The precautionary principle and wind-farm planning in Andalucía

Population Viability Analysis (PVA) is an appropriate, scarcely used tool to assess potential impacts on population dynamics of man-induced mortality. Therefore, the study of Carrete et al. (2009) is a valuable contribution to the assessment of the impact of wind-farms on birds due to collision mortality. Nevertheless, the results and conclusions presented by the article could create confusion about both the current environmental policy applied to wind energy developments in Andalucía (southern Spain) and the consequent predictions concerning existing wind-farms on a wider scale in Spain.

Once the first negative impacts of wind-farms on birds became evident in the mid 1990s, the planning of wind-farm projects in Andalucía (planning competency being its autonomous government) has been made with exceptional care. First, the project's location is evaluated considering all spatial environmental data available in the area (e.g. statutory protected areas, Important Bird Areas, nest sites, roost sites, rubbish dumps, pre-migratory settlement areas, eagle dispersal areas). A large amount of digitized data is available in Andalucía and rarely should a breeding site of an endangered bird species be overlooked in this phase of planning. Risk areas are established around breeding sites using a 'risk radius' based on available data of species' home ranges. In the context of Carrete et al.'s (2009) study this radius is 5 km for the Egyptian vulture *Neophron percnopterus* (Donazar, 1993). Nevertheless, aware that this is not a perfect tool, when a wind-farm project is planned in supposedly 'non risk' areas, a field study is conducted at the selected location, aimed at identifying local bird fauna and bird concentrations of any kind. Based on the data provided by the field study, the competent authority makes a decision about the environmental viability of the project. Additionally, as a rule, a monitoring program of environmental impacts is imposed on approved projects. No other types of developments potentially causing bird collision mortality (power lines, roads, antennae) are controlled this strictly.

Carrete et al. (2009) use mortality data provided by these imposed monitoring programs conducted at wind-farms in Andalucía between 2004 and 2008. The nature of these data is important because the study incorporates them in PVAs across Spain and so they fundamentally influence the main results and conclusions. Two aspects of these mortality data are not reported by Carrete et al. (2009) but should be considered. The first is that it is probably no coincidence that the distribution of fatalities (6–15 km) was greater than the risk radius for Egyptian vultures imposed by the Andalusian authorities (5 km). If other Spanish planning authorities do not impose such a 'no-go' radius then the distribution and level of fatalities may be different. The second aspect is that the mortality records largely correspond to one particular wind farm and thus might not represent a widespread scenario. In

2004 a huge new wind-farm was constructed in Andalucía (Tarifa, Cádiz). Up till then, the mortality rates known from the existing wind-farms in this area were similar or even lower than those found in other areas of Spain (Source: monitoring data Andalusian environmental authorities). Particularly, only 2 dead Egyptian vultures were found (in 1999 and 2004) in all existing wind-farms in about 12 years (over 450 turbines) versus 4 in the 250 turbines of the new wind-farm (2007 and 2008). Additionally, in spite of the fact that 40% of the vulture's territories in Northern Spain are located near wind-farms (Carrete et al., 2009), no studies have recorded collision mortality in this area (e.g. Lekuona and Ursúa, 2007). These rather scarce mortality data contrast sharply with those recorded in the new wind-farm at Tarifa, indicating that this farm may be a sink for the southern subpopulation of Egyptian vulture. Certainly this situation should be solved as soon as possible. The main challenge now is to understand why this wind-farm causes higher mortality than other farms in the same area (several located much closer to breeding sites), and why pre-construction field studies failed to detect this high risk.

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Guyonne F.E. Janss
Manuela de Lucas
Estación Biológica de Doñana,
CSIC,
c/Américo Vespucio s/n,
41092 Seville,
Spain
Tel.: +34 954232340; fax: +34 954621125
E-mail address: guyonne@ebd.csic.es (G.F.E. Janss)

D. Philip Whitfield
Natural Research,
Brathens Business Park,
Glassel,
Banchory,
AB31 4BY,
UK

Alfonso Lazo
Asistencias Técnicas Clave,
c/Progreso 5,
41013 Seville,
Spain

Miguel Ferrer
Estación Biológica de Doñana,
CSIC,
c/Américo Vespucio s/n,
41092 Seville,
Spain

Available online 2 March 2010