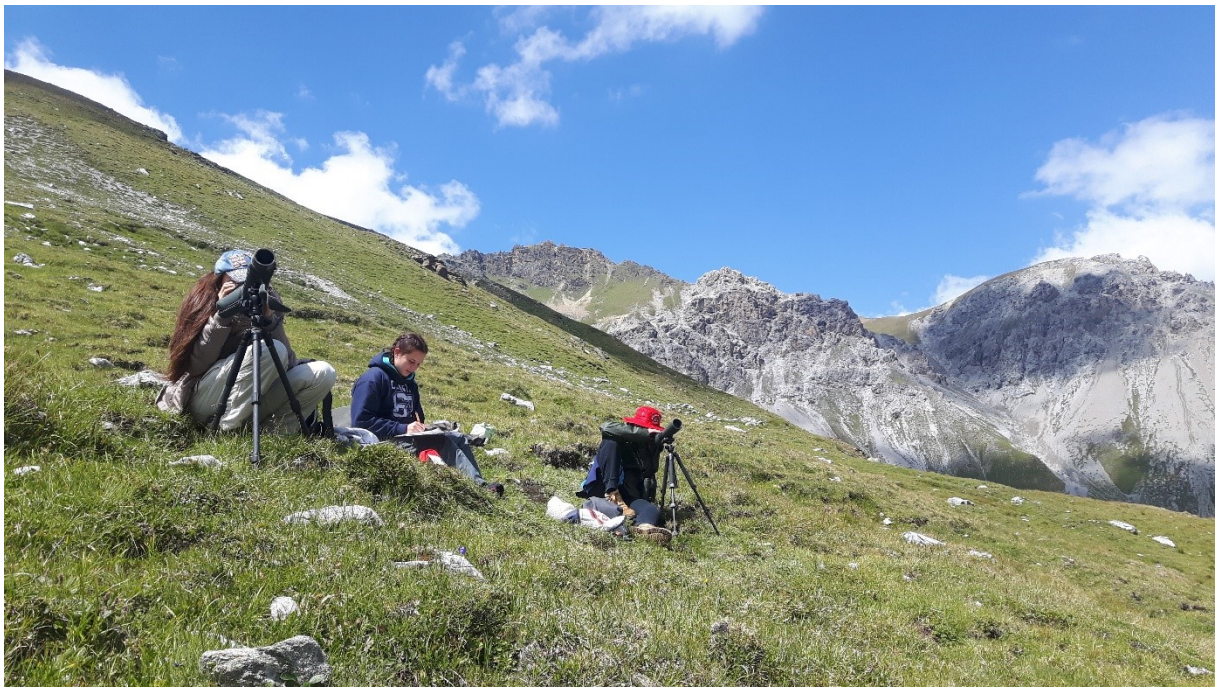
SCHWEIZER JUGEND FORSCHT
LA SCIENCE APPELLE LES JEUNES
SCIENZA E GIOVENTÙ
SCIENZA E GIUVENTETGNA

PROJECT REPORT: **International Wildlife Research Week**

"Eat to live, don't live to be eaten!"



Apollonio D.[1], Geneux M.[2] & Oricchio G.[3]

ITI Omar, Novara, Italy[1], Gymnase de Marcelin, Morge, Switzerland[2], Liceo Lugano 2, Lugano, Switzerland[3]

Supervised by: Arno Puorger

Date: July 27, 2018

Abstract:

We decided to conduct a study about Alpine chamois (*Rupicapra rupicapra*) and Alpine ibex (*Capra ibex*). We did our observations on 3 days. The first day was to get an idea about the behaviour they have and the two other days were used to collect the data needed to answer our question. The aim of the study was to investigate the distance between the animals in their respective groups (that we called individual distance) and the activity they were doing. We first wanted to know what the typical individual distance in the two species is. We then tried to find out what influences the individual distances in each species and compared distances at different activities like feeding, moving, vigilance or resting. The distances were just slightly different between the two species and varied more with their behaviour in both species. We suggest that the individual distance is an adaptation to dangers both species have together in their environment because both species behave in a similar way in similar situations, especially in danger.

