

## CONCLUSIONS AND SUGGESTIONS AFTER EEP-VCF STAFF VISIT AT THE MISKOLC ZOO (HUNGARY)

Following the proposal from Miskolc zoo to participate in the Bearded Vulture EEP network, it was accorded between Miskolc zoo and EEP/VCF to invite Alex Llopis (EEP coordinator & VCF staff) to visit the Zoo, and have a look for the possibilities to house a pair of bearded vultures in one of their raptors facilities.

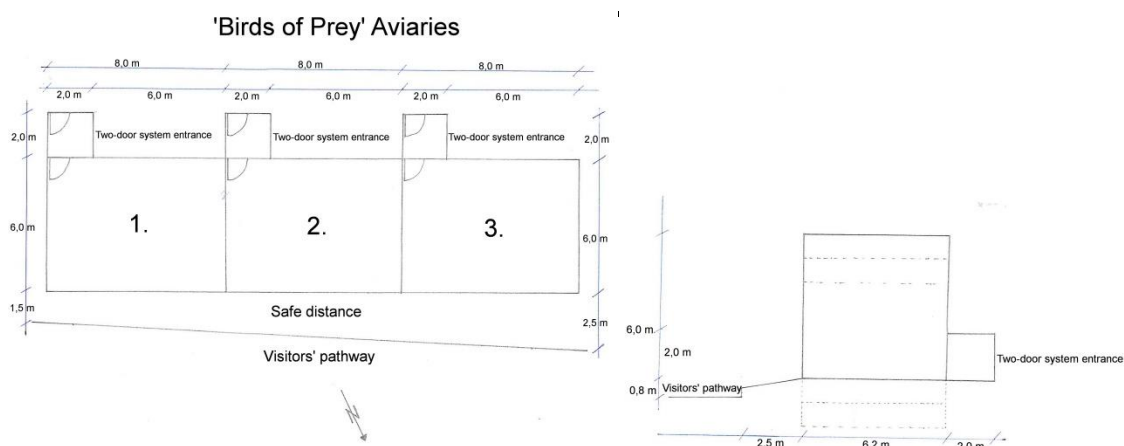
### Introduction:

In May 2018 Mr. Tamás Veress, zoo curator from Miskolc zoo, contacted the EEP coordinator and asked the possibility to participate in the Bearded Vulture EEP. After several email exchanges, was accorded to invite Alex Llopis to visit the Zoo after the breeding season and evaluate the possibility if the suggested raptor aviary from Miskolc zoo could hold a pair of bearded vultures and discuss which adaptations would be necessary to perform.

The visit was done between the 15<sup>th</sup> and 17<sup>th</sup> of May 2019. Alex Llopis had the opportunity to visit the Zoo and also to meet the staff which would be responsible for the future birds.

### The potential Bearded Vulture aviary:

The raptor unit is composed by three terraced aviaries being each one in touch on the 6m width. The orientation of the aviaries is South-West and there is a pathway on the length of the raptor unit where visitors have access (picture 1). The pathway is in average 0.0-0.8m under the level of the aviary ground, giving in concrete in the 3<sup>rd</sup> aviary additional safety distance to the birds (picture 2). On the opposite side of the pathway there are located the entrances with a double-door security system.



Picture 1-2. Plan of the raptor unit, composed by three aviaries.

The aviaries are 8m long and 6m high and located on a slope area, being each aviary about one meter higher than the following. The aviaries have an iron structure divided in 2m with iron pillars and beams. The whole aviaries are enclosed with a rigid wire mesh of 4mm thick and with a hole-size from 5 x 15cm. The raptor unit is covered with vegetation, being partially too shadow. Further the whole unit is surrounded with high deciduous trees assuring enough shadow in summer and sun in winter (pictures 3 & 5).

