

PROGRESS REPORT

With this project, which started in November 2022, we aimed to carry out three main activities (as follows):

- (i) non-invasive sampling
- (ii) monitoring the area for the presence of wolves and jackals using drones, and
- (iii) surveys of the local community.

Evidence for each of the activities is provided below.

(i) Non-invasive sampling - carried out continuously when fresh and well-preserved faeces or hair were found in the field (Fig. 1A-B) Coordinates and photographs are recorded for each sample. We also collect saliva samples from stray dogs (using a kit provided by our collaborators from Poland and Slovenia) to obtain as many samples as possible for laboratory analyses. We included stray dogs in the laboratory analyses to obtain better results on hybridisation of the genus *Canis* in Bosnia and Herzegovina. If available, we use invasive samples (e.g. if we find a dead animal in the field, next to the road, etc). We have already processed several samples in the laboratory (Fig. 1C-F), published a paper and are currently preparing another one on hybridisation in the genus *Canis* in Bosnia and Herzegovina (we will provide results in the other report).



Figure 1. A-B) Non-invasive sampling, C-F) laboratory analyses of samples collected during previous and this Rufford project on wolf conservation in Bosnia and Herzegovina.

- i) Monitoring of the territory for presence of wolves and jackals using drones – has been conducted each month for the long-distanced locations, and at least once per week for the short-distanced destinations (Fig. 2). We organized several trainings to educate young volunteers to use drone and help us in the field (Fig. 3). We have detected, so far, stray dogs (Fig. 4A), and paw prints of jackals (Fig. 4B) and wolves (Fig. 4C). We are also using photo-

traps for monitoring the short-distanced localities for the presence of the target species (Fig. 5).

