WORKPACKAGE 3 – INTELLIGENCE AND ADAPTATION

DELIVERABLE 20 – ANALYSIS OF REPORTS FOR TARTU THROUGH SEASONS

CONTEXT

GENERAL CONTEXT

Solutions for cohabitation between species, especially between humans and other animals, are not easy to generalize successfully. A lot of factors must be taken into account, from ethological point of view, from anthropological point of view but also from a semiotic point of view. One of the least taken into account aspects is probably the animals' agency.

We know that animals of the same species don't communicate, behave or interact in the same way in different places (Freeberg, 2012; McGowan, 2001), sometimes even leading to geographical cultural norms (Whiten, Horner, de Waal 2005). Again, the particularly complex cognitive abilities of corvids (Fleming, 2010) make them very interesting subjects for a case study about animal agency.

INSIDE THE PROJECT

As the project aims to propose semiotic solutions for cohabitation that could be generalized, different aspects have to be taken into account, and this case study aims to address the question of animal agency. By studying the behaviour, habits, geographical and cultural norms of corvids, this step aims to map more precisely the way corvids adapt, understand and create semiosis in their environment, in order to understand on which points a generalization of solutions would have to focus.

RESEARCH QUESTION AND HYPOTHESIS

QUESTION AND SUBQUESTION

This deliverable is part of the Case study 3, aiming to study the relationship between the agency of some liminal species, like corvids, and the generalization of semiotic solutions for a better cohabitation of species in cities. The main question of this Case study is: How can we generalize semiotic solutions for human/animal cohabitation in different environments/cities?

This field reports' analysis is a part of the fieldwork distributed during all the length of the project. This fieldwork aims more precisely to answer the question: What elements of behaviour should be acknowledged when trying to generalize a semiotic solution?

HYPOTHESIS OF THIS STEP

The general hypothesis of this Case study is that some species are particularly well-adapted to human contact, and their behaviour can be different depending on the behaviour and culture of the humans they live with. Their adaptability and intelligence must be taken into account when exporting urbanism solutions to another country, culture or climate.

The precise hypothesis of this step is that some behaviours that need to be acknowledged have patterns that can be seen and recorded, and that are evolving and changing through the year.

METHODOLOGY

METHODOLOGICAL CHOICES

Observations were done during an entire year and documented by notes (see Field diary in the Documents section) and recordings. Videos and photos were archived on an external hard drive (see the Documents section for the nomenclature of the files). Special notes were made about:

- change of behaviour, including change in the repartition of species through the global area
- signs of stress-free attitude in situations than could have been stressful
- aggression behaviours (real aggressions, fake aggressions, threats) towards conspecifics or other species
- unexplained but repetitive behaviours
- exceptional and impressive behaviours

The entire observations were then reviewed in order to extract patterns of behaviours and potential sensitive points for cohabitation.

ISSUES AND PROBLEM-SOLVING

A general issue of the project is that one year is enough to have a complete observation, but probably not enough to have a perfectly representative one. Therefore, some behaviours may still remain unnoticed and undocumented.

Another issue was that crows tend to change spots throughout the year, depending on the weather and their own biological cycle. It was sometimes difficult to find their new spot when they changed. Help about that was provided by Timo Maran and Lona Päll (Semiotics Department).

Also, it must be noted that, since the crows are not identified, there is no way to be absolutely sure that the group that disappeared from one spot was the same that was then found in another. This part could not be solved, but suggestions will be made regarding this aspect after learning from the methods of the French National Natural History Museum (see document I2).

POINTS OF VIGILANCE

This investigation does not take into account exceptional climatic events that can occur from one year to another. It does not take into account changes in behaviour that could be linked with major urban plans and planned works, like the ones happening two years before the start of the project in the area of the new Delta Centre for example.

RESULTS

RAW RESULTS

AUTUMN OBSERVATIONS (SEPTEMBER – OCTOBER – NOVEMBER)

Some interesting behaviours were observed, like stealing food, foraging garbage or gathering in trees, all being possible nuisances for humans. Of all of them, it appears that only the behaviour involving garbage was reported by inhabitants as a nuisance.

