Promoting happiness: Behavioural welfare assessment in captive red pandas (Ailurus fulgens)

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Introduction
Animal welfare is “the state of an animal when it attempts to cope with its environment”. In captivity, enclosure design poses a great challenge, as failing to meet animal requirements for adaptation often lead to development of abnormal behaviour (including stereotypy). This case study will investigate how the enclosure is used by two female red pandas (Ailurus fulgens) at the "Vogelpark Avifauna".

Material & Method
"Vogelpark Avifauna" currently houses 2 female red pandas (“Lisieux” (3 years) and “Paignton” (5 years)). The red pandas were housed in a 450m2 enclosure (15mX30m), which was shared with 2 female Red-crowned cranes (Grus japonensis) and 18 mandarin ducks (Aix galericulata) (figure 1).

Observational data collection took place from 15-01-2018 until 06-04-2018 using ZooMonitor.

The enclosure was cleaned on 01-02, resulting in a Pre-Cleaning and a Post-Cleaning period. Data on stereotypic behaviour (classified as weaving and/or do sentry-go) was collected using the all occurrence observation method. Location was noted every 5 min during the observation, using a pre-determined grid (figure 2). Heatmaps were then constructed using QGIS2 based on the usage percentage per location.

Results

Figure 2: The heatmaps show a clear preference for elevated structures, specifically the evergreen tree (83%). This is comparable with wild panda habitat use, as they live in subtropical forests, spent 84.3% of the time up high and are often predated.

Figure 3A: The pandas showed significantly less stereotypic behaviour after cleaning the nest boxes (Test p<0,05). It is possible stereotypic behaviour developed due to olfactory overstimulation, as both pandas defecated inside of all nest boxes.

Figure 3B: The red pandas also show a significant preference for higher located nest boxes (Wilcoxon signed rank test: Lisieux p<0,001; Paignton p<0,001), as box B2 & E2 were located roughly 4m above the ground, while box F2 & G2 were located roughly 2m above the ground. Wild pandas have a similar preference, as they rest high in trees and use evergreen trees as nesting sites.

Figure 3C: The occurrence of stereotypic behaviour before and after cleaning of nest boxes (Wilcoxon signed rank test: Lisieux p<0,001; Paignton p<0,001).

Recommendations
To ensure good welfare for captive red pandas enclosures should meet several requirements:

- Firstly, enclosures should contain enough climable trees and elevated structures, including at least one evergreen tree to hide in. They should preferably be connected, as both pandas rather stayed up high.
- Secondly, enclosures should contain high-level sheltered nest boxes, as higher boxes were preferred. However, it is important to keep these nest boxes clean. Otherwise, red pandas could develop stereotypic behaviour, indicating compromised welfare.

References