

**Follow up on:  
Behavioral study and analysis of social structures of  
four captive raised black bear cubs. (Ursus  
americanus)**

Done by Anne Hertel, 2009

Executed at the  
Cochrane ecological institute,  
Cochrane, Alberta, Canada.

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## 1. Introduction.

This bear behavioral study has been done in continuation of a study from last year. In April 2009 the CEI got four orphaned bear cubs, which they took care of. A student from Germany, Anne Hertel, did a behavioral study of the bears as a part of her intern at the CEI. She studied the bears activity level during the day and their social structure. Anne observed the bears during three plots of 15-17 hours. The first plot took part in their old smaller enclosure, the second plot during the first days in their new enclosure and the third plot after they had adapted to the new enclosure. Every day the bears were observed for several hours, in shifts of two hours. Every three minutes the kind of behavior each bear showed was noted. Therefore all kind of behaviors were summed up and divided in nine categories (ethogram). Four levels of activity were associated to the different behavior categories, beginning from 1 (very low) to 4 (very high). (See table 1)

To see the development of the bears and to see if there are some differences compared to last year, the study has been copied this year (May 17-20 2010). The four bears were observed from 5:00 till 22:00 and every three minutes the kind of behavior they showed was noted. The same ethogram was used. (See table 1)

The results of this study have to be read with the report Anne made to make it easier to compare. Suggested is also to first read Anne's behavioral study report before reading this report.

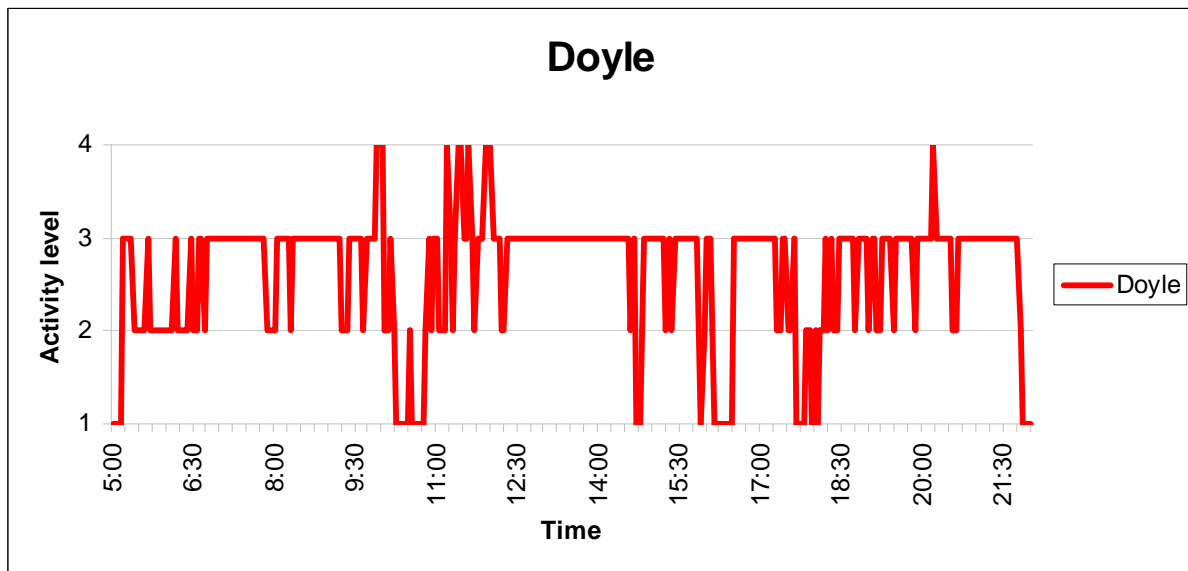
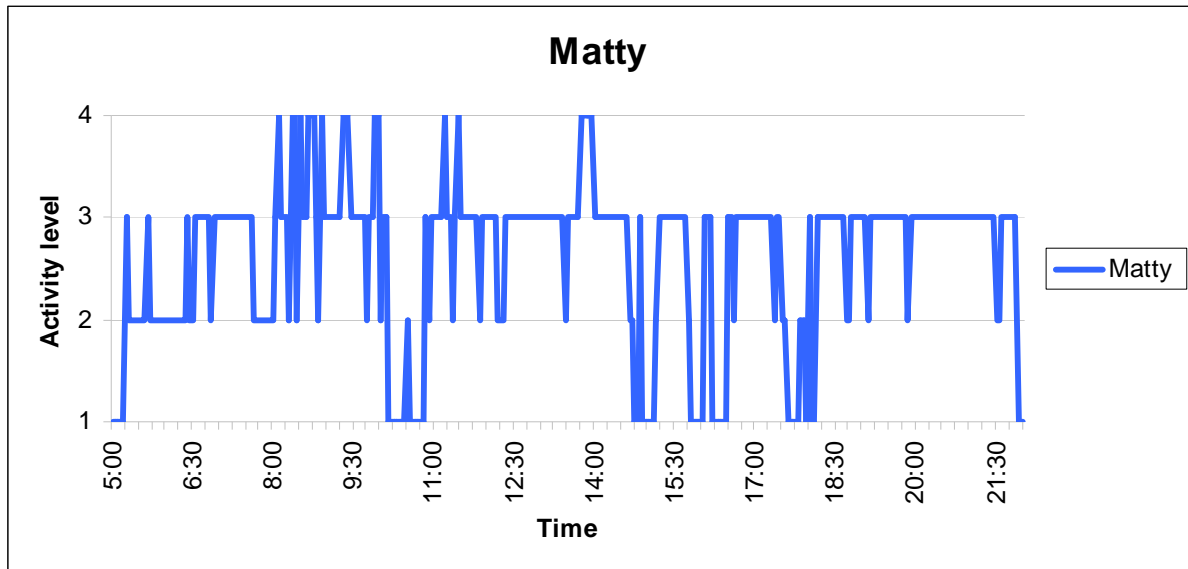
**Table 1: definition of behaviors and category of activity.**