Some behaviours, previously seen in Paris, seem to be absent (like destroying grass to find precise kinds of insect larvae). After discussion with Frédéric Jiguet (CESCO, MNHN), it appears that the larva crows are looking

for in Paris (*Amphimallon majale*) is not present in Estonia, explaining a less destructive behaviour regarding this aspect.

Some behaviours, never seen in Paris, were observed here, like throwing moss from the roof, probably foraging for insects. This behaviour remained rarely observed.

Some patterns of cohabitation with other species seem to emerge: no stress from *Corvus cornix* around small birds or *Coloeus monedula*, signs of tension and food competition around *Corvus frugilegus*, important stress with alarm call around the Charadriiformes family. This was later nuanced, since most of the time the cohabitation between *C. cornix* and *C. frugilegus* is very peaceful (exceptions will be found in the nesting season and when the environment became extremely competitive for food).

WINTER OBSERVATIONS (DECEMBER – JANUARY – FEBRUARY)

A much clearer distinction between "feeding areas" and "resting areas" seems to appear, with feeding areas in the centre of Tartu (where human activity makes finding food easier, by dropping it or melting snow with cars or heavy pedestrian traffic) and resting areas in the suburbs (heavily covered by snow).

Patterns of cohabitation seem to evolve in these conditions, with a lot of aggressive behaviours against any other species in feeding areas, especially pigeons, and no sign of stress at all against any other species in resting areas.

SPRING OBSERVATIONS (MARCH – AVRIL – MAY)

Some nesting behaviours (gathering materials, building a new nest or fixing an old one) were observed for *C. frugilegus* and *C. cornix*. *C. monedula* was found much later, in summer.

Some registered former nesting areas are still unoccupied this year, and the state of some nests indicates that it was probably the same last year. It appeared that the construction of the Delta Centre had modified profoundly the use corvids are making of the riversides of Emajõgi.

Previous cohabitation patterns, observed in autumn and winter observations, are now absent: nesting areas are clearly "monospecies" (or at least presenting only one species of corvids, it is still possible that smaller birds, like *Cyanistes caeruleus*, *Parus major* or *Passer domesticus*, also observed in these areas, also nest near corvids groups).

The nesting area was clearly identified for *C. frugilegus*. Nest building was observed for *C. cornix*, and more observations are necessary to confirm the nesting area. The nesting area of *C. monedula* is still unknown, but observations made by Timo Maran suggest that Raadi Park could be a relevant spot. There were eventually found in Raadi Cemetery.

Vocalizations increased, but this is not specific to the corvid family.

No attack, or even aggressive behaviour toward humans has been observed in these nesting areas.

SUMMER OBSERVATIONS (JUNE – JULY – AUGUST)

The nesting areas, especially Raadi Cemetery, have been completely deserted by all three of the species.

Important Autumn observations spots are starting to be full of individuals of all three of the species again.

Contrary to what was observed during nesting season, aggressivity between species seems to have completely disappeared.

Individuals were also much calmer and more stress-free around other city species, like humans or dogs.

INTERPRETATION

ETHOLOGY

All the three studied species seem to be very well adapted to the city. No pathological behaviour was observed, and very few sick, injured or deformed individuals were observed. All the ecological behaviour mandatory to a good functioning of the species seem met (nesting in safe area, foraging with low competition, finding enough food to feed younglings, having spots to gather in big groups etc.).

In this sense, it is safe to say that the city of Tartu is a completely ecologically fitted environment for the studied species.

INTERACTIONS WITH OTHER SPECIES

No direct predatory behaviour towards small species was observed from the studied species. The behaviour of small birds in their presence (Entry n°13) is a sign that small birds are not expecting predatory behaviour from crows towards them. If such a behaviour exists, it is extremely rare. It is probably more frequent towards eggs or younglings of these small birds, and could be the reason why the ones nesting in the same area than crows are building nests inside trees' trunks (Entry n°45).

