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Breakthrough in Anti-poison Struggle after Introduction of Intensive Satellite Tracking of Griffon Vultures in Balkans

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Abstract. The use of poison baits for controlling predators is illegal practice in Europe nowadays, but it is still in use by some local people as an effective and affordable "solution" for resolving the conflicts with carnivorous mammals and other wildlife species. Many different approaches and activities were implemented in the last two decades to combat poisoning in Balkans, but the problem is still out of control with repeating cases of catastrophic events, also harming seriously the vulture populations in the region. The present research introduce a new strategy for controlling the problem, by using of *patagial* GPS/GSM transmitters for birds, which in the case of the Griffon vulture (*Gyps fulvus*), being more exposed to the sun, have an improved charge of the batteries through the solar panel, and thus offer the possibility for intensive tracking and frequent obtaining of detailed data load. A GPS location can be received on every minute or less and data load on every 10 minutes. This intensity of tracking the vultures' movements is a good tool to control their whereabouts in real time, which gives an essential advantage in anti-poison struggle, by fast location of problematic situations. The following work presents the developed approach and the first results, which are the base for proposing of new, early warning system for wildlife poisoning and poaching control and monitoring.

Key words: wildlife poisoning, GPS transmitters, conservation, *Gyps fulvus*, Vulture safe area.

Introduction

Poisoning is the most significant threat to vultures worldwide and has contributed for the regional extinction or severe depletion of the entire species group (Botha *et al.*, 2017).

During the 1950s and 1960s (in some countries even until the 1990s), poisoning was a legal practice, funded and carried out by governmental authorities in order to control the populations of wild predators (Grubač, 2014). This practice was a severe threat for wildlife and especially for the vulture species, not only in the Balkans but also across the Mediterranean region (Cramp & Simmons, 1980). The use of poison against wild animals became illegal by the end of the 1980s or the beginning of the 1990s (depending on the individual country) after the ratification of the Bern Convention, which banned this practice (Grubač, 2014; Botha *et al.*, 2017).

At present, the use of poison baits to control predators is illegal in Europe, including on the Balkans, but it is still in use mainly by local farmers as a quick and affordable "solution" for resolving the conflicts with the carnivore species. The main driver for poison use is the conflict between livestock breeders and mammalian predators (ANDEVSKI, 2013), mainly wolves (*Canis lupus*) (PARVANOV *et al.*, 2018). In all likelihood, the wider distribution and higher numbers of wolves in the Balkans and the permanent conflict with livestock breeders is one of the main factors behind the great difference in numbers and distributions of the vultures in this region compared to Iberian Peninsula (STOYNOV *et al.*, 2018).

Many different approaches and activities were implemented in the last two decades to combat poisoning in Balkans, e.g. the promotion and provision of guarding dogs, compensation and prevention programmes for livestock to minimize the man/predators conflict and respectively the use of poison (ANDEVSKI, 2013; STOYNOV *et al.*, 2014), public awareness campaigns and most recently the forming of Canine Teams also known as Anti-poison dog units (PANTOVIĆ & ANDEVSKI, 2018). Apart from being a preventive mean, the Canine Teams contribute to the dissemination and increase of awareness regarding this conservation problem and they assist the related authorities in their pre-trial work, collecting findings that can be used as evidence during the investigation and the judicial procedure (PANTOVIĆ & ANDEVSKI, 2018). However, these teams are unable to cover large areas and their effectiveness relies largely on a priori received information of dead animals or poison baits.

Despite the species and habitat protection on government level and the long-term engagement of NGOs in the Balkan region, the threat of poisoning is hardly controlled yet and so far remains misunderstood and underrated among specialized institutions and authorities (PESHEV *et al*, 2018a; b). This is probably because the practice is illegal, with very dynamic presence in space and time and in most cases remains unidentified. It is occasionally noticed, when some animals are found dead – dogs, cats, wild carnivores, as well as scavengers such as vultures and eagles. However, the observer can hardly relate a located poisoned vulture with the specific site of the poisoning incident. In some poisoning cases, the birds or any other dead animals could be found next to the bait, but in the case of the vultures, they could move to some or even tens of kilometres from the place where they consumed the poisoned meat prior to their death. This was clearly confirmed during the poisoning incident in the Kresna Gorge in Bulgaria from March 2017 (PESHEV *et al.*, 2018a; b). In that case, in two weeks more than thirty Griffon vultures (*Gyps fulvus*) were poisoned in a single poisoning incident – a loss that probably would have been reduced if the bait was discovered and neutralized in time. This recent case confirmed again that the vultures may feed on poisoned carcass, move in large numbers and die up to 20 km away (Fig. 1), some even 60 km away. These specifics make the investigation of the crime almost impossible, regardless the will of the authorities to cope with the problem.

