

## FORUM

# Sanitary versus environmental policies: fitting together two pieces of the puzzle of European vulture conservation

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## Summary

1. 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 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.

2. 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.

3. 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.

4. *Synthesis and applications.* 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, which should be effective in 2011.

**Key-words:** biodiversity conservation, EU sanitary policy, supplementary feeding, vultures

## Introduction

Historically, avian scavengers have always been abundant throughout the Mediterranean Basin and humans have never regarded them as threats to either hunting or farming activities

(Donázar *et al.* 1996). This tolerance coupled with stable, non-intensive rural economies meant that by the beginning of the 21st century avian scavengers in Europe constituted one of the few exceptions to the widespread population declines in necrophagous birds (Oaks *et al.* 2004; Green *et al.* 2006; Naidoo *et al.* 2009). However, in the period between the nineteenth to the mid-twentieth centuries avian scavengers numbers plummeted and many species disappeared from vast

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regions of Europe (Bijleveld 1974). Persecution of carnivores (mainly wolves *Canis lupus*) that preyed on livestock through the indiscriminate use of poison soon contributed to the rapid decline of many raptor species, in particular scavengers.

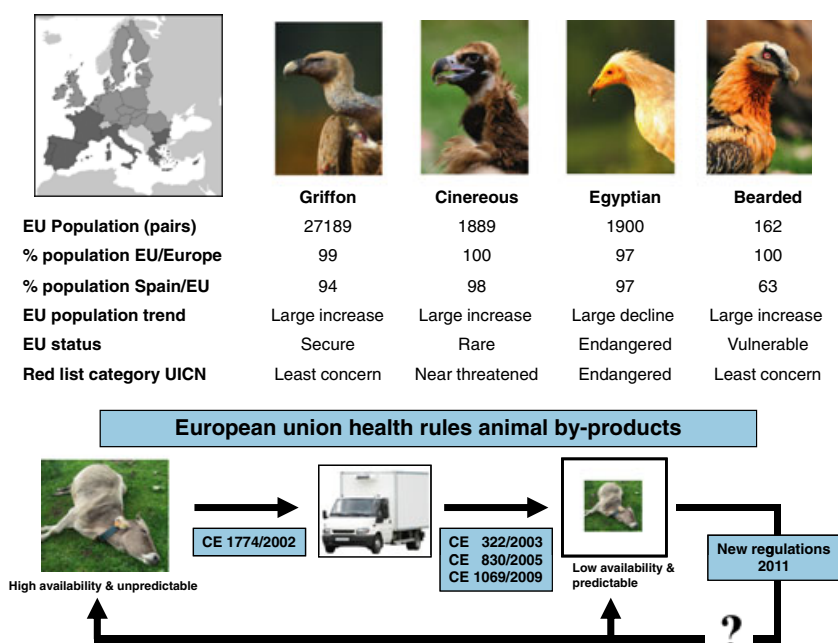
The recovery of European populations of avian scavengers was probably the result of an end to legal persecution in the 1960s and 1970s, and the ban on the use of poison implemented during the 1980s and 1990s. Moreover, in the 1990s and at the beginning of 2000s, the European Union (EU) introduced policies 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>). Of all European countries, Spain boasted the most important breeding populations of these scavenger species (Fig. 1).

Nevertheless, these conservation strategies are vulnerable because low densities of wild ungulates have meant that the availability of carcasses around stock farms has become the decisive factor in the conservation of scavenger populations (Donázar & Fernández 1990; Donázar, Margalida & Campión 2009). Since the mid-twentieth century, farmers have ignored

legislation obliging them to destroy animal carcasses generated on their farms. Thus, avian scavengers such as European vultures became dependent upon this food source at the same time as being vulnerable to changes in sanitary policies that determine how carcasses must be disposed of.

Between 1996 and 2000 bovine spongiform encephalopathy, commonly known as mad cow disease, appeared and swiftly became one of the most serious public health and political crises concerning food safety ever experienced in the European Union. The application of sanitary legislation (Regulation CE 1774/2002) that greatly restricted the use of animal by-products not intended for human consumption deprived bird populations of the resources they depended on to survive. It has been estimated that in some parts of Spain, 80% of animal carcasses generated on farms are being removed for industrial disposal; in the case of cows this figure reaches 100% (see Donázar, Margalida & Campión 2009).