Aggressive behaviours towards medium-size birds, like pigeons, were only observed in a context of important competition for food due to heavy snow (Entry n°25b) or of nesting behaviour (Entry n°41). Most of the time, cohabitation is very peaceful.

Behaviour towards large-size birds, especially gulls, is going from avoidance most of the time, to intimidation attempt in case of food competition, to flight in case of aggression in defense of a nesting area. Crows seem to avoid conflict as much as possible and prefer flight inside of fight. The only systematic aggression towards a bird larger than them was when encountering a buzzard (Entry n°26): even if it was not displaying any sign of aggression, it was actively chased away by crows. It is possible that the predatory behaviour of this species is considered as much more serious than the one of the gulls, resulting in a "zero tolerance policy" from the crows.

INTERACTIONS WITH HUMANS

The usual behaviour of crows towards is a completely stress-free behaviour. They usually tolerate proximity as close as 2 meters (Entry n°4) is static, even closer when the individual is walking and passing by without any attention towards them, and up to 30 centimetres in static in case of necessity (Entry n°25b).

Humans accompanied by dogs do not seem to create any more stress (Entry n°54). Behaviour towards cats could not be observed. In all cases, this stress-free behaviour indicates that cohabitation is generally going well between crows and humans. As crows are able to long-term memory and peer-transmission (Marzluff et al., 2010), malevolent behaviour from humans would have created much more cautious general behaviour patterns.

Aggressive or intimidating behaviours towards humans have been reported exceptionally during nesting season (Entry n°46). Marko Mägi (National Natural History Museum) describes them as a "matter of personality", meaning that, even in a stressful situation during nesting season, aggressive behaviour is not a standard answer: only some individuals will resolve to that extremity.

INTERACTIONS WITH CITY INFRASTRUCTURES

No important degradations have been observed towards city infrastructures. Degradations of gardens and plants were observed as very mild, an information confirmed by Lauri Laanisto (National Natural History Museum).

The main issues with crows remain the droppings and the waste management issue they create by foraging in trash bins. This last behaviour seems to be more intense during autumn (Entry n°70). As it is a period when the ground is not frozen, this behaviour could probably be solved by a better trash management (they seem to be able to open trash bins lids, but only when they are already a bit overfull, for example) without damage for the individuals: it can be considered, during this season, as an opportunistic behaviour, not a mandatory one.

MILESTONE 3 – PROGRESS REPORT

IMPACT OF RESULTS

This step is an important sum-up of all the previous deliverables made in Tartu (Deliverables D12 to D15). It allows us to understand how, in the same city, seasons are influencing behaviours and potentially how nuisances can be different in the same city, with the same species, towards the same inhabitants, only because of the natural cycle of behaviours.

ISSUES, PROBLEMS OR LACKING

The time of the project is, still, quite short. Especially in a context of global climate change, unusual weather, temperatures, climate events (wildfires, tornados etc.) could also have a deep impact on the species that are not taken into account here.

NEXT STEPS

The next step is to propose another kind of field report analysis, this time focusing on one unique season but through the different cities (Deliverable D21).

GENERAL PROJECT – CURRENT STATE OF PLAY

IMPACT OF RESULTS

These results are not yet fully relevant, since they also must be compared with the cross-analysis through cities, but they can still be considered useful for a local aspect.

PROPOSITIONS FOR OTHER ASPECTS OF THE PROJECT

ACADEMIC ASPECTS

These results can be added to the results of Workpackage 2 (see document M2), in order to be introduced to potential international partners that could be interested in the “diagnosis” aspect of the project (see document I3).

POPULARIZATION ASPECTS

These results will be used to enforce the guidelines for dissemination and general audience communication that will be proposed in DM2.

NEXT STEPS

This analysis and the one made through different cities will be cross-analysed in Deliverable D22.

ANNEXES

REFERENCES

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DOCUMENTS

Field diary (PDF – version 01/12/2022)

Nomenclature (xls – version 17/11/2021)