

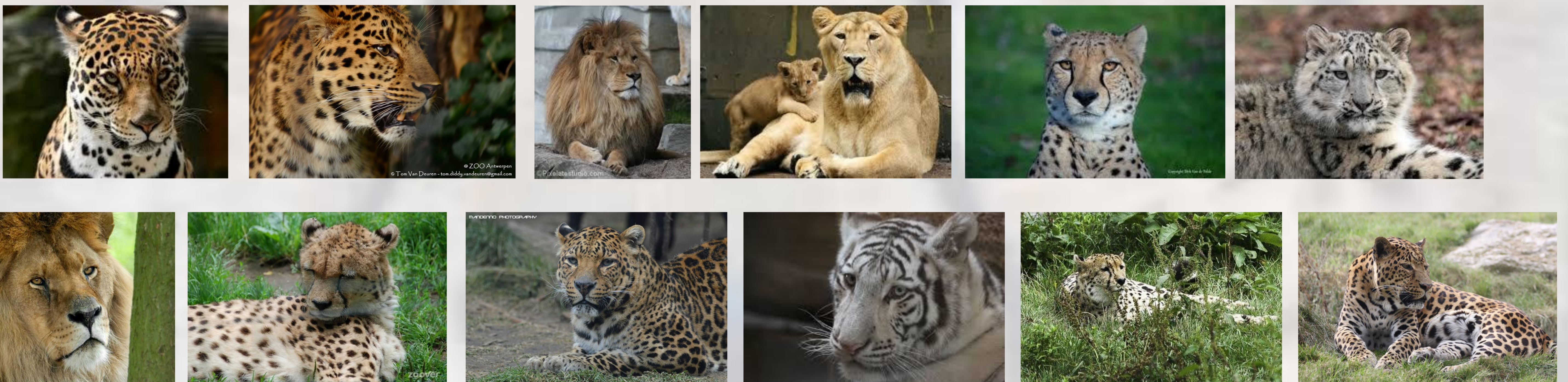
Inventory of stereotypical behaviour of cats in four Belgian ZOOS

The welfare perspective: zero-tolerance to pacing cats

The development of stereotypical behaviour in zoo animals is indicative of an environment in which the animals have unfulfilled behavioural needs and suboptimal welfare. Welfare researchers plead for zero tolerance and zoo visitors perceive stereotypical behaviour as problematic. Carnivore stereotypy levels are significantly predicted by natural ranging behaviour (e.g. home-range size and typical daily travel distances). Wide-ranging carnivores such as large cats are particularly sensitive to the development of locomotory stereotypical behaviour (Clubb & Mason, 2007). Pacing was found to be negatively correlated with enclosure size (tigers: Breton & Barrot, 2014). It has been suggested that stereotypical behaviour is a vanishing relic of old-fashioned zoos that is rapidly diminishing in modern zoos.

A sample of cats in a sample of zoos

We investigated the incidence of stereotypical behaviour of jaguars (*Panthera onca*), leopards (*Panthera pardus*), lions (*Panthera leo*), tigers (*Panthera tigris*) and cheetahs (*Acinonyx jubatus*) in four Belgian zoos (Olmen, Antwerp, Planckendael, Pairi Daiza). Management practices and enclosure characteristics were documented by observation and a questionnaire. Each enclosure was filmed twice during 20 minutes on four different days in a random order.



Results:

Five of the 22 adult individuals showed pacing, a locomotory stereotypical behavior, in four of the twelve enclosures: a jaguar (54.11% of the observation time), an amur leopard (18.84%), two cheetahs (24.97 and 2.31%) and an African leopard (51.43%). Other forms of stereotypical behavior were not observed. In a cheetah enclosure the pacing animals visually fixated the neighbouring antelopes. An African leopard stereotyped along the border with an Eurasian lynx enclosure. On two occasions aggression of a lion and a tiger towards visitors-behind-the-glass was observed. During most of the observations the animals were restricted to the outdoor enclosure and could not freely choose to enter the indoor enclosures. Most cats including night active species such as tigers, leopards, lions and jaguars, were restricted to smaller indoor enclosures during the night.

23% of the cats showed stereotypical behaviour: the percentage is lower than studies of a decade ago (78%: Lyons et al., 1997; 82%: Mason & Latham, 2004). Its' ontogeny is indicative of the need to revise different aspects of housing and management. The aim should be a zero incidence.

Causes of stereotypical behaviour:

- frustration, fear or discomfort : frustration-induced
- behavioural or physical trauma, chronic stress : malfunction induced (Mason et al., 2007)

Factors known to increase the incidence of stereotypical behavior:

- limited behavioural options & unfulfilled behavioural needs;
- absence of choice and control in general over aversive or attractive stimuli eg. prey that cannot be captured, absence of opportunity to retreat from visitors, ... (Clubb & Mason, 2007)

Some factors known to decrease the incidence of stereotypical behaviour in cat species:

- enlarged enclosure size
- unpredictable feeding regimes
- vistas with an outlook over the environment
- access to multiple dens
- choice and control over access to enclosures: keeping indoor and outdoor enclosures accessible (Clubb & Mason, 2007)
- other forms of enrichment (Mason et al., 2007; Mason & Latham, 2004).

There is still room for research on optimization of housing and management of large cats to reduce the development of stereotypical behavior and to reduce its' incidence in affected individuals.

References: Breton, G., Barrot, S. 2014. Influence of enclosure size on the distances covered and paced by captive tigers (*Panthera tigris*). *Appl. An. Behav. Sc.* 154, 66–75; Clubb, R., & Mason, G. J. 2007. Natural behavioural biology as a risk factor in carnivore welfare: How analysing species differences could help zoos improve enclosures. *Applied Animal Behaviour Science*, 102(3), 303-328.; Lyons, J., Young, R. J., & Deag, J. M. 1997. The effects of physical characteristics of the environment and feeding regime on the behavior of captive felids. *Zoo Biology*, 1997, 16(1), 71-83.; Mason, G., Clubb, R., Latham, N., Vickery, S., 2007. Why and how should we use environmental enrichment to tackle stereotypic behaviour? *Appl. Anim. Behav. Sci.* 102, 163–188.; Mason, G., & Latham, N. 2004. Can't stop, won't stop: is stereotypy a reliable animal welfare indicator? *Animal Welfare*, 13, S57-S69.