

Note

MANAGEMENT AND CONSERVATION OF WOLVES IN ASTURIAS, NW SPAIN: IS POPULATION CONTROL JUSTIFIED FOR HANDLING DAMAGE-RELATED CONFLICTS?

Alberto Fernández-Gil*

Estación Biológica de Doñana (Consejo Superior de Investigaciones Científicas), Department of Conservation Biology, C/ Américo Vespucio s/n, Isla de La Cartuja, E-41092 Sevilla, Spain

1. Introduction

Lethal control of large carnivores as a tool to minimize losses on stock and to handle conflicts associated to depredation is a highly controversial issue, moreover when performed by culling the population rather than directed to specific individuals. Lethal control rationale looks to handling problems (e.g. damages) after these are identified, although quantitative evaluations of its effects are uncommon (Treves and Naughton-Treves, 2005). Indeed, lethal control by culling populations of apex carnivores, such as wolves, can lead to environmental costs (e.g. overgrazing by increases in herbivores densities, mesopredators release) through cascading trophic effects (Estes et al., 2011). Such a background leads to the need of deeply justify any lethal control program of large carnivores, and carefully evaluate its effects, particularly if the intended goal is to cull a population. In this contribution we discuss about the correlates between the numbers of wolves killed in control operations

on a wolf population in Asturias, NW Spain and the number of damages on stock, and therefore, discuss on the potential justifications to perform control operations at a population level.

This contribution is conceived as an outline of a chapter in the author's Ph.D. dissertation (Fernández-Gil, 2013), available at: <http://hdl.handle.net/10651/17711>; furthermore, some additional references and comments have been included for this contribution. Data came from the public agency responsible for wolf management and conservation, Consejería de Agroganadería y Recursos Naturales, within Autonomous Government of Asturias (NW Spain), and refer to numbers of confirmed wolf packs, numbers of wolves killed in population control operations, and to statistics of verified and compensated damages.

Asturias autonomous region (10,000 km², Fig. 1) spans along the Cantabrian Mountains and holds about 30 wolf packs, i.e. around 10% of the Iberian wolf population (Álvares et al., 2005). Autonomous Government of Asturias approved in 2002 a Wolf

*Corresponding author: albertofg@ebd.csic.es

Management Plan (Decree 155/2002) and informed yearly an advising Technical Committee on data and actions performed or planned to the concerned wolf population. Main management actions implemented through the Plan are: 1) an ex-post compensation scheme for damages after field verification by official rangers; and 2) annual lethal control programs (hereafter, culling) of the wolf population to minimize and to prevent damages to livestock, and to handle the so-called social conflict. Around 40% of the wolf range in Asturias lies within Natura 2000 (Habitats Directive 92/43/EEC) although the population is subject to lethal control elsewhere, including Picos de Europa National Park (PENP). PENP encompasses 670 km² of mountain landscape, with most of its surface in Asturias terri-

tory, and it is the sole national park in Spain with resident wolf packs.

Asturias administration implemented different levels of wolf culling each year, after the approval of annual programs of population control (sic; “programa anual de control de la población de lobo”, in Spanish). Culling is spread among seven zones following a priori three criteria: a) wolf abundance, i.e. number of packs; b) amount of damages; and c) intensity of social conflict. Each zone averaged about 1,000 km², and co-management with PENP authority is included in one of the zones (Fig. 1). The data discussed in this contribution referring to wolf abundance and damages statistics are thus official data; those that are used by the responsible agency to manage the wolf population.

