

the magazin for friends of the Brno Zoo

Zooreport

No. 1
march 2017

KURA KURA

Save the Turtle



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the magazin for friends of the Brno Zoo Zooreport

march 2017

No. 1/17, volume XIX

publisher four times per year

MK ČR E 17723

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Distribution:

400 pcs in the English version
1,600 pcs in the Czech version

The author of non-attributed texts and photos is: Bc. Eduard Stuchlík

First page:

Hawksbill sea turtle (*Eretmochelys imbricata*)
Photo by Monika Jeglíková

UNSALEABLE

EDITORIAL

So Far, the Biggest In Situ Project

Our quarterly magazine *ZooReport* is entering its nineteenth year, and we present to you, dear fans of Brno Zoo, its new format, which emerged from your ideas and observations contained in the recent readers' poll. An important change has been made to the children's attachment and its number of pages. We are also trying to focus more on what is happening in the zoo itself.

This edition of *ZooReport* is devoted specifically to turtles, especially to our rescue station for sea turtles, which at present is entering into its trial operation on Nusa Penida Island in Indonesia. The new centre is the culmination of Project Kura Kura – Save the Turtles that our zoo developed jointly with the Indonesian non-profit foundation Yayasan Kura Kura Nusa Penida in 2007. The official sponsor of the project is the Union of Czech and Slovak Zoos. Recently, however, the project has been promoted, and is being carried out by our zoo and the aforementioned foundation. The University of Veterinary and Pharmaceutical Sciences in Brno acts as a professional partner of the project in the Czech Republic.

In terms of the history of the rescue station, it is important to mention the association agreement between the Union of Czech and Slovak Zoos and the foundation of Kura Kura Nusa Penida. This was signed in November 2007 as the default document to build, operate, and organize a rescue centre for endangered turtles in Indonesia, as well as leadership programs for the turtles' protection and reintroduction to the wild. The agreement stated that the aim of the foundation is to build a res-



MVDr. Martin Hovorka, Ph.D.

cue and education centre in the village of Toyapakeh on Nusa Penida Island, which is part of the province of Bali. The intention of the Union of Czech and Slovak Zoos is expressed in the agreement as the decision to participate with the professional cooperation of its members on programs intended to rescue the world's fauna.

During the conception of the Kura Kura project, Brno Zoo drew support from recommendations contained in the document of the World Association of Zoos and Aquariums, known as Strategy WAZA. According to this strategy, the member zoos, of which Brno Zoo is one, should focus both on the protection of animals in their natural habitat (*in situ*), and of those outside their natural habitat (*ex situ*; or, in other words, those in the zoo). The inspiration for Brno Zoo also came from the campaign of the European Association of Zoos and Aquariums (EAZA) in 2004 and 2005, which highlighted the global crisis of turtles under the name "Shellshock".

The number of tortoises and turtles worldwide is radically decreasing. Their habitat is smaller, and some species have already completely disappeared. This is due to the collection of their eggs and to a massive amount of hunting for culinary purposes. Tortoiseshell is also sought after for its use in jewellery and souvenirs. Although country laws protect most turtles, the lucrative

illegal trade in turtles still endures. Another threat is the change in the natural environment caused by humans.

Programs *in situ* are not a novelty at Brno Zoo. By the end of the last century, we were already participating in the return of addax antelopes to their original habitat. Some of these animals, which had been bred in zoos and were being transported from Europe to Morocco in 1996, were individuals born in our own zoo. Currently, Brno Zoo participates in the long-term conservation project for little owls in southern Moravia, and has also established a breeding base of European ground squirrels which is designed to strengthen the populations of this critically endangered species of Czech fauna. We cooperate with the Eurasian Association of Zoos and Aquariums in two ongoing rescue projects in Russia's far east. One of these is reintroducing red-crowned cranes into the wild. Some of the chicks in this project were bred from eggs laid in our zoo. The other is the building of a reintroduction station for Steller's sea eagles.

The rescue station of sea turtles on the Indonesian island of Nusa Penida is the first major project *in situ* that our zoo created.

MVDr. Martin Hovorka, Ph.D.,
Director, Brno Zoo
and Environmental Education Centre

We Start the Operation of the Rescue Station for Sea Turtles

After many years of lead up, Brno Zoo, together with the Indonesian non-profit foundation Yayasan Kura Kura Nusa Penida, recently launched the trial operation of its sea turtle rescue station in Indonesia.

The station was built on the small island of Nusa Penida, which is located near the larger and better-known island of Bali. It is equipped with twelve rehabilitation pools for turtles (each with a volume of around 8 m³), veterinary offices, and a workers' residence. The village of Toyapakeh (toya = water, pakeh = salty), where the station is located, lies on the west coast of Nusa Penida.

In the near future, the station will have facilities for environmental education, as well as demonstration programs for the rescue of endangered turtles in Indonesia. The public awareness division of the rescue centre will serve both locals and tourists.

The sea turtle rehabilitation pool in Kura Kura rescue centre at Nusa Penida, with staff lodging in the background.

Photo by Jana Hadová

Unique Focus

In Indonesia and many other countries, there are quite a lot of facilities that deal with the rescue of sea turtles, but they are mostly devoted to rearing the young, releasing them into the wild, and protecting marine beaches where the eggs are laid. The rescue station Kura Kura on Nusa Penida is conceived differently, as it deals with the treatment and rehabilitation of sea turtles which have suffered various injuries associated with illegal trade. Rehabilitated turtles go back into the wild, where – due to their longevity – they can still give birth to several more generations.

The newly opened station receives turtles that the Indonesian government conservation organization BKSDA

(Balai Konservasi Sumber Daya Alam) has confiscated from smugglers in the province of Bali. After treatment and rehabilitation, workers of the station and BKSDA reintroduce the turtles to the sea. At the station, there are two veterinarians (one Czech and one Indonesian), along with students of veterinary medicine from the University of Denpasar in Bali and from Brno's Veterinary and Pharmaceutical University. Volunteers help, too.

Treatment, Rehabilitation, Reintroduction

The most frequent patients of the rescue station on Nusa Penida are loggerhead sea turtles (*Caretta caretta*), hawksbill sea turtles (*Eretmochelys imbricata*), green sea turtles (*Chelonia mydas*), and olive ridley sea turtles (*Lepidochelys olivacea*).

