



Executive Summary:

VCF position statement on incidents between griffon vultures and live livestock.

Rationale / introduction:

In recent decades there has been an increasing number of reports of vultures injuring or killing domestic livestock in Europe, primarily in Spain and France, originating from individuals, organisations and media agencies. Until relatively recently, however, there has been very little scientific investigation into the validity of the reports and whether the number and frequency of such incidents has truly increased. This document provides a brief summary of some of the main sources of scientific evidence to provide relevant background to the topic; describe patterns, trends, underlying causes and impacts of vulture-livestock incidents in Europe; and discuss potential solutions to mitigate the perceived problem.

Background information:

As “obligate” scavengers vultures are the only terrestrial vertebrates that have evolved to feed exclusively on carrion, enabling them to fulfil an important ecological role by maintaining nutrient transfer through food webs and providing valuable ecosystem services by removing carcasses (DeVault *et al.* 2003).

Under normal circumstances, of the European vulture species, only the Egyptian vulture and the cinereous vulture include live prey in their diets, the former consuming invertebrates and small mammals and reptiles (Margalida *et al.* 2012), and the latter only rarely killing rabbits and other small vertebrates (Costillo *et al.* 2007).

Vultures in the *Gyps* genus, including Eurasian griffon vultures, are considered to be true obligate scavengers because their morphological characteristics do not enable them to catch or kill live prey. For example, their foot and bill structure are different from predatory raptor species, their long neck is specialized for reaching into carcasses and their large body size and efficient soaring flight enables them to travel long distances to search for scarcely distributed carcasses (Mundy *et al.* 1992; Ruxton and Houston 2004; Lerner and Mindell 2005).

For millennia vultures and humans have had a very close relationship due to the influence of farming and hunting activities on the distribution and availability of domestic livestock and wild ungulate carrion upon which vultures depend for food (Mundy *et al.* 1992; Moleon *et al.* 2014). Consequently, the distribution, size and behaviour of vulture populations have changed over time in response to changes in land use practices and food availability, which often occur over a relatively short period of time (Dupont *et al.* 2011; Margalida *et al.* 2011; Margalida and Ogada 2018). Severe, sometimes sudden, decreases in the availability of carcasses for vultures are the main cause of these rare cases of griffon vultures feeding on live, incapacitated animals, the patterns, trends and causes of which are discussed below.

Patterns, trends, underlying causes and impacts of vulture-livestock incidents in Europe:

Recent publications have provided in-depth descriptions of how changing land use practices have affected the availability of carrion for vultures, and the subsequent impacts on their populations and behaviour (Cortés-Avizanda *et al.* 2015; Margalida and Ogada 2018). After wild ungulate populations were reduced across much of Europe, domestic livestock became the main food source for vultures, making them particularly sensitive to changes in land management practices (Margalida and Ogada 2018). Vulture populations were drastically reduced as farming



systems became more intensive, the availability of domestic livestock carrion decreased and carnivorous animals, including vultures, were intentionally killed to remove the perceived threat to livestock (Cortés-Avizanda *et al.* 2015). However, since the latter half of the twentieth century, improved legislation and widespread, intensive conservation efforts have resulted in the recovery of many vulture populations (Margalida and Ogada 2018), including a 200% increase in the griffon vulture population in the Iberian Peninsula and other regions of Europe in the last 30 years (Margalida *et al.* 2014).

Since the 1990s, however, there has been an apparent increase in reports of presumed injury or killing of livestock by griffon vultures, particularly in Spain and France, which has stimulated concern and negative perceptions of vultures among the farming community, often driven by misinformed and misdirected media coverage (Choisy 2013; Margalida *et al.* 2014). Such incidents, although rare, are not new, however, with historical reports of vultures eating animals that were not yet dead dating back more than 200 years (Mundy *et al.* 1992). These historical incidents nearly always occurred when there was a severe shortage of carrion in the wider landscape, and when the animals were wounded, sick or trapped and unable to move, particularly during the birthing period (Mundy *et al.* 1992).

Recent research has shown that similar conditions gave rise to the contemporary incidents in Spain and France, with a combination of a sudden decline in carrion availability and unsuitable animal husbandry methods being the main causative factors (Margalida *et al.* 2014; Duriez *et al.* 2016), discussed further below.

It is important to note that although the number of *reported* incidents of vultures killing or injuring livestock has increased in parts of Spain and France, particularly in areas with high densities of livestock and griffon vultures, a large proportion of these cases could not be confirmed during investigations by relevant authorities (Arthur and Zenoni 2010; Margalida *et al.* 2014; Duriez *et al.* 2016). For example, although reported incidents have increased over time in northeast Spain, on average 69% of cases were rejected each year due to a lack of evidence (Margalida *et al.* 2014), and in southern Spain only 10-20% of incidents were accepted (Junta de Andalucía 2003-2007). Similarly, in the Grands Causses in France, although the number of reported cases increased over time, the proportion of cases confirmed by necropsies was low (<10%) and remained rare (~2 cases per year out of >3,000 carcasses) and stable over time (Duriez *et al.* 2016). For the majority of reported cases it is likely that vultures were feeding on animals that had very recently died, but the people that discovered vultures feeding on the carcasses incorrectly implicated them as the cause of death (Margalida *et al.* 2014).

