Animals from Barcelona Zoo in

CONSERVATION AND REINTRODUCTION PROGRAMMES

INTRODUCTION

This report seeks to analyse the success of Barcelona Zoo in achieving its aims of conservation and reintroduction for the species it houses. These are two of the fundamental pillars by which zoos justify their existence and current dynamics.

The number of animals in conservation programmes is statistically analysed here, as is the number of animals reintroduced into their natural habitat and the number of animals living in the Zoo that are not endangered in the wild. In order to carry out this study, we have based our analysis on the animals referenced in Barcelona Zoo's "Animal Inventory 31.12.2013".

This report does not analyse other conservation programmes in which Barcelona Zoo participates - in collaboration with other local or international entities - if the animals involved do not live in Barcelona Zoo, despite being of the same species.

This report does not analyse the Zoo animals included in research programmes other than those of conservation and reintroduction.

This report does not analyse collaboration programmes with other entities, in relation to research and conservation studies, which have not provided concrete and quantifiable results as regards Barcelona Zoo animals reintroduced into their natural environment.

This report does not analyse studies relating to birds that visit the Zoo during their migration. Barcelona Zoo is a member of the European Association of Zoos and Aquaria (EAZA). This association specifies two different levels of breeding programme: the European Endangered Species Programme (EEP) and the European Studbook (ESB), for less endangered species.

EEP conservation programmes entail the intensive population management of a particular species, endangered in the wild, by breeding them in captivity in the network of EAZA zoos.

ESB programmes compile information on births, deaths, transfers and movements from EAZA zoos and aquaria. This information is used to determine whether there is a healthy captive population, or whether a more intensive management is necessary, perhaps proposing that the species be managed as an EEP programme.

Like the rest of the zoos belonging to the EAZA, Barcelona Zoo uses the International Union for Conservation of Nature (IUCN) as a reference point for establishing the degree of threat facing a particular species. This organisation updates species' individual situations according to the degree of vulnerability faced in their respective ecosystems: www.iucnredlist.org

This organisation classifies the degree of threat facing species and subspecies, or taxa, as follows:

- EX- Extinct: A taxon is Extinct when there is no reasonable doubt that the last individual has died.

- EW- Extinct in the wild: A taxon is Extinct in the Wild when it is known only to survive in cultivation, in captivity or as a naturalised population (or populations) well outside the past range.

- CR-Critically Endangered: Considered to be facing an extremely high risk of extinction in the wild.

- EN- Endangered: Considered to be facing a very high risk of extinction in the wild

- VU- Vulnerable: Considered to be facing a high risk of extinction in the wild

- NT- Near Threatened: A taxon is Near Threatened when it has been evaluated against the criteria but does not qualify for Critically Endangered, Endangered or Vulnerable now, but is close to qualifying for or is likely to qualify for a threatened category in the near future

- LC- Least Concern: A taxon is Least Concern when it has been evaluated against the criteria and does not qualify for Critically Endangered, Endangered, Vulnerable or Near Threatened.

- DD - Data Deficient: A taxon is Data Deficient when there is inadequate information to make a direct, or indirect, assessment of its risk of extinction.

NE- Not Evaluated: A taxon is considered Not Evaluated when the established criteria for making an evaluation on the degree of threat have not yet been applied.

Barcelona Zoo uses the International Union for Conservation of Nature (IUCN) as a reference point for establishing the degree of threat facing a particular species.

