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Comment

Why would Romanian carnivores be at a crossroads?

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Abstract. The paper brings into discussion the opinions of Popescu et al. published in 2019 regarding carnivore conservation in Romania in the context of some recent legislation changes, namely the decision of the Ministry of Environment not to issue for 2016 a derogation order for carnivores and the decision of the same ministry to issue such an order in 2017. This article provides important details on carnivore management and conservation along time and reveals the differences between the former active management and the present passive one (culling carnivores only when are dangerous to people, based on derogations). The latter resulted from the strict protection decided at the time of the accession in the European Union and was exacerbated by some further decisions (like those mentioned by Popescu et al.). The paper also addresses the coexistence with carnivores for centuries in the Romanian Carpathians and underlines the need for tolerance from those humans literally sharing the landscapes with carnivores. Such tolerance cannot be attained by the strict protection which intensifies conflicts instead of preventing or keeping them under control. Last but not least, it is proposed that scientific research (advocated by Popescu et al) should be used constantly and not only in a certain direction. Moreover, a precautionary approach should be invoked especially in the cases when changing a system which has worked well along decades is sought. In the case of carnivores in Romania, none of these two (a precautionary approach and scientific evidence) was used in taking the relatively recent decisions under discussion here. The paper concludes that for Romania to remain an example of coexistence of carnivores and humans for the rest of Europe and "to safeguard Europe's last wild frontier", the actual system which produces negative effects on conservation should be reconsidered and not perpetuated as Popescu et al. pretend.
Keywords Romania, carnivore management, carnivore conservation, coexistence with carnivores, sustainable game management.

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Conservation of biodiversity is one of the priorities of modern society and flagship species, like carnivores, are subject to intense controversies. This is more common in countries where such species have large and vigorous populations as is the case of Romania. The more and more frequent attacks on humans but also the numerous cases of bears entering villages and towns in search for food at daylight seem to threaten a relatively peaceful coexistence which lasted along time in Romania – the country with the largest bear population in the European Union. The intense and exaggerated media coverage of such cases bring intense emotions and divergent opinions on the subject. However, very seldom efforts are made to understand the complex causes of this phenomenon, unusual in the past and which seems to drive these species towards a crossroads. In this context, in June 2019, Popescu et al. wrote a letter on carnivores in Romania and recent legislation changes (Popescu et al. 2019), suggesting that such changes would improve the coexistence with carnivores and secure their perpetuation in the future. These changes refer to the decision of the Ministry of Environment not to issue for 2016 a derogation order for bears, wolves and wild cats (despite the existing conflicts with humans), a decision considered by the authors to shake "the decades-old wildlife management system of regulated hunting" and to the decision of the same ministry to issue such an order in 2017 (interpreted by the authors of the letter as being "a new management system"). While we agree that carnivores in Romania are heading to a crossroads, we consider that some of the reasons which could bring them there are indeed the events and legal documents mentioned by the authors and considered by them as ensuring the coexistence of humans with carnivores. Therefore, we would like to bring here more information on this topic (very sensitive but also complex), aiming to find the optimal solutions for the conservation of these flagship species.

Carnivore management and conservation in Romania

Carnivore conservation is not a new story in Romania and the results are visible, as the country is hosting the largest carnivore populations in Europe (except Russia) (Chapron et al. 2014). Different strategies to conserve them were in place for decades. For example, in the case of brown bears (Ursus arctos L.), hunting had been restricted and strictly regulated (i.e. a hunting season was set, hunting of female with cubs and hunting at den had been prohibited) (Decree nr. 76/1953) since 1953, when the population reached very low levels (860 individuals – Ministry order nr. 625/2018, Chapron et al. 2014). Later, in 1976, the hunting season was reduced to 6 months and split in two periods - spring and fall (Law nr. 26/1976). Also special game management areas were set and habitat and feeding conditions were provided for an increase in bear population (Ministry order nr. 625/2018). During the same period, under the communist regime, bears were carefully protected and managed to continuously offer big trophies to the dictator Nicolae Ceausescu (Salvatori et al. 2002). Starting with 1996 (Law nr. 103/1996), bears have been declared protected in Romania. For lynx (Lynx lynx L.), a hunting season was imposed in 1976 (Law nr. 26/1976) and strict protection was imposed starting with 2006 (Law nr. 407/2006). The wolf (Canis lupus L.) had been considered a pest for a long time and hunting was allowed all year long (including trapping and poisoning). It was declared protected in 1996 (Law nr. 103/1996). It is worth mentioning that up to the accession to the EU (2007), even though carnivore species were considered as protected, population density control (including sustainable but strictly regulated and controlled hunting where densities were too high) was the main option for conservation (Law nr. 103/1996; Law nr. 407/2006 in original form).

