

**MS Thesis**  
**Department of Environmental Science and Policy**  
**George Mason University**

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Title: Maternal Behavior and Time Allocation of Red Panda (*Ailurus fulgens*) in Captivity

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**ABSTRACT**

An understanding of the behavior of animals in captive breeding programs is important for reproductive success and conservation efforts. In altricial mammals, sufficient maternal behavior is essential for the survival of the offspring. Red panda (*Ailurus fulgens*) is an endangered species with altricial offspring that remains in the nestbox for the first few months of its life. Captive breeding efforts to secure an insurance population of red pandas has resulted in a 40-50% neonate mortality. Despite the time in nestbox being crucial to the reproductive success of the red panda, not much is known about the behavior of red panda dam and her interactions with the cubs after birth and during cub-rearing season. This study first explored the post-parturition maternal time allocation of two subspecies of red pandas, *A.f.fulgens* at the Smithsonian Conservation Biology Institute (SCBI; n=4) and *A.f.styani* at Chengdu Research Base of Giant Panda Breeding (Chengdu; n=2). Dam behaviors on post-parturition videos recorded from the nestbox were analyzed continuously using Behaviour Pro application to measure duration of state behaviors and rate per hour of events. Resting and grooming made up the largest portion of time allocation per hour. Dams whom failed to rear their cubs to sexual maturity spent more time grooming compared to time spent resting, carried their cubs more than the dams who successfully reared their cub, as well as increased the time spent out of the nestbox away from the cub in the first 72hrs. This study also investigated the time

allocation of non-pregnant female pandas (*A.f.styani*) living in groups of more than three adults in Chengdu. The red panda is believed to be a solitary species; no prior research has investigated the behavior of female pandas in a social setting or non-breeding adults during the cub rearing season. Focal observations were conducted during the day using Behaviour Pro application to measure duration of state behaviors and rate per hour of events. Pandas in these social groups mostly performed non-social activities, such as locomoting and straddling. Gregarious behaviors (play, allogroom, and nose-nose) were seen more frequently in one enclosure while agnostic behaviors (aggressive and chase) were observed more in a second enclosure. Small sample sizes, high individual variation and differences in management strategies between the two facilities limit the ability to draw strong conclusions from these studies. Thus, more research on these topics needs to be conducted. However, the knowledge gained from these studies could be used to enhance cub survivorship through adaptive management as well as provide a foundation for more in-depth research to uncover the cause(s) of newborn cub mortality.