DATA ANALYSIS

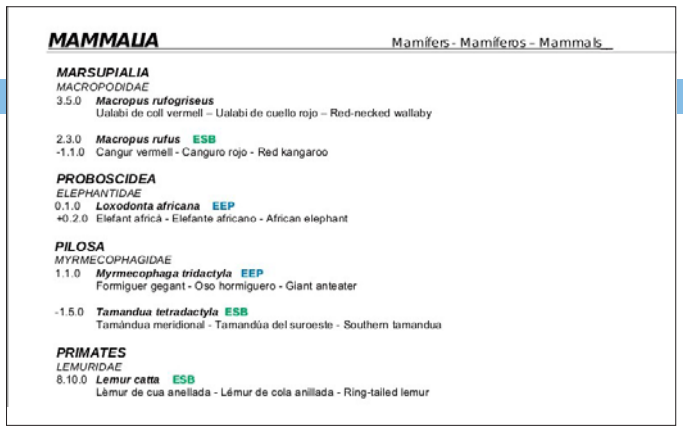
In order to study the success of conservation and reintroduction programmes for animals living in the Zoo, we are using the following documents drawn up by Barcelona Zoo:

- Animal Inventory 31.12.2013. Hereafter **Inventory 2013**.

This report details the number and sex of the animals, and if they are included in the European Programme for Endangered Species (EEP) or the European Studbook (ESB), administrated by the European Association of Zoos and Aquaria (EAZA).

In addition, Inventory 2013 indicates whether the animals are on loan at the Zoo premises (+) or have been loaned to other zoos (-).

Here is an example:



MAMMALIA Mamífers - Mamíferos - Mammals

MARSUPIALIA
MACROPODIDAE
3.5.0 ***Macropus rufogriseus***
Ualabi de coll vermell – Ualabí de cuello rojo – Red-necked wallaby

2.3.0 ***Macropus rufus*** ESB
-1.1.0 Cangur vermell - Canguro rojo - Red kangaroo

PROBOSCIDEA
ELEPHANTIDAE
0.1.0 ***Loxodonta africana*** EEP
+0.2.0 Elefant africà - Elefante africano - African elephant

PILOSA
MYRMECOPHAGIDAE
1.1.0 ***Myrmecophaga tridactyla*** EEP
Formiguer gegant - Oso hormiguero - Giant anteater

-1.5.0 ***Tamandua tetradactyla*** ESB
Tamàndua meridional - Tamandúa del suroeste - Southern tamandua

PRIMATES
LEMURIDAE
8.10.0 ***Lemur catta*** ESB
Lèmur de cua anellada - Lémur de cola anillada - Ring-tailed lemur

- Magazine Oh Zoo 2013. bit.ly/1Emxf5Z

- Activity Report 2009/2014 of the Barcelona Zoo Research and Conservation Programme. Hereafter **PRIC 2009/2014**.

- Zoo books. Guide to Mammals at Barcelona Zoo 2014. Heretofore **Guide to Mammals 2014.**

Despite using figures from December 2013, the statistical conclusions are equally valid and can be extrapolated to the present time and with regard to the results of conservation and reintroduction programmes for animals in Barcelona Zoo.

According to the Inventory, the total number of individuals as of 31.12.13 was 2,214 animals.

ANALYSIS OF CONSERVATION AND REINTRODUCTION PROGRAMMES

- According to the Inventory, the total number of individuals as of 31.12.13 was 2,214 animals.
- We will analyse the situation of the animals by class.
- We understand 'taxon' to mean the classification of animals into species and subspecies.

MAMMALS

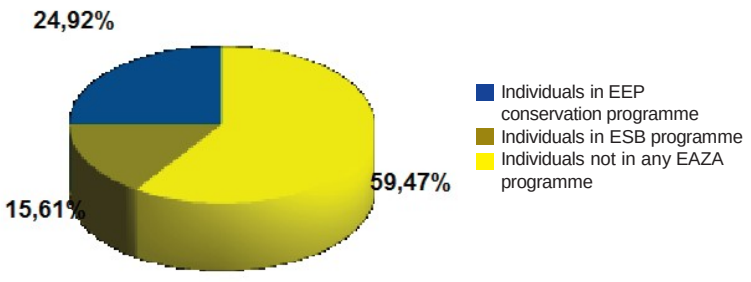
CONSERVATION

Zoo figures:

- 602 individual mammals in the Zoo
- 87 taxa
- 36% of taxa in EEP programmes
- 18% of taxa in ESB programmes
- 46% of taxa not in any EAZA conservation programme.