A key point from the existing analyses is that confirmed incidents of griffon vultures injuring, killing or consuming live animals remain very rare when compared to the total number of livestock in a given region. For example, in northeast Spain, although there were more than 200 confirmed incidents in some years between 2007 and 2010 (but less than 100 reports per year before 2006; Figure 1), this is a very small proportion of the estimated population of 709,294 cows, 3,236,333 sheep, 109,118 goats and 24,772 horses (total = 4,079,517 head of livestock) (Margalida *et al.* 2014). Similar patterns are reported from elsewhere, including during the peak reporting period in the Pyrenees (2007-2009) when vultures were involved in only 6-7% of mortality cases of cattle, and none for goats and sheep (Arthur and Zenoni 2010).

Although these figures illustrate the rarity of such incidents and the limited economic impact at a local, regional or national scale, the impact at the level of individual farms and farmers must



be considered sensitively, particularly given that extensive farmers (where most of the incidents occur) often struggle to sustain their livelihoods due to rural abandonment, market pressures, increasing costs and lack of institutional support (Bernués *et al.* 2011). In order to reduce the likelihood of negative vulture-livestock interactions from occurring, it is first necessary to identify the main causative factors, which are discussed below and summarized in Table 1.

Firstly, the vast majority of historical and contemporary records of vultures feeding on live animals are associated with a sudden and/or sustained reduction in the availability of carrion in the wider landscape (Mundy *et al.* 1992; Margalida *et al.* 2014). The increase in reported incidents since the mid-2000s coincides exactly with the implementation of EU legislation (Regulations CE 1774/2002, 322/2003 & 830/2005) that prevented the deposition of livestock carcasses in the open in response to the BSE crisis, resulting in an 80% reduction in the number of carcasses available to vultures in some areas (Cortés-Avizanda *et al.* 2010), with significant demographic and behavioural implications (Zuberogoitia *et al.* 2010; Margalida and Angels Colomer 2012). The number of reports of vulture-livestock incidents suddenly increased in the years afterwards, supporting the suggestion that food shortage was a causative factor (Arthur and Zenoni 2010; Margalida *et al.* 2014).

Secondly, changes to animal husbandry practices are likely to have left livestock that are sick, injured or giving birth unattended more frequently unattended and vulnerable to dying in the open or being predated (Margalida *et al.* 2014). Declines in traditional shepherding and livestock herding practices have occurred across much of Europe due to rural abandonment depleting the labour force and economic pressures limiting the sustainability of extensive farming systems (Bernués *et al.* 2011). This has probably resulted in interactions between vultures and debilitated livestock more likely because herds tend to be more free-roaming, are checked less frequently and are less likely to be guarded by shepherd dogs which would have been used traditionally (Margalida *et al.* 2014; Moreira-Arce *et al.* 2018). Correspondingly, nearly all of the historical and contemporary records of vulture-livestock interactions involve incapacitated livestock, with the majority of reports occurring during the peak birthing periods (Mundy *et al.* 1992; Arthur and Zenoni 2010; Choisy 2013; Duriez *et al.* 2016), with 36% of the incidents in northeast Spain associated with birthing (Margalida *et al.* 2014).

In order to minimize the risk of vultures attempting to feed on incapacitated livestock a series of measures (summarized in Table 1) can be implemented to address these two causative factors. Broadly these involve improving and restoring traditional livestock management practices; increasing the availability of carrion in the wider landscape and increasing awareness of the ecological role, behaviour and socio-ecological importance of vultures. For example, the economic and environmental benefits of the carcass disposal service that vultures provide have been demonstrated (Morales-Reyes *et al.* 2015; Buechley and Şekercioğlu 2016), and potential opportunities through ecotourism in rural areas are yet to be fully exploited (Cortés-Avizanda *et al.* 2015).

Finally, standardized investigative procedures must be implemented so that the media can report on suspected incidents using scientific evidence rather than speculation, reducing the risk of misinformed and misdirected reporting and the negative consequences for vultures and the wider socio-ecological system. This will become increasingly important with the return of apex predators to rural Europe and the associated risks for vultures (Pauli *et al.* 2018).