After having been treated as if they were inanimate objects by smugglers, turtles arrive at the station in poor health, often with numerous superficial or deep injuries, or with inedible matter in their digestive tracts. On the soft parts of the body, there are sometimes



lacerations and strangulation grooves caused by the excessive pressure of full fishing nets. We even encounter broken turtle shells with some regularity. Turtles often ingest plastic bags (which closely resemble jellyfish, a favourite prey of sea turtles), rags, plastic and glass bottles, and other garbage, and we find this debris in their stomachs. They often have hooks of various sizes and pieces of rope stuck in their oral cavities and oesophagi.

Each turtle is given a detailed examination by the vet, and is put into one of four categories according to the severity of its injury. Turtles with acute illness requiring immediate treatment, including surgery, fall into the first category. In the animal's weakened and dehydrated body, an infusion containing soothing anti-inflammatory drugs will complement the much-needed water. After the operation, during which general anaesthesia is administered, the turtle will stay at the veterinary infirmary for a few days under constant observation. Then it is given a clear mark on its front flippers to identify into which category it belongs, and proceeds to the seawater rehabilitation pool. Each day, workers at the station administer antibiotics, analgesics, and food.

The second category also consists of seriously injured turtles, but ones that can afford to have several days of rest to stabilize their condition before surgery. Treatment, along with preoperative and postoperative care is similar to that of the turtles in the first category.

The third category comprises run-down turtles that do not, however, require surgery. If it is possible to eliminate bacterial, viral, fungal, or parasitic infection, they can be treated directly in the rehabilitation pool.

The fourth category is reserved for turtles whose condition cannot be stabilized, making it necessary to destroy them.

Withered bodies are also examined by veterinarians, both in the station at Nusa Penida and in the laboratory of BKSDA on Bali.

Further rehabilitation of cured turtles continues in a fenced section of the nearby bay. Only when the turtles reach peak physical condition can rescuers from BKSDA transport them in boats to the open sea.



▲ The rehabilitation pools, with the veterinary hospital behind them. Photo by Jana Hadová

Loggerhead turtles, an adult at the bottom and a juvenile above. Photo by Petr Srámek ▶



The Association of Czech Zoos Supported the Construction of the Centre

The Civic Association of Czech Zoos has significantly contributed to the final phase of the implementation of Project Kura Kura mainly with its financial support. And Jaroslav Svoboda, the Association's founder, "lent a hand" at the rescue station without pay during the autumn of 2016. The station also gave himself a major sponsor gift.

The Civic Association of Czech Zoos was founded in 1994. It tries to emphasize the role of zoos in maintaining biodiversity and averting ecological catastrophe in today's society. Since then, with the help of sponsors, it has been supporting and promoting the work of breeders in fourteen zoos included in the Union of Czech and Slovak Zoos. It also promotes new exhibitions that the zoos open to the public, mainly through

its White Elephant competition, which is organized annually in two main categories: Rearing of the Year, and Exposition of the Year. In 2013, Brno Zoo received the White Elephant Prize in both areas: for their breeding of Kamchatka brown bears, and for the construction of Beringia (the Nordic fauna exposition).



Ing. Vladislav Jiroušek. Photo by V. Jiroušek archive



Milan Caha. Photo by M. Caha archive

Work on Nusa Penida is Managed by Two Builders

Since 2015, construction work at the tortoise rescue centre on the island of Nusa Penida, carried out under Project Kura Kura, has been directed by the former president of the Union of Czech and Slovak Zoos, Ing. Vladislav Jiroušek. However, he was not there alone. Every three months, he was relieved for a time by traveller and photographer Milan Caha from Zlín. Caha, a builder by profession, is currently acting as a guide for the diving centre on Nusa Penida. At the conclusion of the successful completion of the rescue station, the two men eagerly answered the following questions:

▼ **How did you get acquainted with Project Kura Kura, and what did you do before?**

Jiroušek: As President of the Union of Czech and Slovak Zoos, I supported the project plan. It was adopted by a general meeting of the Union and, in 2007, I signed a contract with the Indonesian foundation for our cooperation on the project.

Caha: I started to participate in Project Kura Kura naturally, so to speak. The rescue station and our diving base are immediately adjacent. Living side by side, we gradually became acquainted, and we finally “got on the same boat.” I first visited Indonesia 13 years ago, continued to visit this country every subsequent year, and eventually began working as a dive master (guide for amateur divers) for

a Czech diving base on Nusa Penida. At that time, I met MVDr. Martin Hovorka, Ph.D., director of the Brno Zoo, and Prof. MVDr. Zdeněk Knotek, CSc., head of the Department of Disease of Birds, Reptiles, and Small Mammals at the Veterinary University in Brno. In 2014, they invited me to cooperate in building the station. I was glad to accept the offer.

▼ **Was there something there before, or did you start on undeveloped sites?**

Jiroušek: There are no natural clearings on Nusa Penida, and where we started to build looked like a junkyard; but the diving centre in the neighbourhood worked well. It was, and still is, a good partner.

Caha: At the time I joined the work at Nusa Penida, only the unfinished complex of the rescue centre stood there. The pools for turtles were not roofed, and the sewer drain and supply of seawater hadn't been installed.

▼ **How hard was it to make contact with local institutions that deal with the protection of nature, and to persuade them to cooperate?**

Jiroušek: Despite my work of developing the station from the start, I did not have to negotiate with the local authorities.

Caha: That is a question for the representatives of the Foundation Kura Kura Monika Jeglíková and Komang. For a long time, they prepared the ground for negotiations, which they then led with the authorities, Dr. Hovorka, and Professor Knotek. Bureaucracy is rampant everywhere and, from my small participation in their visits to the authorities, I know that Indonesia is no exception. The applicant for a building permit on Nusa Penida required negotiations not only with the municipality of Toyapakeh, but also with a regional office in the seat of the district of Klungkung, the provincial administration of Bali in its capital (Denpasar), and the central authorities in the country's capital (Jakarta). It was a very difficult task for those involved.

▼ *Did the locals help you? What were their reactions to the building of the station?*

Jiroušek: Local people are very friendly, and our activities are perceived positively here.

Caha: We employed several local people in the reconstruction and construction of new facilities, and we could not have done it without them. Of these, the most helpful was a man named Eko, who became our long-time friend. He got reliable construction workers, taught me how to buy materials for a good price, dealt with shipping and payment of workers, and performed many other everyday needs for me.

