	2.2				2.2	
Snow leopard <i>Uncia uncia</i>	EN		EEP/ISB	1.1		1.0	1.0	1.1	
Wolf <i>Canis l. lupus</i>	LC	EN	SAZA/SDF	3.4	3.3		2.1	4.6	
Maned wolf <i>Chrysocyon brachyurus</i>	NT		EEP/ISB	1.1				1.1	
Dhole <i>Cuon alpinus</i>			EEP	3.0		0.2	1.1	2.1	
Euroasian otter <i>Lutra l. lutra</i>	NT	VU	EEP/ISB	1.3	1.1		0.1	0.1	2.2
Wolverine <i>Gulo g. gulo</i>	LC	VU	EEP	3.2	0.4			1.0	2.6
Red panda <i>Ailurus f. fulgens</i>	VU		EEP/ISB	1.1				1.1	
Przewalskis horse <i>Equus caballus przewalskii</i>	EN		EEP/ISB	0.3		1.0		1.3	
Chilean pudu <i>Pudu pudu</i>	VU		EEP/ISB	1.0		0.1	1.0	0.1	
European forest reindeer <i>Rangifer tarandus fennicus</i>	NT		ESB	2.5	1.1		0.3	1.0	2.3
Tadjik markhor <i>Capra falconeri heptneri</i>	CR		EEP	4.8	0.1	1.0	3.3	2.6	
Bukhara urial <i>Ovis aries bochariensis</i>	VU		MON	1.5	1.2	0.1	0.2	2.6	

	Global endangerment Global endangerment Management level	1 jan 2017	Births	Arrivals	Slaughtered	Sold	31 dec 2017	
DOMESTIC BREEDS								
Nordic bee	-	21 hives				50 queens	26 20 adopted hives	
Orust poultry	EN	2.11	8.12.1		8.1.1	0.10	2.12	
Bohus-Das poultry	EN	2.10	8.7.4	3.4	10.9.4		3.12	
Old swedish dwarf poultry	CR	3.16	5.1	2.0	5.2	2.4	3.11	
Öland goose	CR	1.1			1.1	1.1	1.1	
Swedish blue duck	EN	2.6				1.0	1.6	
Blekinge duck	CR	1.4					1.4	
Gorland rabbit	EN	0.3	6.8.4	1.0	6.4.4	0.4	1.3	
Mellerud rabbit	CR	0.3	0.2	1.0	0.1	0.2	1.2	
Linderöd's pig	EN	1.2			1.2	1.1	0.1	1.2
Jämt goat	EN	1.6	2.3			1.2	1.4	1.3
Lapp goat	EN	3.3	3.2			1.1	2.1	3.3
Gorland sheep		2.6	5.6			5.2	0.5	2.5
Värmland sheep		6.20	13.19			11.11	2.7	6.21
Dala sheep	EN	4.8	7.3			6.4		5.7
Swedish red-polled cattle	CR	13.12	7.0			6.1	1.1	13.10
Swedish mountain cattle	CR	0.2	1.0					1.2
Mountain cattle	CR	4.11	1.1			0.4		5.8
Hereford cattle		14.18	8.5			5.0	0.23	17.0
Väne cattle	CR	0.0			4.26			4.26
North swedish horse		0.1	1.0					1.1
Gorland pony		0.1						0.1
Domestic cat		0.1						0.1

## STAFF INVOLVEMENT IN BOARDS AND WORKING GROUPS

**EEP co-ordinator:** Leif Blomqvist (Snow leopard, Wolverine), Emma Nygren (Snow leopard), Eva Andersson (Wolverine)  
**International studbook keeper (ISB):** Leif Blomqvist (Snow leopard)  
**European studbook keeper (ESB):** Leif Blomqvist (Forest reindeer); Ewa Wikberg (Yellow-throated marten); Jimmy Helgesson (McCord's snake-necked turtle)  
**EAZA species committees:** Leif Blomqvist (Snow leopard, Amur leopard, Persian leopard, Tiger, Wolverine, Przewalski's wildhorse); Emma Nygren (Otter, Snow leopard); Ewa Wikberg (Maned wolf, Snow leopard); Christer Larsson (Northern bald ibis), Kristofer Försäter (Giant ditch frog)  
**Participation in EAZA working groups:** Leif Blomqvist (Felid TAG, Small Carnivore TAG, Deer TAG); Christer Larsson (Conservation Committee, Reintroduction and Translocation Group) och Canid and Hyaenid TAG; Ewa Wikberg (Caprinae TAG, Small Carnivore TAG); Jimmy Helgesson (Reptile TAG); Eva Andersson (Education Committee, Small Carnivore TAG); Emma Nygren (Animal Welfare Working Group, Felid TAG)  
**IUCN SSC:** Christer Larsson (Member of Species Survival Commission Specialist Group)  
**Eriksbergsrådet:** Mats Niklasson (Member)  
**Visingsös Eklandskap Management Group:** Mats Niklasson (Member)  
**Participation in Swedish Association of Zoos and Aquaria working groups:** Ewa Wikberg (Bevarande- och transport); Emma Nygren (Animal Welfare) Emil Gunnarsson (Representative on the Board of Agriculture reference group for domestic animal genetic issues); Eva Andersson (Research and training), Therese Patriksson (Communication)  
**EAZA EEP Committee:** Ewa Wikberg  
**EAZA Council:** Mats Höggren (Member)  
**EAZA Technical assistance committee:** Mats Höggren (Member)

## ARTICLES AND REPORTS PUBLISHED BY STAFF 2017

- Dawson, J., Sulton, M., Martin, L., Garcia, G., Harding, L., Nygren, E., Tapley, B. 2017. The Mountain Chicken Recovery Programme. Amphibian Ark Newsletter 40, september 2017
- Försäter, K., Nygren, E. & Niklasson, M. 2017. The European Green Toad rearing and reintroduction project at Nordens Ark, Sweden. Amphibian Ark Newsletter 41, december 2017
- Jansson, N., Avci, M., Bergner, A., Kayis, T., Coskun, M., Abacigil, T.Ö., Varli, S.V., Tezcan, S., Aytar, F., Niklasson, M. 2017. Turkey's oak forests are important for biodiversity. International Symposium on New Horizons in Forestry, 18-20 October, 2017, Isparta, Turkey, Proceeding & Abstracts Book, p. 218, 470 pp.
- Larsson, C. & Helgesson, J. 2017. Breeding butterflies and beetles. Zooquaria 98: 14-15
- Michaels, C. J., Försäter, K. 2017. Captive breeding of Pelophylax water frogs under controlled conditions indoors. The Herpetological Bulletin 142: 29-34
- Niklasson, M. 2017 Ekologisk restaurering av ung produktionspräglad bokskog. Länsstyrelsen Hallands län. Meddelande 2017:10

## ADMINISTRATION REPORT 2017

### SIGNIFICANT EVENTS DURING THE FINANCIAL YEAR

During 2017, several significant goals have been achieved in the field projects Nordens Ark is engaged in.

- The number of Amur tigers in the Russian Far East has been increasing since the project began in 2011, and an increase in the number of their prey animals has also been noted.
- A further three snow leopards were fitted with GPS collars, and this enabled two snow leopards to be located in their dens.
- The next important steps were taken in the PICA project, and educational material about the Pallas cat's biology and conservation in Central Asia was produced in the shape of posters, leaflets and a pocket guide.
- During 2017, Nordens Ark helped the Costa Rican Amphibian Research Center to buy 30 hectares of rainforest as part of measures to save the common tree frog.

It was also a successful year for reintroduction projects.

- Of the 81 lesser white-fronted geese that were released, a large number were later found in the core area, an important step for the future of the species.
- Nine white-backed woodpeckers were released, but the number of individuals and breedings in the wild is still low. An important breakthrough in the project, however, was that the four pairs that succeeded in breeding in wild conditions in 2017 originated from Nordens Ark.
- 112 great capricorn beetles born at Nordens Ark were released at Halltorp nature reserve.
- The work with the longhorn beetle is moving forward, with releases at a fresh site during the year.
- Nordens Ark boosted its number of Nordic brown bee colonies to 26.
- A record number of green toads were released on Öland.

In the park, work continued in line with the collection plan.