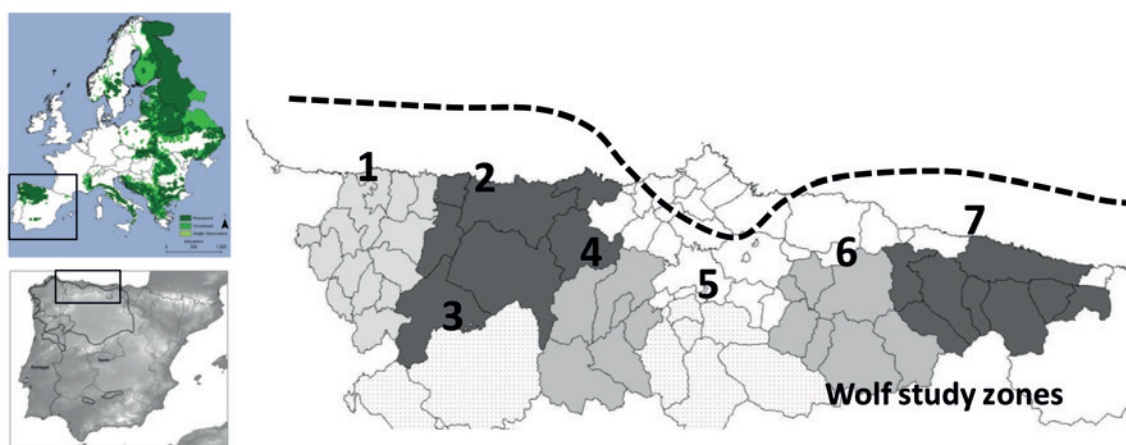


Fig. 1. Study area in Asturias (Cantabrian Mountains, NW Spain) showing wolf range (dashed line, around 7,000 km²) and seven zones, following Asturias Wolf Management Plan. Zone 7 includes Picos de Europa National Park.

2. Wolf population, damages to livestock and compensations

In Asturias, numbers of confirmed packs during 2003–2010 averaged 29 every year and did not show any significant trend during that period (exponential growth rate, $p > 0.1$). In Asturias, more than 400,000 heads of domestic stock (half of them bovine, but also horses, sheep and goats) are raised in a so-called extensive regime, that is, grazing in pasturelands and relatively unattended. Annual percentage of livestock, all species combined, affected by wolf depredation in the period 2003–2010 averaged 0.7%. Annual number of heads affected by wolf depredation averaged 2,951

heads/year in that period, resulting in an average of 700,000 €/year paid as compensations during the same period. About 45% of the affected animals were horses, which are largely kept unattended year round.

In the PENP, wolf packs numbers ranged 3–6 every year in the period 2003–2012 (Table 4.8 in García et al., 2011; and table 2.53 in García et al., 2013a), and did not show any significant trend (exponential growth rate, $p > 0.1$). In the PENP, there are about 20,000 heads of livestock, and losses by wolves were estimated as 0.3% of heads present, which resulted in 19,000 € paid as compensations for all losses in the park in 2008 (Rivas et al., 2011).



3. Lethal population control and correlates with damages

In Asturias, the average number of wolves culled in population control programs every year was 15 in the period 2003–2010 (range = 6–23 wolves killed every year). The number of culled wolves positively correlated with levels of losses to stock in the following year: more wolves killed, more damages in the following year in a given management zone. Nevertheless, variability in damages associated to numbers of killed wolves the previous year was low for the same period ($R^2 = 0.14$); other factors were presumably playing stronger roles (e.g. husbandry of stock, although no data were available for analyses).

The number of killed wolves was strongly correlated with number of news about wolves featured in the regional media, which we used as a surrogate

of “social conflict”. Nevertheless, the management zone with more news published, which included the PENP (zone 7 in Fig. 1) suffered fewer losses in the regional context of Asturias: 41% of the news and 5% of the damages.

In the PENP, lethal population control was approved almost yearly because of the alleged increase in the wolf population, and to minimize damages to livestock. At least 32 wolves were culled in the PENP during 2001–2011, including several pregnant females and a complete litter of seven newborn pups in 2004. In august 2012, PENP authorities approved the culling of six wolves within two packs inside the park. With data provided by the PENP, García et al. (2013b) found some positive correlations between the number of killed wolves and the amount of damages afterwards, at a pack scale and with data for the period 2000–2011.

4. Are lethal control programs justified when performed at a population level?

As a highly controversial issue, lethal control of apex predators should be carefully justified (e.g. in scientific, technical, but also in ethical grounds), moreover if culling is performed at a population level. In the case of wolves, a highly social carnivore, culling of the population can lead to serious environmental effects, given their relevant role as keystone species (Wallach et al., 2009; Ripple et al., 2014). Therefore, it has been advised that only individual wolves should be targeted for lethal control in certain cases (Brainerd et al., 2006); otherwise, social disruption by population control can derive in demographical and behavioural effects (Haber, 1996; Wallach et al., 2009), with consequences on predation rates, including losses on stock, because of the complex dynamics of wolf-prey relations (Jedrzejewski et al., 2002; Vucetich et al., 2002). Indeed, lethal control of a wolf population does not necessarily diminish depredation on stock (Harper et al., 2007; Kroll et al., 2011) and may even have contrary effects.