▼ *Was it easy to get professionals, or did you have to teach them? Do Indonesians have some habits that surprised you and caught you out?*

Jiroušek: Skilled, diligent Indonesians work with primitive tools and adhere to traditional building methods. Sometimes I had to convince and compel them to use a different procedure.

Caha: Indonesians are hard working. They have their habitual procedures, but they can quickly learn new ones. Some-

times they were so quick that, for instance, they laid the new sewerage system and partly covered it even before I was able to photograph and document the workflow. But they had to learn not to adopt new procedures in their own traditional way, as it would turn out badly if they did. But the workers and I basically came to an understanding.

▼ *And what about the language barrier?*

Jiroušek: Many people in Toyapakeh know a few Czech words, and some even speak a little Czech. Of course, this does not eliminate the language barrier; but I have good "explanatory" hands.

Caha: Surprisingly, it is not so difficult as one would imagine. Many Indonesians speak at least some English, and those who helped for years in the construction of the rescue station on Nusa Penida even know a few Czech words. And some fellow Czechs were able to learn a little Indonesian. Where that didn't work, we used our hands and feet. At the end of the day, you always work it out. We drew new ideas in the sand with a stick, or laid out the sewerage fittings on dry ground first.

▼ *Do they know anything about the Czech Republic?*

Jiroušek: Those with whom we work, definitely yes. One of them visited our country and told the rest all about it.

Caha: They know us primarily because of football, which is Indonesia's number one sport. They know Nedvěd, Čech, Rosický... Lots of locals know that our state (which they still think of as Czechoslovakia) is situated in Europe. Otherwise, they do not know much about the Czech Republic. In their minds, there is a sense that anyone who is white is rich.

▼ *How do the locals perceive the rescue work, and how do they relate to the turtles?*

Jiroušek: I think most of them perceive us positively. The people of Nusa Penida are quite poor, and have their troubles.

They understand our efforts, but few of them are active in nature conservation.

Caha: Most locals know what will be here, and they know that as long as turtles are in the sea, tourists will come, from which they can benefit. They now have a different relationship to the turtles, which previously were simply food to them. Some would not hesitate to eat a turtle.

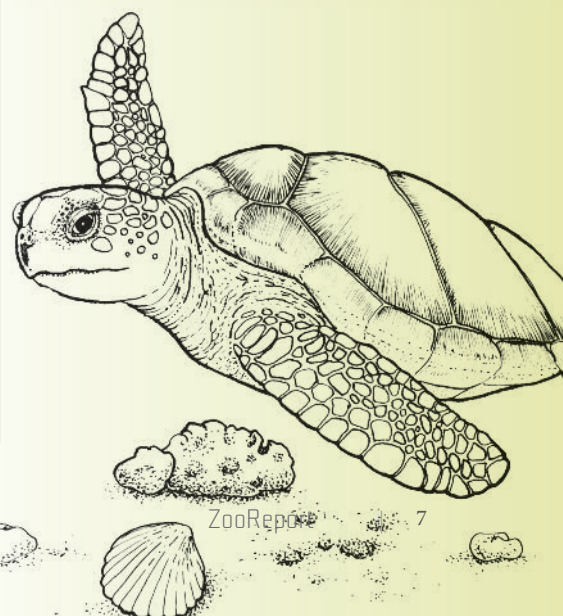
▼ *The contract with the Indonesian parties on the establishment and operation of the Czech rescue station was signed two years ago. What has been built in that time?*

Jiroušek: In short, we built a veterinary dispensary, sufficient accommodation, and repaired and roofed the pools.

Caha: Twelve quarantine pools were repaired and roofed; and a one-story building near the pools, originally designed for teaching and outreach, had another story added and was remade into a boarding station for employees and volunteers. We also repaired the veterinary practice facility. Essentially, the entire infrastructure is new. For example, it was necessary to redo the electrical wiring so that the network was operational and had no failures. We also had to create a supply of salt water to the pools, as well as drainage back into the sea.

▼ *How hard it is to get supplies and equipment to construction sites in Indonesia?*

Jiroušek: Some things are manufactured on Nusa Penida; for others you



must go to Bali; and some things are unavailable. Instruments were especially hard to get: For example, we had to replace a vice with a setup operated by our own two feet.

Caha: Great effort is required to find a suitable vendor of supplies and equipment. Large stores such as our OBI or Baumax exist also on Bali, but mostly they offer insufficiently specialized goods. It is necessary to search for a long time in back alleys or garage-style small businesses, where you can sometimes find, for example, a small electrician's paradise.

▼ **They say the biggest problem at the location is water. Why?**

Jiroušek: Our station is located at a site situated only about 100 meters from the sea, but the strip of land between us and the shore is privately owned by a company called Quiksilver. How to solve it? Ultimately, after lengthy negotiations, the president of Quiksilver agreed with the installation of pipes through the company area.

Caha: The situation with water, whether salt or fresh, is really complicated. Sweet

water is abundant on Nusa Penida, but you must run it from springs to the villages. At the station, we managed to build a separate water connection. Salt water for the pools had to be brought from the sea. It's not far, but we could not lay the pipe down in a direct line. It had to be run along property borders with the consent of the owners, and their agreement was not given quickly.

▼ **What is your relationship to Indonesia? How has it changed in the time you lived there?**

Jiroušek: I love Asia so much. I have a warm relationship with Hinduism, and I also found that the practice of Islam in Indonesia is very moderate.

Caha: I love Indonesia: amazing nature, beautiful sea, wonderful people. Just as the world changes, Indonesia changes as well. I luckily had enough time to get to know it when many places were still unmarked by mass tourism. Today, although the country is still beautiful, I could live without a lot of things that have occurred with the advent of tourism.

▼ **What do you most like in Indonesia and what annoys you most there?**

Jiroušek: I like the happy, smiling people of Indonesia. If I had not known what I was getting into, I would have been annoyed that there is no smaller unit of time than one day in Asia.

Caha: I most like the local people, who are great. If you're on good terms with them, they will do anything for you. The litter across the environment – all kinds of waste, especially plastic bags and plastic bottles – bothers me most. It is unfortunately the case that it was we who brought these things to these lands. The locals are slowly starting to understand that plastic is not a banana leaf, and that it will not just decompose in nature. So we must not only teach them to use plastic, but also to dispose of it properly. But it seems to me that in the last two or three years, the situation is taking a little turn for the better.