The proposal is to unify the 2<sup>nd</sup> and 3<sup>rd</sup> aviary, removing the lower six 2 x 2m big panels. This will give an optimal size for housing a breeding pair, big enough for giving the birds the necessary escape distance from the visitors and not too big preventing to obtain a dangerous flight speed. Between both aviaries there is a 1,5m high artificial wall construction. In the 2<sup>nd</sup>

aviary there is an old drinking bowl stuck to the wall. In the middle of the 3rd aviary there is another drinking bowl. Both bowls are too small and not enough deep to satisfy the needs of the species. By both aviaries the ground is almost filled with small trees/bushes and wooden stumps –with branches some of them-, not giving enough space that birds can land safely on the ground (Picture 6).



Picture 3-5. Aviaries are built on an iron structure divided in iron pillars and beams each 2m and covered with wire mesh.

Between the 2nd and 3rd aviary on the rear there is a 2 x 2m big roof giving additional shadow to the birds (picture 7). Nevertheless they are too small to provide shelter in bad weather.



Picture 6-7. A 1,5m high artificial wall is dividing the 2<sup>nd</sup> and 3<sup>rd</sup> aviary and stuck to it there is a drinking bowl. Ground is covered with vegetation and two roof panels (2 x 2m) are giving shadow to the birds.

### Meeting with the Miskolc zoo staff:

Tuesday afternoon it was possible to meet the staff responsible for the feeding of the birds to advice on Bearded Vulture behaviour, artificial incubation and artificial rearing of chicks. All was graphically accompanied with pictures for better understanding.

### Conclusions and suggestions how to remodel the aviary for keeping a pair of bearded vultures:

All the conclusions and suggestions were directly transmitted to Mr. Tamás Veress. Nevertheless, following are mentioned the exposed suggestions to keep them in mind.



- As the outside trees (picture 4) are able to make enough shadow at the aviary, is recommended the **remove the vegetation which is covering the aviary**, to avoid that in winter doesn't become too shady and humid in it. Bearded vultures are very sensitive against aspergillosis infection. That's why is recommended in winter sunny conditions and in summer shadow for not suffering on heat.
- To prevent accidents by landing it is important to offer open and clean ground. It is recommended that **all vegetation inside of the aviary** should be **removed**. Further most of the **wooden stumps**, particularly those with branches, should be **removed**. These are obstacles that by other facilities have already caused the loss of several individuals. There is the possible to remain 1-2 wooden stumps without branches.
- To prevent collisions with the higher iron wire mesh panels, which divide the 2<sup>nd</sup> and the 3<sup>rd</sup> aviary after removing the 6 lower panels, is recommended to **install visual obstacles like wooden laths (4cm wide by 2cm thick) every 15 cm** on the outside face of the wire mesh panel, for not giving the birds the possibility to reach with their bill and remove it.



- A nesting-platform has to be built on the wide of the 3<sup>rd</sup> aviary and at 4m high from the ground. The **nest-platform should be 6m large, 2m deep and 2m under roof**. To assure to provide the subordinate bird with somewhere to shelter in bad weather is recommended to divide the platform in two. The platform should be closed around with wood with exception the entrance, giving it the form as a cave.




- As the platform to the roof will be 2m high and bearded vultures as cliff breeders like caves for nesting, is recommended to **build 2 x 2m and 40-50cm high platform on the left corner**, where the nest can be built on it, following the recommendations of the guidelines.



On it a **nest 1.3 x 1.3m** should be built in the **left** corner where the sun shines during the morning and **exactly** as is described in the **guidelines** for housing BV in captivity.



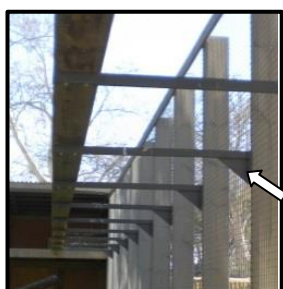
- To prevent the nest from getting wet, the **roof should project out 1m** above the nest platform.
- Bearded Vultures are soaring birds of prey and are impossible for many of them, especially females and older birds, to access perches through flapping flight. Steps make it much easier for the birds to transport material to the nest (an important behaviour during the breeding season that reinforces the pair bond) and to bring food to the perches, where it can be handled more easily than on the floor. **Spiral steps** (20cm wide, 4-5cm thick, 150cm long, and with a height of 45-50cm between them) are the best option to **allow Bearded Vultures to access perches and nest platform**.
 