- The Hereford herd on the Farm was replaced by Väne cattle, an endangered old native breed.
- European crayfish and freshwater pearl mussels were introduced at the Wetlands.
- New European wildcats arrived from the Scottish breeding programme.

Educational and research work is a fundamental part of Nordens Ark's activities.

- A new collaboration got under way with all comprehensive schools in Sotenäs.
- Partnership launched with Dingle College.
- During the year, Nordens Ark initiated and managed three master's degree programmes.

- A total of 119 participants were trained under our Animals and Nature project.

- Research activities in the Ecopark are continuing and are focused mainly on the grazing and diversity project, although species inventories and veteranisation projects are also under way. The return of the Glanville fritillary butterfly to one of the meadows during the summer proved that the restoration is heading in the right direction.

In terms of visitor numbers, 2017 was a very good year, and the total of 122,211 was a new record for the park. Some improvements were made during the year to provide a better experience for our visitors.

- A revamp of the entrance area was completed with the aim of opening up the manor locale and making it more welcoming.
- New entry, booking and till systems were installed to cut down on queues and waiting times.

### INITIATIVES CARRIED OUT AS COLLABORATIVE PROJECTS WITH AUTHORITIES AND ORGANISATIONS

#### Amur tiger

The Northern Tiger Project is run together with the WWF. It aims to ensure a sustainable development of the world's most northerly sub-population of Amur tigers in Khabarovsk province in the Far East of Russia. The main focus of the project is to increase protection and secure availability of food for the tigers as well as their prey animals. The project has been a success and the tiger population has begun to recover in the region. This is positive, but with more tigers there are also more conflicts between human and tiger. For this reason, during 2017 the project concentrated on preventing and reducing the problems that might arise.



*Wild Amur tigers were tracked during the annual follow-up trip to Anuisky National Park in Russia's Far East.*

#### Snow leopard

The collaboration with the Snow Leopard Trust on the long-term snow leopard studies in the Tost Mountains of Mongolia continued during the year. Three more snow leopards (two males and a female) were fitted with GPS collars in spring 2017, which will contribute valuable data to the project. The GPS collar enabled researchers to follow the female's movements and thus pinpoint her two cubs in their den. It's the fourth time scientists have been able to localise a snow leopard den, and the discovery helps them record how often the leopards give birth in the wild, the size of the litters and how many young survive to adulthood. This information is essential in conservation work.

## Pallas cat

The Pallas's Cat International Conservation Alliance (PICA) conservation project is an international collaboration involving Nordens Ark, the Royal Zoological Society of Scotland, the Snow Leopard Trust and the Segré Foundation.

The project embraces conservation measures for Pallas cats in the wild, with a focus on creating a global action plan with solid conservation initiatives. In the course of the year, the project created two different questionnaires, one aimed at herders/villagers and one at scientists, to look at Pallas cat numbers and the threats the cats face.

The project has also put together educational material for the countries where Pallas cats live in the form of posters, leaflets and a pocket guide. Both questionnaires and the educational material was translated into several languages and distributed in some of the Pallas cat nations.



© Christer Larsson

## Common tree frog

In 2017, Nordens Ark helped the Costa Rican Amphibian Research Center to buy 30 hectares of rainforest as part of measures to preserve the common tree frog.

## Giant ditch frog

Conservation work for the critically endangered giant ditch frog, also known as mountain chicken, involves Chester Zoo, the Durrell Wildlife Conservation Trust, Paignton Zoo and the Zoological Society of London and forms part of the Mountain Chicken Recovery Programme (MCRP). MCRP is an international collaboration between European conservation organisations and the governments in Montserrat and Dominica. During the year, our breeding pair produced 17 foam nests, but sadly none was fertilised. Therefore, the focus in 2017 was on testing and developing different management methods that might produce a better result for 2018.

## Lesser white-fronted goose

The Lesser White-Fronted Goose Project is run together with the Swedish Association for Hunting and Wildlife Management. In 2017, 81 geese were released in the breeding area in the Swedish mountains. Over the summer, autumn and winter, large groups of release birds have been spotted together, both in the breeding area and on migration routes and overwintering sites. This is a good sign, and we're on tenterhooks now to see if more individuals return to the release area to breed.

## White-backed woodpecker

In the spring of 2017, Sweden's wild population was estimated at only about 20 birds. Four pairs bred successfully and the result was 11 chicks. All the birds breeding in the wild originate from the reintroduction programme.

In order to bring in new and unrelated breeding birds, four youngsters caught in the wild in Norway arrived in May. They were hand-fed at Nordens Ark and two remained here to become breeding birds, while one youngster was moved to Skansen and another to Järv zoo.

On July 6, nine young white-backed woodpeckers reared in the breeding programme at Nordens Ark were placed out in three aviaries by the Lower Dalälven River. After their release, six of the youngsters remained nearby until mid-August. Each week, they moved across larger and larger areas. Some individuals that hadn't been seen for many days, or even weeks, later revisited the feeding sites.



© Christer Larsson

*Three white-backed woodpecker chicks that were hand-fed by keepers in the off-show breeding facility at Nordens Ark.*

## Peregrine falcon

For several years, the wild falcon population has been so numerous that the bird is no longer considered threatened. As a result, we have halted our breeding and rearing work and are slowly phasing out the species. The remaining breeding birds will stay as long as they are doing well and are able to produce chicks on their own. But we have stopped intensive breeding with hatching machines and hand-feeding to produce as many young as possible.

The result this year was four youngsters placed out at Köping and three at Fjugesta. Nordens Ark has released young falcons at these two sites for many years, with good results. In addition, a little youngster was placed out in a wild falcon nest in Helsingborg where the pair had been unsuccessful with their breeding and were sitting on added eggs.

## Great capricorn beetle

Rearing of great capricorn beetles continues on track, although the planned release on the mainland outside Kalmar was unfortunately put back to 2018. Instead, 112 individuals born at Nordens Ark were placed out as a population-strengthening measure at Halltorp nature reserve in a historic but not publicly announced arrangement on the initiative of Kalmar county administrative board.



*The great capricorn is Sweden's largest longhorn beetle.*

## Longhorn beetle

The work with the longhorn beetle is also continuing and being developed. Twenty-five colonised logs and 105 imagos were released in Björnö nature reserve in Kalmar county. It was the first release at this site, in a part of the country where the species has been extinct for decades. In the Båtfors area of Uppsala county, 120 developed beetles were released. Breeding is carried out following two different methods and is improving all the time.

## Clouded Apollo butterfly

In the second year of the clouded Apollo butterfly project, three males and seven females managed to produce 149 eggs, beating 2016's total. Rearing methodology continues to advance. The county administrative board is considering releases in 2018 in areas under restoration in Ronneby district. The species' population in Blekinge is particularly vulnerable and is at risk of disappearing completely.

## Caledonian pine-hoverfly

Collection of 100 individual Caledonian pine-hoverfly larvae took place in the Ecopark and they were then transported to release sites and rearing in Scotland, where the species has died out. It is not threatened in Sweden.

## Nordic brown bee

Nordens Ark's efforts for the Nordic brown bee moved on a lot during the year. The work is focusing on producing pure-bred queens that have mated freely at our station on the Weather Islands (Väderöarna). There has been great interest from other beekeepers, and the result was that we sold 37 queens and 11 entire colonies.

The free-mating station started up two years ago as part of the important conservation work with the Nordic brown bee. The station is also available for free-mating of newly hatched queens

from other beekeepers. In total, 230 queens mated there with drones from our pure-bred hives, which are transported every year out to the Weather Islands.

In order to continue and even broaden our activities with rearing queens and collaborating with other beekeepers, our own apiary has been expanded and the number of colonies over-wintering has now reached 26.

## Green toad

A total of 4,600 one- and two-year-old toads were released out at two sites on Öland. The release at Ottenby was attended by about 300 people, including radio and press. Quite an achievement!



*A record number of green toads were released at Ottenby bird observatory.*

## European bison

The European bison project was launched at the end of 2017 with felling of spruce woodland in the future pastures. Construction of enclosures begins in the winter of 2017, with the bison expected to arrive in May 2018.

## Väne cattle

An entire herd of Väne cattle has been purchased to replace the group of Herefords acquired during the Ecopark's first year. Now, only old native breeds are being kept on the recreated pastures of the Ecopark.