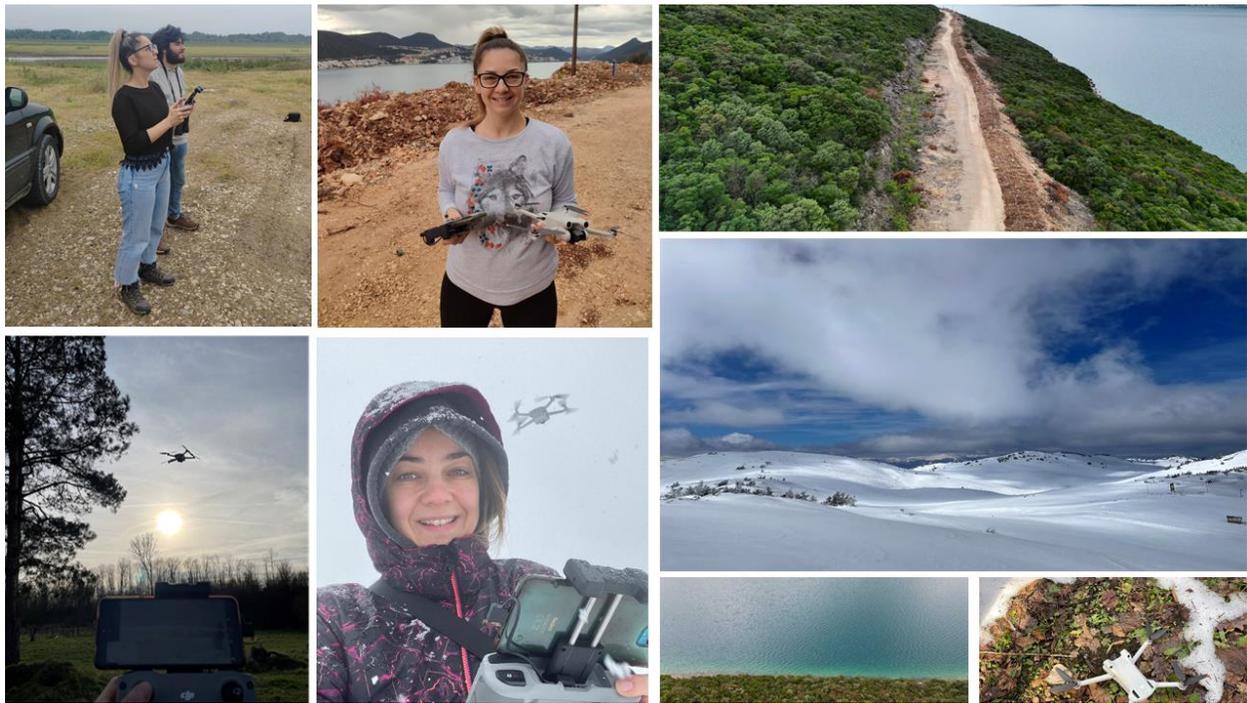


Figure 2. Monitoring of the territory using drone



Figure 3. Trainings of volunteers for using drone



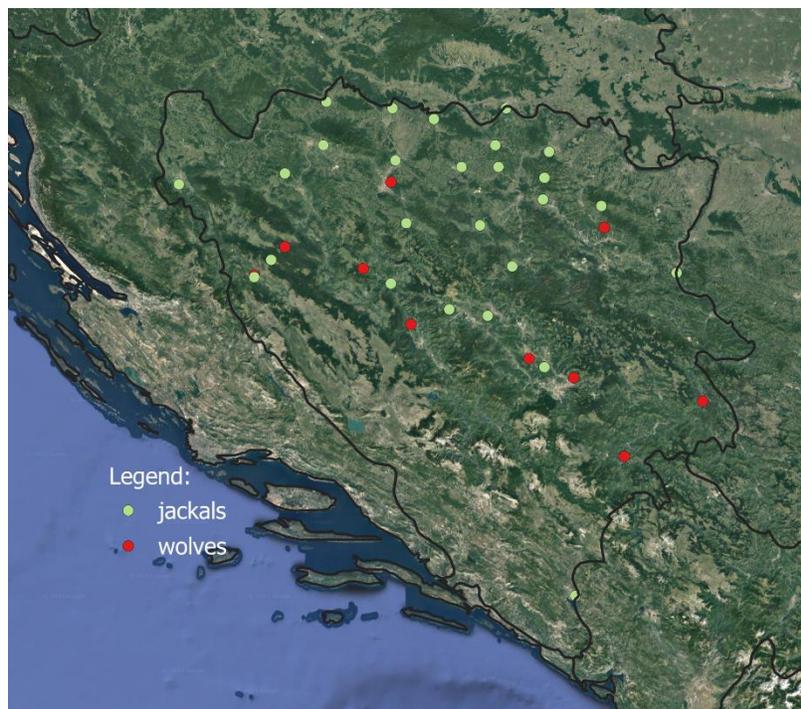
Figure 4. A) Stray dogs B) jackal paw print C) wolves paw prints



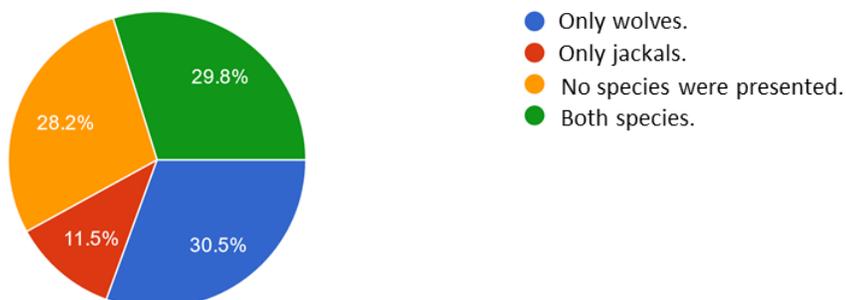
Figure 5. Monitoring of the territory using photo-traps

iii) Local community surveys – has been conducted within regular local community members throughout Bosnia and Herzegovina, foresters, hunters, and farmers (livestock owners) as well, with the aim to have i) as more accurate information about wolves and jackals presence and the overlapping of their territory at the specific site and ii) recommendations about how to prepare a set of conservation measures for the long-term sustainability of wolves and livestock which has been potentially jeopardized by wolves. We had in total 483 filled questionnaires. The results of questionnaire are presented below:

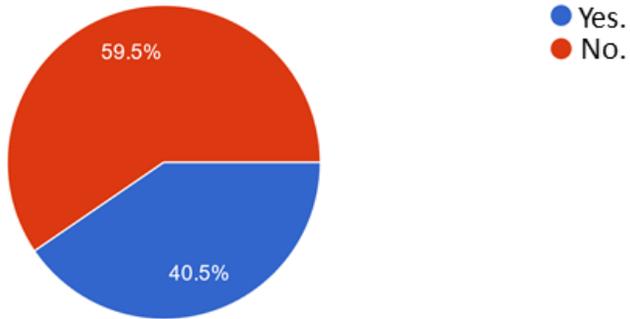
1. Which species is presented in the community where you live?
(Here, we summarized the answers according to the place where our respondents live).