The case in Kresna Gorge was the final step to trigger the introduction of a new approach for using of transmitter data by tracking intensively the vultures' whereabouts and to use the tracked individuals as *"poison detectives"* in the field, which methodological concept was called *"poison aerial control"*. The already well developed technologies of GPS bird tracking devices (light weight, solar powered, 3D printing of any type and shape of housings, permanent settings control by the customer, etc.) and the affordable prices of data load possibility by GPRS service, gave us a powerful tool to constantly track vultures in real time in the internet and follow them in the field if we made any observations of suspicious unusual behaviour.

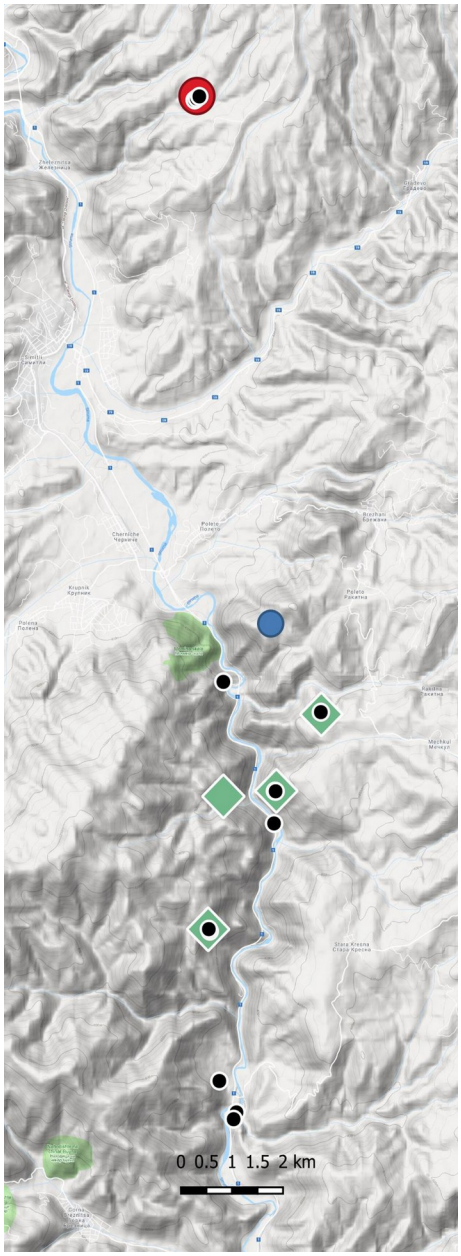

Fig. 1. Map of the Kresna Gorge poisoning incident in March 2017. The black circles indicate dead vultures; the green diamonds indicate the traditional roosting sites; the blue circle indicates the project vultures' feeding site; the red circle indicates the poison bait location.

Materials and Methods

The intensive monitoring of vultures' location was conducted by using of *patagial* transmitters OT-P33, developed by our research team in cooperation with Ornitela UAB, using modern 3D printing technology. Similar transmitter positioning and attachment were used in other raptor research activities, e.g. California condor (*Gymnogyps californianus*) (POESSEL *et al.*, 2017; STOYNOV *et al.*, 2019). In the case of the Griffon vulture, we expected an improved charge of the batteries, through the solar panel being highly exposed to the sun (Fig. 2), and thus a possibility for frequent and abundant data load - the obtaining of GPS location of the equipped individuals became possible at every minute and data load respectively at every 10 minutes. In contrast to the other transmitter-related studies of vultures, this high frequency of locations identification and data load is of essential importance for the proposed "poison aerial control" and provides a very important advantage, or even a breakthrough in the struggle against poisoning of wildlife.

Griffon vultures were fitted with GPS/GPRS transmitters and their whereabouts were constantly tracked on an internet platform from a project staff member, called "Poison alarmist" (hereafter the Alarmist). The role of the Alarmist was to analyse the received data and to observe for untypical behaviour in vulture's movements. According to the expert's data evaluation, he contacted the local field researchers/rangers in order to check locations of possible incidents.