What do these figures represent in terms of the number of individuals? To calculate the number of individuals, we have tallied up all existing members of each species of mammal, according to Inventory 2013, not counting those on loan to other zoos, following the same criteria as the Inventory:

- 602 individual mammals in the Zoo
- 150 individual mammals, 24.92%, are in EEP conservation programmes
- 94 individual mammals, 15.61%, are in the Studbook
- 358 individual mammals, 59.47% remaining, are not in any EAZA programme.



54.48% of mammals at Barcelona Zoo are not endangered in the wild.

Animals from Barcelona Zoo in conservation and reintroduction programmes

Below we have listed the number of individual mammals living in the Zoo, which have been classified as Least Concern (LC) or Not Evaluated (NA) by the International Union for Conservation of Nature (IUCN):

Total in the zoo	Mammals	Classification IUCN
8	Red-necked wallaby	LC
5	Red kangaroo	LC
0	Southern tamandua	LC
6	Pygmy marmoset	LC (*)
3	Emperor tamarin	LC (*)
5	Golden-handed tamarin	LC
3	Black howler	LC
1	De Brazza's monkey	LC
1	Great spot-nosed monkey	LC
6	Patas monkey	LC
9	Talapoin	LC
4	Black-tailed prairie dog	LC
2	Porcupine	LC
11	Capybara	LC
14	Coypu	LC
16	Banded mongoose	LC
18	Meerkat	LC
2	Spotted hyena	LC
4	Brown bear	LC
4	California sea lion	LC
5	Harbour seal	LC
2	Donkey	NA
4	Chapman's zebra	LC
7	Pony	NA
1	Percheron mare	NA
13	Phacochoerus	LC
2	Vietnamese pig	LC
7	Guanaco	LC
22	Chital deer	LC
4	Elk	LC
4	Red deer	LC
6	Fallow deer	LC
2	Muntjac deer	LC
6	Blue wildebeest	LC
1	Cow	NA
9	Nilgai	LC
5	African forest buffalo	LC
3	Spanish ibex	LC
10	Ripollesa sheep	NA
23	Mouflon	NA
6	Lesser Egyptian jerboa	LC
7	Common rat	LC
8	House mouse	LC
49	Guinea pig	NA
328	TOTAL	

(*) Despite being classified as LC (Least Concern), populations have recently diminished (Guide to Mammals 2014) as a result of habitat destruction.

In fact, the emperor tamarin and the Satéré marmoset (these latest given to another zoo by Barcelona Zoo, hence their non-appearance in the previous list) are in the EEP breeding programme for endangered species, despite the fact that the IUCN (International Union for Conservation of Nature) currently has them classified as LC. The argument for breeding them in captivity is that populations are falling as a result of habitat destruction, as indicated on their information files on the Zoo website. However, they are not included in any reintroduction plan, which would only make sense if actions are simultaneously undertaken to brake habitat destruction.

According to these figures from Inventory 2013, **these 328 animals make up 54.48% of the Zoo's mammals. That is to say, populations of these animals are not endangered in the wild.**

Not Evaluated animals are included, as these are all domestic animals (and therefore not in danger of extinction). An exception is the mouflon (a species that has given rise to different breeds of domestic sheep).

REINTRODUCTION

Of the 24.92% of individual mammals found in EEP conservation programmes, effective and quantifiable reintroduction into their natural environment has only been attempted for the Saharan Dorcas gazelle.

As indicated on page 38 of the PRIC report, Barcelona Zoo has collaborated with *"contributing six specimens from the collection, from selected genetic lines."*

This means that **only 1% of the Zoo's mammals is included in reintroduction programmes.**

It is important to mention the otter conservation project as one of the main lines in the development of the research programme applied to the fauna of the indigenous Mediterranean area, but without the reintroduction data bit.ly/1Emxf5Z page 17.