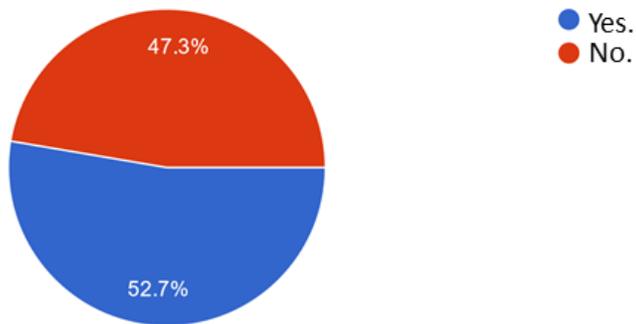
2. Do you know if there have been wolves and/or jackals in your community in the past?



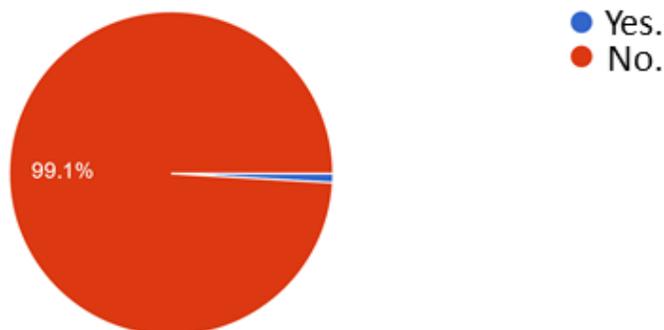
3. Have you ever seen a wolf?



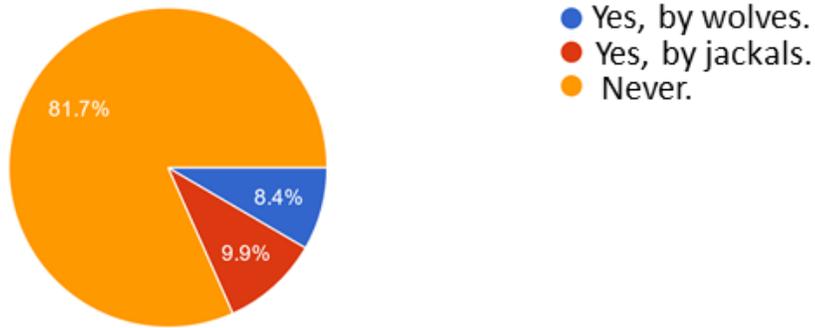
4. Have you ever seen a jackal?



5. Have you ever been attacked by wolf or jackals?



6. Have your livestock been attacked by wolves or jackals?



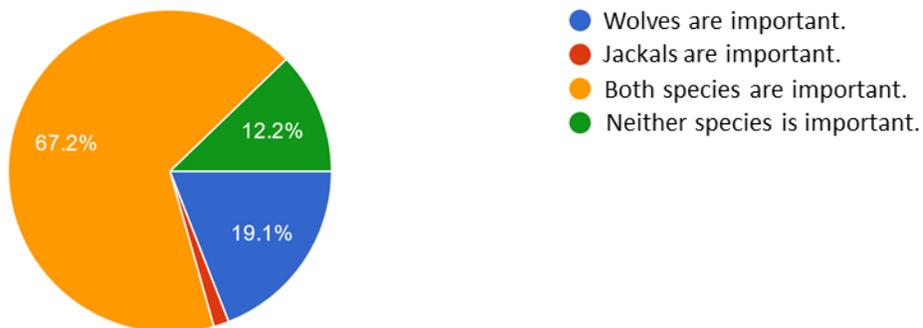
7. If you answered the previous question in the affirmative, could you write whether you received some kind of compensation, from whom and in what way?

- All answers were negative.