For a period of 1,5 years, 14 Griffon vultures were racked in this intensive way during a LIFE project, covering almost all of the Balkan Griffon vulture colonies (Vultures back to LIFE 2017; 2018).

Results and Discussion

The proposed "Poison aerial control" system is already confirmed to be effective in real cases. In May 2018, from its office in Bulgaria, c.350 km away from the Agrafa Mountains in Greece, the Alarmist followed a Griffon vulture with a transmitter and identify that it had stopped moving with mortality icon appeared in the internet platform. After analysing the movement of the bird in *Google Earth*, the place where the

bird had fallen and its whereabouts prior to its death were researched and revealed that in a place located on more than 5 km from the mortality location, the vulture had been on the ground for c.2 hours, which was probably a sign for a feeding event (Fig.3).

Fig. 2. Patagial GPS/GPRS transmitter OT-P33 mounted on Griffon vulture – left- in flight; right – landed/perched.

The coordinates were sent by the observer, working with the Alarmist to the authorities in Greece and to the Canine Team of Hellenic Ornithological Society (HOS) in the region. The common team visited the site some days later and confirmed the tracked vulture's death, as well as found two more corpses of dead Griffon vultures 5 km from it – at the coordinates reported firstly by the Alarmist. A corpse of a calf (used as a bait) and a plastic bottle of pesticide were also found (Vulture Conservation Foundation, 2018). In this way, although the "poison detective" died 5 km away from the poison bait, it provided the important clue to the distantly situated Alarmist system, which shared the information and thus allowed the case to be detected, recorded, and reacted to.

Although only three Griffon Vultures' corpses were found in that case, it is likely that in the radius of 5 km or more in an extremely rugged terrain, more dead birds remained hidden. However due to the fast localisation of the poisoning site, a possible catastrophic event, similar in scale to Kresna gorge poisoning, was prevented (PESHEV *et al.*, 2018a; b).

Although more than 50 checks in the field were executed and only one case of poisoning was detected so far, the introduction of this method is a probable breakthrough in the fight against poisoning in the Balkans and should be employed permanently and widely in vultures' conservation practice.

The practical testing of the proposed warning system showed, that its effectiveness of depends mostly on the number of tracked vultures or "poison detectives" which is directly connected with the coverage of the species range in the targeted area. The preliminary verification of the concept, confirmed with identification of

real poisoning incidents, showed that a GPS fix in every 10 minutes and data load in every 4 hours are probably the optimal settings for the transmitters power use.