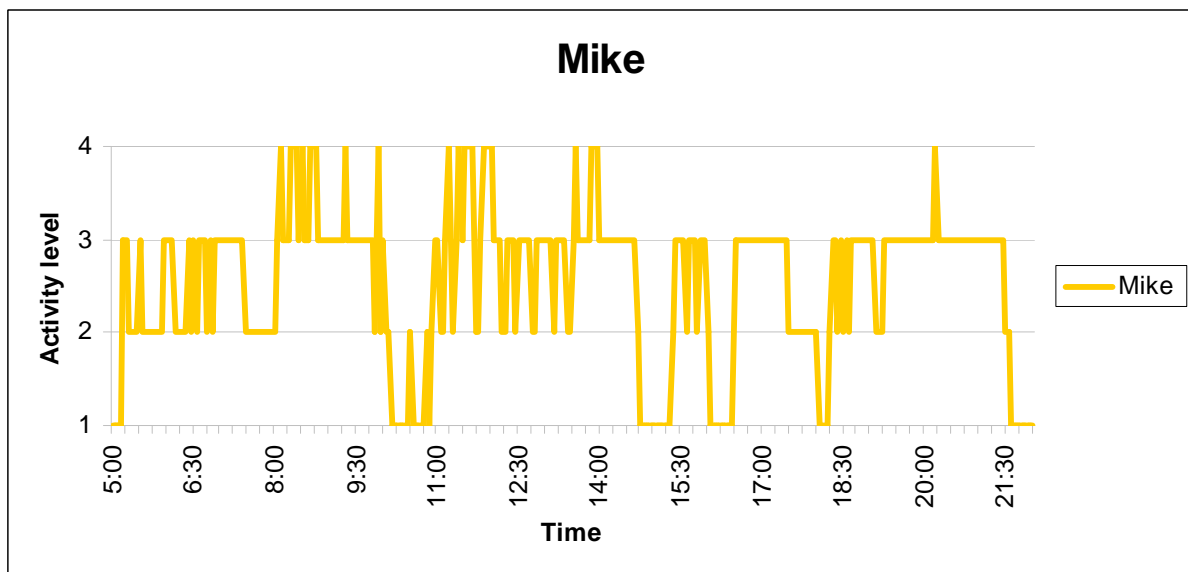
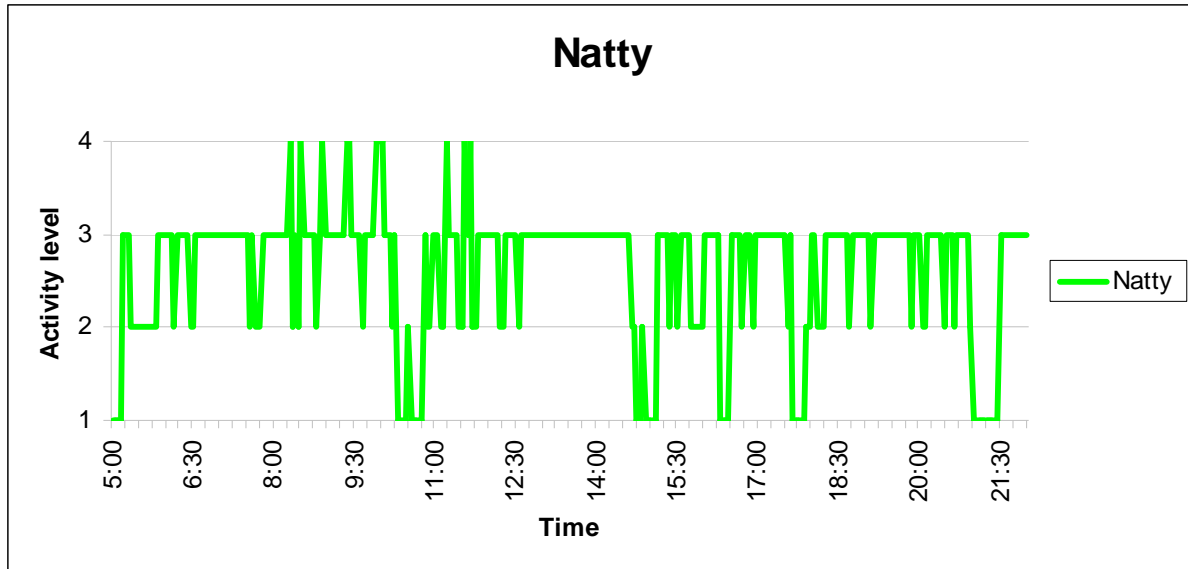
Shortage	definition	level of activity
S	Sleeping: very low level of activity, no movement	1
R	Resting: low activity, sickling, no walking	2
RT	Rest in tree: hanging out in the tree, low level of activity	2
W	Walking and investigating the enclosure, watching people	3
T	Teasing: interaction between the bears, no running	3
IT	In tree: activity while they are in the tree, no direct interaction	3
E	Foraging and eating: all activities which are correlated with the searching and consuming of food	3
P	Playing: lots of interaction between the bears, running around, high level of activity	4
PT	Playful activity in trees,	4

