Bright Future for Black Vulture LIFE14 NAT/BG/649

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Vultures back to LIFE

PROTOCOL ON CINEREOUS VULTURE FEEDING IN BULGARIA

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INTRODUCTION IN TO CINEREOUS VULTURE DIET

Like all vultures (except the Palm-nut Vulture *Gypohierax angolensis* (Carneiro 2017), the Cinereous Vulture feeds mostly on carrion. Its diet consists mainly of carrion from medium-sized or large mammal carcasses, although snakes and insects have also been recorded as food items. Live prey is rarely taken (Batbayar et al. 2006). It mainly feeds on the carcasses of rabbits, sheep and wild ungulates (Hiraldo 1976, Corbacho et al. 2007, Yamac and Günyel 2010). However, changes in the availability of prey over the last 30 years have led to a decrease in the number of rabbits in its diet and an increase in the consumption of domestic ungulates (Corbacho et al. 2007, Costillo et al. 2007, Moreno-Opo et al. 2010). In Mongolia, at least, the species is reliant on livestock numbers for successful nesting (Batbayar et al. 2006). Studies in Spain show that the species prefers individual, medium-sized pieces of muscle and small peripheral scraps of meat and tendon (Moreno-Opo et al. 2010). Juveniles show a preference for sheep and goat carcasses (Moreno-Opo et al. 2015). In Greece, terrestrial tortoises contribute 15% of the diet (Skartsi et al. 2015), whilst in Turkey wild boar are important, and feeding on wolf and fox carcases was also noted. (Yamac and Günyel 2010). Detailed knowledge of its diet and which specific anatomic parts of a carcass it prefers may constitute a fundamental tool for the design of conservation strategies (Margalida et al. 2009, Moreno-Opo et al. 2015).

INTRODUCTION INTO EU SANITARY REGULATIONS

The recovery of European populations of avian scavengers was probably the result of an end to legal persecution in the 1960s and 1970s, and the ban on the use of poison implemented during the 1980s and 1990s. Moreover, in the 1990s and at the beginning of 2000s, the European Union (EU) introduced policies to bolster the conservation strategies used in the management of scavenger populations. Thus, the existence of breeding nuclei of these species became a basic criterion for defining Special Protection Areas for Birds (SPAs) and Sites of Community Importance (SCIs) (Donald et al. 2007). Within this framework, the EU-financed LIFE-Natura programmes were designed to directly manage and conserve local populations of threatened scavenger species, investing 57 million € of European funding in 38 projects (http://ec.europa.eu/environment/life). Over 90% of European vultures live in EU member states. Of all European countries, Spain boasted the most important breeding populations of these scavenger species.

Between 1996 and 2000 the appearance of bovine spongiform encephalopathy swiftly became one of the most serious public health and political crises concerning food safety ever experienced in the European Union (EU). Subsequent sanitary regulations

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(EC 1774/2002) led to profound changes in the management of livestock carcasses (i.e. the industrial destruction of around 80% of all animal carcasses), thereby threatening the last remaining healthy scavenger populations of the Old World and thus contradicting the long-term environmental policies of the EU. Several warning signs such as a decrease in breeding success, an apparent increase in mortality in young age classes of vultures and an increase in the number of cases of vultures attacking and killing cattle, as well as a halt in population growth, suggest that the decrease in the availability of food resources has had harmful effects on vulture populations. Between 2002 and 2005, a number of dispositions to the EU regulations (2003/322/CE & 2005/830/CE) enabled conservation managers to adopt rapid solutions (i.e. the creation of vulture restaurants) aimed at satisfying the food requirements of vultures. However, these conservation measures may seriously modify habitat quality and have indirect detrimental effects on avian scavenger populations and communities.

Conservation managers and policy-makers need to balance the demands of public health protection and the long-term conservation of biodiversity. The regulations concerning carrion provisioning need to be more flexible and there needs to be greater compatibility between sanitary and environmental policies. We advocate policies that authorize the abandonment of livestock carcasses and favours populations of wild herbivores to help to maintain populations of avian scavengers. Conservation strategies should be incorporated into new European Commission regulations, should aim to make public health and carcass-related ecological processes more compatible, thereby permitting scavenger species to benefit as before from extensive animal husbandry and, when necessary, supplementary feeding. This new regulation started to be effective in 2011 and its main subject in the continuation of this report.

In Europe, after the outbreak of bovine spongiform encephalopathy, a restrictive sanitary regulation (EC 1774/2002) prohibited the abandonment of dead livestock in extensive farming (extensive livestock) in the field, which led to negative consequences for scavengers. As an attempt to mitigate this negative impact, a new regulation was approved (EC 142/2011) to allow farmers to leave extensive livestock carcasses in the so-called 'Protection areas for the feeding of necrophagous species of European interest' (PAFs).