The implementation of all these legal procedures has produced and secured not only

the largest carnivore populations in Europe, but also a favorable context of coexistence across large shared natural landscapes. Active management included some very important features: (i) it was planned ahead (the quota for harvest was approved by the state and not decided by managers) and monitored along time; (ii) it controlled densities compared to the habitat carrying capacity (taking into account population size, sex ratio and age structure); (iii) it efficiently controlled conflicts with humans (by prompt intervention on animals which were producing important damage or were aggressive to humans). As a result, by balancing the competitive abilities of both competing players (i.e. carnivores and humans), it ensured a "strong coexistence" (i.e. both actors share the same landscape and none is threatened to be excluded by the other, because competitive abilities are controlled and relatively balanced - Chapron and Lopez-Bao 2016). Moreover, through the first two points delineated above, management has ensured not only a simple density but also a well balanced age structure and a good health status of the population (by careful selection). As a result, the management of the species was sustainable not only in terms of quantity but also in terms of quality (i.e. ensured the permanent presence of dominant, very vigorous individuals which can be obtained only through careful selection and protection). Creation and maintenance of the largest bear population in Europe but also the continuous production along the years of very valuable trophies (even in the recent period), prove the high quality of the management practiced in Romania along time. Despite this reality, at the time of accession in the EU (in 2007), the management of carnivore species changed, based on a political decision (i.e. they were declared strictly protected by Government Emergency Ordinance nr. 57/2007), with no scientific grounds. The former active management was replaced by a passive system based on intervention or derogation (i.e. mostly culling bears which had already produced damage / attacked people) (Government Emergency Ordinance nr. 57/2007; Law nr. 407/2006, the form updated in 2008). This new system does not prevent conflict and cannot even repair its effects. The measures implemented, at best, would only reduce the chances to repeat the conflict with the same animal.

Moreover, it does not take into account any of the population parameters (i.e. it does not ensure control over density, age structure, sex ratio), to keep populations within the limits of the habitat carrying capacity and to keep under control conflicts and it is not planned ahead being based on unpredicted interventions (decided on a case by case basis). Such actions are allowed only if and when decision makers give in to the pressure of the local authorities or the media and approve the intervention for safety reasons (safety of people or goods). These interventions are limited to a maximum number per year at country level (a number which is not a target to reach, as unfortunately was misinterpreted by some people, but a threshold not to be exceeded). Population density control remains an option, but only under certain very special conditions (based on approved management/action plans or according to studies requested by the national authority) and has not been used anymore up to present.

To implement this new system, a legal procedure for derogations was set up in 2007 (Ministry order nr. 1369/2007) and updated in 2009 (Ministry order nr. 14/2009). Based on these procedures, each year (up to 2016) a maximum threshold for interventions was set (Ministry order nr. 1386/2007; Ministry order nr. 1092/2008; Ministry order nr. 1223/2009; Ministry order nr. 1423/2010; Ministry order nr. 2278/2011; Ministry order nr. 3456/2012; Ministry order nr. 2187/2013; Ministry order nr. 1575/2014; Ministry order nr. 1439/2015) and it allowed Romania to extract individuals of these protected species in very special conditions. The Ministry order from 2017 (Ministry order nr. 1169/2017), mentioned by Popescu et al., was just another such order (i.e. it just provided again, after one year, a maxi-