## European wildcat

The population remaining in the Scottish Highlands is critically endangered and is being managed both in situ and ex situ. The pair at Nordens Ark were sent here within the framework

established by the Royal Zoological Society of Scotland.



*The Scottish wildcat is often called the Highlands tiger.*

## EDUCATIONAL AND RESEARCH ACTIVITIES

### Comprehensive school

A new partnership with all the comprehensive schools in Sotenäs municipality got under way in 2017. Every academic year we will receive all grades from 1 to 9 once we have set up all the lessons. During the year, work started to create lessons for Year 6 and they were test-run in the spring. We then received Years 5, 6 and 7 in the autumn.

### Secondary school

We're continuing the established collaboration with Uddevalla secondary school. This partnership featured at a European conference on education in zoos (EZE) in Paris during the spring. The new Dingle secondary school has sought a collaboration and we drew up a new agreement that was signed in the autumn. In this partnership we'll be responsible for four new courses within their animal welfare training. Two of the courses are Djurpark (Zoo) 1 and Djurpark 2, which the Swedish Association of Zoos and Aquaria has developed and the Swedish National Agency for Education has established.

### University

This year, in conjunction with the University of Gothenburg, we continued to work with the course Knowledge Dissemination and Communication for Conservation Biologists, with visits from Uppsala University, the Swedish University of Agricultural Sciences and Skövde College. During the year we initiated and led three master's degree courses – one on our green toads, one on improving the welfare of our Amur leopards, and the third in conjunction with the Royal Zoological Society of Scotland on Pallas cats (it was a student from Sweden who carried out the work in parks in Britain).

### Animals and Nature

The Animals and Nature project financed by the Postcode Lottery arranged 18 courses in 2017, with a total of 119 participants. Forty-three completed at least one of the seven basic courses. Following this, 11 applied courses were held, with 76 taking part, and these have been personal assistants who attended with their users. In October, a two-day workshop was organised on the theme of Green Health at Nordens Ark, with participants from various parts of Sweden. As a further stage in the work, we welcomed study visits from a university course, Nature Based Interventions, with some 30 students.

### Commissioned courses

In the autumn, two commissioned courses were held at Nordens Ark. One was a natural continuation of the Animals and Nature project. The other was aimed at Sweden's county administrative boards and was a further education course for animal welfare inspectors in the holding, welfare and control of amphibians and reptiles. This course is run in association with the Swedish University of Agricultural Sciences.

### Time travel

A communication project, Time Travel, was launched during the year in association with University West (Trollhättan). A walk on the Ecopark trail will be developed with the aim of giving visitors an insight into what different sites in nature looked like, say 6,000 or 300 years ago.

### Pre-school

The pre-school has been fully taken up with 24 children from age one to five. The staff have numbered four educators and 80 per cent cook/cleaning staff. There has been a lot of emphasis on language, and this has permeated all the activities. There were also motorised activities in a woodland setting.



© Jenny Magnusson

*Pre-school children look forward to playing in the snow.*

### Research

#### *Grazing project*

The grazing project, funded by the Hasselblad Foundation and Thuréus forskarhem, is proceeding as planned. Initiatives, burnings and measurements have now been carried out for a third season and the results are being worked on for first publication during 2018.

Another set of five species of vascular plants have been sown as part of the trial. The test areas have been widened so we can plant more tree and shrub species.

Five examination projects/internships have been completed with students from Swedish and Dutch universities. A manuscript on the study of tree grazing from Eriksberg Wildlife Park is in production.

#### *Ecopark*

Research activities are focusing mainly on the grazing and diversity project, but much work is continuing to be done with species inventories in the Ecopark. Proof that the restoration is on the right track came with the discovery of Glanville fritillary butterflies in one of the enclosures during the summer.



© Sverker Thoresson

*The Glanville fritillary butterfly is among the new species to be found in our Ecopark.*

This butterfly, associated with traditional agriculture, has declined all over Sweden due to encroachment, and previously Ramsvikslandet was the nearest place to find it. For the fourth year running, species-determination of moths from the two traps was carried out by Sweden's top experts. A minor followup of the 2011-2013 insect collections was done during the summer of 2016. At the end of the year, a compilation was prepared of all the species data collected during the Ecopark's first five years.

The veteranisation project is proceeding, with a large compilation starting during the year of the 20 detailed test sites, of which Nordens Ark is one. Excursions and training took place in the Ecopark on about ten occasions, with upper secondary schools, colleges/universities and within the Animals and Nature project.

Titel	Universitet/Högskola	Nivå
Hellström, K. 2017. Nötbetets påverkan på dynamiken hos träd- och buskplantor (The Impact of Cattle Grazing on the Dynamic of Trees and Shrubs).	University of Gothenburg	Bachelor thesis
Hermansson, M. 2017. Fukthaltens inverkan på brandspridning i gräsmark (The Impact of Moisture Content on the Spread of Fire in Grassland).	Swedish University of Agricultural Sciences, Uppsala	Bachelor
Meinesz, K. & Shutgens, E. 2017 Effects of Grazing Cattle and Prescribed Fire on Tree Species in the Swedish Boreo-Nemoral Zone.	Van Hall Larenstein University, Netherlands	Bachelor Thesis report wildlife management
Sridharan, P. 2017 Adaptation of Woody Temperate Forest Species to Competition, Herbivory and Fire.	Wageningen University, Netherlands	Internship report
Virns, P. 2017 Tree Establishment under High Browsing Pressure in Eriksberg Wildlife Park, Sweden.	Southern Swedish Research Centre, SLU	Master Thesis

Table 1. Theses completed at Nordens Ark in 2017.

## VISITOR OPERATIONS

A total of 122,211 visitors to Nordens Ark in 2017 was a new record. Income from entry tickets is classified as a gift, so this support is important to the business. More events and activities took place during the year, with 225 reservations and a total of 6,363 people taking part. For every holiday week and weekend, the park programme offered daily activities for visitors. Feeding and information about predators are the subjects that attract most visitors. The harvest market at the Farm and the Christmas market at the Barn, the sheep run, ghost trails and adopters' day are among the events that took place during the year. The Christmas market set a new visitor record with 2,500 guests.

## COMMUNICATION AND MEDIA

The slogan The Park that Makes a Difference was introduced and is used as a key theme in our strategic communication. In 2017, the Nordens Ark website had 1,470,129 unique page views, and it's undoubtedly the Visit Us and Our Animals tabs that are the most clicked on. The number of followers on social media is increasing steadily, and at the end of 2017 we had 13,552 Facebook friends and 5,285 on Instagram. Facebook and Instagram are becoming ever more important channels. Our posts range from daily activities in the park to reports from conservation projects, fundraising events and information about bookable activities. It's the videos that are without doubt most popular on social media. Most viewed in 2017 were the video of one of our Amur tigers catching a goshawk (21,408 unique views), and the one describing and showing how we shear sheep (21,435 unique views). Our first digital Christmas calendar was very popular as well.

Twenty-one press releases were sent out by Nordens Ark during the year. Subjects that generated most press interest were the release of white-backed woodpeckers and green toads, and the wild otter cub that was taken in by Nordens Ark and later released. During the year, Nordens Ark was mentioned in 363 articles, 38 per cent of them web-based.

In the course of the year, Nordens Ark was visible in various outside contexts such as Christmas at Liseberg, on posters in Stockholm in conjunction with the West Sweden Tourist Board, 'Slussens Dag' in Trollhättan, on Djursjukhuset (Animal Hospital) on SVT television, Mix Megapol and TV2 Norge, to name but a few. There have been adverts in national and international media, with awareness and visiting the park being the principal messages.

In 2017, the Friends of Nordens Ark welcomed 3,304 members, taking the total to 8,142 – the third-best year in terms of new signings since membership records began in 1994.

## HOTEL, RESTAURANTS AND SHOP

Following the fantastic record year of 2016, expectations were very high for 2017. A brand-new entry system and express tills were introduced to handle visitors faster and more smoothly. Hand in hand with these changes, the first step was taken in creating a more open and welcoming impression with new gates and planting by the main entrance. A new cash-desk and booking system was also brought in.