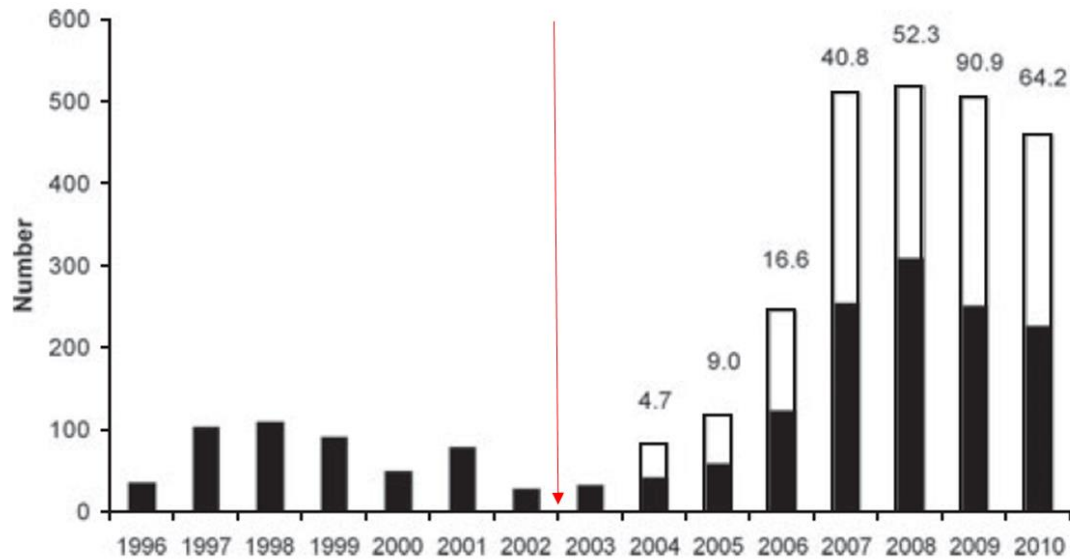


Figure 1. Changes in the number of reported griffon vulture-livestock incidents in north-east Spain between 1996 and 2010. Data on the proportion of accepted complaints (white bars) were not available before 2004. The cost of compensation (1,000s EUR) is shown above the bars. The red arrow indicates the first year that EU legislation was implemented to prevent the abandonment of livestock carcasses, reducing the availability of carrion for vultures. *Adapted from Margalida et al. (2014).*



Table 1. Factors that might contribute to rare incidents of griffon vultures feeding on live animals, and solutions to minimize the risk of such incidents occurring and to reduce the development of misinformed negative perceptions of vultures.

Contributing Factors	Solutions
1. Unattended animals in open fields are injured, sick or giving birth and unable to move.	<ul style="list-style-type: none"> • Daily checks of livestock herds especially during birthing periods. • Treatment and/or housing of sick or injured animals. • Close attendance of animals during and after difficult birthing cases. • In some cases, removal of afterbirth (placenta) to discourage the arrival of vultures and/or other carnivores.
2. Limited capacity for active shepherding or regular checking of livestock.	<ul style="list-style-type: none"> • Investigate the use of traditional shepherd dogs to guard livestock (supported by conservation NGOs if necessary). • Investigate the possibility of volunteer shepherds (e.g. from conservation NGOs) to check livestock herds, especially during birthing periods. • Government/municipal authorities to visit farms more frequently in areas of relatively frequently reported incidents, especially during birthing periods. • Request other farmers in the area to assist with shepherding duties, especially during birthing periods (e.g. through vulture-friendly farming networks, see below).
3. Reduced carrion availability for vultures in the wider landscape.	<ul style="list-style-type: none"> • Establish a stable, unpredictably distributed, uncontaminated* supply of carrion by modifying legislation to allow for the abandonment of livestock carcasses in rural areas. • Promote and support (financial, logistical) of traditional extensive livestock grazing systems and shepherding practices at local, regional, national and continental scales. • Permit and promote the abandonment of hunting waste from animals that were hunted with non-lead ammunition.
4. Lack of awareness of the ecology of vultures and the ecosystem services that they provide.	<ul style="list-style-type: none"> • Establish vulture-friendly farming networks, led by farmers, to increase knowledge of the ecology and role of vultures and promote suitable animal husbandry methods. • Target “hotspots” of potential negative vulture-livestock incidents for educational and awareness-raising campaigns to reduce negative perceptions of vultures (led by conservation NGOs and/or farmers).
5. Misinformed, misdirected and sensationalized media coverage.	<ul style="list-style-type: none"> • Distribute educational materials relating to vulture ecology and feeding behaviour to media organisations. • Encourage responsible, evidence-based reporting by media organisations by emphasizing and illustrating the potential negative impacts on vulture populations, and the socio-ecological impacts, of misinformed and misdirected coverage.
6. A lack of evidence to accept or reject claims that vultures have caused injury or death of livestock.	<ul style="list-style-type: none"> • Relevant authorities and agencies to implement rigorous, standardized procedures to investigate all reports of vulture-livestock incidents, including necropsies by qualified veterinarians or equivalent. • Records and dossiers of reported incidents are independently assessed and reported on a regular basis (at least annually).

*Carrion must be free of veterinary drugs, lead ammunition etc – refer to legislation referring carcass deposition [Ref to relevant EU regulations].



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