mum threshold for interventions like previous orders did). It is worth mentioning that, compared to the previous ones, this order centralized the decision (derogations would be given by the ministry for each particular case) and did not transfer it to managers (i.e. previously a certain number of interventions was assigned to managers in areas with serious damages). Also, the legal timeframe of the order was not set to one year as previously (instead, provisions would last up to when the total number of interventions is reached). Overall, while centralizing the decision might seem good by some people, the very complicated procedure to obtain such derogations (i.e. approving to cull a problem animal), made the system more ineffective than effective, in most cases being impossible to act upon the animal which has produced the conflict. Additionally, this new order does not mention "flora and fauna protection" and "habitat conservation" as reasons for issuing a derogation (although they are still mentioned in the order describing the derogation procedure - Ministry order nr. 14/2009), cancelling any chance to control densities according to the carrying capacity of the habitat. Therefore, this order did not change the regulated and decades-old hunting system (which had already been changed in 2007) and cannot be perceived as a new management system as suggested by Popescu et al. It is indeed just a try to continue the already existing protection system based on derogation procedures, in place since 2007. However, the two reasons mentioned above (centralizing the decision and eliminating interventions for protecting fauna and habitats), make it even less efficient than before.

Within this context, the decision from October 2016 of the Ministry of Environment (and not the Romanian Government as erroneously mentioned by Popescu et al.) to offer no quota for intervention in the case of dangerous animals, not even for ensuring health and safety needs of the human population and to prevent important damage, literally cancelled any chances to ensure the safety of people and their goods against dangerous animals. Such a decision did not shake any "decades-old wildlife management system of regulated hunting" (a change dated back in 2007) but rather reduced seriously the chances for cohabitation with carnivores (and in places with frequent conflicts might have even cancelled any such chances). Therefore, such a move rather shook seriously the decades-old coexistence of the two players, jeopardizing a unique model of successful land-sharing which could be used in other parts of the continent for improving conservation effects and population status at larger scales (Chapron et al. 2014). A step towards a new system should be rather considered the Ministry Order 625/2018 which approves the National action plan for bear conservation in Romania, a plan which was developed according to the EU requirements for protected species. However this order does not bring a totally new system though as it foresees to "maintain the bear population at an optimal level so that game managers will be directly interested to get involved in the conservation measures for the bears and local communities will not be affected by the species presence in their area of activity". To reach this goal, the action plan seeks as objective to maintain the optimal population density which means "the number of individuals from a wildlife species which inhabits a game management area, has a certain population structure and ensures conservation of all species, produces the least damage and does not pose a threat to the human population". For this, the plan ensures both the protection of the species (extracting only dangerous animals) in areas where the density is less than optimal while in those with higher densities ("sustainable management areas"), density control is foreseen "through hunting activities regulated by the central authority in charge with the management of the species". Therefore, this plan is quite similar with the active management system implemented before the accession to the EU. However, so far its provisions have not been implemented and therefore it is hard to say if it is or not efficient.

According to those stated above, the change from active to passive management took place in 2007 and not in 2016, as suggested by Popescu et al.. Although this move is perceived by some as good for conservation, it rather weakened the previously existing "strong coexistence" as competitive abilities of carnivores (especially bears) are not thoroughly controlled anymore and niche differentiation diminished even more than before (i.e. niches started to overlap more and more due to the expansion of human settlements but also the expansion of carnivores, especially bears, in areas where they were not present in the past). Furthermore, decisions as the one from 2016 (not giving any legal tools for humans to ensure their basic health and safety needs) are more likely to drive the relationship towards exclusion (as bears are not controlled at all, while niches are highly overlapped and conflicts would bring rejection from the more powerful competitor - humans) and not towards conservation as sought. Such decisions, imposed with no scientific grounds and ignoring the real context (a very large carnivore population, with a habitat highly overlapping with the one of humans, and frequent conflicts), are more likely the causes which will bring the Romanian carnivores to a crossroads and are more likely to compromise the coexistence for the future instead of "safeguarding Europe's last wild frontier", as expected by Popescu et al..

Evaluation methods used for management decisions

Another goal considered by Popescu et al. as being important for saving carnivores in Romania, refers to improving the procedure for estimating populations (as the one used at present and in the past would be "flawed" and "lacking scientific oversight"). While using scientific research to continuously improve any methods for evaluating large carnivore populations is desired, such improvements become a priority or an emergency for species conservation when actual methods prove to have serious negative impacts on these species. Moreover, such evaluation methods are tools for managers and not for scientific research. They need to be relatively simple and robust to provide good results with relatively low human and financial effort (i.e. improving precision of results should not decrease efficiency in terms of time spent, personnel involved and needed tools). In the case of Romania, the old methods were used for decades and management decisions based on their results helped not only to recover the populations in the past from 860 bears (left after the WW II), to more than 6000 individuals at present (Chapron et al. 2014), but also to maintain it large and relatively stable (Boitani et al. 2015) or even increasing (Cazacu et al. 2014). If the existing methods would be as seriously flawed as inferred by the authors, such outcome would not have been possible.