The positive trend for Nordens Ark Hotel is continuing, and it applies to the restaurant and catering sections too. In terms of hotel occupancy, there was a small decline compared with 2016, but we still sold 3,720 rooms, representing an occupancy rate of 35 per cent over the whole year. So, slightly fewer rooms but almost 300 hotel nights more than in 2016. The explanation is partly that the leisure sector has experienced a positive development since the year before. Overall, our private/leisure sector is easily the biggest and accounted for almost 80 per cent of our guests in 2017.

The restaurant has also developed positively during the year, with the Wolf Lodge and Farm Café in particular increasing their takings. The hotel restaurant saw a slight decrease, due mainly to there being fewer conferences and major events than in the previous year.

## STAFF

The number of annual employees went up to 85.6, of whom 65 per cent were female and 35 per cent male. During the year, 181 people worked at Nordens Ark as permanent, substitute or seasonal employees.

An HR manager was appointed in the spring, and in the autumn we took on a permanent veterinarian.

The focus during the year has been on developing and implementing new HR systems, as well as remaining vigilant on work environment, leadership and employee issues. All managers and supervisors undertook work environment training and went on an internal leadership course. A protection committee was set up during the year.

## ENVIRONMENTAL REPORT

Nordens Ark Foundation is environmentally certified with Swedish Environmental Base. Through its environmental management system and environmental policy, the Foundation aims for a continual reduction of its environmental impact. A review of the environmental work was carried out at the start of the year.

In 2017, a series of measures were undertaken to reduce electricity usage. This resulted in a cut of seven per cent, so we exceeded the target of six per cent.

In order to achieve a greater organisational distribution of environmental efforts, a working group was formed with representatives from different departments who will work both operatively and strategically with internal environmental issues.

As part of the long-term plan to reduce fuel consumption and replace the vehicle fleet, two new electric hybrid cars were acquired.

## GIFTS AND DONATIONS

The Foundation has been a beneficiary of the Swedish Postcode Lottery since 2010, and seven million kronor was received in 2017.



Furthermore, the special project Animals and Nature – Outdoor Courses for Carers and Users with Special Needs will be receiving funding of five million kronor from the Postcode Lottery in the period 2015 to 2018.

The independent membership organisation Friends of Nordens Ark aims to support the activities, both financially

and ideologically, managed by the Foundation. During 2017 the association contributed many hours of voluntary work and made a donation of 2.5 million kronor. The Friends of Nordens Ark had 8,142 members at year's end.

In the course of 2017, Nordens Ark received bequests of 1.2 million kronor and other gifts from the public totalling 6.4 million kronor.

## FOUNDATIONS AND FUNDS, AND SCIENTIFIC PARTNERS

Erna and Victor Hasselblad's foundation funds the research project Grazing and Fire. The Geneva-based Segré Foundation contributed for the fifth year to initiatives for lesser white-fronted geese, white-backed woodpecker and common tree frog, and also financed the Pallas's Cat International Conservation Alliance project for a three-year period starting in 2016. Thuréus forskarhem has contributed to Nordens Ark's scientific endeavours.

## PARTNERS AND SPONSORS

Nordens Ark had two main partners in 2017: AB Volvo and the Gothenburg Post (GP). Both of these companies are longstanding and loyal ambassadors for Nordens Ark.

The many firms and generous private individuals who support Nordens Ark through sponsorship and adoptions contributed with significant resources in the form of goods, services and cash.

## SWEDISH FUNDRAISING CONTROL AND SWEDISH FUNDRAISING COUNCIL

Nordens Ark holds a 90-account and is therefore examined by the Swedish Fundraising Control. Nordens Ark is a member of the Swedish Fundraising Council (FRII) and follows the established quality code. An impact report is published on the Foundation's website in accordance with the quality code. A summary of the impact report can be found under the headlines Significant Events during the Financial Year, Initiatives Carried Out as Collaborative Projects with Authorities and Organisations, and Educational and Research Activities.

## THE WORK OF THE BOARD IN 2017

The Board held four meetings during the year.

- Final accounts meeting in March
- Information meeting in preparation for the summer season in June
- Review of the summer season in September
- Adoption of the business plan, animal collection plan and budget in November

Sven Eckerstein resigned during the year. Johan Höjesjö and Nicke Bäcklund took office as new members.

## EARNINGS AND FINANCIAL POSITION

**The Foundation's revenues**

The Foundation's total revenues amounted to 60.5 million kronor (60.6 million kronor). Of this sum, gifts and entry takings made up 30 million kronor (34 million kronor), with the Postcode Lottery contributing 7.0 million kronor (7.0 million kronor) and bequests 1.2 million kronor (5.6 million kronor). Contributions counted as revenue amounted to 9.5 million kronor (5.5 million kronor). The increase is due mainly to a contribution of 2 million kronor from the Nordens Ark fundraising foundation and contributions from the Hasselblad Foundation amounting to 2.6 million kronor. Income from the sale of goods and services came to 15.7 million kronor (16.1 million kronor). Other revenue amounted to 5.7 million kronor (5.4 million kronor).

**Operating costs and expenses**

Operating expenses amounted to 62.1 million kronor (59.0 million kronor), of which direct operating costs came to 41.0 million kronor (40.0 million kronor). Fundraising and administration costs amounted to 5.6 million kronor (5.4 million kronor).

<i>Overview (000s kr)</i>	2017	2016	2015	2014
The Foundation's revenues	60 468	60 597	59 017	60 408
Income after financial items	-1 408	1 545	5 149	6 665
Operating margin	neg	3 %	9 %	11 %
Balance sheet total	51710	54642	54 133	44 721
Equity ratio	58.71 %	58.14 %	56.00 %	56.00 %

**Net income and general position**

Net income for 2017 came to -1.4 million kronor (1.6 million kronor), a decrease of 3.0 million kronor. This was due, among other things, to direct operating costs rising by 1.0 million kronor and gifts falling by 4.3 million kronor, attributable to bequests. At the same time, revenue from the sale of goods and services decreased by 2.1 million kronor. The Foundation's financial position is good. Equity ratio amounted to 59%.

Nordens Ark strives to ensure secure funding for the Foundation's projects and commitments. Many of our projects are long-term, and viable and secure financing is essential to drive them forward. Strong equity capital is a prerequisite for ensuring future reinvestments and maintenance of our facilities.

**Investments**

The year's total investments came to 4.9 million kronor (4.0 million kronor), of which 3.1 million kronor (3.4 million kronor) is self-financed.

Within the framework of self-funded investments, the following projects have been completed or are in progress: construction of Asiatic wild dog and lynx enclosures; ongoing

investment in a bison facility, funded partly by a contribution of 1 million kronor; and construction of a new entrance area. Planned investments relating to vehicles, machinery and equipment have been made.

**Definition of key ratios***Operating margin*

Operating income as a percentage of total sales

*Equity ratio*

Adjusted equity as a percentage of the balance sheet total

**Change in equity**

	Founda- tion fund	Retained earnings	Net income for the year	Total
Total at beginning of year	24 500	30 200 649	1 545 420	31 770 569
Transfer of retained earnings		1 545 420	-1 545 420	0
Net income for the year			-1 408 582	-1 408 582
<b>Total at end of year</b>	<b>24 500</b>	<b>31 746 069</b>	<b>-1 408 582</b>	<b>30 361 987</b>

**ALLOCATION OF PROFIT/LOSS**

The year's income of -1 408 582 kronor will be carried forward. Equity capital will then amount to 30 361 987 kronor. For the Foundation's net income and general position, please refer to the income statement and balance sheet with accompanying notes that follow.