1.Introduction

Alpine chamois (*Rupicapra rupicapra*) and Alpine ibex (*Capra ibex*) both live in groups, composed of males or females, with their babies of both sexes. Both species live in the same habitat even if ibex tend to go a little bit higher to cooler temperatures in summer. The ibex being a little bit bigger than chamois (35kg to 100kg for adult Ibex and 25kg to 40kg for adult Chamois) (Gressmann et al. 2017) the first idea that came to our mind was that the chamois could be inferior to the ibex. During the first day in the field, we observed that chamois once ran away from the ibex for unknown reasons. Before leaving their location, there was a time where they looked around the area. We saw that they were usually changing their individual space and tended to be closer to each other before running than when they were resting. The ibex didn't move much, they seemed to be trying to hide from the sun at that point of the day and they were more relaxed than chamois. We did not find literature about individual distances in Alpine chamois and Alpine ibex and because of that, we tried to find an answer to these questions:

1. "What is the typical distance between each animal of a group in Alpine ibex and Alpine chamois?"

2. "Does it vary more between species or between common behaviours?

We hypothesized that chamois will be closer to each other than ibex to communicate better to each other in case of golden eagle (*Aquila chrysaetos*) attacks. According to Mueller and Mueller (2004), chamois, apart from humans, have eagles as main predator (because there are no lynx in the study area). Eagles eat chamois kids regularly and might also eat ibex kids, but only occasionally (Mueller and Mueller, 2004).

2. Material & Methods

Our study took place in the Umbrailpass, Val Muestair, Switzerland. The study area extends from 2200m to 2900m, with the vegetation zones: Alm Meadows, Open grassland, Cushion

plants, Mosses and Lichens. But the landscape is characterized mainly by grassland and rocks and snow from the end of November to the end of May. In July, the min. daily temperature recorded was 3 celsius degree, and the max. daily temperature was 13 degrees celcius (NOAA, www.necd.noaa.gov, visited 26.07.2018). All measures are given in body length of the respective species.

Material:

To observe the animals we used three Swarovski binoculars, in particular the EL type (8,5 x 42 and 10 x 42) and two spotting scopes Swarovski ATS type (20-60 x 65) with tripods. We also used maps from swisstopo (Swisstopo, www.map.geo.admin, visited 26.08.2017) with a scale 1:10'000 to write down the position of ibex and chamois with points.

Fieldwork Methods:

We began our research work on the 23.07.2018 and we finished it the 25.07.2018. The first day we did the "preliminary observations", which means that we spent 8 hours observing the behaviour of the animals in the study area, to know the place, to be able to formulate questions and hypotheses and then choose the right measures and recording methods required to answer our question. To take the data of the groups (a group was defined as at least two adult animals of the same species following each other and staying with each other in case of moving), we divided the work: two people watched into the spotting scope and the third person wrote down where the ibex and chamois are on the maps and what they are doing (See table 1).

Table 1: Definitions of behaviours in this study.

Name	Description
resting	the animals are lying on the floor immobile
feeding	the head is in contact with the floor or below the body
staying alert	watching with the head up the body
moving	running away or when they make at least 6 body lengths in 10 seconds)

The second and the third day, we began collecting data: we went on the study area at 6 a.m. because ibex and chamois are mainly active during the morning and the evening because they don't like the heat and tend to rest (Gressmann et al. 2017) and we wanted to observe them when they are active. We finished at 12 a.m. because it is difficult to see ibex or chamois that are not resting or hiding at this time of the day. To collect data, we used the focal sampling method. We first searched one or more groups, then we randomly selected a focus animal of the group (but it should be an active adult and, we should be able to see another group member) and then we approximated the distance to the closest group member in terms of body lengths (which will be called *individual distance* in this report) and its behaviour.

Data analysis:

Eventually, to compare the results, we calculated for ibex and chamois the average of individual distance and their standard deviations. To see how the individual distances vary as a function of activity, we also calculated the average of the individual distance of the ibex and chamois during their different activities (feeding, moving, resting, alert).