Taking into account that the population is very large at present (the largest in Europe – Chapron et al. 2014) and does not show any signs of regress, the evaluation method used for management decisions cannot be blamed for bringing carnivores at a crossroads and changing the method used for evaluation cannot be considered a cornerstone in carnivore conservation (except if can be shown that it is significantly and constantly underestimating the populations). Moreover, the regulated hunting of bears started back in 1953 (Decree nr. 76/1953) and stopped in 2007 (Government Emergency Ordinance nr. 57/2007). In this period the bear population raised from 860 individuals to a maximum of 8000 in 1988 and stabilized to around 6000 individuals at the time of accession in 2007 (Ministry order nr. 625/2018), a similar size being reported at present (Chapron et al. 2014). Therefore, the old system of active management and the evaluation methodology used for management decisions should not be blamed for bringing the carnivores at a crossroads. Rather the new methods/policies of strict protection applied in

the wrong context (of a very large and stable or even increasing population with a habitat highly overlapping with the one of humans and a high level of conflicts), could be the cause.

Coexistence of humans and carnivores in Romania

In their letter, Popescu et al. mention that through reconciliation of ”its own large-carnivore conservation strategies”, Romania can ”serve as an example of human-carnivore coexistence in the European Union”. However, for such coexistence, we believe it is mandatory that humans (the more powerful of the two actors) tolerate carnivores.

In terms of human tolerance towards carnivores and sharing landscapes with them, we do believe that Romania can serve as an example of coexistence in the European Union. Indeed, it is already such an example as it harbored and still harbors these species (even the largest populations of such animals). However, it is important to understand that coexistence implies that we must share the same place in the same period of time. It is even more important to understand that coexistence does not refer to humans in general, but only to those people who literally share the resources with carnivores (live in the same ecosystem with the carnivores - Chapron and Lopez-Bao 2016). Therefore, the coexistence can be attained only if the needs of local community dwellers (in direct contact and actually in direct competition with carnivores) are understood and respected. In this context of competition (the case of humans and carnivores - Chapron and Lopez-Bao 2016), coexistence can be ensured only as a middle way approach or a compromise: none of the two actors has stronger competitive abilities than the other or, if one has such abilities, they are controlled (otherwise the weak one is eliminated - Chapron and Lopez-Bao 2016). Strict protection imposed in the context of very large populations of carnivores increasingly using human sourced resources and even invading villages and towns, does not represent such a middle way approach, but rather a dangerous extreme. This extreme threatens the coexistence, offering to one of the actors (the carnivores) all competitive abilities, while completely alienating all such abilities of the other (the humans). However, contrary to what would be expected in ecology, such a relationship will not drive the exclusion from the ecosystem of the humans but rather of the carnivores as humans (by far the more competitive of the two actors) would not accept anymore the costs of such conservation and would reject the idea of coexisting with carnivores. As a result, dwellers in direct conflict with carnivores would take all efforts, including illegal actions, to eliminate carnivores for safety reasons (Holmes 2007), or just to protest against an „urban-centric” way of conservation (von Essen et al. 2015), which seems more a discrimination than sharing the costs of conservation. As a result, instead of being a model of coexistence with carnivores and tolerance towards these species for the other countries from Western Europe, Romania risks to become like them. In these countries, carnivores were not only exterminated in the past, but societies (despite a generally favorable attitude to conservation) seriously oppose to their return. The cases of the two bears entering Germany in 2006 (Deutsche Welle, 2006) and Switzerland in 2013 (Swiss Info 2013), which were both killed being perceived as potential threats (but without attacking people), provide solid evidence for this. Not to mention the case of a single wild bison entering Germany from Poland in 2017, which was also killed as being considered a potential threat to humans (The Independent 2017).