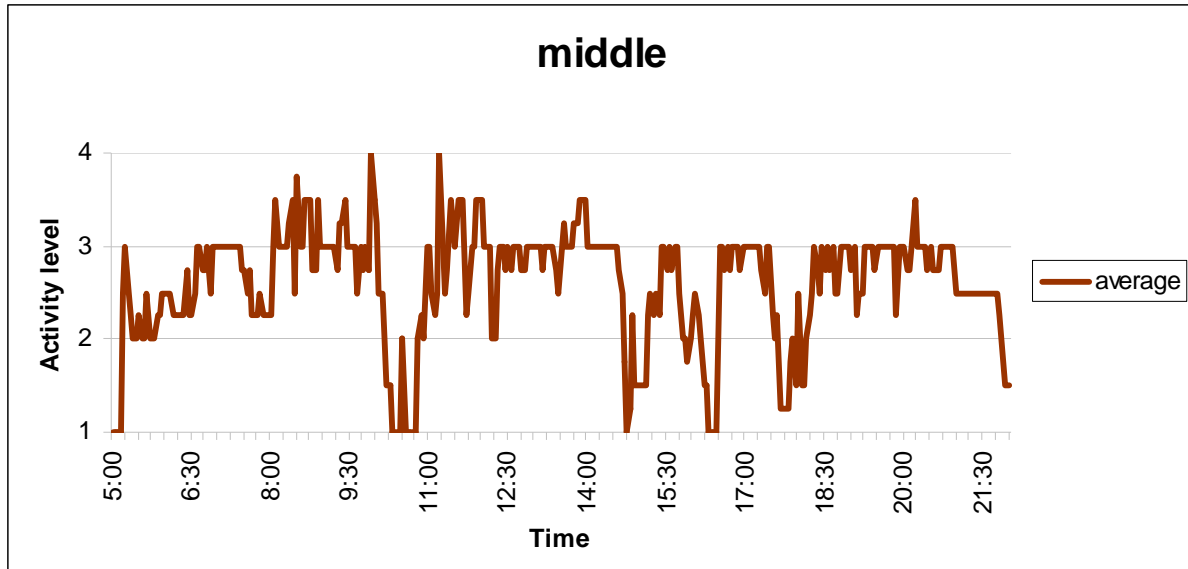
	direct interaction between the bears	
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## 2. The results.