Questions were asked by:

Mgr. Michal Vaňáč,
Head of External Relations
of Brno Zoo

About Nusa Penida

The island of Nusa Penida emerges from the waters of the Indian Ocean at a distance of about 25 kilometres off the southeastern coast of Bali. The coast of the island, roughly oval in shape, measures about 70 km, with the island's widest point being less than 20 km between coastlines.

The north coast of Nusa Penida is made up of white-sand beaches with

maerl beds; on the eastern coast, cliffs alternate with beaches; the south coast is decorated with monumental limestone cliffs; and on the west, the 250-metre-deep Toyapakeh Channel flows between the rocky shores of Nusa Penida and Nusa Ceningan. There, along with coral reefs, we can observe fish, turtles, sharks and many other animals, including giant oceanic manta rays (*Manta birostris*) and the largest fish in these waters, the ocean sunfish

(*Mola mola*). Five ocean currents bring nutrients to Nusa Penida and provide the waters with a rich biodiversity.

Inland tourist attractions include a waterfall and several Hindu temples. The island is hilly and partly wooded, its highest peak being Mundi, at 503 metres. The rainy season (from November to late March) is interrupted by periods of drought, and the overall climate on Nusa Penida is markedly drier than on Bali.



▲ Toyapakeh Bay. Photo by Jana Hadová



▲ Nusa Penida Insel. Map by Wikimedia



Construction Phases

Construction of the sea turtles' rescue centre on the island of Nusa Penida was performed in two stages. Nearly ten years have passed since the start of the trial operation.

2006–2009

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On August 11th, 2006, the South Moravian Regional Authority issued a certificate for the period from 10/9/2006 to 10/8/2009 enabling Brno Zoo to hold a public collection for the purpose of building an educational centre and rescue station for turtles on Nusa Penida Island in Indonesia. In 2007, the foundation Kura Kura Nusa Penida acquired land from the religious community in Toyapakeh for this purpose, and construction started in September of that year. In January 2008, we began building pools and fencing off the area; and in September 2008, we started the construction of an educational centre with accommodation for the staff of the station, with laboratories and technical facilities. The culmination of the first phase of Project Kura Kura, the inauguration of the training centre in a single-story building located close to the quarantine pools, took place on August 5th, 2009.

2009–2014

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The next five years were marked by stagnation caused by protracted negotiations with the Indonesian authorities. Brno Zoo and the foundation Yayasan Kura Kura Nusa Penida finally received a license from BSKDA to handle wild animals in Indonesia in November 2014. Only then could work begin on the construction of a rescue and rehabilitation centre. The South Moravian Regional Authority then gave Brno Zoo a permit with effect from 1/2/2015 to 1/2/2018 to hold another public collection for the same purpose as before.



▲ Construction of the staff lodging at the rescue centre.
Photo by Jana Hadová

The education centre was adapted as staff lodging with the addition of one storey.
Photo by Jana Hadová

2015–2017

...

The second phase of construction of the rescue station began in March 2015 with the reconstruction of the pools, which had eroded as a result of termites and time. Cracked, leaking tanks were repaired, and the termite-infested roofing was replaced. (In the tropics, rehabilitation pools cannot be open to the sky because the water temperature would get too hot.) Columns supporting the roof of the pools had concrete footings to prevent the penetration of termites. It was necessary to establish a supply of salt water to the pools, as well as an outlet to the sea. Although Toyapakeh Bay is only about a hundred metres away, the pipe inserted into the trench had to be much longer because it had to be built along the borders of the land of different owners. It was also necessary, among other things, to install electrical wiring to light the tanks.

The floor plan of the training centre was expanded in May 2015. An additional floor was added, and the entire building was adapted as a hostel for the staff of the station. Also in 2015, we began the construction of a second building, where a veterinary clinic, warehouse, and office are situated. Surgery rooms



were equipped with surgical and laboratory instruments during the following year, while office workers received computers, printers, scanners, internet access, and audiovisual capability. Other important equipment to be provided to the rescue centre will include a small all-terrain vehicle which will transport turtles confiscated by inspectors of BSKDA to the rescue station from the boats moored in Toyapakeh Bay.

Brno Zoo's management signed a contract with BSKDA for regular delivery of seized tortoises in early 2017. This March, we began a trial operation. The inauguration of the rescue centre is expected to take place in May 9 in the presence of political leaders of the province of Bali.

During their phylogenetic development, sea turtles separated from tortoises about 110 million years ago. They were contemporaries of the dinosaurs, but continued to survive at the end of the Mesozoic Era and exist to this day as a representative of one of the oldest lines of animals. The seas and oceans are currently inhabited by seven species of sea turtles. While it may seem that they are perfectly adapted to life on this planet and that their existence is not threatened, the reality is unfortunately different. Once people appeared on the stage, they began directly and indirectly to alter the environment. With the numbers of turtles declining and their occurrence areas shrinking, some species have completely disappeared in certain places and others are on the brink of extinction.

Sea turtles inhabit tropical and subtropical seas and oceans around the

world, and some species marginally extend into temperate zones. We classify them in two families: *Cheloniidae*, with six species; and *Dermochelyidae* with just one. The members of the first family have a bony carapace, whereas the carapace of the leatherback sea turtle (*Dermochelys coriacea*) is covered with a firm elastic skin. It is an adaptation which enables them to remain at great depths.

The leatherback is the largest sea turtle, reaching a length of up to two meters and weighing about 600 kg. It inhabits all continents except Antarctica, and is the reptile species with the largest inhabited area. It can dive to a depth of 1,280 meters, deeper than any other reptile. It eats jellyfish almost exclusively. Throughout the western Pacific, it is critically endangered. As the Indonesian population of leatherbacks is very small, our rescue station at Nusa Penida sees very few of them.

In Indonesia, you can also see four other species of sea turtles: The olive ridley sea turtle (*Lepidochelys olivacea*), which feeds on crabs, molluscs, jellyfish, and algae; the green sea turtle (*Chelonia mydas*), which eats sea grass growing on sand bars not far below the water surface; the loggerhead sea turtle (*Caretta caretta*), which consumes crabs; and the one with the most beautiful shell, the hawksbill sea turtle (*Eretmochelys imbricata*), which eats only sea sponges (*Porifera*). The hawksbill inhabits all tropical and subtropical seas and oceans, and is critically endangered all across its habitat.