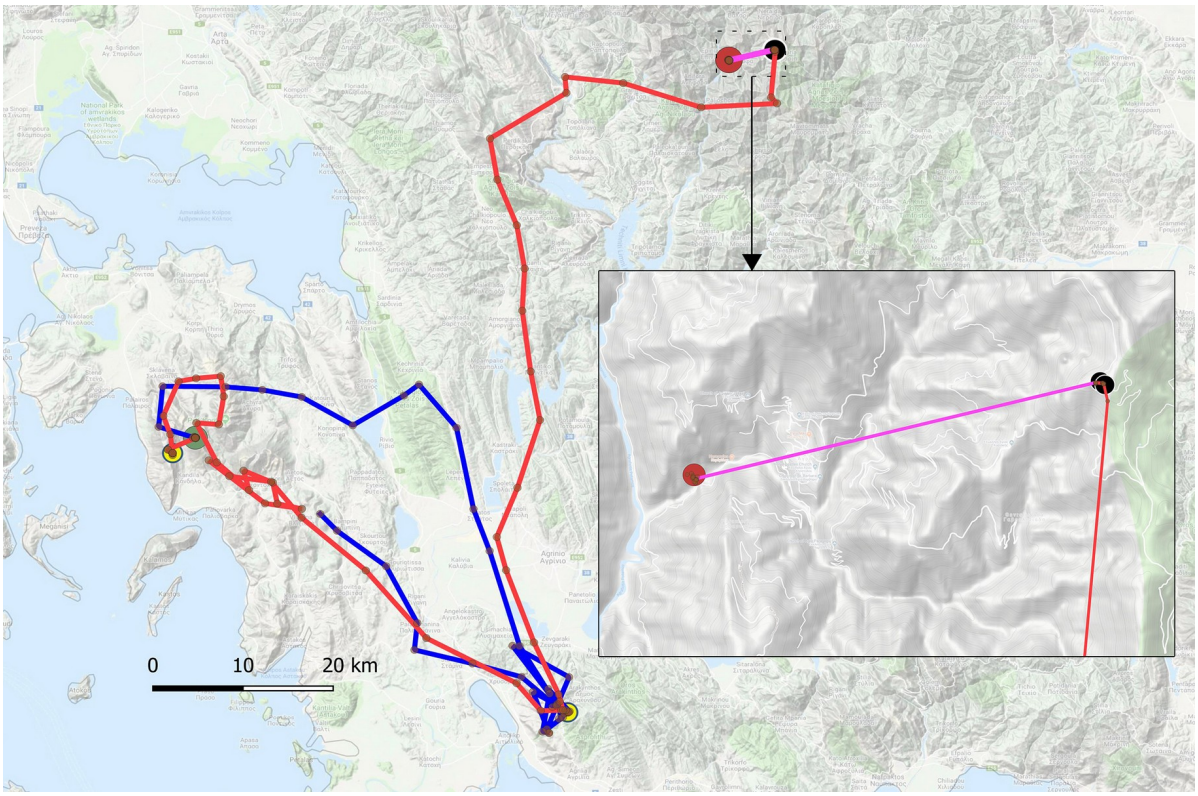

Fig. 3. Map of the case of detected poisoning of Griffon vulture in Agrafa Mountain in Greece in May 2018. Yellow and green circles indicate traditional roosting sites of the species in the region; black circles – indicate the poison bait place and two poisoned Griffon vultures; the red circle indicates the place where the tracked with GPS/GPRS transmitter Griffon vulture was found dead. The lines with different colours indicate the movements of the bird in three consecutive days derived by GPS.

However, in case of emergency – if there is information of potential poisoning incidents in the area, or some specific behaviour of the tracked vulture occurs, i.e. unusual site or position, long staying on the ground etc., the frequency of the GPS fix could be set up on 1-5 min and the data load as intensive as necessary according to the concrete occasion. In such cases, also a team field visit is required to identify every potential problem. If the Alarmist observes that more than one of the tracked vultures go to one location (excluding traditional roosting sites), this is probably due to the presence of food or water source. However, there is also a possibility that vultures are attracted by a poached wild animal, poison bait or depredated livestock, as in the cases described. All of these cases represent important conservation risks and should be closely monitored by field team, which should check the feeding event. In areas where a Canine Team is operating, it is worth sending it on site to find the potentially poached or poisoned dead animals as soon as possible in order to prevent any feeding from them. The Alarmist (if not going on its own) sends the GPS coordinates to any other project team member or ranger from local NGO/authority who is able to do a direct field check (together or instead of Canine

Team, if not available). Despite the check and the work on the case (protocol, monitoring), the presence of the team member at the location where the vultures were/are sets a good example for the local farmers (to whom the dead livestock usually belongs), letting them know that someone is following the vultures in time and space and may notice if they are killed, poisoned etc. In such cases, the witnesses of such interesting phenomena may spread the word in local communities, which raises public awareness on the subject and eventually help prevent criminal attempts.

Conclusion

The described above GPS tracking approach should be widely introduced as poisoning control and prevention measure, especially in marginal (respectively more vulnerable) vulture populations such as those in the Balkans. It will provide fast and accurate detection and thus adequate reaction to poisoning (but also poaching, livestock depredation etc.) cases, even in remote areas that otherwise remain unregistered and could be a powerful tool for prevention of catastrophic mass poisoning events such the one in Kresna gorge in 2017. The analysis of the recent poisoning cases suggested that a minimum of three adult (respectively more territorial) Griffon Vultures should be tracked and used as "poison detectives" at a time per colony. Another two immature birds (more mobile in comparison to adults) per site should be also equipped with transmitters and tracked. Where possible, the poison aerial control should be combined with the work of a Canine Team on the ground. Effectiveness of the system requires not only a monitoring of each colony by at least 3-5 "poison detectives" at a time but also a fast recovery of that number after cases of loss of any transmitter/vulture. The practical testing showed that one Alarmist could follow effectively on-line up to 30 "poison detectives". This approach should be considered as an important conservation practice, and should be widely introduced by managers and supported in conservation programmes. The large amount of data obtained could be also a base for strictly scientific studies, but the primary goals should be the in time reaction to poisoning incidents, which will prevent losses of threatened species – directly – by rehabilitating poisoned birds that are found still alive, destroying poison baits in-time to minimize losses, and indirectly – by increasing the control on poisoning and poaching. This same approach could be introduced in poaching and/or livestock depredation monitoring by managers in protected areas or wherever necessary (in any vulture species range).