### 2.1 Graphs of activity level during the day of each bear.







The four bears all show general a level three activity behaviour with some resting/sleeping periods and with some play periods. The average activity of each bear during the day is: Natty – 2.63, Matty – 2.60, Mike – 2.55 and Doyle – 2.62.

Most play behaviour is shown in the morning between 8:00 and 12:00. Why the bears did not play in the afternoon is not known. A Possibilitie is that it gets to hot in the afternoon. Another possibility is that the bears in general get fed around 15:00 and are more focused on eating. Doyle showed the least playful behaviour which was also the fact last year.

Compared to the study last year and especially the data from the second observation period in the bigger enclosure, because that's the same area where the bears are right now, the bears sleep more during the day. In last years data the bears did not sleep during the day and now they did. This can possibly be because it is a different observer, so behaviour can be judged differently or the bears did really change some behaviour and start taking a couple of naps during the day.

Another aspect is that the bear's activity level was more stable in the data from last year. There are far more peaks in these graphs with the data from this year compared to the graphs with the data from the second period in the bigger enclosure last year. This too can maybe be explained by the fact that it were to different observers.

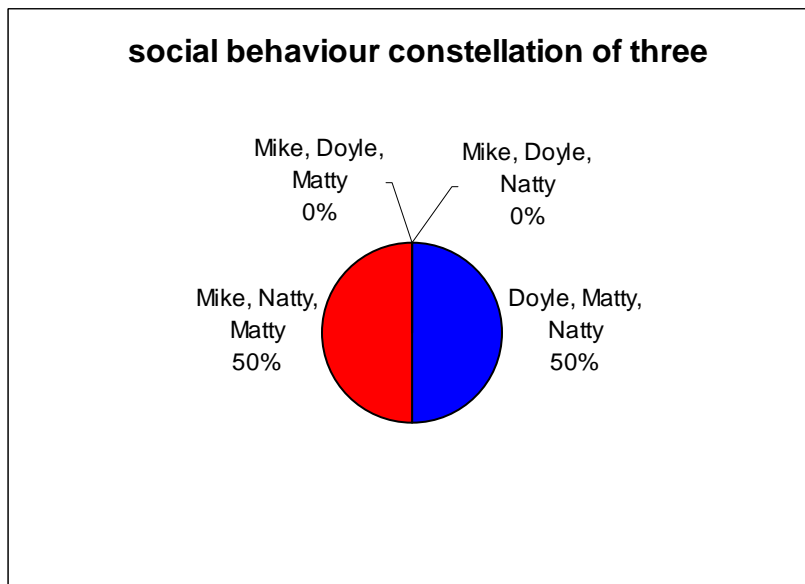
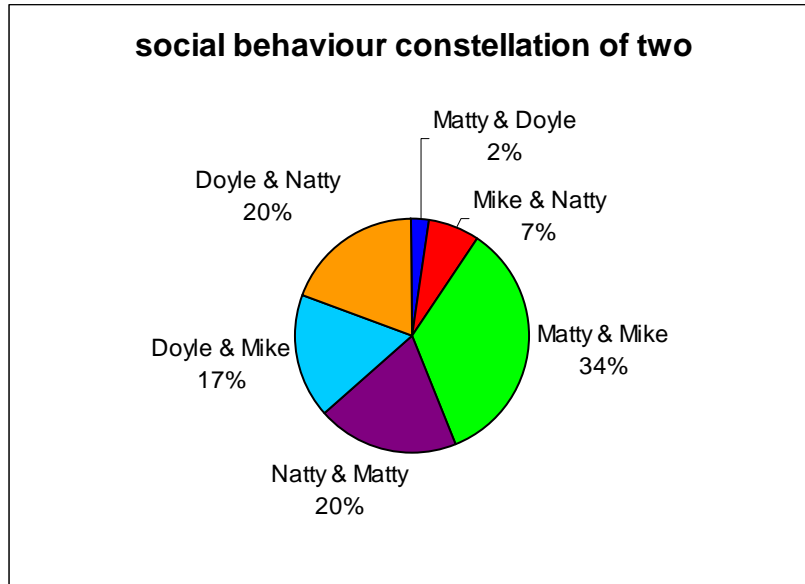
## 2.2 Social behaviour.

Striking is that all four bears keep pretty close to each other. If one wandered away, the rest would soon follow. If one would go lay down for a nap, the others would follow. If one would climb up a tree for a rest, the others would soon follow. Etc. There are of course some exceptions but in general you could say that the four bears are always together. When one is wandering of in general it is Mike the only male and the three females follow him.

If there is any separation than it would be that Mike the only male is more on his own, this by wandering of more than the females or sleeping/resting at a little distance from the females.