The life of a sea turtle begins on land as an egg in a nest dug by the female in a layer of sand on a beach. This is exactly the same secluded beach where she herself had hatched many years ago. This ability to find her birthplace after years of travelling vast stretches of ocean is really extraordinary. Males never return to solid ground. The female lays several clutches during the season, after which she rests for a year or two before the laying cycle repeats. Young turtles seek out coastal meadows of sea grass in which they can hide from predators. Only when they reach roughly the size of a dinner plate do they enter the sea and begin to

Five Species of Sea Turtles in Indonesia, Including Two which are Critically Endangered



▲ Green turtle (*Chelonia mydas*).
Photo by Monika Jeglíková

feed as adults. They grow very slowly, reaching sexual maturity at between fifteen and fifty years of age, depending upon the species. It is estimated that they can live up to a hundred years.

The numerous dangers that turtles face begin even before they hatch, as many clutches are attacked by predators such as ants or crabs. Predation continues during hatching and on the turtles' way from the nest to the sea, with many young ones becoming food for birds and crabs. In the sea, other enemies lurk. After many years, most of these cease to be a threat once the turtles are larger, by which time only sharks can occasionally harm them.

The sea turtles' drastic population decline is related to people. Turtle eggs and meat represent an important source of protein for many natives, who long ago started consuming turtle eggs. Additionally, while the female is on the beach burying her eggs, she is often killed for her meat. Natives also traditionally hunt turtles in the sea. In many countries, the collection of turtle eggs is illegal but, unfortunately, these are often countries with inadequate law enforcement in which you can normally buy turtle eggs in the market.

The remaining parts of the turtle body (shell, bone, cartilage, etc) are eventually utilized, too. Used for hundreds of years for making jewellery, the beautiful carapace of the hawksbill sea turtle is one of the most prized decorative articles, and illegal trade in its shell is the main culprit for its radical decline. Many tourists are



▲ The most endangered sea turtle, the hawksbill, has the most ornamental carapace.

Photo by Petr Šrámek

still buying souvenirs made from tortoiseshell, sometimes unknowingly, and so are supporting the collapse of this species.

Sea turtles are also significantly threatened by fisheries, although mostly unintentionally. Hundreds of thousands of turtles are annually caught up in the nets of small-scale fishermen or in the huge trawl nets of fishing corporations. Most of the trapped animals are injured or die, often since they are unable to come to the surface to breathe when they are entangled in a net.

It has been a long time since seas and oceans were considered symbols of pu-

rity. Nowadays, it is estimated that, every year, thousands of sea turtles die from having swallowed plastic bags. (Turtles often confuse these with their natural prey, jellyfish.) Sea turtles can also become entangled in garbage such as the floating remnants of nets, lines, bags, or packaging materials. In addition, oil, pesticides, fertilizers, and household chemicals today can contaminate seawater. Another factor adversely affecting the lives of turtles is ambient light at night from extended urban areas. This discourages the females from laying eggs, and also can disorient hatchlings. They instinctively move towards the natural brightness over the ocean once they are out of the egg; but if the beach is illuminated by a stronger artificial light, the disoriented young often head inland and can fall victim to predators, or end up under the wheels of cars, or die of exhaustion.

It may seem that negative factors, the list of which is not complete in this article, will soon cause the extinction of sea turtles. However, this does not have to happen. People still have time to change their lifestyles; but such a change can only be brought about by a widespread awareness of the biology of these turtles and by a decision by each of us to lessen our pressure on the ecosystem.

Mgr. Petr Šrámek,
Curator of Reptiles



▲ Juvenile leatherback turtles (*Dermochelys coriacea*). Photo by Petr Šrámek

New tutorials

Since the beginning of this year, educators from Brno Zoo have introduced three new educational programs, the main purpose of which is to show how it might be possible to slow or halt the loss of biodiversity.

One of these is a tutorial program named *Dubious Souvenirs*. It is aimed at elementary school pupils in the 6th to 8th grades, and is presented as an air travel game. Children are seated in the cinema hall of the administration building of the zoo. Suddenly, a tall, slim "flight attendant" in uniform enters and welcomes them to having landed at Prague's Václav Havel Airport. After "landing," the "passengers" go through customs control. The "customs officer" scans the contents of their luggage and explains to the somewhat surprised passengers that some items inside are not permitted. Glittering souvenirs made from coral or shell, or sculptures made of ivory and other natural objects, even if commonly offered by traders in foreign countries, are not permitted to cross state borders, they are told. In addition, when a "customs officer" finds a live animal in a trunk, a simple fine is not sufficient, since this is a serious criminal offense.

This tutorial program is helped by the use of many items. Besides mock-ups of luggage, imitations of natural objects, and stuffed animals, students are supplied with a large world map, which they spread on the floor to mark the route through which illegal imports of live animals or animal derivatives are secretly moved: Illegal traders are even more involved in the lucrative smuggling than are tourists. For example, shipments of turtles for consumption in "luxurious" restaurants are sent out across Southeast Asia to China. Smugglers' corridors can even be longer, sometimes across continents.



The educational programme called Questionable Souvenirs is a game imitating air travel.

Participants of this tutorial program also get smaller maps and stickers with pictures of animals so that they can produce an information leaflet about how we should behave when travelling abroad, which can be then be hung in their school, for example. The children can also create posters while they watch audio-visual recordings from Prague airport showing a range of suspicious souvenirs. These include bottles of liquor with a snake from a protected species floating inside. The buyer of such products has been told that the snake makes the liquid a miracle drug. The question of how the buyer could know that the snake is protected can come up easily. The answer is simple: "Ignorance of the law is no excuse."

A video recording of customs officers from Prague Airport also shows some of the harsh practices of smugglers. We can see, for example, cockatoos with taped beaks packed in plastic bottles, eggs of birds of prey wrapped in stockings and fastened under a smuggler's shirt, or live hummingbirds sewn into the small space between the smuggler's body & his (or her) underclothing. In this tutorial program, children are taught about the Con-

vention on International Trade in Endangered Species of Wild Fauna and Flora, known by the acronym CITES, and then they can see some of these species during their excursion in the zoo.

As part of another tutorial program, named *Animals at Risk*, pupils work with a map onto which they put images of various endangered species in the area of their natural habitats. This program was compiled for primary school pupils in the 5th to 7th grades. They learn how animals can adapt to different natural environments while they gain insight into the history of zoos, and are told about a zoo's role in the contemporary world.

The third tutorial program, named *Forest on Plate*, points to the shrinking areas occupied by tropical rain forests, which are being replaced by plantations of the African oil palm (*Elaeis guineensis*). With the increasing demand for palm oil, many forest species are losing space in which to live, and are threatened with extinction. This program was compiled for elementary students in grades 6 to 9. Program participants are always surprised at how many products contain palm oil, and realize that even small changes in consumer behaviour can help the animals of the forest.