## INCOME STATEMENT

		2017-01-01	2016-01-01
		2017-12-31	2016-12-31
<b>Figures in Swedish kronor</b>			
<b>The Foundation's revenues</b>			
Admission charge		15 317 429	14 703 972
Sale of goods and services	1	15 708 143	16 081 860
Income from training and school		4 272 927	4 406 229
Gifts	2	14 599 929	18 924 085
Contributions	2	9 503 601	5 508 224
Other operating revenues		1 065 933	972 812
<b>Total</b>		<b>60 467 962</b>	<b>60 597 182</b>
<b>Operating costs and expenses</b>			
Goods	3	-5 923 028	-5 587 844
Other external expenses		-14 769 063	-15 292 465
Employee costs	4	-38 704 372	-35 741 736
Depreciation and write-downs on tangible and intangible fixed assets	5	-2 397 598	-2 335 503
		-61 794 061	-58 957 548
<b>Operating income</b>		<b>-1 326 099</b>	<b>1 639 634</b>
<i>Financial items</i>			
Interest and similar income	6	2 850	13 990
Interest expense		-85 333	-88 204
<b>Income after financial items</b>		<b>-1 408 582</b>	<b>1 545 420</b>
Tax on net income for the year		0	0
<b>Net income for the year</b>		<b>-1 408 582</b>	<b>1 545 420</b>

## BALANCE SHEET

Figures in Swedish kronor	Note	2017-12-31	2016-12-31
<b>ASSETS</b>			
<b>Fixed assets</b>			
<i>Tangible fixed assets</i>	5		
Buildings and land		8 937 534	9 078 165
Land improvements		20 038 885	18 371 361
Equipment, tools and other installations		2 568 573	2 625 489
Ongoing new constructions		1 947 421	2 692 963
<b>Total fixed assets</b>		<b>33 492 413</b>	<b>32 767 978</b>
<b>Current assets</b>			
<i>Inventories etc</i>			
Inventories		1 399 087	1 695 730
		<b>1 399 087</b>	<b>1 695 730</b>
<i>Current receivables</i>			
Accounts receivable		2 350 299	1 219 913
Tax refund claim		494 000	493 691
Other receivables		765 529	808 080
Prepaid expenses and accrued income	8	5 099 802	2 258 721
		<b>8 709 630</b>	<b>4 780 405</b>
<i>Short-term investments</i>			
		74 305	74 305
		<b>74 305</b>	<b>74 305</b>
<i>Cash in hand and bank deposits</i>	11	8 034 914	15 323 600
<b>Current total assets</b>		<b>18 217 936</b>	<b>21 874 040</b>
<b>TOTAL ASSETS</b>		<b>51 710 349</b>	<b>54 642 018</b>

## BALANCE SHEET

Figures in Swedish kronor	Not	2017-12-31	2016-12-31
<b>EQUITY AND LIABILITIES</b>			
<b>Equity capital</b>			
<i>Restructed equity</i>			
Foundation fund		24 500	24 500
		<b>24 500</b>	<b>24 500</b>
<i>Unrestricted equity</i>			
Unappropriated retained earnings		31 746 069	30 200 649
Net income for the year		-1 408 582	1 545 420
		30 337 487	31 746 069
<b>Total equity</b>		<b>30 361 987</b>	<b>31 770 569</b>
<b>Long-term liabilities</b>			
Debt to credit institutions	9	3 650 000	3 750 000
Prepaid revenue	10	6 246 578	8 028 270
<i>Total long-term liabilities</i>		<b>9 896 578</b>	<b>11 778 270</b>
<b>Current liabilities</b>			
Bank advances	11	0	0
Accounts payable		3 133 606	2 372 944
Other current liabilities		770 659	771 924
Total accrued expenses and prepaid revenue	12	7 547 519	7 948 311
<b>Total current liabilities</b>		<b>11 451 784</b>	<b>11 093 179</b>
<b>TOTAL EQUITY AND LIABILITIES</b>		<b>51 710 349</b>	<b>54 642 018</b>

## CASH FLOW ANALYSIS

	2017-01-01 2017-12-31	2016-01-01 2016-12-31
<b>Figures in Swedish kronor</b>		
<b>Current operations</b>		
Operating income	-1 326 099	1 619 634
<i>Adjustments for non-cash items</i>		
Depreciation and write-downs	2 397 596	2 355 506
Capital gain/loss from sale of equipment	0	0
Financial income	2 850	13 990
Interest paid	-85 333	-88 204
<b>Cash flow from current operations before changes in operating capital</b>	<b>989 014</b>	<b>3 900 926</b>
<i>Changes in operating capital</i>		
Changes in inventories	296 643	-115 426
Changes in receivables	-3 929 225	1 546 274
Received contributions not used	0	0
Contributions used	-1 781 692	-1 437 100
Changes in current liabilities	358 606	500 761
<b>Cash flow from current liabilities</b>	<b>-4 066 654</b>	<b>4 395 435</b>
<i>Investment operations</i>		
Acquisition of tangible fixed assets	-4 862 032	-4 038 030
Sale of equipment	0	0
Investment contributions received	1 740 000	670 058
<b>Cash flow from investment operations</b>	<b>-3 122 032</b>	<b>-3 367 972</b>
<i>Financing operations</i>		
Increase in long-term liabilities	0	0
Repayment of debt	-100 000	-100 000
<b>Cash flow from investment operations</b>	<b>-100 000</b>	<b>-100 000</b>
<b>Cash flow for the year</b>	<b>-7 288 686</b>	<b>927 463</b>
<b>Liquid funds at the beginning of the year*</b>	<b>15 397 905</b>	<b>14 470 442</b>
<b>Liquid funds at the end of the year*</b>	<b>8 109 219</b>	<b>15 397 905</b>

\* Liquid funds comprise cash in hand, bank deposits and short-term investments.

## ACCOUNTING AND VALUATION PRINCIPLES AND NOTES

### General

This Annual Report has been prepared in accordance with the Annual Accounts Act, BFNAR 2012:1 (K3) and the Swedish Fundraising Council's template for annual reports. The Annual Report also includes certain information required by the Swedish Fundraising Control.

### Changed accounting and valuation principles

The following accounting and valuation principles have been amended with the transition to K3:

Fixed assets have been divided into components that affect depreciation of properties. The opening balance has not been recalculated. In connection with this transition, there has been some reclassification between facilities and buildings.

The principle for classification of gifts and contributions has changed in connection with the transition to K3; the comparison year 2013 has been recalculated in accordance with these new principles.

### Operating revenues

Revenues are taken up at the actual value that has been or will be received. A transaction in which Nordens Ark receives an asset or service that has a value, without giving back an equivalent value in exchange, is considered a gift or contribution. If the asset is received because Nordens Ark has fulfilled, or is going to fulfil, certain conditions and there is an obligation to repay the giver should the conditions not be met, it is considered a received contribution. If it is not a contribution, it is a gift. Gifts are normally accounted for in the period in which they are received, and this applies equally to funds received from the Postcode Lottery. Sales of postage stamps, postcards and similar items are declared when the payment is received.

Where gifts received have been accepted subject to a proviso that they be used for a specific purpose, and they have not been used by the end of the financial year, they are reported as prepaid gifts in the final accounts. The funds are reversed when the gift is used and they are taken up as operating income (received gifts).

The contribution is reported as income when the proviso under which it was received is met. Contributions received are recorded as a debt until the conditions for receiving them are met.

Gifts and contributions for the acquisition of fixed assets reduce the cost of that asset. This means that the asset is recorded at its net acquisition cost, which is the basis for calculating its depreciation. Details of the year's gross acquisition cost and contributions received are shown in the notes. Sales of goods and services are recorded in the period to which the income relates.

### Operating costs

The Foundation's operating costs and expenses consist of direct project costs, fundraising costs and administrative expenses. The Foundation's income statement is classified by nature of expense, and details of direct project costs, fundraising costs and administrative expenses can be found in the appropriate notes.

### Direct project costs

Direct project costs comprise the Foundation's costs for rescuing and preserving endangered animals, and for information, research and educational activities. Costs directly linked to complying with the paragraph on direct projects in the Foundation's statutes are classified as direct project costs. Shared costs distributed over the direct project costs are also classified as direct project costs.

### Fundraising costs

Fundraising costs are direct costs relating to fundraising efforts directed at donors, i.e. revenues in the form of gifts, bequests and donations. The work includes both current donors and efforts to find new ones. Fundraising costs comprise both direct costs such as the collection of staff salaries and shared costs distributed over the fundraising costs.

**Administrative expenses**

Administrative expenses comprise the costs incurred in administering Nordens Ark. These include, for example, administrative systems, wages and salaries for administrative staff, premises and audits.

**Assets and liabilities**

Assets, allocations and liabilities are taken up at acquisition value unless stated otherwise.

**Inventories**

Inventories are valued according to the lower of cost and market principle, using the first-in first-out (FIFO) method. This means that inventories are taken up at the lower of acquisition value according to the FIFO method and real (market) value. A standard deduction of three per cent has been made for obsolescence. Valuation of animals comprises the animals owned by the Foundation. The zoological park's operations also include animals that the Foundation does not own but has at its disposal as so-called breeding loans. The value of these animals is far in excess of the value of the park's own animals. New animals resulting from these operations have not been taken up.