- Further to **facilitate the birds to climb the 1.5m high stone wall** which divided both aviaries, is recommended to **build** on the opposite side of the pathway **two steps** with a height of 45-50cm between them. It can be built **of stone** as the wall. Further at the wall face towards the 3<sup>rd</sup> aviary, is suggested to include stone structure to give more hill form to the wall.
- To prevent collisions by flying against the fence is recommended to **install perches around the aviary** (60cm away from the mesh and **never higher than the nest**). This gives them the possibility to move around the cage without getting on the ground, especially when the nest must be controlled by the keepers. Furthermore by installing perches throughout the aviary, pairing birds can move towards each other gradually.



Subordinate birds can escape from attacks by the other and can choose to sit on a perch where they feel safer.



At the 3<sup>rd</sup> aviary is recommended to install perches 2m from the roof (at platform level), 60cm parallel from the fence, around the aviary and never higher than the nest. At the 2<sup>nd</sup> aviary is recommended to install perches 2m from the roof in the form of “U”.



Bearded Vultures as cliff breeders, perches need to be adapted to suit the anatomy of their feet. For assuring to maintain its balance on it is recommended to install **flat perches, around 20cm wide, 5cm thick** and also need to be **rigid enough** to prevent them from bending during copulation on the perch. It is recommended to install a **holding arm perches system which avoids collisions** with it (see white arrow).

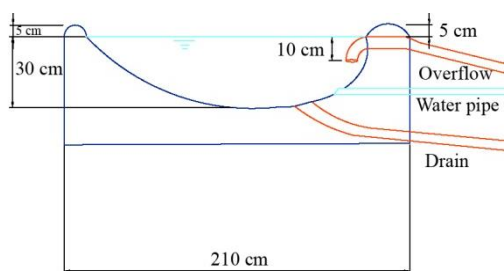
- For giving the birds a greater safety distance, was agreed to **use the entrance from the 2<sup>nd</sup> aviary as the main entrance**.
- **Is recommended to feed the birds through the mesh.** We must remember their cage = their territory. Like in the wild, if you approach their territory the pair feels threatened and leaves the nest. Install a 90 x 90cm feeding place close to the security cabin and feed the birds daily through the mesh without entering in the aviary and approaching to the aviary from under the aviary not from behind the nest platform. Try to avoid any movement behind the nest-platform, especially during breeding season.
- Bearded Vultures only take a mud bath if the mud rich in iron oxide has the ride consistence (sufficiently moist). To maintain the mud moist is necessary to install an impermeable structure where the mud can be placed. We recommend the **build a concrete mud bath in the middle of the 3<sup>rd</sup> aviary**, where mud rich in iron oxide can be provided every 15 days outside the breeding season (1m in diameter and 10cm deep). **It's possible to remodel the existing drinking bowl as mud bath.** Use only mud **free of any toxic substances** (heavy metals or other organic contaminants).





- All birds of prey drink and bath regularly. And especially during egg formation, females drink large quantities of water. The ancient drinking bowl is located just below the stone wall, from where the birds can dirty it with their own faeces.

**We suggest building a new drinking bowl about 2m far from the stone wall in the middle of the 2<sup>nd</sup> aviary.** That would give enough security distance to the nest and allow the keepers to enter in the aviary in case it's needed during the breeding season. This should have a soft access ramp and big enough to allow birds to bathe (210 x 130cm wide and 30-35cm deep). Is recommended to install a **mechanism that allows the drinking bowl to be regulated from outside the aviary**, what avoids disturbances by entering in the aviary during the breeding season. A **closed current water system with filters** helps to maintain the water clean and reduce the necessity to enter in the aviary.



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