Therefore, to maintain the coexistence with carnivores, one should learn from the long experience in managing landscapes and carnivore populations residing inside them. The continuous existence of these carnivores along decades prove the success of the responsible management of both the species and their habitat. These very large and viable populations of carnivores are the result of decades of wise

management (which included strict control of harvesting actions, in other words controlling the competitive abilities of humans over carnivores) and not of the relatively recent decision for strict protection (at the time of accession to the EU in 2007), or the event from 2016 (not to offer any chances for intervention to ensure the health and safety of human population and prevent important damage). These relatively recent decisions (starting with the one from 2007), based on a status of threatened and endangered species (not the case of carnivores from Romania), rather seem to be measures applied in a wrong context and therefore should not serve as an example for others.

Last but not least, large densities of bears are not only bringing more conflicts with local communities, but are also reducing the ungulate populations (by killing or chasing them away – creating the "landscape of fear" – Laundré et al. 2001) and also the costs of wildlife management are increasing (as bears are heavily consuming the complementary food provided for ungulates). As a result, the carnivores start to be considered a pest, even by the game managers who treasured them and conserved them in the past, the same managers who carried all costs for a careful management which brought them at such high densities at present. Therefore, if coexistence is the key "to safeguard Europe's last wild frontier", overall it seems wiser to implement the management systems which have created and maintained this relatively stable coexistence with humans and not to improvise new protection systems or even worse, to adopt abrupt changes (with no scientific grounds), which jeopardize this equilibrium. Such hasty decisions, with no scientific grounds, which ignore and even contradict the rich experience on carnivore management in Romania, are more likely to bring carnivores to a crossroads not only in terms of their conservation status (still favorable), but also in terms of their existence in Romania's forests.

The role of scientific research

Regarding the scientific research, Popescu et al. underline the importance of involving key stakeholders in setting up „a long-term large carnivore research program" and also the fact that a "transparent science accepted by all parties could be the catalyst for Romania to reconcile its own large-carnivore conservation strategies". We agree that science must be used in the management of natural resources and involvement of all parties is needed. However, taking into account the expertise and experience of game managers and of experts in this field, their involvement is essential not only to ensure the success of the research activities, but also to obtain a product which is functional and applicable in the field. Neither of the recent decisions mentioned by Popescu et al. (considered erroneously as favoring carnivore conservation), nor the one at the accession into the EU involved such key factors. Moreover, any scientific results should be carefully tested first in the context where they are sought to be implemented. They should not be generalized without any discernment, especially where the context is very different (e.g. applying strict protection in the case of species which are not rare or threatened but which can become a threat to other species and especially to humans – the case of carnivores in Romania).

Also, we don't believe that science must be accepted by all factors to be implemented. Science needs to be objective (regardless how results are perceived by people). Pleasing everyone is more a goal for politicians and not for researchers. However, scientific results must be communicated in an objective and unbiased way and not truncated or by emotional manipulation.

Last but not least, although scientific research is important in decision making, we believe it should be used constantly and not only in a certain direction. Not all decisions in the field of environment in Romania were based on scientific results and not even on a precautionary

principle. Some decisions used this principle as a pretext while others have ignored it.
We consider that this principle should be invoked especially in the cases when one seeks changing a system which has worked well along decades. In the case of carnivore management in Romania, one cannot say such a precautionary approach was used and the results are already evident. The political decision without any scientific background like the one in 2007 (to change the management system) and also the one from 2016 (not to offer any chance for intervention to ensure the safety of human population) are clear examples in this direction.

Conclusions

The existence of a bear population well above the optimal level (at least from the human population acceptance point of view) shows that past management was favorable to carnivores (maybe too favorable) and cannot be blamed to threaten these species and drive them towards a crossroads. It should be accepted that a large and viable population of brown bears such as the one from Romania is not the result of a few years of restrictions decided politically and with no scientific ground. In fact, it is the result of a long period of sustainable management which has ensured not only the needed habitat conditions but also the conditions needed for the coexistence with humans. Both types of conditions are mandatory for the survival of the carnivores in the future. We will see whether Romania will remain an example of coexistence of carnivores and humans for the rest of Europe or will become a story where politics influence game management in contradiction with empirical evidence and available experience on this topic. The first option requires rethinking the actual system (based on strict protection and control only through intervention) which produces negative effects on conservation and does not seem at all "to safeguard Europe's last wild frontier", as Popescu et al. pretend. An efficient implementation of the action plan proposed in 2018 (Ministry order 625/2018) could repair the mistake made at accession into the EU. However, such an implementation might be a great challenge especially because in Romania decision making is still purely political and based mostly on emotions rather than on realism, experience and scientific support.

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