**Tangible fixed assets**

Tangible fixed assets are taken up at acquisition value less accumulated depreciation and any write-downs. Depreciation according to plan is based on original acquisition values and estimated life. A write-down is made where impairment of value is permanent. Land is not depreciated.

Grants received towards acquisition of fixed assets reduce the cost of that asset. Details of grants received are given in the notes. Accumulated support for each type of facility is shown in Note 5.

The following depreciation periods are used:

Buildings	15-100 years
Enclosures and facilities	20 years
Equipment, tools and other installations	5-8 years

The difference between the above depreciation and depreciations made for tax purposes is reported as over-/under-depreciation, which is included in untaxed reserves.

**Income tax**

The tax for the current financial year as it is reported in the income statement contains the tax costs or tax revenues. Deferred tax is not reported separately if it is only the balance sheet item Untaxed reserves that entails deferred tax. Deferred tax refund claims are reported only if there is a very high probability that they can be legally set off against tax liabilities.

**Average number of employees**

The average number of employees has been calculated by dividing the total number of hours worked during the financial year by an average number of working hours based on the average of the Foundation's blue-collar and white-collar staff's working hours.

## NOTES

## Note 1 Sale of goods and services

The figure represents income from hotel, restaurant and shop sales, and from the sale of timber. Net income from the hotel, restaurants and shop amounted to 148,000 kronor (2,348,000 kronor).

## Note 2 Gifts and contributions

Of the total amount received from organisations, 7 million kronor (7 million kronor) came from the Postcode Lottery. Contributions of 2 million kronor (200,000 kronor) were received from the Nordens Ark fundraising foundation. During 2017, Nordens Ark Foundation received gifts from the general public totalling 22,817,358 kronor (26,628,057 kronor), including entrance fees, with bequests accounting for 1,205,239 kronor (5,550,868 kronor).

Gifts reported as revenue	2017	2016
General public	7 499 929	11 924 085
Other organisations	7 100 000	7 000 000
<b>Total</b>	<b>14 599 929</b>	<b>18 924 085</b>
Entrance fees	15 317 429	14 703 972
<b>Total gifts reported as revenue</b>	<b>29 917 358</b>	<b>33 628 057</b>

Contributions reported as revenue	2017	2016
Companies	2 392 593	2 038 444
Other organisations	6 173 993	3 001 536
Total	8 566 586	5 039 980

Public subsidies

EU	587 265	178 251
Others	349 750	289 993
<i>Total</i>	<i>937 015</i>	<i>468 244</i>
<b>Total contributions</b>	<b>9 503 601</b>	<b>5 508 224</b>

**Total gifts and contributions** 39 420 959 39 136 281

In the income statement, education and schools includes 2,887,489 kronor (2,674,677 kronor) relating to communal childcare expenses.

## Note 3 Operating costs and expenses

Fundraising costs, administrative expenses and direct project costs reported according to the Swedish Fundraising Control's guidelines amount to:

	2017	2016
Direct costs in connection with goods and services	15 231 414	13 554 806
Other fundraising costs	2 992 624	1 958 101
Administrative expenses	2 619 781	3 483 226
Direct project costs	40 950 242	39 981 383
<b>Total</b>	<b>61 794 061</b>	<b>58 977 516</b>

**Note 4 Employee costs**

<i>Average number of employees</i>	2017	2016
Men	25	20
Women	40	33
Male seasonal staff	6	7
Female seasonal staff	15	15
<b>Total</b>	<b>86</b>	<b>75</b>

<i>Total number of employees during the year</i>	2017	2016
Men	59	62
Women	122	120
<b>Total</b>	<b>181</b>	<b>182</b>

*Wages and salaries, other remunerations and social costs*

Board and Managing Director	1 005 000	907 800
Other employees	26 369 888	24 582 861
<b>Total</b>	<b>27 374 888</b>	<b>25 490 661</b>

*Social costs*

Pension contributions for the Board and Managing Director	529 824	180 000
Pension contributions for other staff	1 300 191	1 638 798
Social security contributions	8 621 908	8 332 450
<b>Total</b>	<b>10 451 923</b>	<b>10 151 248</b>

If the MD's employment is terminated by the Foundation, the MD will receive severance pay equivalent to 12 months' pay. The amount will be reduced if the MD finds other employment within a period of 12 months.

<i>Distribution by gender</i>	31-12-2017	31-12-2016
<i>Distribution of men and women on the Board:</i>		
Women	3	3
Men	8	7
<i>Distribution of men and women on the management team:</i>		
Women	6	5
Men	3	3

## Note 5 Depreciation of tangible assets

	31-12-2017	31-12-2016
<i>Buildings and land</i>		
Acquisition value at beginning of year (of which land 6 696 523)	10 547 355	10 547 355
Purchases	0	0
<b>Accumulated acquisition value at end of year</b>	<b>10 547 355</b>	<b>10 547 355</b>
Accumulated depreciation at beginning of year	-1 469 190	-1 324 418
Depreciation for the year	-140 631	-144 772
<b>Accumulated depreciation at end of year</b>	<b>-1 609 821</b>	<b>-1 469 190</b>
<b>Book value</b>	<b>8 937 534</b>	<b>9 078 165</b>
Accumulated contributions amount to 32 609 791 kronor (32 609 791 kronor).		

	31-12-2017	31-12-2016
<i>Land improvement</i>		
Acquisition value at beginning of year	39 712 354	34 759 283
Purchases	3 018 037	0
Reclassification of investment	0	8 236 903
Reclassification of contributions	0	-3 283 832
Contributions	0	0
<b>Accumulated acquisition value at end of year</b>	<b>42 730 391</b>	<b>39 712 354</b>
Accumulated depreciation at beginning of year	-21 340 993	-20 148 754
Depreciation for the year	-1 350 513	-1 192 239
Reclassification	0	0
<b>Accumulated depreciation at end of year</b>	<b>-22 691 506</b>	<b>-21 340 993</b>
<b>Book value</b>	<b>20 038 885</b>	<b>18 371 361</b>
Accumulated contributions amount to 47 267 920 kronor (46 527 920 kronor).		

	31-12-2017	31-12-2016
<i>Equipment, tools and other installations</i>		
Acquisition value at beginning of year	13 617 940	13 378 782
Purchases	849 536	1 023 394
Divestments/scraping	0	0
Reclassification	0	-784 236
Contributions		
<b>Accumulated acquisition value at end of year</b>	<b>14 467 476</b>	<b>13 617 940</b>
Accumulated depreciation at beginning of year	-10 992 451	-9 973 956
Divestments/scraping		
Depreciation for the year	-906 452	-1 018 495
<b>Accumulated depreciation at end of year</b>	<b>-11 898 903</b>	<b>-10 992 451</b>
<b>Book value</b>	<b>2 568 573</b>	<b>2 625 489</b>
Accumulated contributions amount to 1 691 659 kronor (1 691 659 kronor).		

	31-12-2017	31-12-2016
--	------------	------------

Ongoing new construction

Acquisition value at beginning of year	2 692 963	4 517 220
Purchases	254 458	3 014 669
Contributions	-1 000 000	0
Reclassification of investment	0	-7 338 926
Reclassification of contributions	0	2 500 000
<b>Accumulated acquisition value at end of year</b>	<b>1 947 421</b>	<b>2 692 963</b>

<b>Book value</b>	<b>1 947 421</b>	<b>2 692 963</b>
<b>Accumulated contributions amount to 1 000 000 kronor (0 kronor)</b>		

**Note 6 Interest income and similar income**

	31-12-2017	31-12-2016
Interest	2 850	2 538
Dividends		11 452
<b>Total</b>	<b>2 850</b>	<b>13 990</b>

**Note 7 Tax**

The Foundation's activities are liable for tax.