Mention must also be made of the rehabilitation and reintroduction project for the sooty mangabey (Cercocebus atys lunulatus) which Accra Zoo (Ghana) is carrying out in collaboration with Barcelona Zoo. In a 4-step plan (now in its second stage), Accra Zoo is rehabilitating mangabeys confiscated from private collections and zoos with the aim of reintroducing them and teaching the local population through environmental education programmes. A group of nine individuals has been selected from the mangabeys currently in the process of rehabilitation. Barcelona Zoo finances and coordinates this project, and in 2012 sent a female mangabey to Accra Zoo, which has had a baby.

BIRDS

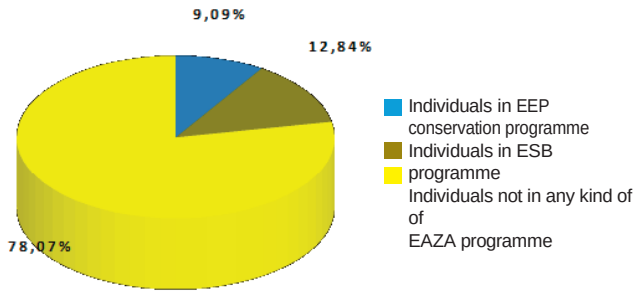
CONSERVATION

Zoo figures:

- 690 individuals living in the Zoo
  - 111 taxa
- 11% of taxa in EEP programmes
- 15% of taxa in ESB programmes
- 74% of taxa not in any EAZA conservation programme.

What do these figures represent in terms of the number of individuals?

- 693 individuals living in the Zoo
- 63 individual birds, 9.09%, are in EEP conservation programmes
- 89 individual birds, 12.84%, are in the Studbook
- 541 individual birds, 78.07%, are not in any kind of EAZA programme.



78.07% of the birds are not included in any kind of EAZA programme.

Below we have listed the number of individual birds living in the Zoo, which have been classified as Least Concern (LC) - no threat - or Not Evaluated (NA) by the International Union for Conservation of Nature (IUCN):

Total in the zoo	Birds	Classification IUCN
3	Ostrich	LC
54	Common peafowl	LC
3	Southern screamer	LC
3	Black-bellied whistling duck	LC
3	Mallard	LC
2	Chilean whistling duck	LC
4	Rosy-billed poochard	LC
1	Ruddy shelduck	LC
2	Common shelduck	LC
1	Greater flamingo	LC
80	Flamenco de Cuba	LC (1)
14	**White stork**	LC
2	Jabiru	LC (1)
15	Scarlet ibis	LC
8	Glossy ibis	LC
8	African sacred ibis	LC
30	**Eurasian spoonbill**	LC
8	Roseate spoonbill	LC
5	**Little egret**	LC
26	**Cattle egret**	LC
8	Green heron	LC
11	**Black-crowned night heron**	LC
2	Boat-billed heron	LC
6	Hamerkop	LC
8	Griffon vulture	LC
1	Sunbittern	LC
3	Purple swamphen	LC
2	Black-winged stilt	LC
10	Avocet	LC
2	Vanellus	LC
3	Blacksmith lapwing	LC
4	Wattled jacana	LC
1	European herring gull	LC
1	Emerald turtle dove	LC
2	Pied imperial pigeon	LC
17	Pheasant pigeon	LC
9	Black-naped fruit dove	LC
2	Superb fruit dove	LC
4	Rainbow lorikeet	LC
4	Budgerigar	LC