The CE 1774/2002 Regulation obliged that all dead livestock had to be removed, using specially authorized vehicles, in order to be transformed or destroyed at approved, designated plants. This regulation classifies the by-products into three categories, in accordance with their potential risk to public and animal health. Thus, depending on their age, the carcasses of domestic ruminants (cows *Bos taurus*, goats *Capra hircus* and sheep *Ovis aries*) are mainly classified as belonging to Category 1, which represents very high-risk material. Meanwhile, the carcasses of monogastric species such as horses *Equus caballus*,



**Fig. 1.** Over 90% of European vultures live in EU member states (dark grey on the map). By 2002, sanitary regulations meant that 80% of all animal carcasses were being destroyed industrially, thereby removing the unpredictable appearance in both space and time of food in the wild. New regulations (2003–2005) now allow scavengers to satisfy most of their food requirements at fenced ‘vulture restaurants’. These feeding stations are a predictable resource with unknown effects on the scavenger. The new European Commission sanitary regulations to be applied in 2011 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. Data sources for population sizes: BirdLife International (2004); Del Moral (2009a,b); De la Puente, Moreno-Opo & Del Moral (2007); Donázar, Margalida & Campión (2009); Margalida & Heredia (2005); authors’ unpublished data.

donkeys *Equus asinus*, mules *Equus mutus*, pigs *Sus scrofa domestica* or birds, belong to a lower risk category (Category 2 materials). Finally, Category 3 materials are those intended for human consumption but which are not used for this purpose (see García de Francisco & Moreno-Opo 2009). The Regulation considers as an exception the possibility of authorizing animal by-products in Categories 2 and 3 for the feeding of wild animals and, in the case of necrophagous birds, also authorizes the feeding of carcasses that are classed as Category 1 materials (cows, goats and sheep).

In light of this complex scenario, we draw attention to some specific reasons for caution regarding the conservation of European vultures that have arisen because of the apparent contradictions between the application of sanitary and environmental policies. We analyse the partial solutions adopted by conservation managers and policy-makers (i.e. the establishment of vulture restaurants) to compensate for the food shortages that sanitary regulations have caused. Our aim is to use scientific information to provide guidance for managers involved in the conservation of populations of avian scavengers in Europe, Asia and Africa.

### Bad solutions for resolving policy contradictions

Full knowledge of the ecological consequences of the sudden disappearance of a large part of the trophic resources (i.e. live-stock carcasses) available to avian scavengers is still lacking, although there is some evidence to suggest that the effects are serious and include a halt in population growth, a decrease in breeding success and an apparent increase in the mortality of young age-classes (see review in Donázar, Margalida & Campión 2009). In addition, given that in recent years the collection of dead cattle has become more widespread, the number of cases or reports of vultures (mostly griffon vultures *Gyps fulvus*) attacking and killing cattle has increased exponentially (Margalida & Campión 2009). Another unexpected change is the dispersion of Iberian griffon vultures into central Europe in search of areas with greater food resources (Terrasse 2006). These behavioural changes reported by the media have had an enormous social impact and have led to demands for the implementation of supplementary feeding schemes in order to reduce both the negative consequences on scavenger populations of carcass collection and the embryonic conflict between 'predatory' scavengers and farmers (Donázar, Margalida & Campión 2009).

This alarming scenario (see also Tella 2001) forced European administrations into enacting a number of dispositions (2003/322/CE 2005/830/CE) regulating the use of animal by-products as food for necrophagous birds. All the legal derogations are aimed at granting exemption from removing certain animal by-products from the carcasses, once a series of specific conditions have been met. These include obtaining permits from the competent authorities, registering the animal by-products or constructing a designated carcass dump. Another requirement is that the animal by-products have to be made available to animals within fenced-in sites. Thus,

although the aim behind these European dispositions is to guarantee food supplies for avian scavengers, in practice the administrative restrictions placed on the creation of feeding stations or 'vulture restaurants' are severe. As a result, the spatial distribution of feeding stations has become very patchy and where once there were numerous small feeding sites, nowadays food is concentrated in just a few places. In other words, the temporal and spatial distribution of food resources has become predictable and has artificially modified habitat quality. The repercussions of these changes on individuals, populations and communities of avian scavengers are still largely unknown, but are undoubtedly significant (Carrete, Donázar & Margalida 2006; Carrete *et al.* 2006; Houston 2006; Robb *et al.* 2008; Cortés-Avizanda, Carrete & Donázar 2010). The link between the food supplied at feeding stations and the increase in antibiotics detected in many scavenger species across Spain is also of concern (Blanco *et al.* 2009a). Finally, the economic cost of this type of conservation measure is anything but negligible and, if current legislation is complied with, the creation of a new feeding station will cost between 30 000 and 50 000 €, to which must be added the running and maintenance costs of the site of around 20 000 €/year (Donázar, Margalida & Campión 2009).