European Union legislation:

- Regulation (EU) No 142/2011 of 25 February 2011 laying down detailed rules for the implementation of Regulation (EC) No 1069/2009 of the European Parliament and of the Council laying down the health rules Applicable to animal by-products and derived products not intended for human consumption, and Council Directive 97/78 / EC as regards certain samples and units exempt from veterinary checks at the border

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- Regulation (EC) No 1069/2009 of the European Parliament and of the Council of 21 October 2009 laying down health rules concerning animal by-products and derived products not intended for human consumption and repealing Regulation (EC) No 1774/2002 (Regulation on animal by-products)
- Regulation (EC) No 853/2004 of the European Parliament and of the Council of 29 April 2004 laying down specific hygiene rules for food of animal origin
- Regulation (EC) No 1774/2002 of the European Parliament and of the Council of 3 October 2002 laying down health rules concerning animal by-products not intended for human consumption
- Regulation (EC) No 999/2001 of the European Parliament and of the Council of 22 May 2001 laying down rules for the prevention, control and eradication of certain transmissible spongiform encephalopathies

BEST PRACTICE EXPIRIANCE FROM SPAIN

Estimated individual and population trophic requirements, in kg, for the different priority necrophagous species according to Royal Decree 1632/2011, of February 14, following bibliographical references indicated in the corresponding section (end of document).

Species	Daily individual requirements (kg biomass)	Nº pairs	Nº territorial individuals approx.	Floating population approx.	Total estimate individuals Nº	Percentage of carrion in diet	Days per year of presence	Total biomass (kg/year)
Bearded Vulture	0,4[1]	134[8]	290	200	490	1,0	365	71.540
Griffon Vulture	0,52[1]	24.609[9]	49.218	15.000	64.218	1,0	365	12.188.576
Black Vulture	0,57[2]	2.068[10]	4.136	1.000	5.136	1,0	365	1.068.544
Egyptian Vulture	0,2[1]	1.452[11]	2.904	200	3.104	1,0	200	124.160
Imperial Eagle	0,26[3]	409[12]	818	300	1.118	0,04[18]	365	5.304
Golden Eagle	0,3[4]	1.553[13]	3.106	600	3.706	0,05[19]	365	20.290
Red Kite	0,2[5]	2.176[14]	4.352	800	5.152	0,05[20]	365	18.804
Kite	0,17[5]	10.300[15]	20.600	1.500	22.100	0,1[21]	200	75.140
Wolf	1,7[6]				2.000[16]	0,4[22]	365	496.400
Bear	15[7]				275[17]	0,07[23]	310[24]	90.750
Total								**14.159.508**

As a conclusion of the above table, Aragon, Castilla-La Mancha, Extremadura, Navarra and Valencian Community, have values over 50%, and are the autonomous communities that have achieved the highest degree of fulfilment with the application of food programs (the biomass needs of necrophagous species), either through supplementary feeding points in feeding sites or through extensive farms authorized. In general, there is a positive progress in all the autonomous communities that develop official programs for the feeding of necrophagous species, in relation to the fulfilment of their nutritional needs.

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Figure. Spatial distribution of carrion biomass availability (t) per 10 9 10 km grid per year and protection areas for the feeding of necrophagous species (PAFs) in peninsular Spain. [Figure can be viewed at wileyonlinelibrary.com].