To get a percentage of social play or teasing behaviour between the bears it was noted down which bear's were playing together when this behaviour occurred at the three minute interval.

Graphs of social play or teasing behaviour between the bear's.





There were hardly times that three bears played together. It was normally two bears who would play together. During the observation time it happened twice that three bears were playing together.

Matty and Mike played the most together, Matty is the most outgoing (if you can say so) female and she was often playing with the slightly bigger male Mike.

Striking is that Matty and Doyle although they are (most likely) sisters, played the least together. In general you would expect that they would play a lot together, because they share a bond, but these data proves otherwise. Maybe the bears when they all got together as orphans more or less excepted each other as brother and sisters, not looking at their genetic bond, but because they were raised together. Which could explain why Matty plays not mainly with Doyle, but this is just speculation.

A lot of playful behaviour was around the water tub. They would run up to it, jump in the tub, walk on the edge, etc. If they played around the tub on purpose to be able to cool down when they were very active is also speculation, but it is a possibility.

### 2.3 Absolute number of hours.

**Table 2: absolute time each bear spend with playful behaviour.**

	Natty	Matty	Mike	Doyle
Minutes	60	78	90	51
hours	1	1.3	1.5	0.85

There is a big difference between the bears with the amount of playful behaviour. Especially between Mike and Doyle. In the study from last year Doyle was also the least playful one of the four and Mike in general the most playful one. In the study from last year there was less of a gap between Mike and Natty and Matty. And Natty was the one who was more playful of the three females and now Matty is showing more playful behaviour. Mike and Doyle's playful behaviours have not really changed over the winter, but Natty seems to have settled down a bit and plays less, while Matty is spending more time with playful behaviour.