Mgr. Jana Galová,
Head of the Education Department



STÁTNÍ FOND
ŽIVOTNÍHO PROSTŘEDÍ
ČESKÉ REPUBLIKY



Ministerstvo životního prostředí

Spring on Hlídka

The educational programs that the Environmental Education Centre offers for children from kindergartens and primary schools can be divided into two groups: year-round programs; and those that change seasonally. From March to June 2017, children can sign up two programs that are geared toward this season – Spring Awakening, and Spring and Traditions.

The program named Spring Awakening begins in one of the classrooms of the Centre. The Spring Fairy Tale About Bird Song introduces the topic, immediately after which the children chat with the instructor about the changes that occur in nature during springtime. On the interactive whiteboard, preschoolers show and name the most common spring flowers, while older schoolchildren try to assign the correct names of flowers to their photos.

The first messengers of spring are not only budding and flowering plants but also insects. Bees and butterflies appear, as well as the very popular firebugs, and we observe these through cup magnifying glasses. We talk about the spring arrival of birds, and about their nesting. Children are shown how complex and laborious nest building is for the birds, and they then have the opportunity to build a nest from materials that they find in the vicinity. These are diverse, consisting of grass, straw, clay, and twigs. Children can



Spring and Traditions is another educational programme, and includes carrying an effigy of Morana to be destroyed. This Slavic ritual represents the end of the dominance of the death goddess.

also play with their parents, and “attack” predators while they learn to appreciate how important it is for the birds to hide and disguise their eggs in the nest.

Another part of the program helps children to get to know young domestic animals as well as the most common wild animals. Kids play the roles of young animals and their parents, and they learn how the mothers recognize their offspring using different senses such as smell or hearing.

Winter sleepers who emerge from their hiding places in spring also include amphibians. Croaking frogs communally move to streams and ponds for food and reproduction. We explain to the children how they can help the frogs to move safely.

Programs of the Environmental Education Centre are not all focused on nature protection. Some are also devoted to folk crafts and traditional ways of life. It thus helps children to acquire knowledge about modern-day holidays and culture.

The program Spring and Traditions begins with Ash Wednesday, taking the children through the Lenten period up to Easter. The program introduces folk customs and traditions relating to various spring festivals. Children learn first-hand how to enjoy these days. They get to know that fasting is not starvation, but internal cleansing, where people not only stay away from delicacies but also from all pleasures, dedicating themselves to cleaning up both dwelling and body prior to the most important Christian festival.

On the first Sunday of Lent, the children enjoy looking for pretzels. On Passion Sunday, they look out for Moran (the Grim reaper), learn that spring trees symbolize the onset of the season, and get familiar with traditional Lenten dishes such as “jidáše,” “pražma,” or “pučálka.” They learn about Good Friday: When the church bells start to ring, they know that the sound symbolizes the truth of the crucifixion of Christ. We also explain to them that even pagan celebrations of Easter are dedicated to the glory of God, so we paint Easter eggs and try to make everything merry and beautiful.

*Mgr. Vladimíra Dolejšová
& Mgr. Monika Chudárková,
Lectors of the Environmental
Education Centre Hlídka*



Also, movement games are part of the educational program Spring and Traditions.



The release of the common pipistrelle which was captured along with 196 other bats which got stuck in little-used quarters in downtown Brno in August 2015.

Photo by Pavel Karas

young bats had chosen a slot under the roof of the house as their shelter. During a storm, water flooded them into the eaves and, from there, to the reservoir. Thirty-eight of them drowned and another seven died later; but we saved 37. Once we rescued them from the reservoir, we kept them warm, gave them antibiotics and fluids, fed them, and later set them free.

Four times in 2016, female European hedgehogs (*Erinaceus europaeus*) and their cubs were disturbed by people who were working on their land. It was then not possible to leave those hedgehog families in peace on the ground, so we adopted them. Although most of the breeding of these cubs at the station is successful, in one case the female was in such great distress that she refused to care for her cubs. The lesson to be learnt here is that people should work in their gardens with great caution, allowing animal mothers to rear their young, or transferring the animals to a more deserted place.

For the first time, we cared for young red foxes (*Vulpes vulpes*). A self-appointed keeper found a cub and took it home from the forest to tame it, locking it in a kennel. Please note that it is illegal to take animals from the wild to your home. They all have the right to live in the wilderness. Thanks to friends of the capturer of the cub, we managed to take it into our care; and with the help of the Prague Rescue Station for Wild Animals, we were able to breed it and set it free.

In the spring of 2016, we were called out to care for some chicks that had been abandoned. First, in the woods near Rosice, people showed us a young tawny owl (*Strix aluco*) that was sitting on the ground. It was useless to take it to Jinačovice – but when we put it on a tree branch, the adult tawny owl peeked out of its hole in the tree! Next, in the Brno preserve of Holedná, we had the same experience with a young long-eared owl (*Asio otus*). When we picked it up and put it on a branch, the

The Animal Rescue Centre has been Operating for Two Years

The Rescue Station for Wild Animals which Brno Zoo operates in Jinačovice (in the district of Brno-Country) has now been active for two years, having opened its doors on February 2, 2015. Its area of influence includes Kuřim, Rosice, and the Brno boroughs of Bystrc and Kníničky. Station workers are often involved in other parts of Brno, too.

During 2015, employees of the station carried out 169 interventions in the field, and 227 animals were admitted to the station. Twenty-nine animals (mostly bats and hedgehogs) wintered at the centre and were returned to the wilderness in April of 2016. In the second year of the station's operation, there were 281 interventions in the interest of animals in distress, and the centre received 545 animals. By the end of 2016, these included 69 different species. Among them were: animals that had suffered various injuries; or were stuck in areas from which they could not escape; or were chicks that had been separated from their parents.

So far, the rarest animal received was a Kuhl's pipistrelle (*Pipistrellus kuhlii*), which is an endangered species in the Czech Republic. A lame male was discovered on November 15th, 2015 in an

apartment in Brno-Žabovřesky. The people living there opened a window, and thought he flew away. However, three days later they found him still in the room! After being transported to Jinačovice, he recovered and wintered in our kennel. We set him free on May 5th, 2016.