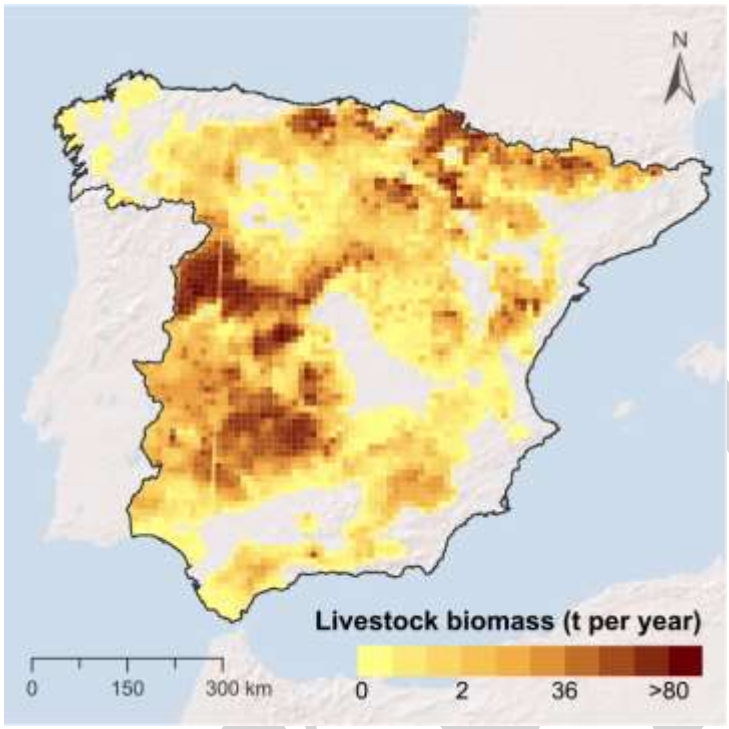
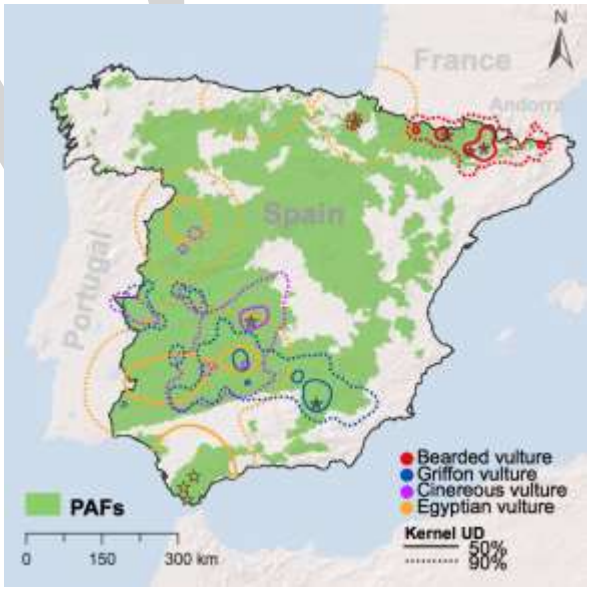
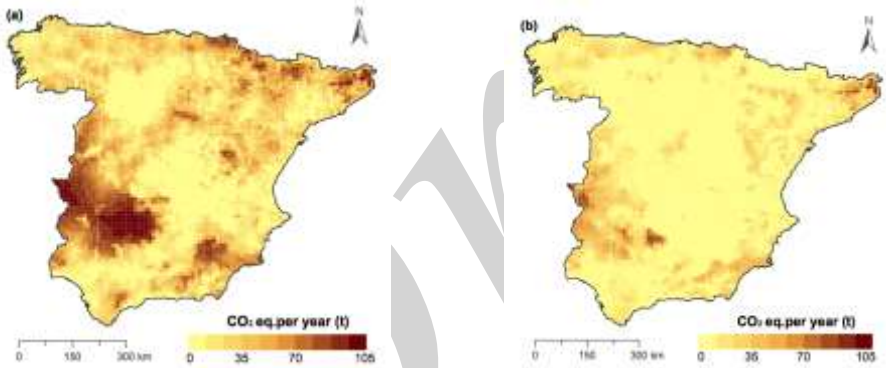


Figure. Spatial distribution of home ranges (k50% and k90% UD) of vultures and protection areas for the feeding (PAFs) of necrophagous species in peninsular Spain. Stars show places of capture. [Figure can be viewed at wileyonlinelibrary. com].



The transport of dead livestock from farms to authorized plants after the new regulation (considering both the live- stock outside of PAFs and the livestock species that must be collected inside PAFs according to each regional rule) meant a minimum emission of 34 300 metric tons of CO2 equivalents to the atmosphere per year. The south-western and north-eastern extremes of peninsular Spain showed the highest levels of GHG emissions (Fig. 7a). Considering that the GHG emissions in the pre-PAF scenario was 77 344 metric tons of CO2 equivalents to the atmosphere per year (Morales-Reyes et al. 2015), the post-PAF scenario (Fig. 7b) meant a potential reduction of c. 55 7% in GHG emissions. The percentage of reduction in GHG emissions ranged between 23% and 95 7% (mean = 44.7%, SD = 30 7%) depending on the region considered.

Figure a) and b). GHG emissions (in metric tons of CO2 eq. per 10 9 10 km grid per year) before (a) and after (b) the implementation of the protection areas for the feeding (PAFs) of necrophagous species in peninsular Spain. [Colour figure can be viewed at wileyonlinelibrary.com].



Recommendation for feeding during the hacking period

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Recommendation for feeding in captivity:

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Recommendation for feeding in the wild at vulture feeding sites:

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Conclusions

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Regomendation
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