When the bears are playing with each other, Natty and Doyle don't have long plays with Mike, they probably find him a bit too rough and intimidating. Matty on the other hand really goes after Mike and is rough to him.

The amount of time each bear spent with playful behaviour last year in the second study in the new enclosure was 66 minutes, 1.06 hours. Mike and Matty are playing more right now, Natty almost the same and Doyle spends less time with playful behaviour. A possibility for these changes can be that the bears are growing up and are now showing more of their grown up personality. While they were cubs before who naturally play a lot, now they are more developing their personality.

**Table 3: absolute time each bear spend with eating and foraging.**

	Natty	Matty	Mike	Doyle
Minutes	414	378	360	378
hours	6.9	6.3	6	6.3

Compared to the data from last year the bears spend way more time eating and foraging. Last year in the data from the second study in the new enclosure they spend 4.12-4.36 hours eating and foraging. Now they spend around a 2-3 hours more each day eating and foraging, which can be due to their growth. The bears are still growing but are also way bigger than last year fall already. So they need to eat more to keep their bigger body going and need to eat for their growth.

Striking was that the bears were grazing a lot to. The grass in their pen is short compared to the pens beside theirs where grazing animals like deer and bison live. Also al the new growth from both deciduous trees like aspen and the spruce trees were eaten by the bears. All the new leafs on the aspen trees were consumed and in general there was not a lot left from the trees. In the spruce trees a lot of the branches are broken from the bears attempt to get to the new growth.

Most of the rocks in the pen have been rolled over a couple of times in search for insects.

The bears are still attracted to humans. When people are around the bear pen, the bears come to check what they are doing and to check if there is any food. The bears are also very keen on the sound of the little food wagon, because they know that they will get food. In the afternoon they hang out in the area of the platforms where they are fed from.

### **3. Conclusion.**

Comparing the results from this study and the study from last year can really show us some changes in the bears behaviour. We have seen some personalities change. Natty is settling down more and is less playful then last year, while Matty has become way more playful than she was and giving Mike a hard time with their play fights. Doyle is still the same, always the last one to come somewhere, a little hesitant and when something scares the bears, Doyle is the one who is the first one to climb up a tree. Mike is also still the same, being the only male, a bit bigger and rougher in play, he wanders of more as male cubs in the wild would do, checking his boundaries more.

A huge change as well is the amount of time spend with foraging and eating. In this data the bears spend 2-3 hours more during a day on foraging and eating than the results from last year. This could be due to their growth. A bigger body needs more food to keep on going and the bears are still growing so they need food for that as well.

The amount of playful behaviour changed as well for the bears. Some played more than the results of last year, some played less. This can be due to their personality changes, becoming a more grown up bear. Doyle played less then last year, he was already the bear that played the least. Natty was the playful one last year, but settled down this year. Matty on the other hand played more than last year and played a lot more with Mike. Mike, being the only male, also played more than last year, which can be a training for him for when he is an adult and has to fight with other males for the right to mate with a female. And Matty being a tough female, was his playmate.

Comparing the social behaviour between the bears is not really possible, because two different methods were used. While in this study the social behaviour was connected to their play, in last years study social behaviour was also connected to all other behaviours.

This shows also a weak point in this study, that the study was done by two different observers. When you have two different people doing the same study you always have a bit different results. You don't judge behaviours the same every time. And if one part of the study is not as clear, when data and results are done by personal judgement, than it is almost impossible to copy the study by a different observer. Two different observers just do not judge the same. When one judges that two bears were long enough (2 minutes) with each other to get a mark, the other can judge it different and does not think it was long enough.

Both studies are a good help to get to know the behaviour of the four bear cubs better, but are not conclusive. It also has to be considered that both studies were not done by highly educated professionals, but by young people learning who don't know everything about bear behaviour.