Bats often seek shelter in human dwellings and then cannot get out. At the end of the summers of 2015 and 2016, we extricated about 200 common pipistrelles (*Pipistrellus pipistrellus*) from unoccupied buildings in the city centre. We set them free on the same day at another, more suitable, location.

More unusual in our current practice was the capture and rescue of another group of the same species on July 26th, 2016. They were stranded in the rain-water reservoir at a family home in Vysoké Popovice. These inexperienced



▲ A collared flycatcher, which was exhausted when it came to us, was released back into the wild after several days of recovery. Photo by Martina Karasová



▲ This red squirrel, which was only some three weeks old upon admission, was the youngest hand-reared individual of that species at our rescue centre.. Photo by Petr Šrámek



▲ The rarest animal admitted to our rescue centre so far was this Kuhl's pipistrelle. Photo by Petr Šrámek

adult owl immediately called to it. And near the playground in Brno-Jundrov, we set free two young common chaffinches (*Fringilla coelebs*). Prior to our arrival, they had spent the night in a bucket that had been hung on a tree, even though they had previously moved freely around in their nest. At the time of our arrival, their parents were still guarding the site.

Great spotted woodpeckers (*Dendrocopos major*) and hawfinches (*Coccothraustes coccothraustes*) were admitted to our station with injuries after hitting glass panels. Some needed only a few days of peace and quiet and could then return to the wild. Two Eurasian sparrow hawks (*Accipiter nisus*) also successfully recovered at our station after hitting obstacles. And a common buzzard (*Buteo buteo*) who had eaten a poisoned rodent also recovered with us.

We also encountered less-routine situations when receiving injured animals, such as the case of a northern white-breasted hedgehog which had a rubber band cut into its skin behind its front legs. The wound healed slowly in our station. Some animals love to gather garbage from all around.

We however still do encounter events that could easily be prevented: Humans are not always kind to animals, though sometimes they are not acting with malice. A pregnant female European hedgehog was brought to us after a collision with a car. Shortly afterwards, she died at our station. We therefore ask drivers to drive cautiously. We also warn against the careless mowing of grass: Baby deer suffered from this near Jinačovice. Before mowing, we should always walk through the plot without the mower.

While the coexistence of people and wildlife may be complicated, one can often find a simple solution satisfactory to all. Anyone who cares about the issues of animals in distress and who would like to help may pick up a leaflet which contains basic advice from our rescue station. We are also always happy to give advice on our standby telephone number: 702 137 837.

Mgr. Jana Švaříčková,
Head of the Rescue Station

Enrichment

helps with an animal's welfare

Enrichment in many cases can ensure animal welfare, but not all welfare principles constitute what is known as enrichment. In the wild, animals are usually active for most of the day. Not only do they expend their energy foraging, breeding, and rearing pups, but also travelling over rugged terrain, either fleeing and hiding from enemies or, vice-versa, chasing prey. In a zoo, hiding food in various places so that the animal has to search it out or putting it into their runs in a frozen state replaces, at least partially, the variety of stimuli with which they interact in the wild. Offering them toys helps with this, as well. This is enrichment.

Almost all zoos enrich animals' lives by identifying what each one needs for its psychological and physiological well-being, and then by providing what is necessary. In Brno Zoo, this type of enrichment is an almost daily job of our breeders and zoo staff.

Here is an example of how this works in our zoo: A crowd of visitors in front of the kea aviary watch, fascinated, as this parrot attacks a cardboard box with its long curved beak. His well-developed sense of smell is telling him that he wants



what is inside. When he breaks the wall of the box, though, he finds a smaller box, which he must also peck through. Once he has torn through that inner cardboard, he can push his head through it to extract the pods of groundnuts (peanuts) that have been hidden there. He brings these pods to a corner of the aviary, where he cracks them and swallows the seeds before he continues to hunt for more food.

Keas evolved in their homeland as observant and resourceful parrots, so we have provided ways for them to keep needing these skills in captivity. The kea's beak serves as a powerful tool. It can open a padlock or unscrew an antenna on the hood of a car or on a roof. In New

Zealand, where keas come from, people must lock their garbage containers well. Otherwise, their contents may be found lying all over the ground the next day.

Keepers at our zoo hide the parrots' favourite foods – for example, low-fat animal biscuits, beetle larvae (mealworms), and carrots – in various places, forcing them to use their initiative and to exert energy, and thus mimicking the kind of lifestyle they might have in nature. Sometimes they will find food in a drawer which our handy carpenter has made for them. They must pull it out to find pumpkin seeds inside.

Many other species that we keep in the zoo also benefit by our hiding their



Leafy twigs are a welcome dietary change even for chimps.

This kea parrot is digging into a carton to get its food.

favourite foods in various ingenious obstacles. But the hideout must not be dangerous: Metal clamps must be removed from cardboard boxes, for example, because the animals could swallow them.

It is necessary to diversify and reinvent challenges as time goes on, or eating would become routine. Animals are most engaged when they have to confront changing situations. For instance, green seedlings are served as a seasonal diet diversification for small marsh birds when seeds germinate in winter.

even with the so-called “processing” of foods themselves. For instance, tigers like to chew thin branches thrown into the enclosure; or we fill a paper sack with hay, straw, and poultry feathers. The tigers then chase the bag around their enclosure, trample it, and chew it. Eating can also easily be enriched when we deploy feed at different places in the enclosure, either in the open or in natural hiding places; or the food may also be frozen in ice or baked into a “cake.”

The life of zoo animals can also be diversified also by introducing different smells to their exposure. Our Sumatran tiger was interested when he found the faeces of a lowland tapir transferred to his

cious and very rugged. This, unfortunately, is not always ensured. Additional help is provided by incorporating different materials into the enclosure such as old textiles and carpets as well as natural materials: hay, straw, leaves, bones, stones, coconut or other nuts, wood wool, feathers, ears of corn, whole corn stalks, etc.

Zoos try to achieve the highest level of welfare and satisfaction for their animals by providing conditions that are as close as possible to the animals' wild environments. Enrichment represents only one of many different parts of welfare that is not able to substitute the lack of others.



The common squirrel monkey will soon find out how to get to the mealworms which we put in a closed bottle.

A Sumatran tiger enjoys chewing a bamboo twig. By doing so, it not only entertains itself but also ingests valuable vitamins and minerals.

Big hairy armadillos also enjoy finding food hidden in a box.

