

The precautionary principle and wind-farm planning: Data scarcity does not imply absence of effects

Scientific discussions such as that raised by Janss et al. (2010) in relation to our paper (Carrete et al., 2009) help to clarify issues in the field of wind energy planning, thus relegating non-technical issues that can potentially contaminate the debate. Janss et al. (2010) recognize the value of our work as the first large-scale assessment of wind farms on the population viability of an endangered species. However, these authors argue that (1) wind-farms in Andalusia (SE Spain) have been carefully planned, with wind-farm locations chosen on the basis of previous risk assessment studies (RAS), and (2) the mortality rate of Egyptian vultures used in our paper to develop the PVA analysis is a local phenomenon that cannot be extrapolated to other areas of Spain. We will try to briefly clarify these points, showing that they are based on outdated information suggesting that results and conclusions brought forth in our paper remain valid.

Janss et al. (2010) directly contradict what they advocate when, after arguing that the locations of wind-farms in Andalusia have been carefully planned, they recognize that the recent installation of a "huge new wind-farm" in 2004 in the area of Tarifa has resulted in high mortality rates for raptors. This shows that either the recommendations made in RAS are not met or, more reasonably, that studies conducted were not able to predict subsequent mortality. For example, the radius of 5 km used to assess risky zones for the Egyptian vulture in Andalusia is based on studies conducted two decades ago, while more recent analyses of radio-tracked birds indicate that the home range for this species can be much greater (average radii of 8 km). This value overlaps with the spatial distribution of fatalities affecting breeding birds (6.37–14.57 km; Carrete et al., 2009). Low predictive ability of RAS may also be mediated by: (1) the use of protocols counting birds at specific points during particular periods of time instead of considering changes in the spatial distribution of the whole population of sensitive species year-round, and (2) the unknown role played by factors such as atmospheric dynamics or the distribution of trophic resources in enhancing mortality rates under certain conditions. Janss et al. (2010) also propose that the mortality data of Egyptian vultures used in our PVA analysis "largely correspond to one particular wind-farm and might thus not represent a widespread scenario". Authors explain that in areas of northern Spain where densities of Egyptian vultures are very high compared to that of Cadiz (Carrete et al., 2009) "no studies have recorded collision mortality for this species". Both statements are incorrect and based on outdated data. The mortality of Egyptian vultures reported in our paper (from 2004 to 2008) has not been produced from one, but rather from three wind-farms, namely Tahivilla (one non-territorial individual, 2004), El Gallego (two non-territorial individuals, 2007), and La Herrería (two territorial individuals, 2008). Also supporting the fact

that our PVA models are not futile exercises in extrapolating a local event to the entire Spanish range of the species, we report at least eight records of death of Egyptian vultures at wind-farms from 2006 to 2009 in the northern range of the species (4 in Navarre, 1 in Castilla-León, 1 in Castilla-La Mancha, 1 in Valencia and 1 in Galicia; Consellería Medio Ambiente, Generalitat Valenciana, authors unpublished data). The absence of prior information may have been a consequence of the less intensive monitoring of this species and of mortality in wind-farms throughout Spain compared to Andalusia, as well as of the recent rampant increment in wind power in Spain (107% from 2004 to 2008; <http://www.portalenergia.es/noticias/2009/02>). Interestingly, compared to poisoning (assumed as the main cause of non-natural mortality for the Egyptian vulture in Spain), mortality at wind-farms is not negligible (reported deaths at wind-farms vs poisoning: Spain: 2.5 vs 18.5 ind/year, Andalusia: 1.2 vs 1 ind/year; Hernández and Margalida, 2009).

The growth of wind power is causing a greater and more widespread impact on long-lived birds highly sensitive to unnatural causes of mortality. The current framework is proving ineffective for planning, and the reality is that removing or reforming existing wind-farms is virtually impossible due to the absence of regulatory and flexible administrative mechanisms (only the activity of two parks in Spain have been paralyzed because of high mortality rates). In this scenario, we reaffirm the need for applying the precautionary principle to minimize the impact of wind-farms on populations of long-lived species. At the same time, we agree with Janss et al. (2010) about the need to more thoroughly study mortality factors in order to incorporate this knowledge into future planning.

References

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