3. Results

All measures below are given in body lengths of the respective species

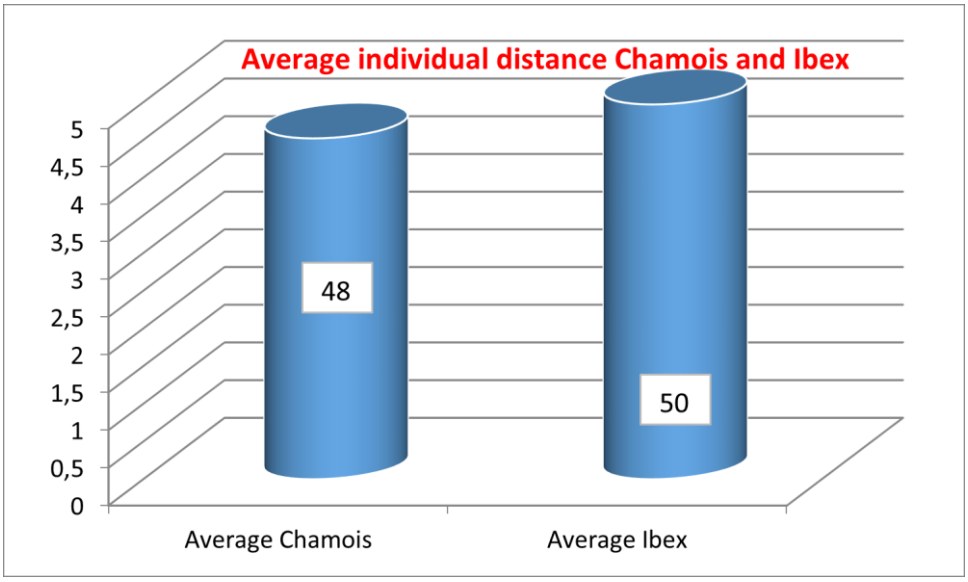


Figure 1: Average individual distances for chamois and ibex. Sample sizes are given in the white boxes.

Table 2: Descriptive statistics of the individual distances of chamois and ibex.

	Nr. Animals	Average D (± SD)	Smallest D	Biggest D
Chamois	48	4,52 (± 3,39)	0,5	20
Ibex	50	4,97 (± 3,37)	0,5	10

Difference between the two distance averages = 0,45
Nr. Animals = Number of animals
Average D (± SD) = Average distance (± Standard deviation)
Smallest D = Smallest distance
Biggest D = Biggest distance