Total in the zoo	Birds	Classification IUCN
1	Eclectus parrot	LC
3	Hyacinth macaw	LC (1)
4	Red-and-green macaw	LC (1)
5	Blue-fronted amazon	LC (1)
12	White-fronted amazon	LC
1	Orange-winged amazon	LC
7	Lilacine amazon	LC
2	Yellow-headed amazon	LC
1	Triton cockatoo	LC
5	Guinea turaco	LC
5	Violet turaco	LC (1)
2	Eastern plantain eater	LC
11	**Eurasian scops owl**	LC
2	Spectacled owl	LC
3	Speckled mousebird	LC
0	Golden-headed Quetzal	LC
4	Blue-breasted kingfisher	LC (1)
3	Collared kingfisher	LC
2	Red-billed hornbill	LC
1	Silver-cheeked hornbill	LC
1	Bearded barbet	LC
1	Red-headed barbet	LC
2	Toco toucan	LC (1)
2	Pico albo	LC
1	Black-and-red broadbill	LC
4	Grey-winged cotinga	LC
5	**Lesser grey shrike**	LC
3	Pied crow	LC
6	Green jay	LC
1	Common hill myna	LC
1	Superb starling	LC
15	Grosbeak starling	LC
5	Superb starling	LC
5	Snowy-crowned robin chat	LC
1	Grey sunbird	LC
1	Red pileated finch	LC
2	Brazilian tanager	LC

502 TOTAL

(1) Despite currently being classified as LC (Least Concern), maintaining populations will depend on the conservation of habitats, affected by human pressure. Without the conservation and recuperation of habitats, breeding in captivity will not help to conserve populations in nature, as there will not be any habitats into which to reintroduce them. Efforts, then, must be aimed at conserving local habitats; such efforts include, by default, the conservation of these species.

According to these figures from Inventory 2013, these 502 animals represent **72.44% of individual birds in the Zoo. That is to say, populations of these animals are classified as Least Concern or not endangered in the wild.**

The highlighting in green indicates local species for which the Zoo has captive breeding programmes. The following birds have been introduced effectively into the local environment: white stork; flatbill: bit.ly/1Emxf5Z page 17; little egret: bit.ly/1I2O0SU; cattle egret: bit.ly/1yfRBN9; heron: bit.ly/1GWgrmN; Eurasian scops owl: bit.ly/1Emxf5Z pág-17.

The highlighting in blue indicates a local species for which the Zoo has a captive breeding programme, but not yet a reintroduction programme: lesser grey shrike: bit.ly/1yfRIs4

REINTRODUCTION

Native birds have been reintroduced in collaboration with other local associations or the Generalitat of Catalonia, but there have been no reintroductions in EEP conservation projects.

Of the 9.09% of individual birds in EEP conservation programmes, no attempt has been made to reintroduce them into their natural environment.

We must mention, however, the collaboration agreement with the Vulture Conservation Foundation. Barcelona Zoo participates in the conservation of bearded vultures (EEP species) at its facilities with the aim of reintroducing them into the wild. As yet there is still no data in this regard (PRIC 2009/2014).

There is also collaboration with the Generalitat of Catalonia with regard to the conservation of the cinereous vulture for later reintroduction (no data as yet). It must be highlighted that these two species, in the EEP programme, are indigenous species.

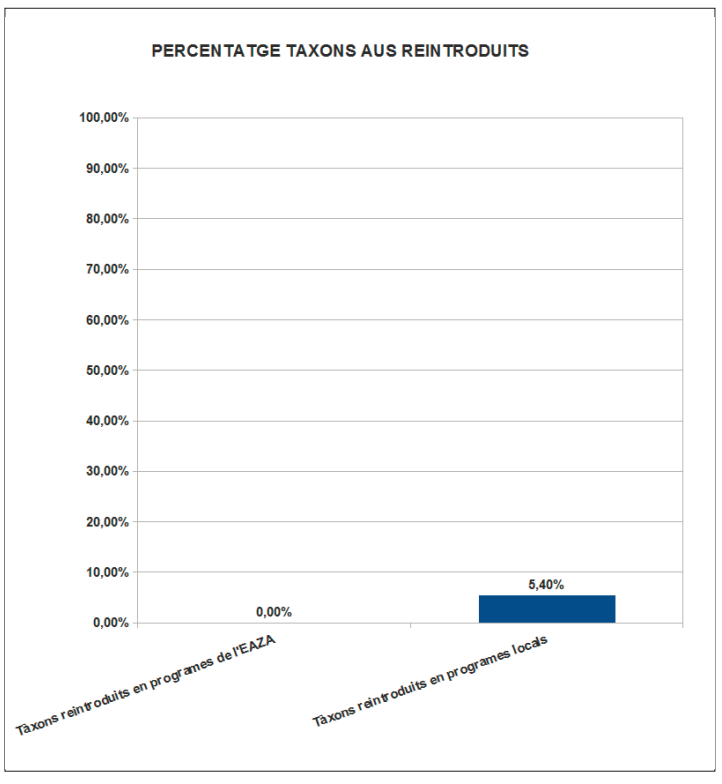
Native birds have been reintroduced in collaboration with other local associations or the Generalitat of Catalonia, but there have been no reintroductions in EEP European conservation projects: **white stork, Eurasian spoonbill, little egret, cattle egret, night heron, Eurasian scops owl.**