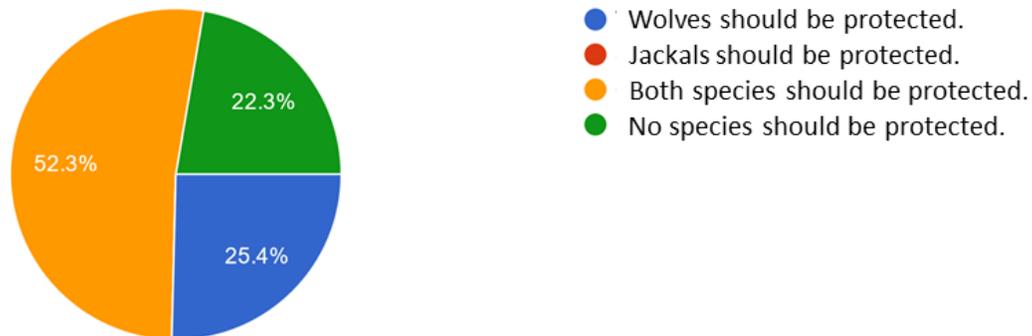
8. Have you ever heard that wolves or jackals attacked someone livestock?



9. Do you believe that wolves and jackals are important for the preservation of biodiversity?



10. Should wolves and jackals be protected by law, and in the case of an attack on your livestock, you will receive compensation?



11. If you think that one of the species listed (wolf or jackal) should be protected by law, please briefly suggest some measures that you think are appropriate (below are summarized answers and the most frequent answers are bolded):

- a) *Prevention of hunting.*
- b) *Measures should be taken to prohibit attacks on wolves and jackals and fines should be imposed if they are attacked. In addition, it is important to educate the population about the importance of these species and the importance of conserving biodiversity.*
- c) *Only "pure" wolves and jackals should be protected, otherwise in the case of hybrids these animals should be eliminated as they violate the genetic purity of the species. As a protective measure, I propose DNA tests to detect hybrids.*
- d) *Both species should be marked in the field and population size and status monitored in this way.*
- e) *Livestock should be better protected. I suggest using electric fences.*
- f) *I propose to ban (or at least reduce) the killing of these species.*
- g) *Wolves and jackals should be collared (or otherwise marked) to track population size. Based on the results, experts should develop measures and proposals to deal with the populations of both species.*
- h) *Measures should be taken to control the population size of both species.*
- i) *I propose to use electric fences and shepherd dogs to better protect livestock and reduce the killing of wolves and jackals.*
- j) *The wolf should be a protected species. If the population is too large, hunting should be allowed to reduce the numbers. Jackals should not be protected because they cause a lot of trouble in the field and it is not our indigenous species.*
- k) *I do not think any species should be protected.*
- l) *Wolves should only be hunted to reduce the population and only in organised hunts, not individually.*
- m) *Both species should be protected with the hunting area.*
- n) *They should be protected, but the population size of both species should be constantly monitored.*
- o) *Both species should be protected with the hunting ground and in case of an attack on the livestock there should be some kind of immediate compensation. This should be strictly and precisely regulated by*

law.

p) People should be educated about the importance of both species, but also about the activities and measures in case one of the species causes harm to humans.

q) The Hunting Act should be amended to make the wolf a protected species by hunting area.

r) There must be continuous monitoring of both species in the field and with laboratory methods. The relevant institutions should propose protected areas where hunting of both species is completely prohibited.

s) Wolves should be protected and in case of poaching the perpetrators should be punished. People should be educated about the importance of wolves.

t) Wolves should be protected in places that are considered their natural habitats.

u) Continuous monitoring with the participation of university experts, non-governmental organizations, hunting and forestry associations and continuous education of the public about the importance of wolves.

Promotion of our project

We have created a promotional material to promote additional our project (Fig. 11):



Figure 11. Promotional material

We had the opportunity to present our project at the several conferences, and we published papers acknowledging the Rufford Foundation for a significant contribution and help:

a) Šnjegota, D., Niedzialkowska, M., Vik Stronen, A., Borowik, T., Plis, K., Arakelyan, M., ... & Jędrzejewska, B. (2023). *The role of the Caucasus, Carpathian, and Dinaric–Balkan regions in preserving wolf genetic diversity*. **Mammalian Biology**, 103(3), 303-315.

b) Nikitović, J., Djan, M., Ćirović, D., Antić, M., & Šnjegota, D. (2023). *The first report on genetic variability and population structure in jackals from Bosnia and Herzegovina*. **Mammal Research**, 68(2), 243-247.

Next activities

- a) We will continue field monitoring and laboratory analysis
- b) We will prepare publications for international journals
- c) We will prepare the final report and organize a meeting to which we will invite representatives of relevant institutions, NGOs, etc. to present our findings and discuss measures for the protection of wolves in Bosnia and Herzegovina.