### Towards new regulations and conservation strategies

The conundrum of the conservation of European scavengers, the subject of both strict protection and highly restrictive health rules limiting food availability, could be partially solved in the near future. The revision of the regulation of the use of animal by-products not intended for human consumption that would guarantee carcasses for avian scavenger populations (CE 1069/2009), will be put into practice on 4 March 2011. The new sanitary regulations being discussed by the EU should make public health issues and carcass-related ecological processes compatible, thereby permitting scavenger species to benefit as before from extensive animal husbandry and, when necessary, supplementary feeding (Donázar *et al.* 2009; Fig. 1). Fallen stock in the wild originating from extensive farming and transhumance (Olea & Mateo-Tomás 2009), and the provisioning of carcasses from farms, should be regarded as small-scale feeding sites that are ideal for avian scavengers, given that they recreate the natural spatial distribution of food resources with which these species have evolved (Houston 2001). Nevertheless, we must not lose sight of the fact that extensive cattle farming is in serious decline in many areas of the Iberian Peninsula and Europe (Caballero 2007), and this trend has already had a direct effect on vultures in terms of the amount of good-quality food that is available. Additionally, lower grazing pressure may provoke changes in landscape structure and reduce the availability of the open areas that scavengers use preferentially to search for food. A way of mitigating these effects is to encourage wild ungulate populations, which may be able to fill the space once occupied by cattle and generate naturally a significant amount of carrion. However, although the remains of these wild ungulates left by hunters

are potentially of great value to avian scavengers, their consumption may result in lead-shot poisoning with harmful effects on individuals and populations (Gangoso *et al.* 2009; Hernández & Margalida 2009). Thus, a policy that allows for the abandoning of carcasses originating from extensive cattle farms and which also favours populations of wild herbivores may help to maintain populations of avian scavengers in the Mediterranean. Moreover, other wildlife would also benefit since the carcasses of wild and domestic ungulates fulfil an important role in ecosystems, maintaining complex faunal communities extending from invertebrates to large carnivores (DeVault, Rhodes & Shivik 2003; Bump, Peterson & Vucetich 2009).

It will probably be necessary to continue the intensive feeding programme in order to support specific species and populations. Feeding stations provisioned with food free of pathogens and toxins may help to reduce mortality rates and other negative effects of scavengers feeding on carcasses of animals containing veterinary-prescribed drugs (Gilbert *et al.* 2007; Blanco *et al.* 2009a,b) and would also reduce the effects of illegal poisoning (Hernández & Margalida 2008; Oro *et al.* 2008). However, the design of feeding stations aimed at conserving specific species and populations will have to be redefined. For example, the location of 'vulture restaurants', the type and frequency of food supplied, and the format of the animal by-products used will have to be further studied in order to yield maximum conservation benefit, in particular for the most endangered scavenger species (e.g. Cortés-Avizanda, Carrete & Donazar 2010; Moreno-Opo *et al.* 2010). Furthermore, in light of new scientific evidence (see reviews in Piper 2006; Donazar, Margalida & Campión 2009) and current economic constraints, the role that supplementary feeding plays in the many reintroduction projects that are currently underway in Europe must also be revised alongside the reassessment of 'vulture restaurants'. These projects should be based on well-designed strategies that take into account the existing availability of trophic resources and evaluate the need to create a network of feeding sites.

Finally, the socio-political context imposed by the complex network of European administrations at community, state and regional levels with competences in the conservation of endangered species limits the applicability and effectiveness of conservation measures. Thus, despite the fact that avian scavengers cross frontiers at will, no efficient supra-national management strategies exist, which inevitably limits the effectiveness of any conservation strategy. Consequently, the global problems affecting these wide-ranging species are tackled only at local level, with little possibility of success.

Conservation managers and policy-makers must balance the needs of wildlife with the need to eliminate animal carcasses from farms, and the demands of public health. The appearance of bovine spongiform encephalopathy has taught us that human health-related issues can escalate rapidly and can take priority over wildlife conservation strategies in the short term. In future, it will be important to link sanitary and environmental policies so that neither is compromised by the other in an emergency situation.

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