Armadillos in Brno Zoo can have their fruit, mealworms, and other food hidden in a cardboard box. Common squirrel monkeys mine mealworms from plastic bottles by drilling a small hole with their fingers; or they must bore a larger hole in a coconut to collect the chopped fruit and vegetables we placed inside; or they might have to extract worms stuck in cardboard boxes or in tubes of bamboo; or they must find the fruit we have studded on skewers and hung at different places in their enclosure.

Many other animals can find pleasure

enclosure by the breeder from our South American exhibit. Although it came from an animal of a different zoogeographical area, the tiger enjoyed rolling around in it. Beasts do this to overlap their scent with the smell of their prey in order to be able to approach closer to whatever animal they are hunting.

Simply finding ingenious ways of presenting the food or putting in various toys is not very effective if it is the only strategy of enriching the zoo animal's life. How the actual exposure is shaped is also very important. It should be spa-





◀ A female woylie with her young.

The First Baby of the Year

The first baby born in 2017, on January 26th, was a woylie (*Bettongia penicillata*). Visitors can see it in the Exotarium pavilion with its mother, who was also born in our zoo, on December 7th, 2014; and she gave birth to her first baby here, a female, in 2015. That young woylie was later moved to another zoo.

This critically endangered species, we have kept since 2003. In the wild, they have a life expectancy of four to six years; in the zoo, they can live longer. They become sexually mature at the age of less than one year. They differ from most other kangaroo species mainly by their small size (they grow on average to a body length of only 33 cm), and by their prehensile tail. Before the colonization of Australia, woylies occupied sparse forests and savannas across most of Australia, but now they are found only on the islands of Wedge and Saint Peter in the Adelaide Gulf and in several reserves on neighbouring parts of the continent.

Wolverines Have Triplets

A pair of Siberian wolverines (*Gulo gulo gulo*) in Brno zoo have reproduced again this year. The female, Nataša, gave birth to triplets. Last year, she gave birth to a male which we named Vasil.

Initially, we did not know that we had three new wolverines. They were discovered by chance by breeders when they were trying to catch Vasil before his transfer to another zoo on the morning of February 7th. The cubs lay curled up at the bottom of a shallow lair, and were

quite easy to see from outside, as wolverines are born with white fur, and the triplets were almost entirely white. Judging from their appearance, they must have been born very recently, perhaps the day before their discovery.

Nataša ferociously attacked the breeders and veterinarians who were trying to

immobilize Vasil, and she began to transfer her cubs to different places to protect them, which is instinctive behaviour. The breeders and the vet quickly gathered Vasil in their net and carried him to the breeding facilities. In the afternoon, Nataša calmed down and rehid her cubs in a small ditch near the pond.

In the following days, we separated the father, Ivan, from his cubs. A male wolverine does not participate in the care of the offspring. Ivan remained in the inner quarters while Nataša continued hiding her cubs in a den. (The wolverines had dug a few dens in the paddock.) Nataša had the freedom of the paddock, the yard, and part of the inside of the enclosure. The passage into the next inner area, where Ivan had been put, was closed to her. After six days, on February 13th, Nataša transferred the cubs from the paddock to the breeding facilities, deciding to place them in the box where she gave birth to her first cub.



▲ Our wolverine triplets shortly after birth.

Photo by Michal Vaňáč.



▲ A six-week-old wolverine.



▲ Visitors can scan the QR code from a billboard located at the lower turn of the zoo train or at certain animal exhibits to access our zoo application.



▲ A southern three-banded armadillo.

Photo by Michal Vaňáč

Want to read about us? ▼ Try the zoo app!

A free application for smart phones and tablets is a new service we offer for visitors to Brno Zoo. Since January 2017, it has been offering engaging information about seventy-three animal species whose breeding facilities are located around the main visitor route.

At any one of these enclosures, an inquisitive visitor can scan the QR code with a reader on his phone. They'll be able to read funny and exciting stories about the animals inside the enclosure, browse information about the place and time of feedings, or check out the latest news and events in the zoo. The basic facts given on the standard labels on panels at each exposure are now enriched in this way.

The staff of the Institute of the Czech language of Masaryk University and students of this faculty, the Czech Language with Orientation on Computational Linguistics, under the leadership of Mgr. Dana Hlaváčková, Ph.D., along with Mgr. Marek Grác, Ph.D., and designer Kevin Scherrer have significantly contributed to the creation and development of this application, which has been a success in our zoo and Masaryk University. These students

came to us after their last year's visit to Brno Zoo with the idea of establishing this service. They completed two different versions of the texts, one for children and one for adults. Their goal was to provide readable content written in an unconventional style. To help with this, they consulted with Brno Zoo's breeders and curators.

The staff of Brno Zoo intend to expand the application in the near future. Visitors will be able, for example, to answer quiz questions, listen to an audio recording of stories about animals, or read linguistic information from the field of zoology.

A new species in our zoo ▼

Since February 17th, 2017 a pair of southern three-banded armadillos (*Tolypeutes matacus*) has been living at Brno Zoo.

This species had not previously been kept by us. They are sharing a space with our blue-and-yellow macaw in the Exotic Pavilion. Ricardo, the male, came from Antwerp Zoo in Belgium, where he was born last year; and the female, who is the same age, comes from Heidelberg Zoo in Germany. When in danger, southern three-banded armadillos can roll up

into an almost complete ball which protects them with its bony armour. Their native home is in the savannas of the Gran Chaco area in South America.

Public Events' – Spring 2017 ▼

Day of Nature Sciences, May the 1st

Our friends, students of Brno Chemical College, will introduce new information from nature sciences to our visitors in the zoo for the third time. This year, they will concentrate on colours and shapes. But you need not worry, you will not be made to feel like a small schoolchild!

Children's Day in the Zoo, June 3rd

On Saturday June the 3rd, our zoo will be full of colours, funny figures, and attractions. Popular commented feedings of bears, tigers, seals, giraffes, and other animals will be presented by Brno celebrities together with our breeders.

International Giraffes' Day, June 21st

These beautiful animals with their long necks have their feast on the longest day of the year. Specialized commented feeding of giraffes and competitions will be prepared in Brno Zoo.



ZACHRAŇ ŽELVU

REHABILITAČNÍ CENTRUM PRO MOŘSKÉ ŽELVY
NA OSTROVĚ NUSA PENIDA OTVÍRÁME 9. 5. 2017

Přispějte na chod tohoto projektu v Indonésii

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Zasílejte SMS
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Cena DMS je 30 Kč, Zoo obdrží 29 Kč.

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