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References

ANDEVSKI J. (Ed.). 2013. *Vulture Conservation in the Balkan Peninsula and Adjacent Regions: 10 Years research and conservation.* Skopje: Vulture conservation foundation & Frankfurt Zoological Society. 40 p.

BOTHA A.J., J. ANDEVSKI, C.G.R. BOWDEN, M. GUDKA, R.J. SAFFORD, J. TAVARES, N.P. WILLIAMS. 2017. CMS Multi-species Action Plan to conserve African-Eurasian Vultures. Coordinating Unit of UNEP/Raptors MoU, Abu Dhabi.

CRAMP S., K. SIMMONS. (Eds.). 1980. *The Birds of the Western Palearctic.* Vol. 2. Oxford – London – New York, Oxford Univ. Press. 695 p.

GRUBAČ B. 2014. *Griffon Vulture Gyps fulvus*. Institute for nature conservation of Serbia. Belgrade. 257 p. (In Serbian)

PANTOVIĆ U., J. ANDEVSKI. 2018. *Review of the problem of poison use and vulture poisoning in the Balkan Peninsula.* Vulture Conservation Foundation, Netherlands. Available at: [4vultures.org]

PARVANOV D., E. STOYNOV, N. VANGELOVA, H. PESHEV, A. GROZDANOV, V. DELOV, Y. ILIEV. 2018. Vulture mortality resulting from illegal poisoning in the southern Balkan Peninsula. - *Environmental Science and Pollution Research*, 25(2): 1706-1712.

PESHEV H., E. STOYNOV, N. VANGELOVA, G. GEORGIEV, N. STOYANOV, A. GROZDANOV. 2018a. *Reintroduction of the Griffon Vulture Gyps fulvus in Kresna Gorge of Struma River, Bulgaria,* Annual Report 2017. Fund for Wild Flora and Fauna, Blagoevgrad. [DOI]

PESHEV H., E. STOYNOV, N. VANGELOVA, A. GROZDANOV. 2018b. Poisoning and re-introduction of the Griffon Vulture *Gyps fulvus* in Kresna Gorge, Bulgaria 2017. - *Vulture News,* 75: 21-32.

POESSEL S.A., J. BRANDT, T.A. MILLER, T.E. KATZNER. 2017. Meteorological and environmental variables affect flight behaviour and decision-making of an obligate soaring bird, the California Condor *Gymnogyps californianus*. - *Ibis,* 160(1): 36-53.

STOYNOV E., A. GROZDANOV, S. STANCHEV, H. PESHEV, N. VANGELOVA, D. PESHEV. 2014. How to avoid depredation on livestock by wolf – theories and tests. - *Bulgarian Journal of Agricultural Science*, Supplement 1: 129–134.

STOYNOV E., N. VANGELOVA, D. ZLATANOVA, H. PESHEV, D. PARVANOV, V. DELOV, A. GROZDANOV. 2018. Wolf and Vultures Sympatric Presence in Europe: Ecological Benefits and Constraints. - *Acta zoologica bulgarica*, Suppl. 12, 2018: 85-92.

STOYNOV E., H. PESHEV, A. GROZDANOV. 2019. Early warning system for wildlife poisoning, using intensive GPS tracked vultures as detectives. Technical report. Fund for Wild Flora and Fauna. Blagoevgrad. [DOI]

Vulture Conservation Foundation. 2018. The silent killer strikes again – at least 3 Griffon vultures found poisoned in Greece. Available at: [4vultures.org]

Vultures Back to LIFE. 2017. LIVE DRONES spy for poisoning. PARIS and BARSA are the new against-poison "spy vultures" in Kresna Gorge. Fund for Wild Flora and Fauna, Nature Conservation Organisation in Bulgaria. Available at: [fwff.org]

Vultures Back to LIFE. 2018. GPS tracking. Poison Detectives vultures, employed within LIFE14NAT/BG/649. Fund for Wild Flora and Fauna, Nature Conservation Organisation in Bulgaria. Available at: [fwff.org]

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