Tax deficit amounts to 76,162,000 kronor (69,815,000 kronor)

**Note 8 Prepaid expenses and accrued income**

	31-12-2017	31-12-2016
Prepaid expenses	1 008 817	381 383
Accrued contributions	1 678 518	1 500 000
Accrued gifts	2 356 429	41 388
Accrued revenue	56 038	335 950
<b>Total accrued expenses and prepaid revenue</b>	<b>5 099 802</b>	<b>2 258 721</b>

**Note 9 Long-term liabilities**

Maturity date

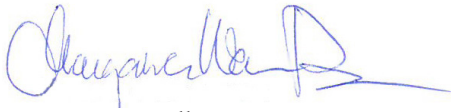
<b>Debt</b>	<b>Debt at 31-12-2017</b>	<b>Within 1 year</b>	<b>Between 1 and 5 years</b>	<b>Over 5 years</b>
Debt to credit institutions	3 650 000	100 000	400 000	3 150 000
<b>Total</b>	<b>3 650 000</b>	<b>100 000</b>	<b>400 000</b>	<b>3 150 000</b>

**Note 10 Long-term prepaid revenue**

	31-12-2017	31-12-2016
Balance at beginning of year	8 028 270	9 465 370
Received contributions	0	0
Funds used in accordance with conditions	-1 781 692	-1 437 100
<b>Total long-term prepaid revenue</b>	<b>6 246 578</b>	<b>8 028 270</b>

<b>Note 11</b>	<b>Bank advances</b>		
		<b>31-12-2017</b>	<b>31-12-2016</b>
	Credit granted in the form of bank overdraft facilities	1 000 000	1 000 000
<b>Note 12</b>	<b>Accrued expenses and pre-paid revenue</b>		
		<b>31-12-2017</b>	<b>31-12-2016</b>
	Employee-related debts	5 435 558	5 115 569
	Prepaid contributions and gifts	964 218	2 107 268
	Other prepaid revenue	693 750	339 067
	Other items	453 993	386 407
	<b>Total accrued expenses and prepaid revenue</b>	<b>7 547 519</b>	<b>7 948 311</b>
<b>Note 13</b>	<b>Pledged securities</b>		
		<b>31-12-2017</b>	<b>31-12-2016</b>
	Corporate mortgages	5 500 000	5 500 000
	Property mortgages	5 000 000	5 000 000
	<b>Total pledged securities</b>	<b>10 500 000</b>	<b>10 500 000</b>
	Contingent liabilities		
	<b>Figures in Swedish kronor</b>	<b>0</b>	<b>0</b>

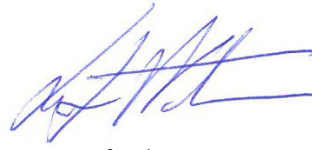
Åby Manor, March 20, 2018



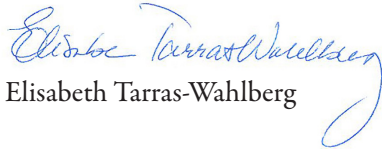
Margareta Wallin Peterson  
Chairman of the Board



Göran Bengtsson  
Deputy Chairman



Leif Nilsson  
Deputy Chairman



Elisabeth Tarras-Wahlberg



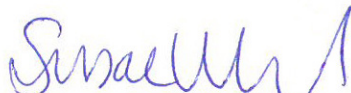
Pål Svensson



Staffan Jufors



Christer Petré



Susanne Wiklund



Nicke Bäcklund

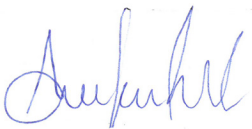


Johan Höjesjö

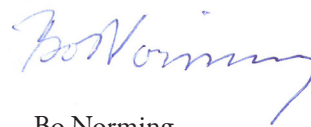


Mats Höggren  
Managing Director

Our audit report has been given on March 27, 2018



Ann-Lovise Rosenqvist  
Authorised public accountant



Bo Norming  
Elected accountant

## AUDIT REPORT

To the Board of NORDENS ARK FOUNDATION  
Org. No. 854600-6191

### Annual report

#### *Statement*

We have audited the annual report for Nordens Ark Foundation for the year 2017. We believe that the annual report has been compiled in accordance with the Annual Accounts Act and gives a view that is true and fair, in all material respects, of the Foundation's financial position as at December 31, 2017, and of its financial results and cash flow for the year, in accordance with the Annual Accounts Act.

#### *Basis for statement*

We have carried out the audit in accordance with generally accepted auditing standards in Sweden. The auditors' responsibilities according to this practice are described more fully in the sections The Authorised Auditor's Responsibility and The Elected Auditor's Responsibility. We are independent of the Foundation, in accordance with good auditing practice in Sweden. As authorised auditor, I have fulfilled my ethical responsibility according to these requirements. We believe that the audit evidence we have obtained is sufficient and appropriate as a basis for our statements.

#### *Responsibility of the Board of Directors and the Managing Director*

It is the Board of Directors and the Managing Director who are responsible for the preparation of the annual report and for giving a true and fair view in accordance with the Annual Accounts Act. The Board and the MD are also responsible for the internal control they deem necessary to establish an annual report that contains no material errors, whether due to irregularities or inaccuracies.

In preparing the annual report, the Board and MD are responsible for assessing the Foundation's ability to continue operations. They indicate, where applicable, conditions that may affect their ability to continue operations and to make the assumption that they will continue. However, the assumption of continued operations is not applicable if the Board and MD intend to liquidate the Foundation or cease operations, or have no realistic option but to do so.

#### *The Authorised Auditor's Responsibility*

I have to conduct the audit in accordance with the International Standards on Auditing (ISA) and good auditing practice in Sweden. My goal is to achieve a reasonable degree of certainty that the annual report as a whole does not contain any material errors, whether due to irregularities or inaccuracies. Reasonable certainty is a high degree of certainty, but it is not a guarantee that an audit conducted in accordance with ISA and good auditing practice in Sweden will always detect a significant error, if any exists. Errors may arise due to irregularities or inaccuracies and are considered to be material if, individually or together, they can reasonably be expected to affect the financial decisions taken by those using the annual report.

As part of an ISA review, I employ professional judgment and have a professionally sceptical attitude throughout the audit. Furthermore:

- I identify and assess the risks of material errors in the annual report, whether due to irregularities or inaccuracies; design and perform audit measures, inter alia based on these risks; and obtain audit evidence that is sufficient and appropriate to form the basis for my statements. The risk of not detecting a material error due to irregularities is higher than the risk of not detecting a material inaccuracy due to errors, since irregularities may include acts of collusion, forgery, deliberate omissions, incorrect information or breach of internal control.
- I obtain an understanding of the part of the Foundation's internal control that is important to my audit in order to formulate audit measures appropriate to the circumstances, but not in order to comment on the effectiveness of internal control.
- I evaluate the appropriateness of the accounting principles used and the reasonableness of the Board and MD's estimates in the annual report and related information.
- I draw a conclusion about the suitability of the Board and MD to use the assumption of continued operation in the preparation of the annual report. I also draw a conclusion, based on the audit evidence obtained, as to whether there is any significant uncertainty relating to events or circumstances that could lead to meaningful doubts over the Foundation's ability to continue its business. If I conclude that there is a significant element of uncertainty, I must in the audit report draw attention to the information in the annual report relating to the significant element of uncertainty or, if such information

is insufficient, to modify the statement on the annual report. My conclusions are based on the audit evidence obtained up to the date of the audit report. However, future events or circumstances may mean that a foundation can no longer continue its business.

- I evaluate the overall presentation, structure and content of the annual report, including the disclosures, and whether the annual report reflects the underlying transactions and events in a manner that gives a true and fair view. Among other things, I must inform the Board of the planned scope and focus of the audit and of the timing of it. I must also inform them of significant observations in the course of the audit, including the significant shortcomings in internal control that I identified.

### *The Elected Auditor's Responsibility*

My task is to carry out an audit in accordance with the Audit Act and to do so according to good auditing practice in Sweden. My goal is to attain a reasonable degree of certainty as to whether the annual report has been prepared in accordance with the Annual Accounts Act, and whether the annual report gives a true and fair view of the Foundation's results and position.

### **Statement on other requirements according to laws and statutes**

#### *Statement*

In addition to our audit of the annual report, we have carried out a review of the Board of Directors and the Managing Director's management of NORDENS ARK FOUNDATION for 2017. It is our opinion that the Board members and Managing Director did not act in breach of the Foundations Act, the Foundations Regulations or the Annual Accounts Act.