These 6 taxa, which have seen reintroductions into the wild, make up 5.4 % of the bird taxa.

On this occasion, we are talking about taxa, and not the number of individuals. This is because it has not been possible to identify the number of individuals included in the reintroduction programmes.

PERCENTAGE TAXA BIRDS REINTRODUCED

- Taxa reintroduced in EAZA programmes: 0.0%
- Taxa reintroduced in local programmes: 5.4%



REPTILES

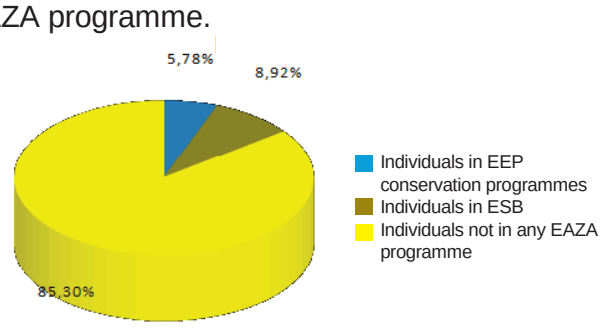
CONSERVATION

Zoo figures:

- 415 individuals
  - 86 taxa
- 5% of taxa in EEP conservation programmes
- 13% of taxa in ESB programmes
- 82% of taxa not in any EAZA conservation programme

What do these figures represent in terms of number of individuals?

- 415 individuals living in the Zoo
- 24 individual reptiles, 5.78%, are in EEP conservation programmes
- 37 individual reptiles, 8.92 %, are in the Studbook
- 354 individual reptiles, 85.30%, are not in any EAZA programme.



Below we have listed the number of individual reptiles living in the Zoo, which have been classified as Least Concern (LC) - no threat - or Not Evaluated (NA) by the International Union for Conservation of Nature (IUCN):

Total in the zoo	Reptiles	Classification IUCN
21	Red-eared slider	LC
12	**Spanish pond turtle**	NA
7	Painted wood turtle	NA
19	Red-footed tortoise	NA
8	Marginated tortoise	LC
4	Red-bellied short-necked turtle	LC
4	West African black turtle	LC
5	Frill-necked lizard	LC
17	Chinese water dragon	NA
1	Central bearded dragon	NA
3	North African spiny-tailed lizard	NA
1	Carolina anole	LC
3	Basilisk	LC
2	Cuban rock iguana	LC
1	Common chuckwalla	LC
5	Blue spiny lizard	LC
14	Leopard gecko	LC
4	African fat-tailed gecko	LC
1	Gecko	NA
1	Lagarto de cola anillada moteado	NA
2	Sudan plated lizard	NA
4	Caiman lizard	LC
10	Solomon islands skink	NA
5	Eumeces schneideri	NA
12	Dumeril's boa	LC
1	Boa constrictor	NA
1	Pacific ground boa	NA
2	Amazon tree boa	NA
1	Hispaniolan boa	NA
3	Green anaconda	NA
2	Madagascar tree boa	LC
1	Kenyan sand boa	NA
1	Reticulated python	NA
2	Green tree python	LC
1	Borneo python	LC
5	Royal python	LC
2	African rock python	NA
1	Corn snake	LC
1	Ladder snake	LC
2	Stripe-tailed ratsnake	NA
1	Red-tailed green ratsnake	LC
7	California kingsnake	LC
2	Florida kingsnake	LC
1	Mexican black kingsnake	LC
1	Arizona mountain kingsnake	LC
1	Milk snake	NA
3	Sinaloan milk snake	NA
2	Madagascan giant hognose	LC
1	Montpellier snake	LC
1	Pituophis melanoleucus	LC
1	Asp viper	LC
3	Broad-snouted caiman	LC
2	Spectacled caiman	LC
2	Yacare caiman	LC
7	Cuvier's dwarf caiman	LC
1	Morelet's crocodile	LC
2	Saltwater crocodile	LC
230	**TOTAL**	