Asturias Government and PENP authority have been culling the wolf population because of alleged high levels of damages to livestock. Moreover, in recent years they are also arguing population control of wolves with some so-called “biological criteria”, that is, because the current wolf population in Asturias and in PENP is resulting in presumed “disequilibrium” of wild ungulates populations, as it has been explicitly phrased in culling resolutions. Nevertheless, no metrics of such “disequilibrium” have ever been provided.

Although no significant trend in wolf abundance has been found, Asturias Government approved in late

2012 the culling of 66 wolves plus four litters during the next twelve months, from a total of 23 confirmed packs in the last available count from 2011. Although there are no empirical estimation of the population size, given that average winter pack size is around 4 individuals (see Fernández-Gil, 2013), such extraction may eventually derive in the collapse of the population. The prescribed culling effort for 2013 was four times higher than the annual average harvest quotas of 18 wolves proposed during 2003–2008. Indeed, the number of legally killed wolves in 2013 was 31, the highest toll in the last decade and doubling the annual average for the period 2003–2012.

The loss and reduction of populations of top predators have overarching impacts on ecosystems (Estes et al., 2011). Moreover, recent suggestions to improve or reinstate areas with functional densities of large carnivores are becoming urgent as encroachment of land continues (see e.g. Ripple et al., 2014). Population control of top predators may alter predator-prey relations and competition among apex consumers, and eventually destabilize ecosystems through trophic cascades; it can also have profound effects in predation rates, both in wild prey and on domestic stock. Yet, management of wolves in Spain by lethal population control operations is being justified to minimize damages to livestock without any evidences of such results, but also recalling on some so-called “biological arguments” (see above), although no metrics have ever been provided. It seems rather hard that some can be obtained, given robust and astounding evidences of the relevant role that functional densities of top carnivores have in ecosystems (Ripple et al., 2014) (Fig. 2).



Fig. 2. A wolf feeding upon the remains of a red deer *Cervus elaphus* freshly killed by the pack, while avian scavengers (griffon vultures *Gyps fulvus* and corvids) await for leftovers. Photo: Alberto Fernández-Gil.

Asturias administration has paid all verified damages by wolves in its territory during the last 25 years, through an ex-post compensation scheme that suffered no variations during that period. This coincided with the implementation of the Common Agricultural Policy (CAP), which subsidized every domestic head in Asturias and, complementarily subsidized the heads that were raised in Natura 2000 areas (Directive 92/43/EEC). For instance, in the PENP, where there are about 20,000 heads of livestock, in 2008 each breeder received in average 8,000 €, up to a total of 7.5 million € for all breeders in that year in the park; about 25% of those subsidies were provided by Natura 2000 programme. In 2013, an estimated 2/3 of the sector's total income rent in Asturias was provided by subsidies from the CAP. Regarding damages by wolves, all verified losses (i.e. those claimed and considered as probable or confirmed of being predated by wolves) were paid by the Asturias Government and PENP authorities, so costs of damages to stock owners are kept at a minimum. Nevertheless, during the last years and with strong vehemence in 2012 and 2013, spokesmen and stock associations have expressed in the mass media the “legitimate demand” of the complete extirpation of wolves within and around the PENP, a “justified” demand that received the support of farmers’ unions, several mayors in the PENP area, and deputies to the autonomous parliament.

In synthesis, we found that: 1) there are no evidences that lethal control programs of the wolf population in Asturias are minimizing wolf depredation on stock (i.e. so-called technical arguments are not met); 2) control of the population could hardly ever be justified with scientific (i.e. biological) arguments (e.g. Ordiz et al., 2013): wolves are key-apex-predators with relevant roles in ecosystems; 3) ex-post compensation schemes in Asturias are not currently facilitating wolf conservation (see e.g. Boitani et al., 2010 for similar findings elsewhere in Europe) neither minimizing conflicts related to losses by depredation; 4) programs in Asturias for culling the wolf population are implemented in virtual absence of actions on factors with presumably strong incidence in the vulnerability of prey (e.g. those related with the husbandry of stock); and 5) by definition, control of the population penalize individuals not involved in depredation on stock; this meant that ethical justification can hardly ever be met if the culling is performed at a population level.



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