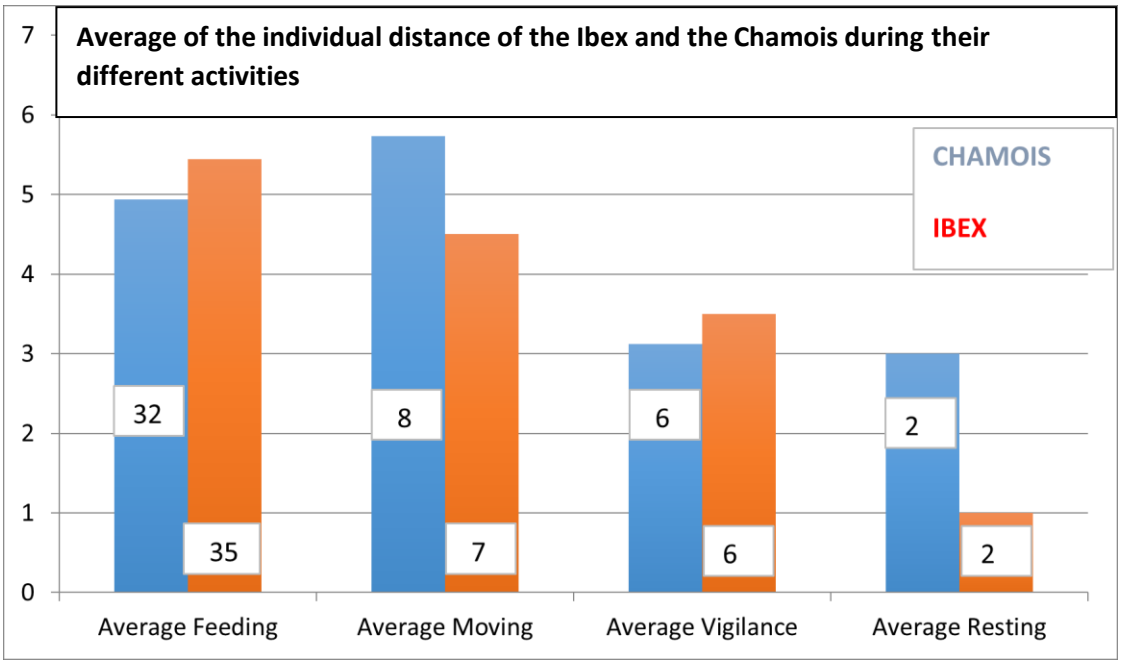


Figure 2: Individual distances of chamois and ibex in relation to their behaviour. Sample sizes are given in the white boxes.

Tabella 3: Individual distances for ibex and chamois during different activities.

	Feeding	Moving	Vigilance	Resting
Average ID C (± SD)	4,94 (±3,45)	5,73 (±3,47)	3,12 (±3,50)	3 (±0)
Average ID I (± SD)	5,44 (±3,37)	4,5 (±3,08)	3,5 (±3,39)	1 (±0)
Smallest DC	0,5	1	1	4
Smallest DI	0,5	1	0,5	1
Bigest DC	14	20	7	4
Bigest DI	10	8	9	1

Average IC C (± SD) = Average individual distance chamois (± standard deviation)
Average IC I (± SD) = Average individual distance ibex (± standard deviation)
Smallest DC = Smallest distance chamois
Smallest DI = Smallest distance ibex
Biggest DC = Biggest distance chamois
Biggest DI = Biggest distance ibex

Tabella 4: Number of chamois and ibex observations during different activities.

	Feeding	Moving	Vigilance	Resting	Total
Chamois	32	8	6	2	48
Ibex	35	7	6	1	49

4. Discussion

As for the difference between chamois and ibex, we can see on the graphic that chamois tend to be a bit closer to each other than ibex. Therefore, the golden eagle could really play a role in the individual distance for chamois than for ibex, as we expected.
Another interpretation of the higher distance in ibex's groups is that there is a higher difference in social rank, because some ibex groups include young to old individuals, which is not so highlighted in chamois groups. This different social position in the ibex groups can make ibex's individuals more detached than chamois individuals.
But in our results we can notice for the both groups the averages of the individual distance of ibex and chamois during their different activities are higher for the feeding and moving activities than the resting and vigilant behaviour and that can be because while they are feeding they take more space to find the right place to browse on grass; and when they move, they have different speeds and that could make the distance higher.
Quite the opposite, when the animals are resting or vigilant, both species tend to be closer to their group mates, maybe to communicate better about common dangers (humans, avalanche, rock fall) which are more decisive on the behaviour evolution than eagles. We have also to add that we only took two observations about resting animals, for this reason, our interpretations about resting have to be interpreted with caution.

5. Acknowledgements

We want to thank the Swiss association Schweizer Jugend forscht, Stiftung Mercator Schweiz, and Proloco di Cureggio e Fontane to giving us the possibility to take part in this camp; our guides Claudia Baumberger, Jonas Landolt, Irene Weinberger and our cook Gilbert Chanton for making this week a beautiful one and especially a huge thank to Arno Puorger our supervisor for his big help and patience.

References

Müller, F., Müller, D.G 2004. Wildbiologische Informationen für den Jäger. Kessel, Remagen.

Deutz, A., Gressmann, G., Grünschachner-Berger, V., Filli, F. 2017. Gams-, Stein- und Muffelwild. Leopold Stocker, St. Stefan.

Swisstopo, https://map.geo.admin.ch, last visited: 26.07.18.

National Centers for environmental information, https://www.ncdc.noaa.gov, last visited: 26.07.2018.