55.42% of individual reptiles in the Zoo are classified as LC - no threat - or Not Evaluated.

According to these figures from Inventory 2013, these 230 animals represent **55.42% of individual reptiles in the Zoo classified as Least Concern - no threat - or Not Evaluated. If we do the calculations on the LC, 134 individuals make up 32.30%.**

However, conservation is pursued for the reintroduction of indigenous species, such as the Spanish pond turtle and Hermann's tortoise (status: Near Threatened).

REINTRODUCTION

Of the 5.78% of individual reptiles in EEP conservation programmes, no attempt has been made to reintroduce them into their natural environment.

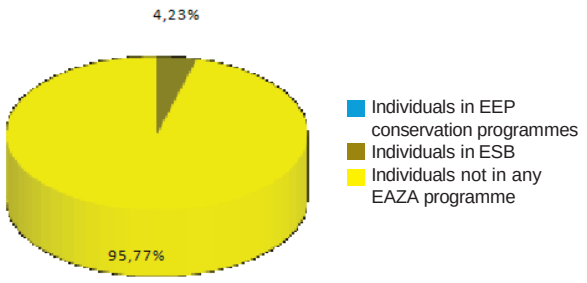
However, there have been effective breeding and reintroduction programmes for indigenous species such as the Spanish pond turtle bit.ly/1DU3N8H and Hermann's tortoise bit.ly/1ID56tV

Animals from Barcelona Zoo in conservation and reintroduction programmes

AMPHIBIANS

CONSERVATION

- 13 taxa
- 189 individuals
- 0 individuals in EEP conservation programmes
- 8 individuals in ESB programme from the species Giant ditch frog. This represents 4.23% of the amphibians
- 181 individuals, 95.77%, are not in any EAZA programme
- 61 individuals, 32.30%, are classified as LC or not endangered in the wild.

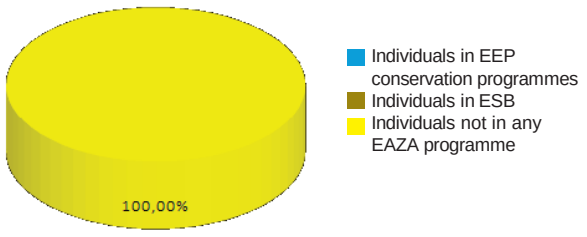


REINTRODUCTION

There is conservation and **reintroduction of indigenous species** (outside the EAZA programme), of the Montseny brook newt (PRIC 2009/2014, page 137) and the Majorcan midwife toad (PRIC 2009/2014, page 136). This represents **15.38% of the amphibian taxa.**

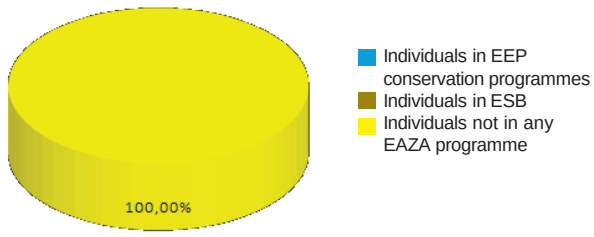
FISH

- 22 taxa
- 253 individuals
- 0 in EEP conservation programmes
- 0 in ESB programme