#### *Basis for statement*

We have conducted the audit in accordance with generally accepted auditing standards in Sweden. Our responsibility in this regard is described in more detail in the section headed The Auditor's Responsibility. We are independent of the Foundation, in accordance with good auditing practice in Sweden. As authorised auditor, I have also fulfilled my ethical responsibility according to these requirements.

We believe the audit evidence we have obtained is sufficient and appropriate as a basis for our statement.

### *Responsibility of the Board of Directors and Managing Director*

The Board and Managing Director are responsible for administration under the Foundations Act and Foundations Regulations.

### *The Auditor's Responsibility*

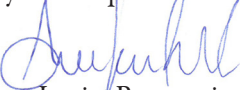
The objective of our audit of the administration, and thus our statement, is to obtain audit evidence in order to be able to assess with reasonable certainty whether any Board member or the MD in any essential respects:

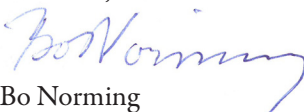
- has taken any action or been guilty of any negligence that may cause liability to the Foundation, or if there are grounds for revocation, or
- in any other way acted in breach of the Foundations Act, the Foundations Regulations or the Annual Accounts Act.

Reasonable certainty is a high degree of certainty, but it is not a guarantee that an audit performed in accordance with generally accepted auditing practice in Sweden will always detect actions or omissions that may result in liability for compensation against the Foundation.

As part of an audit in accordance with good auditing practice in Sweden, the authorised auditor uses professional judgment and has a professionally sceptical attitude throughout the audit. The audit of the administration is based mainly on the audit of the accounts. Any additional audit measures carried out are based on the authorised auditor's professional assessment and the other selected auditors' assessment based on risk and materiality. This means that we focus the audit on actions, areas and conditions that are essential to the business, and where deviations and violations would have particular significance for the Foundation's position. We review and test decisions taken, the basis for decisions, actions taken and other conditions relevant to our statement.

My audit report was submitted on March 20, 2018.

  
Ann-Lovise Rosenqvist  
Authorised auditor

  
Bo Norming  
Elected accountant

## BOARD OF DIRECTORS, AUDITORS AND STAFF 2018

### BOARD OF DIRECTORS

**Chairman of the Board** - Margareta Wallin Peterson

**Deputy Chairman** - Göran Bengtsson, Leif Nilsson

**Board members** - Christer Petrén, Susanne Wiklund, PålSvensson, Elisabeth Tarras-Wahlberg, Staffan Jufors, Johan Höjesjö, Nicke Bäcklund, Mats Höggren

### AUDITORS

**Ann-Lovise Rosenqvist, Deputy Auditor** - Bo Norming



### STAFF

**Managing Director**- Mats Höggren

**Deputy Managing Director** - Linnéa Johansson

**Scientific Leader** - Mats Niklasson

**Snow Leopard Project**- Gustav Samelius

**Zoological Department** - Ewa Wikberg (director), Leif Blomqvist (Zoologist), Christer Larsson, Emma Nygren, Karin Amsten, Sara Nilsson

**Head Keepers** - Susanne Geisen, Alfred Lindskog, Ingela Andersson, Therese Lindström (temp.)

**Zookeepers** - Mia Abrahamsson, Ann- Charlotte Berntsson, David Carlgren, Anna Einemo, Irja Enggren, Elin Eriksson-Byröd, Kristofer Försäter Maria Hallenberg, Josefin Hansson, Sara Hedvall, Jimmy Helgesson, Sandra Josefsson, Dick Liljegren, Kenneth Emil Skydt, John Söderlindh, Catarina Tengroth, Sverker Thoresson, Linda Tordebring, John Uno, Camilla Wikberg, Viktor Åström, Stina Öqvist, Désirée Axén (temp.), Rebecca Mattsson (vik), Pauline Mets (temp.), Sofie Staxäng (temp.)

**Registered Veterinarians**- Michelle Kischinovsky, Sune Gregorius, Bo Runsten

**Buildings** - Mikael Fredriksson (irector), Emil Gunnarsson, Åke Gustavsson, Alf Hjelm, Lars Johansson, Pernilla Knuthsen, Inger Larsson, David Molander, Sandra Svanberg, Sofia Viksson

**Financial department** - Maria Hoffmann

**HR** - Linda Gadd

**Communications and Found Raising** - Therese Patriksson (director), Jenny Magnusson, Ann Mårtensson, Lotta Olofsson, Tom Svensson, Camilla Törnebohm (temp.), Lennart Johansson, Yvonne Johansson

**Education** - Jenny Loberg (director), Eva Andersson, Björn Johansson, Pelle Karlsson, Lorina Stenvall, Patrik Swede

**Pre-school** - Linda Åsberg (director), Karolina Gullberg, Liselotte Nielsen, Eva Petersson, Lina Säll

**Hotel & Guest service** - Anders Mueller (director), Beatrice Ahlgren Svanberg, Sylvia Batiuk, Joakim Bergman, Ann- Sofie Helgesson, Sandra Karlsson, Maria Kautto, Michael Lohr, Tina Olofsson, Marianne Pettersson (temp.)

## NORDENS ARK'S PARTNERS AND MEMBERSHIP



Hasselbladstiftelsen



GÖTEBORGS UNIVERSITET



Conservation Education



World Association of Zoos and Aquariums | WAZA  
United for Conservation



Snow Leopard Trust



Naturskyddsföreningen



Global information serving conservation.



**A BIG THANK YOU  
TO EVERYONE**



Göteborgs Högre Samskola



Coop Väst Ekonomisk Förening, Esab AB, Hogia AB, NBS Security AB, Arctic Paper SA Sverige (Polen) filial, Erna och Victor Hasselblads Stiftelse, SERLA, Engström Shipping AB, Ligula Hospitality Group AB, Elanders Sverige AB, Mycronic, Mikael's Grävtjänst AB, Nordstan Marknadsledning, Holmens Herr AB, OffiTech AB, Varsego Sverige AB, Mobile Storytelling AB, Länsförsäkringar Gbg & Bohuslän, Datia, Martin & Servera AB, Eset, Mats Lundblad/TMA Ewa Lundblad, Volvo Personvagnar, ÅF Industry AB, Liseberg



M-Brain AB, Miramar Seafood AB, Ancon AB, Rambo AB



Magnusson & Freij, Ann-Katrin Lundberg, Kent Holmberg Bildit AB, Canon RCC, Hallbergs Plantskola, Riksbyggen MO Bohus Älvsborg, LRF-Väst, Santa Maria AB, Arnold Andreasson Konsult AB, Leif Nilsson i Göteborg AB, Benro, Eurobag AB, Royal Canin AB Göteborg, Sollidens Handelsträdgård AB, Carlssons El & Jakt, "Medlemsfamiljerna i f.d Montessoriskolan Villa Darjeeling", Henrik O Fiskaffär OffiTech AB, Björn Gillsjö, Brea Fisk, Grönsakshallen Sorunda, L. Simberg Fastighetsförvaltning, Cricket Express, Dormakaba Sverige AB

---

## FACTS THAT MAKE A DIFFERENCE

---

- Thousands of green toads released on Öland.
- More than 150 peregrine falcons released – today, the species is safe.
- Unique breeding facility for endangered insects.
- Research into snow leopards in Mongolia.
- Active participation in conservation work for the giant ditch frog in the Caribbean.
- 81 lesser white-fronted geese youngsters released in Lapland in 2017 – a record!
  - Russian national park wardens trained in animal husbandry.
  - Centre for graduate and postgraduate students.
  - More than 100 white-backed woodpeckers bred and released.
  - One of Sweden's largest gene banks for Nordic native breeds.
    - Sweden's largest private ecopark.
    - Forest reindeer sent to Finland for reintroduction.
    - Participation in global conservation work for the Pallas's cat.
- Project in Nepal to preserve the red panda and the Eastern Himalayan Broadleaf and Conifer Forest

*These are just a few of the many projects Nordens Ark is involved with in its efforts to save endangered species and protect biodiversity.*



©Erik Edvardsson

# NORDENS ARK

Åby säteri, 456 93 Hunnebostrand, Sweden  
[www.nordensark.se](http://www.nordensark.se)  
[nordensark@nordensark.se](mailto:nordensark@nordensark.se)