INVERTEBRATES

- 20 taxa
- 65 individuals
- 0 in EEP conservation programmes
- 0 in ESB programme



79% of the 2,214 animals living in the Zoo are not in any EAZA conservation programme

GLOBAL NUMBERS 31.12.2013

2,214 animals living at the zoo

NO PROGRAMME AND /OR NOT ENDANGERED			EAZA CONSERVATION PROGRAMMES		
Fish and invertebrates do not have any conservation programmes.	**54.48% of individual mammals** are classified as Least Concern in their habitat.	**72.44% of individual birds** are classified as Least Concern in their habitat.	**237 individuals in** EAZA EEP conservation programmes, 10.70%.	**228 individuals** in EAZA ESB programmes, 10.30%	**79% of individuals** are not in any EAZA conservation programme. (*)

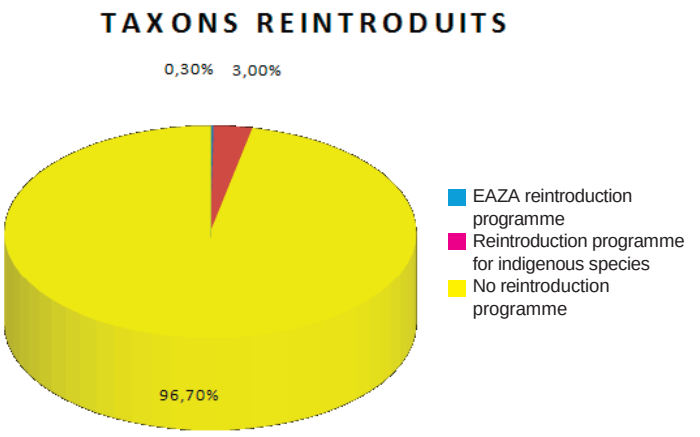
(*) However, some are included in local conservation and reintroduction programmes, being indigenous species (see the following data on reintroduction).

It is much more effective to aim resources at conserving habitats and species in their places of origin, with in-situ conservation programmes.

REINTRODUCTION

• Of all the conservation programmes established with EAZA - according to the previous statistics - only one taxon is included in EAZA reintroduction programmes that have successfully reintroduced individuals into their natural environment. This represents 0.3% of the taxa.

• In collaboration with local bodies or the Generalitat of Catalonia, there are 10 taxa (indigenous species) in local reintroduction programmes. This represents 3% of the taxa.



CONCLUSIONS

• The majority of zoo species and, in counterpart, of individuals living in the Zoo, are not of interest for conservation.

• The vast majority of animals in captive breeding programmes do not have any effective and quantifiable reintroduction programmes, being considered endangered populations in the wild.

• The populations of many animals currently classified as of Least Concern may be threatened by the disappearance of their natural habitat, caused by human pressure. Breeding in captivity will therefore not help to maintain these populations if significant efforts are not made to conserve habitats. Moreover, as we have seen throughout the study, the scant ex-situ conservation programmes with a corresponding reintroduction programme show how it is much more effective to aim resources at conserving habitats and species in their places of origin, with in-situ conservation programmes and in collaboration with local entities.

• Successful reintroduction programmes are those involving indigenous species.

Resources would have to be available at all times for the species and programmes that have and demonstrate a quantifiable impact on conservation for reintroduction.

OTHER DATA OF INTEREST

The data we will present next have not been included in the statistics because they relate to animals that are not in Inventory 2013. This data has been obtained from the Activity Record 2009/2014 of the Barcelona Zoo Research and Conservation Programme (PRIC 2009/2014).

In collaboration with other local bodies, in-situ breeding projects are being undertaken with the aim of repopulating indigenous species for:

• The Spanish tooth carp and Iberian spadefoot toad, in the Llobregat Delta.

• The Catalonian barbel, in the River Gayá.

• Naiads, or swan mussels, Unio (Unio mancus), in the basin of the River Llobregat.

• Crayfish, native to the Llobregat basin and the Ter.